

Mario BENASSI  
Facoltà di Scienze Politiche  
Università degli Studi di Milano

Alberto DI MININ \*  
MaIn Scuola Superiore Sant'Anna

Playing In Between: Patents' Brokers  
In Markets For Technology

\*Corresponding author: [alberto@sssup.it](mailto:alberto@sssup.it)

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**MAIN Laboratory**  
[www.main.sssup.it](http://www.main.sssup.it)

Piazza Martiri della Libertà,33  
56127 Pisa (Italy)  
Phone: +39 050 883 805  
Fax: +39 050 883 839

**Scuola Superiore Sant'Anna**

## INTRODUCTION <sup>1</sup>

Intellectual property (IP) can be defined as all the intellectual assets for which the law grants individuals or a company exclusive rights and protection against improper use by third parties (Rivette & Kline, 2000). Over the last two decades, intellectual-based assets have become the main source of a firm's competitive advantage (Teece, 2000). Protection of intellectual assets occurs through patents, trademarks, copyrights, and trade secrets. Patents and licenses are the main object of transaction on technology markets. A patent is a set of exclusive rights granted by a government to a person or organization for a limited period of time in exchange for the regulated, public disclosure of an invention.

Starting in the nineties, the market for patents and licenses has burgeoned rapidly. Patents are revenue-generating assets and can increase companies' market value. IBM, Texas Instrument and Intel are just a few examples of corporations that profited from licensing and selling patents. How does the patent market work and who are its main players? These questions are receiving an increasing amount of attention in the industrial organization and strategic literature (Arora, Fosfuri, & Gambardella, 2001a; Davis & Harrison, 2001) Generally, companies exploit their new knowledge internally or trade it with other partners. Internally, they can develop new products and processes directly through a nested set of patents and proprietary technologies. Companies can also trade their IP on secondary markets (Arora et al., 2001a). They might for instance license their patents or reassign their ownership rights to an interested third party (Chesbrough & Di Minin, 2005). The development, acquisition and commercialization of IP assets can become a fundamental revenue creating component of a company's business. This is true in high-tech industries where

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established companies like IBM and Texas Instruments get a large share of their revenues and profits from IP commercialization (Jones, Norris, & Solomon, 2000; Sullivan, 1998). Other high tech companies, like Qualcomm and Rambus, base their entire business models on the exploitation of their IP assets (Tansey, Neal, & Carroll, 2005). In a variety of industries IP-based transactions play a key role in the business models of several firms (Chesbrough, 2003), both in high tech and low tech sectors (Chesbrough and Crowther, 2006).

This paper focuses on patent brokers and explores their role in the technology market. Patent brokers are here defined as organizations whose business is to match supply and demand of technology and to facilitate IP-based transactions. In doing so they can serve a support function to R&D managers of firms adopting various approaches to technological change (Rush et al. 2007).

Our first question is: *what types of activity do patent brokers perform?* Patent brokers work with market imperfections and correct information asymmetries. They do not develop new knowledge, carry out research and development, or patent their ideas. Patent brokers exploit a monopolistic and independent position, as they temporarily own information that is crucial for a transaction. This not only redirects value from legitimate owners, but can also produce distortions on the markets. However, the presence of brokers can facilitate transactions with a win-win solution for both supply and demand. To consider the positive and negative effects brokers can have on patent markets, we need a thick description of their role and activities.

Our second question is: *why do patents' brokers exist?* We believe that such discussion is particularly relevant for the current debate on "Open Innovation" (Gassmann, 2006). There are many different theoretical explanations for why patent brokers exist, in particular we have found particularly useful the interpretation offered in Lamoreaux and Sokoloff (2002). We here suggest that transaction cost economics and structural holes theory partly address the issue of why "third parties" play a role in economic and social exchanges. Transaction cost economics explains why specific transactions characterized by "incomplete contracts" require a third party to be completed. Structural holes theory suggests that untapped connections can be exploited by proactive actors.

Drawing from these two theories and our own empirical evidence, we discuss the effectiveness of these theories in explaining patent broker existence.

This paper is organized into six sections. In the first section we discuss the increasing role of Intellectual Property (IP) in the modern economy. We briefly mention the main factors that have led to a greater role of patenting in the past two decades. We then discuss the specific aspects of IP that we believe are important in understanding the emergence of patent brokerage. In the second section we review the literature and look for the theoretical explanations for patent brokerage. Specifically, we discuss how transaction cost economics and structural holes theory address the role of “third parties” in economic and social exchange. In the third section we discuss our empirical methods and then provide a “thick description” of what patent brokers do in the fourth section. This analysis is based upon qualitative, exploratory research we conducted in the U.S. between June and September 2006. In the fifth section we offer a taxonomy of brokers’ activities. We argue that transaction cost economics and structural theory are only partially useful for explaining patent brokerage. In the sixth section we draw our conclusion and identify directions for future research both at a micro and macro level. At the micro level, we suggest that brokers can be treated as highly skilled entrepreneurs with relevant relational capabilities. At the macro level, we predict that structural conditions of the industry and technological field where patent brokers are active will impact the success and relevance of intermediaries activities.

## 1. THE INCREASING IMPACT OF PATENTS IN THE MODERN ECONOMY

To understand where the phenomenon of patent brokers occurs, we need to explore three aspects of the IP system.

The first aspect of patents worth considering is their exclusive nature. A patent is a contract between the assignee and society. It establishes a *quid pro quo* which both facilitates the commercial exploitation of an invention and encourages the diffusion of knowledge that would otherwise remain eventually applied as an industrial secret. Technically, a patent grants the assignee a limited monopoly over some “claimed inventions” in exchange for the disclosure of the details that would allow a person “trained in the field” to reproduce the claimed invention. The law grants assignees the right to prohibit others from using or making the claimed invention. Moreover, assignees also have the right to dispose of their patents by granting licenses or reassigning these rights to other parties. These rights have a time limit, and as patents expire, knowledge and techniques become part of the public domain: anybody can get access to and apply them. Patents grant the right to exclude. They do not grant the right to make. In fact, other preexisting patents, related to the claimed invention, might impede the use or commercialization of an invention. When products are complex, the possibility of patent infringement is high. In the high tech industry, not buying from companies with extensive IP means taking some amount of risk. If one finds they are infringing another company’s rights, they will have to pay extra money for settling the case (Chesbrough, 2003). Note that infringement of patents might occur accidentally: companies cannot search and scrutinize all possible patents impacting their activity. They might not know they are infringing a patent. If they know they might be infringing a patent, they have two options: getting a license over this patent or waiting for this patent to expire. Transactions occur when parties are willing to trade and are satisfied with the terms and conditions of exchange.

