# Essays on Trademarks

PhD Thesis

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## Abstract

My PhD thesis focus on trademarks. Trademarks are one type of intellectual property right which is very common and popular among firms across the entire economy, but have received so far little attention by academic researchers. Their primarily function is to distinguish the goods or services provided by the trademark's owner from those provided by its competitors: on the one hand the good or service on top of which the trademark is applied becomes immediately recognizable by consumers; on the other hand, it protects the owner from competitors using its brand illegally.

In my work I rely on the most comprehensive dataset on trademarks available at present and analyze the impact of trademarks on firm performance in the very short run (overnight) and in the long run. The thesis is divided into three chapters: the first chapter summarizes the existing literature on trademarks, the second chapter analyses the impact of weaker trademark protection on stock market returns overnight, the third chapter measures the impact of stronger trademark protection on firm's profits, innovation and market share in the long run.

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The views expressed in this dissertation are my sole responsibility and cannot be attributed to Luiss University.

## Contents

# Chapter 1
## Trademarks: a Review

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**Abstract.** This paper summarizes the existing economic literature on trademarks. Trademarks are one type of intellectual property rights which have not received much attention so far by economists, although they are very popular among firms. I firstly explain the functions of trademarks, secondly the trademark lifecycle and law in the USA, and finally I review the body of literature by topic.

**Keywords:** Trademarks · Intellectual Property

## 1 Introduction

There are four types of intellectual property rights: patents, trademarks, copyrights, and trade secrets. Economists have always focused on the former - patents - since they are a natural candidate to measure innovation (together with R&D). Trademarks - despite being far more popular and widely used across the entire economy than patents - have received little attention and have been relegated to the marketing field. Nevertheless, the body of literature on trademarks has grown in the recent years, and new large datasets have become available.

The aim of this paper is to summarize the existing economic literature on trademarks. The paper is divide in 5 sections: section 2 legally defines a trademark and explains its functions, section 3 describes what is the most complete dataset on trademarks at present and the American trademarks law, section 4 presents the literature on trademarks divided by topic, section 5 draws some conclusions.

## 2 What is a Trademark

A trademark can be defined as any word, phrase, symbol, design, color, smell, sound, or combination thereof that identifies and distinguishes one's goods and services from those of others [1]. The term *trademark* is often used to identify both trade marks and service marks. Despite the distinction between a trade mark and a service mark, these marks are essentially the same thing.

It has the primarily function to distinguish the goods or services provided by the trademark's owner from those provided by its competitors. This function has

[1] See 15 U.S.C. § 1127.

two purposes: on the one hand the good or service on top of which the trademark is applied becomes immediately recognizable by consumers; on the other hand, it protects the owner from competitors using its brand illegally.

Trademark signal also to consumers the origin of the product. In this context, they can facilitate the search of consumers for the product that best fits their tastes. If the trademark includes crucial information on the characteristics of the product, it can reduce asymmetry information between the seller and the consumer (Akerlof, 1970; Spence 1973; Shapiro 1982). Trademarks can also build loyalty in the consumer (if the consumer liked product A from firm X, he/she will probably like product B from the same firm X).

Firms can build and maintain brand reputation by releasing on the market high-quality products (Chamberlin 1933; Landes and Posner 1987; Economides 1988). Trademarks might help firms in this process if applied on these high-quality products. In fact, if a firm is not able or does not want to produce high-quality goods, it might not want to file and maintain trademarks. Furthermore, trademarks can support product differentiation in a market characterized by homogeneous products: firms can possibly move away from pure price competition and apply a positive markup (Hotelling 1929; Chamberlin 1933).

## 3 Trademarks in USA: the USPTO Trademark Case Files Dataset

In the United States the common law grants to the trademark owner the exclusive right to prevent unauthorized third parties from using the mark or a similar version that might "cause confusion" among consumers. The trademarks right is established by the owner by creating a connection between the mark and the goods or services on top of which it is applied. The protection is at the geographical level - the area in which the owner is running the business and therefore using the trademark - and does not need a formal registration. If not registered, the trademark shows the symbol $^{TM}$ on the bottom right of the text.


**Fig. 1.** Example of a non-registered trademark

The registration in the Principal Register at the USPTO is voluntary, and provides to the trademark owner additional protection benefits not available under the common law. A federal trademark registration grants *prima facie* evidence of mark ownership and the right to use the mark exclusively nationwide on

all the goods and services listed in the registration. The protection is therefore extended at the national level with no regard of the geographic use, and ensures that imported goods' marks do not cause confusion with the existing ones nationally registered. Once the mark is registered, the owner has the exclusive right to block any unauthorized use from third parties of the same or a similar mark that confuse the consumer. If an unauthorized use of the mark occurs, the owner may file a suit in federal court and, under some conditions, can recover profits, statutory damages, attorney fees, and treble damages for infringement[2]. Registration at the federal level is also indicated in the use of the ®symbol with the mark, which possibly dissuades other competitors from adopting the same or similar marks.

**Fig. 2.** Example of a registered trademark

### 3.1 Trademark Lifecycle

The procedure for registration is divided into four steps: application, pubblication, opposition and registration.

In the first step, the applicant submits a depiction of the mark that wants to be registered to the USPTO. The mark may consist of any combination of text and images. The applicant has also to indicate a complete list of goods and/or services with which it uses or intends to use the mark, and the USPTO assigns each good/service to the appropriate class number. Since September 1st, 2003 the USPTO follows the so-called Nice classification (International Classification of Goods and Services under the Nice Agreement), which currently includes 45 classes, 34 of which are good classes and the remaining 11 are services classes. Classes have broad coverage, so there might include goods and services belonging to different sectors.

Before 1973, United States followed their own classification system. After the shift to the International system, the U.S. has remained as secondary system, and continues to be the primary for very older registrations in force. Unfortunately, there is no exact correspondence between the old U.S. classification and the International classification.

[2] See 15 U.S.C. §§ 1057(b), 1115(a), 1125(a), 1121, and 1117.

It is possible for the applicant to amend good or services listed, but only in the first phase. After the registration the owner cannot add anymore goods or services. What instead the owner can do to expand the protection of the mark on other products is to apply for a new registration of the same mark identifying the additional goods or services. For this reason, there might be more than one registrations corresponding to the same mark.

The payment of fees are part of the registration process and the lifecycle of a trademark: the owner has to pay a fee when submitting the application, in the maintenance phase and in renewal phase. However, the magnitude of those fees are relatively small [3].

The applicant must state a legal basis for filing for each class. The two most popular bases are *use in commerce* and *intent to use in commerce*. In the first case, the applicant must submit a declaration stating that at the time of the filing date the mark is already being used in commerce. The second option was introduced in 1989 but rapidly became the most popular based indicated by owners. Under the *intent to use in commerce* the owner has a bona fide intent to use the mark on each good or services listed in the application. However, this bona fide intent must be verified during the examination. In fact, the registration cannot be obtained until (a) the mark is effectively used in commerce, (b) a declaration to that effect is filed, (c) a specimen of use is submitted.

Once the application is submitted to the USPTO, it is examined by attorneys. The mark must satisfy specific requirements, otherwise the application is abandoned. The main requirement is the distinctiveness, meaning that there should be no "likelihood of confusion" between the proposed mark and other marks already registered. Other secondary grounds for refusal include that the proposed mark cannot be too generic or descriptive; it cannot contain the surname of a person or the name of a state, municipal or national insignia; it cannot be deceptive [4].

If the requirements are met, the examining attorney approves the application for *pubblication*; otherwise, if not, she will issue an office action explaining to the applicant the reason behind the refusal. The applicant may respond to the office action, and in that case the attorney will examine again the application. Finally, the attorney may issue a final refusal action after the applicant has responded. The applicant has the possibility to formally appeal the decision to the Trademark Trial and Appeal Board (TTAB) within six months.

After publication, the application is published for *opposition* in the USPTO Trademark Official Gazette[5]. The *opposition* is the first chance for any third party to directly oppose or object to the prospective registration: the third party has 30 days to file a notice of opposition the the mark's registration stating the grounds for opposition. In that case, the applicant has 30 days to file an answer with the TTAB, and later an opposition proceeding is held before the TTAB.

[3] For a list of current fees, see `http://www.uspto.gov/trademarks/tm_fee_info.jsp`.
[4] 15 U.S.C. § 1052.
[5] See `Seehttp://www.uspto.gov/news/og/trademark_og/index.jsp`.

Instead, if no third party steps up to oppose the owner's application, the mark is finally registered.

Prior to November 16, 1989, the duration of a trademark was 20 years; after that date, it was reduced to 10 years. The owner must pay a fee and show continued use to maintain the registration at the end of the sixth year, otherwise the trademark is cancelled. At the end of each successive 10-year period, the owner can renew the registration by filing a renewal application, consisting of a fee and continued use. The registration can be renewed indefinitely. The owner can also only maintain or renew the registration of the mark for a subset of goods and services in the case of a multiple-class registration.

The owner can transfer the trademark rights to another party through an assignment. For the USPTO it is not mandatory to register the assignment, but the new assignee must record it to make legal claims or take action on anapplication or registration at the USPTO, including renewal and maintenance[6].

### 3.2 Trademark Law

Registration of a trademark protects from *infringement* and, more recently, from *dilution*. *Infringement* is defined in the Lanham Act of 1946 - which is the main statute of U.S. modern trademark law - as "use of an identical or similar mark that would cause confusion as to the source of goods or services". Instead, *dilution* is a much broader concept than infringement and implies that the power of a trademark exceeds the ability that allows the buyer to identify the seller. *Dilution* is legally defined as as any action "weakening... a famous mark's ability to identify and distinguish goods or services regardless of competition in the marketplace"[7] The first law which granted protection from dilution at the federal level was the Federal Trademark Dilution Act (FTDA) in 1996. Before that time, protection from dilution was granted at the state level and in cases of proven dilution only (Oswald 1999). The FTDA no longer required to prove actual infringement, the owner of the mark only needed to convince the judge of the likelihood of dilution to obtain an injuction (Kim 2001; Bickley 2011). This law was weakened on 2003 when the Supreme court ruled in the Moseley Case that a successful dilution claim required proof of actual economic damages, effectively nullifying the FTDA's key provision. However, a new law called Trademark Dilution Revision Act (TDRA) was introduced in 2006, de facto restoring the FTDA.

## 4 Findings of Literature by Topic

### 4.1 Trends in Trademark Activity

Trends of trademark applications differ over time across countries based on their state of development. High-income countries - those with the longest trademark

[6] See 15 U.S.C. § 1060(a)(4).

[7] Quoted from the INTA Trademark Dilution Factsheet (`http://www.inta.org/TrademarkBasics/FactSheets/Pages/TrademarkDilution.aspx`).

history - register an astonishingly rapid growth in trademark applications since the mid-seventies. Graham et al. (2013) analyse the time series of trademark applications and registration in the USA using the UPSTO Trademark Case Files dataset, showing that both filings and registrations have geometrically increased over time. The upsurge is particularly dramatic since 1981, date from which data coverage is more complete.

