

# Future of professional work: evidence from legal jobs in Britain and the United States

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What is the impact of digital technology on professional work? This paper addresses this question by developing a theory on professional jurisdictional control, which we define as a profession's power to maintain or shift from existing jurisdictional settlements in the face of external disturbances. Digital technology is a disturbance, and who ends up undertaking digital tasks depends on the nature of professional jurisdictional control. With protective jurisdictional control, the profession engages in full or subordinate jurisdiction, delegating new tasks to subordinate semiprofessionals. By contrast, with connective jurisdictional control, the profession prefers settlements by division of labor or advisory links, enabling equal-status professions to work together. Using a large and representative database of online job postings, we find evidence for this hypothesis. Empirically, we deploy three ways to gauge the nature of professional jurisdictional control: first, by comparing traditional law firms and alternative business structure firms in the UK; second, by contrasting the US (with protective jurisdictional control) and the UK; and third, by examining the legal sector (in which the legal profession dominates) and non-legal sectors. We also find that protective (connective) jurisdictional control is associated with lower (higher) pay premia for digital skills, consistent with theory. Our findings highlight the mediating role of professional jurisdictional control to inform the future of work debate.

**KEYWORDS:** *future of work; system of professions; digital technology; lawyers; data scientists; burning glass technologies.*

**JEL CODES:** C8, J24, J31, J44, L84, L86, O57

## INTRODUCTION

Digital technology, including artificial intelligence (AI), is likely to give rise to dramatic changes in professions and professional practice. Yet the socio-economic process of this transformation is not well-understood. Multiple future scenarios exist, including the end of the “grand bargain”—the traditional arrangement that grants today's professionals their special status and monopolies—and the delivery of professional expertise by machines augmented by suitably trained technophiles (Susskind and Susskind 2015). Consequently, professionals face a high degree of uncertainty about what skills are required for the future. Should lawyers embrace the change and learn to code? Or else, should

they learn to collaborate with coders without acquiring digital know-how?

The lens we adopt to address this issue combines the future of work (Acemoglu and Restrepo, 2019; Frey and Osborne 2017) and the system of professions literature (Abbott 1988; Freidson 1989). The future of work perspective contributes to our understanding of the structural transformation of job tasks within work roles. However, it has little to say about the process by which new tasks are incorporated into job roles. The system of professions literature fills this gap by putting a spotlight on jurisdictional settlements, i.e. agreements that resolve competing jurisdictional claims over professional job tasks. Digital technology as an external disturbance has created a

contest over the jurisdiction of burgeoning digital tasks, and potentially shifts the boundaries of professional practice. The outcome of jurisdictional turf wars has important implications for the future of professional work.

To date, empirical studies on the future of work are primarily about estimating the proportion of today's jobs that are at risk of automation, or otherwise susceptible to digital technology. But such estimates vary enormously, from 9% in OECD countries Arntz, Gregory and Zierahn (2016), 10–30% in the UK (The British Academy and Royal Society 2018), 47% of 702 O\*NET occupations in the US (Frey and Osborne 2017) to 96% of 769 occupations (Dellot, Mason and Wallace-Stephens 2020; Manyika et al. 2017; Muro, Whiton and Maxim 2019). The wide variation in the estimated range is due to differences in methodology and data sources. The coverage of the technology under investigation also differs: some studies consider “jobs at risk” of automation from all types of technology (Frey and Osborne 2017), while others focus on AI to examine occupational “suitability for machine learning” (Brynjolfsson, Mitchell and Rock 2018) or exposure to AI (Acemoglu et al. 2020; Felten, Raj and Seamans 2021; Webb 2019). What is common across all studies, however, is that they do not take account of institutional and organizational contexts that translate “jobs at risk” or “occupations exposed to AI” into jobs or occupations actually being transformed by technology. This paper puts a spotlight on one such mediating factor, namely the nature of professional jurisdictional control.

To understand what determines how new and old tasks become repackaged into existing or new job roles, we focus on the role of professional jurisdictional control, i.e. a profession's power to maintain or shift from existing jurisdictional settlements in the face of external disturbances. Professional jurisdictional control is the action element in policing Abbott's jurisdictional settlements (Abbott 1988: Chapter 3). When an external disturbance occurs, a profession may respond by attempting to maintain the existing settlement, or by shifting to another form of settlement. Our aim is to empirically track a profession's response, and to analyze the rationale behind the chosen response in terms of the nature of professional jurisdictional control. This approach enables us to link the concept of professional jurisdictional control to the contrast between “protective professionalism” and “connective professionalism” (Noordegraaf 2020; Noordegraaf and Brock 2021).

In what ways does professional jurisdictional control mediate the impact of digital technology on practice boundaries? Our key hypothesis is that professional jurisdictional control in line with protective

professionalism—emphasizing the protective shields of professional work by way of legal, cultural, and symbolic means—leads to settlements by full jurisdiction with professionals themselves undertaking digital tasks, or by subordinate jurisdiction with lower-status semiprofessionals undertaking digital tasks (Abbott 1988). In law, for instance, lawyers would rely more on paralegals and legal assistants than on non-legal employees to execute their work that requires digital skills. Conversely, professional jurisdictional control in line with connective professionalism—emphasizing the ability of professionals to navigate relations and to thrive in a system of distributed expertise and authority—leads to settlements via division of labor or advisory jurisdiction. In this case, lawyers would rely more on non-legal employees (including data scientists) to source digital skills. Moreover, we hypothesize that protective jurisdictional control implies that new digital skills lie outside a profession's knowledge base and are therefore not valued by the profession. By contrast, connective jurisdictional control implies no such negative penalty: digital skills, accessed within or across professions, are deemed necessary for developing relational agency based on a capacity to work with others from different professions (Edwards 2011).

The empirical setting that we use to study the nature of professional jurisdictional control is the work of lawyers in relation to other professionals. With the rising demand for digital skills, jurisdictional fault lines are emerging not only between high-status lawyers and subordinate paralegals, but also between lawyers and potentially equally prestigious professionals such as data scientists. We test our hypotheses using a large and representative database of digital job adverts from Burning Glass Technologies covering seven years from 2014 to 2020. The time window coincides with breakthroughs in a subfield of artificial intelligence called deep learning, which makes it technologically feasible to automate some legal tasks, such as automated contract drafting, document review, and litigation support. Using the database, we examine whether the extent to which digital skills are specified in job postings for lawyers, other legal professionals, and non-legal employees vary according to the nature of professional jurisdictional control.

Empirically, we deploy three ways to operationalize the nature of professional jurisdictional control. First, a comparison of job postings at traditional law firms and alternative business structure (ABS) firms in the UK enables us to gauge the impact of tighter protective jurisdictional control in traditional law firms. Second, we compare the UK and the US with tighter protective jurisdictional control. Third, we compare the legal sector and non-legal sectors, with the former subjected to tighter protective

jurisdictional control. Our findings are supportive of our hypotheses and have implications for intra-professional and inter-professional jurisdictional turf wars (Feyereisen and Goodrick 2019; Heusinkveld et al. 2018; Liu 2018).

This paper makes the following contributions. Our main contribution lies in placing professional jurisdictional control squarely in the future of work debate. The nature of professional jurisdictional control mediates the impact of digital technology on practice boundaries, by affecting how tasks are packaged (and repackaged) into professional jobs. Protective professional jurisdictional control increases the likelihood that new-to-the-profession tasks such as digital tasks are incorporated into the jurisdiction of the profession. By taking account of professional jurisdictional control, we can better understand—if not predict—how tasks are bundled into different job roles with the diffusion of AI and related digital technology. The existing literature assesses the likelihood of exposure to AI, based on current occupational definitions (Felten et al. 2021). Our approach attempts to assess in what ways exposure to digital technology is likely to redefine occupational boundaries. Our study thus moves away from what Barley calls an isolationist view of technology and a reductionist view of work, and embeds technologies in job roles and role relationships (Barley 2020).

We also contribute to the sociology of professions by treating digital technology not just as a force that influences jurisdictional boundaries, but also as an occasion for new professions to emerge. Implicit in our analysis is a system of professions in which distant professions (lawyers and data scientists) co-exist. When one profession is emergent, observable jurisdictional settlements are more akin to temporary staging posts in a long trajectory to establish legitimacy (Baba, Sasaki and Vaara 2021). Nevertheless, our evidence is consistent with interpreting jurisdictional settlements between distant professions as a move towards connective professionalism that hinges on relational agency (Avnoon 2021; Edwards 2011; Noordegraaf 2020). We respond to Noordegraaf's call for more detailed empirical work on connective professionalism (Noordegraaf and Brock 2021). But we focus less on professionalism and more on how professional action leads to mechanisms of connection and protection (Faulconbridge, Henriksen and Seabrooke 2021). By doing so, and via explicit international comparisons, we identify two types of jurisdictional control coexisting within the same profession, each embedded in a different geographic context (Adams et al. 2020).

The rest of the paper is structured as follows. In Section 2, we review the extant literature on the future of work and the system of professions, with a view to developing our hypotheses. Section 3 explains the data and methods

used, and Section 4 presents empirical findings. Lastly, Section 5 discusses implications for theory and practice.

## THEORETICAL FOUNDATIONS

Digital technologies, including artificial intelligence (AI), are transforming the world of work. In order to shed light on specific impacts on professional work, this section reviews two areas of literature: first, economic analysis of the future of work, and second, sociological analysis of the system of professions. We develop three sets of hypotheses by combining insights from the two.

### Future of work debate

To get a good traction on how automation and AI might impact jobs, many scholars adopt a task-based approach (Autor 2015). There are three separate effects of technology on tasks: (1) machines substitute certain tasks; (2) machines complement or augment certain tasks; and (3) machines create new tasks (which can be new to the world or new to the industry) in which humans have a comparative advantage over machines (Wilson, Daugherty and Bianzino 2017). They correspond to what Acemoglu and Restrepo, with their interest in wages and employment at the national economy level, call (1) displacement effect, (2) productivity effect, and (3) reinstatement effect (Acemoglu and Restrepo 2018). Economists also recognize the presence of discretion in balancing the three effects; it is “a matter of societal and business choice how much job displacement AI will create” (Acemoglu et al. 2020). But if not careful, “the wrong kind of AI” might result from too much labor displacement, i.e. substitution, and not enough reinstatement, i.e. creation of new tasks (Acemoglu and Restrepo 2020b).

The fear of job loss has led scholars and policymakers to pay most attention to the first of the three effects, namely machines substituting humans via automation. Machines are better than humans at doing well-defined repetitive tasks at scale, whereas machines cannot (yet) substitute for tasks requiring social and emotional intelligence (Frey and Osborne 2017). Equally important to substitution is technology's capacity to complement (or augment) what humans do (Brynjolfsson and McAfee 2016). For example, a micro-level investigation of professional work documents how AI augments, and is augmented by, what lawyers do (Armour, Parnham and Sako 2022). Lawyers become more effective in giving legal advice based on interpreting AI outcomes, while other lawyers augment the AI model by providing legal expertise to train and improve the model (Armour and Sako 2020).

The least well-understood and the most under-studied of the three effects is the creation of new tasks due to AI

(Sako 2020; Wilson et al. 2017). New tasks created by AI might be bundled into existing jobs or become part of new jobs. But what factors determine this choice? Incentive-based theories predict task recombination (Holmstrom and Milgrom 1991), but they are not applied to the future of work debate. Consequently, there is a research gap in understanding what factors influence whether new tasks are bundled into existing or new jobs.

### System of professions

One factor that determines how new and old tasks become repackaged into existing or new job roles is the nature of professional control (Freidson 2001; Saks 2010, 2012) and how jurisdictional disputes are settled in a system of professions (Abbott 1988). The profession “controls or commands the determination of what the work shall be, and how it shall be performed and evaluated” (Freidson 1989). Professions exercise control over recruitment, training, and the work professionals do. In this study we focus on professional jurisdictional control, i.e. a profession’s power to maintain or shift from existing jurisdictional settlements in the face of external disturbances. We identify below the types of professional jurisdictional control that result in a preference for specific kinds of jurisdictional settlements. We also discuss key processes for maintaining such control.