The second aspect of the IP system is major legislative shifts that occurred in Europe and in the U.S. during the 80’s and 90’s. These shifts have led to increasing enforceability and

(consequently) greater value of IP assets. After the formation of a centralized appellate court in 1982 (the Court of Appeals for the Federal Circuit) in the U.S., the likelihood of winning a patent infringement case went up from 50% to over 70%. This institutional change paved the way to a “pro-patent” judicial period (Merges, 1992). In 1986 the “Kilby patent” decision set an important precedent in high tech industries, granting Texas Instruments a significant source of income and significant controlling power over the semiconductor industry (Grindley & Teece, 1997). The 1989 sentence in the Polaroid Vs. Kodak case showed that courts were not shy in setting high damage payments for a considerable infringement. Today multimillion settlements over infringements are not a rare occurrence; the \$612 million paid by Research in Motion to NTP in order to settle a dispute over some patents that were supposedly infringed by the Blackberry device is only the latest example<sup>2</sup>. In Western economies, the jurisprudence on patents is still in full swing, and deep reforms are quite possible. The direction of change is toward increased patent protection. During the course of the 90’s, the number of patents granted by the USPTO (U.S. Patents and Trademarks Office) increased at an unprecedented rate. Empirical studies are still providing contradictory explanations for this surge in patenting. A new approach to management of innovation seems to be the primary driver across industries in the U.S., while the “friendly court” hypothesis, and the presence of more technological opportunities, or higher investment in R&D remain secondary, and industry specific, causes (Kortum & Lerner, 1999). Patents have become an effective tool to better appropriate the results of R&D, increase revenue, and gain contractual power through cross-licensing agreements (Hall & Ziedonis, 2001). Figure 1 provides data on patent applications and patents granted by the USPTO between 1980 and 2005.

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<sup>2</sup> The Research in Motion - NTP litigation received large press coverage in the period 2003-2006. For years, Research in Motion tried to prove the invalidity of NTP patents, but it was forced to settle the case as an injunction which would have suspended the sales of the Blackberry was pending (see [http://www.rim.net/news/press/2006/pr-03\\_03\\_2006-01.shtml](http://www.rim.net/news/press/2006/pr-03_03_2006-01.shtml)).

FIGURE 1. USPTO Activity (1980-2005)

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Insert Figure 1 about here  
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Increased patenting is also the outcome of increasingly defensive strategies. Several companies began patenting to protect their products against possible infringements. These companies patented as many of their technologies as possible, and the result is a significant amount of overlapping patents of questionable quality. More patents do not necessarily mean better patents. In fact, the quality of most of what companies across industries are patenting is of little or no commercial relevance and difficult to correlate with shareholder value (Hall, Jaffee, & Trajtenberg, 2000). The percentage of granted patents that are going to be applied to products or enforced through licensing agreements does not reach double digits (Granstrand, 2004; Teece, 2000). Forward patent citations are often used as a proxy for patent usefulness. Distribution of patents' citations is extremely skewed, as a small minority of extremely important patents are receiving most of the citations from subsequent patent documents (Hall et al., 2000). Citations do provide only a partial (ex-post) proxy of patent value. Interesting research is currently being conducted to better evaluate patent value starting from the use of technical words and the development of application procedures (Reitzig, 2004). With no standardized tools with which to gauge the value and potential usage of patents, browsing through an overcrowded technology market is indeed a difficult task and requires specialized know-how.

The third aspect has to do with licensing practices. Recent evolutions in patenting systems led to a growing separation between technology (and IP) providers, technology users, and integrators. Companies started to rely on the existence and functioning of a burgeoning market for proprietary technologies. Patents' primary role as a defending mechanism for a firm's proprietary

technology took on a new importance. Patents became valuable components of market exchanges and a key element in transactions such as licensing or strategic alliances.

The surge in licensing revenues and patent sales was the consequence of some eye opening success cases. In some situations, as traditional resources for investment in R&D declined, leading companies turned to the licensing of their existent IP portfolio as a possible source of income. One of the most successful examples of this has been IBM, which as early as 1995 officially recognized licensing revenue as an important item in its budget. As patents became a valuable component of market exchanges, several companies realized they lacked expertise and resources to directly manage their patent portfolio. The same holds true for independent inventors. Independent inventors have limited resources and are not very likely to commercialize their technologies. Independent inventors can also experience problems getting crucial information about potential buyers and licensees. Transaction cost in dealing with companies can become unbearable.

Universities and public research centers have also entered the patent business. Universities and public research centers are a significant source of potential patents. Since the approval of the Bayh Dole Act (1980), University Technology Transfer Offices (TTO) have significantly increased their presence in technology markets. The number of patents filed by university researchers has surged. This is also true of (repetitive construction) licensing agreements between universities and corporations (Markiewicz & Di Minin, 2004).

More players are turning to patent transactions as a critical function for both their technology transfer and knowledge exploitation. While for some of these companies, institutions and individuals this represents the core of their business models, for others licensing is a secondary activity, and only one of the various forms of technology sourcing and new modes of exploitation for internally developed assets (Cesaroni, Gambardella, & Garcia-Fontes, 2004).



## 2. HOW DO ECONOMIC AND SOCIAL THEORIES EXPLAIN TECHNOLOGY BROKERAGE?

Brokers are common in everyday economic life. Whenever we deal with buying, selling or renting a house, getting an insurance policy, or trade options and futures in the financial market, we rely on the services of a specialized agent. This agent makes the transaction possible by guaranteeing both parties an acceptable solution among the available options. To do so, a broker might perform a variety of different tasks required for the completion of a transaction. Thus we can assume that under specific circumstances the transaction would not occur or would be much more difficult were a broker not present. Common sense suggests this might be true in several circumstances. Consider for instance the real estate market, where brokers gather, process and distribute information about possible deals at a low cost. In most cases, sellers would not be able to properly indicate their intentions, the conditions under which they want to sell, etc. due to an unfamiliarity with the market. They would also likely be unable to pick up on the signals coming from prospective buyers. As a result, some market transactions would not occur even though both parties were present and wanting to close the deal.

A common way to explain why brokers exist is to assume that markets and economic exchange are characterized by imperfections. If information were homogeneously distributed and freely accessible so that no asymmetries existed, perfectly rational agents would be able to complete transactions in their own interests without any assistance. Homogeneous information and perfect knowledge) would render the presence of a broker unnecessary. According to this view, brokers are a temporary, viable solution to existing imperfections. Still under these circumstances brokers might play a positive or negative role. Brokers are efficient as they offer a second best solution to agents on the market. Brokers can temporarily mitigate market imperfections and provide reliable, trustworthy information. They can also provide legal assistance and control for free-riding behavior. On the other hand, brokers might also represent an obstacle to market efficiency, as they could be a

primary cause of information asymmetry. Brokers can convey limited information or hide relevant information. Brokers may act opportunistically if their reputation is not at stake or if there are minimal rewards for playing fair (Merges, 1999). However, this type of brokerage is doomed to disappear as industry matures. As knowledge of the market diffuses, the bridging function of brokers loses its appeal. In theory, companies can skip the intermediaries and directly manage their transactions.

Teece (2005) provided indirect support for patent brokers' relevance by discussing the interplay between patenting, firms' boundaries, and firms' specialization. Building on an argument explored by Arora & Merges (2004; 2001b), Teece (2005) suggests that IP combined with complementary and proprietary assets allows companies to successfully leverage the results of innovation. In other words, patents might indeed encourage more dispersed sources of innovation; however, access to key complementary assets is going to determine the success or failure of an innovation. Knowledge of the industry as well as ownership of the essential IP are key ingredients. Companies might not have both at the same time, and some form of brokerage might be necessary. Moreover, as recently reinforced by Rush et al. (2007), firms hold different approaches to technological change, and for some of them, external help is necessary to identify opportunities and threats.