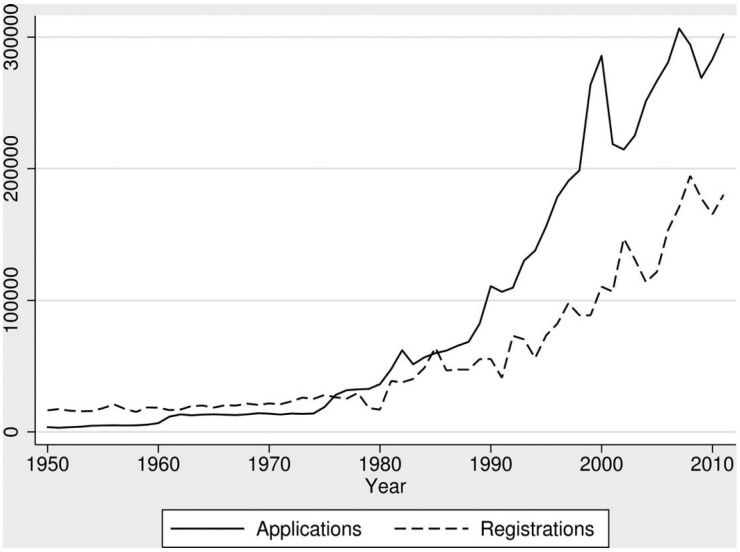


**Fig. 3.** Nre Filings and Registrations by Year. Source: Graham et al. (2013)

The path of new filings reflects economic growth, as it is evident from the peak in 1999-2000 and the subsequent drop (following the Dot-com bubble). These US trends are also confirmed by other studies using the same dataset (Heath and Mace, 2020; the first chapter of my dissertation).

Duguid, Lopes and Mercer (2010) and Jensen and Webster (2004) document similar trends for trademark registrations for UK, France and Australia over the period 1975-2002, even though France and Britain showed an earlier interest in trademarks, and its growth was more volatile.

Lybbert, Zolas and Bhattacharyya (2014) report that trademark growth experienced between 2004 and 2008 by middle-income countries was faster than in high-income countries. Instead, low-income countries did not experience any growth. In accordance to these findings, Baroncelli, Fink, and Smarzynska Javorcik (2005) measure the shares of foreign and domestic residents registering trademarks across countries. Their analysis evidences clear differences by level of country development: foreign residents' share is inversely related to the level of

income per capita, as in high-income countries it was only 34%, 46% in middle-income countries and 81% in low-income countries. The authors interpret the difference in results across countries as indicating that domestic brands in high-income countries are able to dominate their home market and play a crucial role also in foreign market of low-income countries.

### 4.2 Sector Heterogeneity

Baroncelli, Fink, and Smarzynska Javorcik (2005) document that the use of trademarks is more intensive in the pharmaceuticals and in the R&D-intensive scientific equipment sectors, followed by advertising-intensive manufacturing industries, such as clothing, footwear, detergents and food products. These results apply across the world since their database is cross-country. Greenhalgh, Longland, and Bosworth (2003) focuses on UK trademarks over the period 1989-2000 and find that the largest expansion of trademarks reported were service trademarks. Jensen and Webster (2004) analyse trademark applications in Australia from 1975 to 2002, highlighting strong trademark growth in service industries (communication, education, and personal services). These sectors were subject to substantial economic deregulation over that period. Greenhalgh and Rogers (2008) study intellectual property right (IPR) activity - both trademarks and patents - in the UK from 1996 to 2000, comparing IPR activity in eight service sectors with that in agriculture, manufacturing, utilities, and construction sectors. Manufacturing and utilities sectors were those with the highest trademark activity.

One issue of studying sector and industry differentials is the need to match for each firm the IPRs owned to financial data, as datasets for trademarks do not possess information on firm's balance sheet. Apart from the stand-alone firms - where there is no issue - the problem arises when dealing with parents and subsidiaries as one must decide how to allocate the IPRs owned by other parts of the group. A subsidiary might work independently and file its own trademarks; in that case nothing needs to be done. It is often the case instead that the parent firm possesses all IPRs and subsidiaries are free to use them or to acquire exclusive licenses; or, alternatively, an individual subsidiary is in charge of dealing with the group's IPR holding. The studies mentioned in this review add up all IPRs for a group and then distribute the aggregate number of IPR to each firm within the group. This approach probably overstates the effective number of trademarks.

Another issue relates the industry classification of trademarks: the two possible alternatives are the primary activity and the NICE classes. On the one hand, firms can be active in more than one industry, therefore the primary activity might not be appropriate. On the other hand, NICE classes are not perfectly informative about the product category. For instance, the NICE class 9 includes computers and fire-extinguishing apparatus. On this matter, Lybbert, Zolas, and Bhattacharyya (2014) proposed a matching algorithm which uses a list of keywords for each industry to link industry codes to NICE classes.

### 4.3 Firm Heterogeneity

Studying whether small or big firms are more prolific in innovation has always been an eternal question, and patents had been used as a proxy for innovation intensity. Trademarks are different from patents, and probably are not the best proxy for innovation, but it is worth assessing which size of firms is more prone in using them.

Greenhalgh, Longland, and Bosworth (2003) examine trademark intensity of medium and big UK firms over the period 1986-2000. Trademark intensity is defined as the ratio between the number of trademarks owned by the firms and a proxy for the firm size (employment or sales). Results show how medium-size firms seem to be more active, as they report a higher trademark intensity. Similar evidence is found by Greenhalgh and Rogers (2008), which performed the analyis for the service sector.

Rogers, Helmers, and Greenhalgh (2007) propose a more comprehensive study with a database including the entire population of UK firms for the period 2001-2005. The databse was created drawing on the available FAME[8] database. The authors confirm that SME firms are generally more IPR intensive (and therefore also trademark intensive) than large firms. Moreover, the ratio of SME to large-firm trademarks activity was around 74%. Findings seem to be consistent with the view that firms need to reach a critical mass of trademarks in order to be valuable and useful.

### 4.4 Trademarks and Innovation

The traditional variables used in the literature to proxy for innovation are R&D activity and patent counts. However, there are sectors - like the service sector - where firms do not usually engage in R&D activity, or there are cases in which firms might not able to patent their innovative products because they do not satisfy all the legal requirements. For this reason, there are studies that try to fill this gap in measuring innovation using trademark activity.

In an early attempt Schmoch (2003) uses the Community Innovation Survey - contaning information on innovation activities of 377 German firms in 2001 - to find a positive correlation with trademarks in the service sector. Innovation is proxied by the share of turnover with new products and services. Gotsch and Hipp (2012) rely on the same dataset, confirming that this positive correlation between the use of trademarks and innovation exists in high-tech manufacturing and knowledge-intensive service sector, but not for low-tech and other service sectors.

Jensen and Webster (2009) provide a more comprehensive study covering more than 1,000 Australian firms from all sectors of the economy. They find positive and statistically significant correlation between patents and trademarks, but the magnitude of this correlation is relatively small. Instead, when proxying innovation by R&D activity, correlation is much higher. The authors suggest

[8] Financial analysis made easy.

that perhaps firms are more likely to use trademarks if they are attempting to innovate (spending in R&D). Also in this case, results are not constant across sectors, with particularly weak correlation for the service sector.

Malmberg (2005) analyses one particular type of innovation - related to products - together with trademark activity in four industries: electromechanical, automotive, and pharmaceutical. In the first two industries, the need for trademarks is obviated by the fact that new products are often identified by model numbers. For this reason, they are not very popular. By contrast, in the pharmaceutical industry competition is fierce, therefore once the patent expires firms frequently register new products in the attempt of building brand name to sustain customer loyalty. This mentioned firm behavior is studied also in Flikkema, de Man, and Wolters (2010). The authors draw on a survey collecting 660 firms which had applied for trademarks at the Benelux patent and trade mark office between 2007 and 2008. Results show that about 60% of trademark applications refer to some kind of innovation activity. Moreover, trademark seem to be able to capture product innovation in the late stages of development, which is something that R&D expenditure do not always do.

### 4.5 Incentive to Use Trademarks

The primary reason for holding trademarks is to protect the owner's brand from other competitors' illegal use, but trademarks serve also the crucial function to communicate with customers.

Greenhalgh et al. (2011) investigate the relationship between trademarks and brands, relying on two datasets: the Annual Respondent Database (ARD2) from the UK Office for National Statistics (ONS) for the period 2000–2006, and the Oxford Firm-Level Intellectual Property Database (OFLIP). They report that both advertising and trademarking contribute positively to the value generated by a firm. Since creating and registering a trademark is a one-time event, while advertising involves a longer term commitment since it is directed at building a brand, one would expect a priori to be complementary activities. Instead, the authors find evidence that advertising and trademarking are imperfect substitutes. The reason behind this finding might be that registering and maintaining a trademark are costly and time consuming activities that serve only as a legal basis for brand, but do not directly enhance it.

Jenson and Webster (2008) document how trademarks are able to convey meaningful information to consumers. They use monthly data on 92 goods in 12 categories from Australian supermarkets over the period 2002-2005. As goods are sufficiently homogeneous, they measure whether adding labels to unobservable attributes of goods influence consumer demand: consumers seem to be more attracted by labeled goods. Furthermore, age and number of trademarks seem to affect demand and competition. Up to a certain point, each additional year a trademark exists increases the demand for that brand, after that point, the effect turns negative. Moreover, the higher is the number of trademarks are in a given product category, the lower is the demand for each trademark in that category.

Firms may have the incentive to use trademarks also in complementary with other IPRs to generate synergies. Parchomovsky and Siegelman (2002) theoretically claim that firms may want to build brand loyalty in order to extend the patent lifetime, therefore they charge less than the monopoly prices during the period in which the patent is valid - enhancing brand loyalty - and then charge more than the marginal costs when the patent is expired. The authors present five case studies to support their theoretical predictions. Davies and Maniatis (2010) present other two cases that go in the same direction: trademarks and patents can generate complementaries by building brand reputation on the temporary monopoly granted by the patent. However, the external validity of findings based on case studies, interviews or small surveys is very usually limited, therefore one has to be extremely cautious in making generalization at a higher level (such as industry, geographic, country, etc...).

Llerena and Millot (2013) base their analysis on a dataset containing 785 French publicly traded firms in the year 2007, and patent and trademark applications between 1998 and 2007. The econometric strategy is a market value equation containing four dummy variables, each of which represents one possible patent – trade mark strategy. Their study on the relationship between patents and trademarks states that industry characteristics play a crucial role in defining the direction of the relationship: if the impact of advertising is persistent but hard to capture for the firm, patents and trademarks act as complements; instead, if the effects of advertising disappears quickly, patents and trademarks act as substitutes.

Graham, Marco, and Myers (2014) find evidence of how trademarks are used in transactions: by exploring the most comprehensive dataset on trademarks - the USPTO Trademark Assignment Dataset - they document about one third of the 3.4 million trademarks registered over the period 1973-2013 were subject to at least transaction. In one tenth of them, trademarks were used as collateral to secure debt, and about 80% of all secure agreements involved multiple trademarks.

Raising competitors' costs represent another possible incentive for firms to use trademarks. Greenhalgh (2012) and Collette (2012) suggest that firms with may use the possibility of opposing rivals' trademarks applications with the objective to raise the legal costs of alleged infringers. This strategic behavior is peculiar of those firms with "deep pockets", since opposing to competitors' applications is costly.

### 4.6 Firm Performance

Common firm performance indicators are firm survival, stock market value, and profitability.

Studies on firm survival identify and measure the determinants of firms' likelihood to survive. Helmers and Rogers (2010) estimate a Probit model and track over 160,000 limited companies in the UK over a period of five years. They

match IPR applications to firms, but do not take into account ownership structure. Their research include non-parametric Kaplan– Meyer survival estimates for the first five years of existence and the analysis of the relationship between the firms' characteristics and the risk of exit. Results show that firms applying to at least one trademark had a probability of exiting the market during the 5-year period of observation which is 16% lower compared to firms trademark inactive. Moreover, those firms applying to national trademarks display lower risk compared to those applying to CTMs (Community Trade Marks).