The system of professions examines the coexistence of professional groups in an interdependent system in which each profession makes jurisdictional claims to distinct activities requiring specific education and training (Abbott 1988). These jurisdictions are often in flux, and can overlap with neighboring professions (Halpern 1992; Sanders and Harrison 2008). The existence of overlapping domains can result in battles for control, with higher-status professions typically defending their established boundaries, while lower-status professions try to change them (Battilana 2011). For example, lawyers’ control over lower-status paralegals and legal assistants has not been contested (Sandefur 2001). More contestation has been evident in the medical field, where physicians were successful to a varying degree in curtailing encroachment from ancillary workers by circumventing the latter’s occupational territory. Specifically, radiologists decried X-ray technicians’ encroachment to interpret results. Pathologists also pushed back on laboratory workers interpreting test results and offering medical diagnosis during the 1940s–1960s (Halpern 1992).

The broad literature on the sociology of professions contains a variety of approaches including functionalism (Carr-Saunders and Wilson 1933; Parsons 1939), structuralism (Wilensky 1964), and monopoly power (Freidson 1970; Larson 1977). With this backdrop, we

favor the system of professions perspective, not least because of its explicit examination of the substance of professional work in the form of tasks: “Each profession is bound to a set of tasks by ties of jurisdiction, the strengths and weaknesses of these ties being established in the processes of actual professional work” (Abbott 1988: 33). Jurisdiction is defined as the link between a profession and its work. “The central organizing reality of professional life is control of tasks. The tasks themselves are defined in the professions’ cultural work. Control over them is established ... by competitive claims in public media, in legal discourse, and in workplace negotiations” (Abbott 1988: 84).

Following Abbott, we examine professional tasks as a means of studying the internal dynamics of a profession. We also consider it important to analyze the evolution of professions via their inter-relations. “Technology, politics, and other social forces divide tasks and regroup them”, (Abbott 1988: 35). But technology is not merely an external force that disturbs the internal dynamics of a profession and inter-relations among professions. It can also give rise to new professions.

Data science is indeed an emergent profession that combines the knowledge bases of mathematics, statistics, and computer science (Brandt 2016; Davenport and Patil 2012). The practical application of data science knowledge requires a bundle of skills that involve writing code using a variety of programming languages. The social status of the coding elite (Burrell and Fourcade 2021) is said to be underpinned by data scientists’ omnivorous approach to skill acquisition and domain expertise (Avnoon 2021). Brandt provides ample evidence from his fieldwork that “data nerds” never initiate jurisdictional conflicts due to the emergent nature of data science as a profession. However, chances of provoking such a conflict are on the rise as technology transitions from being an information infrastructure (back office) towards an integrated system of data storage, data processing, and actions (in both back and front offices) (Brandt 2016: 141). Thus increasingly, data scientists have a choice between claiming certain tasks as their own on the basis of their superior expertise, and articulating their contributions in terms of practical complementarities between data science and domain expertise (such as audit or law).

Such choice in how to resettle jurisdictional boundaries in the face of an external disturbance is the starting point for understanding the logic of professional jurisdictional control (Abbott 1988; Heusinkveld et al. 2018). Abbott (1988) identifies different types of settlements, including full jurisdiction (by the profession incorporating new tasks), subordinate jurisdiction (by delegating new tasks to a subordinate profession),



intellectual jurisdiction (with control over the cognitive knowledge of an area but not practice), settlement by division of labor (e.g. as accountants and lawyers have done over tax), advisory jurisdiction (with one profession positioning itself in an advisory role in relation to another profession as clergy has done in relation to medicine and psychiatry), and client differentiation with each profession choosing a specific client base (e.g. historically, physicians looked after the upper class, surgeons the middle class, and apothecaries the lower classes). These settlements, however, are laid out as outcomes of jurisdictional turf wars, without much regard to agency and preference of professions.

Preference for jurisdictional settlements depends largely on the type of professional jurisdictional control. We deploy the contrast between “protective professionalism” and “connective professionalism” (Noordegraaf 2020). Protective professionalism is about expertise, autonomy, and authority as fixed and closed entities; control is exercised by shielding a profession and minimizing dependence on others. It follows that protective professional jurisdictional control is exercised with preference for full jurisdiction (e.g. with professionals themselves undertaking digital tasks) and for subordinate jurisdiction (e.g. with lower-status semiprofessionals undertaking digital tasks). Conversely, connective professionalism is about being equally knowledgeable, independent, and authoritative but via acquiring relational agency in a system of distributed expertise and authority. The relational agency “involves a capacity for working with others to strengthen purposeful responses to complex problems” (Edwards 2011: 34). This mode leads to professional jurisdictional control via a preference for settlements by division of labor or via advisory jurisdiction. Our interest is, however, less on professionalism per se and more on how professional action leads to mechanisms of connection and protection (Faulconbridge et al. 2021). We also offer an approach to understanding how connective and protective modes of control may co-exist (Alvehus, Avnoon and Oliver 2021).

The persistence of professional jurisdictional control depends on cultural and regulatory processes. Professional jurisdictional control applies to all stages of professional work in diagnosis, inference, and treatment as spelt out by Abbott (1988, Chapter 2). Some part of professional work is based on practical experience. But to legitimate professional work, a formal system of knowledge that formalizes the skills and enables the generation of new diagnoses, treatments, and inference methods is “universally important throughout the professions” (Abbott 1988: 52). The knowledge system, however, may change over time. Here, protective control implies

shielding the existing knowledge and expertise base of a profession, while connective control implies greater fluidity in such knowledge base.

Professions also rely on privileged regulatory mechanisms that exclude outsiders and command higher income, status and power. Professions, to use a neo-Weberian terminology, are based on “exclusionary social closure in the marketplace sanctioned by the state” (Saks 2012: 4). By extension, the nature of professional jurisdictional control can be gauged via the strength of such exclusionary closure. In other words, professions are successful because they are underpinned by the state, and the legal boundaries privilege them compared to other occupations in the marketplace. The more protective jurisdictional control is, the more professions demand exclusionary closure to shelter themselves in the marketplace. By contrast, the more connective jurisdictional control is, the more possible it would be for professions to thrive without exclusionary closure.

In sum, professional jurisdictional control is a profession’s power to protect or shift from existing jurisdictional settlements in the face of external disturbances. The more protective professional jurisdictional control is, the more likely that jurisdictional settlements would be via full or subordinate jurisdiction. By contrast, connective jurisdictional control is associated with other types of settlement, notably via division of labor and advisory jurisdiction. Jurisdictional settlements within a system of professions may be temporary resolutions and staging posts in a longer-term dynamic to establish legitimacy (Baba et al. 2021). Jurisdictional battles are also played out at different levels, at the organizational level (Bucher et al. 2016) and at the field level (Freidson 1970; Kahl, King and Liegel 2016; Larson 1977). Nevertheless, we find that a focus on professional jurisdictional control is a fruitful line of enquiry to examine how a dominant established profession not only exercises jurisdictional control over contiguous semiprofessionals, but also relates to other distant professions with which some form of jurisdictional settlement is required.

## Empirical context

### *Digital skills for the legal profession*

A good empirical context to study the impact of professional jurisdictional control on the future of professional work is the work of lawyers in relation to other professionals. Jurisdictional settlements are being crafted not only between high-status lawyers and subordinate paralegals, but also between lawyers and potentially equally prestigious professionals such as data scientists (Brandt 2016). As noted above, data scientists would be capable

of claiming high-status with their reliance on knowledge albeit in a totally different knowledge domain from lawyers.

Over time, the adoption of digital technology may influence a wide range of professional work in diagnosis, inference, and treatment (Abbott 1988, Chapter 2). Whereas in the past, lawyers tended to insist on full or subordinate jurisdiction in all three (diagnosis, inference, treatment), the unbundling of tasks, in part enabled by digital technology, has given rise to opportunities for (and vulnerabilities to) other types of settlements. For instance, in litigation, lawyers diagnose facts of the case, applies reasoning to infer a range of treatments, and chooses a specific treatment (pleas, out-of-court settlement, etc.). Treatment and inference were considered the exclusive domain of lawyers, with diagnosis subject to subordinate jurisdiction. Diagnosis takes the form of e-discovery (e-disclosure), automating the analysis of relevant electronic documents for a particular court case. TAR (technology-assisted review), as the name indicates, used to be about lawyers using computers to annotate and classify types of information relevant to a case. More recently, predicting what is relevant for a case comes from training an AI model with data annotated by non-legal employees who are supervised by lawyers. This shift has also led lawyers to rely more on data scientists to set up an AI model, a form of advisory or divided settlement. At the same time, data-driven decisions on the choice of treatment (based on machine predictions

about court outcomes) imply that advisory or divided settlements have invaded the work of inference and treatment.

In this context, digital skills give rise to a variety of tasks, some of which are substituted, others augmented, and yet others newly created. One way to visualize these effects is to create a one-to-many mapping from a skill to tasks (see Fig. 1). Tasks requiring digital skills in this schema appear primarily due to the augmentation effect. In particular, we would expect job descriptions for lawyers acting as “producers” of digital technology (Armour et al. 2022) to mention digital skills as a requirement, so that they can specify the models, algorithms, and data features to be labeled. By contrast lawyers acting as “consumers” of digital technology do not undertake digital tasks and focus on providing legal advice based on technological outputs (including AI predictions). In reality, the same lawyer may act as both a producer and a consumer, making it difficult to identify the relative balance of the two roles from job postings.

Another approach, adopted by economists in their empirical work, is to focus on relative exposure to AI and to remain agnostic about whether AI complements or substitutes for tasks (Acemoglu et al. 2020; Felten et al. 2021). We adopt this approach for empirical and theoretical reasons. Empirically, we can only impute the requirement of a new skill—digital skills—as a starting point for exploring how occupational boundaries are likely to be redrawn. Theoretically, this may be a wise approach also due to the interdependence over time between

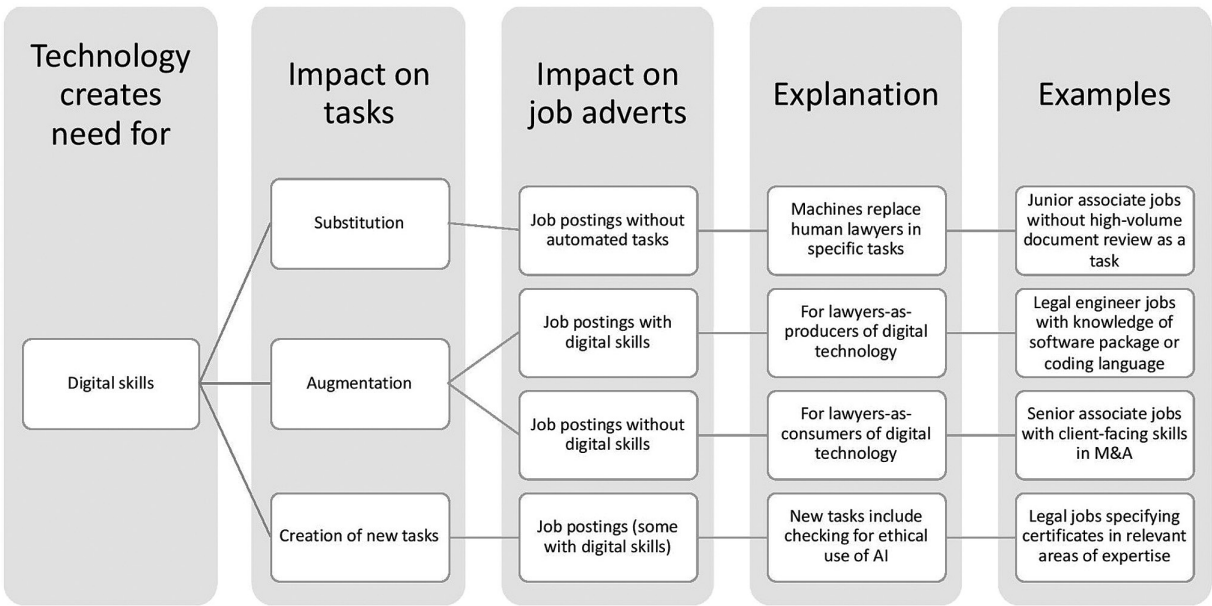


Figure 1. Skill-to-task mapping.

substitution and complementarity in tasks (Raisch and Krakowski 2021).<sup>1</sup>

There is evidence that multi-disciplinary teams (of lawyers, data scientists, process experts, project managers, etc.) facilitate the implementation of AI (Sako, Armour and Parnham 2020). However, multi-disciplinarity in teams may exist in more than one mode. In one mode, lawyers may work effectively in multi-disciplinary teams by becoming “T-shaped” (Conley et al. 2017), that is, they have a deep knowledge of law and just enough knowledge of other non-legal disciplines to be able to communicate effectively with those non-legal experts; this is equivalent to connective professionalism (Noordegraaf 2020). In another mode, lawyers may embody multi-disciplinarity by becoming “lawyer-coders” or even “renaissance men”, incorporating at least some of the new technical, business, and other non-legal skills within the knowledge base of the profession; this is equivalent to hybrid professionalism (Noordegraaf 2015). Our task is to identify in what ways the nature of professional jurisdictional control influences the choice between these two modes of multi-disciplinarity.

