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LEGAL CAPABILITIES AND COMPETITIVE ADVANTAGE: AN APPLICATION ON IP MANAGEMENT

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INTRODUCTION

Firms' value chain activities are everyday intersected by legal issues that managers are obliged to face and to manage since law imposes many duties to firms, such as environmental regulation, taxes, employment and labor laws, etc..

In spite of this, for many years managers have underestimated the role of legal capabilities within the firm. The reason why is maybe due to the general perception of law as a constraint for managers striving to create and appropriate value (North, 1990) and of legal counselors as professionals always acting in the interest of public and governments (Ring, Bigley, D'aunno, & Khanna, 2005; Wallace & Kay, 2008) or in their own (Sundaram & Inkpen, 2004) rather than in the one of the firms (Ladinsky & Grossman, 1966; Reed, 1969).

This perception, that was quite widely diffused among Top Management Teams, was overcome in the early 2000s, when many scholars, especially in the legal fields, hypothesized the chance for lawyers to positively contribute in the achievement and sustainment of a competitive advantage for firms (Bird, 2008, 2010, 2011; Siedel, 2000).

At the same time, managers started to consider legal tools as a part of market strategy (Edelman & Suchman, 1997).

Drawing upon this empirical evidence, a new research stream emerged, the so called"proactive approach of law" (Siedel & Haapio, 2010, 2016).Accordingly, legal strategies are imagined as pursuing to exploit opportunities that new international regulatory frameworks and their uncertainty (Malhotra & Morris, 2009) offer to firms. In more details, companies may benefit from the non unanimous application of statutes and law made by Courts (Jones, 2000) in the exclusive interest of clients.

As a consequence, firms started including legal capabilities as a source of competitive advantage and thinking how to extract value from legal functions (Bird, 2008).

It is not surprising to find out that managers are strongly advised to hire attorneys[1] within their firms and to empower them to manage and solve many in-house issues such as contracting activities (with clients, suppliers and competitors), governance forms (delegating them in the choice whether a limited liability company or a corporation is the most suitable solution for the business), taxes, real estates, licenses and management of Intellectual Property Rights strategies.

Furthermore, lawyers are also required to work effectively outside of the legal system (Rosen, 2000), to develop relationships with legal decision-makers (Tsang, 1998), to build networks and alliances (Tracey & Phillips, 2011).

This dissertation focuses on the active and positive contributions that legal counselors can provide to the management of the firm in the achievement and sustainment of a competitive advantage delineating the existence of legal capabilities concerning the exploitation of legal tools and the mixture of strategies, deeply focusing on the Intellectual Property (aftermath, IP) Management activities.

Notwithstanding the huge amount of prior work on sources of competitive advantage (Barney, 1991; Teece, Pisano, & Shuen, 1997), legal capabilities havealmost been underestimated.

The resource based view of the firm (Barney, 1991; Peteraf, 1993) stresses the relevance that each resource which is rare, valuable, inimitable and difficultly substitutable can be useful for firms in achieving a competitive advantage.

The same characteristics should be as well owned by capabilities, meant as special types of resources embedded within the firm purposed to improve the productivity of other resources possessed by firm (Makadok, 2001).

This dissertation intends to explore how legal capabilities may maximize the value of other resources, and specifically the value of IP tools within firms.

[1]https://www.entrepreneur.com/article/58326

This choice is consistent with the relevance IP toolsachieved in the last decade, more specifically the surge of patent applications and grants and, in turn, the growing number of patent lawsuits (Hanel, 2006).

Therefore, IP management is a newly emerged stream of literature which calls for more scholarly attention in order to provide an integrative framework of IP tools (such as patents, trademarks, secrets and copyrights) within overall business model design and corporate strategies (Al-Aali & Teece, 2013).

In order to profit from innovations, firms have to pursue proper strategies (Dai, 1996) aimed at protecting IP tools and appropriability chances for firms.

The goal of this dissertation is provide some empirical evidence on how and why legal capabilities strategies can be crucial in shaping proper strategies which may contribute to lower a firm's net costs and/ or to increase its revenues beyond what would otherwise be expected (Barney & Arikan, 2001).

With the exception of Bagley (2006, 2008, 2010, 2016), the "legal astuteness capability" is a neglected issue in the capabilities literature and this knowledge gap calls for more scholarly attention,

In spite of the demonstration of how much valuable this capability is for the firm, it has not been explained in which ways this capability can contribute in the achievement of a competitive advantage (Hsu & Ziedonis, 2013).

To achieve this goal, this dissertation is structured in 3 Chapters.

The first one is entitled "Don't Forget of Lawyers: Legal Counsel as a Source of Competitive advantage" and aims to highlight the role of lawyers as a source of competitive advantage taking a resource-based view perspective (Barney, 1996).

Therefore, in order to map the effective contributions of lawyers aimed in generating higher revenues (through the exploitation of advantageous contractual terms) or in reducing net costs and the so-called legal hazards, a co-word analysis has been run.

The purpose of this chapter is to detect the main activities of the firm's value chain where lawyers actually provide a concrete and positive contribution. The results show that these activities are stronger concerning IP Management, Personnel relationships and interpersonal and inter-organizational relations.

The following chapters are aimed to provide demonstrations of effective potential applications of the wise application of law pursued to create revenues and to reduce costs. Both of them are deeply focused on Intellectual Property (IP) Management.

Chapter II, entitled "Patent Designing Strategy: some empirical evidence on EP Patents" concerns how the "optimal patent" should be designed in order to reduce the risk of being involved in a patent infringement litigation and to increase its value.

To define "patent value" we use Harhoff, Scherer and Vopel (2003) concept which includes all benefits that a patent holder might perceive from application.

Previous studies, in fact, have depicted some possible strategies (Somaya, 2012) that may be pursued after the application phase: this paper, instead, provides some useful insights for practitioners in order to realize the patent that represents the best compromise between the trade-off given by the necessity of achieving the highest value and, on the contrary, the willingness of occurring in the lowest possible number of infringement litigations.

The main assumption that stands behind this paper is that patent infringement litigation costs are very costly and for most of the firms they are prohibitive: consequently, a lawsuit represents an event that must be avoided.

To do so, firms can resolve the potential conflicts through the so called ADR (alternative dispute resolution) tools or as it is addressed in this paper, taking some precautions in order to reduce at most the risk of being involved in a litigation.

This study has been undertaken by considering the endogenous characteristics of patents. Law expertise in Intellectual Property Rights may contribute in the so-called IP value chain (Reitzig & Puranam, 2009) and, consequently, in the value creation activities.

In this case, legal expertise contributes in reducing the risk of being involved in a costly infringement litigation and, consequently, in avoiding economic losses for the firm.

Chapter III, entitled "Forum Shopping as an IP Management Capability: Some empirical evidence from European Firms" provides an example of offensive strategy to be pursued in patent infringement litigations.

This under-explored theme is developed by taking a managerial perspective.

First of all it is necessary to clarify what forum shopping is: in particular, for the aim of this paper, it represents an unfair but perfectly legal exploitation of jurisdiction and venue rules to affect the outcome of a lawsuit. In deed, even if patents are almost ruled by international treaties (such as for example Patent Cooperation Treaty– PCT – and European Patent Convention – EPC), all the procedural aspects concerning infringement are still regulated by national legislations, such that differences in the potential lawsuit's outcome are possible.

Within the general category of IP management capabilities, forum shopping represents a specific aspect concerning the firms' ability to use legal astuteness to enhance the enforceability of property rights and, eventually, to improve the appropriability of innovative activities, by conferring to firms major possibilities in profiting from innovations.

In this paper, forum shopping has been presented as an iconic representation of legal astuteness and as a dynamic capability since the continuously changing environment in which firms seem to be leveraged against competitors.

Overall, the three papers intends to highlight the crucial role of legal capabilities in IP management and how firms may leverage some gaps and uncertainties in the global IP legal framework. The thesis provides both theoretical and practical contributions.

Future research on these issues has the potential to pave new avenues for achieving anenhanced understanding of how relevant legal capabilities are and how firms may create and nurture them over time, by leveraging synergies among internal and external sources of competitive advantage.

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CHAPTER I

Don't Forget the Lawyers: Legal Counseling as a Source of Competitive Advantage

ABSTRACT

For many years, law has always been considered as a constraint, since the duties that it imposes to the firms. It is quite recent in times and born in legal studies, the pro-active approach to law and, consequently, the perception that legal tools and their wise application during the firm's life can become a source of competitive advantage, both providing more revenues or reducing the net costs to firms.

The aim of this paper is to dig deeper in the real and effective contributions to management practitioners provided by legal counsel and to underlie which are the main areas where this contribution is more effective, suggesting the framing of legal services within the firms as a valuable capability and, consequently, a source of competitive advantage under the Resource-based view of the firm. To identify these areas, a co-word analysis of the keywords of the main papers on this subject has been run. The results show that legal services play an important role in the Intellectual Property Rights (IPRs) Management, in the Personnel Management and in the Interpersonal and Inter-organizational Relationships.

KEYWORDS: Lawyers; Resource-based view of the firm; Intellectual Property Management; Personnel Management; Inter-organizational Relationships; Interpersonal Relationships; Co-Word analysis

JEL CLASSIFICATION: K1; K12; M54

1. INTRODUCTION

For many years scholars in strategic management studies have dig deeper in the research about the continuous attempt of firms in achieving and sustaining a competitive advantage (Barney, 1997; Porter, 1985) even investigating many business-related fields (Bharadwaj, Varadarajan, & Fahy, 1993; Dunk, 2004; Lado & Wilson, 1994; Silvi & Cuganesan, 2006).

In spite of this, law has unexpectedly always been underestimated and mostly ignored as a firm's resource (Bird, 2010, 2011; Downes, 2004).

This low consideration attributed by scholars and practitioners is due to many factors.

Firstly, law has been considered as a constraint rather than a resource for managers striving to create and capture value (North, 1990) because of the many duties imposed and the risk of condemns to pay damage awards (Bagley, 2010), or, in the extreme cases, to the closure of firms or to the imprisonment of its officers or personnel (Berger-Walliser, 2011).

Secondly, this misrepresentation has been caused by the vagueness of the boundaries between what is lawful and what is not (Stohl, Stohl, & Popova, 2009) and the perception of lawyers as professionals operating in the interest of governments and public (Ring, Bigley, D'Aunno, & Khanna, 2005; Wallace & Kay, 2008) or even in their own one (Sundaram & Inkpen, 2004).

The overcome of this background concerning law as a constraint rather than a resource is strictly linked to the new-born stream of literature, mostly developed in legal studies, about the so-called "proactive approach to law" (Siedel & Haapio, 2010; 2016): this new conception leads practitioners to start in including legal functions into the planning process (Bird, 2008).

The aim of this paper is to dig deeper exploring the many potential contributions of lawyers the achievement and sustainment of firms' competitive advantage through the wise

exploitation of legal tools, mapping all the legal activities and their intersection with management planning.

This study represents, to the best of our knowledge, the first attempt in organizing the fuzzy previous studies in this field that have only dealt with legal contributions concerning specific interventions about specific issues and have not provided a systematic study of lawyers' activities.

The novelty of the present research is to take as unit of analysis the lawyers itself, suggesting the framing of legal counsel a firm valuable resource, under the Resource based view (RBV) of the firm.

To detect the fields that are actively and positively impacted by contributions of lawyers, we have selected papers concerning this topic that had been published in top journals in Management Studies; therefore, we have collected key terms both the ones provided by authors and by editor in order to run a co-word analysis.

The paper is structured as follows: Section II provides a theoretical background about legal counseling as a valuable managerial capability under the Resource Based View of the Firm paradigm; Section III is about co-word analysis and the centrality-closeness measures and provides as well a description of the sample space used to run the analysis; Section IV is about the results, identifying which activities of the firms' value chain are majorly sustained by legal counseling contributions, deeply focusing on attorneys' contributions concerning Personnel Management, Interpersonal and Inter-organizational relations and Intellectual Property (IP) Management fields; Section V is about discussion and limitations, providing some useful insights for further research.

2. THEORETICAL BACKGROUND

Within the studies about competition among firms, the 5 forces of Porter (1981) model has been criticized by various scholars (Baden-Fuller & Stopford, 1994;Rumelt, 1991) who addressed the necessity to take in consideration the firm's strategic role in inter-industry and intra-industry competition (Dagnino, 2015). These critiques show the dissatisfaction with the static, equilibrium framework of industrial organization scholars (Grant, 1991).

Consequently, in the 1990s, researchers' attention was shift towards endogenous variables of the firm as sources of competitive advantage over thirds: from this assumption, paradigms such as the resource based view (RBV) of the firm (Barney, 1991; Nonaka, Toyama, & Nagata, 2000; Peteraf, 1993; Teece, Pisano, & Shuen, 1997) and knowledge based view (KBV) of the firm (Grant, 1996, 2002) were born and rapidly developed among scholars with the purpose of explaining the differences between firms in performance and economic rents.

The main assumption, in fact, of the resource based view of the firm is that heterogeneity between firms is due to their distinctive resources, competences and capabilities (Barney, 1995).

Accordingly, Barney (1991) addressed that resources within the firms useful in order to achieve a sustainable competitive advantage over the time are those ones that are neither perfectly imitable nor substitutable without great effort, rare and valuable.

The first attempt of the present research is to explore the possibility of legal counseling within the firm as representing a valuable capability that can positively impact on firms' strategies in pursuing a competitive advantage. First of all it is necessary to highlight that, according to Makadok (2001) capabilities are a special type of resources embedded within the firm whose purpose is to improve the productivity of the other resources possessed.

Oberman (1993) observed that business organizations can treat social and political institutions, such as for example the law itself, as firm resources, creating the so called "institutional resources": the main characteristics of this kind of tools is that even if they cannot be controlled by a firm, they can nonetheless be exploited in the achievement of competitive advantage.

Accordingly, we consider that legal services (the ones that concern the wise exploitation and application of law regulations) provided to the firm are difficult to be imitable and to be substituted without great effort.

Notwithstanding the availability of lawyers, and deeply of corporate lawyers, in the market, legal counseling provided within the firm is idiosyncratic to individual firms in its details, custom-tailored on firms' specific needs and path dependent in its emergence. It is necessary, in fact, for entrepreneurial lawyers to identify and create strategic opportunities in law, integrating law with the client's strategy (Evans & Gabel, 2013).

These characteristics underline that the contribution of lawyers are not subject to low-cost imitation or replication by thirds and it is not neither transferable to thirds.

Furthermore, Penrose (1959) highlighted that a resource should not considered as an input of production itself but only for the services that the resources can render within the firm. Notwithstanding the complaints of Priem and Butler (2001) about the overemphasized attention shown by previous researches about whether resources are valuable, just few studies explain why and how such resources are advantageous (Hsu & Ziedonis, 2013).

Following the intuition of Porter (1985) that addressed that the reach of a competitive advantage is possible by reconfiguring the value chain activities to provide either a lower cost or a better differentiation, Hasl-Kelchner (2006) focusing on the role that might be played by law, addressed that companies may perform those activities at a lower cost while reducing undesirable legal hazards.