The other papers on firm survival estimate a piecewise-constant exponential hazard function (PCEH). The PCEH is a semi-parametric model where the time is continuous (and not discrete such as in the Probit model) and the baseline hazard since is a not-specified function of time. These features avoid avoids biases from a mis-specified parametric form of the baseline hazard. Schautschick (2015) analyse two cohorts of new firms established in 2003 and 2006 in Germany during a period of economic turmoil. The main results for trademark applications are in accordance with Helmers and Rogers (2010): firms registering new trademarks are associated with a lower risk of exiting the market compared to those firms not registering any trademark. Moreover, firms holding a stock of CTMs show significantly higher risk of exit.

Jensen, Webster, and Buddelmeyer (2008) and Buddelmeyer, Jensen, and Webster (2010) analyse Australian 229,869 companies for a period of 7 and 5 years respectively. Their results are very similar and very pronounced: applying for the first trademark in firm's existence extends life expectancy by 6.6 years (median), and renewing the stock of trademarks increases by 19.5 years.

Literature on the relationship between firm market value and its intangible assets is traditionally based on the market value approach developed in Hall (2000): the value on a firm on the stock market reflects both the tangible and the intangible assets owned. The empirical equation is $V = q(K_1 + K_2)^{\theta}$, where $q$ is a parameter assessing the current market evaluation of firm's total assets, $K_1$ is the tangible assets and $K_2$ the intangible assets, and $q$ takes into account the possibility of non constant returns to scale of market evaluation. Patents and R%D had been traditionally used as proxy for intangible assets. More recently, there have been attempts also for trademarks.

Greenhalgh and Rogers (2006) is one of the first study showing results on a sufficiently large sample (670 UK firms): they compare the impact of applying for UK trademarks on firms belonging to three different sectors (manufacturing, financial service, utilily). Results are heterogeneous across sectors, with the financial service sector showing the strongest benefit (the sector where trademark applications have been growing sharply and stock market returns to trademarks is high), and the utility sector with the weakest benefit (no effect at all).

Sandner and Block (2011) rely on a multi-country database consisting of a sample of 1,200 European firms covering the period 1996-2002. The requirement for a firm to enter the dataset is being trademark active in Europe at least once during the period analysed. For this reason, only CTMs are taken into account, while national trademarks are excluded. The authors develop four trademarks

indicators to measure their value: (1) the number of of classes per trademark,(2) the seniority of the mark claimed at the time of the application, (3) opposition to other competitors by the firm, (4) opposition received by the firm from other competitors. Results are significant for the (2) and (3) indicators, while for (1) and (4) no significant effect. Overall, it seems that trademarks impacts positively on firm stock market value.

Greenhalgh and Rogers (2012) focus on large and medium size 1,600 UK firms throughout the period 1996-2000, analysing both national trademarks and CTMs. The authors compare the impact of trademark activity on firm stock market value of two different sectors: manufacturing and service. Results are positive and significant, with magnitude much larger for the service sector. Moreover, the effect is slightly bigger for national trademarks than for CTMs. Assessing trademark intensity - defined as the stock of trademarks relative to firm size - is associated with positive gains in market value only in the early period, then the gains disappear.

One chapter of my dissertation contributes to this topic analysing the impact of weaker trademark protection on stock market value. Relyng on US data (USPTO Trademark Case Files dataset and Compustat/CRSP) I estimate a Fama-French model - widely used in the empirical finance field - to measure the impact of the weakened trademark protection on stock market returns: firms which benefited in the past from trademark protection saw faced negative stock market returns in the two days after the event, while competitors experienced positive returns.

There are also papers which try to shed light on the impact of trademarks on profitability and productivity in the long run. Greenhalgh and Longland (2005) assess whether the use of trademarks can be associated with higher value of firm's output given the inputs. The authors use a standard production function in natural logs $ln(Y) = ln(A) + \alpha ln(L) + \beta ln(K_1)$, where $Y$ is output, $L$ is labor employed, $K_1$ is tangible assets, and $A$ measures productivity. This latter factor is influenced by intangible assets $K_2$, such as trademarks. The dataset consists of 740 UK manufacturing firms which were observed in the period 1988-1994. Findings for the whole sample show that trademark activity - both national and CTMs - has a positive impact on firm's next year output. Not only the results hold when controlling for productivity, but firms engaging in trademark activity exhibit permanent higher productivity.

This evidence seems to be confirmed also by Greenhalgh and Rogers (2012): firms which engage in trademark activity display value-added premium for 10-30% for next year output. Moreover, the authors show that competitors can reduce firm's value-added by applying for new trademarks.

Heath and Mace (2020) take a different approach and study the effects of trademark protection on firm's profits using the Federal Trademark Dilution Act (FTDA), which is a fedeal law granting additional protection from dilution to famous trademarks. The authors rely on this exogenous source to estimate a diff-in-diff model, finding that the introduction of the FTDA raised treated

firms' profits and was followed by a spike in trademark lawsuits and lower entry and exit in affected product markets.

In one chapter of my thesis I depart from the Heath and Mace's approach to confirm the same results using a different trademark law introduced in 2006 (Trademark Dilution Revision Act - TDRA). I also find that treated firms become less innovative (less patents regitered) and are able to expand their market power (higher market share).

## 5 Conclusion

The purpose of this paper was to identify and analyse the main studies concerning trademarks. Despite haing received little attention in the past, the body of literature on trademarks is rapidly growing.

The wide majority of papers focus on firm-level data from USA, UK, Germany, and Australia. On this matter, the US one - USPTO Trademark Case Files dataset - is probably one of the largest and more complete, both in terms of time coverage and number of firms. US and European data suffer from two different issues: while the American counts only trademarks registered at the federal level (and not those used at the regional level which are protected by the common law), in Europe national trademarks and CTMs are in competition between them. These issue might create distorsions or lead to biased findings, and penalize small firms.

Regarding the trademarks analysed, some studies use trademark applications, some other studies trademark registrations.

There is not a unique way to classify firms according to their sector: some authors rely on the NICE classification, some use firms' economic classification, some others propose classifications based on matching algorithm.

The results linking trademarks to innovation should be cautiously interpreted as a trademark in order to be registered do not require any innovative component (like for patents). Trademarks are more about brand building and customer loyalty enhancing.

The econometric techniques used are pretty standard (market value approach, probit, ordinary least squares). What are still missing are papers incorporating theoretical models which are able to explain the reasons that drive firms to use trademarks.

To wrap up, trademarks need still to be deeply explored, especially now that comprehensive datasets are available. Current literature can provide a good starting point for a broader understanding of this intellectual property right.

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# Chapter 2
## Trademarks and Stock Market Returns

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**Abstract.** I present evidence that firms place value on trademarks they own. Trademarks are one type of intellectual property used by firms to protect their brands from competitors' unauthorized exploitation. Taking advantage of a decision of the Supreme Court in USA - which de facto weakened the intensity of protection of trademarks from dilution - I measure the impact of this unexpected event on the stock market using the Fama French 3-factor model. Firms which could benefit from that trademark protection before the verdict of the Supreme Court experienced negative abnormal returns, while firms which could not benefit in the past from that protection experienced positive abnormal returns. This finding happens to be true across sectors, but it is particular significant on the manufacturing sector (a trademark-intensive sector).

**Keywords:** Trademarks · Stock Market · Empirical Finance

## 1 Introduction and Literature

Academic literature has been trying for long time to assess the value of intellectual property (IP). The vast majority of papers focus on patents since they are often used as a proxy for innovation activity of firms. Hall (2000) is a cornerstone study showing how the financial market places value on knowledge assets of publicly traded firms. Using a market value approach, she finds that the market value of manufacturing firms are strongly related to their intangible assets, and that patents provide information above its value beyond what is conveyed by R&D.

Regarding trademarks and market value, Schautschick and Greenhaulgh (2016) review the existing empirical literature. One of the first attempt is by Boswerth and Rogers (2001), which analyse the value of R&D and IP's activity (trademarks included) of a small sample of 60 Australian firms using a Tobin's q approach. Results for trademark activity are significant in all sectors except for manufacturing, although the coefficient is relatively small compared to the value attributed to patents and R&D. The volume "The Management of Intellectual Property" includes two articles by Greenhalgh and Rogers (2006) and by Griffiths and Webster (2006) which present additional evidence of positive value attributed by investors to trademark activity.

Greenhalgh and Rogers (2006) document positive trends for trademark acquisition by UK firms with a comparison across different sectors: financial services,

manufacturing, transport, communication and utilities. Then using a standard model of market value based on Griliches (1981), they find that this increasing use of trademarks is reflected in increased share prices. This happens to be true only in the financial services sector, while in other sectors trademarks are not a significant determinant of share price.

Griffith and Webster (2006) use annual data from 300 Australian firms covering the period 1989-2002 to study the trends over time of patents and trademarks. From a fixed-effects panel estimation they present evidence suggesting that the value of patents have been falling, while the value of trademarks have been rising.

Sandner and Block (2011) rely on a multi-country database for the period 1992-2002 to assess the economic value of trademarks while controlling for other intangible assets, and develop four value indicators to distinguish between high and low value trademarks. Results indicate that the contribution of trademarks to firms' value is positive: investors assign larger market values to those firms holding a larger portfolio of trademarks. Furthermore, a higher market value is assigned to those firms which defend their trademarks portfolio, and to those firms possessing trademarks for a long time.

In the empirical part of their analysis, Greenhalgh and Rogers (2012) measure the impact of trademark activity in the given year on firm's market value and also study the relationship between trademark intensity and firm size. They find that trademark activity has a positive impact on firm's market value, and this effect is greater in magnitude in the services sector compared to the manufacturing sector. Findings on trademark intensity are more complex and in contrast with Griffith and Webster (2006): higher trademark intensity is initially associated with gains in market value, but gains disappear over time and are replaced by a falling in value. Moreover, greater trademark activity by firms in the same four-digit sector appear to reduce net output of firms, but raise their stock market value.

Fosfuri and Giarretana (2009) use trademark activity - together with product innovation and advertising - to distinguish between the business stealing and the market expansion effect. In their empirical analysis focusing on Pepsi and Coca Cola between 1999-2003, they find that competitor product announcements decrease firms financial market value, and that competitor filed trademarks increase it.

**Contribution** The goal of this paper is to show evidence of the value represented by trademarks for firms. With this aim, I take as response variable for my analysis stock market return - and not stock market price - at a daily frequency. Using an exogenous variation in trademark protection, I assess the magnitude of the impact this unexpected event had on firms's value. While the majority of studies mentioned above use the market approach, I am going to rely on a technique borrowed from the empirical finance literature on stock market: the Fama French 3-factor model, which is a refined version of the famous CAPM. This method will allow me to measure the overnight difference in stock mar-

ket return due to the exogenous event. Results are significant and different in sign depending whether firms possess famous[1] trademarks or not: negative for the former and positive for the latter. When looking at the heterogeneity by sector, findings hold across sectors, but they are particularly significant for the manufacturing sector, which turns out to be trademark-intensive.

## 2 Data

The data on which the analysis is conducted are composed of two datasets: USPTO Trademark Case Files Dataset for the trademarks and the CRSP-Compustat from WRDS for stock market prices and firms' financial balance sheet.