#### *Operationalizing protective vs connective control*

This study uses three types of comparisons to proxy the contrast between protective and connective jurisdictional control. These are three pair-wise proxies. First, we compare two types of worksites in the UK: traditional law firms which are owned and managed by lawyers only (hence with protective jurisdictional control) and alternative business structure (ABS) firms. Second, we make comparisons between the UK and the US (with protective jurisdictional control). Third, we contrast the legal sector (where lawyer-dominated worksites are prevalent) and non-legal sectors (in which lawyers may be outnumbered by other equally prestigious professionals). The first two proxies are explained below.

In the UK, most law firms remain lawyer-only partnerships. Protective jurisdictional control governs traditional law firms, which may face difficulty recruiting and retaining quality data scientists. But since the Legal Services Act of 2007, solicitors in England and Wales are permitted to own and manage law firms with non-legal professionals by incorporating them as Alternative Business Structures (ABS) (Sako and Parnham 2021). In effect, the new business structures permit connective jurisdictional control with lawyers and non-legal employees managing work alongside each other. Thus, ABS firms are more able to access coding skills in different ways including by hiring data scientists.

Country-specific regulations are also useful proxies for different types of professional jurisdictional control. We

proxy the US jurisdiction as governed by tighter protective control compared to the UK for the following reasons. In the US, the American Bar Association continues to uphold Model Rule 5.4 which forbids lawyers from sharing fees or co-owning law firms with non-legal professionals. The US regulatory regime enforces protective jurisdictional control by policing “unauthorized practice of law” in all areas of law. By contrast in the UK, apart from alternative business structures, jurisdictional control by lawyers is less extensive as solicitors have exclusive claims to specific reserved areas only, such as the right of audience in courts. Some evidence exists that these regulatory differences result in different types of jurisdictional settlement, with US law firms tending to recruit lawyers with coder skills, and UK firms recruiting more technologists who are not lawyers (Qian, Saunders and Ahrens 2020).

### Hypotheses

We are now in a position to state our hypotheses about ways in which professional jurisdictional control influences who is likely to undertake new tasks created by digital technology.

#### *Lawyers' jobs with digital skills*

In the system of professions, lawyers as high-status professionals are capable of full jurisdiction by incorporating digital tasks to be undertaken by lawyers themselves. Equally, lawyers may engage in subordinate jurisdiction by delegating digital tasks to lower-status semiprofessionals such as paralegals and legal assistants. Protective jurisdictional control exerted by the dominant profession makes these outcomes more likely. By contrast, connective jurisdictional control is associated with greater reliance on digital tasks carried out by non-legal professionals.

Our first set of hypotheses is therefore as follows:

*H1: A greater proportion of job postings for lawyers and other legal professionals require digital skills when lawyers' professional jurisdictional control is protective rather than connective.*

*H1a: A greater proportion of job postings for lawyers and other legal professionals require digital skills in the non-ABS firms than in ABS firms within the regulated legal sector in the UK.*

*H1b: A greater proportion of job postings for lawyers and other legal professionals require digital skills in the US than in the UK.*

*H1c: A greater proportion of job postings for lawyers and other legal professionals require digital skills in the legal sector than in non-legal sectors in both the UK and the US.*

### *Non-legal jobs with digital skills*

Non-legal employees are defined as employees other than lawyers and other legal professionals. Non-legal employees are heterogeneous with different skills and include data scientists and project managers. It is hypothesized that connective professional jurisdictional control is associated with greater acceptance of jurisdictional settlements by division of labor or by advisor links (Abbott 1988). In particular, lawyers may develop a common language and understanding to work with other non-legal professionals in multi-disciplinary teams, and develop a level of comfort with the execution of some tasks led by non-legal employees. In either type of settlement, lawyers acquiesce to relying on other professions outside their control to carry out new tasks requiring digital skills.

The second set of hypotheses is as follows:

*H2: A greater proportion of job postings for non-legal employees require digital skills when lawyers' jurisdictional control is connective rather than protective.*

*H2a: A greater proportion of job postings for non-legal employees require digital skills at ABS firms than at non-ABS firms in the regulated legal sector in the UK.*

*H2b: A greater proportion of job postings for non-legal employees require digital skills in the UK than in the US.*

### *Pay premia for digital skills*

Next, we theorize how professional jurisdictional control mediates the extent to which digital skills may or may not lead to pay premia for legal professionals. Following seminal work on the impact of computers on wages and wage inequality in the 1990s, more recent work by economists studies the impact of automated technologies including industrial robots on wages (Acemoglu and Restrepo 2020a; Autor, Katz and Krueger 1998; Deming and Noray 2020; Krueger 1993). Economists are interested in wages as an outcome of labor demand and supply.

Our study examines intra-professional pay levels as resulting from value attached to new digital skills in a profession's knowledge base. Looking across different professions, there is solid evidence that higher-status professions do not necessarily command higher salaries (Friedman and Kuznets 1954). However, within a specific profession, we argue that the nature of professional jurisdictional control affects whether new skills and tasks are incorporated into a profession's knowledge base, which in turn affects the level of pay.

As noted earlier, while some part of professional work is based on practical experience, a formal system of knowledge that formalizes the skills is universally important to legitimate professional work

(Abbott 1988: 52). Moreover, the knowledge system may change over time. Cultural work is required to legitimize the incorporation of any new skills into the profession's knowledge base. In order to defend a profession's jurisdiction, professionals commonly rely on the notion of professional purity. This is the ability to exclude professionally irrelevant issues from practice (Abbott 1991).

We argue that protective jurisdictional control implies strong insistence on professional purity, making it tougher to accept new tasks and skills as part of the professional knowledge base. By extension, inability to exclude the professionally irrelevant is a sign of professional impurity, leading to lower pay. In a protective professionalism environment, therefore, lawyer-coders (lawyers with digital skills) do not earn any privileges, as digital skills may signal distraction from honing the core essential skills of lawyering. In a connective and looser professionalism environment, by contrast, lawyers may accept, or even value, digital skills that would improve the quality of lawyering. In this environment, lawyers with digital skills command higher pay than lawyers without digital skills. Thus, protective control implies shielding the existing knowledge base of a profession, while connective control implies greater fluidity in such knowledge base, and undertaking new tasks involving digital skills are rewarded differently.

The above discussion leads to our third set of hypotheses:

*H3: Digital skills command a lower pay premium when professional jurisdictional control is protective rather than connective.*

*H3a: Digital skills command a lower pay premium for lawyers and other legal professionals in the US than in the UK.*

*H3b: Digital skills command a lower pay premium for lawyers in the legal sector than in non-legal sectors in both the UK and the US.*

## DATA AND VARIABLES

This section discusses the data sources and variable construction. We describe the database, Burning Glass Technologies, and the steps followed to identify online job postings in relevant occupations and sectors. Furthermore, it is worthwhile detailing how we identified digital skills in job postings, and Alternative Business Structures in the UK.

### *Data on online job postings*

Burning Glass Technologies is an analytics software company that scrapes job postings from the internet.



Every day, the firm checks a corpus of more than 40,000 online job boards and company webpages to find new job vacancies. Burning Glass then parses and deduplicates the job vacancies into a machine-readable form. This process extracts up to 70 standardized fields from vacancy postings, including occupation, industry, skill requirement, firm name, geographic location, and salary. Most studies using this database focus on the United States only (Acemoglu et al. 2020; Felten et al. 2021; Goldfarb, Taska and Teodoridis 2022). We are therefore the first to use this database to conduct cross-country comparisons focused on specific occupations.

For the legal sector, we extracted nearly 900,000 job postings in the UK and nearly 800,000 in the US in the seven-year period from 2014 to 2020. We also extracted just under 3,000,000 job postings for lawyers and associated legal professionals across all sectors in the UK and the US. The broad coverage of the database represents a significant improvement over single-source databases, such as Reed.co.uk or the British Labour Force Survey. Cammeraat and Squicciarini (2021) attest to the representativeness of the Burning Glass data, especially for the occupational categories of “professionals” and “technicians and associated professionals”. However, the database does not capture vacancies that are not advertised online. These vacancies are most likely to be for senior lawyers (including partners) in both countries. Notwithstanding this shortcoming, the Burning Glass database provides the most comprehensive attempt to approximate the population of online job postings in the two countries. We also checked the geographic locations of legal job postings and found that they were dispersed but with clusters in large cities known for legal services (Sako and Parnham 2021).

Relying on both industry and occupational classifications enables us to obtain occupational breakdowns of job postings within the legal sector industry, and sectoral breakdowns of legal job postings. These breakdowns are discussed in greater detail below.

#### *Occupational breakdowns within the legal sector*

In the UK, we filtered for the legal sector using Standard Industry Classification (SIC) code 69.1: legal activities. Within this SIC, we classify job postings into three occupational categories, using the following Standard Occupational Codes (SOC): lawyers, other legal professionals, and non-legal occupations.<sup>2</sup> They respectively represent 48%, 22%, and 30% of the total of 891,803 UK legal sector job postings during the period 2014–2020 (see Table 1).

For the US, we extract the legal industry using the North American Industry Classification (NAICS) code 5411: legal services. With respect to occupations, we used O\*NET codes to identify the same three occupational groups: lawyers, other legal professionals (such as paralegals and legal assistants), and non-legal occupations.<sup>3</sup> They correspond to 37%, 30%, and 33% of the total of 789,270 US legal sector job postings during 2014–2020.

#### *Lawyers and legal professionals across sectors*

Relevant SOC or O\*NET occupational codes for lawyers and other legal professionals are used to filter job postings. Their distribution across legal and non-legal sectors is summarized in Table 2. Interestingly, in non-legal sectors, there are less job postings for lawyers compared to those for other legal professionals in the UK, whereas job postings for lawyers outnumber those for other legal professionals in the US.

