



Paper to be presented at the DRUID 2011

on

INNOVATION, STRATEGY, and STRUCTURE -  
Organizations, Institutions, Systems and Regions

at

Copenhagen Business School, Denmark, June 15-17, 2011

## **Institutional Logics and Status: Strategic Patenting in the Legal Service Sector**

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### **Abstract**

Professional service firms adhere to at least two often conflicting institutional logics - serving their clients and serving as a gatekeeper of societal institutions, but the literature says little about under which conditions professional service firms align their actions with each of these conflicting logics. Simultaneously, a large literature emphasizes that the behavior of professional service firms are driven by status dynamics, however, this literature has yet to consider how status dynamics affect firms' adherence to institutional logics. We bring these two previously separate literatures together by investigating law firms' tendency to aid their clients with strategic patenting. Drawing on a large dataset of patent applications from the European Patent Office we first show that status is a strong predictor of following a client logic. Yet, the effect of status wanes as firms gain more experience with patenting. This paper contributes to the literature on institutional logics by specifying the conditions that influence firms' adherence to conflicting institutional logics. We also discuss the impact of our results for the literature on status.

# **Institutional Logics and Status: Explaining Strategic Patenting in the Legal Service Sector**

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**June 2011**

**Acknowledgements:** We thank Lee Fleming, Suma Arthreye, Paola Cillo, Jeannette Colyvas, Dominique Guellec, Caroline Haeussler, Simcha Jong, Young-Kyu Kim, Francesco Lissoni, Michael Lounsbury, Fabio Montobbio, Andrew Nelson, Kelley Packalen, Walter W. Powell, Emanuela Prandelli, Laurel Smith-Doerr, Kaisa Snellman, Bruno Van Pottelsberghe de la Potterie, Georg Von Graevenitz, Nicolas van Zeebroeck, Gianmario Verona, Stefan Wagner, David Wilkins, Kjersten Bunker Whittington and all other participants at the seminar at Bocconi University, Harvard University, Ludwig-Maximilians-Universität (LMU) Munich for their valuable comments on this paper. The usual disclaimer applies.

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## ABSTRACT

Professional service firms adhere to at least two often conflicting institutional logics – serving their clients and serving as fiduciaries. While we know that the actions of professional service firms are often driven by status dynamics then we have yet to consider how status affect firms’ adherence to conflicting institutional logics. We bring these two previously separate literatures together by investigating law firms’ tendency to aid their clients with strategic patenting. Drawing on a large dataset of patent applications from the European Patent Office we first show that status is a strong predictor of following a client logic. Yet, the effect of status wanes as firms gain more experience with patenting. This paper contributes to the literature on institutional logics by specifying the conditions that influence firms’ adherence to conflicting institutional logics. We also discuss the impact of our results for the literature on status.

**Keywords:** *Institutional logics, status, strategic patenting, professional service firms, legal service sector, and cumulative innovation*

## INTRODUCTION

Professional service firms constitute an increasing part of the global economy (Greenwood, Suddaby and McDougald 2006). Yet, our understanding of professional service firms remain limited (Leicht and Fennell 2008; Leicht and Lyman 2006). Professional service firms are “organizations comprised primarily of professionals that facilitate economic and commercial exchange by providing advice to business” (Greenwood, Suddaby and McDougald 2006 p. 1). They include among others accounting firms, law firms, engineering and management consulting firms, and architectural service firms. A core tension exists within professional service firms: On the one hand they are committed to serving their clients and on the other hand they serve as fiduciaries of societal institutions (Greenwood, Suddaby and McDougald 2006; Leicht and Fennell 2008; Smets, Morris and Greenwood 2011). This tension positions professional service firms at the intersection of two institutional logics: The fiduciary and client logic (Leicht and Lyman 2006; Smets, Morris and Greenwood 2011). Yet, these two logics often conflict as service to the client might undermine or challenge the societal institutions that professional service firms simultaneously are dedicated to upholding. For example, law firms have through time been torn between on the one hand serving the needs of their clients and on the other acting as a guardian of the legal system. Lawyers are expected to be the extended hand of their clients by aiding them in avoiding prosecution or obtaining legal protection, but simultaneously lawyers are trained to be the guardians of the legal system and to ensure that justice is done (Wilkins 2009).

Institutional logics within professional service firms are important, because they shape organizational actions (Friedland and Alford 1991; Lounsbury 2002; Thornton,

Jones and Kury 2005; Thornton and Ocasio 1999; Thornton and Ocasio 2008).

Institutional logic are “the socially constructed, historical patterns of material practices, assumptions, values, beliefs, and rules by which individuals produce and reproduce their material subsistence, organize time and space, and provide meaning to their social reality”(Thornton and Ocasio 1999 p. 804). Most of the literature on institutional logics has examined how a temporal change (Thornton and Ocasio 1999)or geographical dispersion(Lounsbury 2006; Marquis and Lounsbury 2007) displace a dominant logic. For example Scott et al. (2000) show how logics of markets, professions and the democratic state interacted in changing how medical services were organized. Yet, more recently scholars have questioned whether logics exist in isolation and have begun examining how multiple often conflicting logics co-exist (Kraatz and Block 2008; Thornton, Jones and Kury 2005).Dunn and Jones (2010) for example identify that the logic of care and the logic of science have co-existed and conflicted within the medical profession leading to an oscillation between these two logics over time. While this recent literature on institutional logics has provided insight into the development and dynamics of institutional logics at the field level the literature still leaves unexplored the attributes that lead individual firms to choose one logic over the other.

Logics often conflict within professional service firms (Dunn and Jones 2010; Kraatz and Block 2008; Thornton, Jones and Kury 2005). If we fail to understand firms’ differentiated commitment to institutional logics we might overlook a central dynamics of professional service firms, and thereby fail to grasp a core organizational dynamic within the modern knowledge economy. Furthermore, we have yet to grasp how conflicting institutional logics might persist within a field (Dunn and Jones 2010;

Greenwood and Suddaby 2005; DiMaggio and Powell 1991) even though scholars have called for examination of the actions that firms take that facilitate institutional maintenance in the face of contradictions (Lawrence and Suddaby 2006; Zietsma and Lawrence 2010; Lawrence, Suddaby and Leca 2010; Zilber 2010; Hirsch and Bermiss 2010). Examining the attributes that make firms choose to adhere to one of several conflicting institutional logics is thus of utmost importance.

Scholars have found that one of the key drivers of the actions of professional service firms is their embeddedness within a status hierarchy (Abbott 1988; Phillips and Zuckerman 2001; Sherer and Lee 2002). Adherence to prevailing institutional logics can add to a firm's status (Smets, Morris and Greenwood 2011). Furthermore, a firm's position within a status hierarchy might be particularly important when understanding firms' adherence to conflicting institutional logics as high status firms due to their position within a social hierarchy are exposed to countervailing external influences (Greenwood and Suddaby 2006). Phillips and Zuckerman (2001) provide evidence that the status characteristics of firms can explain whether firms will engage in practices that stray from the social ordering within the profession. In the context of law Sherer and Lee (2002) show that elite law firms are more likely to engage in institutional change by adopting new organizational practices.