Transaction cost economics (TCE) and structural holes theory don't directly address the issue of patent brokers. Nevertheless, they provide a theoretical framework for understanding the role of brokerage.

TCE views hierarchies and markets as two alternative governance modes to perform transactions (Williamson, 1975). Depending on asset specificity, frequency and uncertainty, hierarchies or markets are better off in performing transactions. For instance, markets are better off in governing transactions on commodities. A commodity does not require high costs for collecting relevant price, setting up and reinforcing contracts. Transactions for commodities are usually standardized agreements, making switching costs negligible or absent. Companies are better off

governing highly asset specific transactions. Hierarchy allows for a tighter control of opportunistic behavior. Making rather than buying avoids lock-ins, as in the case of a company relying on a non-substitutable supplier.

Transaction cost economics subsequently recognized that hybrid governance modes are also possible (Williamson, 1985). Thus, while hierarchies and markets remain polar modes, other different governance structures are also possible. Trilateral governance is possible when transactions are occasional and of mixed and highly specific kinds. Third parties and intermediaries might play a role as they reinforce the institutional setting needed to make transactions happen: “thus rather than resorting immediately to court-ordered litigation – with its transaction-rupting features—third party assistance (arbitration) in resolving disputes and evaluating performance is employed instead” (Williamson, 1985: 75). TCE recognizes that the cost of contracting, enforcing the contract, and dealing with unforeseen circumstances varies significantly (Bailey & Bakos, 1997). Brokers can match buyers and sellers, thus reducing the costs of searching. Brokers can also act as agents of trust. They can shield buyers and sellers, protecting them from opportunistic behaviors by other players.

TCE offers a parsimonious explanation of why brokers exist. Brokers can help buyers and sellers in setting up appropriate governance modes to execute risky transactions. This is especially true in the case of patents, whose value is difficult to ascertain precisely and where several contingencies are at work. TCE maintains that brokers offer buyers and sellers an insurance policy against malfeasance in situations of incomplete contracts. Thus TCE implicitly equals brokers to regulatory institutions or substitutes for contractual regulations. This way, brokers exist because transactions have specific features that cannot be governed through polar modes. According to TCE, brokers stay in the middle. Note that a TCE explanation of why brokers exist is compatible with the one offered by classic industrial organization (Tirole, 1988). As specialized agents, brokers can facilitate the market by reducing operative costs. They can benefit from economies of scale and scope and reduce bargaining asymmetry. TCE and industrial organization assign brokers a

“bridging” function. Their role is to connect market players that want to engage in transactions but cannot do so efficiently on their own. The work of Lamoreaux and Sokoloff (2002) tries to interpret the role of intermediaries in the market for technology through this lens. These two authors claim that the development of specialized markets allowed firms to “outsource” to professional individuals the “responsibility for developing and commercializing their invention”. If we apply the TCE/Industrial Economics view to patents’ brokers, we deduce the following proposition.

*TCE/Ind.Econ. Proposition: incomplete contracts explain the presence of patent brokers in between technology demand and supply. Patent brokers provide a hybrid form of governance for transactions on technology markets.*

An alternative view of brokerage comes from socio-economic theories. Burt (1992; 2005) suggests that brokerage is a function of structural holes in a network structure. While TCE suggests that intermediaries are “equidistant” from supply and demand, and they simply regulate an information asymmetry, network theories conceptualize brokers as proactive players. A structural holes exists when two people or groups are unaware of value available if they were to coordinate. A structural holes refers to a missing element of coordination. Structural holes imply resources are unevenly distributed. Distribution can be random or occur in densely knitted clusters. Within these clusters homogeneity is normally high. Individuals spanning several clusters are in the position of exploiting differences. People spanning structural holes are more likely to have good ideas. Bridge relations are the channels through which discussion changes opinions and behavior. Brokerage is the act of creating value by filling in the hole.

In reviewing existing literature, Burt (2005) suggested two possible ways to control for effects of brokerage. One is to study returns to the people connected by brokers; the other is to study returns to the broker. Garmaise & Moskowitz (2003) studied the effect of brokers in the commercial real estate market and found that brokers substantially raised the probability that a transaction would be financed with a bank loan. However, there is not compelling evidence that brokerage itself leads to success and superior business.

Network theories imply that brokerage is not a simple support function. Brokerage can be realized in several ways. Putting in contact two parties who share similar interests or could have common goals is one way. However, brokering is a complex and multidimensional activity, and information transmission is only one component of the broker's role in orchestrating a deal (Pollack, Porac, & Wade, 2004). Brokers can transfer from a cluster to another best practices and routines. Also, brokerage can take the form of analogy and of synthesis. Thus brokers may add distinctive, unique value (Hergadon, 1998). This is the case for example of internal brokers. Internal brokers share complex knowledge between very distant contexts in large organizations (Cillo, 2005). If we use structural holes theory to explain patent brokers, we formulate the following proposition.

*Structural Holes Proposition: structural holes explain the presence of patent brokers in between technology demand and supply. Patent brokers add value to a transaction, creating a bridge between two previously disconnected groups of players on technology markets.*

In conclusion, we have two distinct explanations for why brokers exist and what they do. These theoretical approaches converge when considering asymmetries as a natural precondition for brokers' existence. For TCE, asymmetries are embedded in transactions. Brokers facilitate market exchange by limiting their negative side effects. For the structural holes theory, asymmetries exist between densely knitted cliques. By bridging these cliques, brokers leverage their position.

Our field work aims to confirm or reject these two separate theoretical explanations of why patent brokers exist.

### 3. METHODS AND DATA

Due to the exploratory nature of our research, we chose to take a case-study approach. A case study approach is beneficial because it creates a foundation on which to build new theories and to explore

new phenomena (Eisenhardt, 1989). This method was also necessary due to the lack of public data about patent brokers and the scattered nature of information we were able to get from primary sources, such as associations' directories and existing databases.

Our first task was to identify and select IP intermediaries. No comprehensive directory of patent brokers exists. We relied on secondary sources of information and used a snowball technique to build our sample. Through exploratory interviews with industry experts, key informants and TTO professionals we were able to come up with a tentative list of patent brokers. This first task proved to be quite straightforward. In an industry where relationships are key, knowledge about “who is who” is rather diffused at least among key players. Also, once we identified and contacted patent brokers, getting their feedback was facilitated by the fact that most of these companies were eager to share their view of the industry and discuss their business models. While confidentiality issues arose (as will be discussed below) many of the interviewees welcomed the opportunity for higher visibility. Biases of such an approach are inevitable. Less well-known companies did fall off our radar screen and we were unable to get information out of those companies still operating in stealth mode. Nevertheless, the convergence of opinions expressed in the course of semi-structured interviews allows us to be confident about the general validity of results here described.

Through the process of snowballing and conducting interviews between May and September 2006, we were able to identify, select and collect non-confidential information from 15 companies. Only two firms were unavailable for comment. Table 1 lists interviewed companies included in this study. We believe they represent a satisfactory representation of the larger universe of U.S. intermediaries.