#### *Digital skills in legal job postings*

Next, we identify job postings that contain at least one digital skill among their list of skills. Acquisition of digital skills among legal professionals is yet at an early stage. So we adopted a broad approach to include digital skills in the use of package software as well as coding skills (for example data science, AI, Python, SQL, etc.).<sup>4</sup> Sample job postings with digital skills include the following. In January 2020, an English magic circle law firm, Freshfields, advertised for a “Legal Solutions Specialist Paralegal” to be based in Manchester, with required skills that ranged from basic internet skills, computer literacy, online research and LexisNexis.<sup>5</sup> The same English law firm also posted an advert in the same month for a Database Administrator with required skills in clustering, database design, and SQL.<sup>6</sup> In the United States, in April 2020, a mid-sized law firm Barkley Legal advertised for a Litigation Secretary, whose required skills included data management and the maintenance of network hardware and software.<sup>7</sup> In the same month, a Philadelphia-based law firm, Morgan Lewis Bockius, advertised for a Data Analyst with required skills in data science, Python, and SQL.<sup>8</sup>

The word clouds for job skills in Fig. 2 highlight the most frequently mentioned skills in job postings. Job ads for legal professionals specifying digital skills (see panel B) focus on skills ranging from C#, javascript, SAS, to software development. Moreover, job postings both with and without digital skills call for communication skills and teamwork collaboration (see panels A and B). The word clouds for non-legal employees in the legal sector also reveal interesting contrasts: Non-legal job postings that specify digital skills indeed mention data science

**Table 1.** Job postings within the legal sector, by occupation in the UK and US

<b>Legal sector job postings</b>					
<b>United Kingdom</b>			<b>United States</b>		
<b>Year</b>	<b>Count</b>	<b>% of UK job ads</b>	<b>Year</b>	<b>Count</b>	<b>% of US job ads</b>
Panel A: Job postings by year, 2014–2020					
2014	104,456	1.71	2014	120,011	0.62
2015	131,598	1.69	2015	96,988	0.41
2016	121,780	1.41	2016	87,567	0.35
2017	139,523	1.49	2017	73,259	0.32
2018	156,068	1.79	2018	110,010	0.38
2019	123,568	1.78	2019	150,231	0.44
2020	114,810	1.78	2020	151,204	0.42
Total	891,803	1.65	Total	789,270	0.42
<b>SOC label</b>	<b>Count</b>	<b>% of total</b>	<b>O*NET label</b>	<b>Count</b>	<b>% of total</b>
Panel B: Job postings for the top 5 occupations					
Solicitors	426,361	47.81	Lawyers	240,862	30.52
Legal associate professionals	117,994	13.23	Paralegals and legal assistants	224,078	28.39
Legal professionals n.e.c.	42,585	4.78	Legal secretaries	39,255	4.97
Legal secretaries	34,696	3.89	Secretaries and adm. assistants	17,012	2.16
Other administrative occupations n.e.c.	12,445	1.40	Receptionist and information clerk	13,456	1.70
Others	257,722	28.90	Others	254,607	32.26
Total	891,803	100.00	Total	789,270	100.00

*Notes:* The table shows the Burning Glass legal sector job postings in the UK and US. The legal sector is defined by the industry code. For the UK, the job postings are filtered with the SIC code 69.10 legal activities. For the US, the job postings are filtered with the NAICS code 5411 legal services. Panel A shows job postings by year from 2014 to 2020. It breaks out the number of job postings in the legal sector. Panel B displays job postings for the five most frequent occupations within the legal sector in the UK and the US. The occupation is defined by the occupational code. For the UK, the SOC codes are 2413 solicitors, 2419 legal professional n.e.c., 3520 legal associate professionals, 4159 other administrative occupations n.e.c., and 4212 legal secretaries. For the US, the O\*NET codes are 231011 lawyers, 232011 paralegals and legal assistants, 436012 legal secretaries, 436014 secretaries and administrative assistants, and 434171 receptionists and information clerks. The column “% of total” exhibits the share of all job postings in the legal sector that belong to each occupation.

skills, notably SQL, as well as Microsoft Active Directory (see panel D), whereas non-legal jobs without digital skills require skills in business development or human resources among other things (see panel C).

#### Alternative business structures in the regulated sector in the UK

An important margin of comparison we deploy in the type of professional jurisdictional control is between traditional law firms (non-ABS) and Alternative Business Structures (ABS). The UK legal sector is regulated by several front-line regulators, the largest of which is the Solicitors Regulation Authority (SRA). To identify the regulated legal sector, we use lists of regulated firm’s names

provided by the SRA and the Law Society of Scotland. We thus discard for this purpose unregulated firms in the legal sector. We use fuzzy matching to link the Burning Glass data and the regulator’s lists. This is because law firm names may be extremely similar but slightly different due to inconsistencies in spelling, abbreviations, omissions, and punctuation. Given that the matches are not perfect, we use an algorithm that takes advantage of a numerical statistic called the term frequency-inverse document frequency to match firms’ names. We validate that the matches are correct via verification sampling and manual inspection. To complete the process, we merge the data with the SRA list of firms licensed as Alternative Business Structures.

**Table 2.** Distribution of job postings in legal and non-legal sectors in the UK and US

	Job postings by occupation			Total
	Lawyers	Other legal professionals	Non-legal occupations	
United Kingdom				
Legal sector	426,526	195,275	270,002	891,803
Non-legal sectors	191,065	211,810		402,875
Total	617,591	407,085		
United States				
Legal sector	295,737	240,926	252,607	789,270
Non-legal sectors	373,163	1,044,278		1,417,441
Total	668,900	1,285,202		

Notes: The table breaks down the count of Burning Glass job postings in the UK and US by sector and occupation. The legal sector is defined by the industry code. For the UK, the job postings are filtered with the SIC code 69.10 legal activities. For the US, the job postings are filtered with the NAICS code 5411 legal services. The occupational category is defined by the occupation code.

## ANALYSIS AND RESULTS

In this part, we present the key findings in relation to our hypotheses on the impact of professional jurisdictional control. We start by considering the share of job postings with digital skills, and then turn to pay premia for digital skills. Where possible, we make three pair-wise comparisons to find out if protective vs connective modes of control result in different outcomes. Figure 3 provides a roadmap for our hypotheses to test the impact of professional jurisdictional control (protective vs connective) on two outcomes of interest: digital skills in legal jobs and pay premia for digital skills.

### Broad trends

Figure 4 shows time trends in the number of job postings for the UK regulated legal sector posted from 2014 to 2020.<sup>9</sup> Given the short time span, we are more interested in general patterns than time trends per se. Proportionately there have been more job postings by ABS firms than by non-ABS firms. ABS firms, which comprise 7% of all firms in the UK regulated legal sector, posted 25% of the jobs. Moreover, job postings have been increasing steadily at ABS firms since 2014, while they are stagnant at non-ABS firms.

Figure 5 shows corresponding trends across UK and US legal and non-legal sectors.<sup>10</sup> In the UK, the ratio of lawyer job ads to non-legal employee job ads has been stable over time (see first panel). For every lawyer job posting, there have been at least three times as many job postings for others (including paralegals, legal assistants, and other professionals). This indicates that the ratio of lawyers to non-legal employees in the legal sector could have declined over time.<sup>11</sup> The COVID-19 impact is

evident in the data for 2020, with non-legal employee jobs hit harder than lawyer jobs. Lastly, comparing the legal and non-legal sectors (see left panels), the evolution of job posting counts has followed similar trends.

Similarly in the US, there have been more job postings for non-legal occupations than for lawyers and other legal professionals (see second panel). As in the UK, these trends indicate a relative decline in the share of lawyer job postings over time. Non-legal employee job postings have seen a particularly strong growth since 2018. COVID-19 in 2020 led to a decline in job postings, but unlike in the UK, this decline hit both lawyers and non-legal employees in the US. Lastly, comparing the legal and the non-legal sectors (see right panels), there have been more job postings for other legal professionals than for lawyers in both sectors.

### Digital skills for lawyers and other legal professionals

We now turn to our central concern, to discuss the incidence of digital skills specified in job postings for legal professionals. We expect, according to H1, higher shares of digital skills in segments governed by protective professional control, at traditional law firms (than at ABS firms), in the US (than in the UK), and in the legal sector (than non-legal sectors).

#### *Comparing ABS and non-ABS firms in the UK*

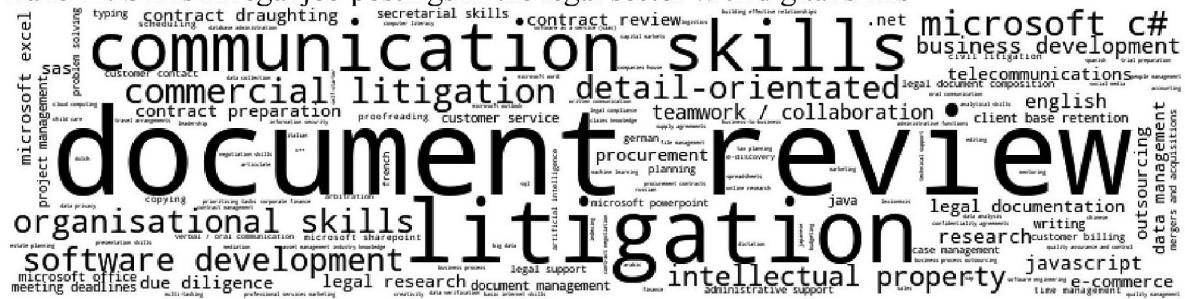
Figure 6 shows that the share of digital skills in job postings is higher in non-ABS firms than in ABS firms: 2% of non-ABS lawyers vs 1% of ABS lawyers, and 1% of other legal professionals at non-ABS firms compared to 4% at ABS firms. This provides support for hypothesis H1a.



Panel A: Skills in legal job postings in the legal sector without digital skills



Panel B: Skills in legal job postings in the legal sector with digital skills



Panel C: Skills in non-legal job postings in the legal sector without digital skills



Panel D: Skills in non-legal job postings in the legal sector with digital skills



Notes: The figures show word clouds of skills based on Burning Glass job postings in the UK from 2012 to 2020. The larger font size for some skills indicates its more frequent occurrence. The legal sector is defined by the industry code: the job postings are filtered with the SIC code 69.10 legal activities. The occupational category is defined by the occupation code: legal job postings comprise of the SOC codes 2412 barrister and judges, and 2413 solicitors, 2419 legal professional n.e.c., 3520 legal associate professional, and 4212 legal secretaries.

Figure 2. Word clouds of skills for legal and non-legal jobs.



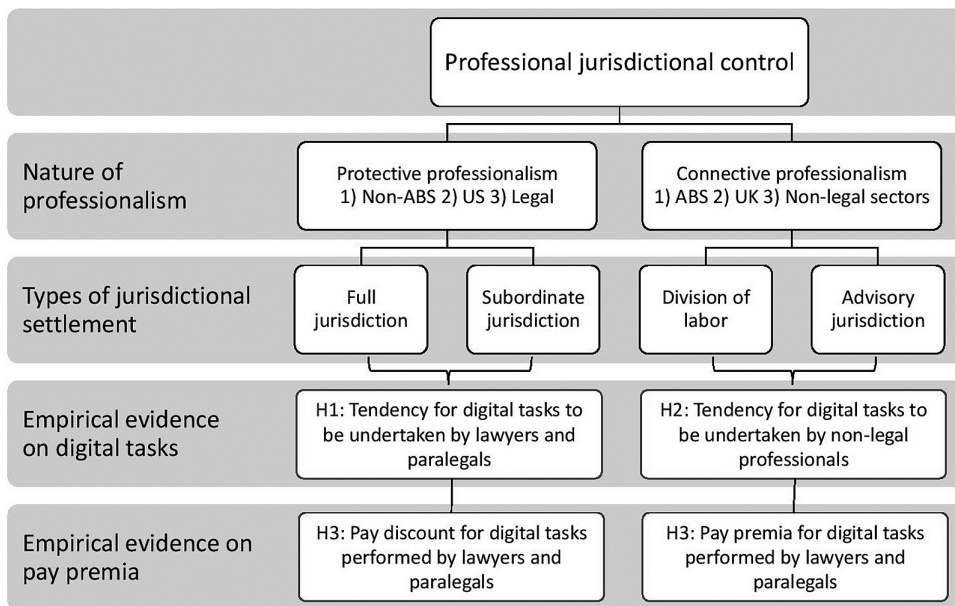


Figure 3. Theory and hypotheses roadmap.

