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Market for Trademark

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Abstract

This paper focuses on the notion of ?market for trademarks?. First, we look at trademark market vis-à-vis patent to unveil their market differences which unveils trademarks have higher market visibility, less complementarity, less value rivalry, lack of repugnance, indefinite renewability and are employed in broader range of products. Second we posit a formal model to discusses how fluctuation in maintenance cost impacts trademark transactions. Our model explains that, an increase in trademark maintenance cost increases rate of transactions, these transactions are more likely to be in form of security interest and among parties in distant locations.

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Introduction

Trademarks are the most valuable thing that companies as diverse as Apple and McDonald's own, often worth much more than property and machinery. Google worth almost $159 billion, Apple $148 billion and McDonald's $86 billion[1]. These numbers reflect the value of trademarks of the above companies. Brands account for more than 30% of the stock market value of companies in the S&P 500 index, reckons Millward Brown, a market-research company" (The Economist, 2014).

Over the past two decades intellectual properties (IP) - patents, copyrights and trademarks- have been recognized as the dominant factor in numerous significant commercial transactions. However, for the most part the existing literature on market for IP is focused on Market for Technology and Idea (MfTI) (Arora et al, 2001, 2010). Though extremely elegant, these studies by and large are concentrated on patents. Research and exploring market for other forms of IP, in particular "Market for

[1] According to the 2014 report of BrandZ top 100 most valuable brands in the world. (http://www.brandz100.com/#/tabbed/global-100/149?tab_id=150&tab_url=%2Ftop-table%2Ftop-100-48673d91-a201-4477-aefd-86db2db2b656%2F150)

Trademarks[2]" remains scarce (Graham et al, 2014). The aim of this study is to explore this topic.

There are various reasons that make this topic worth investigating. First, this research allows us to complement our general understanding about potential unexplored features of market for IP. Secondly, making a comparison between patent and trademark can unveil their market similarities or differences. Thus, the first goal of this study is to make such comparison and investigate whether market for the two IP's follows the same path or the differences in the nature of trademark, compared to patents, renders different market dynamic. And the second goal is to formalize a model for understanding how cost fluctuations affects trademark transactions.

The focus of our comparison in this paper is from market efficiency perspective. A body of studies has addressed the efficiency of the market for IP; in particular MfTI's and patents (Roth 2007, Arora and Gambardella 2010, Gambardella et al 2010, Gambardella 2002, Gans and Stern, 2010, Giarratana and Fosfuri 2010, Hagiu and Yoffie 2013). These studies, on one hand emphasize on the importance of the technology transaction and patent market. And on the other hand, they note that patent market is marked by high level of uncertainty, transaction costs and asymmetric information that can lead to potential opportunistic behavior among economic actors. All of these elements can be a source of market inefficiency. Building upon these elements, I juxtapose trademark with patent to investigate whether and how the "Market for Trademark" (MfT) differs from

[2] It is worth mentioning the two terms brand and trademark can be used interchangeably if one has in mind that trademarks are legal incarnation of brands. Brand refers to firm's marketing activities while trademark is the legal protection of these marketing activities.

patents. The main elements of interest are market visibility, complementarity, value rivalry, renewability and range of product coverage.

The result of this comparison is: Trademarks have more visibility and their market is not as blind as patents (Lemley and Myhrvold, 2008). Hence, it is easier to assess and evaluate trademarks among the goods and services in the same product market. This higher comparability allows their price to be shaped by outside options in the market. While trademarks can range from umbrella brands and bundles to singletons, often times they are not as interdependent as patents. Therefore, their value is not drastically affected whether they are transferred as a portfolio or singleton. Some studies suggest that individual trademarks can be even more attractive for buyers (Graham et al, 2014). Yet, there is a weak point in trademarks and that is their low value rivalry. Replicating a mere 'sign' is not that difficult, thus the abundance of counterfeit products in markets where the IP rights are not strongly enforced. Trademarks are one of the most commonly used forms of IP (WIPO 2013, Graham et al 2013). They are employed in all range of product categories, from high-tech to low-tech and services. Finally, registered trademarks in US are indefinitely renewable, so long as they are used in commerce.