While the literature has shown that status dynamics are central to the actions of professional service firms, then this literature still lacks examination of how status influences the actions of professional service firms when institutional logics conflict. The current study addresses this problem and thereby contributes to expanding our knowledge of how professional service firms choose between conflicting institutional

logics. More specifically, we examine how status influences professional service firms' tendency to adhere to a fiduciary versus a client centered logic.

We focus on intellectual property services within the legal profession. The legal profession is a particularly interesting case in which to study logics, as through time the legal profession has struggled with two different and conflicting logics: To serve the client versus being a fiduciary of the legal system (Wilkins 2009). When following the logic of serving the client the lawyer optimizes the outcome for the client, whether or not the lawyer believes that the clients' claims are valid. The client based logic was first articulated by Lord Brougham in 1820 when he in an address to the House of the Lords stated that the lawyer ought to serve his client at any cost:

“[A]n advocate, in the discharge of his duty, knows but one person in all the world, and that person is his client. To serve that client by all means and expedients, and at all hazards and costs to other persons, and, amongst them, to himself, is his first and only duty; and in performing this duty he must not regard the alarm, the torments, the destruction which he may bring upon others.” (cited in Wilkins 2009, p. 669).

In the quote Brougham stresses that even if serving the client might bring torment to others the goal of the lawyer is to serve the client. Yet, Brougham's perspective represents only one side of the coin. Many legal scholars and lawyers express the dual role that lawyers have to serve not only their client but also to be fiduciaries. The fiduciary logic was first expressed by Jeremy Bentham in 1827 when he argued that from the perspective of the legal system the lawyer ought to serve a larger social function that ensures justice (Wilkins 2009). The fiduciary logic has, however, persisted through the decades. As stated by a lawyer in 1999:

Lawyers are special people...[...]..We're fiduciaries. We're in the Constitution. We're Officers of the Court. And we hold in trust the very

fabric of this society. It has been lawyers who have kept the playing field level, who have kept people honest in the marketplace and who have stood between the individual and the abuse of authority for 200 years and contributed to the very success of this great American experiment. (Dunbar testimony, 1999 quoted in Suddaby and Greenwood 2005, p. 52).

In contrast to serving the client the logic of being a fiduciary for the legal system might not always optimize the outcome for the client if such actions undermine justice.

Through the centuries the legal profession has struggled with the tension between the client and the fiduciary logic, with some firms adhering more strongly to one logic or the other (Wilkins 2009). Yet, it remains unanswered why some law firms choose to act in accordance with the client logic rather than the fiduciary logic. While much research has examined how laws and regulations influence the functioning of markets (Haveman 1993; Smith and Grimm 1987) less is known about how status and institutional logics influence the actions of law firms.

We examine the question of what determines whether law firms adhere to a client centered versus a fiduciary logic by investigating when law firms engage in strategic patenting. When a firm engages in strategic patenting it tries to increase the value of a patent even if these actions conflict with the intent of the legal system. By engaging in strategic patenting law firms extend the scope of a patent and increase the technological uncertainty around the patent, thus, creating disincentives for clients' competitors to enter into the same technological area (Jaffe and Lerner 2004; Stevnsborg and van Pottelsberghe de la Potterie 2007). Strategic patenting serves the need of the client firm by providing the client with a competitive advantage, but simultaneously strategic patenting undermines the legal system by taking advantage of the intellectual property

protection afforded by the patent system(Hall and Ziedonis 2001). Strategic patenting thus provides a tremendous opportunity to study the conflict between serving the client and being a fiduciary of the legal system within a single practice carried out by a professional service firm. Furthermore, strategic patenting is an important area of inquiry for several reasons. First, modern firms' competitive advantages are increasingly determined by their ability to innovate which places firms patenting abilities at the core of their competitive advantage (Powell and Grodal 2005). Second, while patents in most of the literature has been viewed as proxies for firms innovative capabilities recent research has shown that firms use patents as a strategic tool to fend off competition among others by engaging in advantageous patent drafting practices (Hall and Ziedonis 2001; Jeffe and Lerner 2004). Third, even though a tremendous literature exists on firms' patenting practices the role that law firms play in the patenting practice has been largely overlooked (but see Reitzig and Wagner 2010), and in particular no paper has to date looked at the role of law firms in shaping strategic patenting. In addition to augmenting the literature on status and institutional logics we, thus, also add to the literature on strategic patenting by demonstrating the role that law firms play in this practice and in the drafting of patents in general.

We answer the question of how status influences firms' tendency to adhere to a client centered versus a professional logic by examining all patent applications to the European Patent Office during the five year period 2001-2005. Drawing on this large dataset of nearly half a million patent applications we show that the status of the law firm shapes its tendency to abide by a client centered logic even if these actions undermine the intent of the legal system. However, the effect of status wanes with experience within the

patent system as law firms become embedded in the institution of patenting. We find that the opposite holds for client firms, that is with experience they engage less in strategic patenting as they are not restrained by the service to the legal system that come from being a professional service firm. As law firms gain experience with the institution of patenting they shift to emphasize the fiduciary logic.

Our study makes several theoretical contributions. First, we add to the theory of institutional logics by detailing how the status of professional service firms shape their actions in accordance with a specific institutional logic. Furthermore, we show how the actions of professional service firms differ from client firms due to their adherence to the institutional logics of their profession. Second, our study augments our understanding of status dynamics by showing how the effects of status can be counteracted by firms' embeddedness within an institutional arrangement. Finally, we also discuss the implication of our results for the functioning of the patent system.

In the next section we describe strategic patenting and the role that law firms play in this practice before we use this analysis to hypothesize about how status influences law firms tendency to abide either by a client centered or a fiduciary logic.

## **STRATEGIC PATENTING WITHIN THE LEGAL SERVICES SECTOR**

To examine how status impacts professional service firms' adherence to conflicting institutional logics we study whether law firms abide to a client centered or a fiduciary logic. In particular, we examine law firms' tendency to engage in strategic patenting, that is the practices undertaken during the drafting and processing stage of a patent by trying to extend the scope or delay the granting of the patent (Hall and

Ziedonis, 2001). The drafting of a patent starts before a patent application is submitted, where the law firms interact with the client firms in order to translate the technological discovery made by the client firms into a legally binding document (Wang 2010). After the patent application is submitted the law firms interact with and respond to enquiries made by the patent examiners during the processing of the patent. During this processing stage of the patent law firms also have opportunities to shape the content of the patent and the timing of the granting of the patent.