Therefore, this capability is as well valuable since, as suggested by Barney and Arikan (2001), they "enable a firm to develop and implement strategies that have the effect of lowering a firm's net costs and/or increase a firm's net revenues beyond what would otherwise be expected" and are even of great importance for the productivity opportunity of a firm, since their availability of being used in different ways and for different purposed (Hsu & Ziedonis, 2013).

For many years, practitioners have underestimated the role of lawyers within the firm. It is only in the early 2000s, contemporaneously to the development among legal scholars of the stream of literature concerning the so-called "proactive approach to law" (Siedel & Haapio, 2010, 2016), that practitioners started to recognize an active role in the business strategies.

Therefore, few scholars have considered the law as a source of competitive advantage (Bird, 2010). The underlying purpose of this approach is to adopt legal strategies that can be helpful in order to avoid more onerous government regulation and to take advantage of the opportunities linked to the innovation that regulation and deregulation offers. Therefore, legal counsel can also advantageously exploit the uncertainty areas (Malhotra & Morris, 2009) that are created because of non unanimous interpretations and application of rules, statutes and case-based law made by Courts (Jones, 2000) by interpreting the extant law deploying arguments and using appropriate forms of logic and persuasion in relation to the specific problem case that are their own core tasks (Halpin, 2000; Schön, 1987).

The consequences of this new perception are many: on one side, lawyers are now recognized to operate primarily in the interests of their clients (Ladinsky & Grossman, 1966;Reed, 1969) and they are entitled to provide competent and diligent services addressed to achieve clients' whishes (Brickson, 2005; Stewart, Hope, & Muhlemann, 2000) within the boundaries of the attorney-client relationship (Wilkins, 1992); secondly, practitioners have put on evidence the enabling aspects (Edelman &Suchamn, 1997) and the managers' ability in using legal tools as

a part of market strategy, provoking among CEOs an increased interest about the significant potential of legal environment in improving firms' operations (Bird, 2010) and underlying many sources both facilitative and adversarial useful for firms in achieving and sustaining a competitive advantage (DiMatteo, 2010).

Accordingly, Hinthorne (1996) argues that "lawyers and corporate leaders who understand the law and the structures of power in the USA have a unique capacity to achieve business ends".

Law can, indeed, be a sustainable factor in value creation (DiMatteo, 2010) through the protection of innovation, the enabling of free labor markets, the enhancement of share-owner wealth (Hinthorne, 1996), and the efficient regulation of contracts (Bird, 2008).

Therefore Bagley (2008, 2016), underlining the necessity of an active collaboration between managers and legal experts, has addressed the existence of "legal astuteness", a valuable managerial capability that may provide a competitive advantage to firms.

Deeply, this capability consists in communicating effectively with legal counsel and to work together to solve complex problems that everyday can affect and negatively impact in the management of the firm because of the socially complex relations with all the subjects within and outside the firm.

So, generally speaking, when assisting their clients, lawyers usually advise them about legal risks, leading clients to achieve what they want (Sandberg &Pinnington, 2009) through minimization and management of legal risks and the identification and management of the maximum level of client's risk tolerance.

Unlike in the past, clients, in fact, today have less need for a lawyer that acts exclusively for their litigation cases, but prefer a partner that can join and take care of them in every main event of the firm legal life, advising them on major corporate event such as M&As, the creation of foreign subsidiaries (Wilkins, 2009), privatization of organizations, joint venture

agreements (Sandberg & Pinnington, 2009) and the development of an effective worldwide strategy (Pincus &Belohlav, 1996).

To satisfy modern clients' needs, law firms are becoming large legal "department stores" (Galanter & Palay, 1994), offering a wide range of services delivered by many lawyers and providing combinations of various competencies owned by different attorneys (Paolella & Durand, 2016).

Next to these primary benefits provided by legal services, legal counseling has also other more hidden functions within the firms: first, it allows them to reach an image of strength or readiness to battle (Conlon & Sullivan, 1999) and, consequently, deterring others from filing suits against them in the future (Romano, 1991); secondly, more legal representation can delay the speed of the resolution of lawsuits, especially when there is a trade-off in resources between the claimant and the defendant and, given their position of power, resource and advantages, a firm with constant legal assistance can hope of eventually forcing their counterpart to capitulate (Conlon & Sullivan, 1999).

For these reasons, managers should recognize the importance of law for the success of the firm (Shell, 2004; Siedel, 2000) and consequently, they should engage lawyers in each stage of strategy formulation and execution (Bagley, 2006, 2008, 2016); on the contrary, lawyers are expected to suggest and underline the existence of potential opportunities and threats and manage them in ways that are legally permissible, effective and efficient (Daly, 1997).

In conclusion, it is not surprising to find out that nowadays it is strongly advised to firms to hire attorneys[2] in order to face house closings and other "non business" matters mainly concerning contracts (with clients, customers and suppliers), business organizations (in order to decide whether a corporation or a limited liability company is the better way to organize

[2] https://www.entrepreneur.com/article/58326

the business), real estate (leases of commercial spaces such as offices and retail stores), taxes and licenses and intellectual property rights.

Furthermore, lawyers are also required to work effectively outside of the legal system (Rosen, 2000), to develop relationships with legal decision-makers(Tsang, 1998), to build networks and alliances (Tracey & Phillips, 2011).

3. METHODS

To dig deeper in the role played and map the active contribution provided by legal counsels in the firm management, we run a co-word analysis. This technique was firstly developed by Callon, Courtial, Turner and Bauin (1983) in collaboration with the Centre de Sociologie de l'Innovation of the Ecole Nationale Superieure des Mines de Paris and the CNRS (Centre National de la Recherche Scientifique) of France during the 1980s. Previous applications of co-word analysis in management studies can be found in Ronda-Pupo and Guerras Martin (2012) and in Peters and van Raan (1993).

Co-word analysis is one of the three general approaches in information science aimed at showing the evolution of socio-cognitive structures from a set of documents. Deeply, co-word analysis uses the co-occurrence and co-absence patterns of pairs of objectives (such as words, nouns, adjectives) in a corpus of texts in order to identify the relationship ideas within the subject areas presented in such texts (He, 1999).

Indexes based on the co-occurrence frequency of items, such the inclusion and the proximity one, are used to measure the strength of relationships between items. Other indexes such as the density or centrality are employed to evaluate the extent to which area is central to the others.

Deeply, centrality index (closeness) is used to measure the strength of a subject area's interaction with another one: the higher is the number and strength of a subject area's connection with other subject areas, the more central it will be in the research network (Bauin, Michelet, Schweighoffer, & Vermeulin, 1991).

The measure of centrality used in this study is closeness centrality: this choice is due since the network of analysis is undirected and the measure of centrality allows us to obtain the centrality of each single word related to the distance to all other key terms in the network (De Nooy, Mrvar,& Batagelj, 2011).

In the field of management, this technique has been first used and developed by Burt (2001, 2007, 2008).

It is realized through a set of algorithms calculated in each network. As a mathematical formula closeness centrality, c_i, of node i can be written as:

$$c(i) = \sum_{i} d_{ij}$$

whered_{ij} is the number of links in a shortest path from node i to j (Otte & Rousseau, 2002).

We then proceeded in calculating the farness and closeness of each key term inserted in the network. The farness is the sum of the distance from each ego to all others in the network. This concept of "farness" is then transformed into "nearness" as the reciprocal of farness. Several alternative approaches are available in order to measure the "farness" index. The most common that has even been used in the present study, is the geodesic path distance, that consists in the sum of the lengths of the shortest paths from ego (or to ego) from all the other nodes (Freeman, 1978).

The end result is a full description of the content of the research effort and its development (Callon et al., 1983; Callon, Courtial, & Penan, 1993).

In order to realize the co-word analysis, we selected the top 20 journals ranked for 5-year impact factor in the category of Management according to the InCites[3] Journal Citation Report[4] for the year 2015 provided by Thomson Reuters[5]. A list of the selected journals is available at Appendix A.

We chose to limit our sample only to peer-reviewed journals since they represent an example of certified knowledge (Merton, 1973), approved by the scientific and academic community in the field of Management, and all the papers are subjected to peer reviewed revisions (Clark &Wright, 2007).

The 5-year impact factor has been chosen as an objective quality measure of journals impact (Franke, Edlund, & Oster, 1990), estimated on a quite long-range time planning, and is a proxy of the capacity of the each paper there published to become highly influential for scholars and practitioners.

Consequently, from the sampled journals we selected all the papers- whenever they were published- through the application of Boolean search tool provided by EBSCOhost Research Databases[6].

[3] InCites is a customized citation-based research evaluation tool that lets academic and government administrators benchmark an organization's output against peers worldwide. Conduct in-depth analyses of your institution's role in research, or produce reports showcasing particular aspects of research performance (http://ipscience-help.thomsonreuters.com/inCites2Live/overviewGroup/atAGlance.html)

[4] Journal Citation Reports offer a systematic, objective means to critically evaluate the world's leading journals, with quantifiable, statistical information based on citation data. By compiling articles' citer references, JCR help to measure research influence and impact at the journal and category levels, and shows the relationship between citing and cited journals (http://thomsonreuters.com/en/products-services/scholarly-scientific-research/research-management-and-evaluation/journal-citation-reports.html)

[5] Thomson Reuters provides professionals with the intelligence, technology and human expertise they need to find trusted answers. We enable professionals in the financial and risk, legal, tax and accounting, and media markets to make the decisions that matter most, all powered by the world's most trusted news organization. (http://thomsonreuters.com/en/about-us.html)

[6] EBSCOHost is a powerful online reference system accessible via the Internet. It offers a variety of proprietary full text databases and popular databases from leading information providers (https://help.ebsco.com/interfaces/EBSCOhost).

We chose to insert in our sample all the papers containing the words "legal" or "lawyer*" or "attorne*" in the abstract, and "firm*" and "strateg*" in the whole text, and "lawyer*" or "attorney*" in the whole text.

We completed this second step of the building of the sample by manually removing all the papers that contained the above mentioned words in the references or in the biographical information of the authors, because they were misleading and not coherent to the purposes of this study.

As a result of this selection process, we drew a sample of 36 papers that satisfied the above mentioned selective constraints.

This selective criterion has been adopted because we consider that is the best and most objective one to select papers concerning the contribution of lawyers in many different fields within the firm.

From the sampled papers, we have drawn all the keywords, both the ones provided by the authors and, whenever available, the ones added by the editor.

At this stage, 214 key terms appearing at least once in the sampled articles were selected.

In order to check the co-occurrences and co-absences of pairs of keywords, we realized a 214 x 214 matrix using the software NVivo 11[7] provided by QSR International.

Once the co-occurrence and co-absence matrix was built, we run the social network analysis aimed to detect the closeness centrality measures, according to the above mentioned criteria.

The last analysis has been realized with UCINET software[8].

[7] NVivo is software that supports qualitative and mixed methods research. It's designed to help you organize, analyze and find insights in unstructured, or qualitative data like: interviews, open-ended survey responses, articles, social media and web content (http://www.qsrinternational.com/what-is-nvivo).

[8] UCINET is a software package for the analysis of social network data. It was developed by Lin Freeman, Martin Everett and Steve Borgatti (https://sites.google.com/site/ucinetsoftware/home).

4. RESULTS AND DISCUSSION

The results should demonstrate a certain underlying consensus acknowledged by authors and editors of top journals.

Descriptive statistics about the centrality closeness index as shown in Table 1.

Insert Table 1 about here

The key words listed in Table 2, instead, are the ones with the highest closeness measures and show the key terms that indicate the most important value chain activities that are supported by the contributions of lawyers.

Insert Table 2 about here

The results obtained about the centrality closeness measures show the ones that are more frequently combined in the majority of the sampled papers and so, they represent the nucleus of the legal counsel activities within the firms.

Among the listed words, some words such as "management" and "management search" are quite obvious.

The others, instead, can be grouped in 3 many sub-fields where, according to the results of our research, the impact of lawyers' activities is the highest.

In particular, we detected these three main areas that are: inter-organizational relations, personnel management and intellectual property management.

4.1- Personnel Management

Strategy management scholars interested in human resource management (HRM) policies and practices on firm performance (Boudreau, 1988; Jones & Wright, 1992; Kleiner, 1990) have addressed that comprehensive employee recruitment and selection procedures, incentive compensation and performance management systems, extensive employee involvement and training can improve the knowledge, skills and abilities of a firm's current and potential employees, increase their motivation, reduce shirking and enhance retention of quality employees (Huselid, 1995). Specifically, they focused their attention to the threat of employees' exit from the firm and studied, on this purpose, a system of returns for individual employees that distinguish themselves for their performance and allow firms to generate higher returns (Campbell, Ganco, Franco, & Agarwal, 2012).

Many studies concerning this topic (Agarwal, Campbell, Franco, & Ganco, 2016; Bonet, Cappelli, & Hamori, 2013; Campbell et al., 2012; Jonczyk, Lee, Galunic, & Bensaou, 2015) used "lawyers" as sample to test their hypotheses: the reason why is due to the fact that they represent (as well as inventors) key-individuals and their movement across the organizations can affect organizational performance (Bonet et al., 2013; Somaya, Williamson, & Lorinkova, 2008).

Lawyers, indeed, positively contribute in developing relationships with potential clients (Agarwal et al., 2016) in so impacting in the chance of firms of gaining revenues, that is why Jonczyk et al. (2015) used lawyers' transitions as a proxy of specific tie losses and gains. On this purpose, Campbell et al. (2012) put on evidence how the negative impact on the firm performance is higher in case of lawyers' exit, especially in case they had a specific specialization (Garicano & Hubbard, 2007).

Carnahan, Agarwal and Campbell (2012), instead, focused on the risk that the former employee may create a spin-out and addressed that the negative impact for the parent firm is

higher rather than when the employee moves to an another already established enterprise (Phillips, 2002; Wezel, Cattani, & Pennings 2006).

4.2- Interpersonal and Inter-Organizational Relations

Firms are organizations that always need to put in correlation with the market environment outside and, consequently, to create interpersonal and relationships (even in the work-nonwork interface) with other firms, and with their own stakeholders.

These relations offer many potential advantages to the parties, such as the exchange of products, knowledge and services (Lane & Lubatkin, 1998; Larsson, Bengtsson, Henriksson, & Sparks, 1998; Mowery, Oxley, & Silverman, 1996; Pisano, 1989); on the contrary, they may expose firms to many dangers such as the misappropriation of data (Hallen, Katila, & Rosenberger, 2014).

To reduce the hazards and the risks connected to them, these relationships have generally been managed with legal (Argyres & Mayer, 2007), timing (Katila, Rosenberger, & Eisenhardt, 2008) and social remedies (Hallen et al., 2014) in order to prevent or eventually resolve disputes.

Among the legal tools, contracts are generally chosen to complement inter-firm cooperation (Arrighetti, Bachmann, & Deakin, 1997; Burchell & Wilkinson, 1997; Lane & Bachmann, 1995) and to reduce the risks of trust (Harrison, 2004).

About contracts, Argyres and Mayer (2007) proposed the existence of a contract designing capability that aids in the governance of the firm's inter-organizational relationships, facilitating joint problem solving and aimed to create and preserve value in the transaction. This capability, that should be developed with the collaboration of lawyers, engineers and managers, specifically concerns the designing of effective and efficient contract terms.