The aforementioned elements provide evidence that trademark market differs from patents and opens a very interesting realm that requires further investigation at various levels. Clearly, this is beyond the scope of a single study. Hence, I limit my study on investigating this market from specific perspective. The second part of this study then focuses on how increase in the maintenance cost affects trademark transactions. I look at this effect from two dimensions: geographical proximity and mode of transaction. From geography perspective, I am interested to explore how fluctuations in cost effect impacts

the local transactions compared to distant ones. That is when both economic parties, the assignor and assignee, are located in the same city and conversely, when the transaction is conducted among parties in different cities.

Second dimension is the mode of transaction. The two most common modes of trademark transaction are assignment and security interest. Fluctuations in maintenance costs can affect these two modes of trademark transactions, particularly since for trademark owners the decision to choose each mode is driven by very different motivations: one is gaining revenues through change of ownership, the other is use them as a collateral for accessing financial resources.

Next, I elaborate about formal models to posit three hypotheses: An increase in renewal cost, triggers higher number of trademark transaction. These transactions are more likely to be in form of security interest and finally among parties in different cities.

Empirically, I use the dataset of US registered trademark transactions obtained from USPTO (Graham et al, 2014). This data contains detailed information on 786,931 transactions recorded at the USPTO between (1952 – 2013). This information includes assignor (owner) and assignee's names, addresses, type of legal entity and the execution date of the transaction. In the second step, I combined this data with the case file dataset of these transacted trademarks also obtain from USPTO. This combined data allows me to have additional detailed information about each trademark. Particularly, the product classification and filing date of these transacted trademarks.

The remainder of this paper is structured as follow. In the first section, I make a comparison between patents and trademarks from market efficiency perspective. Second, I explain the mechanisms of local versus distant transactions based on product

classifications and posit my hypotheses. Next, I elaborate on different modes of trademark transaction focusing on assignment and security interests. I continue by giving a comprehensive description of the empirical setting for testing the hypotheses followed by the methodology used for our analysis. Finally, I conclude by discussing the results and implications.

Market for Patents vs. Market for Trademark

Patents

Over the past two decades numerous studies have raised awareness of importance of IP in valuing companies and financial deals. The seminal study by Arora et al (2001) discusses the notion of "Market for Technology and Idea" (MfTI). The body of literature following this topic mainly revolves around patents. Hence, in the existing literature market for other forms of IP in particular trademarks remains understudied. A stream of studies in this area has addressed the efficiency of market for IP and in particular MfTI. I recognize that it is important to understand the main sources of market failures in MfTI to explore market for other forms of IP. Below, I provide an overview of this literature.

The study by Gambardella (2002) discusses transaction cost mechanisms to improve three market failures: (i) R&D duplication;(ii) externalities in potentially public R&D outcomes; (iii) deviations from marginal cost pricing in the down stream market. Using European patents, Gambardella et al (2010) note that weak protection; limited breadth and low economic value make patents less appealing and therefore decreases the propensity of occurrence of licensing activity. They also find that the most important determinant of occurrence of licensing in patent is firm size. Arora and Gambardella (2010) highlight the different factors that explain supply and demand for technology.

Giarratana and Fosfuri (2010) elegantly summarized various papers included in the Industrial and Corporate Change special section, which predominantly addresses IP.

Hagiu and Yoffie (2013) build upon the patent market failure to explore the role of intermediaries in this market. Gans and Stern (2010) take a rather different view. They focus on market failures in market for ideas by looking at the main market design principals mentioned by Roth (2007): thickness, lack of congestion, safety and repugnance. And provide additional dimensions: complementarity, User-reproducibility and value rivalry.

Many of patent market inefficiencies stem from the high level of uncertainty associated with patents. Patents capture very early stages of innovative process therefore they come with a promise, which may or may not be realized. Literature is full of examples of unsuccessful or "sleeping" patents (Rivette and Kline, 2000; Palomeras, 2003) that never see the face of marketplace. Patents, compared to other assets, are extremely difficult to value. The main reason is that by definition they are unique and for the most part incomparable. So much so that, Lemley and Myryhld (2008) consider patent market to be blind. That is, finding a suitable 'match' between buyer and sellers is extremely hard. This issue negatively affects the thickness of market and creates congestion. Interdependence of patents or complementarity often time makes them valuable only when sold in terms of patent portfolios. Singular patents are often less appealing and face problem being sold. The other source of inefficiency of patent market rises from the asymmetric information and opportunistic behavior. This in turn leads to high risk of user reproducibility and value rivalry. More over, repugnance can be an important issue when is comes to patent. Finally, patents are subject to expiration and hence have limited

period of protection. Many firms use this exclusivity period in building strong trademarks and brand loyalty so that they can secure their sale and curb the loss once the patent has expired. In other word, strong trademarks can create high barriers to market entry, as new competitors may not be able to bear the high advertising costs of inducing consumers to switch to their products. Many pharmaceutical companies employ this strategy for their patented drugs (Appelt, 2009).