### 2.1 USPTO Trademark Case Files

The Trademark Case Files Dataset derives from the USPTO (United States Patent and Trademark Office) main database for administering the procedure of trademark application, registration, renewal and maintenance.

Although having received little attention by the economists, trademarks are the most popular type of intellectual property as they are constantly used by firms whenever they want their brand to be protected. It is pretty straightforward why firms might want to protect their brand as it represents an essential intangible asset.

To protect the brand and obtain the registration, the firm has to follow a standard procedure. When filing for an application to the USPTO, the firm submits a depiction of the mark - which should be distinctive - and pays a fee that ranges from $225-$400. The firm also indicates the goods and services on which wants to apply the trademark. In the following three months the examining attorney evaluates the compliance of the application and if the requirements are met, the application is approved and published for opposition. Within the next 30 days any third party that considers itself damaged by the new trademark can come forward and file an opposition procedure. If this is the case, the examining attorney evaluates again the application of the trademark; otherwise the trademark is finally approved and filed in "due course".

Once the trademark is registered, the owner has the exclusive right to use it within the scope of the activity mentioned in the application. Any competitor which uses the mark without authorization can be held liable and taken to court. In most cases, the protection is extended also outside the goods and services submitted in the original application. Prior to November 16th, 1989 the duration of a trademark was 20 years; thereafter it has been reduced to 10 years. At six years after the registration, the owner must pay a fee and show continued use in order to maintain the registration, otherwise the trademark is cancelled. At the end of the 10-year period the owner can renew the trademark by filing a

[1] I am going to define later what I mean with "famous" trademarks.

renewal application, paying the prescribed fee and showing continued use. The renewal can be done indefinitely at the end of each 10-year period.

**Summary Statistics** The dataset comprehends about 7 million all trademark applications from 1870 up to present. Registrations are almost 4 million, since not all applications eventually end up registered. For registrations issued before 1962 there is little data coverage. Almost complete data coverage is from 1982 onwards, time in which the yearly number of application and registrations started booming.

**Table 1.** Summary statistics on trademarks from USPTO

| | Overall |
|---|---|
| # unique firms | 1,971,850 |
| # unique applications | 7,240,781 |
| # unique registrations | 3,988,095 |
| mean firm size** | 3 |
| 1st percentile firm size | 1 |
| median firm size | 2 |
| 90th firm size | 5 |
| 95th firm size | 9 |
| 99th firm size | 30 |

**: firm size = number of trademarks within a firm

The distribution of registrations is very right skewed, since most of firms own just one trademarks. Median and mean are respectively 2 and 3, while I find very high numbers as I look into the percentiles over the 90th (see table 1 above).

**Trademark Law Background** Trademark law has a long history. In the United States the statute of modern trademark law dates back to 1946, and defines *infringement* as "use of an identical or similar mark that would cause confusion as to the source of goods or services". Although a trademark might not be registered, it is still protected from infringement by the state-level common law but only in the geographic area where the mark is used. In this case the mark has a symbol "TM", which signifies an unregistered mark. Once the

mark is registered, it has the "R" symbol. Registration extends the protection at the national level, provide prima facie evidence of ownership (the possibility to file action in federal Court to obtain injunctions and recover damages), and the trademark is listed within the U.S. Customs and Border Protection Service (which protects the owner from import counterfeits).In fig.1 I show an example of a registered trademark, as it is indicated by the "R".


**Fig. 1.** Starbucks Registered Trademark

In the years following the Lanham Act proved to be insufficient in litigation, as dilution started to play an increasing role (Derenberg, 1956). Dilution is a much broader concept with respect to infringement, and is defined by law as any action *weakening... a famous mark's ability to identify and distinguish goods or services regardless of competition in the marketplace.*[2] Protection from dilution was granted at the state level in proven cases only.

The first law to grant protection form dilution at the federal level was the Federal Trademark Dilution Act (FTDA) in 1996. The major expansion of trademark protection was given by the fact that the trademark holder was not required anymore to provide proof of actual dilution but only to convince the judge the likelihood of dilution in order to obtain an injuction (Kim 2001; Bickley 2011). The main limitation of the FTDA is that it provides protection only to "famous" trademarks, but the law does not specify the term "famous". For this reason, the interpretation of what constituted a "famous" trademark was given on a case-by-case basis by the judge (Duffy and Nagel 1997; Becker 2000; Dollinger 2001).

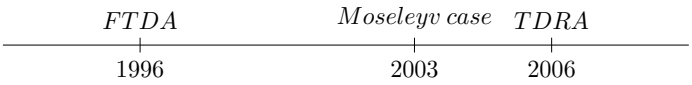
That being sad, the legal literature attributed to the FTDA a significant role in increasing the scope and strength of protection of trademarks (Zando-Dennis 2004; Jacobs 2004). This lasted until 4th, March 2003 when the Supreme Court ruled in *Moseley v. V. Secret Catalogue, Inc.* (2003) that a successful dilution

[2] from the INTA Trademark Dilution Factsheet.

claim required actual proof of economic damages, in this way de facto nullifying the FTDA. Therefore for the next three years trademarks' rights were reduced as similar to the situation pre-FTDA.

In 2006 the legislator responded to the *Moseley* case by implemeting a new trademark law: the Trademark Dilution Revision Act (TDRA), which was basically a reboot of the FTDA since it restored the possibility of trademark holders to take legal action on the basis of likelihood of dilution without proof of actual damage.

Here is the timeline of the events:




### 2.2 CRSP/Compustat

This dataset comprehends financial data on publicly traded firms from 1960 up to present. The time frequency can be yearly, monthly, or daily. I am interested in daily frequency since I want to capture the overnight reaction on the stock market of the decision of the Supreme Court for the *Moseley* case.

### 2.3 Merging the Two Datasets

Since I want to understand how stock market returns change with respect to the ownership of (famous) trademarks by firms, I need to build a bridge between the two datasets. Unfortunately there is not a unique identifier that allows to easily merge the two datasets, therefore I need to proceed by string-name matching.

Firms' names are cleaned with an algorithm that removes punctuation and spaces and uniformes acronyms. The match is done at the firm-time level, where in the CRSP dataset time is the day of the week in which the x-th firm registered that particular stock market price, and in the USPTO Trademarks dataset time is the day in which the x-th firm had that particular trademark registered.

The time period chosen for the analysis covers the entire year 2002 and the year 2003 up to a week after the decision of the Supreme Court for the *Moseley* case (4th, March 2003). In the final merge I have 14,874 firms; almost 33% of them (4,239) have at least one trademark registered in the time span considered. This does not necessarily imply that the remaining 10,635 do not possess or use trademarks: they could possess and use trademarks that are not registered at the USPTO, meaning that they are protected by the state-level common law. Firms possessing trademarks are generally bigger (in terms of assets) compared to those that do not possess trademarks, are more profitable and have slightly higher stock market price. See table 2 below

**Table 2.** Summary statistics of dataset

| | Firms w/ trademarks | Firms w/out trademarks |
|---|---|---|
| # unique firms | 4,239 | 10,635 |
| # mean stock market price | 23.8 | 22 |
| # median stock market price | 4.2 | 9.1 |
| mean assets* | 9,570.4 | 3,591,4 |
| median assets* | 258.8 | 146.8 |
| mean net income* | 90.7 | 40.6 |
| median net income* | 1.3 | 0.6 |

*: expressed in million $

## 3 Empirical Strategy

**Objective** Estimation the impact of the Supreme Court decision on firms' stock market returns.

Contrary to the standard literature on the relationship between trademarks and stock market value - based on the market value approach - which uses the stock market price as response variable, I am going to use stock market returns. The empirical finance literature tells us that stationary is a very important property for time series analysis. Prices have a unit root because they are highly dependent on the previous period's price, implying that they are not stationary, because the moments change over time. Instead, returns have correlations near zero, therefore they can be assumed to be stationary.

**Exogenous variation** The decision of the Supreme Court occurred on 4th, March 2003. The Court ruled in *Moseley v. V. Secret Catalogue* that a successful dilution claim required actual proof of economic damage, weakening de facto the protection intensity of trademarks. I can reasonably assume that this event is unexpected because no one knows the decision of the Supreme Court before its verdict. Since the *Moseley* case began on 18th, November 2002, one could argue that the market could have formed expectations on the verdict during the days after and before the begin of the case. In the robustness checks section we will see that this is not the case.

**Estimation strategy** The approach I am going to use is the Fama French 3-factor model (FF3M) developed by Fama and French (1992). The FF3M is an asset pricing model designed to descrive stock market returns. It expands the capital asset pricing model (CAPM) by adding size risk and value risk factors to the market risk factor in the CAPM. The traditional CAPM states that the

only thing you need to know in order to estimate the expected return of a stock is the sensitivity of that stock to the market return. Other factors should add no value in estimating the expected return. However, if one examine historical data and adjusts for market capitalization and book-to-market equity of stocks, this linear and positive relation between the expected return and the sensitivity to market return seems to be gone. The two factors added by the FF3M account for those two dimensions (market capitalization and book-to-market-equity of the stock) in this way re-establishing the positive linear relation.

The specification is:

$$R_{i,t} - RF_t = a_i + \beta_i^{mkt}(RM_t - RF_t) + \beta_i^{size} SMB + \beta_i^{value} HML + \epsilon_{i,t} \quad (1)$$

where the response variable is the excess return defined as the difference between the stock market return of firm $i$ at time $t$ and the market risk free rate at time $t$ (proxied by the return of the SP500); $a_i$ is a constant for firm $i$; $\beta_i^{mkt}$ is the market risk measuring how sensitive is the expected return on the market; $SMB$ is first FF factor (size factor risk) capturing the market capitalization variation of the stock; $HML$ is the second FF factor (value risk factor) capturing the book-to-market equity variation of the stock; $\epsilon_{i,t}$ is the error term. The $SMB$ and $HML$ factors can be freely downloaded from Kenneth French's website [3].

The FF3M's approach is divided into two steps: firstly, I am gonna estimate for each firm the $\beta$s for the stock market returns of stock in the period before the unexpected event (the Supreme Court decision); secondly, I am gonna use those $\beta$s to estimate for each firm the *predicted* return of stocks in the event window (the day of the event plus the period immediately before and after the event); and finally I am gonna compute for each firm the *abnormal returns* (AR) and *cumulative abnormal returns* (CAR). The *predicted* return of stock $i$ is the return that one could have observed on the financial market had the unexpected event not occurred; consequently, the AR are the difference between the *predicted* returns and the observed returns, which can be imputed to the event. The CAR is the sum of ARs across firms in a single time or over time for a single firm.

Once estimated the ARs, I test for significance whether the average abnormal return for each stock is statistically different from zero. The test used is:

$$Test = \frac{(\frac{\sum AR}{N})}{\frac{ARsd}{sqrt(N)}} \quad (2)$$

where N is the number of days in the event window, and $ARsd$ is the abnormal return standard deviation. If the absolute value of the test is greater than 1.96, then the average abnormal return of that stock is significantly different from zero at the 5% level.

Traditionally the literature chooses as *estimation window* the sixteen months of returns of a stock; in this case, the frequency is not monthly but daily, for this

[3] Kenneth French's website

reason I choose the period 1st, January 2002 up to 4th, February 2003. I intentionally exclude the whole month before the day of the event (4th/March/2003) in order to remove very short term fluctuations. For the *event window* I include the day of the event and the two days immediately before and after, therefore from 27th, February 2003 up to 6th, March 2003. Since the periods chosen for the estimation and event window might be judged arbitrary, I run the same regression with different values but results do not change significantly.

