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ABSTRACT

Despite its potential social and economic benefit, innovation in legal services has to date received little academic attention. Drawing on the largest survey of legal services innovation ever undertaken (c. 1500 firms) this paper explores the strategic, resource and environmental drivers of service and delivery innovation among solicitors, barristers and other legal service providers. Adopting an activity-based approach, modelling emphasises the value of a structured and organised approach to innovation involving multi-functional working, promoting effective team-working, developing in-house research capability, having a leadership team committed to innovation and having strong external relationships. Relationships with suppliers and professional associations, for example, contribute positively both to idea generation and transformation. Non-lawyer ownership also has positive impacts on innovation also influencing both idea generation and transformation. Regulatory effects on innovation prove relatively weak, and we find little evidence of competition effects on innovation, suggesting perhaps that de-regulation in the sector has some way to go if market forces are to operate effectively.

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Keywords: Innovation; legal services; value chain; regulation

JEL Codes: O31, O33, K40

CONTENTS

INTRODUCTION

The legal services sector, which include the activities of solicitors, barristers and other legal professionals such as patent attorneys, conveyancers and will writers, plays an important economic and social role (Rickman and Anderson 2011). In economic terms, legal services play an 'enabling' role ensuring fair competition and enforcing property rights and contractual compliance (Legal Services Board 2011). In social terms, legal services are important in addressing criminality, and ensuring the maintenance of domestic and human rights. Fundamentally, however, legal service provision shares many of the standard attributes of services - i.e. their intangible nature, inseparability, and extensive inter-activity between client and provider. In terms of the typology of service sectors developed by Miozzo and Soete (2001), legal services is characterised by the same type of buyer-supplier relationships as other 'specialised suppliers' of services (e.g. information technology) but differs from many similar sectors by being subject to more extensive regulation.

Despite its importance, innovation in legal services has to date received little attention with the sector being largely ignored in other studies of service innovation (Rickman and Anderson 2011; Tilly 2013). Economic benefits may arise from more rapid and cost-effective legal service provision, while social benefits may arise where legal services are more accessible or available at lower cost. From a public finance point of view legal services innovation may also be important in reducing the costs of legal aid or other aspects of the justice system (Legal Services Board 2012). Some de-regulation designed to stimulate innovation has taken place in the UK sector following the Legal Services Act of 2011 and internationally, with some evidence of cost reductions (Engstrom 2013; Johnson, Yazdi, and Gelb 1993) and service improvements (Parker, Gordon, and Mark 2010; Roper et al. 2015). However, we have little understanding of the impact of these regulatory changes on the nature of competition and/or business structures in the legal service sector and how any changes might be influencing firms' innovation activities. Here, we draw on the first large-scale survey of innovative activity in legal services to

provide detailed insights into the distribution and nature of innovation activity in this sector. Our approach, designed to avoid potential issues caused by service sector heterogeneity, complements the more cross-sectoral approaches adopted by Asikainen (2015) for example, and responds to the call from Menor et al (2002) for more in-depth analysis of single types of service innovation activity.

The lack of prior research on innovation in legal services suggests that our study might be regarded as 'exploratory'. However, it extends the literature on service innovation which has alternatively seen service innovation as the result of the assimilation of technology by service businesses (Madeira Silva et al. 2014), demarcated due the peculiarities of service industries or as something which can be readily integrated or synthesised with studies of manufacturing innovation (Carlborg, Kindstrom, and Kowalkowski 2014; Madeira Silva et al. 2014). More recent empirical studies have tended to adopt this latter approach with Pires et al (2008), for example, using the same set of determinants to explain innovation outputs in manufacturing and services firms in Portugal over the 1998 to 2000 period. They conclude, despite significant sectoral heterogeneity in their study, that manufacturing and service innovation are 'not so different and support the integrative approach' (Pires, Sarkar, and Carvalho 2008, p. 1355)[1]. More specifically, they find levels of innovation activity which are broadly similar in manufacturing and services and, more importantly, commonalities in the determinants of innovation outputs such as the positive effects of intermural and extramural R&D and firm size and the negative effect of business vintage[2]. This commonality suggests our starting point which is the innovation value chain, an activity-based approach to modelling firms' innovative activity which has been used previously to model both

[1] The similarities and differences between the innovation processes of manufacturing and services firms have long interested innovation scholars (Carlborg, Kindstrom, and Kowalkowski 2014; Ettlie and Rosenthal 2011; Castellacci 2008; Pires, Sarkar, and Carvalho 2008).

[2] More recently Mina et al (2014) have adopted a similar synthesis or integrated approach applying the same measurement framework to assess the determinants of openness in innovation in UK manufacturing and services firms.

manufacturing (Roper, Du, and Love 2008) and services firms' innovation behaviour (Love, Roper, and Bryson 2011).

We pay particular attention to aspects of work organisation in innovation. It is generally recognised that professional service firms (PSFs) gain competitive advantage principally by exploiting their intangible knowledge assets: this in turn often involves teamwork and the sharing and combining of knowledge within the firm (Fu 2015). We therefore put particular emphasis on the role of team-working and multi-functional working, and on the leadership processes in place for encouraging innovative practices, issues which are rarely considered in detail in large-scale surveys.

Inter alia our study therefore provides evidence of whether models of innovative behaviour, which envisage innovation as a structured business process linked to strategy and undertaken systematically and consistently, can usefully be applied to a highly regulated and conservative service activity. Or is it the case, as some writers have suggested, that (legal) services innovation an inherently informal, unsystematic and ad hoc activity (Leiponen 2005; Ettlie and Rosenthal 2011)? Our study also contributes to methodology by exploring the value of a 'deep dive' approach to profiling innovation activity in a tightly defined sector, an approach which may be of interest to regulators and/or industry lead bodies with a focussed sectoral mission.

CONCEPTUAL FOUNDATIONS

Innovation in services – an activity based approach

Service activity is characterised by 'bidirectional knowledge exchange with suppliers and customers acting as co-producers, a dynamic disposition of resources (people, technology, organisations and shared information) that creates and delivers value between service provider and customer' (Hidalgo and D'Alvano 2014, p. 699). This emphasises the networked, iterative and open nature of innovation in services with the potential for customers to play a lead role in identifying market needs with positive

implications for innovation quality (Jespersen 2010). Definitions of 'innovation' itself vary, but generally stress the commercialisation of new knowledge or technology to generate increased sales or business value. The US Advisory Committee on Measuring Innovation, for example, defines innovation as: 'The design, invention, development and/or implementation of new or altered products, services, processes, systems, organisational structures or business models for the purpose of creating new value for customers and financial returns for the firm' (Advisory Committee on Measuring Innovation in the 21st Century Economy 2008, p. i). Implicit in this – and other similar definitions such as that used in the OECD Oslo Manual - is the notion of innovation as a technological rather than a business process, a view driven largely by the manufacturing focus of many innovation studies.

Increasingly, this position is being re-evaluated even in terms of manufacturing, but in services there is a recognition that 'technological innovation is by no means the only field in which service firms innovate … over time there has been a shift from the focus on binary frameworks towards frameworks that recognise a wider range of different types of innovation' (Vergori 2014, p. 147). Definitions of service innovation therefore tend to be more general, reflecting novelty and commercialisation rather than new technology. In their recent review of the service innovation literature, Carlborg et al. (2014), for example, refer to the definition suggested by Barcet (2010, p. 51) that service innovation 'introduced something new into the way of life, organisation timing and placement of what can generally be described as the individual and collective processes that relate to consumers'.