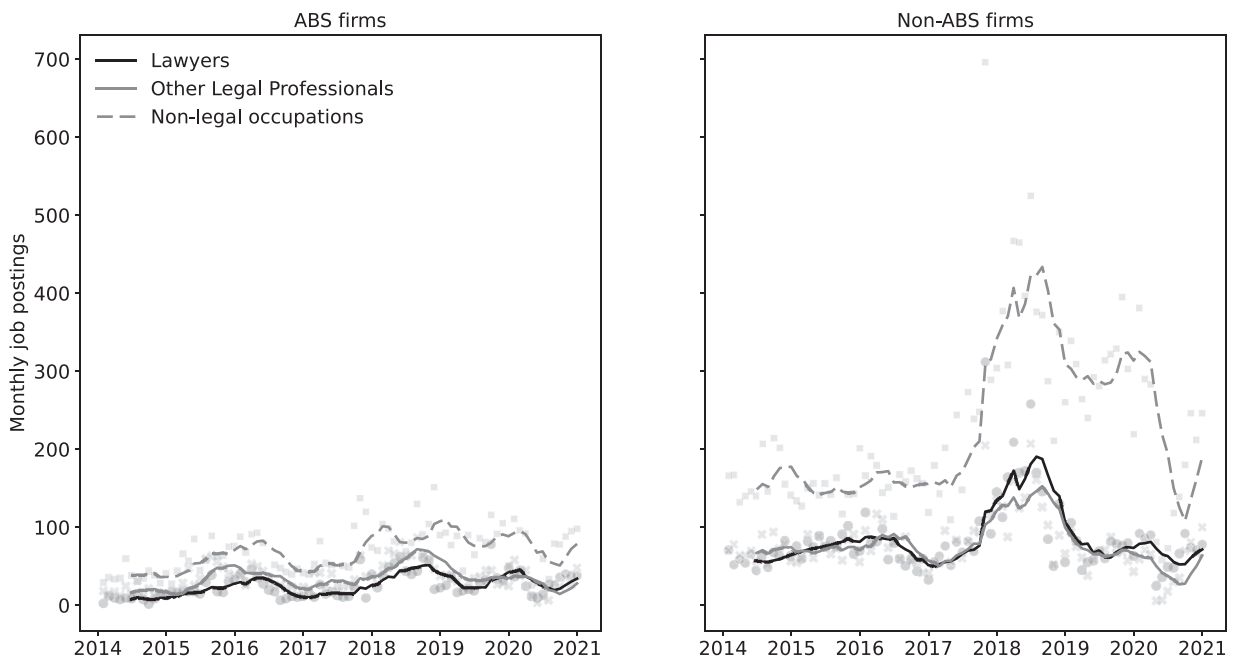
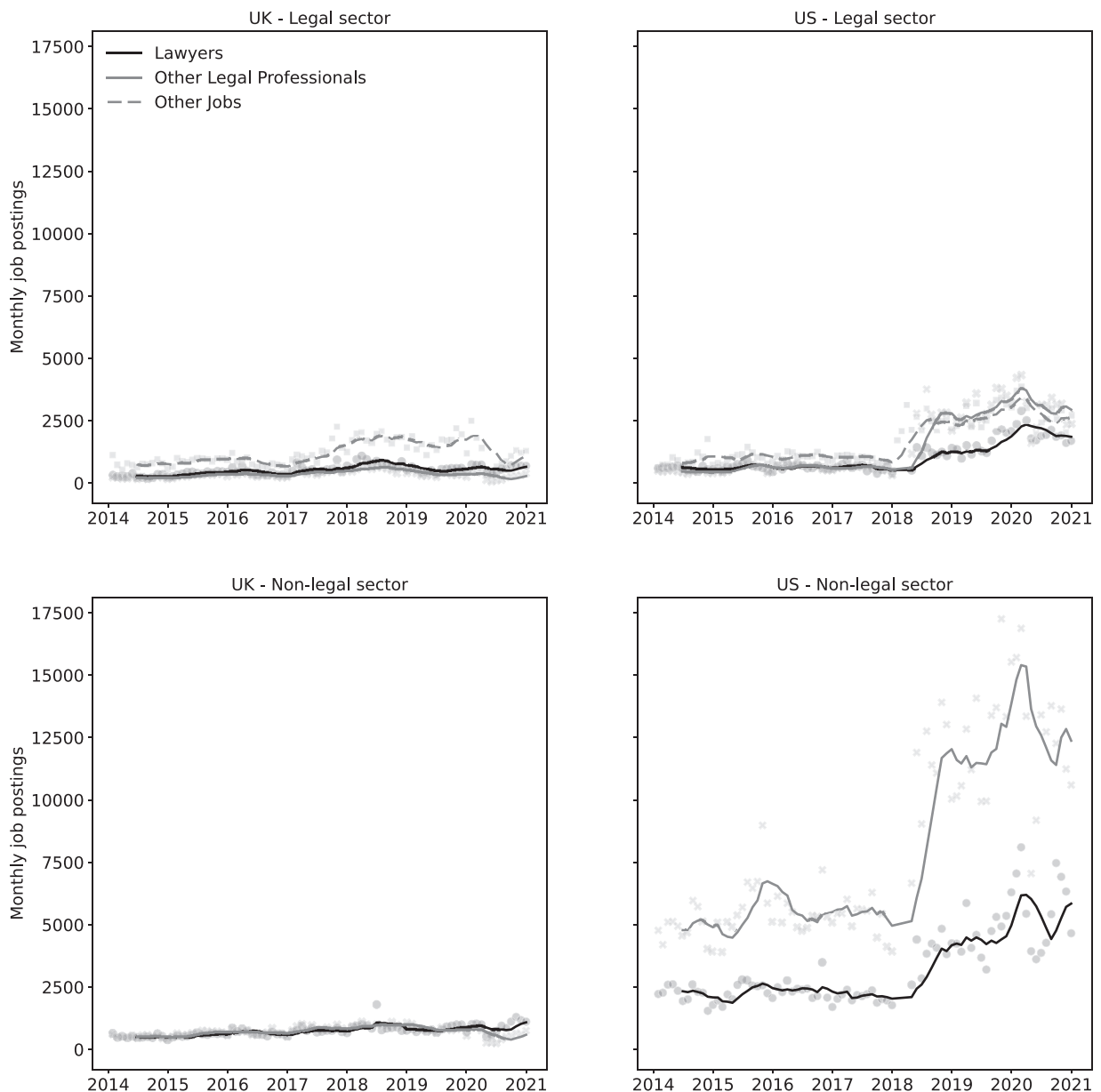


Figure 4. Job postings in ABS and non-ABS firms in the UK.

#### Comparing the US and the UK

Next, we compare digital skill shares across the two countries and find that H1b holds. In the UK, lawyers (i.e. solicitors, barristers, and judges) have a very low share of job postings that ask for digital skills throughout the 2014–2020 period—around 1–2% (see Fig. 7 top left

panel). Other legal professionals tended to have higher shares of digital skills than lawyers, although these shares remain below 5%. In the US, the proportion of job postings for lawyers (i.e. attorneys who are authorized to practice law) with digital skills is also quite low, 2–3% (see top right panel), not so different from the 1–2% in the UK.



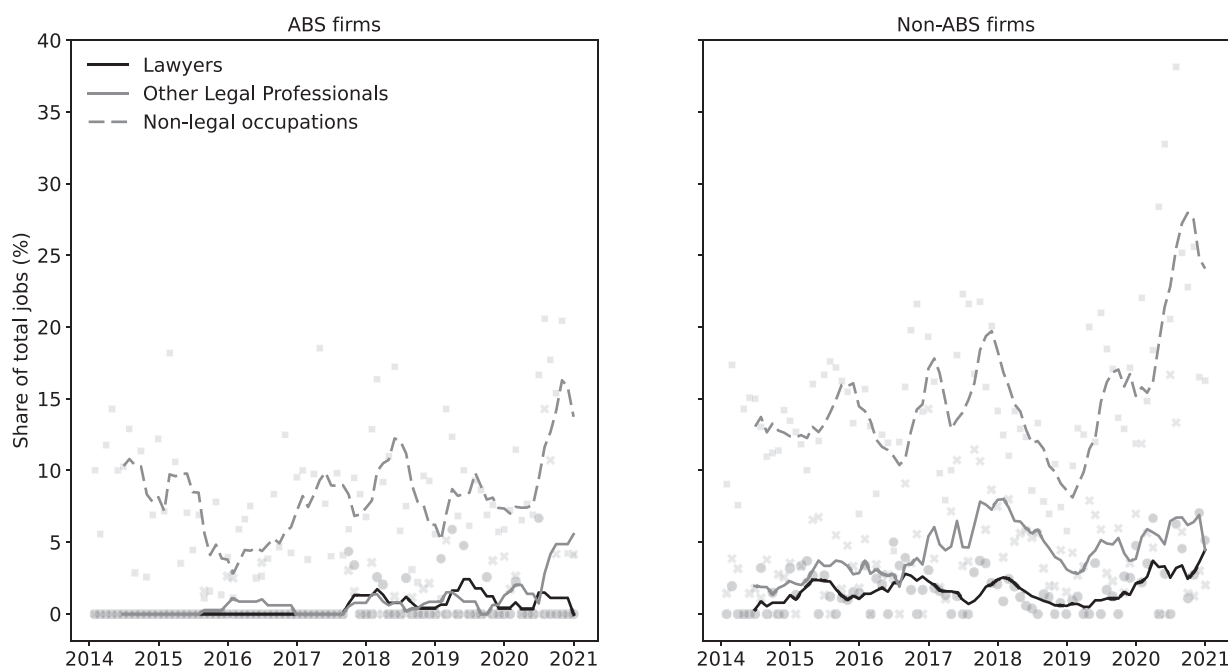
**Figure 5.** Job postings in the legal and non-legal sectors in the UK and US.

However, when we look at a broader category of legal professionals (i.e. lawyers as defined above, plus other legal professionals), the share of job postings with digital skills is considerably higher at around 5%, peaking at 8% in 2016. Thus, there is evidence of full and subordinate jurisdiction in the US compared to the UK.

#### *Comparing the legal and non-legal sectors*

The third and last comparison is between the legal sector and non-legal sectors. In the UK, we find that the

proportion of job postings with digital skills is not so different in the legal sector and non-legal sectors (see Fig. 7 left panels). In the US, the proportion of job postings with digital skills is actually lower for lawyers in the legal sector than in non-legal sectors (see right panels). Moreover, the proportion of digital skills for other legal professionals is not so different in the legal and non-legal sectors, hovering around 5% in both countries. Thus, H1c that predicts higher digital skill shares in legal than non-legal sectors is not well supported.



**Figure 6.** Digital skill shares in ABS and non-ABS firm job postings in the UK.

#### *Regression analysis*

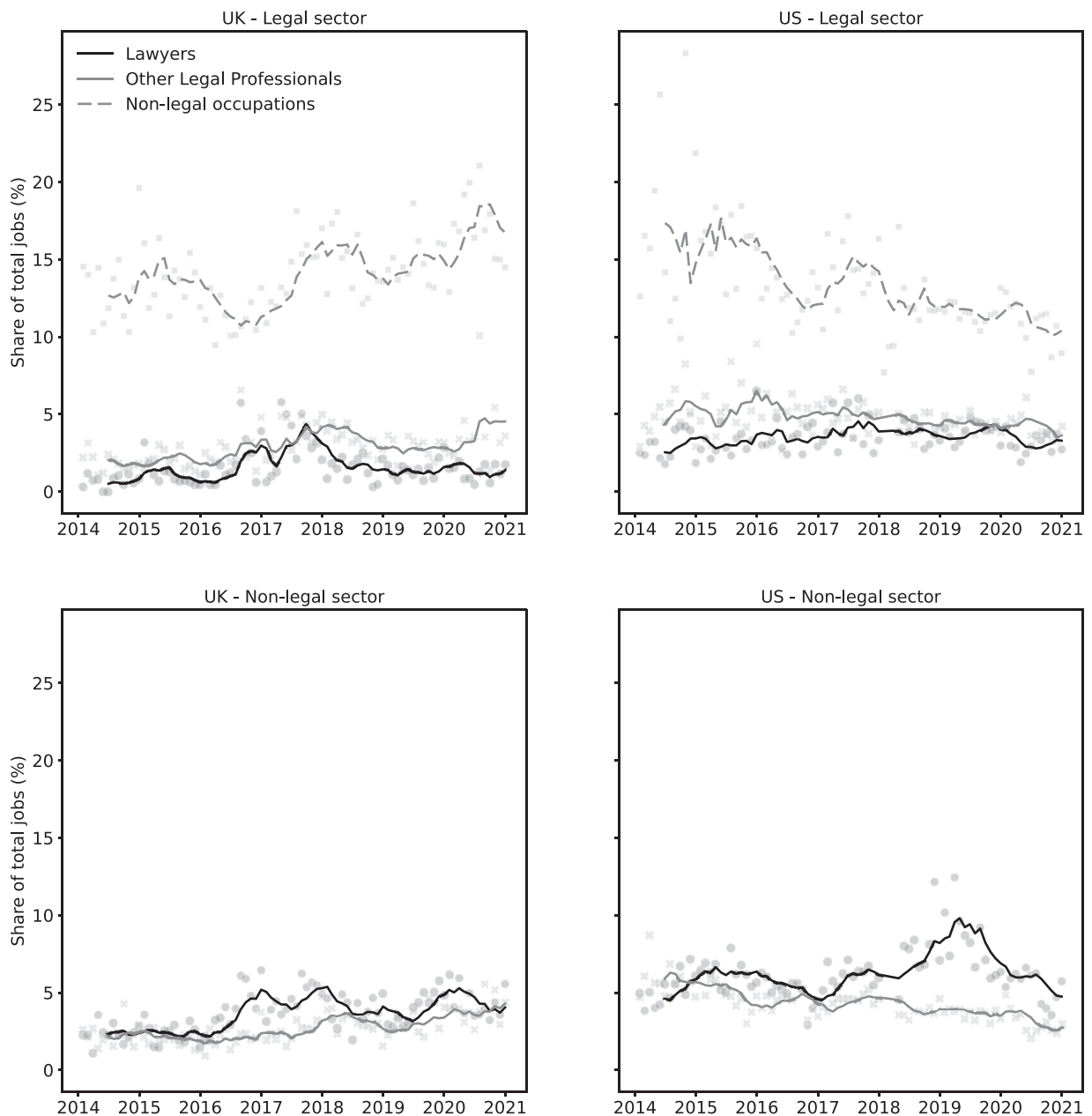
Table 3 shows the OLS regressions at the firm-level with year fixed effects which examine the statistical significance level of the patterns we detect in the figures above. The dependent variable is the percentage share of job postings requiring digital skills in a year and firm, for lawyers, and for other legal professionals. We proxy lawyers' protective control using three separate firm-level dummy variables taking a value of 1: (1) if the firm is not an alternative business structure in the UK regulated sector; (2) if the firm is located in the US; and (3) if the firm is in the legal sector. We also use two firm-level control variables: the lawyer-to-non-legal employee ratio (the other legal professionals are in the non-legal employee category) and the number of job postings per firm each year.