Yet, patents are not purely technical descriptions of innovations, but a strategic tool for firms seeking a competitive advantage (Hall and Ziedonis, 2001). The patent system serves to regulate and coordinate behavior, allocate rewards and legal protection for organizations seeking to patent their innovations (Hall and Ziedonis 2001; Merges and Duffy 2007; Scotchmer 2005; Stevnsborg and van Pottelsberghe de la Potterie 2007). But at times firms can strategically use the patent system in order to reap benefits beyond the exact technology that they have invented. The patent strategies that firms employ include incomplete and ambiguous patent drafting to secure priority in winner-takes-all innovation battles (Guellec and van Pottelsberghe de la Potterie 2007). In particular, firms engage in strategic patenting by broadening the claims of the patents, delaying patent processing and filing divisional extensions to their patents in order to gain a competitive advantage by creating uncertainty about technological assets and capabilities (Stevnsborg and van Pottelsberghe de la Potterie 2007; van Zeebroeck and van Pottelsberghe de la Potterie 2008).

Strategic patenting is not done by firms in isolation, but is aided by law firms. Patents are legal documents, and they are written in a legal language that describes the

innovation in a way that can be interpreted and protected by legal institutions (Grandstrand 2005). It is only through this compatibility with the legal system that patents obtain their value. Patents are thus partly co-created between the client firm that has made a technological discovery and the law firm that aids the client firm in translating the technological discovery into a legal document (Wang 2010). While most attention has been paid to how client firms innovate and create patents then law firms are also important players in shaping patent outcomes. Yet, client firms and law firms differ in their approach to the patent system as law firms are professional service firms that not only are loyal to the client, but also serve as guardians of the legal system. This means that whereas client firms might benefit from the law firm helping them engage in strategic patenting, then such behavior puts the law firm at odds with their role as fiduciaries (Abbott 1981).

Strategic patenting, therefore, involves a dilemma for law firms. On the one hand engaging in strategic patenting might increase the value of the patent and thus serve the good of the client. On the other hand strategic patenting undermines the patenting system by allocating excessive rewards to a particular firm to the detriment of its competitors, and by overburdening patent examiners with work (Guellec and van Pottelsberghe de la Potterie 2007). Strategic patenting can be detrimental to the intent of the patent system, because it not only provides undue competitive advantages for the client firm, but limits the cumulateness of innovative activities which is an essential goal of the patent system (Jaffe and Lerner 2004). That is strategic patenting limits how other firms might build on and use innovations, because successful subsequent invention demands both disclosure and access to preexisting knowledge (Murray and O'Mahony 2007). The conflict that

law firms face between serving the client and being a fiduciary of the legal system when deciding whether or not to engage in strategic patenting makes strategic patenting an instructive place in which to observe how law firms behave when faced with conflicting institutional logics.

## **MULTIPLE INSTITUTIONAL LOGICS AND STATUS**

### **Institutional Logics**

In their seminal work on institutional logics Friedland and Alford (1991) presented the idea that the behavior of firms can be explained by their adherence to different institutional logics. Logics consist of meaning and beliefs systems that guide behavior (Friedland and Alford 1991). Building on their framework a large share of the literature on institutional logics has focused on the shift from one dominant logic to another (Glynn and Lounsbury 2005). For example, Thornton and Ocasio (1999) investigated how a shift from an editorial to a market logic led to a new organizational structure within higher education publishing, Haveman and Rao (1997) examined how the rise of the progressive thought changed the organizational form of the saving and loans industry, and Scott et al. (2000) observed how the changing logics within the field of health care led to a shift from an emphasis on “quality of care” over “equity of access to service” with the health care field ultimately being governed by a logic of “efficiency of service provision”.

In much of the existing literatures logics have been viewed as distinct entities pertaining to separate spheres of institutional life (Thornton and Ocasio 1999). However, logics are seldom in binary opposition but co-exist within the same organization (Kraatz and Block 2008) and organizational field (Scott et al. 2000). Lately more research has

focused on this simultaneously co-existence of multiple logics by emphasizing plurality and the contestation of meaning. For example Thornton, Jones and Kury's (2005 p. 151) historical study show how within architecture several hybrid logics existed, where "as a professional, the architect enhanced the beauty of the built environment with their design skills. As an entrepreneur, the architect competed in the building market." The relationship between logics might indeed be dynamic. Dunn and Jones (2010) for example show that interprofessional change, interprofessional dynamics and intraprofessional contestation led the logics within the field of medical education to oscillate between a logic of care and a logic of science.

### **Status Dynamics within Professional Service Firms**

The actions of professional service firms are shaped by their position within a status hierarchy, which can lead them to both maintain or disrupt institutions (Abbott 1988; Kraatz and Moore 2002; Phillips and Zuckerman 2001; Podolny 1993).

On the one hand scholars have argued and demonstrated that high status firms act to maintain institutions (DiMaggio and Powell 1983; Fligstein 1991; Haveman 1993; Stinchcombe 1968; Kraatz and Moore 2002). The primary argument behind these findings has been that high status firms benefit from the arrangements found within existing institutions. In order to reinforce their social position and the associated benefits they aim to maintain the status quo. On the other hand scholars have found that high status firms disrupt existing institutions (Phillips and Zuckerman 2001; Greenwood and Suddaby 2005; Sherer and Lee 2002; Colyvas and Powell 2006). Authors within this stream have put forward two different arguments for why high status firms might disrupt

existing institutions. First, Greenwood and Suddaby (2005) have argued that high status firms due to their position within a status hierarchy are exposed to conflicting institutional logics. Second, early work suggested that deviant behavior were more frequent among low status groups (Wattenberg and Balistreri 1950), which led Hollander (1958) to theorize that high status actors' confidence in their social position emboldensthem to deviate from the norm. In particular, scholars have argued that high status firms are motivated to deviate in order to differentiate(Phillips and Zuckerman 2001). Within the context of gastronomy Rao, Monin and Durand (2005), for example, show that high status actors began blending culinary traditions thereby eroding traditional perceptions of the boundaries between classical and nouvelle cuisine, each of which represented a different perception of which values and skills ought to be the distinguishing characteristics of a professional chef.

Within the current literature there is, thus, no consensus about whether we would expect high status firms to work to maintain or disrupt existing institutional structures. We suggest that a reason for this contradiction within the literature might be that practices are often governed by conflicting logics and that in many circumstances no one practice is more aligned with the professional norm than others. This existing literature on status does not provide an explanation for which practices high status firms will adhere to when multiple practices exist each of which are governed by different conflicting logics. In the case of professional service firms we suggest that these puzzles might be resolved by distinguishing between the fiduciary logic and the client logic and disentangling the effect of status from the effects of experience with a professional practice as we will elaborate below.

## **Client Logic and Status**

While the literature on status is conflicted about whether high status firms tend to maintain or disrupt existing practices then the literature on professional service firms have suggested that an important distinction in firms' behavior is the extent to which they follow a fiduciary versus a client centered logic (Greenwood, Suddaby and McDougald 2006; Leicht and Fennell 2008; Leicht and Lyman 2006).