Successful innovation in both manufacturing and services involves a number of diverse activities from opportunity recognition and ideation to commercialisation (Carlborg, Kindstrom, and Kowalkowski 2014). For example, Hidalgo and D'Alvano (2014) adopt a five-fold distinction – scan, focus, resource, implement and learn – in their examination of the organisation of service innovation activity in Venezuela. Love et al. (2011) suggest a less specific breakdown dividing the innovation process into

three activities reflecting knowledge acquisition, transformation and commercialisation. Each of these activities requires different resources and capabilities, which may imply different patterns of investment and external relationships. Patterns of engagement with external partners such as customers may also differ between activities and between different types of innovation activity (e.g. service v delivery, incremental v radical). Jespersen (2008), for example, identifies five different modes of customer engagement - first buyers, requesting, launching, pioneering and lead users – each of which delivers different value and engages with different elements of an innovation process.

The potential value of partnering will also differ depending on firms' innovation objectives (Shenkar 2010; Schnaars 1994; Bolton 1993). New to the market innovation may, for example, create first-mover advantages for the innovating firm. These may lead to higher returns from a desirable and unique service but may also have other advantages in terms of helping the first mover to learn rapidly about the markets and build brand loyalty among customers (Kopel and Loffler 2008)[3]. Such innovation also involves greater risks reflecting the technological complexity of the project as well as commercial concerns about sales, profitability and potential competition (Keizer and Halman 2007; Roper, Du, and Love 2008; Cabrales et al. 2008; Astebro and Michela 2005). Moreover, in highly regulated sectors such as legal services, new to the market innovations may also face regulatory risk, where innovators face uncertainty whether new developments may contravene regulation, potentially leading to more incremental innovation strategies due to regulatory-risk aversion (Eichler et al. 2013; Sass 1997). Avoiding such risks may potentially lead to more incremental innovation strategies due to regulatory-risk aversion,

[3] A key issue for innovators in any market place, however, is their ability to sustain their position of market leadership. In some sectors – biotechnology or engineering – this may involve formal strategies such as patenting to protect intellectual property; in other sectors more strategic approaches may be adopted such as frequent changes or upgrades to product or service design. Aggressive pricing also provides a way in which market leaders may protect any first mover advantages (Ulhoi 2012).

particularly where regulation is ambiguous or regulators are unable or unwilling to provide guidance on potential liabilities.

Imitation based strategies focussed on new to the firm innovation may also have the potential for 'second mover advantages'. Perhaps the key advantage for imitators is that the market leader has already taken much of the uncertainty out of the initial product or service introduction. On the supply side this may mean that the imitator can copy, emulate or reverse engineer the service design or delivery of an innovator. On the demand side, the imitator can learn from the innovator about consumers' appetite for a particular product or service and what consumers are prepared to pay. The imitator's problem, however, is not always simple as they try to establish a position in a market share in which there is already at least one established player (Ulhoi 2012). Second mover advantages can certainly occur at a firm level and there is some evidence – particularly in less dynamic markets such as legal services – that imitation may be a more profitable strategy than new to the market innovation (Lieberman and Asaba 2006)[4]. While introducing new services may face regulatory risks this is perhaps less likely where firms' innovation activity is focussed on upgrading the delivery of existing services (Rasiah, Gopal, and Sanjivee 2013). In highly regulated sectors such as legal services this might encourage firms to emphasise delivery innovation over more risky new service development.

The extent and value of openness in the innovation process, and differences in the type of partners with which services firms engage, will also depend on firms' boundary spanning capabilities and the openness of the decision makers leading or shaping the innovation process (Agrawal, Cockburn, and Rosell 2010; Jespersen 2010). Jespersen (2010) suggests

[4] Imitation – second-mover - strategies may provide individual firms with a less risky option than innovation. At an industry and social level, however, imitation can have either positive or negative effects. On the positive side imitation may help to maximise the social and consumer benefits of the original innovation by making products or services available to more consumers. Imitation may also have negative effects, however, by reducing the variety of products or services within a market and increasing the collective vulnerability to external competition (Lieberman and Asaba 2006).

that in scanning or ideation it is 'requesting users', in the development phases 'lead users', and at launch 'pioneering users' which provide the most valuable input. Effective partnering with users requires other corporate capabilities, however, with evidence that lead user openness positively moderates the impact of external users on innovation and may also contribute to the ability for firms to deal with larger cognitive distances (Jespersen 2010). In legal services this type of flexibility may be particularly important in terms of the adoption of non-traditional modes of governance such as Alternative Business Structures (ABS) which may also require different modes of management (Parker, Gordon, and Mark 2010). Different organisational and leadership approaches may also be necessary in the early exploratory and later exploitation stages of an innovation process (Rosing, Frese, and Bausch 2011).

Innovation and regulation

Elements of the regulatory environment have attracted significant attention in recent years spurring international initiatives such as the Ease of Doing Business Index and UK national initiatives to reduce 'red tape' and compliance costs. Regulation can be defined as: 'the legal and administrative rules created, applied and enforced by state institutions – at local, national and supra-national level – that both mandate and prohibit actions by individuals and organisations, with infringements subject to criminal, civil and administrative penalties' (Kitching 2006). Regulation is seen as necessary in a free market economy to protect property and consumer rights, ensure contractual compliance and prevent coercion and abuse of power. However, over regulation may inhibit or delay innovation, particularly where compliance is costly and time-consuming, e.g. in pharmaceuticals (Epstein 2013). Regulation may also place disproportionate costs on some groups of firms. For example, US commentary suggests that 'most of the professional writing on regulation examines the subject from the viewpoint of the large enterprise [while] numerous legislative provisions exempt small firms from regulatory requirements … a very substantial middle sector of American business is neglected in professional as well as public discussions of regulatory

matters' (Weidenbaum 1996, p. 1-2).

Regulatory activity is of three basic types: economic regulation designed to maintain market efficiency and competition; social regulations which aim to protect individuals and the environment; and institutional regulations relating, for example, to the labour market or intellectual property (Blind 2012). Where regulation imposes increased compliance costs on firms this will reduce the resources available for innovation and other business development activities. On the other hand, regulation may create incentives for innovation by reshaping markets or providing intellectual property protection. Blind (2012) considers studies of economic regulation and notes the rather ambivalent effects on innovation both in aggregate and in individual sectors. Evidence on the impact of social regulation – which includes that with an environmental focus - is more extensive, with a focus on the 'Porter Hypothesis' which argues that regulation may lead to innovation to reduce costs of compliance with positive implications for productivity. If this is the case, environmental regulation may be a win-win, ensuring environmental protection along with higher productivity (Porter and Van de Linde 1995). Both of the implicit linkages here (i.e. regulation to innovation, regulation to productivity) have been investigated extensively in terms of environmental regulation, and there is considerable evidence that environmental regulation may act as a stimulus for innovation – the so called weak Porter Hypothesis (Blind 2012). Evidence is more mixed for any regulation effect on productivity (Rubashkina, Galeotti, and Verdolini 2015). This mixed evidence has led to recent suggestions that innovative responses to regulation will depend on the capabilities of firms themselves, and that firms faced by regulatory barriers may co-ordinate or partner in order to develop innovative responses (Ford, Steen, and Verreynne 2014). Finally, institutional regulation also has no consistent effects on innovation with Blind (2012) summarising the effects of liability laws and intellectual property rights on innovation as 'ambivalent', bankruptcy law as 'negative' and employee protection laws as 'mostly positive'.