First, Table 3 shows the results for all job postings. Within the UK regulated sector, being a non-ABS firm, compared to an ABS firm, is associated with a 0.13% lower share of digital skills for lawyers and 1.4% higher share of digital skills for other legal professionals (see columns 1 and 2). The coefficient for lawyers is insignificant, while the coefficient for other legal professionals is significant at the 1% level. The second proxy for professional jurisdictional control, location in the US, is highly significant at a 1% level. Lawyer jobs in the US are associated with a 1.2% higher share of digital skills compared to those in the UK, while other legal professional jobs postings in the US are associated with a 1.5% higher share of digital

skills compared to those in the UK (see columns 3 and 4). Third, job postings for other legal professionals have a 0.8% higher share of digital skills in the legal than in the non-legal sectors, but job posting for lawyers is associated with a 2.1% lower share of digital skills in the legal than in the non-legal sectors (see columns 5 and 6). Both are significant at a 1% level.

Next, we present regression results for two subsamples, one for permanent (or regular) job postings and the other for temporary (or fixed-term) job postings. We use two methods to categorize job postings into permanent and temporary. In the US, Burning Glass extracts the contract type from the vacancy text, and we use their pre-processed data. In the UK, we use the contract type classification method in Adams-Prassl, Balgova and Qian (2020). This involves labeling the text of ~7,000 job postings for their contract type, and then using natural language processing to train a machine learning classifier, which in turn is applied to all UK job postings in our sample. In the US, 51% of all job postings are permanent, and 7% are temporary. In the UK, 75% are permanent and 12% are temporary.<sup>12</sup>

Tables 4 and 5 show that the results from the full sample hold with similar significance levels for each subsample. However, as expected, the coefficient sizes are larger for temporary job postings than for permanent job postings. For example, being a non-ABS is associated with a 3.3% higher digital skill share for other legal professionals



**Figure 7.** Digital skill shares in legal and non-legal sector job postings in the UK and US.

if jobs are temporary, compared to a 1.3% higher digital skill share if jobs are permanent (compare column 2 in Tables 4 and 5). In other words, traditional law firms (non-ABS) rely more heavily on subordinate jurisdiction than ABS firms, and do so by relying more on temporary than permanent hires. Also, comparing the US and the UK, US lawyer jobs are associated with a 4.9% higher digital skill share for temporary jobs, but only a 1.5% higher digital skill share for permanent jobs (compare column 3

in Tables 4 and 5). In other words, US law firms practice full jurisdiction particularly by hiring more temporary lawyers with digital skills.

Thus, in relation to our first set of hypotheses, we find evidence for H1a (a greater proportion of job postings for lawyers and other legal professionals require digital skills in the non-ABS firms than in ABS firms within the regulated legal sector in the UK), as job postings for other legal professionals in non-ABS firms require more



**Table 3.** Hypothesis tests on professional jurisdictional control and digital skill shares in all job postings

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
H1a			H1b		H1c		H2a	H2b
Lawyers		Other legal professionals	Lawyers	Other legal professionals	Lawyers	Other legal professionals	Non-legal occupations	
UK regulated sector			UK-US legal and non-legal sector			UK regulated sector		
			DV: digital skill share			UK-US legal sector		
Proxies for professional control								
Non-ABS firm	-0.1309 (0.780)	1.4337*** (0.003)					3.4149*** (0.002)	
United States			1.1609*** (0.000)	1.5053*** (0.000)				4.0447*** (0.000)
Legal sector					-2.1232*** (0.000)	0.7592*** (0.000)		
Control variables								
Lawyer to non-lawyer ratio	-0.4653 (0.359)	-1.0059 (0.944)	0.2678 (0.165)	9.2136*** (0.000)	-0.166 (0.931)	8.8993*** (0.000)	-1.9195 (0.315)	-2.0426*** (0.003)
Number of job postings	0.0241* (0.063)	0.0636** (0.019)	0.0061** (0.029)	0.012 (0.342)	0.0046* (0.067)	0.0016 (0.192)	0.0515*** (0.000)	0.0182*** (0.000)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	2,307	2,262	106,065	301,986	106,065	301,986	2,184	44,135
Adj. R <sup>2</sup>	0.005	0.009	0.001	0.011	0.003	0.011	0.016	0.007

*Notes:* The table shows the coefficients of regression models that evaluate the hypothesis H1a, H1b, H1c, H2a, and H2b. The parenthesis display *p*-values. \*\*\*Indicates statistical significance at a 1%, \*\*at a 5%, and \*at a 10% level. The standard errors are MacKinnon and White (1985) hetero-skedasticity robust. The dependent variable is the firm-level share of job postings with digital skills by year. The main independent variables proxy lawyer's professional jurisdictional control over tasks. Lawyer's professional jurisdictional control is of protective nature in non-ABS firms in the UK regulated sector, in the US, and in the legal sector. A regression coefficient of one corresponds to a one percent change in the share of job postings with digital skills. The control variables are the ratio of job postings in a firm for lawyers and non-lawyers (with other legal professionals in the non-lawyer category), and the number of vacancies a firm post in a year. The regressions include a year fixed effect and an intercept. The occupational category is defined by the occupation code.

digital skills than in ABS firms. We also find some evidence for H1b (a greater proportion of job postings for lawyers and other legal professionals require digital skills in the US than in Britain). In the US, paralegals and legal assistants are asked to conduct tasks requiring digital skills under the direct supervision of qualified lawyers. This is because lawyers can exercise better jurisdictional control over these lower-status semiprofessionals via subordinate jurisdiction (Abbott 1988: 71), than over occupations outside the legal field. Comparing legal and non-legal sectors, evidence for H1c (a greater proportion of job postings for lawyers and other legal professionals require digital skills in the legal sector than in non-legal sectors in both the UK and the US) is mixed, with support for other legal professionals only. Job postings for lawyers require less digital skills in the legal than in the non-legal sectors.

### Digital skills for non-legal employees

Next, we turn to investigate the incidence of digital skills required in job postings for non-legal occupations. As before, we compare ABS and non-ABS firms in the UK, then the UK and the US. We omit to compare the legal sector and the non-legal sectors, as the high diversity of non-legal employees in the latter sector makes such a comparison meaningless.

In the UK, the percentage of non-legal job postings asking for digital skills is much higher than the proportion for lawyers, starting from 12%, facing an upward trend, albeit with fluctuations, to 16% (see Fig. 6, first panel). When we contrast organizations that adopted alternative business structures and organizations that are traditional law firm partnerships, we find a higher share of digital skills for non-legal occupations in non-ABS firms (see Fig. 6). This is contrary to H2b which predicts higher digital skill shares in ABS firms governed by connective professional control.

In both the UK and the US, digital skill shares in non-legal job postings are substantially higher than for legal job postings (Fig. 7, first row). In both countries, digital skill shares fluctuate around 14%. However, while the UK exhibits an upward trend in digital skill shares, the US exhibits a downward trend. In other words, the UK shows a divergence of digital skill shares between legal professionals and non-legal occupations, while the US shows a corresponding convergence of digital skill shares. The divergence in the UK could suggest a shift over time towards the division of labor or advisory jurisdiction, while the convergence in the US could suggest a shift to full jurisdiction or subordinate jurisdiction.

### Regression analysis

We extend the regression analysis to evaluate the second set of hypotheses. The structure of the regression models remains the same as before. We find that being a non-ABS firm, compared to an ABS firm, increases the share of digital skills in job postings by 3.4% (see Table 3, columns 7 and 8). Also, being a US firm rather than a UK firm leads to a 4% higher digital skill share in job postings. Both coefficients are significant at 1% level.

Therefore, the second set of hypotheses is not supported. We find that the groups with connective jurisdictional control have a lower share of job postings with digital skills. The time trends, however, indicate that the share of digital skills in job postings may not be the most revealing measure for this hypothesis. Instead, jurisdictional turf wars are played out over time, and the convergence or divergence of digital skill shares across legal and non-legal occupations may be more revealing of shifts in jurisdictional settlements.

### Pay premia for lawyers and other legal professionals

We now turn to investigate the third set of hypotheses that predict whether or not digital skills lead to a pay premium or discount. We find robust evidence in descriptive statistics and regression analysis that connective professional control leads to pay premia and protective control to pay discounts for digital skills.

Table 6 shows pay premia for a range of legal occupations. In the UK, legal professionals command pay premia for jobs requiring digital skills compared to those that do not, except for legal professionals not elsewhere classified. Patterns are very similar in the legal sector and non-legal sectors. Solicitors with digital skills in both sectors would be paid £5,000 more on a median salary of £45,000 for solicitors without digital skills, a pay premium of 11%. Larger pay premia exist for legal associate professionals (i.e. paralegals). With a baseline median salary of £22,500 without digital skills in the legal sector, they are paid 24% more for having digital skills; similarly with a median salary of £24,000 in non-legal sectors, they are paid £6,000 more for having digital skills, a pay premium of 25%. Mood's median test, a special case of Pearson's chi-squared test, was performed to test the null hypothesis that the two samples (job postings with digital skills and jobs without digital skills) come from populations with the same median salary. As shown in Table 6, the null hypothesis was rejected at the 1% level. This pattern indicates that in the UK, lawyers and other legal professionals are valued and rewarded for their knowledge of digital technology and/or data science.

Table 4. Hypothesis tests on professional jurisdictional control and digital skill shares for permanent job postings

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	H1a		H1b		H1c		H2a	H2b
	Lawyers	Other legal professionals	Lawyers	Other legal professionals	Lawyers	Other legal professionals	Non-legal occupations	
UK regulated sector			UK-US legal and non-legal sector			UK regulated sector		UK-US legal sector
DV: digital skill share								
Proxies for professional control								
Non-ABS firm	-0.739 (0.898)	1.2573** (0.022)					1.6824 (0.229)	
United States			1.4666*** (0.000)	1.6026*** (0.000)				1.8982*** (0.006)
Legal sector					-2.1218*** (0.000)	0.3389*** (0.000)		
Control variables								
Lawyer to non-lawyer ratio	-0.7210 (0.275)	-1.5287 (0.135)	-0.4868** (0.044)	8.8363*** (0.000)	-0.7569*** (0.002)	8.5026*** (0.000)	-6.7767*** (0.002)	-0.1552 (0.840)
Number of job postings	0.0236 (0.179)	0.0453** (0.043)	0.0090 (0.139)	0.0057 (0.045)	0.0049 (0.357)	0.0057** (0.044)	0.0664*** (0.000)	0.0355*** (0.000)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	1,849	1,559	64,570	222,680	64,570	222,680	1,307	31,178
Adj. R <sup>2</sup>	0.006	0.008	0.001	0.012	0.004	0.011	0.023	0.010

Notes: The table shows the coefficients of regression models that evaluate the hypothesis H1a, H1b, H1c, H2a, and H2b. It includes only job postings which advertise permanent contracts. The contract type is provided by Burning Glass for the US and classified using the machine learning method in Adams-Prassl et al. (2020) for the UK. The parenthesis display *p*-values. \*\*\*Indicates statistical significance at a 1%, \*\* at a 5%, and \* at a 10% level. The standard errors are MacKinnon and White (1985) heteroskedasticity robust. The dependent variable is the firm-level share of job postings with digital skills by year. The main independent variables proxy lawyer's professional jurisdictional control over tasks. Lawyer's professional jurisdictional control is of protective nature in non-ABS firms in the UK regulated sector, in the US, and in the legal sector. A regression coefficient of one corresponds to a one percent change in the share of job postings with digital skills. The control variables are the ratio of job postings in a firm for lawyers and non-lawyers (with other legal professionals in the non-lawyer category), and the number of vacancies a firm post in a year. The regressions include a year fixed effect and an intercept. The occupational category is defined by the occupation code.