# 4 Results

## 4.1 Preview of Results

Before going to the results, I show some suggestive graphical evidence of what happened on the financial market on the 4th, March 2003 - day in which the Supreme Court ruled in the *Moseley case* - and in the days immediately before and after.

As I said before, the Supreme Court de facto nullified the FTDA, therefore decreasing the intensity of trademark protection. Since stock prices are forward-looking they are able to incorporate any future business conditions: in this case firms which possess trademarks saw their trademark protection from dilution diminished, for this reason shareholders might expect a decrease in firm's market power and therefore to drop in profits. In figure 2 - below - I plot the kernel density function for excess returns on the day of the event dividing for those firms which possess at least one trademark and those firms which do not possess any trademark.
The distribution for those firms not possessing any trademark (blue line) is very narrow and almost centered at zero; for those firms possessing at least one trademark instead the distribution is broader and slightly leaning on the left. That being said, one could argue that the difference between the two density functions is not that sharp, but it should kept in mind that not all the firms possessing trademarks were de facto touched by the decision of the Supreme Court because the FTDA granted additional protection from dilution only to those trademarks which were considered famous. Since the law does not identify specific requirements, the status of "famous" was decided case by case by the court. For this reason I am going to borrow the identification strategy from Heath and Mace (2020) which I already used in another paper: I use the duration of trademarks to capture the famous trademarks in the sample. The standard duration of a trademark is 10 years, but at the end of the fifth year the owner must confirm its use to the USPTO with an affidavit. Furthermore, at the end of the tenth year the owner can renew the trademark by paying a fee, therefore a trademark can last indefinitely. Since the renewal of a trademark is costly for the owner - payment of a fee and the bureaucracy - it makes sense that the owner is going to get through the procedure only if the trademark is useful for him/her. Therefore if a publicly traded company renews a trademark, this trademark is important and for this reason it is likely to be "famous". Although the identification is fuzzy - I am not able to precisely capture the firms possessing

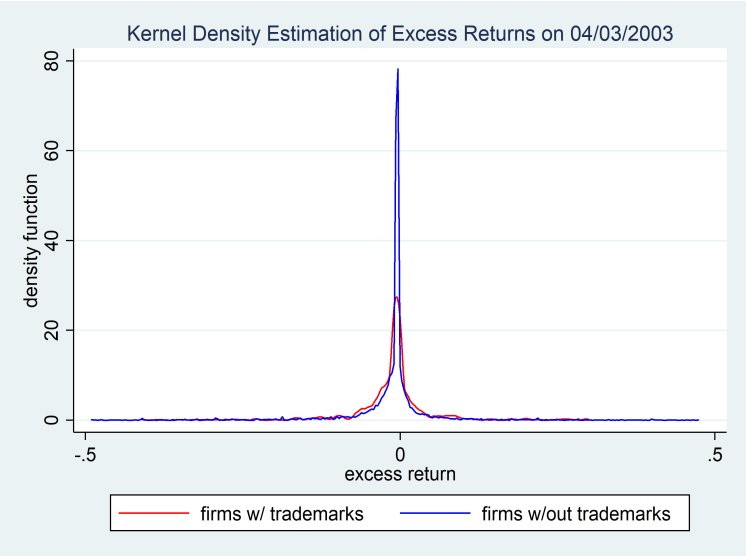



**Fig. 2.** Density Function of Excess Returns on 04/03/2003

famous trademarks - if it proxies correctly I would observe in the kernel density estimation increasingly diversion between the red and the blue density function. In fig. 3 above I plot the kernel density function of excess returns on 04/03/2003 dividing the sample between firms possessing famous trademarks and firms not possessing famous trademarks. In defining the trademark "famous" I use the fuzzy identification strategy based on duration and I change the minimum threshold from panel to panel: a trademark has to be at least 6 years old to be considered famous in the top left panel, 11 years old in the top right, 16 years old in the bottom left and 21 years old in the bottom right. As I increase the minimum threshold the density function for those firms possessing famous trademarks becomes broader and more left centered, possibly indicating that - if according to our expectations the decision of the Supreme Court negatively hit that groups of firms - my identification is able to capture the "real" famous trademarks.

The Supreme Court ruled on 4th, March 2003 but there might be chances that rumors about the final decision could be released on the market some time before the official verdict. Moreover, it could be that shareholders needed more than one day to incorporate the decision. This might be the case for example if the verdict is published late in the day when the financial market is already closed. For this reason I plot the kernel density function also in the days before and after the event to observe where is the peak.

From observing fig. 4 one can confirm that the peak is on 4th, March 2003 but there are already some movements in the distribution the day before. From 5th,

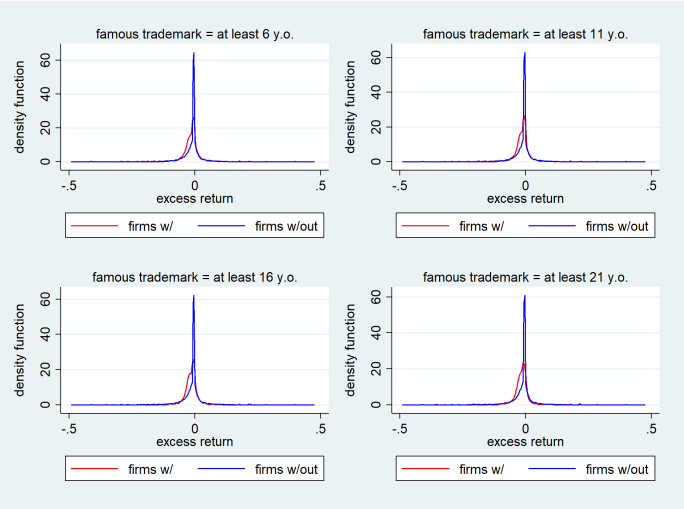



**Fig. 3.** Density Function of Excess Returns on 04/03/2003 by Duration of Trademarks

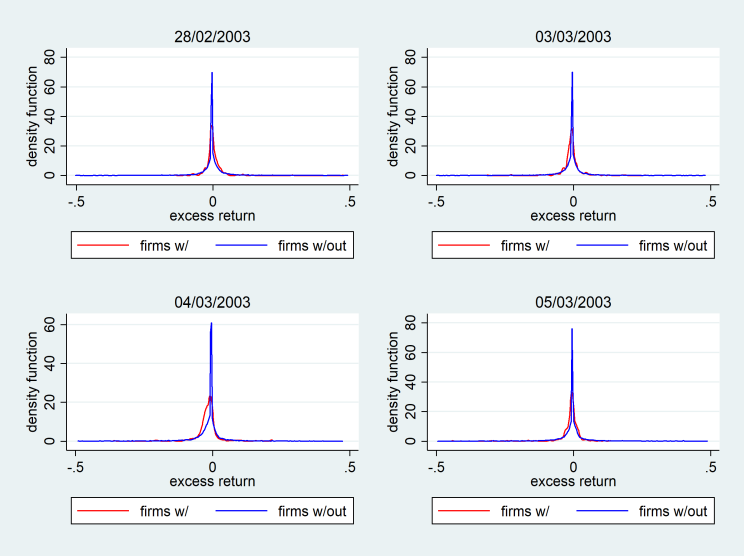



**Fig. 4.** Density Function of Excess Returns on Different Days

2003 the density function for firms possessing famous trademarks stretches back centered at zero an is not anymore leaning on the left.

### 4.2 Fama French 3-Factor Model

After setting the estimation and event window, I drop those firms which do not have sufficient observations, leaving eventually 11,836 firms in the sample. According to the test the firms which have ARs significantly different from zero are 2,722; 758 of them ( ≈18% of 4,239) possess at least one trademark, while the rest 1,964 do not (≈ 18% of 10,635). Regarding the composition of firms, those with at least one trademark are greater in terms of assets and net income with respect to those not possessing any trademark. Furthermore, these firms which have ARs significantly different from zero resembles in terms of size the initial sample.

Firms possessing at least one trademark have greater CAR than those firms which do not possess any. On the one hand, since in the former group both mean and median of CAR is negative, it implies that the decision of the Supreme Court had a negative impact on their future profits (see table 3). On the other hand, in the latter group mean and median for CAR are positive, meaning that those firms benefited from the Supreme Court verdict. FTDA granted to firms with trademarks an advantage over firms not possessing trademarks, and this advantage was removed by the Supreme Court.

If I use again the fuzzy identification strategy by Heath and Mace (2020) [4] to distinguish those firms which possess at least one famous trademark from those which do not possess any famous trademark (but they can own other non-famous trademarks), I find the same evidence from table 3 but augmented in magnitude. Now the difference in CARs both in mean and median between the two groups is even more striking, and it rises as I increase the threshold.

I also plot the average ARs over the period of the event window, dividing the sample between those firms possessing trademarks (red line) from those firms which do not possess any trademark (blue line) (see fig.5). The green vertical line highlights the day of the event. The former group have a slight positive jump the day before the event and then a big drop right after the green vertical line; the latter group have a moderate increase after the event. The figure seems to confirm my result.

To give an idea of the magnitude of the results, I computed the variation in market capitalization on 4th and 5th, March 2003 (the day of the event and the day after) and then summed together (see table 5). Firms possessing trademarks suffered significant loss, while the competitors gained profits. Magnitude of losses increases as I increase the minimum threshold for a trademark in order to be considered famous.

**Sector heterogeneity** In table 6 I analyse which sector is more affected by the decision of the Supreme Court. To proxy the sector I use the NAICS code

[4] A trademark has to be at least $x$ years old in order to be considered famous.

**Table 3.** Results from the FF3M

| | Firms w/ trademarks | Firms w/out trademarks |
|---|---|---|
| CAR (mean) | -0.0395856 | 0.0323739 |
| CAR (median) | -0.0704397 | 0.0565459 |
| Assets* (mean) | 7,560 | 3,345 |
| Assets*(median) | 390 | 226 |
| Net Income* (mean) | 25 | 25 |
| Net Income* (median) | 1.4 | 0.7 |

*: expressed in million $

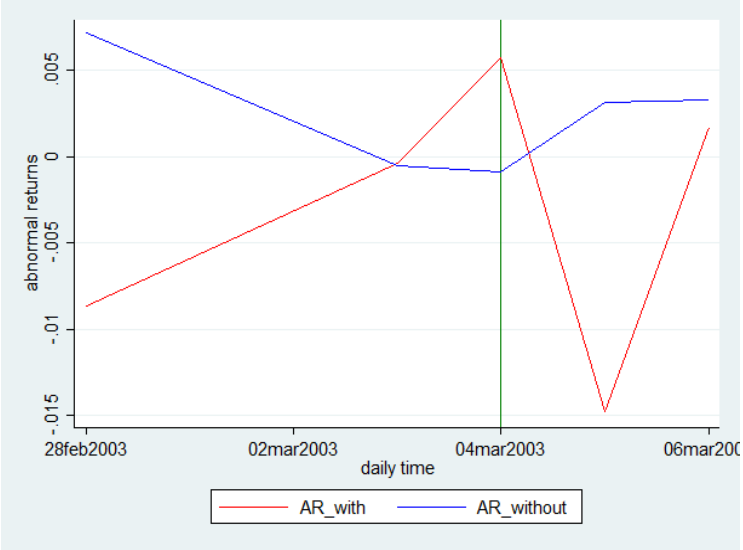



**Fig. 5.** Abnormal Returns

**Table 4.** CAR by Different Threshold

| Threshold | Firms w/ trademarks | | Firms w/out trademarks | |
|---|---|---|---|---|
| | Mean | Median | Mean | Median |
| at least 6 y.o. | -0.058717 | -0.0813621 | 0.0178771 | 0.0457817 |
| at least 11 y.o. | -0.0606734 | -0.081199 | 0.0166747 | 0.0452895 |
| at least 16 y.o. | -0.0671953 | -0.0858391 | 0.0157722 | 0.0439942 |
| at least 21 y.o. | -0.0791665 | -0.0858391 | 0.0142278 | 0.042298 |