The collaboration between many subjects is necessary since many different skills are required.

On one side, the presence of engineers and managers is necessary since they had been directly involved in the development and improvement of the technologies or services that are the object of the agreement; on the other, lawyers' skills are necessary in the draft of contract terms concerning the allocation of decision power and control rights (Mayer & Argyres, 2004).

Mainly, the contract terms that are drafted by attorneys concern legal issues such as the preferred jurisdiction in case of litigation, the level of details that is needed, intellectual property rights issues and specific provisions in these contracts (Gutierrez, 2011; Hagedoorn & Hesen, 2007; Vanneste & Puranam, 2010).

Evidence provided by Argyres and Mayer(2007) addresses that this contract designing capability can become a key source of competitive advantage (Nonaka & Takeuchi, 1995; Zollo & Winter, 2002).

Generally speaking, the approach of lawyers to the inter-organizational relationships is more conservative and tends to favor more detailed contractual structures because of a sense of obligation to "protect" their client aimed at minimizing all the risks (Barker & Mueller, 2002; Delmas & Toffel, 2008; Langevoort & Rasmussen, 1996; Ring & Van de Ven, 1994), and so, to avoid any potential litigation. Deeply, legal counselors should look forward to related precedent-setting decisions in order to limit the legal ramifications before they arise (Mykytyn, Mytykyn, & Slinkman, 1990).

This much more conservative approach has been noticed by Lewis, Walls and Dowell (2014) while investigating on the firms' responses to institutional pressures, also in the executives that owned a legal knowledge background in their business activities (Barker & Mueller,

2002; Ring &Van de Ven, 1994) and it is much more intense in CEOs with legal expertise, since they have an higher number of responsibilities for business decisions (Bagley, 2008).

Furthermore, lawyers are engaged also in many different types of "boundary works", i.e. relationships that are activated to pursue substantive and relational goals (Trefalt, 2013).

This kind of interactions are necessary, especially those with clients and colleagues (Lawrence, 1999) both at a junior and at senior level, since lawyers obtain working engagement through a direct hiring by clients or through collaboration's requests advanced by colleagues (Casciaro, Gino, & Kouchaki, 2014).

4.3- Intellectual Property Management

In recent times, firms discover a new interest to the management of Intellectual Property Rights (IPRs). Accordingly, many scholars addressed the chance of using patents and other IP tools in a strategic way (Somaya, 2012) such as adopting offensive patent strategy (blocking others from commercializing) and a defensive patent strategy (securing technology space by establishing countervailing litigation threats) or a leveraging strategy in which patent can be used as a bargaining chips for licensing (Steensma, Chari, & Heidl, 2015).

Many scholars have focused on the reasons why a patent application can or cannot achieve the objective of being granted.

It happens many times that even inventions that own all the required characteristics in terms of novelty, do not succeed in being granted since the many bureaucratic intricacies that may be required (Granstand, 1999; Reitzig & Puranam, 2009).

One of the obligations for the applicant concerns the mandatory disclosure of relevant information of the relevant prior art, helping ensure that only novel claims are granted by patent protection (Steensma et al., 2015).

In pursuing patent protection for intellectual property, legal advisors provide guidance about claims and explain the prior art, ensuring as well that all legal obligations are met.

On this purpose, Cotropia (2009) addressed the existence of an information flow between inventors and legal counsel. Steensma et al. (2015) focused on the differences between services provided by in-house lawyers rather than outside legal counsel.

On one side, outsourced legal counselor' activities can provide specialized capabilities that may be prohibitively expensive to be maintained internally (Mowery et al., 1996).

On the other, evidence provided by Steensma et al. (2015) is that in-house lawyers can guarantee a more efficient performance since there is a greater flow of information between value chain activities that are within an organization rather than between value chain activities and outsourced resources (Teece, 1996).

Applying this intuition to legal services, Steensma et al. (2015) addressed that the higher performance provided by in-house lawyers is due to a major familiarity with inventions developed by the firm and the knowledge underlying these inventions and, in a quite large range of time, the legal counsels will gain an highly specific knowledge to their employer and its inventors, providing a good deal of interchange of information (Somaya, Williamson, & Zhang, 2007).

Therefore, in-house patent lawyers play a critical role in identifying patentable inventions that might be otherwise have gone unnoticed or whose value might not have been recognized, since the closer are the lawyers to their clients (and in particular to Research and Development activities), the more likely they are to come up with things that could be patented (Somaya et al., 2007).

In few words, although outsourced attorneys may have expertise over a broad technological domain, in-house counsel have a greater knowledge of their client's inventive pursuits (Steensma et al., 2015).

Lawyers play as well an important role in cumulative innovations, since they should shape the mechanisms through which a firm can participate in these kinds of innovations (Murray &O'Mahony, 2007): doing so, in fact, requires a deep understanding and a patent law expertise in order to protect firm's assets.

Furthermore, in IPRs management, firms can protect and leverage the value of their resources and a proper contractual capability can help firms in increasing revenue through licensing agreement (Bagley, 2008) and, furthermore, the proactive use of patent infringement remedies, might lead in the achievement of higher revenues (Gutierrez, 2011).

5. CONCLUSIONS

This research aims to explore and dig deeper into the role actively played by legal counselors in the achievement and sustainment of a competitive advantage over the paradigm of the Resource Based View (RBV) of the firm. In particular, this paper explored the activities concerning the minimization of the so-called legal hazards that can generate a competitive advantage through a reduction of net costs. Through the co-word analysis, three main sub-fields of intervention provided by legal counsel have been detected. These are the personnel management, the intellectual property (IP) management and the inter-organizational relationships.

The results show that attorneys are considered key employees within the firm, both due to their specialization and to the relationships that they are entitled to maintain with other firms and potential clients.

Consequently, lawyers are strictly linked to the opportunities of generating revenues for the firm. Concerning, instead, the interpersonal relationships, the activities of lawyers may be helpful in avoiding to be filed in a lawsuit, in so reducing legal hazards costs.

Legal counseling, instead, in IP management may be helpful, above all, in obtaining more advantageous conditions in licensing agreements and even in assisting firms in the legal intricacies concerning the patent application phase.

The present study represent, to the best of our knowledge, the first attempt in systematically delineating the role played by advocates in the achievement and sustainment of a competitive advantage, filling a gap that was left unexplored by previous researches that have never taken in consideration lawyers as "unit of analysis" but only as secondary characters helpful in the resolution of issues affecting the firm.

Further research on this point may delineate the evolution and compare with a dynamic approach the centrality of legal activities.

This paper aims to highlight and revamp the attention of practitioners on the topic of legal counselors.

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APPENDIX A. Sampled Journals

Rank	Full Journal Title
1.	Academy of Management Annals
2.	Academy of Management Review
3.	Academy of Management Journal
4.	Journal of Management
5.	MIS Quarterly
6.	Journal of Operations Management
7.	Administrative Science Quarterly
8.	Journal of Applied Psychology
9.	International Journal of Management Reviews
10.	Long Range Planning
11.	Organizational Research Methods
12.	Journal of Management Studies
13.	Personnel Psychology
14.	Journal of Information Technology
15.	Organization Science
16.	Strategic Management Journal
17.	Journal of International Business Studies
18.	Academy of Management Perspectives
19.	Research Policy
20.	Journal of Organizational Behavior

Top 20 Journals in the category of "Management" ranked by 5-year impact factor according to InCites Journal Citation Report.

Table 1. Descriptive statistics about the centrality closeness index of key-terms.

	1 Farness	2 nCloseness
Minimum	1420	0.476
Average	2620.439	12.936
Maximum	44730	15
Sum	560774	2768.207
Standard Deviation	6513.612	2.018
Variance	42427136	4.073
SSQ	10548881408	36679.801
MCSSQ	9079407616	871.543
Euclidean Norm	102707.750	191.520
Observations	214	214
Missing	0	0

Table 2. Top 20 key words ranked by Closeness Measures

Rank.	Key term	Farness	NCloseness
1.	Management	1420.000	15.000
2.	Research	1442.000	14.771
3.	Business Enterprises	1469.000	14.500
4.	Lawyers	1474.000	14.450
5.	Interorganizational relations	1481.000	14.382
6.	Management Research	1492.000	14.276
7.	Organizational Sociology	1497.000	14.228
8.	Personnel Management	1498.000	14.219
9.	Legal services	1501.000	14.191
10.	Intellectual Property	1507.000	14.134
11.	Organizational Behavior	1512.000	14.087
12.	Organizational Research	1515.000	14.059
13.	Patents	1517.000	14.041
14.	Industrial Efficiency	1520.000	14.013
15.	Competitive Advantage	1521.000	14.004
16.	Entrepreneurship	1522.000	13.995
17.	Contract	1524.000	13.976
18.	Partnership (business)	1525.000	13.967
19.	Resource Based Theory of the Firm	1526.000	13.958
20.	Cost Control	1526.000	13.958
20.	Heterogeneity	1526.000	13.958
20.	Joint Ventures	1526.000	13.958

CHAPTER II

Patent Designing Strategy:

Some Empirical Evidence on EP Patents

ABSTRACT

It is widely perceived that costs linked to a patent infringement litigation are prohibitive especially for small firms that cannot afford these costs and that, in the majority of cases, are strongly induced to unwillingly accept agreements with alleged infringers. This paper focuses on the trade-off between the necessity for firms of increasing the patent value and, meanwhile, to decrease the risk of being involved in a patent infringement litigation through the optimal designing of the patent.Indeed, building up the main patent endogenous characteristic of the IP tool can be useful to this purpose.

Results show that an higher number of words used on average per each claim has a positive impact on the patent value and, on the other side, has a negative impact on the risk of lawsuits.

Keywords: patent designing; patent value; patent infringement litigation; IP value chain; legal astuteness; patent strategies; EP patent

JEL CLASSIFICATION: K40; K40; K41.

1. INTRODUCTION

The inevitable consequence of the great and wide development of the "knowledge" or "information" economy is the increase of attention paid to instruments designed to protect intellectual property rights (IPRs) associated with these intangibles (Hall, 2007) such as, specifically, patents.

Inventions that have the required characteristics of novelty, non-obviousness and utility may advance to the competent offices an application for a patent: in this way, policymakers aim to grant incentives for innovation and to remunerate inventors of their R&D efforts.

These recognized awards mainly consist in the chance for the patent holder of exploiting in a monopolistic way all the consequent economic benefits linked to the IP asset and, furthermore, in carrying out a power of veto over thirds who unlawfully use her idea (Weatherall &Webster, 2014).

So, metaphorically speaking, it can be said that patents and their strategic use (Somaya, 2012) have become "strategic weapons" and, consequently, the enforcement of IPRs has become a strategic mean in technological competition (Cremers, 2004; Weatherall &Webster, 2014).

The increasing attention acknowledged to these intangibles lead scholars and practitioners to be more concerned both about the creation and the enforcement of IPR assets.

In the new economy, knowledge represents one of the main principal economic asset such that its management and protection have become cornerstones of corporate strategy and a daily preoccupation of CEOs in many industries (Hanel, 2006).

Notwithstanding the institutional measures to discourage the infringement of inventors' rights, managers must always be aware of competitors' attacks: that is why the increase in patent application is strictly linked to the increase in enforcing practices against those who ignore or willingly want to ignore the existence of a patentee's right.

Enforcement does not include only litigation but also many less formal methods (such as extra judiciary transactions or the alternative dispute resolution tools).

The diffusion of these instruments is due to the perception that having a patent litigation at a reasonable cost is considered to be impossible: according to a survey conducted by AIPLA (the American Intellectual Property Law Association) in 2011, median litigation costs for patent infringement suits produced "jaw-dropping numbers"[9].

The results show that for a litigation that could worth less than a $1 million, median legal costs are around $650,000. For claims that worth between $1 million and $25 million, the total litigation costs can hit $2.5 million.

For an allegedly infringed patent that worth over $25 million, median legal costs are about $5 million. That is why patent litigation has often been considered "the sport of kings" (Meurer & Bessen, 2005).

On this purpose, it is not surprising to read on the eminent "The Economist" that "in a majority of cases, the cost of litigation will far exceed any revenue the inventor may subsequently earn from royalties or licensing[10]"; accordingly, Raghu, Woo, Mohan and Rao (2008) demonstrated that litigations are not "zero-sum games" in the mean of the loss to the defendant is potentially higher than the gains for the patent holder.

In spite of this, the effect of the increase of the number of granted patents is the explosion of patent litigations as well as the ratio between the amount of granted patents and the number of lawsuits filed[11].

[9]"How much is that patent lawsuit going to cost you?" by Jim Kerstetter on https://www.cnet.com/news/how-much-is-that-patent-lawsuit-going-to-cost-you/

[10] http://www.economist.com/node/15479680

[11] The Patent Litigation Landscape: recent research and developments, Council of Economic Advisers Issue Brief. March 2016

Furthermore, it is getting common about academicians and practitioners the perception that litigation is becoming increasingly difficult to avoid, pushing up patent enforcement costs and making it more difficult for small firms to protect their IPRs (Eisenberg, 1999; Hall & Ziedonis, 2001; Heller & Eisenberg, 1998; Lanjouw & Schankerman, 2001, 2004- b; Shapiro, 2001).

These costs make patent infringement litigation to be prohibitive, especially in David vs. Goliath battles, where small entrepreneurs (Davids) may not be able to assert their legal rights against what is, in most of the cases, a much larger allegedly infringing entity (Goliaths), that owns greater means to defend any potential legal attack (Beron & Kinsella, 2011) and are strongly induced to unwillingly accept to settle the potential litigation (Kesan & Ball, 2006).

On the other side, smaller parties with little to lose may also hold up with large sunk investments at risk (Hall & Ziedonis, 2001).

Furthermore, economical losses due to patent infringement litigation are not the only kind of costs to be faced: indeed, the lawsuit involves huge efforts also in terms of time and social costs linked to the firm's reputation (Bessen & Meurer, 2005): the same authors (2008) found out that alleged infringers lose about half a percentage point of their stock market value upon being sued for patent infringement.

For these reasons, patentees dig deeper in strategies to be pursued on one side to avoid of being involved in a patent infringement litigation (suggesting, for example, an alternative use of dispute resolution tools); on the other, to exploit the threat of a lawsuit to extract a license agreement and so, a revenue.

However, the aforementioned strategies concern the phase following the patent application phase: no studies have, to the best of our knowledge, depicted any strategy to be previously pursued by patent applicants.

The aim of this paper is to dig deeper in "patent designing", id est how to build up the "optimal patent", the one that represents the best compromise between the trade-off given by necessity of achieving to the highest value and, on the contrary, the willingness of occurring in the lowest possible number of infringement litigations.

To do so, we detected the main patent endogenous characteristics that differently impact on value and on the risk of being litigated, analyzing patent portfolios of 696 firms involved (both as plaintiff and as defendant) in a litigation concerning an EP patent in an EU Court during the sampled period between 2010 and 2015.

Previous studies about optimal patent have always applied a social perspective, focusing on the existing trade-off between the purpose of rewarding innovators and the welfare losses due to the market power created in their favor (Arora, Fosfuri, & Gambardella, 2004; Gilbert & Shapiro, 1990; Mazzoleni & Nelson, 1998), addressing a question highly debated among policymakers about the optimal patent length and breadth.