TABLE 1. Interviewed Companies

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Insert Table 1 about here

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For each company we interviewed one of the partners or top managers. Interviews were in person and lasted between one and two hours. Each interview was reviewed and edited with the feedback we got from the interviewees. In several cases we did a second interview to discuss specific topics more in depth.

Our second task was to come up with a clear understanding and possibly a “thick description” of what patent brokers really do. Interviews were divided in two parts. In the first half we discussed general market and business trends to get an overall understanding of the industry. In the second part we asked specific questions about the company, i.e., its origin and foundation, area of specialization, activities carried out, examples of specific deals, and financial performances. Whenever possible we double-checked the information we got and asked respondents to give us their view on other respondents’ comments.

Informants were very cooperative on every issue except financial performances. None of the informants provided us detailed figures about revenue and profits, paralleling the privacy normally observed in the venture capital industry. Due to the nature of business, yearly revenue might be inaccurate or non significant. Very few of the 15 companies have managed to secure a stable and secure base for their revenue stream, and as one of the informant stated, *“it takes several times to finalize very complicated agreements, and sometimes even more (..) as a consequence yearly figures might make little sense.”*

#### 4. RESULTS

Ten out of fourteen of the patent brokers in our sample were founded after 2000. Half of them are headquartered on the East Coast, and the other half in California, namely Silicon Valley. While the reader might think that this is the result of convenience sampling, as we searched the area where we were physically located at the time, we were told that Silicon Valley and California are

home to a large population of patent brokers. If one thinks about the concentration of high-tech industries in these areas, it makes perfect sense that patent brokers would be localized mostly near the companies they will work with. Also, the dot com boom of the 90s and bust of the early 2000s left a high concentration of unexploited IP up for grabs among the ruins of many failed start-ups.

Only three of the fourteen cases we examined appear to be a continuation of pre-existing activities. However, partners and founders have been around for longer periods of time. Consistent with Chesbrough (2006) we found evidence of significant innovation in the business models described to us, and various entrepreneurial solutions have been explored by these companies. We here try to stratify our sample into four different “value creation” paths.

The first path to venture creation was an inventor willing to leverage his or her own experience in patenting. This is the case for instance of Science+Technology, whose founder experienced several problems trying to leverage his own inventions in video-games and then turned to the brokering business. Realizing how problematic it was to extract value from a patent and get support for marketing, he founded a company that engaged in a variety of commercialization and support functions that need to be carried out after the patent has been granted, such as market evaluation, product design, and product commercialization. According to the founder of Science+Technology, *“we realized there were inventors willing to develop their patents. They were technically very skilled but totally lacked commercial and marketing expertise. We decided there was a market for patents held by individuals that was worth exploring.”*

The second path to venture creation was professionals and managers with deep knowledge and experience in IP management at large corporations who decided to spin-off and establish their own firm. This is the case of Intellectual Ventures. One of its founders used to be a senior manager and key technologist at Microsoft. Having perceived that there were opportunities to explore, he teamed up with other professionals to leverage his previous knowledge and contacts. Intellectual Ventures is today a specialized IP broker that aggregates and manages underutilized patents.



The third path to venture creation was lawyers and professionals who teamed up with business colleagues to offer integrated services. This is the case, for instance, of Inflexion Point Strategy. These companies are usually the outcome of partnerships among experienced individuals who decide to team up and become independent patent brokers, and in so doing raise enough capital to finance their operations. Pre-existing ties and common background turn out to be, in some cases, very beneficial, as one of the informants clearly states, *“we had common background in high-tech and were very complementary... as soon as we realized we wanted to experience an entrepreneurial career, teaming up looked natural.”* The experience of large multinational companies, public centers and universities provided the foundation for dealing with patents and offered risk-seekers an opportunity to start their own company.

The fourth path to venture creation was bold entrepreneurial activities backed by large financial resources. This is the case for instance of IP Value Management. IP Value Management is backed up by the capital of important institutional partners such as General Atlantic Partner and Goldman Sachs. Another example is the already cited Intellectual Ventures. Contrary to the vast majority of patent brokers we interviewed, Intellectual Ventures directly owns its traded assets. Even if the company would not comment on the size of its patent portfolio, nor on the identity of the investors, business press insists that Intellectual Ventures managed to aggregate and control thousands of patents within a few years and that its operations are financed by companies such as Microsoft and Intel.

Degree of sectoral specialization among patent brokers varies. Some of them – roughly half of our sample – are mainly focused on technologies used in one or two industries. This is clearly the case of very complex industry, like electronics, IT or biotech, where patents are key in protecting knowledge in several domains, and where integration of various technologies, often in the hands of different companies, is a necessary step towards product development and commercialization of an electronic gadget or a drug. Specialization remains rather high for patent brokers who spun-off from larger companies. For the rest of our sample, specialization is not a crucial issue. These patent

brokers cover several segments of high-tech industries and sometimes also mature ones. In these situations, key competitive advantage is given by a bundle of activities such as patent evaluation, IP identification, and value extraction.

We found only two patent brokers with operations in Europe, and a third one who is about to open its offices overseas. Although all patent brokers are giving Europe and other areas serious consideration, they also suggest that the U.S. market is extremely rich in opportunities and remains their priority for the next future.

If we consider only the companies that decided to disclose quantitative information about their operations (6 out of 12) the average size is around 20 employees. Since most of the companies were not able to provide us data about the volume of their operations, it is not possible to estimate the share of patent transactions that are served by these companies and in general we cannot speculate on how representative this sample is of the entire population. Most of the companies are privately owned and decided to share information about the sources of their funding only under condition of anonymity. In most cases, we learned that traditional venture capital firms, big investment banks, and large high tech companies are heavily financing some of the most well known intermediaries. Only a few companies claimed to rely exclusively on seed capital from their founders and individual partners.

All informants agreed that brokerage in general has become more common and that the IP market is growing. Informants did not provide an estimate of the global market, and they were very circumspect in exploiting their specific markets. However, commenting on their customers' needs, patent brokers in our sample identified three distinct drivers triggering growth in the IP market.

The first factor that appears to trigger the creation of a patent market is increasing patent intensity, an observation that is consistent with available data. As the market grows, it becomes possible to trade patents as any other goods. Already discussed institutional factors, as well as deliberate company strategies, ultimately drove these changes. Thus, the existence and development of a market for patents provides a common ground for specialized players – other than buyers and

sellers. As the market grows, it becomes more and more difficult to monitor all possible patents that might impact a company's business. As one of the informants put it, "*available public information is not enough (..) public data must be complemented by a deeper analysis and an overall understanding of the context (..) the patenter, its strengths and weaknesses, as well as the prospective buyer stakes and interests, all become relevant.*" Consistent with what might be expected, development of the market for patents implies a general need for up-to-date, reliable and customized information. The variety of the information required is great. For instance, a company might want to know whether a specific patent exists, who the owner is, and whether or not the owner is willing to license or sell it. Similarly, a company and even an individual who has patented an innovation may want to know whether a company is infringing its patent rights. Some of our informants suggested that one of the first brokerage activities in the United States was a directory listing key information on the most relevant patents<sup>3</sup>. However, it is more than a simple matter of "publishing information."