Traditionally, legal services regulation has been primarily 'social' designed to protect individual and corporate rights. More recently, however, there

has been a shift towards a more economic rationale for regulation (or de-regulation) designed to introduce more competition into the sector to reduce costs and stimulate innovation. Johnson et al (1993) , for example, examine the removal of the ban on advertising by lawyers in the US in 1977 and the subsequent impact on the proportion of deaths occurring without the individual making a will. They find a strong positive effect, suggesting that advertising did lead to an increase in the demand for legal services perhaps due to overcoming consumer uncertainty about the cost of completing a will. Other studies have suggested that advertising in the US may also have reduced legal costs for routine services but less evidence that in areas like personal injury it has had any significant effect on costs (Engstrom 2013). Other regulatory changes have focussed on the governance of legal services, designed to reduce barriers to entry and increase competition. Central to these changes has been the introduction of Alternative Business Structures (ABS) which allow ownership of legal services firms by non-lawyers and introduce more liberal capital structures. Evidence from Australia suggests that the adoption of ABS has encouraged better management in legal services firms, reducing legal complaints (Parker, Gordon, and Mark 2010), while UK evidence suggests that ABS adoption is associated with an increased probability of new service innovation (Roper et al. 2015).

The innovation value chain in legal services

In order to explore the innovation process in legal services we make use of the concept of the innovation value chain (Hansen and Birkinshaw 2007; Roper et al 2008; Love et al 2011), which conceptualises the innovation process as comprising three interlinked stages of knowledge generation and sourcing, through transforming this knowledge into new services, and finally the commercialisation of these new services leading to business growth. Since our main issue is with the determinants of innovation, we restrict ourselves to the first two phases of the IVC: knowledge generation and sourcing, and the transformation of knowledge into innovative products and services.

The legal services sector is a mature industry in which firms face intense and often complex regulation. Both factors have implications for the level of competition and innovative activity which may also be influenced by the relatively small scale of many legal service providers. As in other service sectors, innovation in legal services is also likely to be multi-dimensional – involving new service development alongside new or improved delivery processes. Legal service innovation is also likely to be characterised by strong interactive relationships between firms, their suppliers and customers. Successfully delivering innovation in the sector is therefore likely to require capabilities across the innovation value chain both in knowledge acquisition and ideation – identifying market opportunities and potential solutions – and the process by which knowledge is transformed into marketable delivery or service innovations.

The internal organisation of work practices and management is also a key issue for legal firms. Previous research suggests that the nature of the work organisation plays a key role in permitting professional service firms to become innovative: for example, in a study of accounting firms, Fu (2015) finds that two key elements of developing innovation in PSFs are relational routines and relational coordination. The former are routines that allow employees which allow colleagues to learn about each other and the organisation in which they work (Gittell 2001), especially important in project-based, multifunctional teams (Gardner et al 2012). Relational coordination involves clear communication and direction in terms of task-based relationships, again important in the task- and team-based relationships which are common in PSFs. Relational coordination therefore "builds role relationships among professional staff during their interactions and fosters the knowledge exchange and combination as well as the promotion, generation and implementation of new ideas for innovation." (Fu 2015 p 739).

The initial, knowledge acquisition stage of the IVC is typically the most interactive or open element of the innovation process in services with innovation collaboration with customers, competitors and professional associations common across a range of service sectors (Love, Roper, and

Bryson 2011). There is also strong evidence that multi-functional teams can contribute positively to service firms' knowledge acquisition capabilities (Love, Roper, and Bryson 2011), although this effect may be weaker in legal services where firms have tended to foster a culture of individual practice (Kabene, King, and Skaini 2006) and may discourage non-fee earning activities such as knowledge sharing (Terrett 1998). The ability of multi-functional teams and R&D activities to contribute to successful innovation also depends significantly on the business culture and organisation within which they are operating (Dackert, Loov, and Martemsson 2004). In a study on organisational culture within Australian law firms, for example, it was found that an organisational culture that motivates and fosters innovative behaviours among employees, along with showing an appreciation of and rewarding employees, positively influenced firm innovation and performance (Hogan and Coote 2013).

The process by which legal services firms translate knowledge- whether gathered from outside the firm or generated internally – into marketable innovations is the focus of the second stage of the IVC. Multi-functional working, team-working as well as external collaboration – encoding linkages – have all been shown to be important in this activity in services businesses (Love, Roper, and Bryson 2011), although again specific information on legal services is limited. Investments in knowledge creation and development through R&D have also proved important in previous studies of service innovation and may also be important in legal services firms' knowledge acquisition capabilities[5]. As with the knowledge gathering activity, the success of firms' knowledge transformation activities will also depend on the extent to which a firm's structures and culture are supportive

[5] Although research departments are not traditionally associated with law firms, the International Legal Technology Association (ILTA) recently awarded a 'Most Innovative Law Firm 2014 Award' to Seyfarth Shaw for the creation of a research department staffed by lawyers, project managers, technologists, and software developers. The research department was set up in 2012, and now comprises 35 staff. Outcomes from this department include: expert systems made directly available to clients, a legal management platform, and the capture of all client data to facilitate the movement from descriptive statistics to predictive data. Source: Hendersen, B., Ahead of the Curve: Three Big Innovators in *BigLaw*, in *The Legal Whiteboard*, W. Henderson, J. Lipshaw, M., and M. DeStefano, Editors. 2014.

of innovation. First, the importance of firms' innovation orientation which guides it in adapting, integrating and reconfiguring technological capabilities, managerial capabilities and resources endowment as necessary in order to maintain and enhance continuous innovation. Second, successful innovation requires that firms and managers provide clear and consistent signals to employees about the goals and objectives of the firm (Guan 2009), an important element of relational coordination (Fu 2015). SMT attitudes and decisions which are a function of their education, functional background, experience, and values may also influence firms' innovation (Smith 1994). Therefore, senior management team (SMT) composition may directly affect innovation strategy and resulting innovation outcomes (Talke, Salomo, and Rost 2010). A recent report highlights, for example, that 70 per cent of UK legal practices have non-lawyer management or a non-lawyer non-executive member on the management team even when they have not formally adopted an Alternative Business Structure (ABS)[6]. While non-lawyer involvement in law firms can create tensions, diversity in SMT can facilitate innovation. Third, clear signals and public recognition of employees' accomplishments serve to motivate other employees to greater effort in meeting the firm's objectives (Trice and Beyer 1984). A study of Australian law firms found, for example, that acknowledging and rewarding practices (such as, adoption of new practices and processes, implementation of new services, solving problems in a novel way and bringing new practices to the firm) positively influenced innovative behaviour and firm performance (Hogan and Coote 2013). Fourth, the importance of training employees to develop innovative products, services and processes has been widely appreciated by innovation scholars (Freel 2005). The legal services profession is also beginning to place more importance on developing staff (Tilly 2013). Skilled staff are often said to play a dual role in innovation – assisting firms with the development of new ideas inside the firm but also having greater absorptive capacity – i.e. the ability to identify, assess and appropriate

[6] Baker Tilly, *Legal Innovation 2013: New Developments in an Old Profession*. 2013

knowledge from outside the firm. R&D and design staff are often said to play a similar role in their specific functions (Griffith, Redding, and Van Reenan 2003).

DATA AND METHODS

The aim of our fieldwork was to provide a representative view of innovation across the whole of the legal services sector (including those activities regulated and unregulated under the Legal Services Act 2007) in England and Wales[7]. The survey covered a structured sample of regulated and un-regulated legal service activities provided by organisations whose *primary business* relates to the provision of legal services (see Annex 1)[8]. For barristers the unit of analysis was the Chamber rather than the individual barrister. Publicly available information which provides a list of Chambers was augmented with sample information provided by the Legal Services Board to create a comprehensive sampling frame. For solicitors sampling frame data was provided by the Solicitors Regulation Authority from their internal database which covers all regulated enterprises. For other legal service providers the sampling frame data was sourced from a commercial provider (Experian) and the sample was structured by employee sizeband. In the analysis responses are weighted to provide representative results.