This paper is structured as follows: Section II provides a theoretical framework; Section III depicts some hypotheses to be tested; Section IV describes the dataset employed and methods used for the analysis; Section V is about the results; Section VI is about practical implications and provides some useful insights for future research.

2. THEORETICAL FRAMEWORK

Since the birth of "strategic management" as an autonomous science many years ago, one question has always been at the center of all the debates (Dagnino, 2015; Ghemawat, 2002): why do firms differ in terms of performance? And more over, why some firms succeed in achieving a competitive advantage over thirds rather than some others?

On this purpose, the resource-based view (RBV) of the firm addresses that performance differences can be due to an unequal distribution of resources across firms (Barney, 1991), including all existing firm assets (tangible and intangible) that can be used and positively contribute in gaining a competitive advantage (Penrose, 1959; Wernerfelt, 1984).

For many years in managerial and economical literature, patents have been considered not only as a key resource of value of many new products or processes, but also they have been an instrument to evaluate the development of new technology markets(Arora et al., 2004; Gambardella, 2013) or to assess the internal performance of firms' R&D departments (Rosenberg, 1982; Teece, 1986).

Patents have been used in previous studies as a proxy of many intrinsic phenomena of the firm, such as the efforts in product innovating (Hausman, Hall, & Griliches, 1984), or as indicator of corporate knowledge resources, in the mean that all the patents that are assigned to a firm represent the knowledge that the firm itself has created.

Considering firms' "innovative performance", and in a deeper way the patenting performance- that is commonly used as a measure of firm innovation since patents are tangible manifestations of firms' ideas, techniques and products (Ahuja & Katila, 2001; De Carolis & Deeds, 1999; Griliches, 1990; Hall & Ziedonis, 2001)-, previous literature has largely focused on the role of one resource, specifically firm investments on research and development (R&D) and its relationship with innovation (Griliches, 1990; Hall & Ziedonis, 2001; Nicholls-Nixon &Woo, 2003).

In most recent times, instead, both academicians and practitioners have started in considering patents as a strategic tool: according to Somaya (2012), the ownership of critical pieces of intellectual property rights (IPRs) is an important strategic battleground (Granstrand, 1999, 2000) and patent strategies can represent an exciting challenge for management research (Rivera, 2000).

On this purpose, it should be underlined that patent strategies concern a set of resource allocation decisions that primarily occur in three kinds of activities: rights, licensing and enforcement.

The "rights" strategies concern all those decisions about the sector and invention type in which patenting (Arundel & Kabla, 1998; Brouwer &Kleinknecht, 1999), in renewing it or lapsing at periodic intervals (Lanjouw, Pakes, & Putnam, 1998), to affect competitors' portfolios by using opposition or reexamination proceedings (Blind, Cremers, & Mueller, 2009).

The licensing strategies, instead, are about the decisions of sharing the rights of use the patented technology: on this purpose, "strategies" affect the need of decision making about the terms regarding the exclusivity and scope of the licensed rights (Anand &Khanna, 2000; Somaya, Kim, & Vonortas, 2011).

Enforcement entails, instead, the use or threatened use of litigation to encourage infringers to stop using patented inventions, to pay royalties or to accept an alternative agreement.

The above mentioned conclusions about patent strategies show that, up to now, most of the attention has been paid to the ex post strategies concerning the "strategic" usage of already granted patents.

Indeed, a wrongful preliminary assumption underlying the past research is that inventions generated by R&D are automatically converted into patents (Somaya, Williamson, & Zhang, 2007): meanwhile, on the contrary, legal practice and knowledge, meant as a firm's resource– always been underestimated by management scholars (Hinthorne, 1996; Siedel & Haapio, 2010)- may play a necessaryrole in eliciting, collating and evaluating patentable inventions and in navigating the legal intricacies of the patent process and so to transform IP assets in strategic weapons useful to gain a competitive advantage.

It is clear that the main requisite for patent granting is the innate novelty and inventive step of technical invention underlying the patent application (Guellec &van Pottelsberghe de la Potterie, 2000): however, a patent application is a bureaucratic affair whit lots of procedural expect (prior art searches and mentioning of all the backward citations, drafting of the most suitable claims, drafting of the patent application and prosecuting to the patent office) that may determine the grant or the revocation of the patent.

This suggests that even for inventions of comparable levels of objective technological novelty, there may will be substantial variations in the ability of the firms seeking to be granted (Reitzig & Puranam, 2009) which may be due also to the organizational structures (Granstrand, 1999).

The analysis of organizational capabilities has focused on the sources of interfirm performance differences: at this level, scholars agree in addressing that organizational capabilities (patterns of recurring interactions between individuals and resources that create productive results)- shape important organizational outcomes (Eisenhardt & Martin, 2000; Nelson& Winter, 1982; Reitzig & Puranam, 2009).

Unfortunately, up to now, most of scholars focusing on organizational capabilities have focused on value creation rather than on value appropriation (Reitzig & Puranam, 2009), considering the latter as a subsequent template of the former.

Following this approach, there would not be taken in the due consideration that some appropriation problems may be impactful on the shape of decision making underlying value creation, such as for example the strength of the intellectual property rights regime (Cohen, Nelson, & Walsh, 2000) or the existence of complementary assets during the innovation phase (Teece, 1986).

On this purpose, Reitzig and Puranam (2009) argued the importance of creating interactions between all the patterns across the IP value chain (R&D, legal and business development

activities within the firm): accordingly, they pointed out to the importance of close links between organizational factors in value appropriation and in value creation in order to succeed at the former.

Notwithstanding the disregard of top management teams concerning legal aspects (Bagley, 2015; Ring, Bigley, D'Aunno, & Khanna, 2005; Siedel, 2000; Somaya, 2003), their business management becomes one of the most critical capabilities in achieving a successful corporate strategy (Shanley & Peteraf, 2004).

Bagley (2008) postulates "legal astuteness" as a valuable managerial capability in communicating effectively with counsel and to work together in resolving problems.

In any case, this positive interaction between all the patterns of the IP value chain may be pursued as well with the purpose of preventing problems, specifically the infringement lawsuits.

Similarly, Somaya, Williamson and Zhang (2007) highlighted the important role played by patent law expertise owned by top management in structuring the patent, which may be helpful for firms in converting novel ideas into tangible innovation outputs and, moreover, to navigate the legal intricacies of the patent process: the results of their research highlighted that managers with a deeper patent law expertise succeeded in generating better applications (in the mean of they had an higher likelihood of being granted) and in filing and revising them more quickly, avoiding, in so doing, economical losses.

Legal resources, that have always been underestimated by management scholars (Hinthorne,1996; Siedel & Haapio, 2010), in fact, are necessary to elicit, collate and evaluate patentable inventions and to navigate the legal intricacies of the patent process.

The aim of this paper is to provide some useful insights for entrepreneurs as well to patent attorneys on how to shape their patent during the application phase, detecting the main

characteristics that increase the value and reduce the risk of being involved in a litigation and, consequently, of occurring in great economical losses.

This topic represents, in fact, a literature gap: even if, indeed, many researches have detected the main aspects characterized the litigated patents in comparison with non-litigated patents, no studies have developed the theme of making the patent value to increase.

3. HYPOTHESES

Notwithstanding many studies that highlighted the great skewness of the value distribution of patents (Griliches, 1990; Griliches, Pakes, & Hall, 1986; Pakes & Schankerman; 1984; Schankerman & Pakes,1986; Scherer, 1965; Scherer & Harhoff, 2000; Silverberg & Verspagen, 2004), literature about patent value and patent quality is overwhelming.

First of all, it is interesting to clarify what is meant with the expression of patent value: according to Harhoff, Scherer and Vopel (2003), it is represented by the benefits that the applicant will perceive thanks to the application.

Considering the main purposes of patents, such as the right of exclude thirds from the economic exploitation of the patented invention and the right to block others' inventions that depend on their one, it can be considered that the private value of the patent is due to the difference in profits generated by the firm thanks to the patent.

It is not a fixed price but an abstract concept as a function of very many factors and different dimensions (Lee, Su, & Wu, 2010).

Generally speaking, previous studies have adopted two different categories of variables to evaluate patents, respectively "market based" and "patent based" (van Zeebroeck, de la Potterie & Guellec, 2008).

On the first side, “market based” indicators mainly consist of financial or economic indicators, such as, for example, the Tobin’s q, productivity or stock market values (Gambardella, Harhoff, & Verspangen, 2008; Hall &Harhoff, 2012; Hall, Jaffe, & Trajtenberg, 2005; Hall & Oriani, 2006; Lanjouw & Schankerman, 2004- a; Pakes & Schankerman, 1984; Toivanen, Stovanen, & Bosworth, 2002).

We do not take these indicators in the due consideration, since they are not coherent with the purposes of this paper.

The second class of indicators, the “patent based” ones, are different in their nature and rationale (van Zeebroeck et al., 2008) and use data that are “part” of the patent itself: patents, in fact, provide rich, fine-grained detail on technologies, pinpointing the people, places, times and technological characteristics of every patented invention (Gittelman, 2008).

In coherence with the purpose of this paper, only indicators that may be chosen and actively modified by the patent holder before the application phase will be explored.

Many scholars considered the number of claims as a determinant of patent value, (Lanjouw &Schankerman, 2004- a; Tong & Frame, 1994) even if they are strongly influenced by drafting styles and legal systems (Archontopoulos, Guellec, Stevnsborg, de la Potterie, & Van Zeebroeck, 2007; van Zeebroeck, de la Potterie, & Guellec, 2009) where the protection is sought.

The number of claims, in fact, can be indication that an innovation is broader and of greater potential profitability: that is why, it is a widespread idea that an applicant has an incentive to claim as much as possible even if, on the contrary, the patent examiner may require that the claims should be narrowed in order to gain the granting.

For completeness, it should be mentioned that van Zeebroeck, de la Potterie and Guellec (2009) found out that there is no correlation between patent claims and value since, even

under the assumption that claim counts are indicative of patent scope, there is no evidence that a larger one is indicator of the existence of a larger market for the invention.

Indeed, notwithstanding many possible applications of an invention can only be detected over time (Cattani, 2005; Rosenberg, 1998), during the application phase, the applicants are incentivized to identify as many variations and possible usages of their inventions in order to increase their pre-emptive advantage over their competitors (Aljalian, 2005; Ceccagnoli, 2009; Chiang, 2010) and to avoid that other firms may patent other new available usages with limited costs in R&D for the second patentee.

The claims in the patent specification delineate the property rights that are protected by the patent: they delineate the essential novel features of the invention and should defend and sustain in front of the examiner the novelty of the patent, describing exactly what the patented invention does that has never been done before (Hall, Jaffe, & Trajtenberg, 2000).

According to Novelli (2015), claims inserted in an application file correspond to an additional area of the inventive space that the patent should protect.

Considering the risk of being involved in patent infringement litigation, Lerner (1994) and Lanjouw and Schankerman (1997) addressed that patents with an higher number of claims run a larger risk of conflict with competitors, since "broad patents" such as those ones with more uses detected in the application form, are faced with more potential infringer and thus they are more likely to be litigated.

Hp. 1 A patent with an higher number of claims is positively correlated with an increase of the patent value.

Hp. 1a A patent with an higher number of claims has more likelihood of being involved in an infringement lawsuit.

In any case, we strongly believe that the only number of claims is not a sufficient proxy of patent value. On this purpose, Gambardella, Harhoff and Verspagen (2006), following the suggestions of some patent lawyers, addressed that a broad patent is usually described with few words, while a narrower one has to define the object in a more precise way in order to distinguish it from other inventions.

On the other side, Malackowski and Barney (2008) pointed out that an higher rate of patent maintenance (so the chance of the patent holder to pay the renewal fees) is significantly correlated to a smaller number of words per claim.

These authors, moving from the assumption that claim breadth cannot be measured through statistical or mechanical approaches just counting the number of claims, suggested that average number of words can be used as a rough proxy (when considered on a sufficiently large and statistically relevant sample of IPtools) of patent value.

We disagree with these assumptions, since we point out that the number of words employed to describe the claim introduce a further legal limitation upon its scope (Malackowski & Barney, 2008) and so, it increases its value.

Considering the risk of being involved in a patent infringement litigation, we suppose that an higher number of words on average per claims is negatively correlated to the risk of being involved in litigation since the more precisely are all the potential uses of the issued patent described, the lower is the risk of thirds competitors to infringe the patent.

Hp. 2 The higher is the average number of words used in claims description, the higher is the patent value.

Hp 2a. The higher is the average number of words used per claim, the lower is the risk of being involved in a patent infringement litigation.

Each patent is assigned by the patent examiner to 4-digit categories of the technology-based IPC classification system: this system eases the analysis of specific technological aspects and they allow the coverage of international technological developments. As for the patent claims, the inserted IPC classes capture the scope of the patented invention and report a positive and sizable correlation between the market value and the scope of the patent itself (Lerner, 1994). Findings of Harhoff, Scherer and Vopel (2003), demonstrate, instead, that the number of IPC classes is not correlated to the patent value.

Literature about the technological classes has long been discovered as determinant of the efficacy of patent protection.

We do not agree with these assumptions, for the same reasons aforementioned concerning the claims. Indeed, an higher number of IPC 4-digit subclasses increases the breadth of the patent, since it represents the possible and available technological categorization of the usages of the patent and so it increases its value.

On the other side, concerning the risk of being involved in a patent infringement litigation, the higher are the possible available usages of the patent, the higher is the of possible thirds competitors in conflict.

Hp. 3 A patent with an higher number of IPC 4-digit subclasses is positively correlated with an increase of the patent value.

Hp. 3a A patent with an higher number of IPC 4-digit subclasses has more likelihood of being involved in an infringement lawsuit.

Some scholars addressed also the existence of a negative correlation between the number of backward citations and the value of a patent (Harhoff, Scherer, & Vopel, 2003). In particular a large number of backward citations to others suggests that the considered innovation is likely to be more derivative in nature (Lanjouw & Schankerman, 1999) and show from which pieces

of “prior art” the patent differs, identifying upon which “shoulders” the new claims stand in their attempt to advance in technology (Harhoff, Narin, Scherer, & Vopel, 1999).

We think that the number of backward citation is not correlated to the patent value: indeed, in some cases, notwithstanding a great amount of prior art cited, the innovation can noticeably improve the quality and so the potential market value of the patent; on the contrary, a larger amount of backward citations, can demonstrate a lack in terms of originality respect previous innovations.

Concerning patent litigation, findings of Lanjouw and Schankerman (1997) addressed that there is not a significative evidence of correlation between the number of backward citations and the risk of being involved in a patent infringement litigation.

We do not agree with this assertion, considering that backward citations can represent the acknowledgement of others’ legal property rights and so, it should reduce the rate of being involved in a patent infringement litigation.

Hp. 4 A larger number of backward citations is not correlated to the patent value

Hp 4a A larger number of backward citation is negatively correlated to the risk of being involved in a patent infringement litigation.