The second factor that appears to trigger the creation of a patent market is what we label "increasing compelling IP blindness." As technology evolves at a faster pace and becomes more convergent, companies pursuing innovative strategies might violate other companies' rights. This is the case because time-to-innovation and time-to-market are much shorter than the whole process needed to file a patent and to have it granted. As a result, companies might end up unintentionally violating existing patents. As one of the informant stated, "*infringing a patent can occur inadvertently... companies developing an innovation cannot know for sure whether or not they are infringing existing patents.*"

No matter how many resources they commit to IP management, companies cannot monitor all possible innovators. Therefore, patent brokers might be better at scouting the market for patents. This is especially true for patents that have been filed but not yet granted. Such information is crucial for a company willing to buy a specific patent. The same holds true for a small company that

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<sup>3</sup> Interview with Scott Taper (Science+Technology).

depends on R&D and whose main asset is IP. It is unlikely that such a company would be able to set aside resources for investigating who is infringing its patent, nor would it have the expertise to negotiate an agreement where technical, business and legal issues converge.

The third factor that appears to trigger the creation of a patent market is that patents and IP management in general have become part of company strategy and sometimes one of companies' core revenue stream. Such an increased attention to IP management by medium and large companies does not necessarily imply only in-house solutions. Large companies staffed with IP management practices might need consulting services from specialized companies. As one of the informant put it, *"we have contacts and knowledge outside the industry we mainly do business with(..) so every time there is a patent with a possible application in several domains, we are requested to do "business and technical due diligence to assist our client."* At the same token, small-medium companies that lack needed resources must rely on external services to protect and value their patents. It is not usually the case that small-medium companies have a specialized internal unit; they do not patent on a regular basis, and patenting is not supposed to be one of their main activities.

Patent brokers in our sample are mostly specialized either in licensing or in selling.

TABLE 2. What patent brokers do

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Insert Table 2 about here

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Licensing makes sense when original assignees are seeking to obtain a continuous revenue stream, but lack the resources or have difficulty accessing the complementary assets necessary to invest in the commercialization of these technologies. For established companies, licensing out internally developed technologies can represent the lightest form of business diversification.

Negotiation between licensor and potential licensees can be tricky, but common standard and general formats offer a solid base for finding mutually acceptable solutions. Licensors normally grant rights to manufacture and/or distribute their originally assigned inventions in exchange for a percentage of total sales.

Patent brokers intervene in licensing through (1) IP asset evaluation (2) market identification and selection and (3) negotiation.

During the first phase, IP assets are analyzed on technical, business and legal bases. Initial evaluation is normally followed by a more detailed analysis in order to understand the real market potential. As one of the interviewed managers stated *“inventors normally overestimate the potential of their patents and underestimate costs associated with turning patents into a prototype or a product.”*

Patent brokers develop a detailed analysis of the patent potential by relying on a knitted web of professionals. These professionals are normally key-players in their area of expertise. Scientists and technical experts normally carry out a technical evaluation of the patent. They make sure that patents are truly innovative from an industrial point of view and give advice on how to define commercial solutions building from the technology that patents read on. Market consultants and business experts perform a market due diligence .They assess market potential for the product, its strengths and weaknesses, as well as potentially interested licensees. IP lawyers scrutinize the patent and its claims to assess whether or not the title has all the needed legal prerequisites for being licensed or commercialized. Patent brokers normally directly perform these activities in situations where inventors are individuals or small companies. When inventors are large companies, brokers normally assist internal units to perform these activities.

Several interviewees suggested that teamwork, which combines internal resources with external ones, is extremely critical during this phase. The wider and more reliable their net of experts, the more reliable the final assessment will be and the smoother the whole process will go. As an outcome of this phase, a patent gets bundled with an overall technical, business and legal

evaluation. Patent brokers also take care of selecting a qualified group of potential licensees, and they enter in negotiation for a potential deal. The majority of the interviewees claimed that *“evaluation lies at the core of our business model.”* One manager, who was specialized in managing entire IP portfolios on behalf of customers, claimed that *“Our most important trade secret is how we scrutinize a patent portfolio and identify its strengths and potentials.”*

Selection and negotiation also have the potential to be extremely high value adding activities. Whether a potential licensor is going after a quick return for an isolated invention or a healthy revenue stream for a large bundle of patents, the identification of the right licensee is critical for the success of the operation, since normally licensing revenue will be tied to the sales of products “reading on” the licensed IP assets.

Relational capital and knowledge of possible future markets are going to make the difference in the eyes of the broker’s client. The first important assignment in this stage is to identify which industry is going to be interested in this technology, and to market it accordingly. This is often a difficult task because the market for the technology is not clear, or may be quite distant from the traditional market where the company operates. The ability to connect distant markets is therefore often a *“creative effort that is required by my company,”* as one of the interviewees put it.

In licensing, patent brokers are therefore acting as business developers. Sometimes they have to envision a new market for a new product, bring to the table both inventor and licensee, mobilize other resources and provide market and business intelligence to have the deal closed. One of the interviewees put it this way: *“developing a business plan that makes sense out of a patent is sometimes a very demanding job(..) luckily it is also very creative and challenging, as success depends not only on how robust and advanced the patent is (..)sometimes the rest is as important.”* And in this “rest” lies the core of the broker’s business. While the first cases of IP intermediaries were doing little more than bridging informational divides, the professionalization of IP brokerage led them to provide a more complete package of services in assisting a licensing transaction.

Licensing can also be the end result of a very different process. Instead of playing in the middle, a patent broker can also become representative of the inventors. Patent brokers' main task is to control whether or not other companies are infringing the inventors' IP. Infringement is common and therefore "patent trolling" has become a very prolific, and profitable, niche. In this case, patent brokers, but more often lawyers, assist inventors to make sure they can benefit from the output of their innovation. Assistance requires a deep understanding of a patent in its technical, business and legal aspects, as well as a deep knowledge of the companies of a specific industry. Assessing whether or not an existing company is violating a patent is not an easy task by any means. A threat to sue a company must be credible and patent brokers can effectively assist individuals and small companies to make their threat believable. Licensing and settlement are the ending point of this process, where legal skills are predominant. Also, the boundary between a genuine infringement allegation and a frivolous charge is not always an easy one to draw. Some patent brokers have gained the undesirable reputation of being "IP Trolls," meaning that their main purpose is to get a quick payment by spamming dozens of established companies with infringement claims of dubious strength.

When patent brokers assist companies seeking to reassign their patents, they operate in ways similar to what we have discussed in the case of licensing. We can distinguish the assistance brokers give when aiding supply or demand of technology. When working together with a technology provider the identification of the best possible buyer is critical for the maximization of the price that the potential user is going to be able to pay.