**Table 5.** Variation in Market Capitalization

| | Firms w/ trademarks | Firms w/out trademarks |
|---|---|---|
| at least 6 y.o. | -4,368,119 | 1,081,567 |
| at least 11 y.o. | -2,656,381 | 584,889 |
| at least 16 y.o. | -4,203,509 | 594,907 |
| at least 21 y.o. | -7,898,710 | 530,496 |

*: expressed in million $

limited to the first two digits (2-digit code). The share of firms affected by the unexpected event is substantially constant across sectors: percentages range from 20 to 30 percent, with some exceptions below 20% (educational services) and some others over 30% (agriculture, construction, retail trade and transportation and warehousing). Differences are sharper in absolute terms: the manufacturing sector - which comprehends the codes 31, 32 and 33 - includes 870 firms, almost one third of the totality of firms affected by the event (2,722). Interestingly, manufacturing sector turns out to be also a trademark-intensive sector. Moreover, the variation in magnitude for mean and median of CARs between firms with and without trademarks is greater compared to the full sample. Other sectors accounting for a significant number of firms affected are finance and insurance (551), information (288), mining (128), professional and scientific services (118) and real estate (100).

**Table 6.** Heterogeneity by sector

| Sector | 2-Digit Code | Firms Affected* | Total Firms | Share |
|---|---|---|---|---|
| Agriculture | 11 | 17 | 41 | 34% |
| Mining | 21 | 128 | 604 | 21% |
| Utilities | 22 | 41 | 204 | 20% |
| Construction | 23 | 46 | 139 | 33% |
| Manufacturing | 31 | 111 | 370 | 30% |
| Manufacturing | 32 | 251 | 1,173 | 21% |
| Manufacturing | 33 | 508 | 2,259 | 22% |
| Wholesale Trade | 42 | 98 | 349 | 28% |
| Retail Trade | 44 | 56 | 234 | 24% |
| Retail Trade | 45 | 60 | 182 | 33% |
| Transportation and Warehousing | 48 | 45 | 179 | 25% |
| Transportation and Warehousing | 49 | 6 | 18 | 33% |
| Information | 51 | 288 | 1,426 | 20% |
| Finance and Insurance | 52 | 551 | 2,539 | 22% |
| Real Estate | 53 | 100 | 376 | 27% |
| Professional and Scientific Services | 54 | 118 | 530 | 22% |
| Administrative and Remediation Services | 56 | 54 | 275 | 20% |
| Educational Services | 61 | 7 | 37 | 19% |
| Health Care and Social Assistance | 62 | 45 | 192 | 23% |
| Arts and Entertainments | 71 | 17 | 89 | 19% |
| Accommodation and Food Services | 72 | 50 | 186 | 27% |
| Other Services (except PA) | 81 | 10 | 38 | 26% |
| Nonclassifiable Establishments | 99 | 94 | 330 | 28% |

* with CARs significantly different from zero

# 5 Robustness Checks

## 5.1 Anticipation Effect

So far I find that the decision of the Supreme Court on 4th, March 2003 - weakening the intensity of trademark protection from dilution - harmed those firms which were benefiting from FTDA, and had a positive impact on those firms which were not benefiting from it. Despite the verdict of the Supreme Court was published on 4th March, some movements in the density function are present also in the day before (3rd, March 2003) (see fig. 4).

However, the *Moseley case* began many months before, exactly on 18th, November 2002, therefore there is also the chance that some news might have been released during the days when the trail started and agents formed expectations on it. For this reason, I run again the model this time using 18th, November 2002 as unexpected event. The event period covers 17th, November 2002 to 19th, November 2002; and the estimation period ranges from January 2002 up to one month before 18th, November 2002.

This time firms that have ARs significantly different from zero are 3,836, but one cannot find anymore the diverging trend between firms with trademarks and firms without trademarks. In both cases mean and median of CARs are negative, indicating that some bad news was released on the market during that period but it is unlikely related to the beginning of the trial of the *Moseley case*, otherwise one could have found different signs for the two groups (see table 7). I obtain the same results with the Heath and Mace (2020)'s approach: both firms with and without famous trademark have negative mean and median for CAR, and the magnitude of those two values does not increase as I increase the threshold [5] (see table 8).

**Table 7.** Anticipation Effect

| | Firms w/ trademarks | Firms w/out trademarks |
|---|---|---|
| CAR (mean) | -0.0704024 | -0.0287565 |
| CAR (median) | -0.0804393 | -0.0297199 |

## 5.2 Placebo Test

I run again the FF3M with a random date as unexpected event to check whether my findings are specifically related to 4th, March 2003 or they are the result of a

[5] It is defined as the minimum number of years that a trademark has to be old in order to be considered famous.

**Table 8.** Anticipation Effect - CAR by Different Threshold

| Threshold | Firms w/ trademarks | | Firms w/out trademarks | |
|---|---|---|---|---|
| | Mean | Median | Mean | Median |
| at least 6 y.o. | -0.0748508 | -0.0919122 | -0.0394149 | -0.0440704 |
| at least 11 y.o. | -0.0839979 | -0.094843 | -0.0394464 | -0.0441924 |
| at least 16 y.o. | -0.08145 | -0.0922115 | -0.0402394 | -0.0452691 |
| at least 21 y.o. | -0.0783045 | -0.072005 | -0.041197 | -0.046335 |

market fluctuation. I choose 15th, September 2002 as placebo; the event window comprehends five days (the day of the event plus the two days immediately before and after); the estimation window ranges from January 2002 up to 15th, August 2002 (one month before the event). Results are in line with the regression for the anticipation effect: negative impact but generalized, indicating some bad news on the market but not related to trademarks. In fact, if I use the Heath and Mace's identification, the magnitude of values does not change (see table 9).

**Table 9.** Anticipation Effect - CAR by Different Threshold

| Threshold | Firms w/ trademarks | | Firms w/out trademarks | |
|---|---|---|---|---|
| | Mean | Median | Mean | Median |
| at least 6 y.o. | -0.1402307 | -0.1630597 | -0.0490886 | -0.0519243 |
| at least 11 y.o. | -0.1431534 | -0.1630597 | -0.0506698 | -0.0544396 |
| at least 16 y.o. | -0.1270701 | -0.1527676 | -0.0528166 | -0.0558062 |
| at least 21 y.o. | -0.123663 | -0.143173 | -0.0544288 | -0.0595897 |

### 5.3 An Alternative Approach

The aim of this section is to find confirmation of the results I showed so far by using the diff-in-diff approach. This approach is in some way similar to the CAPM (and therefore to the FF3M), but in this case there is a neat distinction between treated and control group in the sample. Another objective of this

section is to build a bridge between this study (where I analyse the impact of a variation in trademark protection on firms in the very short run) and another paper of mine, where I measure the impact of trademark law reforms on firms' profit, innovation and market power in the long run.

The exogenous variation I exploit is the decision of the Supreme Court on 4th, March 2003. The identification strategy I rely on is duration of trademarks from Heath and Lace (2020): a trademark has to be at least $x$ years old in order to be considered famous. The threshold $x$ is defined in turn 6, 11, 16 and 21 years old. If a firm owns at least one famous trademark one week before the decision of the Supreme Court, it is considered as treated, otherwise it belongs to the control group.

The main specification is:

$$excess\, ret_{i,t} = \beta * PostDecision * Marks + excess\, ret_{i,t-1} + \theta_i + \epsilon_i t \qquad (3)$$

where $excess\, ret_{i,t}$ is defined as the difference between daily stock return at time $t$ for firm $i$ and the risk free rate at time $t$, and daily stock return is in turn $return_{i,t} = log\frac{price_{i,t}}{price_{i,t-1}}$; $PostDecision$ is a dummy variable equal to 1 from the day of the decision of the Supreme Court on (treatment); $Marks$ is another dummy variable equal to 1 if the firm possesses at least one famous trademark the week before the event (treated); $excess\, ret_{i,t-1}$ is the excess return for form $i$ at time $t-1$, which I added to control for time trends; $\theta_i$ is a firm fixed-effect; $\epsilon_i t$ is the error term.

**Crucial assumption of identification strategy**: trends of treated and controls firms would not have changed path if Supreme Court had not dismantled the law. I check using the pre-trends (see fig.6 below).

In fig.6 the red vertical line highlights the decision of the Supreme court on 4th, March 2003, while the green and blue line represent the average daily stock return for control and treated group. Despite some fluctuations, trends of both groups seem overall on the same path before the event; there appears to be some wrong expectations of the verdict of the Supreme Court the day before (3rd, March 2003), since average stock market return increases for treated. As expectations are not met, a big drop is reported on the day of the event for the treated group, while the line for the control group remains on the previous path. After the drop, the market recovers quickly.

In table 10 I show the results of the diff-in-diff model: the response variable is the same (excess return), while I change in each row the threshold for the identification strategy. In the first row the treated include all firms possessing at least one trademark (with no reference to its duration); in the second row the treated include all firms possessing at least one trademark which is at least 6 years old, in the third row the treated include all firms possessing at least one trademark which is at least 11 years old; in the fourth row the treated include all firms possessing at least one trademark which is at least 16 years old; and in the last row the treated include all firms possessing at least one trademark which

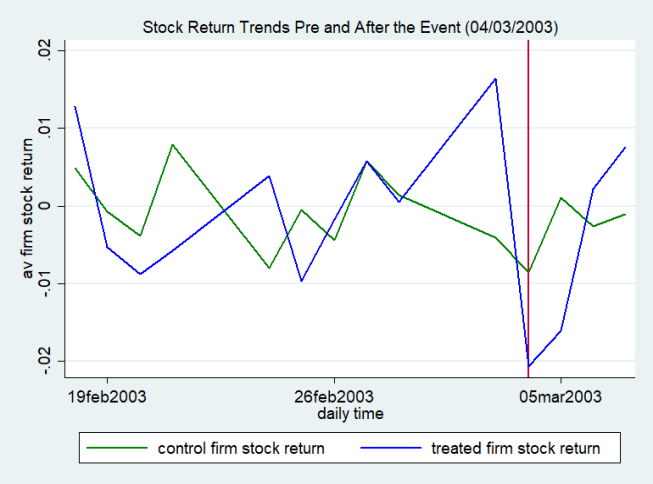



**Fig. 6.** Pre-trends

is at least 21 years old. Coefficients are all negative and significant, confirming the findings obtained with the FF3M. Moreover, as I increase the threshold the coefficient increases as well, indicating that duration of trademark is a good proxy for being famous.

Despite the results in accordance to my expectations I am aware of the limitation of this approach. In the stock market it is difficult to control for fluctuations, especially when I cannot use many controls in my regression except for fixed effects, since the frequency required (daily) is too high for Compustat.