The core function of professional service firms is to assist clients with tasks that require expert knowledge (Leicht and Lyman 2006). Professional service firms have, therefore, always placed service to their clients as a central logic. The growth of the knowledge society has meant that there are an increasing number of tasks that require knowledge outside the domain of most firms. This has led to an explosive growth in the number professional service firms (Heinz, Nelson and Laumann 2001; Kronman 1995). For example within the legal profession law firms have through the centuries viewed service to their clients, whether they believe in the innocence of the client or not as one of their core logics (Wilkins 2009).

We suggest that high status firms will be emboldened by their position within the status hierarchy to be less inclined to protect the societal institutions of which they are part as high status firms have more liberty to enter into new markets (Hallen 2008; Jensen 2003) and develop new business opportunities (Suddaby and Greenwood 2005) making them less dependent on existing institutional arrangement. In contrast low status firms have to rely on their past performance in order to secure new business areas (Hallen

2008). In the case of law firms we would thus expect that high status firms would be more inclined to aid their clients even though such actions might erode the institutional arrangements that form the basis of their livelihood. That is high status firms would be more inclined to abide by the client than the fiduciary logic. In the case of strategic patenting we would, thus, also expect that high status firms would aid their clients with creating the broadest and most valuable patent possible even if engaging in these practices might undermine the patent system.

***Hypothesis 1: Status increases a law firms' tendency to engage in strategic patenting***

### ***Fiduciary Logic and Experience***

Friedland and Alford (1991) and Thornton (2004) show that one of the fundamental institutional logics is the fiduciary logic. Professional service firms are characterized by a strong commitment to protecting the societal institutions with which their professions interact – that is they serve as fiduciaries that make sure that their clients do not abuse the societal institutions (Abbott 1988). In the example of law firms then they are not only committed to serving their clients, but they also protect the legal system and make sure that justice is done (Wilkins 2009). That is law firms protect the legal system, even if this means not optimizing outcomes for their clients.

The longer a professional service firm has been engaged with a specific societal institution the more likely the firm is to protect it (Abbott 1988). We, therefore, suggest that the extent of experience a professional service firm has will influence the firms' tendency to adhere to a fiduciary logic (Greenwood, Suddaby and McDougald 2005). In

the case of law firms we would expect law firms with more patenting experience to have become more embedded with the institution of patenting and therefore be more engaged in maintaining and upholding the principles associated with the patenting system. However, this ought to only be true for law firms as they engrained with the fiduciary logic. In contrast we would not expect to find this effect for their client (technology) firms as they are not embedded within the logic of the legal profession. Instead we would expect that the more experience that a client firms as with the patent system the better they will be at drafting patents that provide them with a competitive advantage even though such action might undermine the functioning of the system. We thus hypothesize:

***Hypothesis 2a:** Law firms with more patenting experience are less likely to engage in strategic patenting.*

***Hypothesis 2b:** Client firms with more patenting experience are more likely to engage in strategic patenting*

As stated above then the literature on status is conflicted about whether high status firms tend to act in accordance with the client or the fiduciary logic (DiMaggio and Powell 1983; Fligstein 1991; Haveman 1993; Stinchcombe 1968; Kraatz and Moore 2002; Phillips and Zuckerman 2001; Greenwood and Suddaby 2005; Sherer and Lee 2002). This might be explained by disentangling the effect of status from the effect of experience. That is even though high status might afford professional service firms the legitimacy to adhere to a client centered logic then high status firms are still influenced by their institutionalembdedness and their actions have become infused with the values of that institutional arrangement (Selznick 1954). We, therefore, hypothesize that the

effect of status on a law firm's tendency to engage in strategic patenting will decrease with the firm's patenting experience.

*Hypothesis 3: The effect of status on a law firm's choice of logic wanes with experience*

## METHODS

### Data

To investigate which law firms engage in strategic patenting we examined all patent application in the European Patent Office (EPO) in the five year period from 2001-2005. From the PATSTAT database we collected detailed information about patents included in the front page of patent documents such as inventors, applicants, their respective address information, patent claims, patent citations, and technological classes. From the EPOLINE dataset we further extracted the procedural information regarding the examination of each patent by the EPO such as application date, pending status and time, communications with the patent examiner and divisional applications. From EPOLINE and EPO's web directory on legal representatives we collected data on the law firms that had helped write and process each patent including the address of the law firm.<sup>2</sup>

### Dependent Variable

*Strategic Patenting.* We identify two goals that client firms strive for in their strategic patenting efforts: 1) Enlarge the boundaries of the patent, and 2) increase technological uncertainty for their competitors. Both goals are advantageous to the client firm. By enlarging the boundaries of the patent it becomes more valuable to the client as other firms will not be able to develop technologies within this area without a

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<sup>2</sup>See for example <http://www.epo.org/patents/Grant-procedure/representatives.html>

licensing agreement. By increasing the technological uncertainty the client firm gains a competitive advantage as their competitors will be stymied in their decisions about which technologies to develop. These two goals can be achieved through four strategic patenting practices: Create a patent with more claims, create a patent with broader claims, increase pending time by delaying and hampering communication with the patent office, and file extensions to the patent. We created a measure that corresponded to each of these practices: 1) The amount of claims in the patent, 2) the number of XY backward citations, 3) whether the patent was still pending in December 2008, and 4) the number of divisionals per application. The claims in a patent are the different subdivisions of the technological innovation that the patent declares are novel. By increasing the number of claims in a patent the patent becomes broader and thus more valuable. An X or Y citation is the patent examiners' way of disclosing that they believe that the patent is totally or partially overlapping with another patent, that is in order for a patent examiner to assign an X or Y citation the claims in the patent has been written in an overly broad fashion.<sup>3</sup> The pending time is the amount of time that the patent examiner has spent processing the patent until the final granting of the patent. A long pending time can be achieved by among others delaying communication with the patent office, not answering mails and faxes, many useless clarification questions to the examiner and delaying the payment of fees. The number of divisionals per patent is the amount of times that a firm has filed a new extension to the patent (Harhoff and Wagner 2009). By filing divisionals to an existing patent, innovations that were done after the patent application was filed can be counted as having the same priority date as the original patent. Previous literature

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<sup>3</sup>Patent examiners are employed by the European Patent Office and their job is to check that the patent is valid and that it does not overlap with any prior patents.

have shown that divisionals can be used strategically by firms (Graham, Hegde and Mowery 2009). All these measures have been validated during interviews with examiners and experts from the EPO and in the current literature (Guellec and van Pottelsberghe de la Potterie 2007) as ways that firms try to exploit the patent system to gain a competitive advantage.

Whereas these four patent practices might accrue benefits to the client firm, then the practices involved in doing strategic patenting are not difficult nor skillful. For example, the practice of not replying to the patent examiner’s mailing is something that can be done by any law firm. The choice of whether a law firm replies to the patent examiner is, thus, governed by their beliefs of whether it is most important to serve the client or represent the law. This diagnosis of the meaning of these patent processing practices was supported by interviews with intellectual property lawyers.