Table 5. Hypothesis tests on professional jurisdictional control and digital skill shares for temporary job postings

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	H1a		H1b		H1c		H2a	H2b
	Lawyers	Other legal professionals	Lawyers	Other legal professionals	Lawyers	Other legal professionals	Non-legal occupations	
UK regulated sector			UK-US legal and non-legal sector			UK regulated sector		UK-US legal sector
DV: digital skill share								
Proxies for professional control								
Non-ABS firm	0.7576 (0.592)	3.2833** (0.011)					3.5053** (0.023)	
United States			4.7800*** (0.000)	1.1918*** (0.001)				5.8554*** (0.000)
Legal sector					-0.4644 (0.514)	2.5322*** (0.000)		
Control variables								
Lawyer to non-lawyer ratio	-3.5661** (0.013)	-2.6856 (0.336)	-1.7181* (0.080)	6.2359*** (0.000)	-2.6978*** (0.008)	5.9092*** (0.000)	2.0819 (0.544)	-4.1418 (0.115)
Number of job postings	0.0055* (0.957)	0.3515** (0.030)	0.0263 (0.528)	0.0177 (0.493)	0.0428 (0.295)	0.0195 (0.459)	0.2722*** (0.000)	0.1163*** (0.010)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	384	680	6,956	15,903	6,956	15,903	1,150	3,038
Adj. R <sup>2</sup>	0.041	0.021	0.015	0.007	0.006	0.008	0.032	0.018

Notes: The table shows the coefficients of regression models that evaluate the hypothesis H1a, H1b, H1c, H2a, and H2b. It includes only job postings which advertise temporary contracts. The contract type is provided by Burning Glass for the US and classified using the machine learning method in Adams-Prassl et al. (2020) for the UK. The parenthesis display *p*-values. \*\*\*, \*\* indicates statistical significance at a 1%, \*\* at a 5%, and \* at a 10% level. The standard errors are MacKinnon and White (1985) hetero-skedasticity robust. The dependent variable is the firm-level share of job postings with digital skills by year. The main independent variables proxy lawyer's professional jurisdictional control over tasks. Lawyer's professional jurisdictional control is of protective nature in non-ABS firms in the UK regulated sector, in the US, and in the legal sector. A regression coefficient of one corresponds to a one percent change in the share of job postings with digital skills. The control variables are the ratio of job postings in a firm for lawyers and non-lawyers (with other legal professionals in the non-lawyer category), and the number of vacancies a firm post in a year. The regressions include a year fixed effect and an intercept. The occupational category is defined by the occupation code.



**Table 6.** Pay premia for digital skills in legal occupations in UK and US

	(1)	(2)	(3)	(4)	(5)
	Number of job postings		Median salary of job postings		Pay premium
	Digital skills		Digital skills		
	Yes	No	Yes	No	
United Kingdom					
Legal sector					
Solicitors	2,875	246,116	£50,000	£45,000	£5,000***
Legal associate professionals	1,542	73,502	£28,000	£22,500	£5,500***
Legal professionals n.e.c.	370	22,542	£42,000	£51,000	-£9,000***
Legal sec.	117	22,995	£23,500	£21,000	2,500***
Barristers and judges	22	56	£62,400	£41,210	£21,190
Non-legal sector					
Solicitors	1,996	93,751	£50,000	£45,000	£5,000***
Legal associate professionals	1,224	58,233	£30,000	£24,000	£6,000***
Legal professionals n.e.c.	487	21,902	£32,000	£38,325	-£6,325***
Legal sec.	454	47,619	£23,000	£20,500	£2,500***
Barristers and judges	115	1,378	£27,872	£28,728	-£856***
United States					
Legal sector					
Lawyers	3,778	43,059	\$66,560	\$90,224	-\$23,664***
Paralegals and legal assist.	5,729	90,166	\$52,000	\$45,000	\$7,000***
Legal support workers	193	7,607	\$26,500	\$29,120	-\$2,620***
Legal support workers, all others	346	2,950	\$52,000	\$40,000	\$12,000***
Legal sec. and admin. assist.	785	13,696	\$47,500	\$45,000	\$2,500***
Non-legal sector					
Lawyers	7,081	69,900	\$72,993	\$84,160	-\$11,167***
Paralegals and legal assist.	6,637	61,371	\$49,818	\$46,632	\$3,186***
Legal support workers	4,137	274,373	\$32,500	\$28,080	\$4,420***
Legal support workers, all others	1,842	11,192	\$52,500	\$44,598	\$7,902***
Legal sec. and admin. assist.	1,536	20,446	\$42,640	\$42,500	\$140*

Notes: The table presents the pay premia for digital skills in the legal occupations in the UK and US. It uses occupation and salary data in Burning Glass job postings from 2014 to 2020. Column 1 shows the number of job postings with digital skills. Column 2 shows the corresponding number without digital skills. Column 3 shows the median salary of the job postings with digital skills. Column 4 shows the corresponding salary for job postings without digital skills. Column 5 shows the pay premium, which is the difference between the two median salaries for job postings with and without digital skills. \*\*\*Indicates statistical significance at the 1%, \*\*at the 5%, \*at the 10% level using Mood's median test. The occupational category is defined by the occupation code. In the UK, we use the SOC codes 2413 solicitors, 3520 legal associate professional, 2419 legal professional n.e.c., 4212 legal secretaries, and 2412 barrister and judges. In the US, we use the O\*NET codes 231011 lawyers, 232011 paralegals and legal assistants, 434171 legal support workers, 232099 legal support workers, all other, and 436012 legal secretaries and administrative assistants. The legal sector is defined by the industry code. For the UK, the job postings are filtered with the SIC code 69.10 legal activities. For the US, the job postings are filtered with the NAICS code 5411 legal services.

The pattern is somewhat different in the US. Using the O\*NET occupational category, lawyers with digital skills are paid a median salary of \$66,560 compared to \$90,224 for lawyers without digital skills in the legal sector, which amounts to a negative premium of 26%. Even in non-legal

sectors, US lawyers with a median salary of \$84,160 without digital skills would encounter \$11,167 less pay if they apply for jobs requiring digital skills, a negative premium of 13%. This observation also holds when we consider job titles instead of occupations: litigation attorneys with

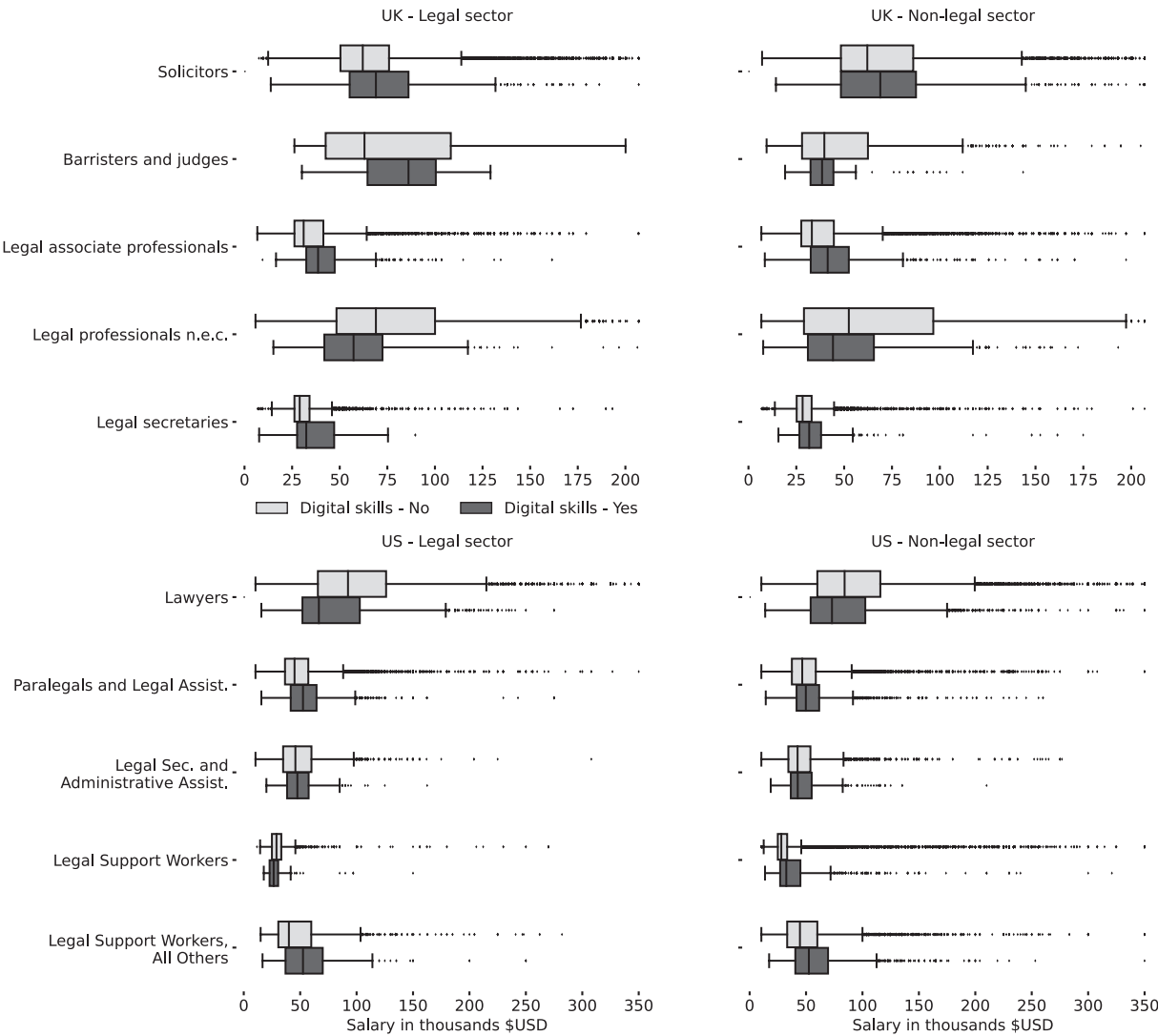


Figure 8. Pay premia for digital skills in legal and non-legal sectors, in the UK and US.

digital skills are paid \$10,155 less on average than litigation attorneys without digital skills. Figure 8 visualizes the pay premia.

### Regression analysis

We also present regression results with firm-level differences in the median salary for jobs with and without digital skills as the dependent variable (see Table 7). Except for the change in the dependent variable, the structure of the regressions remains the same as before. We use two proxies of protective professional jurisdictional control of lawyers, the US (compared to the UK) and the legal sector (compared to the non-legal sector). We cannot use the ABS and non-ABS comparison, as the sample sizes

are too small. The effect sizes are smaller in the regression models in Table 7 as compared to Table 6, because the analysis is within firms, but significant differences in pay premia remain at the firm-level.