In the next section I draw upon insights from patent market to highlight the characteristics of market for trademark. Table 1 summarizes this comparison.

<Insert Table 1 here>

Trademarks

While patents and trademarks are intangible assets -which makes many features of illiquid IP market apply to both them- there are distinct differences between the natures of the two IP's that can affect their market. Moreover, high cost of introducing new brands into the marketplace and the high failure rate of new brands enhanced perceptions about the value of already established trademarks (Simensky, Melvin, 1997). Recent studies (WIPO, 2013; Graham et al, 2014) suggest that more and more firms strive to monetize on their trademarks. According to Graham et al (2014) mergers involving trademarks represent roughly 19 to 28 percent of M&A activity during the 1997 to 2003 period. Juxtaposing trademark features with patent features can shed light on whether and how market for trademark differs.

First, trademark market is not as blind as patents and they have much more visibility. This higher visibility facilitates finding a match between interested buyers and sellers. Brand (trademark) equities (Aaker, 1996, 2009) are routinely valued. Several institutes, namely BrandZ, Interbrand, Brand Finance, Milward Brwon, periodically publish their reports with the estimates of brand values. Second, unlike patents were majority of the investments are undertaken before they are granted; large share of investments on marketing activities are undertaken only after the trademark is granted (Sander and Block 2011), which is close to the point when a product is set to be launched in the market. That is mainly because according to US trademark law an actual good or service, ready to be used in commerce, is necessary for registration in USPTO. This necessary condition implies that a good or services is ready to be launched and commercialized in the market. This aspect can mitigate a lot of uncertainties. A trademark can be a signal for discerning whether a potential innovation (patent) has been realized in terms of a commercializable good or service. However, novelty is not a criterion for trademarks registration. Now, whether trademark is a perfect measure of innovation is subject to discussion and is not the interest of this study. However, several emerging studies corroborate for a positive correlation between firms' patenting and trademarking activities (WIPO, 2013; Graham et al, 2013; Flikkema et al, 2014; Gra, Sandner and Block, 2011, Graevenitz, 2007, 2008). That is basically the point were firms strive to secure returns of their earlier investment in R&D or patenting. The function of trademark is to help customers to reliably identify and differentiate the goods of different producers in the market place. On the other hand, this lack of novelty condition provides a comparability-ground between

trademarks for similar goods and services. As a result, the trademark evaluation is easier and its price can be shaped by outside options.

Trademarks have low to medium complementarity. In a sense that while they can range from "umbrella brands" to singletons, often times are not as interdependent as patents. Consequently, their value is not drastically affected whether they are transferred as a portfolio or singleton. Some evidence suggests that individual trademarks can be even more attractive for buyers. Graham et al (2014) indicates that 64 percent of US trademark assignments are single property transactions, suggesting that trademarks may often be transferred individually rather than as part of a large portfolio deal. The underlying reason might be the easier post-transaction maintenance of brand identity of individual trademarks. However, trademarks have high value rivalry. Replicating a mere 'sign' is not that difficult, thus the abundance of counterfeit products in markets where the IP rights are not enforced. When consumers are unable to distinguish fake goods from genuine goods, they can no longer rely on the reputation mechanism to guide their purchases. Producers, in turn, have a reduced incentive to invest in product differentiation, thus undermining product quality and diversity. Despite this, trademarks are one of the most commonly used forms of IP (WIPO 2013, Graham et al 2013). They are employed in all range of product categories, from high-tech to low-tech and services. Finally, trademarks do not have expiration period. Registered trademarks in US are perpetually renewable so long as they are used in commerce. According to US and WIPO not everything is trademarkable. Offensive marks, generic terms (e.g. tissue), descriptive names (e.g. "Florida Orange Juice" where the product is actually produced in California), scandalous and immoral marks and finally name marks (e.g. a name, portrait, or signature

identifying a particular living individual except by his or her written consent), cannot be registered as trademarks. These restrictions to large extent deal with the repugnance issue.