4. DATA AND METHODS

To test the aforementioned hypotheses, we focused on the European Patent System and on the EP patent: these patents represent a “bundle of national patents” and in this case, the patentee, with only a formal application in one of the 38 countries involved in the European Patent Convention (EPC) can sought for protection in all the 40 states of EPC validity (the previously cited 38 states and the two so-called “extension states”).

A dataset composed both of litigated and non-litigated patents was created.

Specifically, to build our dataset, we considered all the firms involved in a patent infringement litigation in front an EU Court during the sampled period between 2010 and 2015.

Data has been drawn by DARTS IP[12] database: more than 700firms have been identified as being involved (both as claimant or as defendant) in at least one patent lawsuit concerning an EP patent.

Lawsuit data has been then matched with data about firms' patent portfolios. From QPAT-ORBIT[13], we thus obtained data about all the patent families held by sample firms.

For each firm, among all the patents, we extrapolated the litigated patents that were part of the sample and, whenever it was possible, two non-litigated patents for each firm's litigated one.

This choice of selecting just a small and proportional part of the firm's patent portfolio is due to the consideration that patent litigation represent a rare event during firms' life.

Following Silverman (1999) non-litigated patents have been randomly selected, using Excel's random number generator.

Due to a mismatch in terms of data availability, the final sample was composed of 696 firms and a total of 2595 patents.

We then proceeded to compute the following variables:

- **Litigated**: it represents a dummy variable with value of 1 whether the observed patent has been involved in an infringement lawsuit at least once during the sampled period and the value of 0 whether it has been not.

[12] DARTS-IP is a global intellectual property case law database: it covers cases involving patents, trademarks and domain names. Darts-IP collects lawsuits and courts documents from the major IP courts such as Europe, Hong Kong, China, Brazil and United States. This database provides as well case law statistics and data to check how legal issues concerning IP are handled differently across countries, checking judges' approach to specific legal topics.

[13]QPAT-ORBIT is a service powered by Questel IP Business Intelligence. It collects more than 100 databases for specialists in patents and designs: it covers more than 95 offices grouped by invention-based families and enriched with full-text data.

- **AvgClaims**: it represents the average length of the claims and is equal to the ratio between the number of words totally used in describing the patent claims and the number of claims per each patent. In the case a patent has no claims, we set this variable equal to zero;
- **ZeroClaims**: it represents a dummy variable which takes the value 1 in the case the patent has no claims and 0 otherwise;
- **NClaims**: it represents the number of claims inserted in the observed patent;
- **LClaims**: it represents the total amount of words employed in describing the patent claims. In case of availability of different translations in many languages, English version was the only one considered for all the sampled patents;
- **BkwCit**: it represents the total amount of existing cited patents, both inserted by the applicant and by the examiner, in the application form;
- **NumIPC**: it represents the total amount of 4-digit IPC subclasses inserted in the patent application form for the issued patent;
- **Renewals**: this variable represent the number of renewal fees paid by the patent holder in order to maintain alive and effective the protection in all the designated states selected at the application moment;
- **AvGDPe11**: represents the average value of the GDP of the designated states during the period of the patent validity. Data about GDP has been drawn from the World Bank web site[14] and computed in current US$ and divided by 100billions.

Descriptive statistics and correlations among all the variables are reported in tables 1 and 2.

Insert Tables 1 and 2 about here

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[14] http://data.worldbank.org/indicator/NY.GDP.MKTP.CD

Because of the presence of predictors highly correlated, we checked for the presence of multicollinearity among the variables through a VIF (Variance Inflation Factors) test. The output gained shows the variance inflation factors together with their reciprocals.

To check the presence of multicollinearity, we followed Chatterjee and Hadi (2012). According to these rules, there is evidence of multicollinearity every time that the largest VIF is greater than 10 and the mean of all the VIFs is considerably larger than 1.

VIF Test's results are reported in table 3.

Insert Table 3 about here

Collinearity diagnostics show that there are no VIFs greater than 10 and even if the meanVIF is greater than 1 it is not considerably so.

The results confirm that no collinearity is detected in the model.

Based on the available data, we then decided to test our hypotheses by using the following models:

$$Litigated = \alpha_i + \beta_1 AvgClaims + \beta_2 ZeroClaims + \beta_3 NClaims + \beta_4 LClaims + \beta_5 BkwCit + \beta_6 NumIPC + \beta_7 Renewals + \varepsilon$$

And:

$$AvGDPe11 = \alpha_i + \beta_1 AvgClaims + \beta_2 ZeroClaims + \beta_3 NClaims + \beta_4 LClaims + \beta_5 BkwCit + \beta_6 NumIPC + \beta_7 Renewals + \varepsilon$$

For the first model, since "Litigated" is a dummy variable, we decided to test our regression through a Probit model.

The second one, instead, has been tested through a linear regression model (OLS).

Concerning the second model, the dependent variable AvGDPe11 has been chosen as a measure for patent value. The density distribution of the value of sampled patents measured

through AvGDPe11 variable has been estimated with the univariate kernel density model. The distribution is displayed in Figure 1.

Insert Figure1 about here

Since patents have been often adopted as indicators of R&D efforts as well as of the innovativeness of the firms, scholars have shown a great interest in evaluating each single patent.

In so doing, they studied with a continuous and increasing interest the topic of patent value, adopting, every time, different indicators.

On this purpose, some academicians employed a single factor such as the number of the renewal decisions (Bessen, 2008; Schankerman, 1998): the assumption that stands behind this assertion is that not all the patents are maintained alive till the end of the statutory life (that is 20 years), but every fixed period that, in case of the European Patent System, is an annual period, they should pay a renewal fee. Considering the patent holder as a rational agent, she would never pay these fees, if the patent doesn't ensure to her an higher revenue: in few words, renewal fees should be meant as a lower bound of patent value (Bessen, 2008;Gambardella, 2013; Schankerman & Pakes, 1986).

Furthermore, Putnam (1996) points out that the number of jurisdictions in which the applicant looks forward to the protection is correlated with the value of the invention and thus with the value of any single national patent.

If so, considering the European Patent (EP) as a bundle of national patents, it can be said that an higher number of designated states may increase the value of the patent.

Following Van Pottelsberghe de la Potterie and Van Zeebroek (2008), the patent value should be measured as the average value of the GDP of all the designated states where the renewal

has been sought during the life of the patent: in this case the GDP is an approximation of the potential market size of the invention.

5. RESULTS

Results of the Probit regression model and of the Linear regression model are reported in Table 4 and 5.

Insert Table 4 and 5 about here

Results show that the average length of the claims (**AvgClaims)** is significatively and negatively correlated to the dependent variable **Litigated.** It derives that the higher is the average length of the claims, the lower is the risk of being involved in a patent infringement litigation. Furthermore, this dependent variable is also significatively and positively correlated to the variable used to measure the patent value (**AvGDPe11).**

The consequence is that increasing the average length of the claims inserted in the patent application form, increases its value and reduces the risk of being involved in a patent infringement litigation.

Hypotheses 2 and 2a are widely confirmed.

Concerning the number of claims (**NClaims**), instead, the results show that there is no evidence of its significative correlation both to the patent value and to the risk of being involved in a litigation.

Hypotheses 1 and 1a (*Hp.1 and Hp.1a*) ,so, have not been confirmed.

Instead, a negative significative correlation has been found out between the length of the claims (**LClaims**) and the patent value.

It has been widely confirmed, instead, the hypothesis 3a: results, indeed, show a correlation between the number of IPC 4-digit subclasses and the risk of being involved in a litigation, demonstrating that the higher is the number of IPC 4-digit subclasses the higher is the risk of being involved in a litigation.

An higher number of IPC subclasses, instead, has not any significative correlation to the patent value.

As we supposed, there is no correlation between the number of the backward citations (**BkwCit)** and the patent valueand, unexpectedly, this correlation is as well not present neither between this independent variable and the risk of being involved in a litigation.

6. DISCUSSION AND CONCLUSIONS

This paper aimed in depicting an useful strategy for firms on how to design their patents, putting in correlation the debated issues of patent value and patent infringement litigations.

Considering the high and prohibitive costs linked to the lawsuits, it would be useful for firms to avoid or, at least, to reduce any risk of being sued.

This objective can be realized pursuing a specific "patent strategy" that aims in putting in correlation all the patterns across the IP value chain (R&D, legal and business development activities within the firm): furthermore, this assumption highlighted the importance of close organizational links between organizational factors in value appropriation and in value creation in order to achieve a better performance on the former.

The strategy suggested in this paper can be considered as an ex ante strategy, since it concerns how to practically build up and face all the legal intricacies concerning the patent applications.

On this purpose, we focused on the main patent characteristics trying to find out the ones that can increase the patent value while, on the contrary, reducing the risk of being involved in a litigation.

If so, the advantages for the firms consist in a reduction of costs in terms of money, efforts and reputation.

Results confirmed our hypotheses.

It emerges, indeed, that an higher number of words per claim in a patent can increase its value and reduce the risk of being involved in a patent infringement litigation. Better described claims, in fact, can differentiate the issued IP tool from the ones previously existing.

Furthermore, patents that are described in a more specific way, leave "less innovative space" to thirds competitors: these ones, in fact, in order to sought for the protection of a patent should make an higher innovative effort in order to avoid of being considered to have infringed existing property rights.

In this way, an average number of words per claim positively impacts on the patent value since it increases the chance of a monopolistic exploitation on the market for a larger period of time.

Another wariness that can impact on the propensity of being involved in a patent infringement litigation can be of reducing the number of inserted IPC 4-digit subclasses.

In any case, it should be recognized, that this practice does not depend only on the applicant behavior since, most of the times, these are modified and added by the patent examiner.

A limitation of this study can be represented by the fact that we do not consider other reasons why firms can be involved in a patent infringement litigation, such as those cases where the so-called patent sharks willingly try to trap R&D intensive manufacturers in patent infringement situations in order to receive damage awards for the illegitimate use of their technology (Reitzig, Henkel, & Heath, 2007).

Furthermore, our analysis takes in consideration patents per se considered, ignoring that in many cases firms can adopt patent portfolios strategies: those ones, in fact, may be impactful on the shaping of each tool.

In the study of the patent main characteristics that have a significative impact on the value and on the risk of being involved in an infringement litigation, we aim at expanding our research realizing a semantic analysis of the words used in the patent description as well as the patent claims, in order to detect the words that frequently appear in the litigated patents, of course differentiating among different technological sectors.

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Figure 1. Kernel density estimates of AvGDPe11 (Patent Value)

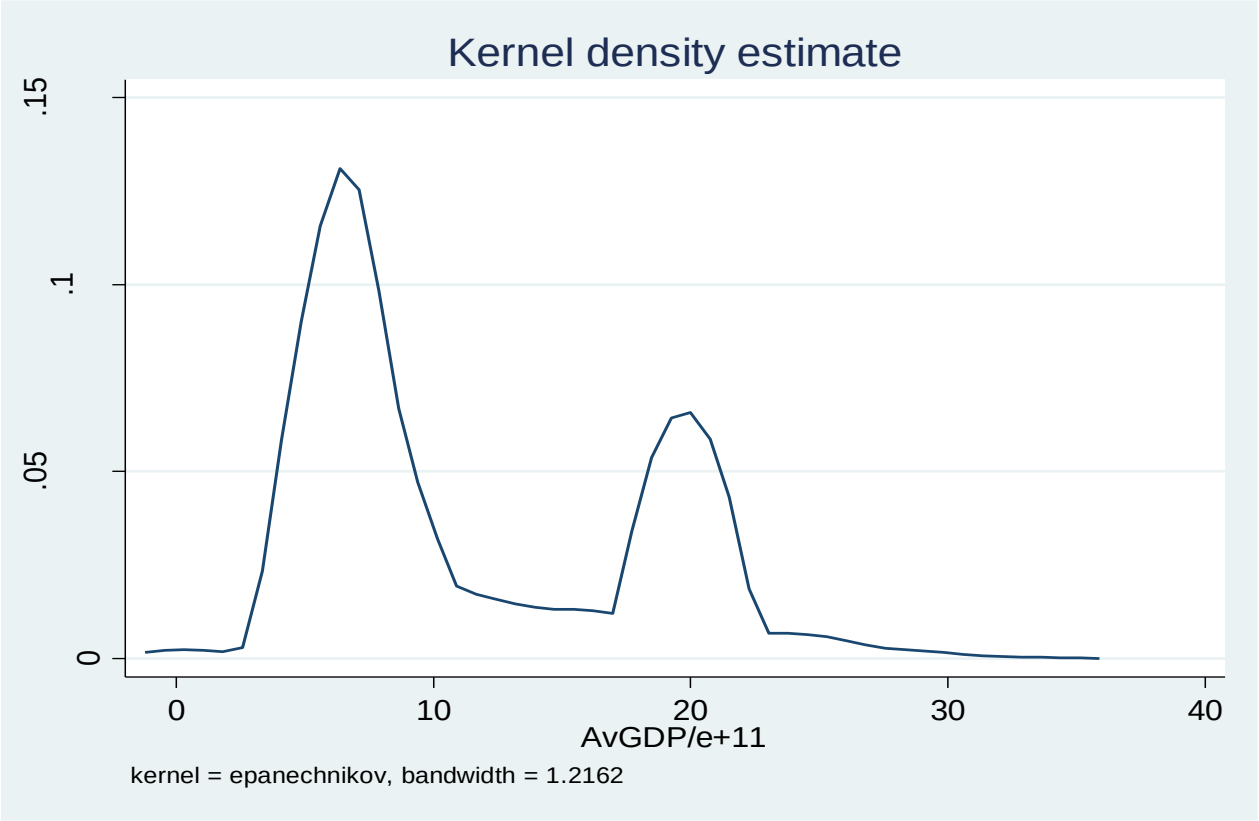

Table 1. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Litigated	2595	.3552987	.478696	0	1
AvgClaims	2595	46.44774	37.56165	0	424
ZeroClaims	2595	.1953757	.3965661	0	1
NClaims	2595	12.22524	14.77029	0	416.5
LClaims	2595	615.7869	605.7389	0	6020
BkwCit	2595	6.301734	8.003149	1	185
NumIPC	2595	4.685164	5.231119	1	59
Renewals	2595	12.51329	6.170611	0	23
AvGDPe11	2595	11.35563	6.510126	0	34.68905

Table 2. Variables' pairwise correlations

	Litiga~d	AvgCla~s	ZeroCl~s	NClaims	LClaims	BkwCit	NumIPC
Litigated	1.0000						
AvgClaims	0.1922*	1.0000					
ZeroClaims	-0.3333*	-0.6095*	1.0000				
NClaims	0.1708*	0.0855*	-0.4062*	1.0000			
LClaims	0.2016*	0.4568*	-0.4988*	0.7097*	1.0000		
BkwCit	-0.0096	-0.0214	0.0078	0.0400	0.0333	1.0000	
NumIPC	0.1431*	-0.0100	-0.0365	0.1657*	0.1667*	0.0739*	1.0000
Renewals	0.4391*	0.3228*	-0.4690*	0.2120*	0.2536*	-0.0777*	0.2431*
AvGDPe11	0.5632*	0.2274*	-0.3173*	0.1172*	0.1412*	-0.0372	-0.0055