Table 1 shows the correlations of the four indicators that we used to construct the measure of patent strategies. All four indicators are positively and statistically correlated at the 1% confidence level, allowing us to include all of them into one single indicator using maximum likelihood factor analysis. The existence of only one factor suggests that the four indicators may capture a general propensity for the applicants and their law firms to engage in strategic patenting. The normalized factor loading for each of the four indicators is 38.0% for claims, 25.1% for XY citations, 22.8% for pending status and 2.5% for divisionals.

**Table 1 Correlation structure of the four indicators of strategic behavior in the European Patent Office**

	Claims	XY citations	Pending status	Divisionals
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<b>Claims</b>	1.0000			
<b>XY citations</b>	0.1488	1.0000		
<b>Pending status</b>	0.1370	0.1018	1.0000	
<b>Divisionals</b>	0.0193	0.0065	0.0133	1.0000

Notes: All the coefficients are significant at 1% level of confidence.

The factor index representing strategic patenting assigns more statistical importance to the number of claims, less to divisionals, and nearly equal weights to XY citations and pending status. The validity of the index was supported by interviews with experts from the EPO, who clarified that the number of claims is an easy and direct way to achieve more patent protection and that divisionals is an uncommon filling practice.

### **Independent Variables**

*Status.* We collected the status ranking from the magazine *Managing Intellectual Property (MIP)*, which is considered an authority on issues related to intellectual property.<sup>4</sup>Every year since 1997 *MIP* has created a world wide ranking of the most prestigious law firms within each country. The ranking is based on votes by senior practitioners in multinational companies and private practice, and is thus not a judgment made by employees at *Managing Intellectual Property*.<sup>5</sup>We created a dummy variable, which took the value of 1 if a law firm was represented on the list in either 2002 or 2003

<sup>4</sup> <http://www.managingip.com/>

<sup>5</sup>Nomination forms were sent to over 4,000 IP specialists in companies and in private practice across over 100 countries. Each individual was invited to nominate up to three leading firms in each of 50 countries. Responses were received by fax and e-mail from practitioners all over the world, covering patent and trade mark/copyright work. Only nominations from people in the database who received nomination forms were accepted; no more than two individuals per organization were canvassed in each country; and private practice firms were not allowed to vote for themselves. When the votes were in, the researchers added up the scores, awarding each firm three points for a first vote, two points for a second vote, and one point for a third vote. As stated by MIP: "It is important to stress that the firms listed are not necessarily the biggest, oldest or most active firms. And we do not claim that they are the best, or that other firms are inferior. MIP does not recommend or endorse any particular law or patent attorney firm. What is clear is simply that those listed will have received a large number of votes and command a great deal of respect among their peers around the world."

and 0 if it was not represented on the list. We focused on those years, because they were in the middle of the time period we considered. Status systems are fairly stable social systems, so there was only little change in the status ranking from year to year.

*Experience.* To examine the extent to which a law firm became embedded within the patenting institution we examined the duration of the firms' experience with patent law. We created a measure based on the log difference between year 2005 and first time the focal law firm created a patent. We took the log of experience, because studies suggest that there is a decreasing return to experience (Agarwal et al. 2004; Klepper and Simons 2000). Furthermore, we created an interaction variable by multiplying our status measure with the duration of the firm's experience within patent law.

In the regression analysis we control for several other characteristics of law firm, clients, and patent document. For sake of brevity we summarize the control variables in Table 2.

[Insert Table 2 about here]

### **Descriptive Statistics**

Table 3 shows descriptive statistics of the variables discussed in this section. The average patent in our sample has about 18.8 claims and almost three XY backward citations. Two thirds of the patents are pending and divisionals in the EPO account for only 7% of all patents. On average a patent is made by 2.6 inventors and controlling for the number of inventors each patent receives about five citations in the subsequent three years after the publication of the application.<sup>6</sup> Outsourcing across national borders is

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<sup>6</sup>We have counted forward citations using a consolidation at the INPADOC family level both on the citing and cited patent document.

frequent; indeed about 69% of the patent applications are outsourced to a foreign law firm.<sup>7</sup>

[Insert Table 3 about here]

In general, law firms have about 20 years of experience in the EPO system. The specialization index is less than 1/10 suggesting some degree of diversification in law firms' activity. Finally, the high status law firms account for a relevant share of the total applications (about 32%).

Some descriptive statistics by law firm's status are shown in Table 3. Statistical test – both parametric and non parametric – demonstrate that the two samples are different with regards to the number of claims, XY backward citations, pending status, and divisionals. Also the distribution of the factor index for strategic filing practices is statistically different for the two samples. Only in the case of the divisionals the test of the equality of the medians is not rejected; however only 7% of the applications have divisionals, which might contribute to this confirmation.

The literature has found that the number of inventors and forward citations are closely related to patent value (Fleming 2001; Harhoff et al. 1999; Trajtenberg 1990). Our analyses indicate that there does not seem to be a selection effect as high status law firms processing differently valuable patents.

[Insert Table 4 about here]

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<sup>7</sup> This trend might be associated to the statutory act of the EPO, according to which law firms allowed to operate in the EPO system have to be located in one of the European Patent Convention contracting states. Fifty-seven percent of the patent applications within the EPO are filed by an applicant in a non European country, thus outsourcing by non European applicants to a European law firms accounts for about  $57/69=82\%$  of the overall outsourced applications. The rest of the outsourced patent applications were done by European applicants, but processed by a law firm in a different European country. While intra European outsourcing is only about 10% of the overall outsourced patent applications, it matters for about  $7/(100-69)\approx 23\%$  of the applications filed by European applicants.

## FINDINGS

In this section we analyze the conditions that affect law firms' tendency to adhere to a client or professional logic. The results of the econometric model at the patent level are reported in Table 5.

[Insert Table 5 about here]

We estimated six models adopting three different statistical techniques. In the first two models we advanced an ordinary least squares estimation. Then, to account for unobserved heterogeneity at the client level we estimated a panel fixed effects. Third, we model a Heckman two stage estimator to check for potential endogeneity between the law firm and the client characteristics.<sup>8</sup> We included the interaction effect across law firms' status and duration of experience in Models 2, 4, and 6.

Overall, all of our hypotheses are strongly supported at the 1% confidence interval across the different statistical techniques adopted. Our first hypothesis focused on the role status plays in determining firms' tendency to adhere to a client centered logic. We found that law firms' status has a positive, large and significant effect on the strategic filing practices index. In particular, high status law firms have about a 10%

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<sup>8</sup> To check for endogeneity we assume that the client's selection of a law firm is done primarily on geographical distance; that is the client searches for a law firm locally first and then subsequently engages in a broader search. Typically the writing of a patent requires a continuous interaction among the client and the law firm. Thus, location matters at least in terms of smaller transportation costs. We use this assumption to estimate the relationship between law firm characteristics and the distance among the client and the law firm as an instrument in a two stage Heckman selection model. In the first step we model the decision to outsource an application abroad based on the client's characteristics using a probit regression, and in the second step we test our hypotheses by the variables without the client's characteristics with a linear regression model.