Transactions: Cost effect vs. Revenue Effect

As mentioned earlier, trademarks can be renewed indefinitely as long as they are used in commerce. However, "use" and remaining active in the marketplace is expensive. Therefore, an increase in costs, for example renewal fees, can affect firms' decisions in keeping the trademark live, let it expire or sell their trademarks. The study by Landes and Posner (2002) shows that trademark renewals are highly cost sensitive. In this regard a shock in the renewal fees can affect the transaction rate of the trademarks in the period after enforcement of the new fees. Selling the trademarks becomes favorable when the "revenue effect" (Fosfuri, 2003) of the trademarks, which is driven from the transaction, is higher than the "cost effect" of maintaining the trademark live. In other words, trademark transactions entail a tradeoff between revenue and cost effect. Owners prefer to continue renewing their trademarks so long as the expenses associated with maintaining a trademark in the marketplace does not surpass the revenues obtain through its conveyance to another economic party. Below, I elaborate on a formal mechanism for this situation.

At any point in time, two possible outcome can happen to a trademark TM: a) to be transacted b) non-transacted. If TM is transacted to another party, as a result the owner (assignor) enjoys a revenue effect of P. However, if the trademark is not transacted the owner is left with A, where A is denoted in (1).

$$P = Revenue\ Effect\ ,\ \ Cost\ Effect\quad A = {}_{t_0}^{t_R}E\ (\pi) - C^R \quad (1)$$

In this specification, ${}_{t_0}^{t_R}E\ (\pi)$ is the expected value of the profit corresponding to TM between time t_0 till upcoming renewal time t_R, and C^R is the renewal cost. Now, if $P > A$, that is the revenue effect is more that the overall expect value after deducting the renewal cost, then transacting the trademark becomes more optimal. Conversely, if $P < A$ then two possible situation can happen either A has a positive value or a negative one. If A>0, the overall expect value after renewal cost deduction has a positive value, but this positive value is still less than the revenue effect P, then the owner would prefer to renew the trademark. On the other hand, if the $A < 0$ then letting the trademark expire would be the optimal situation. Table 2 summarizes these specifications and mechanisms.

<Insert Table 2 here>

Now suppose that renewal cost increases due to an exogenous shock. In this case, the under-bar renewal cost $\underline{C^R}$ is the renewal cost before the shock and the over-bar $\overline{C^R}$ indicates the increased price after the shock as denoted in (2).

$$\underline{C^R} \quad \rightarrow \quad \overline{C^R} \qquad (2)$$

This increase in renewal cost, affects the absolute value of $\underline{A}$, such that the absolute value of $\overline{A}$ decreases, where $\underline{A}$ and $\overline{A}$ are, respectively, the cost effect before and after the shock. In this case, the cost effect of some trademarks decrease, so much so that their revenue effect becomes more appealing as result of this cost difference. Thus, these

trademarks switch from no transact situation (a) to transacted situation (b) after the shock.

$$P < \underline{A} \quad \rightarrow \quad P > \overline{A} \qquad (3)$$

Hence I hypothesize:

H1: Ceteris paribus, an *increase in trademark's renewal* cost leads to increase in number of transactions.

Mode of Transaction: Security interest and Assignment

In the previous section we discussed that in presences of an increase in the trademark cost trademark owners face three possible choices after the shock: renewal, expiration and transaction. We posited that sudden increase in cost effect triggers trademark transactions. Now, these transactions can be in different modes. The literature on IP law and the study by graham et al (2014) indicated the two most common modes of transaction for trademarks are assignment and security interests.

Assignment refers to change of ownership of right, title and interest of a mark from the assignor to assignee through conveyance. The other most prevalent usage of trademark is security interest or collateral asset, which is transferring the title to the intellectual property from the debtor to the creditor. Security rights in a trademark are created by entering into a conditional assignment that passes title in the event if the assignor-debtor's default. This collateral assignment is subject to defeasance through reassignment to the assignor after repayment of the debt. In other words, a trademark is released from collateral once creditor has received back the payment. However, the literature of IP

collateralization is sparse, predominantly using legal analyses to examine the use of intangibles to secure debt (Bezant, 2003; Brian, 2011).