	Renewals	AvGDPe11
Renewals	1.0000	
AvGDPe11	0.3789*	1.0000

Table 3. Collinearity diagnostics

Variable	VIF	SQRT VIF	Tolerance	R-Squared
Litigated	1.65	1.28	0.6064	0.3936
AvgClaims	2.23	1.49	0.4482	0.5518
ZeroClaims	2.28	1.51	0.4378	0.5622
NClaims	2.68	1.64	0.3737	0.6263
LClaims	3.01	1.74	0.3321	0.6679
BkwCit	1.02	1.01	0.9814	0.0186
NumIPC	1.14	1.07	0.8738	0.1262
Renewals	1.59	1.26	0.6293	0.3707
AvGDPe11	1.57	1.25	0.6381	0.3619
Mean VIF	1.91			

Table 4. Probit regression results

Probit regression — Number of obs = 2595
Wald chi2(7) = 585.31
Prob > chi2 = 0.0000
Log pseudolikelihood = -1339.9692 — Pseudo R2 = 0.2064

Litigated	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
AvgClaims	-.0019178	.001061	-1.81	0.071	-.0039973	.0001617
ZeroClaims	-1.260853	.1387244	-9.09	0.000	-1.532748	-.9889581
NClaims	-.001637	.0028669	-0.57	0.568	-.007256	.003982
LClaims	.0001135	.0000737	1.54	0.124	-.0000311	.000258
BkwCit	.0041224	.0035376	1.17	0.244	-.0028112	.011056
NumIPC	.0110344	.005423	2.03	0.042	.0004056	.0216632
Renewals	.0885407	.0050694	17.47	0.000	.0786047	.0984766
_cons	-1.469045	.1000265	-14.69	0.000	-1.665093	-1.272997

Table 5. Regression results

Linear regression

Number of obs	= 2595
F(7, 2587)	= 129.23
Prob > F	= 0.0000
R-squared	= 0.1774
Root MSE	= 5.9126

AvGDPe11	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
AvgClaims	.0085783	.0045517	1.88	0.060	-.0003469	.0175036
ZeroClaims	-2.485419	.3963044	-6.27	0.000	-3.262525	-1.708313
NClaims	.0132341	.0083706	1.58	0.114	-.0031796	.0296478
LClaims	-.0004775	.0002826	-1.69	0.091	-.0010317	.0000767
BkwCit	-.0030323	.0109981	-0.28	0.783	-.0245983	.0185337
NumIPC	-.1057246	.0228707	-4.62	0.000	-.1505713	-.0608779
Renewals	.3346767	.0208455	16.06	0.000	.293801	.3755523
_cons	7.901539	.418497	18.88	0.000	7.080916	8.722162

CHAPTER III

Forum Shopping as an IP Management Capability:

Some Empirical Evidence from European Firms

ABSTRACT

The recent increase in firms' patenting activity and in subsequent infringement litigations has made clear that firms need to enhance patent enforceability and to pursue proper strategies to increase the appropriability of innovation outcomes and related intellectual property (IP) rights. Accordingly, the aim of this paper is to explore how firms employ Forum Shopping – defined as an unfair but perfectly legal exploitation of jurisdiction and venue rules to affect the outcome of a lawsuit – as an offensive IP strategy and to understand which firm's characteristics and IP management practices affect its relevance. Drawing upon a sample of about 300 firms that have undertaken at least one patent litigation during the last 5 years, we estimate how firms' patent intensity, prior experience in patent litigation, and the extent of geographical coverage of patent protection affect the likelihood that firms make use of such a legal practice. From the findings of the study we draw suggestions for both theory and practice. Particularly, we stress that legal astuteness –as a firm's capability – and forum shopping – as its iconic representation –should be considered by firms as a strategic resource rather than a cost.

Keywords: forum shopping, patent litigation, patent enforcement, dynamic capabilities, legal astuteness, European Patent Convention.

JEL CLASSIFICATION: K40; K41; K42.

1. INTRODUCTION

The resource-based view (RBV) of the firm has postulated that specific physical, human and organizational assets can be used by firms to pursue value-creating strategies (Barney, 1986). Within RBV theoretical framework, dynamic capabilities have been defined as organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve and die (Eisenhardt & Martin, 2000). Theorists shed light on the market dynamism that impose firms to continuously recombine their strategic decisions to achieve and sustain a competitive advantage. Within the same RBV theoretical framework, in last years a new born stream of literature has been postulating the existence of legal astuteness as a valuable managerial capability that may provide a competitive advantage to firms (Bagley, 2008; Bird, 2011).

At the same time, both in Europe and in the United States, legal scholars have explored aspects of legal strategy relating to competitive advantage and the role of law as a positive force within companies (Siedel & Haapio, 2010).

Against this background, the purpose of this paper is to analyze the juridical theme of Forum Shopping, reformulating it as an offensive strategy that firms may adopt to protect their Intellectual Property Rights (IPRs).

Indeed, the increasing firm propensity to patenting put emphasis on patents' portfolio strategies. Among them, one strategic choice consists in the right enforcement in order to achieve the monopolistic exploitation of the invention in the market, ensuring protection from unlawful behaviors played by competitors. Among other alternatives available to firms, forum shopping– defined as an unfair but perfectly legal exploitation of jurisdiction and venue rules performed by plaintiffs to affect the outcome of a lawsuit – could represent a valid strategy

that firms may pursue in patent litigations capable of becoming a relevant source of competitive advantage.

In fact, even if patents are almost ruled by international treaties (such as for example Patent Cooperation Treaty– PCT – and European Patent Convention – EPC), all the procedural aspects concerning infringement are still regulated by national legislations, such that differences in the potential lawsuit's outcome are possible. In turn, the choice of the venue where to sue an infringer can be relevant: plaintiffs spend lots of money and efforts in deciding it, considering as relevant in their decision the win-rate for patentees, the speed of the trial, the average amount of damages whom infringers had been condemned to, the existence of Specialized Courts (Lemley, 2010).

As it will be better explored later, only few firms characterized by a greater experience and knowledge of patent litigations and of the international legal environment where patent grant is required perform this strategy and have access to the benefits that are presumably reachable by forum shopping across countries. And so, it is on evidence that forum shopping depends on the competencies gained by experience and represents a resource for firms that can achieve some benefits that are valuable.

To address our research question, we analyzed a sample of firms having undergone at least one patent litigation in a European country during the last five years, and empirically estimate which factors (both related to firm's characteristics and IP management practices) affect the firm's ability to benefit of Forum Shopping.

The remain of the paper is organized as follows. In Section 2 we revise existing literature, develop a theoretical framework and formulate specific hypotheses. In Section 3 we describe our empirical strategy and introduce data used for the analysis, whose outcomes are reported in Section 4. Finally, in Section 5 we discuss our results and provide final conclusions.

2. THEORETICAL FRAMEWORK

2.1 Legal tools as a source of competitive advantage

Intellectual property management issues are gaining increasing attention from both academics and practitioners that are scrutinizing their portfolios, searching for a better return on investment in technology and R&D (Carlsson, Dumitriu, Glass, Nard, & Barrett, 2008), seeking to maintain and/or to gain a competitive advantage over competitors (Granstand, 2000), emerging as a key component of the so-called "appropriation advantage" (Di Minin & Faems, 2013), which refers to the ability of an actor to outperform competitors in terms of taking possession of and extracting value from knowledge and technology. In a seminal work, David Teece (1986) suggested that companies do not profit from innovation just by coming up with new ideas: firms, in fact, must also be able to capture (that is, to appropriate) a share of returns that may compensate the risks associated with investing in innovation. IPRs are one of the means that firms may use in this respect. Among all the IPRs, patents of course represent a key tool that can be used by firms to capture rents from innovation (Cohen, Nelson, & Walsh, 2000).

Firms invest lots of time and efforts in developing and managing their patents' portfolio, especially in enforcing strategically patents by actively searching for infringement and eventually looking for a legal strategic protection in Courts (Rudy & Black, 2015). Specifically, prior works have focused on linkages between appropriability and rights enforcement. Teece (2000) and Teece and Pisano (1994) pointed out two different but relevant aspects concerning appropriability regimes: on the one side, the nature of core knowledge in innovation and, on the other side, the efficacy of legal protection of intellectual assets, that is, the enforcement of a right.

Thus, seeking for legal protection of patent rights and for its enforcement represents an issue of appropriability.

In general terms, the concept of appropriability has been defined as the extent to which an innovator is successful both in protecting the invention and in preventing competitors to benefit from it. In this respect, institutions play an highly relevant role in value appropriation processes, since they influence appropriability by providing legal tools to enforce the firm's rights.

Some scholars have highlighted that IPRs are probably the most evident form of institutional protection, being a formal means provided by society to innovators (Hurmelina-Laukkanen & Puumaleinen 2007).

Sherwood (1997) first proposed a measure of IPR protection that considered some main indicators, and in the specific: enforceability, administration, substantive law and treaties (see also Ostergard, 2000). But enforceability assumes also the existence of attorneys and practitioners with specific competencies in handling all the rules and procedures in patent protection.

Among all enforceability mechanisms, legal astuteness represents a valuable managerial capability that may provide a competitive advantage to firms (Bagley, 2008; Bird, 2011), as RBV suggests (Barney, 1991).

Accordingly, both in Europe and in the United States, legal scholars have explored aspects of legal strategy relating to competitive advantage and the role of law as a positive force that companies can exploit for competitive purposes (Siedel & Haapio, 2010). However, although strategic management scholars have identified several sources of competitive advantage in many business-related fields, law and regulatory processes have been a largely neglected topic. As a consequence, even if managers deploy a lot of time and efforts on legal issues, the topic of legal tools as source of competitive advantage is quite unexplored in literature.

Nevertheless, as claimed by Siedel and Haapio (2010), "law is perhaps the most hidden of all competitive strategy tools. It is sometimes complex and not all managers like to deal with it- or with lawyers" (p. 16).

Moving from RBV, firms may obtain sustainable competitive advantage by focusing on strategies that leverage their internal resources to take advantage of environmental opportunities (Wernerfelt, 1995).

As expressed by Hinthorne (1996), "lawyers and corporate leaders who understand the law, have a unique capacity to protect and enhance share-owner wealth". Similarly, Bagley (2008) thoughtfully encouraged managers to treat their lawyers as strategic partners in decision-making, since law can be used as a mechanism for capturing value and reducing risk. Following this reasoning, Bagley (2008) then proposed the concept of "legal astuteness", defined as the ability of a top management team to communicate with legal counsel and collaboratively solve problems, as a valuable managerial skill that enhances firms.

Legal astuteness may be developed in several declinations and consists in adopting strategies that sometimes are on the border line of legality and sometimes seriously threat fairness and substantial justice. In this macro-area Forum Shopping may be included. With the term "forum shopping" academicians, judges, counsel and scholars use to reproach a litigant who, in their opinion, unfairly exploits jurisdictional or venue rules to affect the outcome of a lawsuit (Juenger, 1989). It happens when venue statutes, next to the general primary criterion that impose where to file a litigation, puts other residual secondary criteria.

In this respect, as far as patent litigations are concerned, the primary criterion is represented by the forum of domicile of the defendant; next to this, there exists a secondary one that imposes as the one competent the forum where infringement occurred. However, through this secondary criterion and because of market globalization, it seems that almost every fora becomes competent, and forum shopping practices may be promoted by firms strategically.

Forum Shopping, even in patent cases, has always been studied under a juridical approach (Bell, 2003; Juenger, 1989; Moore, 2001).

Few studies have investigated the reasons why some venues are more attractive for plaintiffs in the decision on where to file the infringer: these can be found in a lower duration of the trial, in a pro-patentee reputation, in the existence of a specialized Court with higher knowledge of technologies or in the existence of specific national rules and procedures (Lemley, 2010; Offen-Brown, 2010).No studies have explored the issue of which common characteristics are shared by forum shoppers.

Against this background, this paper fills a literature gap by exposing why forum shopping can be identified as an iconic application of legal astuteness and can be considered as a dynamic capability, allowing firms to pursue a competitive advantage in the market rather than competitors.

2.2 Forum Shopping

To properly articulate why forum shopping may be considered as an expression of legal astuteness some clarifications about Bagley's (2008) concept of legal astuteness are due. In particular, it should be stressed that legal astuteness requires a proactive approach to regulation, an exercise of thoughtful judgment and possession of legal literacy (Bagley, 2008). The proactive component consists in taking a proactive approach to regulation, both to avoid more onerous government regulation and to take advantage of the innovation opportunities that regulation and deregulation offer.

This element is still present in forum shopping that exploits at most the differences among different country legislation, procedural rules as well as praxis in order to gain the presumed

best and most favorable outcome of the lawsuit. A patent holder, in fact, cannot physically withhold thirds of exploiting his invention, but necessarily must rely on legal system to protect it (Al-Aali & Teece, 2013).

But legal systems across the world are not the same. One of the main assumptions of forum shopping consists in the differences among Courts. Despite the establishment of international treaties that impose to their contracting states some common standards, rule harmonization is not total, such that differences in regulation are allowed. Furthermore, these international treaties impose some common minimal rules about application processes and the pre-grant phase; infringement, instead, is still ruled by national legislations. In turn, the proactive approach in forum shopping represents the most characteristic element, since it moves by the assumption of the existence of different regulations on the same subject by different legislators.

Judgment component, instead, moves from the observation that law is not an exact science such that similar cases can reach very different outcomes. In particular, judges' wisdom becomes key to evaluate all the potential outcomes and risks for the firm. This element is present in forum shopping as well: in fact, it is based on the evaluation of all the possible outcomes of litigations, in order to move across venues.

Generally speaking, forum shopping is performed on the base of attorneys' personal experiences: but, on this theme, it is necessary to notice that some US studies (Lemley, 2010) have attempted to suggest a statistical model to select the best American federal venue to file a case of patent litigation, which considers as indicators the evaluation of the past experience. In this respect, legal literacy in legal astuteness consists in the communication among managers and lawyers: legal "language" in fact is such a technical one, and because of this, managers may neglect to keep in touch with them. This aspect is quite relevant as well in forum shopping: even if attorneys identify a forum as the most convenient for the disputation,

firms may be neglecting to file the judgment in another country, ignoring what advantages may be linked to it. Firms, in fact, may ignore the international legal context, assuming the equality among several national legislation, procedural rules and ignoring that even within the same country, there might be differences in law application. Therefore, forum shopping as strategic behavior has the same characteristics that are used to describe legal astuteness and, as such, it can be defined as a possible expression of legal astuteness.

Furthermore, forum shopping also possesses the typical characteristics of resources. According to RBV, firms' resources are valuable when they enable a firm to implement a strategy that will improve its efficiency or effectiveness (Barney, 1991). Forum shopping consists in the assumption of choosing the presumed most favorable venue to file a lawsuit. Patentee plaintiffs usually spend a great deal of time and effort in worrying where strategically to file their case, believing that litigating in a particular court than in another will favor him over the defendant (Taylor, 2007). Choosing the considered most favorable venue for the patentee, a firm can have an higher rate of success in winning a litigation and so firms can more likely continue to exploit their monopolistic patent rights. If so, forum shopping seems to have the characteristics of value, in the mean of that it represents a possible strategic tool in accessing innovation rents.