Comparing the UK and the US, we find support for H3a. The regression model estimates the pay premium for lawyers in the US to be \$5,206 lower than in the UK (see column 1). The coefficient is significant at a 5% level. In the UK, connective professional jurisdictional control implies that digital skills are valued and rewarded with higher pay for lawyers. By contrast, protective professional jurisdictional control by the US bar discounts digital skills as not being fully part of the professional knowledge base for US attorneys, regardless of whether

**Table 7.** Hypothesis tests on professional jurisdictional control and pay premia

	(1)	(2)	(3)	(4)
	H3a	H3a	H3b	H3b
	Lawyers	Other legal professionals	Lawyers	Other legal professionals
UK-US legal and non-legal sector				
DV: salary in thousand \$USD				
Key variables of interest				
United States	-5.206** (0.0483)	1.311 (0.4188)		
Legal sector			-2.440 (0.4469)	-2.018** (.0399)
Control variables				
Lawyer to non-lawyer ratio	-6.505 (0.3578)	0.922 (0.6251)	-7.274 (0.3147)	0.459 (0.8118)
Number of job postings	0.012 (0.2996)	0.007 (0.1779)	0.012 (0.3222)	0.006 (0.2228)
Year fixed effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Sample size	802	2,418	791	2,407
Adj. R <sup>2</sup>	0.003	0.000	0.001	0.001

Notes: The table shows the coefficients of regression models that evaluate the hypothesis H3a and H3b. The parenthesis display *p*-values. \*\*\*Indicates statistical significance at a 1%, \*\*at a 5%, and \*at a 10% level. The standard errors are MacKinnon and White (1985) hetero-skedasticity robust. The dependent variable is the firm-level median difference of legal job posting's salaries with and without digital skills. The main independent variables proxy lawyer's professional jurisdictional control over tasks. Lawyer's professional jurisdictional control is of protective nature in non-ABS firms in the UK regulated sector, in the US, and in the legal sector. British salaries in £GBP are converted to \$USD using the exchange rate on 15 Oct 2021. A regression coefficient of one corresponds to a \$USD1000 median difference in the salaries. The control variables are the ratio of job postings in a firm for lawyers and non-lawyers (with other legal professionals in the non-lawyer category), and the number of vacancies a firm post in a year. The regressions include a year fixed effect and an intercept. The occupational category is defined by the occupation code.

they work within the legal sector or in non-legal sectors. This implies that even with some law schools offering courses in data science, their graduates would face lower pay if they wish to deploy digital skills to practice law. For other legal professionals, the coefficient is insignificant (see Table 7 column 2).

Comparing the legal and non-legal sectors, we find support for H3b. The regression model estimates the pay premium for lawyers in the legal sector to be \$2,440 lower than in the non-legal sector, and for other legal professionals to be \$2,018 lower in the legal than in the non-legal sectors (see Table 7 columns 3 and 4). Only the latter coefficient is significant, at a 5% level. Within the legal sector, protective jurisdictional control implies that digital skills are less valued and rewarded with lower pay for lawyers and other legal professionals.

## DISCUSSION AND CONCLUSION

In this paper, we study the impact of digital technology on professional work by focusing our attention on the

mediating role of professional jurisdictional control. We develop a theoretical framework to link jurisdictional control to preferences for jurisdictional settlements in the face of disturbances including technology adoption. The economics literature on the future of work and the sociological literature on the system of professions are synergistic in highlighting in what ways the impact of digital technology on task recombination varies due to the nature of professional jurisdictional control. We apply the contrast between protective professionalism and connective professionalism (Noordegraaf 2020) to identify different types of jurisdictional control.

The growing importance of digital skills in value creation in legal services enhances the possibility that other professionals with digital skills could drive a wedge in the jurisdictional claims of lawyers as a dominant profession. In this empirical context, our key findings are as follows. First, we find that protective professional jurisdictional control is associated with higher proportions of job postings requiring digital skills for lawyers and other legal professionals. We interpret this result as

evidence of full jurisdiction and subordinate jurisdiction (Abbott 1988). Second, we did not find evidence that connective jurisdictional control is associated with higher proportions of job postings requiring digital skills for non-legal employees. However, convergence in digital skill shares across legal and non-legal jobs in the US over time is suggestive of full or subordinate jurisdiction, while divergence in the UK is consistent with jurisdictional settlement via division of labor or advisory links (Abbott 1988). Third, protective jurisdictional control is found to be associated with lower pay premia for digital skills. We interpret this as evidence that the legal profession does not regard knowledge that underpin digital skills—mathematics, statistics, coding, etc.—to be part of its knowledge base.

### Contribution to theory

The overall findings of this study help us draw theoretical implications for the future of work and the systems of professions. With respect to the economic analysis of the future of work, our study points to professional jurisdictional control as an important factor that mediates the impact of digital technology on packaging tasks into jobs. In particular, professional jurisdictional control helps us narrow down the scoping condition, and points us to specific resolutions in terms of how new tasks are packaged into existing or new jobs. Consequently, instead of stopping at estimates of jobs or occupations “at risk of automation” or “exposed to AI”, we could derive narrower possibilities by gauging if a new task may or may not occasion changes in job roles, and may or may not create the foundation for a new occupation. Our study demonstrated that the technology’s influence on jobs varies across contexts, specifically across different organizational forms and location-specific jurisdictions.

With respect to the system of professions, new digital technology is treated not just as an external force that impacts tasks and jurisdictional boundaries. It is also framed as an occasion for new professions to emerge. Moreover, a system of professions may incorporate the study of inter-relations between distant professions, such as law and data science. Our findings are consistent with regard to jurisdictional settlements as temporary staging posts (Baba et al. 2021), particularly when one of the professions is emergent. It is also possible that a relational perspective of open interfaces with new professions (Kahl et al. 2016) and connective professionalism (Noordegraaf 2020) is more important than occupational closure for the survival of a profession when jurisdictional challenges come from professions whose knowledge base is quite different yet complementary.

### Implications for practice

Technological change challenges the durability of occupations. Thus, the most salient implication of our research for practice concerns the future size and shape of the legal profession. The future of the legal profession, which may remain cohesive or splinter, is best understood in terms of the consequences of the prevailing professional jurisdictional control.

On the one hand, protective jurisdictional control by lawyers leads to incorporating digital tasks themselves or delegating them to paralegals, while digital skills are not valued in lawyers’ professional knowledge base. The most likely future scenario is the incorporation of lawyers with digital skills as part of a unified legal profession, and the profession will continue to regard data scientists, project managers and other non-legal employees as support workers. In this scenario, lawyers may decline in number, not because of the adoption of technology (substituting lawyers’ tasks), but because the slow take-up of digital technology sustains high costs of legal service delivery, with an associated shrinkage in demand for this sort of lawyers.

On the other hand, connective jurisdictional control by lawyers leads to greater accommodation in working with data scientists, due to their willingness to rely on the superior digital skills of data scientists. Data scientists could either advise lawyers or agree to a division of labor with lawyers. In this case, likely future scenarios include the splintering of the legal profession into sub-disciplines, including legal engineering and legal operations, which may evolve into separate professions with the assimilation of professional knowledge among lawyers and data scientists. Legal engineers and legal operations experts would not need to have a license to practice law, and therefore need not be called “lawyers”. Therefore, while jurisdictional battles between lawyers and legal engineers may be regarded today as battles within the profession, they may evolve into battles between professions. This is a distinctly different perspective from the *Future of Professions* in which technology itself is given center stage (Susskind 2008; Susskind and Susskind 2015).

### Limitations of our study and future research

We acknowledge the following limitations. First, our study developed a theory concerning tasks, but our empirical evidence tracked skills in job postings. We provided a skill-to-task mapping and assumed that a job advert requiring digital skills would lead to a successful candidate performing digital tasks. Following some empirical studies (Acemoglu et al. 2020; Felten et al. 2021), we also did not query empirically what tasks are being substituted,



augmented or created by digital technology. In future, we may investigate tasks in job postings, and examine how AI-exposed jobs repackage tasks differently in different organizational settings. This may involve comparing how law firms and corporate legal departments bundle tasks differently. Equally worthwhile would be to examine if startup ventures pioneer more novel task recombinations for various professions compared to more mature firms.

Second, we looked at the system of professions from the perspective of the legal profession. We did not carry out a corresponding study from the perspective of data science as a profession. Future studies might take up an industrial sector such as the ICT sector, in which data science may have a good foothold to become a dominant profession, in order to examine jurisdictional settlements between data scientists and other professionals.

Third, due to data availability, our empirical findings are primarily cross-sectional, with a timeline of only several years (2014–21). Despite our quantitative methodology, therefore, our findings are more akin to studying short-term resolutions—i.e. temporary staging posts—in jurisdictional battles (Baba et al. 2021; Barley 1986; Bechky 2003; Huising 2015; Kellogg 2009), rather than studying how professions survive over a period spanning decades (Kahl et al. 2016). For the latter, attention should be paid to how jurisdictional battles take shape also at the field level, via associations, as well as at the organization level. Our study may develop into a longer-term comparative historical study to complement the existing US-based research (Atalay et al. 2020). But for now, our focus on professional jurisdictional control enables us to spell out possible scenarios for the future of the legal profession.

## NOTES

1. Over time, AI systems require iterative inputs of lawyers as producers-of-technology. But the process of augmentation (with humans in the loop) may lead eventually to substitution (humans out of the loop) as machines improve their performance.
2. Lawyers are defined as Barristers and Judges (SOC 2412) and Solicitors (SOC 2413). Other legal professionals are defined to include Legal Associate Professionals (SOC 3520), Legal Professionals n.e.c. (SOC 2419), and Legal Secretaries (SOC 4212). Subsequent analyses for “legal professionals” as a category include “lawyers” and “other legal professionals”. Non-legal occupations include data scientists and project managers.
3. Lawyers defined as Lawyers (O\*NET 231011) and Judges (O\*NET 231023). Other legal professionals including Paralegals and Legal Assistants (O\*NET 232011), Judicial Law Clerks (O\*NET 1231012), and Legal Secretaries (O\*NET 436012). Non-legal employees data scientists and project managers.
4. The full list of words used is provided below: artificial intelligence, ai, machine learning, deep learning, data science, data scientist, accountant engineer, accountancy engineering, accountancy tech, accountancytech, natural language processing, nlp, semantic analysis, decision tree, document analysis, document review, contract intelligence, case prediction, neural networks, neural nets, full stack, developer, automate, api, data architecture, micro-services architecture, technology stack, devops, net core, docker, kubernetes, azure cloud, chef, java,

- python, angular, coding, testing, deployment, agile kanban, restful api, soa.net, javascript, c#, sql, continuous integration, test automation, automated configuration, relational database, non-relational database, soap, rest, software design, data extraction, data visualization, data visualization, workflow, rules based analysis, margin matrix, technology, technologies, tech, material efficiencies, document management system, 3e, epic, peoplesoft, data mining, data modeling, artificial intelligence technologies, data collection plan, structured data, structured sources, unstructured data, unstructured sources, data exploration, hypothesis testing, statistical modeling, data analysis, pocs, data cleaning, statistical analysis, algorithm, algorithms, algorithm development, tableau, sas, big data, sql server reporting services (ssrs), data warehousing, teradata dba, transact-sql, microsoft sql server integration services (ssis), microsoft sql, microsoft c#, .net, asp.net, asp.net mvc, active server pages (asp), statistical analysis, statistics, statistical reporting, microsoft powershell, data verification, relational databases, software engineering, software development, system design, hypertext preprocessor (php), sap, web application development, nunit, kanban, scrum, c++, linux, sql server, hardware and software installation, enterprise resource planning (erp), cognos impromptu, microsoft sharepoint, visual studio, microsoft active directory, data manipulation, data management, data quality, metadata, database design, data collection, extensible markup language (xml), object-oriented analysis and design (ood)
5. The full list of required skills for this job is: basic internet skills, building effective relationships, computer literacy, copying, detail-orientated, document management, document review, due diligence, english, legal document composition, legal documentation, legal research, legal solutions, meeting deadlines, microsoft excel, microsoft office, online research, proofreading, scheduling, version control, lexisnexis.
  6. The full list of required skills for this job is: clustering, database administration, database design, database schemata, disaster recovery planning, optimization, sql, sql server, teradata dba.
  7. The full list of required skills for this job is: administrative support, communication skills, customer billing, customer contact, data management, legal document composition, legal documentation, litigation, network hardware/software maintenance, writing.
  8. The full list of required skills for this job is: data science, python, sql, audit planning, data analysis, data management ‘geometry, information systems, microsoft access, microsoft office, microsoft word, statistical reporting, trigonometry, written communication.
  9. Even after smoothing the data using six-month moving averages, there remain idiosyncratic fluctuations over time in all figures.
  10. In contrast to Tables 1 and 2, Figs. 3 and 4 only include job postings from where the firm name is disclosed to and processed by Burning Glass.
  11. The argument assumes the same job ad filling rate, job ad capture rate, and employee retention rate for lawyers and non-legal employees.
  12. Because the contract type data originates from the vacancy text, some job postings miss the contract type variables, if the vacancy text does not contain such information.

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## CONFLICT OF INTEREST

None declared.

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