In this section I build upon this emerging literature and I intend to investigate fluctuation in cost effect triggers which of these two modes of transaction.

The sudden increase of cost effect renders a process of "shakeout" for the existing trademarks in the market place. Owners have to evaluate the trade-offs and decide on the faith of their trademarks: live, expire or sell. In this process several of the weak and poor-functioning trademarks are forced out of the market. Therefore, those that remain are those that are strong and valuable enough for their owners to continue functioning in the commerce or worth enough to be sold to others. Then on the one hand, number of active trademarks decreases through the shakeout, which can lead to lower competition and higher economic value for the remaining trademarks. Naturally, these stronger and resilient trademarks command higher prices from the buyers. Such circumstances generate difficulties in finding a match and suitable buyer. Therefore I expect that the increase in cost effect result in decrease in rate of assignments.

On the other hand, this shake out can be beneficial for the owners. The higher economic value of their trademarks allows them to use their trademarks as collateral assets in return for higher levels of credit. In other words, it enables them to access more financial resources. Intensifying trademark collateralization, by providing a means to raise capital in the credit market, may benefit trademark holders and possibly affords an alternative to the sale of trademark assets (WIPO, 2013). Hence I hypothesize:

H2: Ceteris paribus, an *increase in trademark's renewal* cost leads to increase in number

of security interests and decreases the assignments.

Geography of Transactions

In this section I attempt to look at trademark transaction behavior from geography perspective. Economic geography literature is built upon one premise: importance of geographic distance (Saxenian, 1996; Stuart and Sorenson, 2003; Jaffe et al, 1992). There are extant number of studies that have focused on the role of geography on innovation, knowledge flows and labor mobility at city or regional level (Gittelman, 2006, 2007; Gambardella and Giarratanta, 2010, Gleaser, 2005). Large portion of these studies focus on patent-level studies. Once again, the relationship between geography and other forms of IP is scant. Therefore, I intend to investigate whether increase in costs associate to trademark maintenance affects the location of transaction. The interested level of analysis here is cities.

In previous sections I discussed that an increase in cost effect can trigger the rate of trademark transaction, particularly, resulting in higher number of security interests and lower number of assignments. Every trademark can then be transacted either locally or distantly. I define local transactions as those that the assignor (seller) and assignee (buyer) are located in the same city. And conversely, when they belong to different cities this type of transaction is considered to be distant.

We are only considering the location of those which were transacted, that is, $P > A$. Now, if we assume that every transaction involves a search cost of C^S for finding a suitable buyer. Then we have two cases as below:

$$P - C^S > {}_{t_0}^{t_R}E(\pi) - \underline{C^R} = A \qquad (4)$$

$$P - C^S < {}_{t_0}^{t_R}E(\pi) - \underline{C^R} = A \qquad (5)$$

In the case denoted in (4), the trademark transacted both locally and distantly. If it is a local transaction we can assume that the search cost is normalized to zero. Conversely, if it is a distant transaction then it will be the case that the revenue *P* is so large that makes paying the search cost of finding distant assignee worthy. Contrarily, in the case of (5) the transaction happens only locally, and distant transactions are not economically optimal. Now, suppose the situation that renewal cost increases to $\overline{C^R}$ as result of an exogenous shock. This increase in renewal cost decreases the value of the A in (5) creating the instances denoted in (6) that makes transaction favorable.

$$P - C^S > {}_{t_0}^{t_R}E(\pi) - \overline{C^R} = A \qquad (6)$$

This means, that some trademarks transaction that before the cost increase were only optimal if there were conducted locally, after the increase have the possibility to be traded also to distant assignees.

Moreover, as we argued previously, the cost shock leads to increased rate of security interests type of transactions. Then the main motivation of this transaction is accessing financial resources. This motivation can make the hassle of the geographical distance less problematic. Such that, assignors are willing to make the effort of going extra miles to find suitable creditors.

Hence, I Hypothesize:

H3: Ceteris paribus, an *increase in trademark's renewal* cost leads to increase in number of distant transaction.