When intermediaries assist buyers, which are scanning the market for possible acquisitions of third party's technologies, they can perform a special "shielding" function. They guarantee anonymity by keeping prospective buyers' signals from being sent across the market. As one of the interviewees stated, "*companies are worried not to let competitors know what they are after(..) they prefer closing deals in the dark.*" They also avoid closing deals in which the price is high only because the prospective buyer is a large company; "*sometimes it is so difficult to assess the real*

*value of a patent that people use rules of thumb like a fixed percentage of the total revenue of the buyer,(..) but when large companies are involved inventors become greedy and ask for unrealistic compensations(..) Patent brokers can help assess a right value.”*

The need for anonymity and even more so a marketplace for tradable IP is the catalyst behind patent brokers’ evolution from information to complete service providers.

Patent auctions have so far registered mixed success and most of the interviewees confirm general skepticism about the future of auction based companies. Nevertheless, the arguments offered by proponents of such a vision are rather compelling. Patents, much like commodities and stocks, will soon require their own exchange place, where supply and demand meet in the most efficient way. According to one of the respondents, *“investing in a patent can be a more transparent form of investment than buying stock of a company. When you buy a valid patent, you invest in the future of a technology, and if the market for technology is efficient, this technology will find its most appropriate adopter.”*

Patent brokers representing buyers can also scout the market on a continuous basis to select patents the buyer might be willing to acquire. Reasons might be different and not necessarily “aggressive”, as for example when a patent is needed to enter a new market. Companies might also be willing to buy patents for defensive reasons, like to prevent competitors from threatening infringement charges. Companies might prefer to leave patents in their archives and avoid unnecessary risks. In this case, patent brokers add their knowledge both in terms of industry and process. They not only have to be very knowledgeable about a specific industry, but must also know how to collect and control useful information about patents acting as antennas on a specific market. This antenna role often cannot be directly performed by large companies. As one broker puts it *“due to our reputation we can collect critical information without revealing how we will be using it (..) we have a net of informants that is very large and very reliable (..) we can also approach inventors and propose them a deal without revealing whom are we working for.”*



Here we encountered the evolution of yet another model of brokers: brokers that attempt to facilitate the aggregation of IP to create platforms to be licensed or assigned to companies seeking to make sure that they can build their proprietary technologies from a sound and secure base. The final results can be an aggregation similar to the result of the work of a standardization committee, and indeed the organization of some standard setting bodies can be considered a form of IP intermediation. The numbers of actors solicited to define these platforms can be significant, ranging from the single inventor to large patent holders and universities, and the generality of the technology extremely broad. Moreover, some patent brokers, often blessed with extremely deep pockets, are attempting to build private platforms that would completely alienate original assignees from eventual future licensing revenue. These companies work on the assumption that the value of a portfolio of patents around a technology is much higher (and much more enforceable) than the sum of the value of single and separated patents. As they acquire and combine patents in technology platforms, IP aggregators submit to the patent office continuations and divisions of the original patent titles to architect a portfolio which would grant them a much stronger “right to exclude” other companies to use a specific technology. While the promoters of these [private] platforms are claiming that their action will encourage dispersed innovation and facilitate technology transfer, both policy makers and most of the other intermediaries see the potential threat of a strong monopoly over broad and basic technologies.

## 5. DISCUSSION

Patent brokers’ origin and growth is largely accounted for by the factors we have mentioned above. Interviews confirmed that increasing patent density, increasing compelling IP blindness, and IP as part of the companies’ business model have contributed to the growth and diffusion of patent brokers.

Patent brokers are not all alike; they differ substantially according to the way they make IP transactions possible. Many models do and will coexist. The picture we walk away with is an extremely rich one, and this section attempts to provide the reader with an overview of an industry that we believe is still in full swing.

Two variables are helpful in understanding patent brokers and differentiating their business models. The first variable is how much value they add to patents. Patents' value has two components, one intrinsic and one "context-specific." The intrinsic component could be measured in an ideal auction, where bidders would consider only the nature of the technology and the essence of the claims on the patent document, in determining how much they would be willing to pay for a reassignment or a licensing agreement. The "context-specific" component is the value companies attach to patents when they use them for defensive or offensive reasons, no matter how much money they can directly extract. This is the case of a patent that a company can buy on the open market in order to prevent a competitor from having it. Clearly, the amount of money paid for the patent only partially reflects the "true," objective value of such an asset. What we observe on the secondary markets of technologies are transfers whose value is based on the combination of both the intrinsic and the context specific components.

The value that patent brokers add to patents varies. At one extreme, little value is added when the role of the broker is limited to the "pre-market" stages. An example of this is a consulting law firm that helps a company or an individual file a patent or extend a patent in a foreign country. While this is an important function, the patent broker in this case only covers a small section of all the activities that have to be performed so that the patent produces value. At the other extreme, we might have a patent broker that builds portfolios of patents. They might target the most promising scientific and technological domains, bring together inventors, get ideas and suggestions from them, control for the legal aspects, file patents and commercialize them in different formats. Clearly, the value added in this case is more substantial.

The second variable that can be used to differentiate brokers' activities is commitment in the transaction. Commitment has two components. The first depends on whether or not payment is dependent on performance. . For example, if patent brokers take an upfront fee, their commitment to close the deal is limited. If, however, a "success fee" is the only way they will be paid back, their commitment will be high. The second component has to do with the investment a patent broker is willing to make and the risk he/she is willing to take in a transaction. A patent troll who enforces patents in only one industry and sends a large number of infringement letters, for instance, is only putting his/her reputation on the line (if that), thus bearing a very moderate risk. On the other hand, a patent broker that invests his/her own capital and specializes resources to make a deal would bear a high level of risk.

These two variables, "value added" and "commitment", identify four different categories of patent brokers, as expressed in Figure 2. We will now describe each of the four quadrants and discuss how TCE and structural holes theory, presented in section 2, fit in.

FIGURE 2. A typology of patent brokers

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The lower left category is **consultants**. Companies often use consultants in patents intermediation. Consultants are normally retired managers or professionals knowledgeable about specific domains. These consultants often come from law consulting firms that did not want to add business and market services to their portfolio. Consultants might provide companies fresh and reliable information, suggest contacts, and give advice about how to proceed. Consultants rely upon their personal networks. They have been with the industry for years, are knowledgeable about existing companies and can easily search among start-ups. Although their contribution might

become relevant -- as in the case of skilled consultants who are assigned full responsibility of a patenting process by a company – consultants normally add little value. Consultants act on a personal basis. They do not usually mobilize or invest large resources. Their knowledge of the market and familiarity with companies is normally limited to specific geographic areas.

Consultants' commitment to a transaction is also limited. Unless consultants take on other roles, they do not take up an entrepreneurial role and are normally paid by flat fees, sometimes associated with variable incentives. IP consultants match the expectations of the TCE proposition. They facilitate transactions characterized by incomplete contracts. They keep an equidistant position between supply and demand of patents.

The second category, in the lower left quadrant, is **patent brokers acting as “shields”** to protect potential buyers' identities. Buyers do not want to be visible for several reasons. First, they don't want to send signals to the market and to competitors, which would threaten their strategic processes. Buyers prefer invisibility, at least in the early stage of transactions, so as to prevent the price of a possible deal from skyrocketing due to their reputation or market power. Under these conditions, patent brokers provide such invisibility by acting as shields. Shields are not very committed to the transaction and their contribution doesn't go beyond the contractual phases of the deal. Prospective buyers do most of the job; they identify hot technological areas, search for competitors' activity and possible start-ups and analyze the potential impact of the patent both from a business and market viewpoint. Shields also take limited risks, as they leave the field early in the game. Structural holes theory is indeed very appropriate to understand patent brokers in their role as “shields”. When patent brokers act as shields they are not “equidistant” from demand and supply; they benefit the party that seeks to exploit information asymmetry in the patent market. As stated in our structural holes based proposition, patent brokers create a bridge between two previously disconnected groups of players in technology markets.