We could execute this procedure for the European clients only. Indeed, only for European clients is there a true decision to outsource across a national border as all non European clients must choose a European law firms according to the European Patent Convention. We found that the Inverse Mill's ratio is positive and statistically significant which confirms that client characteristics have an impact on their choice to outsource patent processing to a law firm outside of their own country. In particular, large and younger clients with patents in cumulative technologies search more broadly for an appropriate law firm. For sake of brevity we have omitted the results of the first stage estimation, which is available under request to the authors.

higher probability of creating a patent using strategic patenting tactics than do low status firms. Indeed, high status law firms' utilize the liberty provided by their status to assist their clients in obtaining the best possible outcomes.

Our second hypothesis investigated the impact of experience on firms' tendency to adhere to the fiduciary logic. We found that the longer the law firm has been patenting at the EPO the less likely the law firm is to engage in strategic patenting. This result, thus, confirms hypothesis 2a, because the law firms with more experience have been embedded within the norms of the legal profession for longer than their less experienced counterparts. These results become even more convincing when law firms are compared to the client firms. In contrast to the law firms we found that client firms that have been patenting at the EPO for a longer period of time engaged more in strategic patenting than did their less experienced counterparts. This finding confirms hypothesis 2b and reflects the fact that whereas for law firms the fiduciary logic became strengthened through their embeddedness in the patenting institution, then client firms were not professionalized and thus not constrained by the fiduciary logic. Client firms could, thus, draw on their experience with the patenting system in order to exploit its weaknesses to their own advantage, whereas experienced law firms were less likely to engage in this behavior because they were constrained by the fiduciary logic which cast them as guardians of the legal system.

We also find support for our last hypothesis which states that the effect of status on logic choice wanes with experience, that is the tendency for high status law firms to engage in strategic patenting decreases as they are exposed to the logic of the legal profession. Indeed, the interaction effect across law firms' status and duration of

experience is always negative and statistically significant across the different models estimated. We find that the impact of status over experience is about twice that of experience (Model 1), which means the average experienced law firm can outweigh the impact of status by increasing the embeddedness within the professional logic by one standard deviation from the mean. That is when high status law firms have 1.8 more years of experience than the average firm then the effect of experience will outweigh the effect of status.

Our results are robust after adding controls at the law firm level. We find that more specialized law firms, with clients originating both from civil code and common law countries, and with more experience in patent litigation have a higher tendency to engage in strategic patenting. Furthermore, we find that longer term contractual relation with the client and the absolute number of clients reduce the effect on strategic patenting. This last finding might be explained by the fact that if a law firm has multiple clients it provides them with the liberty to uphold the fiduciary logic. Likewise, when a law firm has worked with the same client for a long time then the increasing dependence of the client on the law firm might enable the law firm to adhere to the fiduciary logic.

Finally, it is worth mentioning that estimation results of the variables at the client level are consistent with the previous evidences such as Hall and Ziedonis (2001). In particular Hall and Ziedonis show that old and large firms, originating from specific sectors characterized by cumulative technical change, are responsible for the lion's share of strategic patenting practices. We show that what matters is not the propensity to patent in general but the size of patenting in some technical areas such as electrical devices and

engineering, audiovisual technology, telecommunications, information technology, semiconductors, optics and analysis, measurement, and control.

## **DISCUSSION**

We began this research by asking which attributes influence professional service firms' tendency to abide by one of several conflicting institutional logics. We found that firms' adherence to either logic can be explained by the interaction between status and experience. Our study therefore adds nuance to our understanding of how institutional logics and status in unison shape firm behavior.

We argue that through time law firms have been torn between two conflicting institutional logics – serving the client and being a fiduciary of the legal system. Our results show that a firm's position within a status hierarchy is a strong predictor of following a client centered logic. Second, we show that the more experience a law firm has the more the firm tends to adhere to a fiduciary logic. Third we show that the effect of status wanes with experience. The more experience a high status law firm has the higher the firm's tendency to adhere to a fiduciary logic. Status and experience are thus countervailing forces and their mutual influence might help explain how two conflicting institutional logics might co-exist within a profession.

### *Institutional Logics and Status*

Prior research on institutional logics has focused on a temporal or geographic change from one dominant logic to the other (Lounsbury 2002; Thornton 2004) thereby assuming

that only one logic can be dominant at any given place and point in time. Recently, research has aimed at understanding how firms respond to being embedded in multiple institutional logics (Chen and O'Mahony 2009; Dunn and Jones 2010; Thornton, Jones and Kury 2005). This paper adds to this research by specifying how exposure to multiple institutional logics might enable firms' strategic behavior. We develop a more nuanced theory of multiple institutional logics by identifying the conditions that lead law firms to adhere to one of several competing logics. Furthermore, we expand the theory of institutional logics by examining how status and institutional logics interact in shaping firm behavior.

In the legal profession the client centered logic and the fiduciary logic have co-existed for centuries (Wilkins 2009). Law firms, thus, do not adhere to one dominant logic only instead they choose between at least two competing logics – serving their client or serving the legal system. Their choice is not random, but depends on both the firm's place within a social hierarchy and its embeddedness with legal institutions.

Indeed, our findings move towards a novel conceptualization of logics as not only conflicting (Chen and O'Mahony 2009; Glynn and Lounsbury 2005), but also as reflecting a larger complex social and symbolic structure. Symbolic boundaries are the boundaries between different belief and meaning systems (Lamont and Molnar 2002). A symbolic boundary, thus, could exist between firms adhering to a client centered logic and firms adhering to a fiduciary logic. Prior literature has tended to assume that social and symbolic boundaries are aligned and that the boundaries that are created by social structures are reproduced in the symbolic sphere (Bourdieu 1989). In the case of law firms that would mean that high status and low status firms ought to adhere to different

institutional logics. Recent research has highlighted that social and symbolic boundaries are more permeable than previously thought and that social and symbolic systems diverge and intermix in unexpected ways (Hall 2001). We add to this stream of research by showing how the status hierarchy does not map on cleanly to the two institutional logics, instead the firms experience with a professional practice. We also find that high status actors choose between logics, and thus navigate more freely between different meaning systems.

We do, however, find that there is a tendency for firms to align social and symbolic boundaries as they gain experience within the profession and begin to adhere more strongly to the professional logic. Furthermore, even though firms in the beginning of their tenure increase their tendency to simultaneously use both logics then over time variance decreases and they become more uniform in their symbolic practices.

### *The Patent System and Cumulative Innovation*

Our paper adds to theories about cumulative innovation that is the ability of subsequent technologies to draw on prior ones (Murray and O'Mahony 2007). Recently there has been an increased interest in how firms use societal organizations, like for example the patent system, but empirical examinations still remain scant (Miller, Wright and Dannels 2001). In particular, most research has been descriptive or normative in nature, thus failing to explain why and why not organizations might take advantages of loopholes in institutional structures (Campbell 2007).