The survey questionnaire was designed following a literature review and series of twenty exploratory case studies with legal service providers. The questionnaire was structured to reflect the activity-based structure of the IVC model with firms being asked separate question sets related to knowledge acquisition, transformation and commercialisation. The questionnaire was piloted using 'live' CATI interviewing over a 2 day period from 23rd to 24th February 2015 and involved 11 solicitors and 5 barristers'

[7] Legal regulation derives from the Legal Services Act 2007. Regulated activities include: patent and trade mark attorneys, notaries, legal executives, licensed conveyancers and cost lawyers. Un-regulated activities include: will writers, bailiffs, arbitrators, examiners and referees etc.

[8] This includes barristers' chambers, Solicitors and other legal service providers (OLSPs) including: patent and copyright agents, notaries, bailiffs, arbitrators, examiners and referees etc.

chambers. The aim was to make improvements to the script to ensure common understanding and/or help to ensure that as many of the individual circumstances of survey respondents were reflected and catered for within the questionnaire. Some wording changes were made to the questionnaire as a result of the pilot. The main issue highlighted, however, was one of questionnaire length. As a result some questions were dropped, options amalgamated and open ended questions were included for only a proportion of respondents. Fieldwork was completed on the 16th April 2015.

Our analysis is based on information provided by a single rater in each organisation with the dependent and explanatory variables derived from the same survey. Common methods variance is therefore a concern (Podsakoff et al. 2003). In the questionnaire design we use different scale types to reduce potential concerns and, wherever possible, randomise item lists to offset any cognitive biases. We also use multivariate statistical analysis and alternative dependent variables which use different scale types to reduce any related biases (Chang, van Witteloostuijn, and Eden 2010). Among those variables used in our final analysis principal components factor analysis identified 12 factors with eigenvalues greater than one which, in combination, accounted for 63 per cent of the sample variance. The single most powerful factor accounted for 21 per cent of the sample variance. A single factor model also fits the data poorly with RMSE of 0.125-0.135 and SRMR of 0.135-0.161. Both tests suggest that common method variance is unlikely to compromise our analysis.

Our main empirical analysis focuses on the first two stages of the IVC. In the first stage – knowledge acquisition – the dependent variable is the proportion of ideas sourced externally – which in other studies of business services has been positively linked to innovation success (Love, Roper, and Bryson 2011). Two strategy variables specifically targeted at knowledge acquisition are of particular interest here both of which we anticipate being positively related to the proportion of externally sourced ideas: multi-functional working and external knowledge sourcing partnerships (Love, Roper, and Bryson 2011). Also of interest is the coefficient on whether a firm is either wholly or partially non-lawyer owned,

reflecting diversity of background and experience in the firm's management team (Talke, Salomo, and Rost 2010). Offsetting these positive effects are the potential negative effects of regulation, legislation and resource constraints linked to finance, market opportunities or a lack of perceived collaboration opportunities (Hewitt-Dundas 2006).

The second stage of the IVC relates to the development of marketable innovations – knowledge transformation - taking into account the proportion of externally generated ideas (Love, Roper, and Bryson 2011). Here, we consider two alternative dependent variables: the percentage of firms' sales derived from innovative services; and, a percentage measure of the diversity of firms' innovation outputs (see Annex 2). In both cases we are interested in the effect of four strategy measures specifically targeted at the development of marketable innovations. These relate to research, multi-functional working, team-working and external partnerships with the intent of knowledge transformation. In each case we anticipate positive innovation effects. At the firm-level we are also interested in the impact of IT investments, non-lawyer ownership and the consequent diversity of the management team and the structures the firm has in place to support innovation (e.g. leadership, processes and rewards). External factors (competition, lack of expertise) may offset these positive influences. Descriptive statistics for each variable are shown in Table 1.

Each of our dependent variables are percentages and tobit estimation is therefore appropriate. We first estimate single equation models for each of the two IVC stages. This implicitly assumes that there is no simultaneity between the two elements of the IVC. Another possibility is that decisions made relating to the second stage of the IVC are conditional on the outcomes of the first stage and to model this sequential decision process we use the CMP module within Stata 13. This allows us to embed the tobit model for the percentage of external ideas within the models for innovative sales and diversity. The two estimation approaches provide a robustness test of the results.

EMPIRICAL RESULTS

The first stage of the IVC relates to the extent of openness in legal service providers' innovation activity, a factor which previous studies have suggested is important in determining service firms' innovation outputs (Love, Roper, and Bryson 2011). Estimation results are reported in Table 2 after eliminating some wholly insignificant variables. The results emphasise the importance of both activity-specific variables, firm-level factors, and a range of elements of the business environment. Two activity-specific variables prove important – multi-functional working and external connectivity. Both increase the proportion of ideas sourced externally. The positive impact of multi-functional working may relate to internal knowledge sharing and diffusion within each firm, which has been emphasised in the past as one of the key elements of implementing open innovation (Chesborough 2003). Perhaps unsurprisingly, having knowledge sourcing – exploratory – links to suppliers, customers, clients, professional associations and technology suppliers also increases the proportion of ideas sourced externally (Table 2). Notably perhaps the largest effects arise from links to customers and technology suppliers, reflecting previous studies which have noted the importance of customer input at the early stages of any service innovation process (Jesperson, 2010). More unexpected perhaps is the significant and positive role played by professional associations in helping legal service providers to access external ideas[9]. Previous studies have highlighted the potential role for professional associations in technology diffusion and stressed the importance of both size and penetration in assessing the potential impact of any given group (Newell and Swan 1995; Swan and Newell 1995). In the legal services sector membership of professional associations is almost ubiquitous perhaps explaining their positive and significant influence on the diffusion of new ideas (Table 2).

[9] Note however that organisations such as the Law Society have sponsored awards for Business Development and Innovation as part of their Excellence Awards initiative and supports a range of 'communities' for solicitors with particular demographic or practice characteristics. See for example: http://www.lawsociety.org.uk/support-services/events-training/excellence-awards/2014-winners/excellence-in-business-development-and-innovation.

At the firm level the most significant factor shaping the use of external ideas is whether or not the firm is lawyer or non-lawyer owned: firms which are fully or partially non-lawyer owned utilise a larger proportion of externally sourced ideas (Table 2). This is consistent with the results of Talke et al. (2010) who for a sample of US and European listed firms find that diversity in firms' top management team both shapes the orientation of firms towards specific types of innovation but also their subsequent success. Particularly interesting is the presence of this diversity effect along with that of multi-functionality in firms' innovation activity, two effects which have previously been shown to have positive complementarities (Auh and Menguc 2005). More generally this result also supports regulatory reforms adopted in the UK and elsewhere which, through the adoption of Alternative Business Structures, have allowed legal services providers to be owned by non-lawyers.

Environmental factors also prove important in shaping legal service providers' use of external ideas for innovation. Legislation and regulation have significant effects on legal services firms' use of external ideas with contrasting positive and negative effects. More general elements of the business environment such as a shortage of finance for innovation, market opportunities and a lack of collaborators also prove important (Hewitt-Dundas 2006), although the (positive) effects are the opposite of what might have been anticipated if these effects operate as resource constraints. This type of positive effect is, however, a general finding in the innovation literature, reflecting the endogeneity of the these constraints where firms are more strongly engaged in innovation rather than applying generally (Efthyvoulou and Vahter). It is therefore difficult to directly interpret these environmental effects as either enablers or barriers to innovative activity.