**Table 10.** Results from Diff-In-Diff

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Identification | excess return | excess return | excess return | excess return | excess return |
| Dummy Marks | -0.00740*** | | | | |
| 6 y.o. | | -0.00899*** | | | |
| 11 y.o. | | | -0.0106*** | | |
| 16 y.o. | | | | -0.0107*** | |
| 21 y.o. | | | | | -0.0124* |
| $R^2$ | 0.110 | 0.110 | 0.110 | 0.110 | 0.110 |

$* : p < 0.10; ** : p < 0.05; *** : p < 0.01$

## 6 Conclusion

In this paper I have analyzed how a variation in trademark protection intensity impact firms' stock market returns. The focus of the research is very short term, as I wanted to appreciate the difference overnight in the financial market.

According to my expectations, firms which benefited from trademark protection registered negative returns, indicating that they were actively using the trademarks owned and the law to protect themselves from competitors. On the other hand, those firms which did not benefited from trademark protection took advantage of the decision of the Supreme Court, as it is showed by their positive abnormal returns. Magnitude of losses and profits experienced by firms are significant. The decision of the Supreme Court seem to have had an effect across sectors, but the impact is more pronounced in the manufacturing sector, which is trademark-intensive.

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# Chapter 3

## The Role of Trademarks for Firm Strategy

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**Abstract.** Trademarks are a popular intellectual property right among firms but they have not received proper attention by academic literature so far. In this paper I try to shed light on the role they play in firm strategy. Using trademark law reforms - which strengthen trademark protection - as source of exogenous variation, I use a diff-and-diff strategy to understand which impact such reforms had on firm's profits, innovation, and market competition. Results seem to agree with Chamberlin (1933)'s predictions: trademarks do not foster innovation and competition, instead they allow firms to shirk and live on their reputation.

**Keywords:** Trademarks · Innovation · Competition

## 1 Introduction

Innovation and product introduction have been long recognised as important drivers of firm' growth (Romer, 1990; Grossman & Helpman, 1991; Aghion & Howitt, 1992; Klette & Kortum, 2004). In doing so, firms often rely on intellectual properties (IP) in order to protect their innovative processes and products. The rationale for IPs are twofold: on the one hand, firms have an ex-ante incentive to innovate and maintain high quality products so in this way enhancing their reputation; on the other hand, once they have built a good reputation, they have an ex-post incentive to slack off by exploiting it, with potential monopoly power and adverse effects for competition on the market. There are several type of IPs: copyrights, trade secrets, trademarks and patents. Economics literature has so far focused on the latter - patents -, trying to understand their role innovation, competition, and industry dinamics (Hall, Jaffe and Trajtenberg, 2001; Bessen, 2008; Trajtenberg, 1990). Instead, not much is known about how firms use trademarks and what are the implications of these IPs for firm strategy and market competition. Academic literature has had so far little interest on this type of IP. However, firms actively apply for trademarks to mark their products and maintain their reputation. Starting from the 1980's, more than 80,000 firms in the USA have applied on average for 186,000 trademarks each year.

In this paper, I want to explore the role of trademarks for firm strategy and industry dynamics: do trademarks incentivize firms to innovate and produce high quality goods or they help maintain market power hurting competition? By relying on a comprehensive American dataset on trademarks - the USPTO Trademark Case File Dataset - matched with Compustat and the USPTO dataset of

patents, I try to answer to these questions by empirically assessing the role of trademarks for firm's performance, innovation and market power. Using two sources of exogenous variation - two changes in the Trademark Law which strengthened trademark protection - I apply a difference-in-difference strategy. Findings seem to corroborate the negative view according to which trademark protection do not foster competition, but instead enhance monopoly: stronger trademark protection has a negative effect on two innovation proxies - number of patents yearly registered and r&d and - but has positive impact on profit. Furthermore, those firms which received stronger trademark protection saw also their market share increasing with respect to their competitors.

The rest of the paper is structured as follows: section 2 will be dedicated to the literature review, in section 3 I will explain what are trademarks and how firms can apply for them, in section 4 the dataset, in section 5 the research design and main specification, and in section 6 the results, in section 7 the robustness checks, in the final section the conclusion.

## 2 Literature Review

Literature on IP are mainly constituted by studies on the role played by patents for firms. There is a strand of literature suggesting that patent value - and thus probably patent quality - is positively correlated with patent citations despite some mitigating factors. Trajtenberg (1990) analyzes a particular innovation (Computed Tomography scanners) and find that there is a close association between citation-based patent indexes and independent measures of the social value of innovations in that field. Hall, Jaffe and Trajtenberg (2005) show that patent citations are positively correlated with stock market value. Bessen (2008) finds that small patentees issue much less valuable patents compared to those issued by big corporations. However, patent citations do not seem to explain much of variance in value, casting doubts on the measure of citations as patent quality.

Trademarks have not attracted much attention so far from researchers, although there are widely used by all firms across the whole economy. There is a comprehensive review by Schautschick (2015) summarizing the existing economic literature divided by topic. Regarding trends and patterns, trademarks started growing rapidly since 1975 - ten years before patents. This upward trend has been found in three different high-income countries (USA, UK and Australia) by Jensen & Webster (2004) in the period 1975-2002 with similar degree of correspondence. Possible reasons behind this surge in trademarks might be two: the demand for differentiated and higher quality products since consumers saw their incomes rising; higher production has led to the creation of more products and more firms. The authors seem to give more credit to the demand effect. Lybbert et al. (2014) show different trademark growth by level of income of the country: medium-income countries are those which experienced the fastest growth in trademarks between 2004 and 2008, then high-income countries reported an increase of 50%, and finally low-income countries saw no trademark growth at

all. Baroncelli et al. (2005) analyzes over 100 countries and find that foreign shares of trademark registrations are inversely related to the level of income per capita: countries with high level of income per capita show high dominance of domestic brands over foreign brands in the home market. The use of trademarks is not constant across sectors. The same authors show that the highest use of trademarks occurs in R&D-intensive scientific equipment and pharmaceutical sectors, and advertising-intensive manufacturing industries. Greenhalgh et al. (2003) observe that service trademarks expanded much faster than product trademarks. Jensen & Webster (2004) find strong growth in trademark applications in service industries, such as education, communication, personal services. Furthermore, trademark growth was particularly strong in those industries experiencing deregulation. Trademark intensity - defined as the stock of marks over firm sales or employment - seems to change with respect to firm size. Most studies (Greenhalgh et al., 2003; Greenhalgh & Rogers, 2008; Jensen & Webster, 2006; Rogers et al. 2007) generally agree that small and medium size firms are more trademark intensive compared to large firms, implying that firm's portfolio of intangible assets needs to be a minimum size in order to be useful. In addition to that, the trademark system appears not to put SMEs at disadvantage compared to large firms.

The empirical link between trademarks and innovation is difficult to establish because innovation is per se hard to measure. Traditionally R&D expenses have been used as a proxy, and more recently also patent counts. There are sectors where firms usually do not engage in R&D and are not able to patent their innovative process or product; on the other hand, they rely on trademarks. This is the case of the service sector for instance. Gotsch and Hipp (2012) find positive association between trademarking and innovation, but only in the knowledge-intensive and high-tech manufacturing sectors. Instead, Millot (2012) observes positive correlation between trademark activity and innovation in all sectors analyzed, while Schmoch (2003) obtains inconclusive results. Jensen & Webster (2009) show positive (even though not very high) correlations between trademarks, patents and innovation, but claim the need to distinguish these differences in correlations by sector and innovation type. Flikkema et al. (2010), using a very small sample of 660 Benelux firms, find that 60% of trademarks application refers to different types of innovation, and that most of them were filed close to the introduction of a new product in the market. Therefore, authors conclude that trademarks might be a good proxy of product innovations in the late stages of their development. About product differentiation, there is some empirical evidence showing a positive correlation with trademark activity and horizontal(variety) and vertical(quality) differentiation (Fink et al. 2005; Mangani, 2007). Jensen & Webster (2008) investigate how adding labels - disclosing unobservable attributes - to products can affect consumer demand. Results give credit to the view according to which trademarks can convey more information than just product's origin. Moreover, each additional year of existence tends to increase the demand of that product up to a certain level; beyond that point it decreases. Also, the greater the number of brands is in a single category of

products, the lower is the demand for each brand in that category. There seems to be a sort of relationship between trademarks and other types of IPs (mainly patents), but it has not been sufficiently clarified. Parchomovsky and Siegelman (2002) present five case studies arguing that firms can use trademarks to extend the protection of patents once they are expired. In doing that, they charge a lower price during the legal protection of the patent in order to create reputation and enhance consumer loyalty, and then a higher price once the protection is over. Instead, Frey (2013)[**?**] suggests that firms might use both IPs in combination in order to increase exclusivity. Llerena and Millot (2013) claim that the relationship between trademarks and patents depends on some industry characteristics: if advertising has a persistent effect, then trademarks and patents are complements; otherwise, if the effect of advertising disappears quickly, they are substitutes. Collette (2012) suggests that firms possessing strong brands and with deep pockets might use strategically trademarks opposing applications by rivals and then also delay the proceedings to burden them. Literature finds a positive relationship between trademarks and firm performance. Most common indicators of firm performance are firm survival, stock market value, profitability, and productivity. Helmers et al. (2011) observe that firms which apply for trademarks have a lower probability of exiting in the 5 years of investigation compared to those firms which do not engage in trademark applications. These results seem to agree with Schautschick (2015). There a few studies focusing on the impact of trademarks on firm market value. Greenhalgh & Rogers (2006) compares the effect of trademarking on different groups of firms: manufacturing, financial service, and utility sector. Results show a positive evidence of acquiring trademarks on firm market value, but the magnitude is greater for financial service firms, and no effect on utility sector. Griffiths & Webster (2006) report positive returns for trademarks for a sample of 300 publicly listed Australian firms. Greenhalgh & Rogers (2012) - using a sample of 1600 large and medium firms covered for the period 1996-2000 - show trademarking had a positive effect on market value in a given year for the whole sample, with some heterogeneity at the sector level agreeing with Greenhalgh & Rogers (2006). Moreover, they show that a higher trademark intensity in a given year does not imply a rise in stock market value. Interacting trademark intensity with a time trend they find that the impact of higher trademark intensity is positive in the first years but then declines over time. Fosfuri & Giarratana (2009) use trademarks as proxy for advertising and show that both product innovation and advertising of rival firms can impact on firm market value. Greenhalgh & Longland (2005) observe on sample of 740 manufacturing firms that trademark intensity has a positive impact on next year's output. This result holds also controlling for patents and R&D. Cross-section analyses reveal that trademarking is associated with permanent productivity differences between firms. Furthermore, there are also significant differences at the sector level: trademarks impact more on low-tech sectors, while R&D and patents more in high-tech sectors. Greenhalgh & Rogers (2012) report that trademarking shows a significant value-added premium for those firms which applied in the previous year. Greenhalgh & Longland (2001)

with an analysis of firm-specific effects find that there are persistent differences between firms which register trademarks and firms which do not: the former systematically employ more workers. These results seem to be confirmed also by Greenhalgh er al. (2011).

Another interesting piece of research is Heath & Mace (2020), who study the effect of stronger trademark protection on firm profits and strategy using the Federal Trademark Dilution Act (FTDA) implemented in 1996, which provided with additional protection to famous trademarks. Results point at increased profits for treated firms and a rise in trademark lawsuits. Moreover, treated firms innovate less and produce goods of lower quality.