The second characteristic of resources is that of "rareness". Barney (1991) explains that the number of firms possessing the valuable resource must be less than the number of firms needed to generate perfect competition dynamics in an industry. Forum shopping is a legal strategy pursued by a firm that exploits a deep knowledge of rules at an international level of patent systems and leverages on the personal experience gained by the firm. In this case, it is on evidence that only firms that are inserted in more than one international market and that have experienced patent litigations in different legal systems can exploit their not codified knowledge in choosing the more favorable venue to sue a patent litigation. The consequence

is that forum shopping is a resource that only a small amount of firms owns. It derives that forum shopping seems to be rare among firms.

Third, resources, in the RBV, must be difficult to imitate. Barney (1991) articulates three sources of imperfectly imitable resources: 1) unique historical conditions; 2) a causally ambiguous link between a firm's resources and its advantage, 3) or social complexities. For the same reasons expressed above, forum shopping is almost driven by the experience. Each firm may perform this kind of opportunistic behavior, since they had in their past tested more fora, such that in their future they are able to identify the most favorable to their specific needs. Thanks to the past experience that they have gained, firms' attorneys are able to choose, for future patent litigations they are going to file, among several fora all competent. In this case, it is clear that forum shopping is a resource built on prior experience and depends on the unique history of the firm: so, it is difficulty imitable by thirds.

Finally, it is required the lack of an equal substitute. In this respect, it is worth noticing that forum shopping is not a necessary behavior: it represents only an opportunistic behavior performed by practitioners that believe that in this way they can achieve a better result than the one that they would gain suing the litigation in the forum identified according to the first criterion. As previously mentioned, firms aim at obtaining higher winning rates, higher trial speed, a specialized Court that can consciously decide on the dispute, and a less complex procedure. All these outcomes can be obtained through forum shopping, which, in turn, presents the characteristics of being non substitutable.

Overall, it thus results that forum shopping represents a resource able to lead firms in achieving legal astuteness and, eventually, a competitive advantage. According to Hall (1993), even a single resource may generate a capability: it is on evidence that forum shopping represents a recombination of particular skills and experiences gained by employees and lawyers during the firm's life. In particular, forum shopping attains to the competencies in

the development and the procedures of the trial: according to Coyne's (1986) classification of capability differentials, forum shopping may be defined as a functional capability and it relates to the ability in performing specific things and, in a deeper way, in handling all the procedural rules in terms of litigations and in opting for the most favorable forum.

Furthermore, forum shopping can be seen as a dynamic capability. According to Teece, Pisano and Shuen's (1997) and Eisenhardt and Martin (2000), dynamic capabilities consist in exploiting existing internal and external firm-specific competences to address changing environments: if so, forum shopping should be meant as a dynamic capability by definition. In fact, since it is based on the proactive exploitation of continuous and constantly changing regulations and deregulations by courts, forum shopping as a capability is strictly linked to the continuous changes not only of Government rules, but, at the same time, of the internal Court juridical addresses.

2.3 Hypotheses

According to the discussion presented in the previous section, we can postulate that there should be a correlation between some characteristics of the firms and their forum shopping behavior and, in particular, the prior experience in patent litigations, the firm size, the level of patents' penetration into the European market and experience with patent system.

As for the first factor, forum shopping consists in choosing a Court where to file a suit that is presumed to be more favorable. These fora can be identified by a learning-by-doing process. A greater experience can help in choosing the forum, identifying some Courts' characteristics that can weigh in this option. For example, Courts' speed, procedural rules, the existence of a specialized Court are elements that can be recognized and wisely handled by patent attorneys

with a great and dynamic experience in patent litigation field. It can be noticed that, especially in US literature (Lemley, 2010), there are a few examples of systematic approaches to help forum shoppers, based on the existence of stats about the assumed relevant element in choosing the venue. But statistics, in this case may not differentiate all the kinds of litigations that may be filed and, in any case, the dynamic and continuous changes of Courts may misrepresent the effective data.

For this reason, a direct experience of the forum may be due and more appropriate than all the available statistics. In turn, we should expect that the greater is the number of patent litigations sued by the firm during its life, the greater is its ability to recognize the most favorable fora to file the lawsuit and so on, to forum shop across Courts. Accordingly, we formulate the following hypothesis:

Hp. 1: *Firms with a greater litigation experience are expected to forum shop more than counterparts*.

Forum shopping is an opportunistic behavior that is quite far from the normal behavior that plaintiffs should normally perform. It is on evidence that the greater the experience and the knowledge of the patent system and of its rules, the higher is the propensity to forum shop. Because of the main assumption of the existence of a linkage between appropriability and enforceability, a greater knowledge of patent system can increase the firm's ability in enforcing its patents. But knowledge of the patent system depends on the propensity the firm shows to employ patents as an appropriation mechanism. Therefore, we hypothesize:

Hp. 2.a: *Firms with a greater propensity to patent are expected to forum shop more than their counterparts*.

In a similar vein, it should be noted that forum shopping assumes the capability of choosing the most favorable venue among several ones through a comparative approach among countries.

This knowledge may be acquired by firms by requiring patent protection in different States, in order to perceive all the expects concerning patent management. In this way, the higher is the amount of States where patent protection is applied for, the higher is the knowledge of the countries' legal structures in patent field.

Thanks to this, entrepreneurs and practitioners can develop a comparative knowledge of several legislations concerning patents and consequently about infringement statutes. In turn, we formulate the following hypothesis:

Hp 2.b: *Firms with a greater knowledge of international patent systems are expected to forum shop more than their counterparts*.

Finally, also greater firms are expected to forum shop more than smaller firms. First, forum shopping requires some explorative studies to choose and verify which Court characteristics are the more relevant in enforcing their rights.

These efforts generate transaction costs. Second, filing a lawsuit in a different Court from the natural one can lead to greater costs in finding a national attorney, moving and sustaining all the trial expenses in another country.

Therefore, larger firms in possess of greater financial, human and organizational resources are expected to be better able to support all the expenses in performing forum shopping-related tasks. Accordingly, we hypothesize:

Hp. 3: *Firm size can positively influence the propensity of firms in forum shopping.*

3. DATA AND METHODS

To test these hypotheses, we focused on the European Patent system. In last years, an increase in patenting by inventors in EU has occurred: since the European Patent Convention, all the contracting States recognize both national and European patents. In the latter case, an inventor can apply for a patent at the European Patent Office (EPO) gaining a bundle of national patents. At the moment, there are 38 countries involved in EPC and two so-called extension countries.EPO is the venue for all post-grant opposition of European patents: infringement or revocation are instead regulated by each national law. In turn, despite all the attempts to harmonize the IPRs' law, Conventions put some common minimal rules and there exist the local autonomy to rule this subject: that is why it is possible to have different conclusions in identical cases. Differences and inconsistencies of the several national Courts generate the chance for firms to perform forum shopping.

Within the boundaries of the European patent system, we considered all the lawsuits filed in EU Courts during the time period between 2011 and 2014 by European patentees. Data has been drawn from DARTS-IP database.[15]From this dataset, we then identified all companies having filed at least one lawsuit in the examined period. A total of 373 firms has been identified.

[15]DARTS-IP is a global intellectual property case law database: it covers cases involving patents, trademarks and domain names. Darts-IP collects lawsuits and courts documents from the major IP courts such as Europe, Hong Kong, China, Brazil and United States. This database provides as well case law statistics and data to check how legal issues concerning IP are handled differently across countries, checking judges' approach to specific legal topics.

Lawsuit data has been then matched with data about firms' patent portfolios. From QPAT-ORBIT,[16] we thus obtained data about all the patent families held by sample firms, among which we were able to identify the share of litigated patents in US Courts. For each patent family, we obtained a set of detailed data, included information on Designated States.

Finally, we obtained firm level data (number of employees and firm's total assets) from AMADEUS (Bureau van Dijk).[17] Unfortunately, Amadeus data do not perfectly match our patent litigation data. In turn, in some empirical analyses the total number of observations reduces with respect to the original sample of 373 firms.

We then proceeded to compute the following variables:

- **NumFS**: it represents the number of times that a firms has performed forum shopping in the sampled period, by filing a lawsuit in a venue that it is not equal to the one of domicile of the defendant. Indeed, for the aim of this study, forum shopping has been approximated as occurring every time that the forum of domicile of the defendants and the filed one do not coincide.
- **PatInt**: it represents the firm's patent intensity, expressed as ratio between the amount of patent families held by the firm during the period 2011-2014, and the amount of firm's Total Assets during the same period;

[16]QPAT-ORBIT is a service powered by Questel IP Business Intelligence. It collects more than 100 databases for specialists in patents and designs: it covers more than 95 offices grouped by invention-based families and enriched with full-text data.

[17] AMADEUS (Bureau van Dijk) is a database of comparable financial and business information on Europe's biggest 510.000 public and private companies by assets. 43 countries are covered. Amadeus includes standardized annual accounts (consolidated and unconsolidated), financial ratios, sectoral activities and ownership data. The database is suitable for research on competitiveness, economic integration, applied microeconomics,business cycles, economic geography and corporate finance. (description is available at http://www.eui.eu/Research/Library/ResearchGuides/Economics/Statistics/DataPortal/Amadeus.aspx)

- **Litigations**: it represents the number of patents that have been litigated at least once up to 2014 in a US Court;
- **DS**: it represents the average number of designated states where patent protection has been granted to all the firm's accumulated patents up to 2014;
- **Employees**: it represents the natural logarithm of the average number of employees between 2011 to 2014;

Descriptive statistics and correlations among all the variables are reported in tables 1 and 2.

Insert Tables 1 and 2 about here

Based on available data, we then decided to test our hypotheses by using the following model:

$$NumFS_i = \alpha_i + \beta_1 PatInt_i + \beta_2 Litigations_i + \beta_3 DS_i + \beta_4 Employees_i + \varepsilon_i$$

In estimating the model, however, we had to keep in mind that the distribution of forum shopping events among our sample firms is quite skewed. As shown in Figure 1, almost 70% of firms (257 out of 373) never forum shopped during the analyzed 5-year period and less than 8% of firms forum shopped two times or more. The distribution of patents possessed by the same firms does not appear as skewed (Figure 2).

Insert Figures 1 and 2 about here

Accordingly, we decided to employ a regression method that took into account such a skewness and, specifically, the unevenly high number of zero events in our dependent variable. We thus decided to employ three different regression models, namely Tobit, Poisson and zero-inflated Poisson regression models. It is worth noting that the zero-inflated Poisson model accounts for the prevalence of zero counts in the data by splitting the estimation

process into two sub-regressions, thus modelling the outcomes as zero or nonzero. In turn, this model provides greater flexibility with respect to Tobit and Poisson models, by distinguishing which factors affect the probability of zero outcomes, and the probability of non-zero outcomes.

4. RESULTS

Table 3 reports the results of econometric estimations for the three regression models. All the models provide almost comparable results, thus enhancing the robustness of our estimations.

Insert Tables 3 about here

First of all, it emerges that firm's litigation experience (**Litigations**) is positively and significatively associated to the number of times a company has adopted forum shopping practices in all the three model specifications. Thus, hypothesis 1 results strongly supported. By contrast, hypothesis 2.a only receives weak support from our estimations, since patent intensity (**PatInt**) is positively associated to **NumFS** only in the Poisson specification, while it results non-significant in the remaining models. As for hypotheses 2.b and 3, both of them find strong support from our estimations, since firm size (**Employees**) does result positively and significatively associated to **NumFS** in all the three specifications, and the number of designated states in which firms have sought for patent protection (**DS**) results positively and significatively associated to **NumFS** in Poisson and zero-inflated Poisson models (but not in Tobit model).

Furthermore, specification III (zero-inflated Poisson model) provides interesting insights about which firms' characteristics are associated to the likelihood of not adopting forum shopping practices (i.e., cases in which **NumFS** equals zero). It emerges that two firms' characteristics matter in this respect, namely firm size and the extension of international patent coverage sought by firms. Coefficients associated to both variables result positive and significant. Thus, it emerges that the larger the firm size and the higher the average number of designated states firms' patents are applied for, the higher the likelihood of not adopting forum shopping practices. In other words, smaller firms and firms with a more geographically focused patent portfolio seems to be the type of firms more inclined to forum shopping practices.

5. DISCUSSION AND CONCLUSIONS

This paperanalyzed the under-researched topic of forum shopping by taking a managerial perspective in order to understand to what extent firms' characteristics drivethis firm capability. Within the general category of IP management capabilities, forum shopping represents a specific aspect that expresses the firms' ability to use legal astuteness to enhance the enforceability of property rights and, eventually, to improve the appropriability of innovative activity. In this sense, forum shopping capability is expected to confer to firms a competitive advantage by raising the possibility that firms may profit from innovations. Furthermore, provided that legal aspects related to IP enforceability evolve over time, especially on a multinational bases, firms that make use of forum shopping in a changing environment seem to possess a dynamic capability to be leveraged against competitors.

While the analysis of the effects of forum shopping as a (dynamic) capability on firm's competitive advantage and performance exceeds the purpose of this study, in this work we explored what factors affect the firms' ability to build such a capability. Specifically, we investigated the role played by firms' characteristics (such as firm size) and firms' IP management practices (such as patent intensity, experience in patent litigations, and the extension of international patent coverage that firms seek, on average, with their patents). Results largely confirm our hypotheses.

Firstly, it emerges that to obtain advantage from the differences existing among IP-related legal systems at the international level (that is, to forum shop) firms have to have gained experience with legal practices concerning enforceability of IPRs. In fact, only those firms that have experienced a large number of patent suits do show higher forum shopping capability. Notice that while forum shopping has been computed in this study by observing the (legal) behavior of firms in European patent courts, experience in litigations has been computed by observing the (legal) behavior of firms in the US, with the latter explaining the former. Thus, it is the knowledge and experience of patent trials, in general, that matters, not the specific knowledge of the (European) patent system where forum shopping practices have been analyzed by this study.

Second, the tendency firms show to seek patent protection to appropriate the returns of innovative activity (which we proxied in this study with Patent Intensity) results only weakly associated to the firm's forum shopping capability. Our results not always confirm our hypothesis, in this respect. Thus, patent intensity does not appear to be a strong driver of forum shopping, which is similarly adopted by both high and low patent intensive firms. If this result is linked with the previous one, it thus emerges that firms' forum shopping capability it strictly related to the experience firms have gained in patent litigations, not in patenting. Once again, this result expresses the idea that the ability to exploit for own

advantages the inner inefficiencies of the international patent system (in terms of subjective differences in the resolution of patent lawsuits) derives from a specific know-how of the mechanisms to legally enforce IPRs, not of the mechanisms or strategies to seek patent protection and to build a strong patent portfolio. Surely, a strong patent portfolio can be better defended in trials. However, the actual enforceability of patent rights then depends on factors that exceed the characteristics of a firm's patent portfolio.

As for the extension of the international patent coverage sought by firms, our estimations show apparently contradictory results. On the one hand, it emerges that the lower the geographical extension of patent protection, the higher the likelihood of forum shopping. On the other hand, the higher the geographical extension, the higher the strength of the firm's forum shopping capability.