Estimating the second stage of the IVC – relating knowledge inputs to innovation outputs – also emphasises the importance of activity-specific, firm-level and environmental factors (Table 3). Here we use two alternative

dependent variables which reflect innovation success (i.e. sales) and the diversity of legal services firms' innovation activity. In both cases the proportion of external ideas used by the firm is positively and significantly linked to innovative outputs (Table 3), suggesting the value of openness in the initial stage of the IVC to subsequent innovation success. This reflects findings from other studies for the broader business services sector (Love, Roper, and Bryson 2011). By and large the activity, firm and environmental factors also have similar effects on both innovation output indicators although there are some notable exceptions.

Four activity-based variables prove important in determining legal services firms' innovative outputs. First, in-house research activity is positive and significant in both models reflecting the results of numerous other studies of innovation, even in services (Pires, Sarkar, and Carvalho 2008). This may reflect both the value of research activity in generating new ideas to drive service activity but also the contribution of research staff to the absorption of external knowledge (Griffith, Redding, and Van Reenan 2003). However, while Pires et al (2008), find a positive innovation effect from extra-mural research in Portuguese services we find a weak positive effect in terms of innovation diversity but a strong *negative* effect on innovation success (Table 3). Some care is necessary in the interpretation of this effect, however, as this may reflect the endogeneity of this variable as well as potentially substantive effects such as competition from previous research partners.

Multi-functional working and team-working both contribute positively to both innovation success and the diversity of firms' innovative output (Table 3). The significance of both variables suggest the value of structured processes for innovation, even in the context of a sector such as legal services. This point is re-emphasised by the strong positive effect of some of the firm-level strategy variables on innovation outputs, most notably the impact of effective innovation leadership and (for diversity of innovation at least) structured innovation processes (Table 3). Reward systems prove a less significant influence. Taken together, these results reinforce the findings of Fu (2015) on the importance of relational routines and relational

coordination in enhancing innovative practices in professional service firms. These positive elements of internal structure are, again, reflected in the value of external innovation linkages as legal services firms seek to transform knowledge into marketable innovations (Table 3). Interestingly, here rather different external connections prove important for innovation success (Table 3, Model 1) and the diversity of firms' innovation outputs (Table 3, Model 2). Links to professional associations contribute most positively to innovation success offset by a rather more surprising negative effect of partnering with customers[10]. For innovation diversity, links to regulators and technology suppliers prove most positive, again offset by a negative effect from customer linkages.

At the firm level, full or partial non-lawyer ownership again proves a positive and significant impact on firms' innovation activity as in the first stage of the IVC. More diverse ownership structures therefore appear to contribute to legal services firms' innovative outcomes through two mechanisms, increasing firms' openness to external ideas (Table 2), and the effectiveness of their knowledge transformation activities (Table 3). The significance of both mechanisms reinforces the value of more flexible ownership regulation in the sector (Parker, Gordon, and Mark 2010). It also reinforces earlier evidence of the significance of firms' strategic and organisational choices in terms of innovation and the value of structured rather than ad hoc innovation processes (Sundbo, 1997; Miles 2007, Leiponen 2001 and Leiponen 2005).

ROBUSTNESS TESTS

The potential endogeneity of the proportion of externally sourced ideas in the second stage of the IVC suggests the value of alternative estimation approaches which allow for this possibility. In Table 4 we therefore report conditional recursive mixed process (CMP) estimators following Roodman (2009, 2011). This flexible estimator allows us to embed a model for the

[10] In their analysis of innovation in UK professional services, Love et al (2011) find a not dissimilar pattern: linkages with customers have a markedly positive effect on sourcing external ideas, but a marginally negative effect on innovation outputs.

proportion of externally sourced ideas directly within the models for innovative sales and the diversity of innovation producing consistent estimators and efficient estimates which take into account both the bounded nature of the dependent variable and error co-variances. This approach which is consistent with the sequential logic of the IVC, essentially amounts to instrumenting the proportion of externally sourced ideas within the two innovation models with the validity of the instruments (i.e. the determinants of the proportion of externally sourced ideas) depending two conditions - their fit and a lack of correlation with any unobserved factors which may explain the innovation output indicators. We use the variable set from Table 2 to ensure consistency with the first condition. Here, $F(18,1348)=18.98$, well above the usual benchmark for weak instruments ($F>10$). No formal test is available to assess the validity of the second condition but a test of the joint significance of the set of variables from the first stage of the IVC in the second stage model suggests their weak direct influence ($F(13, 1260)=2.54$, $rho=0.0019$).

Table 4 reports the CMP estimates in detail and Tables 5 and 6 provide a symbolic summary of the single equation and CMP estimation results. The results prove strongly consistent in terms of both sign and significance with some minor variations. In particular, we continue to see strong positive links between the proportion of externally sourced ideas and firms' innovative output; research and external connectivity remain important in both stages of the IVC estimation; and, firm ownership also remains important in both IVC stages (Tables 5 and 6).

DISCUSSION AND CONCLUSIONS

Our analysis suggests five main conclusions. First, we find strong evidence that legal services firms implementing structured and organised processes are more successful in their innovation activity. These can be related to the key aspects of relational routines and relational coordination outlined by Fu (2015). Multi-functional working contributes positively to both increasing the number of externally sourced ideas utilised by legal services firms and the effectiveness with which these ideas are translated into new

marketable innovations. In terms of the second – knowledge transformation – stage of the IVC, multi-functional working is reinforced where firms value and adopt positive steps to promote effective team-working. In this stage of the IVC having a leadership team committed to innovation and open to exploring the potential value of new ideas from outside the firm also proves important. Finally, legal services firms' external relationships also prove important in both sourcing new innovative ideas and translating these into marketable innovations. Relationships with suppliers and professional associations contribute positively both to idea generation and transformation. The positive contribution of customers to the innovation process in legal services is predominantly early in the process with customer linkages becoming a negative influence in the knowledge transformation stage of the IVC.

The second finding relates to the role of research in driving innovation in services. This issue has been widely debated with some studies suggesting that it plays a less important role than in manufacturing and others, in the synthesis tradition, suggesting a more homogenous effect (Pires, Sarkar, and Carvalho 2008). Here, our evidence suggests a marked distinction between the positive contribution of in-house and negative effect of external research activity on the knowledge transformation process (Table 6). The effect of in-house research is, as anticipated, positive reflecting both the contribution of research staff to innovation and external knowledge absorption (Roper and Love 2002). The negative effect of external research activity is more unexpected with the possibility that this reflects knowledge leakage in collaborative research projects with negative consequences for firms' ability to benefit from future innovations (Frishammar, Ericsson, and Patel 2015). An alternative – non-exclusive - explanation for the negative effect of external research activity relates to the difficulty of managing external research projects which may distract managerial resources from other aspects of the innovation process (Laursen and Salter 2006).

Our third main result relates to the positive innovation effects of non-lawyer ownership which has a dual benefit – increasing legal services firms' utilisation of external ideas and the effectiveness of the knowledge transformation process. Although there is little comparable evidence from legal services these results are consistent with the generally acknowledged contribution of diversity to ideation as different perspectives contribute to and create novel responses (Harvey 2013). The positive impact of non-lawyer ownership on the effectiveness of the knowledge transformation process also reflects broader evidence related to the extent of innovation among firms with more diverse workforces and top management team composition (Talke, Salomo, and Rost 2010).