Sample

Data

The empirical setting of this study is based on the data obtained from USPTO based on the Trademark Assignments (Graham et al, 2014). The Assignment data provides a comprehensive dataset of all assignments and other transactions recorded during the 1952-2013 period. These transactions have affected over 4 million registered trademarks or applications. Transactions over registered trademarks are not uncommon. In fact, the study of Graham et al (2014) provides evidence that among the 3.4 million registrations issued during the 1978-2013 period: 31 percent of were affected by some transaction over their life; 21 percent changed ownership through assignment or merger; and 12 percent were affected by a security interest agreement. However, recordation of any of these types of transactions in USPTO is not mandatory, but statutory and regulatory law provides compelling incentives for parties to record.

Building upon this data, I used the information about the trademark's owner (assignor) and the recipient (assignee). This information includes, type of transaction, transaction date, both the assignor and assignees name, address, type of legal entity.

For the interest of this study I used the address, particularly the city name of the assignor and the assignee. However, assignor address data coverage basically disappears for transactions recorded after 1992, presumably because the USPTO-1594 coversheet was

revised and ceased recording addresses for assignors (Graham et al). Hence I restricted the period of analysis on transaction executed 1952-1992 where the city-level information about both assignee and assignor is not missing. Moreover, since geography is a key element in this study all the other observations which either assignor or assignee's city were missing were also excluded from the sample. These restrictions leave us with 399,281 recorded transactions. If the assignee and assignor were located in the same city then the transaction was defined to be local. On the contrary, if the two parties were located in the different cities then the transaction was considered to be Distant.

Based on the nature of conveyance text USPTO categorizes the transaction in 6 different types. The transaction can be recorded as an assignment, name change, security interest agreement, merger, release or other instrument. In this study I focus on the top two most common modes of transactions: assignments (ownership transfer) and security interest. Other modes, mergers and release occurrence are pretty scant in the period of analysis and consist only 2% of overall transactions. Finally, name change does not really involve actual transaction.

This data also indicates the legal entity of assignor and the assignee. These entities can be individuals, company, corporation, partnership, national banking, non- profit, etc.

By using the serial number indicated in the Assignment data I combined this data with the data on case-files of registered USPTO. Doing so allows me to have valuable information on the corresponding NICE product classification of each transacted

trademark. Based on NICE classification, each trademark can be assigned to one or more of the 45 of products or service classifications.

The case-file data also includes the filing-date of the trademark in USPTO. Comparing this date with the execution-date of transaction allows me to calculate each trademark's age at the time of transaction. In the instances were the execution-date was missing the acknowledgement-date was used to calculate the age at time of transaction. The status allows me to determine the current status of the trademark, whether it is live, expired or abandoned.

Main Variables

My main variables of analysis are the RATE of TRANSACTION, GEOGRAPHIC LOCATION and MODE of TRANSACTION. Empirically, I define RATE of TRANSACTION, proportion of transacted trademarks compared to total number of existing live trademarks in each year. Next, GEOGRAPHIC LOCATION is a dichotomous variable that is equal to 1 if the assignor and assignee are located in the same city and 0 otherwise. Finally, MODE of TRANSACTION is set by information on conveyance type, if obtains values 1 if the conveyance is assignment and 2 if the conveyance is security interest. Other variable of interest are Nice product CLASSIFICATION (WIPO, Graham et al 2013). Out of 45 classifications the first 34 are goods and last 16 services. Hence, CLASSIFICATION gets the values 1 if it belongs to goods and 2 if it is a service mark. As for control variables, we control for FILING YEAR, which is the year the trademark was first filed in USPTO. Further more, we

include the type of LEGAL ENTITY of both assignor and assignee. We also control for AGE, which is the difference between filing date and each transaction's execution date. Table 3 summarizes these variables.

<Insert Table 3 here>

Method

Setting

US trademark law went through some major revisions during the 1980's. This changes affected trademarks in different levels. The first major change in the early 80's affected the renewal process. The registration fees has remained pretty much stable over last 60 years and there has been little variation in this type of fees. Currently, USPTO charges a filing fee of $325 per class of goods and services. For example, if the trademark is used on goods and services in two different classes, such as musical sound recordings in Class 9 and live performances by a musical group in Class 41, then a $650 filing fee is required.