Thus, overall, it seems that while only firms with a more focused patent portfolio (that may reveal a firm's commercial interest focused on a limited geographical market) engage in forum shopping, then only those firms with greater international experience are more able to leverage the features of the international patent system for their own purposes.

A similar consideration can be drawn also in the case of firm size (number of employees). Also in this case obtained results seem contradictory. With respect to smaller firms, larger firms do seem to possess stronger forum shopping capabilities, maybe because of the higher amount and intensity of financial, human and organizational resources they may devote to operate internationally within the various patent jurisdictions.

However, only smaller firms seem to adopt forum shopping practices. Thus, while the attempt to exploit the patent legal system seems to represent a goal for smaller firms, only those that are large enough seem to succeed.

All these issues open up interesting and promising considerations that deserve attention both for theory development and for practice. At the same time, however, we are aware of the fact

that this study represents the first attempt to explore this topic and, as such, it also suffers of some limitations what we put in our future research agenda.

First, while we claim that forum shopping represents a dynamic capability, we only performed a cross-section analysis. Thus, we plan to exploit the time dimension of our dataset, by better estimating the effect of experience accumulation on the forum shopping capability over time. Second, we aim at exploring additional factors that, along with those analyzed in this study, may affect the likelihood of forum shopping. The role of potential moderators or mediators is of great interest in this respect. Finally, we aim at expanding our study by including in the empirical framework the outcome dimension. In fact, while we suspect and claim that the firms' ability to forum shop may enhance their competitive advantage relative to competitors, *ad hoc* analyses have to be performed to pursue this relevant goal.

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Table 1. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
NumFS	373	0.493	1.106	0.000	11.000
PatInt	289	0.068	0.969	3.57E-08	16.400
Litigations	371	3.497	19.148	0.000	259.800
DS	373	15.579	8.152	1.500	39.000
Employees	262	5.241	2.703	0.336	12.888

Table 2. Variables' pairwise correlations

	(1)	(2)	(3)	(4)	(5)
(1) NumFS	1.000				
(2) PatInt	-0.009	1.000			
(3) Litigations	0.478 *	-0.003	1.000		
(4) DS	0.001	0.089	-0.043	1.000	
(5) Employees	0.309 *	0.234 *	0.387 *	-0.164 *	1.000

Note: *p<0.1, **p<0.05, ***p<0.01.

Table 3. Regression results

	Tobit			Poisson			Zero-inflated Poisson		
	Coef.	**Std. Err.**		**Coef.**	**Std. Err.**		**Coef.**	**Std. Err.**	
NumFS									
PatInt	1.567	1.471		0.654	0.358	*	0.540	0.353	
DS	0.017	0.024		0.034	0.012	***	0.054	0.012	***
Litigations	0.031	0.007	***	0.009	0.002	***	0.006	0.002	***
Employees	0.169	0.079	**	0.158	0.035	***	0.173	0.040	***
_cons	-2.375	0.673	***	-2.232	0.339	***	-2.181	0.364	***
Zero-inflate									
PatInt							8.105	7.891	
DS							0.147	0.047	***
Litigations							-0.458	0.379	
Employees							0.362	0.197	*
_cons							-4.798	1.919	**
No. of obs.		224			224			224	
Zero observations		149			149			149	
Non-zero obs.		75			75			75	
LR chi2 (4)		37.450			91.700			65.630	
Prob > Chi2		0.000			0.000			0.000	
Pseudo R2		0.072			0.171				
Log Likelihood		-243.059			-221.617			-205.793	
Inflation model								Logit	

Notes: *p<0.1, **p<0.05, ***p<0.01.

Figure 1. Distribution of Forum Shopping events among sample firms

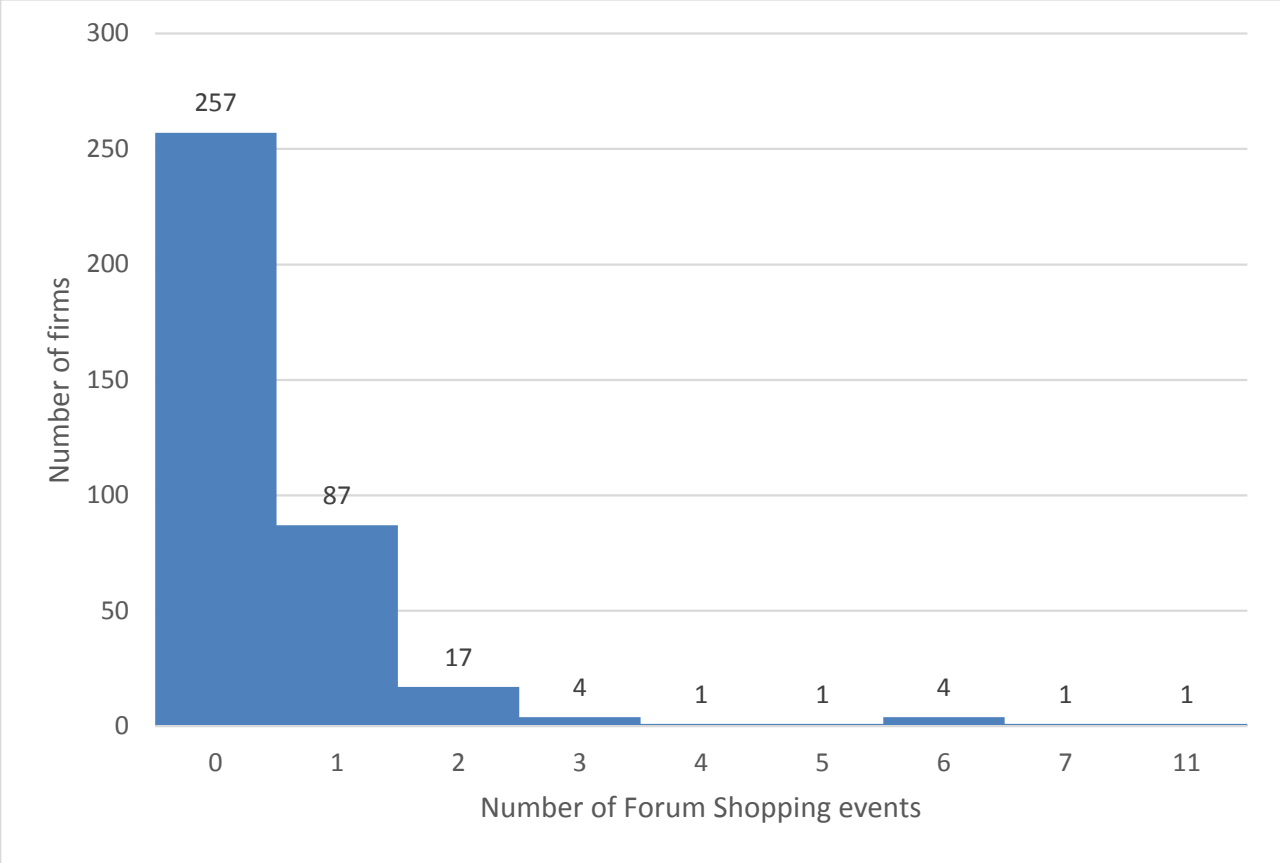
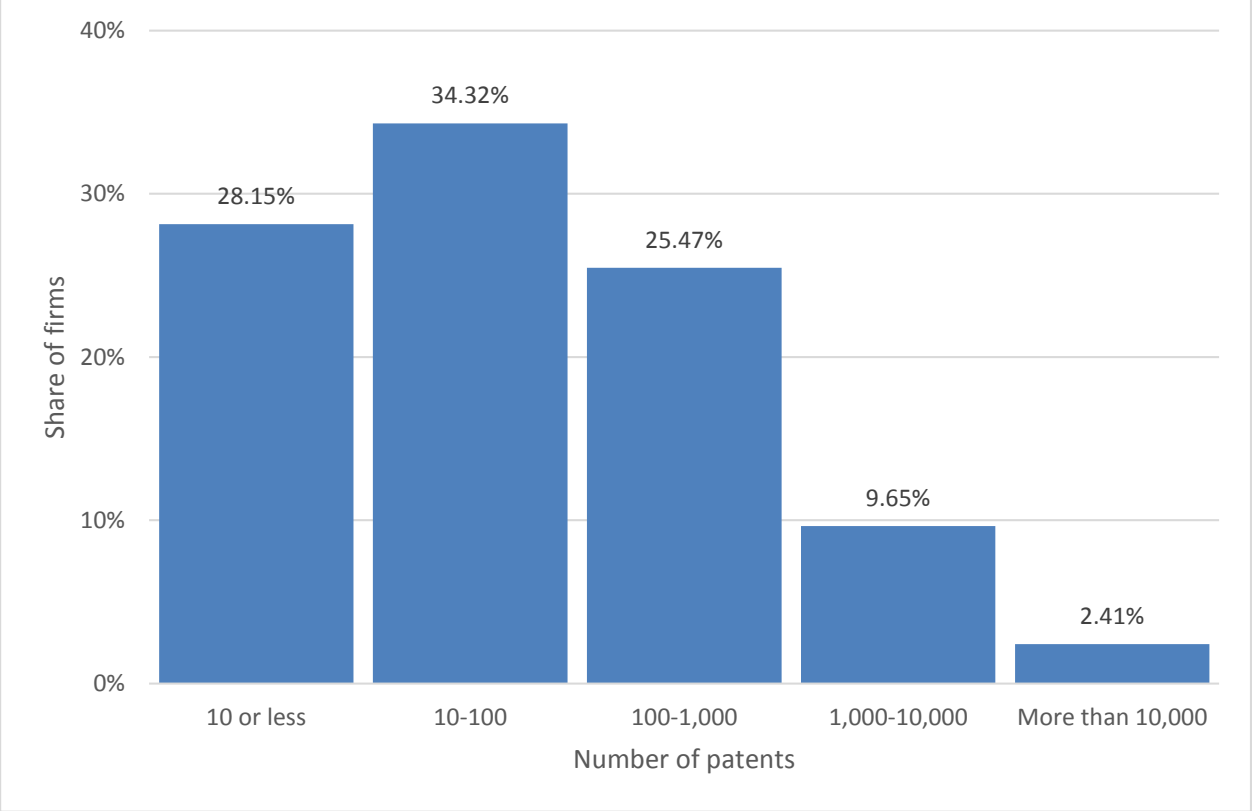


Figure 2. Distribution of patents among sample firms



CONCLUSIONS

The purpose of this dissertation was to dig deeper in the effective contributions that may be provided by lawyers in the achievement and sustainment of a competitive advantage over thirds, shedding light on the existence of legal capabilities.

Previous studies, especially those developed in legal fields, have only recently recognized the importance of legal activities within the firms: in spite of this, a study providing a systematic approach focusing on the lawyers' contributions was missing.

The results of this dissertation aim to revamp the debate and to push practitioners to hire lawyers or legal advisors in order to better manage some in-house issues that firms are everyday asked to challenge.

This dissertation has ambitiously tried to provide evidence of the useful and active contributions of lawyers within the firms and suggested two different applications of legal strategies mainly concerning Intellectual Property Rights (IPR) Management.

In particular, Chapter I, entitled "*Don't Forget the Lawyers: Legal Counseling as a source of competitive advantage*" has explored the role actively played by legal counselors in those activities that minimize the so-called legal hazards and, consequently, the generation of a competitive advantage through the reduction of net costs.

Through a co-word analysis, the main areas influenced by legal capabilities, that previous studies have unsystematically explored, have been depicted.

In particular these are: interpersonal and inter-organizational relations, IPRs Management and personnel management.

This study has shed light on the link between the role played by lawyers within the firms and the opportunities of generating revenues for the firm, thanks to the relationships (with

competitors, clients and suppliers) that they are empowered to manage and thanks to the reduction of the risks of being involved in litigations.

This work may be enhanced with an investigation of the specific contributions that lawyers are required to provide to the firms, that may be realized through many surveys both concerning the perception that managers have about the role played by lawyers and the effective results achieved.

On this purpose, it may be interesting to measure the differences in terms of performance among firms that make use of legal counselors and those who do not.

For the extent of this research, performance can be measured both in terms of litigations where the firms have been sued as well as in terms of revenues obtained.

Future research may also overcome some limitations of this study such as the missing differentiation between small and large firms, whose needs are assumed to be different.

Chapter II, instead, is entitled "*Patent designing strategy: some empirical evidence on EP Patents*" explores the impact of some patents' endogenous characteristics on the patent value (meant as the total benefits that a patent holder will perceive thanks to the application) and the risk of being involved in a patent infringement litigation.

In particular, the main purpose of this paper is to build up a patent that succeeds in reducing the trade off between patent value and the risk of being involved in an infringement litigation: this can be possible only through the correlation of all patterns across the IP value chain and specifically R&D and the legal and business development activities within the firm.

The results ambitiously aim to provide some useful insights on how practically build up and face all the legal intricacies concerning the patent applications.

In particular, it has been found out that a higher number of words per claim in a patent and a lower number of listed IPC subclasses can increase patent value while reducing the risk of being involved in a patent infringement litigation.

Concerning the average length of claims, this can be due to a deeper description that can better differentiate the issued IP tool from the ones previously existing and leave "less innovative space" to further innovators.

At the same time, better described claims can impact positively on the patent value, increasing the chance of a monopolistic exploitation on the market for a larger period of time and consequently increasing the potential benefits perceived by the applicant.

Concerning, instead, a lower number of inserted IPC 4-digit subclasses can, on one side, reduce the number of potential competitors and, consequently, the number of potential litigators.

Therefore, this study provides only a misrepresentation of the factors that make firms involved in a patent infringement litigations, and does not consider the influence played by the so called "patent sharks" and does neither consider the chance for patent holders of pursuing some "portfolios" strategies, deciding to "sacrifice" a single patent, in favor of the whole portfolio.

Further research on this point may realize a semantic analysis of words used in patent descriptions and claims, in order to detect the words that most frequently are used in the building of each IP tool.

This paper as well can be consider as a first attempt concerning the reduction of the above mentioned trade off between patent value and the risk of being involved in an infringement litigation: on this purpose, the research can be enlarged including in the sample patents and litigations at a global level.

Last but not least, Chapter III entitled "Forum Shopping as an IP Management Capability: some Empirical Evidence from European Firms".

Comparing this chapter to the second one, it can be noticed that in this paper an ex post strategy is provided.

In particular, forum shopping has been studied as a possible strategy that may be pursued by a patent applicant whose IP tools have been allegedly infringed in order to enforce her own rights.

This strategy can represent an opportunity and is played by attorneys with the purpose of occurring in a higher possibility of "winning legally" and, consequently, increasing the possibility that firms may profit from innovations.

The results of the study show that soma firm's characteristics such as firm size, firms' IP management practices (such as patent intensity, previous experience in patent litigations and the extension of international patent coverage that firms seek, on average, with their patents) impact on the probability of pursuing this strategy.

Notwithstanding one of the major purposes was to demonstrate the existence of forum shopping as a legal dynamic capability, a cross-sectional analysis has been run. So, one of the main intentions for the future development of this research is to exploit the time dimension of the considered dataset by better estimating the effect of experience accumulation on the forum shopping capability over time.

Furthermore, this research will be partially renewed in correlation to the establishment of the EPO Unified Patent Court.

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