Fourth, and contrary to evidence from other sectors (Correa and Ornaghi 2014) we find little evidence that in legal services competition at either regional, national or international level is playing any significant role in stimulating innovation. This is, however, consistent with recent evidence for European banking (Tabacco 2015). More influential are specific barriers to innovative activity related to finance, expertise and a lack of potential collaborators, factors which are typical inhibitors of innovative activity in smaller firms (Hewitt-Dundas 2006). Finally, we find surprisingly weak differences between levels of innovative activity in solicitors, Barristers chambers and other legal service providers whether or not they operate in regulated or un-regulated sectors.

Our results have direct strategic implications for legal services businesses seeking to upgrade or develop their innovation activity. Broadening the ownership of the enterprise, ensuring that the business leadership adopts an 'open' attitude to new ideas, and putting in place structures to support team-working, boundary spanning links and multi-functional working all seem important. Investments in internal research capacity also have potential benefits for innovation outcomes. More generally our results confirm the value of a structured process for undertaking innovation in legal services, reflecting the emphasis on the importance of innovation and technology management in manufacturing firms. This raises questions about whether a wholly 'new' or specific conceptualisation of service

innovation is actually needed. Rather, our results are consistent with much of what has been written about the implementation of and capabilities necessary for inward open innovation (Chesborough 2003, 2006) and involve elements of the 'expertise-based' and 'turf-based' innovation pathways suggested by Anand et al. (2007)[11].

At a policy level the potential innovation value of legislation – such as that relating to ABS – is clear in facilitating more diverse ownership and financing structures. More significant perhaps is our evidence of the lack of any competition effect in driving innovation in legal services provision, and the lack of any significant difference in the level of innovative activity even in those sectors where legal service activities are 'unregulated'. This suggests the value of considering further legislative and regulatory changes which might encourage greater competition and potentially innovation.

[11] Anand et al (2007) define three pathways for service innovation: expertise-based where emergent knowledge is developed by a employees; turf-based, where new knowledge is developed in partnership with external agents; and support-based, where new knowledge is generated from firms' top-level goals and plans.

Table 1: Sample descriptives

	Obs.	Mean.	SD.
Dependent variables			
Proportion of ideas externally generated (%)	1426	6.185	15.361
Innovative sales (% of turnover)	1439	6.434	16.839
Diversity of innovation (%)	1429	29.379	28.153
Firm level regressor			
Research conducted in house (% firms)	1478	0.357	0.479
Research conducted externally (% firms)	1489	0.112	0.316
Invested in new IT (% firms)	1493	0.635	0.482
Employment in 2012	1496	41.731	161.568
Age of the enterprise (years)	1494	17.442	11.454
Non-lawyer owned (% firms)	1500	0.227	0.419
Facing regional competition (% firms)	1500	0.607	0.488
Facing national competition (% firms)	1500	0.302	0.459
Facing international competition (% firms)	1500	0.053	0.225
Leadership for new ideas in place (% firms)	1500	0.700	0.458
Processes for developing ideas in place (% firms)	1500	0.472	0.499
Rewards for developing new ideas in place (% firms)	1500	0.252	0.434
Lack of expertise – signif. barrier (% firms)	1500	0.125	0.331
Finance significant barrier (% firms)	1500	0.185	0.389
Market opportunities signif. barrier (% firms)	1500	0.143	0.351
Lack of collaborators signif barrier (% firms)	1500	0.072	0.259
Info demands by regulators (negative effect, % firms)	1500	0.156	0.363
Legislation (negative effect, % firms)	1500	0.072	0.258
Activity level regressors – K. sourcing			
Knowledge sourcing – suppliers	1500	0.117	0.322
Knowledge sourcing – clients	1500	0.211	0.408
Knowledge sourcing – competitors	1500	0.173	0.378
Knowledge sourcing – consultants	1500	0.127	0.333
Knowledge sourcing – professional associations	1500	0.141	0.348
Knowledge sourcing – accountants	1500	0.135	0.342
Knowledge sourcing – technology suppliers	1500	0.166	0.372
Multi-functional working – K. sourcing g (%)	1442	16.356	27.072
Activity level regressors – K. transformation			
Multi-functional working – K. transformation (%)	1442	15.702	25.587
Team-working – K. transformation (% firms)	1410	14.241	29.805
Knowledge transformation – suppliers	1500	0.074	0.262
Knowledge transformation – clients	1500	0.078	0.268
Knowledge transformation _– professional associations	1500	0.055	0.229
Knowledge transformation technology suppliers	1500	0.115	0.320
Knowledge transformation - regulators	1500	0.049	0.217

Table 2: Modelling external idea sourcing: Tobit

Dependent variable	% of ideas sourced externally
Activity specific variables	
Multi-functional working	0.167**
	(0.070)
Knowledge sourcing – suppliers	10.040**
	(4.737)
Knowledge sourcing – clients	32.309***
	(5.282)
Knowledge sourcing – competitors	10.975***
	(3.971)
Knowledge sourcing – consultants	5.98
	(4.331)
Knowledge sourcing – professional associations	10.928***
	(3.938)
Knowledge sourcing – accountants	4.451
	(4.331)
Knowledge sourcing – technology suppliers	22.460***
	(4.449)
Firm specific variables	
Non-lawyer owned	9.453**
	(3.827)
Environment variables	
Info demands by regulators (negative effect)	-6.128*
	(3.607)
Legislation (negative effect)	5.128*
	(3.004)
Finance significant barrier	5.914*
	(3.407)
Market opportunities signif. barrier	-4.949
	(3.735)
Lack of collaborators signif barrier	10.844**
	(5.461)
Controls	
Employment in 2012	0.016**
	(0.008)
Barristers' chambers	-4.208
	(5.560)
OLSPs (regulated)	-4.874
	(5.944)
OLSPs (un-regulated)	2.151
	(3.803)
Number of observations	1366
Pseudo R^2	0.234
Bic	1634.952

Table 3: Modelling innovative sales and diversity: Tobit

Dependent variable	(1) Innovative sales	(2) Diversity of innovation
Proportion of ideas externally generated	0.570***	0.372***
	(0.110)	(0.065)
Activity specific variables		
Research conducted in house	8.759**	12.125***
	(4.313)	**(2.156)**
Research conducted externally	-17.990***	1.623
	(6.131)	(3.066)
Multi-functional working – K. transformation	0.587***	0.500***
	(0.079)	(0.047)
Team-working – K. transformation	0.262***	0.119***
	(0.064)	(0.040)
Knowledge transformation – suppliers	13.547*	4.128
	(7.578)	(4.169)
Knowledge transformation – clients	-15.708**	-8.270**
	(7.463)	(4.003)
Knowledge transformation – Prof. Assoc.	25.785***	-1.757
	(8.638)	(5.446)
Knowledge transformation – Tech. Suppliers.	10.534	7.516**
	(8.033)	(3.647)
Knowledge transformation – Regulators	-8.657	12.750**
	(9.612)	(5.860)
Firm specific variables		
Invested in new IT	6.390*	7.932***
	(3.874)	(2.076)
Non-lawyer owned	8.340*	6.442**
	(4.488)	(2.608)
Leadership for new ideas in place	11.130**	12.013***
	(4.683)	(2.346)
Processes in place	1.497	4.236*
	(4.251)	(2.300)
Rewards In place	-1.527	3.847
	(4.452)	(2.548)
Environment factors		
Lack of expertise – signif. barrier	-4.407	3.207
	(4.858)	(2.967)
Facing regional competition	-2.825	6.678
	(13.070)	(5.470)
Facing national competition	11.349	5.117
	(12.916)	(5.518)
Facing international competition	7.691	-1.809
	(13.768)	(7.421)
Controls		
Employment in 2012	-0.045**	0.047***