Strategic patenting is a manipulative behavior from the point of view of the patent system (Jaffe and Lerner 2004). First, it overburdens the patent office with work,

because manipulative organizations apply for patents with little technical novelty. This is evident in new technological areas such as biotechnology (Harhoff and Reitzig 2004; Lerner 1994), semiconductor (Hall and Ziedonis 2001), software (Bessen and Hunt 2004; Hall and MacGarvie 2006) and business methods (Hall 2009; Hall, Thoma and Torrisi 2009). Second, strategic patenting exploits that patent examiners only have a limited amount of time to examine each patent such that it might be possible to claim a larger contribution than is actually valid (Guellec and van Pottelsberghe de la Potterie 2007; Jaffe and Lerner 2004).

Cumulative innovation is particularly important in general purpose technologies and innovations that require standards (Scotchmer 1996), or when innovation needs co-inventions in order to be adopted (Bresnahan and Trajtenberg 1995). For example, some times adopter firms have to co-invent in order to adapt the technologies locally, and typically the nature of co-invention is cumulative meaning that it necessitates collective action. Successful co-invention demands both disclosure and access to preexisting knowledge related to the cumulative innovation (Murray and O'Mahony 2007).

Cumulative innovation is particularly important in information technologies, software, biotechnology, and nanotechnologies, which account for a large share of recent innovations (Lemley 2005; Scotchmer 2005).

One goal of the patent system is to encourage cumulative innovation through disclosure of patent documents (Jaffe and Lerner 2004; Murray and O'Mahony 2007). However, for intellectual property protection to function the institution governing the assignment of property and the disclosure of ideas need to be strong (Bessen and Meurer 2008). Lately there has been much debate about whether the patent system facilitates or

hinders innovative activity (Jaffe 2000). We show that in the case of strategic patenting the knowledge exchange relationship that is the foundation of the patenting system is undermined.

In this vein, strategic patenting may discourage co-invention, because strategic patenting increases uncertainty in proximate technological areas. Inventors and their law firms are seeking legal protection for their innovation, but at the same time working to obfuscate and minimize the disclosure and publication by artificially increasing the number of claims, write broader claims, and delay the granting moment of the patent in order to include many more revisions to the patent. Moreover, reduced disclosure may also limit the access to these patents: on the one hand, more and broader claims increase the risk of hold-up in the subsequent generation of the cumulative innovation.

Furthermore, longer pending time hampers licensing negotiations. As a consequence competitors may post-pone co-invention until the boundaries of a specific patent has been resolved. This may in turn delay investments in research and development within a particular technological area thus putting at risk the overall success and diffusion of the cumulative innovation. In nanotechnology for example, Lemley(2005) shows that the risk of holding-up is accelerating because inventors are engaging in manipulative patent strategies.

We find that the law firms that engage in strategic patenting tend to be less experienced. Furthermore, the deviant firms tend to be located in financial clusters. These results add to the policy debate on the role and function of the patent system by showing that both technology firms and law firms abuse the system in order to serve their self-interest. This kind of abusive behavior undermines the sustainability of the patent

system and increases the hindrances to innovative activities already incurred by the patent system.

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**Table 2 Description of variables employed in the analysis**

<i>Dependent variables</i>	<i>Description</i>
Claims	Number of claims in a patent application.
XY citations	Number of citations made whose claims overlap completely or partially with at least one claim of the focal patent application.
Pending status	A dummy variable that takes the value 1 if a decision on the fate of patent application has not been reached: such as granted, rejected, or withdrawn.
Divisionals	Number of divisional application related to the patent document sharing the same priority date.
Factor Index	A composite factor index based on Claims, XY citations, Pending Status, and Divisionals.
<i>Independent variables describing the law firm</i>	
High status law firm	Dummy variable whether a law firm is included in <i>Managing Intellectual Property Magazine</i> ranking during years 2002-2003. Source: www.mip.com
Age of law firm's activity (in log)	Log of the experience of the law firm computed as 2005 minus the year of first EP patent.
Law firm's specialization index	Herfindhal index of the patenting activity of the law firm over OST30 tech classes in the EPO.
Law firm with international clients	Law firm having at least 10% of the clients originating by a different legal system, such as common law vs civil code legislations.
Law firm involved in patent litigation	Dummy variable whether a law firm is involved in the patent opposition system in the EPO.
Law firm with many clients	Inverted Herfindal index of the patenting activity of the law firm over the number of distinct clients.
Experience of the law firm with the client	Log of the experience of the law firm with that client computed as 2005 minus the year of first EP patent.
Competition effect by other law firms	Herfindhal index of the patenting activities at the law firm's country level over OST7 tech classes.
<i>Independent variables related to the client firm</i>	
Non European applicant dummy	Binary variables for clients originating from non European Patent Convention designated countries.
Age of activity (in log)	Log of the experience of the client firm computed as 2005 minus the year of first EP patent.
Stock of patents (in log)	Log stock of EP patents of the client firm (depreciated at 15% annual rate).
Patents in cumulative technologies	Log stock of EP patents of the client firm (depreciated at 15% annual rate) in the following technological areas: Electrical devices and electrical engineering, audiovisual technology, telecommunications, information technology, semiconductors, optics, and analysis, measurement and control.
<i>Independent variables related to the characteristics of the client firm</i>	
Outsourced application abroad	Dummy variable for clients coming from a different country of that of the law firm.
Inventors per patent (in log)	Number of inventors in a patent (log).
Forward citations	The number of forward cites received by the patent or its equivalents during the first 3 years.
Application year dummies	Binary variables related to year of application by the patent document.
OST 30 tech. class dummies	Binary variables related to OST30 technological classification of the patent document. They can be multiple.

**Table 3 Descriptive Statistics**

(useful observations: 447,183 EPO applications filed during the years 2001-2005)

<b>Variables</b>	<b>Mean</b>	<b>Median</b>	<b>Std</b>	<b>Min</b>	<b>Max</b>
Claims per patent	18.788	15.000	14.882	0.000	746.000
XY citations per patent	2.763	2.000	2.792	0.000	123.000
XY citations per claim	0.215	0.133	0.323	0.000	33.000
Pending application dummy	0.610	1.000	0.488	0.000	1.000
Divisionals per patent	0.070	0.000	0.406	0.000	16.000
Inventors per patent	2.601	2.000	1.957	1.000	62.000
Forward citations within three years per patent	5.498	1.000	46.181	0.000	5766.000
Outsourced application abroad	0.690	1.000	0.462	0.000	1.000
High status law firm per patent	0.320	0.000	0.467	0.000	1.000
Age of law firm's activity in EPO (in log)	3.063	3.258	0.460	0.000	3.296
Law firm's specialization index over OST 30 tech. classes	0.088	0.065	0.072	0.000	1.000
Law firm with international clients	0.864	1.000	0.343	0.000	1.000
Law firm involved in patent litigation	0.839	1.000	0.367	0.000	1.000
Law firm with many clients	0.854	1.000	0.266	0.000	1.000
Experience of the law firm with the client (in log)	3.555	3.258	2.264	0.000	8.633
Competition effect by other law firms	0.055	0.029	0.083	0.000	1.000