The third category is formed by **patent promoters**. Both propositions are insufficient to explain the activities performed by this type of intermediaries. Prospective customers for these

brokers are companies already established in a specific market that want to consolidate or widen their IP portfolio or protect their position against hostile moves. These companies are not interested or are unable to perform a detailed scan of the market and sometimes lack the technical expertise to evaluate the exact trajectory of a specific technology. Patent promoters act on behalf of companies that are either interested in acquiring patents or are trying to capitalize on some of their unexploited IP. Patent promoters are more autonomous and creative than shields. They may, like shields, protect the identity of buyers to some extent, but their main value added is a more informed and imaginative knowledge of potential “downstream” markets for a particular technology. Patent promoters are potentially instrumental in helping a market or a technology grow. Without patent promoters, small companies and start-ups that have filed promising patents would have a hard time collecting all complementary resources needed to turn a patent into a product or even beginning the process. By scanning the market and investigating new technologies, patent promoters can act as “connectors” between previously unconnected actors. Foreign or large multi-product companies might need their services when they seek to understand the key issues of an industry they are not familiar with before diversifying into it. However “structural holes” are not a precondition for patent promoters, as they might end up suggesting licensing contracts between two mutually known companies. The structural holes proposition is therefore not always verified in this case. The TCE proposition is also insufficient. Incomplete contracting is indeed part of the picture, but patent promoters “play in the middle,” in the sense that they do not always respond to the specific requests of customers. They might have a high degree of autonomy, and be extremely entrepreneurial in suggesting that potential customers pay attention to specific scientific and technological areas. Compared to consultants and shields, IP promoters add more “context specific” value and their commitment to the transaction is also higher, as they usually get rewarded through success fees.

In the lower right quadrant we find **patent evaluators**. In this case, brokers take the role of consultants for both parties. This happens not because buyer and seller (or licensor and licensee) lacks the expertise needed to evaluate a patent, but because both of them need a third, specialized

and possibly neutral opinion. The role of patent evaluators is delicate, as a clear, standard methodology for evaluating patents does not exist. Each patent is by definition “unique” so that assessment and evaluation require specialized skills. This role is especially critical during mergers and acquisitions, as patents are often the most attractive assets for possible buyers. Under these circumstances, patent brokers provide assistance and facilitate the flow of the market. Patent evaluators add value to the extent that they provide specific knowledge. Patent evaluators don’t add much value if they only perform a “hands-off evaluation”. Patent evaluators might add high “context specific” value if they provide specific knowledge to the transaction, or use unique, innovative internal evaluation processes. Patent evaluators bear some risk because their reputation is on the line when wrong evaluations are produced. This category is largely consistent with the TCE proposition. IP evaluators complete contracts. They make transactions possible. However, they act in extremely densely connected environments. This contradicts the structural holes proposition.

Also, **patent deal makers** (5) and **patent aggregators** (6) happen in extremely densely populated industries. These types of intermediation, however, are more than completing contracts, as they are both characterized by high value added and high risk-taking. Patent deal makers are brokers that complement patents with various services. They might carry out preliminary scientific, technical and business investigations to assess the potential of a patent. They might also develop a component or a product, at least as prototypes or find possible customers or directly build up a knitted web of partners to do the whole job. Patent deal makers are therefore highly involved and they add high intrinsic and context specific value to the patents. The same holds true for patent aggregators. They help developing patents that they will acquire in order to build portfolios or platforms of intellectual capital. This strategy is risky, as it requires a high volume of financial resources. Pay back might be difficult and materialize only in the long run. However, by building portfolios of patents in specific domains, these brokers are in the position of adding high, unique value. For the reasons mentioned above, neither TCE nor structural holes propositions is not sufficient to explain the presence of this type of intermediaries.

The last category is formed by **patent enforcers**. Patent enforcers work for individuals and small-medium companies. Their role is to protect inventors who patented their inventions against possible infringement. Their role is exclusively to increase the “context specific” component of patent value, scouting out and acting on possible infringement scenarios. Infringements might be the result of contractual power imbalances that often exists between an isolated patent holder and a large, powerful company violating his or her patent. Patent enforcers can help balance the power structure in this situation by stepping in to defend the patent holder. Risk for patent enforcers is limited, but they add high value by helping their customers to extract hidden value from their patents. The more a patent has strategic and competitive impact on the products or technology of the violating company, the more IP enforcers can help capture this hidden value<sup>4</sup>. Patent enforcers simply help capture and redirect value in the markets for patents. TCE and structural holes propositions are not fully suitable to understand this type of intermediation

We therefore conclude with our own proposition, suggesting that: *even in very dense environments, the bridging role of IP intermediaries is that of market-makers, who leverage their specific investment to “play in between” technology demand and supply.*

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<sup>4</sup> The aggressive attitude of some of the intermediaries in this category led the press and scholars to talk about the phenomenon of “patent trolls,” Patents’ brokers who sue or simply threaten to sue for infringement companies on frivolous bases

## 6. CONCLUSIONS

The appropriability strategies of companies are changing (Pisano, 2006), and in a new -often more open- approach to innovation and technology transfer, the role of intellectual property intermediaries has gained momentum.

Our contribution is twofold. First, we have presented reasons why patent brokers emerged and why they are likely to expand. A more prolific scientific and technological environment, and a more favorable judicial one, paved the way for patent brokers as specialized companies. This emerged also as a consequence of a changed approach to innovation management of companies. In this article, we have explained their origins and what trends have reinforced their presence. Since various literature has explained brokerage, we sought to find an explanation of patent brokerage in transaction cost economics and structural holes theory. Our empirical study finds only partial evidence in support of the propositions derived by these schools of thought, and we therefore derive our own proposition, suggesting that: *even in very dense environments, the bridging role of IP intermediaries is that of market-makers, who leverage their specific investment to “play in between” technology demand and supply.* Our research setting was limited to USA and specifically California, and this was not by chance. We believe patent brokers tend to emerge and be co-localized in highly innovative areas. The reasons are simple. Patent brokers have been up to now small-medium companies with limited resources. They mostly rely on personal contacts and close relationships. This is a common trait in business life, but in the patent market this is even more critical. Patent holders, prospective licensors and prospective buyers need to work out their relationship in such a way as to find a mutually satisfactory equilibrium. Patent brokers are fundamental in this respect. By building trust, understanding each party’s requirements and by



collecting the needed resources, patent brokers can become “market makers.” Becoming a market maker is more likely in highly specialized innovative areas.