	(0.022)	(0.014)
Employment in 2012 2	0	-0.000***
	(0.000)	(0.000)
Age of the enterprise	-0.303*	-0.165**
	(0.159)	(0.083)
Barristers' chambers	3.589	-9.768**
	(6.949)	(3.898)
OLSPs (regulated)	-1.72	-0.458
	(8.452)	(3.438)
OLSPs (un-regulated)	3.305	-2.311
	(4.590)	(2.686)
Number of observations	1299	1309
Pseudo R^2	0.125	0.096
Bic	2035.053	4390.319

Table 4: Combined models for sourcing external ideas and innovation: CMP models

	(1) Innovative sales	(2) Diversity of innovation
A. Models for innovation	b/se	b/se
Proportion of ideas externally generated	0.306**	0.433***
	(0.155)	(0.138)
Activity-specific variables		
Research conducted in house	9.366**	15.419***
	(4.298)	(3.578)
Research conducted externally	-17.312***	-5.462
	(5.886)	(4.585)
Multi-functional working – K. transformation	0.633***	0.772***
	(0.081)	(0.071)
Team-working – K. transformation	0.262***	0.259***
	(0.063)	(0.059)
Knowledge transformation – suppliers	14.250*	13.484**
	(7.374)	(6.214)
Knowledge transformation – clients	-13.740*	-13.570**
	(7.136)	(6.345)
Knowledge transformation – professional association	27.686***	4.134
	(8.491)	(7.235)
Knowledge transformation – consultants	1.124	12.885**
	(7.361)	(5.991)
Knowledge transformation – technology suppliers	9.721	13.520**
	(7.742)	(5.582)
Knowledge transformation – regulators	-7.804	5.966
	(9.147)	(8.193)
Firm-specific variables		
Invested in new IT	6.771*	7.415**
	(3.918)	(3.347)
Non-lawyer owned	9.377**	9.232**
	(4.532)	(3.978)
Leadership for new ideas in place	11.351**	12.125***
	(4.656)	(3.932)
Processes in place	1.7	5.141
	(4.233)	(3.712)
Rewards In place	-1.515	5.285
	(4.434)	(4.242)
Environment variables		
Lack of expertise – signif. barrier	-4.428	-2.707

	(4.799)	(4.938)
Facing regional competition	-3.101	4.623
	(13.115)	(9.006)
Facing national competition	11.455	9.168
	(12.958)	(9.002)
Facing international competition	9.066	7.808
	(13.912)	(11.279)
Controls		
Employment in 2012	-0.045**	0.001
	(0.021)	(0.020)
Employment in 2012 squared	0.000	0.000
	(0.000)	(0.000)
Age of the enterprise	-0.339**	-0.145
	(0.160)	(0.134)
Barristers' chambers	2.864	0.403
	(7.029)	(6.005)
OLSPs (regulated)	-2.583	0.21
	(8.648)	(6.710)
OLSPs (un-regulated)	3.27	0.282
	(4.627)	(4.196)
B. Models for Proportion of ideas externally generated		
Activity specific variables		
Multi-functional working	0.188***	0.182***
	(0.068)	(0.071)
Knowledge sourcing – suppliers	9.081*	9.615**
	(4.739)	(4.814)
Knowledge sourcing – clients	32.150***	32.426***
	(5.249)	(5.284)
Knowledge sourcing – competitors	10.508***	10.711***
	(3.910)	(3.968)
Knowledge sourcing – consultants	6.136	5.613
	(4.234)	(4.340)
Knowledge sourcing – professional associations	11.916***	10.754***
	(3.919)	(3.985)
Knowledge sourcing – accountants	4.524	4.269
	(4.213)	(4.291)
Knowledge sourcing – technology suppliers	22.356***	22.837***
	(4.356)	(4.525)
Firm specific variables		
Non-lawyer owned	9.854**	9.492**
	(3.920)	(3.873)
Environment variables		

Info demands by regulators (negative effect)	-5.834	-6.284*
	(3.588)	(3.631)
Legislation (negative effect)	5.253*	5.550*
	(2.980)	(3.001)
Finance significant barrier	6.336*	6.125*
	(3.410)	(3.432)
Market opportunities significant barrier	-3.481	-4.647
	(3.822)	(3.836)
Lack of collaborators significant barrier	9.146*	10.393*
	(5.419)	(5.573)
Controls		
Employment in 2012	0.017**	0.016**
	(0.008)	(0.008)
Barristers' chambers	-4.694	-4.679
	(5.546)	(5.610)
OLSPs (regulated)	-5.276	-4.953
	(5.921)	(5.956)
OLSPs (un-regulated)	1.789	2.14
	(3.897)	(3.845)
Number of observations	1366	1366
Equation χ^2	223.085	808.214
Bic	3674.894	3799.442

Table 5: Summary of estimation results for the proportion of externally sourced ideas

	Single Equation Tobit	CMP Innovative Sales	CMP Diversity of innovation
Activity specific variables			
Multi-functional working	+	+	+
Knowledge sourcing – suppliers	+	+	+
Knowledge sourcing – clients	+	+	+
Knowledge sourcing – competitors	+	+	+
Knowledge sourcing – consultants	(+)	(+)	(+)
Knowledge sourcing – professional associations	+	+	+
Knowledge sourcing – accountants	(+)	(+)	(+)
Knowledge sourcing – technology suppliers	+	+	+
Firm-specific variables			
Non-lawyer owned	+	+	+
Environment variables			
Info demands by regulators (negative effect)	-	(-)	-
Legislation (negative effect)	+	+	+
Finance significant barrier	+	+	+
Market opportunities significant barrier	(-)	(-)	(-)
Lack of collaborators significant barrier	+	+	+
Controls			
Employment in 2012	+	+	+
Barristers' chambers	(-)	(-)	(-)
OLSPs (regulated)	(-)	(-)	(-)
OLSPs (un-regulated)	(+)	(+)	(+)

Notes: Table is based on Tables 2, 3 and 4. '+' denotes a significant positive coefficient, '-' a significant negative coefficient, (+) an insignificant positive and (-)' an insignificant negative coefficient.

Table 6: Summary of estimation results for innovative sales and diversity of innovation

	Single Equation Tobit	Single Equation Tobit	CMP Estimator	CMP Estimator
	Innovative Sales	Diversity of innovation	Innovative Sales	Diversity of innovation
Proportion of ideas externally generated	+	+	+	+
Activity-specific variables				
Research conducted in house	+	+	+	+
Research conducted externally	-	(+)	-	-
Multi-functional working – K. transformation	+	+	+	+
Team-working – K. transformation	+	+	+	+
Knowledge transformation – suppliers	+	(+)	+	+
Knowledge transformation – clients	-	-	-	-
Knowledge transformation – professional assoc.	+	(-)	+	(+)
Knowledge transformation – tech. suppliers	(+)	+	(+)	+
Knowledge transformation – regulators	(-)	+	(-)	(+)
Firm-specific variables				
Invested in new IT	+	+	+	+
Non-lawyer owned	+	+	+	+
Leadership for new ideas in place	+	+	+	+
Processes in place	(+)	+	(+)	(+)
Rewards In place	(-)	(+)	(-)	(+)
Environment variables				
Lack of expertise – signif. barrier	(-)	(+)	(-)	(-)
Facing regional competition	(-)	(+)	(-)	(+)
Facing national competition	(+)	(+)	(+)	(+)
Facing international competition	(+)	(-)	(+)	(-)
Controls				
Employment in 2012	(-)	+	-	(+)
Employment in 2012 2	(-)	-	(-)	(-)
Age of the enterprise	-	-	-	(-)
Barristers' chambers	(+)	-	(+)	(+)
OLSPs (regulated)	(-)	(-)	(-)	(+)
OLSPs (un-regulated)	(+)	(-)	(+)	(+)

Notes: Table is based on Tables 2, 3 and 4. '+' denotes a significant positive coefficient, '-' a significant negative coefficient, (+) an insignificant positive and (-)' an insignificant negative coefficient.