**Table 4 Comparison of the main patent indicators by law firm's status**

(useful observations: 447,183 EPO applications filed during the years 2001-2005)

	Low status law firms				High status law firms				Test on the equality of distributions	
	obs	mean	median	st. dev.	obs	mean	median	st. dev.	On means 1)	On medians 2)
Claims per patent	303,963	18.237	14.000	14.398	143,220	19.959	16.000	15.797	rejected	rejected
XY citations per patent	303,963	2.740	2.000	2.739	143,220	2.811	2.000	2.901	rejected	rejected
XY citations per claim	303,963	0.218	0.136	0.319	143,220	0.208	0.125	0.331	rejected	rejected
Pending application dummy	303,963	0.594	1.000	0.491	143,220	0.645	1.000	0.478	rejected	rejected
Divisionals per patent	303,963	0.066	0.000	0.390	143,220	0.080	0.000	0.437	rejected	rejected
Factor index	303,963	-0.024	-0.091	0.566	143,220	0.052	-0.016	0.594	rejected	rejected
Inventors per patent	303,963	2.558	2.000	1.954	143,220	2.692	2.000	1.961	rejected	rejected
Forward citations per patent	303,963	4.910	1.000	38.647	143,220	6.746	1.000	59.048	rejected	rejected

Notes: 1) T-student test 2) Kruskal-Wallis equality-of-populations rank test

**Table 5: Analysis of the determinants of strategic filing practices at the patent application level.**  
**Dependent variable: the four indicators factor index**  
 (applications filed during the years 2001-2005)

	Pooled sample				Applicant fixed effects				Two stage estimator@			
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
<i>Variables at the law firm's level</i>	<i>coeff.</i>	<i>std</i>	<i>coeff.</i>	<i>std</i>	<i>coeff.</i>	<i>std</i>	<i>coeff.</i>	<i>std</i>	<i>coeff.</i>	<i>std</i>	<i>coeff.</i>	<i>std</i>
High status law firm	<b>0.048</b>	<b>0.002</b>	<b>0.090</b>	<b>0.020</b>	<b>0.020</b>	<b>0.003</b>	<b>0.088</b>	<b>0.029</b>	<b>0.024</b>	<b>0.003</b>	<b>0.189</b>	<b>0.022</b>
High status law firm * Age			<i>-0.013</i>	<i>0.006</i>			<i>-0.021</i>	<i>0.009</i>			<i>-0.053</i>	<i>0.007</i>
Age of law firm's activity in EPO (in log)	<b>-0.021</b>	<b>0.002</b>	<b>-0.020</b>	<b>0.002</b>	<b>-0.021</b>	<b>0.003</b>	<b>-0.020</b>	<b>0.003</b>	<b>-0.020</b>	<b>0.002</b>	<b>-0.017</b>	<b>0.002</b>
<i>Other controls at the law firm's level</i>												
Law firm's specialization index over OST 30 tech. classes	<b>0.037</b>	<b>0.012</b>	<b>0.037</b>	<b>0.012</b>	0.015	0.018	0.014	0.018	-0.003	0.013	-0.005	0.013
Law firm with international clients	<b>0.059</b>	<b>0.003</b>	<b>0.060</b>	<b>0.003</b>	<b>0.032</b>	<b>0.004</b>	<b>0.032</b>	<b>0.004</b>	<b>0.065</b>	<b>0.003</b>	<b>0.066</b>	<b>0.003</b>
Law firm involved in patent litigation	<b>0.017</b>	<b>0.002</b>	<b>0.017</b>	<b>0.002</b>	<b>0.007</b>	<b>0.003</b>	<i>0.007</i>	<i>0.003</i>	<b>0.016</b>	<b>0.003</b>	<b>0.016</b>	<b>0.003</b>
Law firm with many clients	<b>-0.009</b>	<b>0.003</b>	<b>-0.009</b>	<b>0.003</b>	0.001	0.004	0.001	0.004	<i>0.009</i>	<i>0.004</i>	<i>0.009</i>	<i>0.004</i>
Experience of the law firm with the client	<b>-0.019</b>	<b>0.001</b>	<b>-0.019</b>	<b>0.001</b>	<b>-0.013</b>	<b>0.001</b>	<b>-0.013</b>	<b>0.001</b>	<b>-0.005</b>	<b>0.001</b>	<b>-0.005</b>	<b>0.001</b>
Competition effect by other law firms	0.007	0.014	0.006	0.014	-0.014	0.021	-0.015	0.021	<b>0.103</b>	<b>0.017</b>	<b>0.104</b>	<b>0.017</b>
Country of the law firm	yes		yes		yes		yes		yes		yes	
<i>Controls at the applicant firm's level</i>												
Non European applicant dummy	<b>0.082</b>	<b>0.003</b>	<b>0.082</b>	<b>0.003</b>	-		-		-		-	
Age of activity in EPO (in log)	<b>0.009</b>	<b>0.002</b>	<b>0.008</b>	<b>0.002</b>	-		-		-		-	
Stock of patents in EPO (in log)	<b>-0.012</b>	<b>0.001</b>	<b>-0.012</b>	<b>0.001</b>	-		-		-		-	
Stock of patents in EPO (in log) in cumulative technologie	<b>0.011</b>	<b>0.001</b>	<b>0.011</b>	<b>0.001</b>	-		-		-		-	
<i>Controls at the patent level</i>												
Outsourced application abroad	<b>0.046</b>	<b>0.003</b>	<b>0.046</b>	<b>0.003</b>	<b>0.038</b>	<b>0.005</b>	<b>0.038</b>	<b>0.005</b>	<b>0.157</b>	<b>0.013</b>	<b>0.160</b>	<b>0.013</b>
Inventors per patent (in log)	<b>0.129</b>	<b>0.002</b>	<b>0.129</b>	<b>0.002</b>	<b>0.126</b>	<b>0.002</b>	<b>0.126</b>	<b>0.002</b>	<b>0.108</b>	<b>0.003</b>	<b>0.108</b>	<b>0.003</b>
Forward citations within three years per patent (in log)	<b>0.096</b>	<b>0.001</b>	<b>0.096</b>	<b>0.001</b>	<b>0.065</b>	<b>0.001</b>	<b>0.065</b>	<b>0.001</b>	<b>0.088</b>	<b>0.001</b>	<b>0.088</b>	<b>0.001</b>
Application year dummies	yes		yes	yes	yes		yes	yes	yes		yes	yes
OST 30 technological class dummies	yes		yes	yes	yes		yes	yes	yes		yes	yes
Costant	yes		yes	yes	yes		yes	yes	yes		yes	yes
Adjusted R squared	<b>0.194</b>		<b>0.193</b>		<b>0.172</b>		<b>0.173</b>		<b>0.451</b>		<b>0.451</b>	
Observations	447,183		447,183		447,183		447,183		181,218		181,218	

Notes: All the coefficients in bold are statistically significant at 1% level of confidence. Those in Italics at 5%.

@ It includes only patent documents by European applicants. See footnote 8 for more details of this approach.