Our second contribution is that we have provided a first, vivid picture of patent brokers. We here go beyond the intuition in Lamoreaux and Sokoloff (2002), suggesting that they do not simply offer companies an outsourcing solution for their business development. Patent brokers engage in a wide spectrum of activities. We mapped them here according to the value they add to transactions and their level of commitment. Patent brokers do not just stay in the middle and connect two previously disconnected parties by introducing and so bridging an information divide. Instead, patent brokers can and do play in between, knowing that patents are a potential resource. A patent might lead to huge profits or it might expire generating no results. A patent represents the beginning of a process that involves different actors, and it is ultimately only an input to the innovative process. Patent brokers can appropriate a high proportion of returns on the innovative investment, because they provide an indispensable contribution to the overall process. Although patent brokers often team up with a buyer or seller, they can and do play their own game according to their own specific interests. Some brokers actively seek opportunities and are able to engineer bold bridges with distinctive features. All together, patent brokers are a rich laboratory that is worth exploring. Figure 2 provides a taxonomy of different types of brokerage.

We suggest that there are various avenues of research that can be explored. In particular, we approached this phenomenon from a perspective suggested in Teece (2005). While such a viewpoint remains useful in explaining the distribution and combination of innovative labor, it hardly recognizes the presence of entrepreneurial risk and skills of technology intermediaries. Other literature on technology entrepreneurship (see here the theoretical frameworks presented in: Gans and Stern, 2003 and Stuart and Sorenson, 2003) is providing tools for exploring high-tech entrepreneurship, and it might be fruitful to connect these two streams with this analysis of

technology intermediaries. Finally, both practitioners and policy makers are in need of a definitive answer on how beneficial patent intermediaries are to the facilitation of high-tech transactions.

FIGURES AND TABLES

FIGURE 1. USPTO Activity (1980-2005)

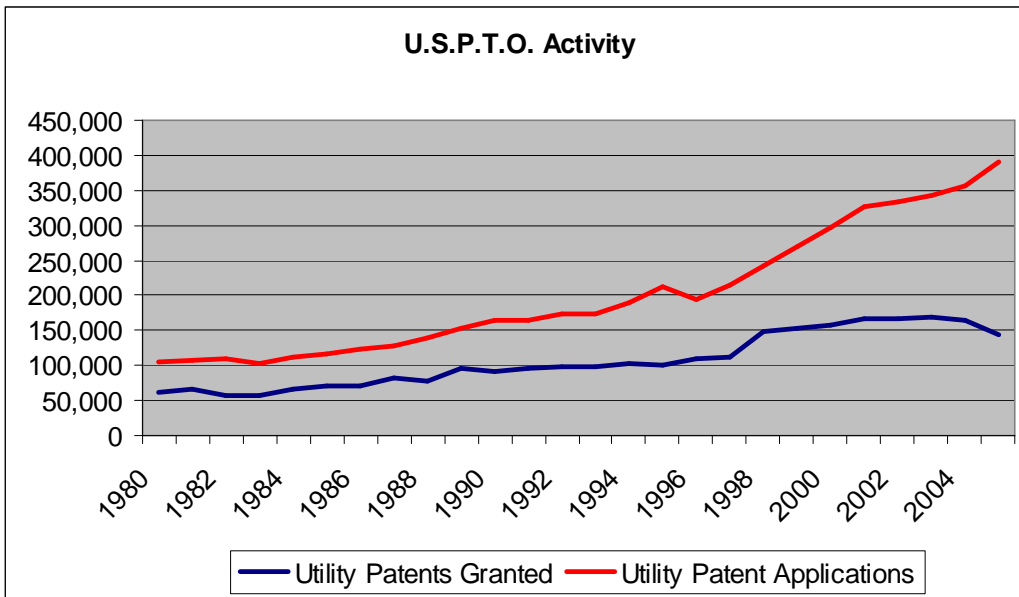


FIGURE 2

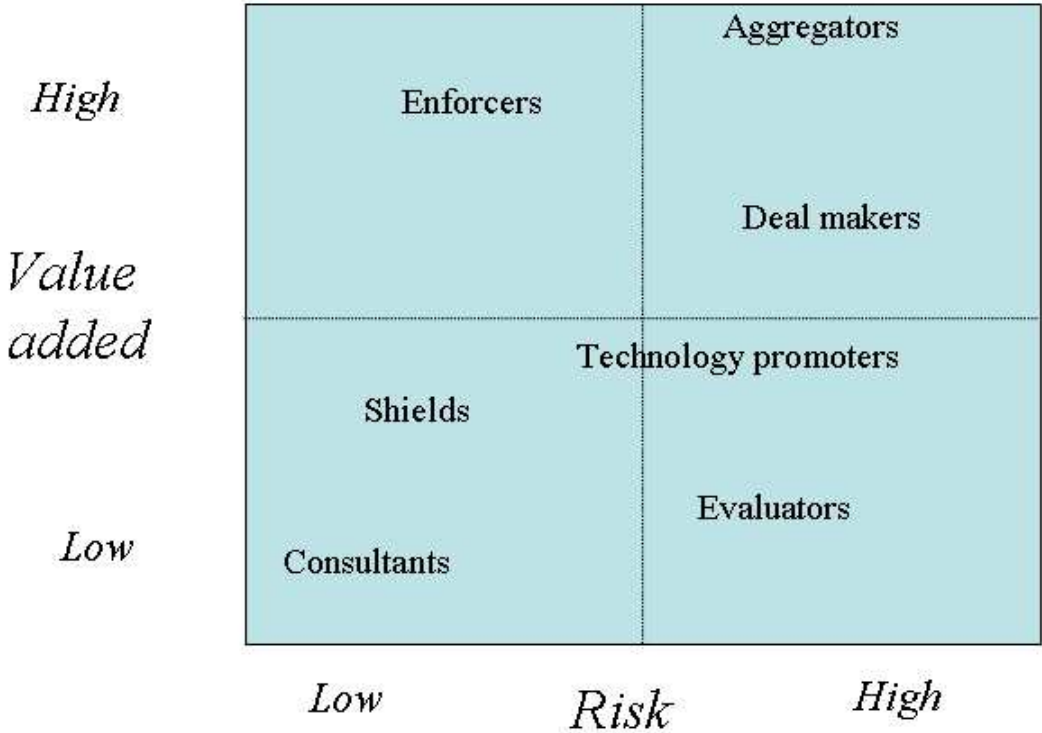


TABLE 1. Interviewed companies

Capital Value Partners
Inflexion Point
Intellectual Ventures
IP Investments Group
IP Strategic Group
IP Value Management
IPotential
Mayo
Oceantomo
Science+Technology
SRI International
Stanford TTO
Tynax

TABLE 2. What brokers do

COMPANY	MAIN ACTIVITY
Capital Value Partners	Assisting buyers and sellers
Inflexion Point	Consulting in licensing
Intellectual Ventures	Patent portfolio builder
IP Investments Group	Transaction and licensing services
IP Strategic Group	IP Consulting
IP Value Management	Licensing and patent transactions
IPotential	Assisting buyers and sellers
Mayo	Licensing in-licensing out
Oceantomo	IP merchant banking
Science+Technology	Business development from patents
SRI International	Licensing-selling
Stanford TTO	Licensing
Tynax	Licensing, Technology Promotion

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