Annex 1: Defining the legal services sector

There are different perspectives on the scope of the legal services sector. The UK's Legal Services Act of 2007, for example, lists six reserved activities which can be provided by authorised persons only (the exercise of the right of audience; conduct of litigation; conveyancing; probate; notarial activities; administration of oaths). These reserved activities, however, form only a small part of what might be thought of as the Legal Services Sector which also includes the provision of advice, assistance or representation in connection with the application of the law and the resolution of disputes determining the nature of a person's legal rights or liabilities. These activities might be undertaken by consumer facing organisations such as the Citizens Advice Bureau (CAB), the Community Legal Advice Centres (CLACs), charities such as Age UK, trades unions, and business facing organisations such as professional business advisers such as accountants and investment banks. This diversity of consumer and business facing organisations suggests a broad definition of the Legal Services sector which includes[12]: *'suppliers of legal services include the private bar, lawyers in government employment, and those working for non-profit organisations. In addition, there are many organisations and individuals who work with the law, with lawyers, or as intermediaries. Broadly defined, these stakeholders make up the legal services industry' (Rickman and Anderson 2011).*

For many of these consumer and business facing organisations, however, the provision of legal services is only a small part of their activity. This means that innovation in these organisations may be driven – ether wholly or predominantly – by factors outside the legal services arena. It also means that some or all of the barriers and constraints on innovation are also likely to be outside the sector. Here, therefore we adopt a more focused approach concentrating on those organisations whose *primary*

[12] Rickman, N and Anderson, James M (2011) Innovations in the provision of legal services in the Unites States', RAND Occasional Paper.

business relates to the provision of legal services. These organisations would be included within the Standard Industrial Classification (2007) 69.1 'Legal activities'. The definition of this is as follows:

> 'This division includes legal representation of one party's interest against another party, whether or not before courts or other judicial bodies by, or under supervision of, persons who are members of the bar, such as advice and representation in civil cases, advice and representation in criminal actions, advice and representation in connection with labour disputes. It also includes preparation of legal documents such as articles of incorporation, partnership agreements or similar documents in connection with company formation, patents and copyrights, preparation of deeds, wills, trusts, etc. as well as other activities of notaries public, civil law notaries, bailiffs, arbitrators, examiners and referees'.

This broad category includes three main groups of legal service providers:

- Barristers at law — members of the legal profession who have been called to the bar
- Solicitors and members of the legal profession qualified to deal with: conveyancing, drawing up of wills, advising clients on legal matters, instructing barristers, etc.
- Other legal services (OLSPs) including patent and copyright agents; other legal activities including the preparation, drawing up and certification activities, the provision of advice regarding patents and copyrights and other legal activities not elsewhere classified such as the activities of notaries, bailiffs, arbitrators, examiners and referees etc.

Note too that the regulatory frameworks and bodies surrounding the provision of legal services differ between Scotland, Northern Ireland and England and Wales. Our study focuses specifically on organisations whose

primary activity was the provision of legal services and which was located in either England or Wales. Firms in Scotland and Northern Ireland are excluded from the analysis.

Annex 2: Variable definitions

Dependent variables	
Proportion of ideas externally generated	The percentage of new services 'typically coming from ideas initially developed outside the organisation'.
Innovative sales	Percentage of sales derived from services which have been newly introduced or improved over the last three years
Diversity of innovation	A scale variable (%) reflecting the percentage of six different types of innovation activity undertaken by the firm (service, processes, strategy, management systems, organisational change, marketing innovation). If an organisation engaged in all six types of innovation activity and 50 if the organisation undertook three different forms of innovation.
Organisation level regressors	
Research conducted in house	A binary indicator of whether an organisation carried out any in-house research
Research conducted externally	A binary indicator of whether an organisation carried out any external research
Invested in new IT	
Employment	Full time employees in the organisation in 2012 (including all partners, managing partners, barristers and directors but excluding management consultants on short term contracts)
Age of the enterprise	Number of years since the enterprise was established
Non-lawyer owned	A binary indicator taking value 1 where a firm is either wholly or partially owned by non-lawyers.
Facing regional competition	A binary variable taking value 1 where the main competition is other regional organisations
Facing national competition	A binary variable taking value 1 where the main competition is other organisations throughout England and Wales
Facing international competition	A binary variable taking value 1 where the main competition is other organisations internationally
Leadership for new ideas in place	A binary variable taking value 1 where an organisation has 'a leadership team which supports new ideas'.
Processes for developing ideas in place	A binary variable taking value 1 where an organisation has 'structured processes to support the introduction of new ideas'.
Rewards for developing new ideas in place	A binary variable taking value 1 where an organisation offers 'rewards or incentives for valuable new ideas'.
Lack of expertise – signif. barrier	A binary variable taking value 1 where 'lack of expertise or capacity' has been a significant constraint on new service development.
Finance significant barrier	A binary variable taking value 1 where 'lack of necessary finance' has been a significant constraint on new service development.

Market opportunities signif. barrier	A binary variable taking value 1 where 'limited market opportunities for new services' has been a significant constraint on new service development.
Lack of collaborators signif barrier	A binary variable taking value 1 where 'a lack of collaborators for developing new services' has been a significant constraint on new service development.
Regulator info requests	A binary variable taking value 1 where 'complying with information requests from a regulator' has had a negative effect on an organisation's ability to develop new services.
Legislation on legal services	A binary variable taking value 1 where 'changes in legislation relating to legal services' has had a negative effect on an organisation's ability to develop new services.

Activity level regressors – K. sourcing

Knowledge sourcing – suppliers, clients etc.	Binary variables taking value 1 where an external organisation has been 'a source of the ideas and information needed for developing new or improved services or how these are delivered'.
Multi-functional working – K. sourcing	A percentage indicator of those occupational groups involved in 'obtaining the ideas and information needed to develop new or improved services or how they are delivered'. Seven occupational groups are identified (Managing partner, Partners and senior fee earners, Associates and junior fee earners, Executives/senior managers (non-fee earning) , Para-legal staff, Administrative staff, Marketing staff / bid managers).

Activity level regressors – K. transformation

Multi-functional working – K. transformation	A percentage indicator of those occupational groups involved in 'the process of actually developing new or improved services or how they are delivered'. Seven occupational groups are identified (Managing partner, Partners and senior fee earners, Associates and junior fee earners, Executives/senior managers (non-fee earning) , Para-legal staff, Administrative staff, Marketing staff / bid managers).
Team-working – K. transformation	A percentage indicator of organisations' agreement with five statements about team-working: Team-working plays a major role in the development of new services and how we deliver them; Our development teams are cross-functional and involve people from different parts of the organisation; Teams operate very independently and are left to get on with solving the problem; Our organisation invests in training in team working; Our teams often involve clients or suppliers.
Knowledge transformation – suppliers, clients etc.	Binary variables taking value 1 where an external organisation has been 'involved in the process of actually developing new or improved services or how they are delivered'

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