However, renewal fees have varied over time. Especially, in the beginning of 80's renewals faced a sudden increase in their price. Renewal fees were $15 from 1935 to 1945, $25 from 1946 to 1981, were increased sharply in the next two years (to $150 in 1982 and $300 in 1983), and have remained at $300 since then. Landes and Posner (2003) provide evidence that trademark renewal rates declined following the substantial fee increases in 1982 and 1983. Renewal rates averaged 0.27 in the five-year period 1977–1981 compared to 0.23 in the five-year period 1984–1988, when the fees were

much higher.

I use this drastic change in renewal fees in years 1981-82 as a cost shock and test my aforementioned hypotheses in periods before and after this shock. In this specification, transacted trademarks are the treated group. And for control, I consider the subset of trademarks, which are least, affected by increase of renewal cost. This subset is identified as follows. Before 90's the registration and renewal period of trademarks was in place for 20 years. The study by (Landes and Posner, 2002) indicates that the average life of US trademarks are 15 years. Therefore, those trademarks that had been renewed or registered just before the shock are the ones least affected by the shock. In other word, say that they have close to 19, 18 years left to their next renewal. Therefore the shock does not impact the decision to renew, expire, or sell.

Results

In this section I start by looking at some basic statistics about trademarks. Table 4 refers to mode of transactions. It indicates that total number 399,382 of transactions had been conducted between period 1952-1992. Out of this number a large portion of them, almost 82 % were assignment. That's indicates that assignment transactions are the most common modes of transaction. With larger difference, security interest, come in the second with about 12% present. The remaining 5 % includes, corrections name changes, release from security which are not conventionally considered as transactions. Only mergers merger can lies within transactions that due to very small number of occurrence

(0.19 %) these type of transaction in our setting is negligible.

<Insert Table 4 here>

Next we focus on the cross tabulation between main variables of interest, particularly before and after the increase of renewal fees. Table 5 presents the cross tabulations between location of transaction and modes of transaction. A first glance at the table indicates that on average security interests have increased after the increase in renewal fees. Especially, distant security interests that had a striking increase from less that 1% in periods before the transaction to more that 15% of transactions after the cost shock. However assignments seem to follow an opposite path. Despite the increase in frequency of assignments regardless of their location, their proportion after the shock was reduced. Particularly, in case of local assignments, they faced more than 12% reduction.

<Insert table 5 here>

Table 6 shows the cross tabulations between product classifications and location of transaction. The results indicate that on average distant transactions have increased after the shock. Interestingly, distant service transactions have almost tripled from less than 2% to 5.8 % after the increase in the fees. Moreover, services seem to have jump in transaction regardless of their location. Where as when it comes to goods location seems to matter and play a role; while local transaction of the goods plummeted from 38% to 26.9 %, percentage of goods that were transacted distantly had increase after the shock.

<Insert table 6 here>

Finally, table 7 presents the cross tabs between product classifications and mode of transaction. The noteworthy results of this table are: assignment of services and security interest of goods. These results suggest that after the shock, trademarks associated with goods are more likely to be used as collateral assets. They have skyrocketed from mere 1% of transactions before the shock to17% after the cost shock. When it comes to assignment though, services seem to be more positively affected by the shock and service mark assignments more than doubles from 4.5% to 9.2 %.

<Insert Table 7 here>

Conclusion

Market for brands play an important but underappreciated economic role. Similar to patents, trademarks are increasingly licensed, bought and sold at the national and international levels. Markets for brands allow companies to diversify their business and to expand into additional product categories. Although concept of brand equity (Aaker, 1996, 2009) is well established in marketing literature, market for trademarks in strategy literature is largely understudied.

In this study I tried to address this notion of market for trademarks. The initial comparison between trademarks and patents from market efficiency suggested that market for trademarks are more efficient than patents. Patent markets proved to be

inefficient mainly inefficient since complementarity, user reproducibility, and value rivalry significantly undermine the ability to achieve certain types of contracts and engage in certain types of bargaining, which are essential for an effective multilateral trading mechanism. The main drivers of trademark market efficiency vis-à-vis patents are then; higher market visibility, less complementarity, less value rivalry, lack of repugnance, indefinite renewability and broader range of product coverage. Second I posit a formal model to discusses how fluctuation in cost effect impacts location and mode of trademark transactions.

This study contributes to literature on market for IP both conceptually and empirically. Moreover, by focusing on cost driven fluctuations of this market I investigate the behavior of the local and distant transactions. This research also brings attention on the importance of IP collaterization, which is currently highly scant in the strategy literature. This research was merely an initial attempt to explore trademarks as a collateral asset for accessing financial resources. Intensifying trademark collateralization, by providing a means to raise capital in the credit market, may benefit trademark holders and possibly affords an alternative to the sale of trademark assets (WIPO, 2013). Several more detailed studies are required to examine the impact of IP collaterization in firms' innovative process.

The initial comparison market for trademarks indicated in Table 1, can suggest that such credit practices may have emerged from greater market efficiency and improved valuation practices. If that is the case, then the drivers and welfare effects of trademark collateralization may have implications in the increasingly innovation-driven economy and warrant further study.

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Tables

Table 1. Comparison between trademark and patent from market efficiency perspective.

Main Elements	Trademark	Patent
Visibility (Lemley and Myhrvold, 2008; Hagiu and Yoffie, 2013)	Yes	No
Thick (Roth, 2007)	Yes	No
Lack of Congestion (Roth, 2007)	Somewhat yes	No
Safety and lack of opportunism (Roth, 2007)	Somewhat yes	No
Repugnance (Roth 2007; Gans and Stern, 2010)	No	Maybe
Complementarity (Gamabardella et al, 2001; Gambardella, 2002; Gambardella et al, 2010; Fosfuri, 2006; Pisano 2006; Giarratana and Fosfuri 2010)	Medium/ Low	High
User-reproducibility (Fosfuri, 2006; Pisano 2006; Giarratana and Fosfuri 2010)	High	High
Value Rivalry (Fosfuri, 2006; Pisano, 2006; Giarratana and Fosfuri, 2010)	High	High

Expiration (Graham et al, 2013, 2014; Landes and Posner, 1989)	No	Yes
Range of product Coverage (Graham et al, 2013, 2014; Landes and Posner, 1989)	All	Only patenting Industries

Table 2. Revenue effect and Cost effect mechanisms

$\boldsymbol{P > A}$		Transaction
	$A > 0$	Renewal
$\boldsymbol{P < A}$		
	$A < 0$	Expiration

Table 3. Definitions of variables

Variables	Definition	
RATE of TRANSACTION	Proportion of number of transaction over total number of live trademarks per year	# transacted trademarks/total
GEOGRAPHIC LOCATION	Local if assignor's city= assignee's city Distant if assignor's city ≠ assignee's city	Local= 1 Distant=0
MODE of TRANSACTION	The type of conveyance recorded in USPTO	Assignments=1 Security Interest=2 Others =0
CLASSIFICATION	WIPO's NICE product classification	1<Nice code<35 =1 34<Nice code<46 =2
FILING YEAR	The year the trademark was first filed in USPTO	
LEGAL ENTITY	Dummy variable, indicating whether the assignee or assignor is individual, corporation, bank, etc.	
AGE	Round of (Transaction execution date – Filing data)/ 365.25	

Table 4. Frequency and percentage of mode of transaction

Transaction Mode	Freq.	Percent
Assignment	329,237	82.44
Security interest	46,260	11.58
Other	23885	5.98
Total	399,382	100

Table 5. Cross tabulation of location of transactions and mode of transactions

	Assignment		Security Interest	
	Before	**After**	**Before**	**After**
Local	56,450 (41.6 %)	70,632 (28.9 %)	206 (0.1%)	6,590 (4.5%)
Distant	77,908 (57.4%)	128,642 (52.7%)	1,230 (0.9%)	38,234 (15.7%)

Table 6. Cross tabulation of Location of transactions and product classifications

	Good		Service	
	Before	**After**	**Before**	**After**
Local	54,472 (38 %)	68,964 (26.9 %)	3,537 (2.5%)	11,781 (4.5%)
Distant	80,061 (56.9%)	162,723 (62.9%)	2,702 (1.9%)	15,041 (5.8%)

Table 7. Cross tabulation of product classifications and mode of transactions

	Assignment		Security Interest	
	Before	**After**	**Before**	**After**
Good	128,295 (94.5 %)	176,829 (72.5 %)	1,411 (0.1%)	41,462 (17%)
Services	6,035 (4.5%)	22,388 (9.2%)	25 (0.01%)	3,354 (1.4%)