From the theoretical point of view, there are two main arguments on the role and effect of trademarks on firms and market competition. On the one hand, there is the *positive* view, according to which trademarks foster competition and the maintenance of high-quality products by securing to the producer the benefits of good reputation. Trademark protection incentives firms to innovate and develop high-quality products, and prevents a race to the bottom, by allowing firms to distinguish their products from inferior products (Klein & Leffler, 1981; Landes & Posner, 1987). On the other hand, there is the *negative* view, which claims that trademarks do not encourage high-quality products or innovation but only foster monopoly and channel rents to incumbents (Chamberlein, 1933). In other words, firms can slack off by exploiting the good reputation they had acquired previously.

**Contribution** I enrich the literature by reinforcing and extending Heath and Mace (2020): I replicate their results (positive impact of stronger trademark protection on profits, negative impact on innovation), find the same evidence for a second trademark law introduction, and observe an effect on market competition.

## 3 What are Trademarks

A trademark is defined as "*a word, phrase, symbol, design, color, smell, sound, or combination thereof that identifies and distinguishes the goods and services of one party from those of others*".[1] Below I report examples of famous trademarks.


[1] See 15 U.S.C. § 1127.

Trademarks carry out several functions, both on the consumer and owner side. From the point of view of the consumer, they work as a source identifier, preventing confusion and preserving expectation on the quality of goods and services purchased. From the point of view of the owner, trademarks help build and maintain costumer base and reputation, and also protect enterprise's goodwill and investments therein from misappropriation by preventing one seller from free-riding on another seller's reputation by offering similar goods or services under a confusingly similar mark.

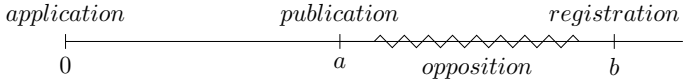
It is important to clarify the difference in trademark protection under the American common law and under the federal registration system. Under the American common law, a trademark owner has the "*the exclusive right to prevent unauthorized third parties from using the same or similar mark on goods and services where such use would likely cause confusion among consumers as to the source of the goods and services offered under the mark.*"[2]. Since infringement is treated as an act of unfair competition under common law, there is no need of any formal registration. The user of a trademark is liable if there is a likelihood of confusion from the use of the same mark or a similar one. Moreover, common law provides protection only at the regional level in which the trademark is used. The federal registration system was created in 1870 with the Federal Trade-Mark Act , but the modern system was provided by the Lanham Act in 1946, which creates legal procedures for service, certification and collective marks, and to assist owners in enforcing their rights. Registration provides additional benefits to the trademark owner: protection is guaranteed at the national level, no matter where the regional area is of use of the mark; the owner has prima facie evidence of ownership, therefore "*evidentiary presumption of an exclusive right to prevent unauthorized third parties from using the same or similar mark in a manner likely to cause consumer confusion, mistake, or deception as to the source of the goods and services*"[3]. The owner of a registered mark can file an action and - if the action is successful - can "*recover profits, statutory damages, attorney fees, and treble damages for infringement*"[4]. Furthermore, the U.S. Customs and Border Protection Service blocks the importation of those goods bearing an infringing registered mark.

There are eligibility requirements to be met in order for a trademark to be registered. In absolute terms there is no black and white here, but trademarks can be classified along a spectrum of distinctiveness. On the one hand of the spectrum there are those terms which are fanciful, arbitrary or distinctive. Fanciful terms are words adopted specifically to be used as a trademark. Arbitrary terms are words which, despite being ordinary, do not suggest any particular attribute or features of the good or service involved. A suggestive term says something of the product which is referred to but it requires imagination. Those three categories are considered inherently distinctive, therefore they are eligible for registration. On the other hand of the spectrum there are those terms that are generic or

[2] Graham et al. (2013)
[3] See 15 U.S.C. §§ 1115(a) and 1125(a).
[4] See 15 U.S.C. §§ 1121 and 1117.

descriptive. Generic terms are not eligible for registration because they miss the ability to distinguish the source of the products; for this reason they must remain free of universal use. Descriptive terms are usually not eligible because they carry some characteristics of the good or service but they not distinctive. However, if one descriptive term is used continuously and exclusively for a long period of time, it might acquire the distinctiveness needed in order to be eligible and therefore registered.

**Lifecycle of Trademark** The process of birth of a trademark is divided into three steps: application, publication, registration.



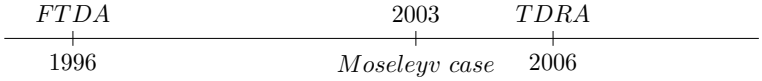

At $t = 0$, the owner files an application to register a mark with the USPTO. The application has to satisfy some legal requirements to obtain a filing date: (a) legal name of the applicant, (b) name and address for correspondence, (c) depiction of the mark, (d) the list of goods and services on top of which the owner wants to apply the mark, (e) the filing fee. If these requirements are met, the application goes through the examination process. To obtain registration, the applicant has to provide: (i) applicant's citizenship, (ii) legal basis for filing, (iii) an affidavit or a declaration of use, (iv) a specimen of the mark in use, (v) the applicant's signature[5]. With regard to the point (iv) of the registration requirements, it implies that a mark cannot obtain the registration until the owner proves that the mark is actually used in commerce. At $t = a$ if the requirements are satisfied, the mark passes the examination and is published for opposition. The opposition is the first change for third parties to directly oppose to the registering mark. During the thirty day after the publication date, a third party may file for opposition a notice of opposition with the TTAB[6]. When an opposition is filed, the owner has thirty days to file an answer with the TTAB. If the owner fails to answer, the application is abandoned. If there is no opposition or the opposition is successfully overcome, the mark is finally registered ($t = b$).

The duration of the validity of a registered trademark was 20 years until 1989; after November 16th of that year, the duration has been reduced to only 10 years. Trademarks can be renewed indefinitely. To obtain the renewal, the owner must file an acceptable affidavit or declaration of continue use or excusable non-use with the USPTO. The same procedure has to be followed in the sixth year after registration or after the renewal, plus the payment of the prescribed fees.

**Trademark Law Background** The Lanham Act in 1946 is the main statute of modern trademark law. The protection it provides is from infringement, defined

[5] 37 C.F.R. § 2.32.
[6] Trademark Trial and Appeal Board.

as "*the unauthorized use of a trademark or service mark on or in connection with goods and/or services in a manner that is likely to cause confusion, deception, or mistake about the source of the goods and/or services*"[7]. In the decades after the Lanham Act, dilution started to play an increasing role in litigation (Derenberg, 1956). Dilution is a much broader concept than infringement, which implicitly attributes to a mark more importance than the simple ability to identify the seller, but also the feelings it can evoke in consumers. Legally speaking, dilution is defined as "*weakening... a famous mark's ability to identify and distinguish goods or services regardless of competition in the marketplace*"[8]. The first attempt to regulate dilution was made in 1988 with the Trademark Law Revision Act (TLRA). However, the anti-dilution part of the law - implemented later on in the subsequent trademark reforms - was removed from the TLRA before its final approval due to freedom of speech concerns (Denicola, 1997)[9]. The first successful attempt to regulate dilution was implemented on 16th January 1996 with the Federal Trademark Dilution Act (FTDA), which expanded the trademark protection against dilution at the federal level. Before 1996, dilution was regulated at the state level in cases of proven dilution only (Oswald, 1999). FTDA explicitly granted protection against likely and not only actual dilution, meaning that the owner was not required anymore to prove that he/she had received actual damage. Last but not less important, this expansion of protection was given only to "famous" trademarks. However, since FDTA did not define the word "famous", this status of the trademark would be decided on a case-by-case basis and was obviously subjected to much debate(Becker, 2000; Dollinger, 2001). *Moseley v. V. Secret Catalogue* (March, 2003) was a turning point for the trademark law: the U.S. Supreme Court ruled that a dilution claim - in order to be successful - required proof of actual damage, killing in this way the main novelty of the FTDA. The second major development in trademark law occurred in 2006 with the Trademark Dilution Revision Act (TDRA), which basically restored the possibility of owners to sue on the basis of likely damage. Below I leave a timeline with all the major events in trademark law just mentioned.




## 4 The Dataset

This paper rests on three dataset: the USPTO Trademark Case Files Dataset, Compustat, and the USPTO dataset on patents. The USPTO Trademark Case Files Dataset contains the universe of trademarks applied and registered in the United States from 1870 to 2017. More than 8,600,000 trademarks were applied

[7] 15 U.S.C. §§1114, 1116-1118

[8] From INTA (International Trademark Association. Trademark Dilution Factsheet).

[9] Failure is attributable in part to the opposition of Congressman Robert Kastenmeier, and in part to the absence of interest in trademark protection in foreign markets.

over that period, and more than 5,000,000 were eventually registered. For each application, there are attached information such as owner (firm name), filing date, publication date, registration date, cancellation date, the text of the mark, classes of products on which it is applied, product lines on which it is applied. Since the USPTO Trademark Case Files Dataset does not have firms' balance sheet, I matched it with Compustat, which is a dataset containing financial information on American publicly listed firms. Finally, for the patents I rely on the USPTO dataset on parents.

The match contains 225,108 firm-years and 10,844 firms. Accounting variables are winsorized at the 1% and 99% level. The sample includes all those firms which over the period covered had applied for at least one trademark. I am not interested in those firms not possessing trademarks because they probably do not represent a good control group. Firms possessing "famous" trademarks[10] are generally bigger, employ more workers, hold more trademarks, invest more in R&D and register more patents.

## 5 Research Design and Main Specification

Since the objective is to study the impact of trademark protection on firm performance and market power, I borrow the Heath & Mace (2020)'s approach. I exploit the variation in trademark law protection on a subset of firms, and use this variation for my difference-in-difference strategy. However, while in Heath & Mace (2020) there is only one variation, this time there are three of them. The first one is FTDA in 1996, which extended trademark protection against dilution but only to those firms possessing "famous" marks; therefore the FTDA is the treatment and the firms possessing "famous" marks the treated group. The control group consists of those firms which still have trademarks, but they are not considered "famous". The second variation in trademark protection is in 2003 with the *Moseley v. V. Secret Catalogue*, which nullified the FTDA. Therefore the first treatment is from 1996 up to 2002. The third variation is in 2006 with the TDRA, which reinforced again the trademark protection, so the second treatment is from 2006 to 2015.

As mentioned before, unfortunately the law does not define the word "famous", for this reason I need to find a way to identify the treated firms - those firms possessing "famous" trademarks. Whatever identification strategy I choose is going to create both false positives and false negatives. However, both kind of errors are errors-in-variables in the research design and therefore they might lead only to a downward bias - and not to a upward bias - of the estimate. This is good news because the only risk is to find no difference between treated and control firms, as long as these errors are not correlated with changes in outcome variables around the FTDA and the TDRA. I choose a "fuzzy" identification, using the renewal event of trademarks. Since famous trademarks are likely to stay for a long period on the market because they support and enhance firm

[10] More about the definition of "famous" trademarks in the next section.

reputation, they are likely to be renewed. For this reason, I consider "famous" those trademarks which have been renewed for at least once - and at least twice -, so they have to be at least 11 years old - and 21 years old. So, if we consider the first trademark reform (FTDA), since it was implemented in 1996 I classify a firm as treated if it possesses at least one famous trademarks the year before the introduction of the FTDA (1995). The trademark will be classified as famous if it was registered in 1984 or earlier (for 11 years) - and in 1974 or earlier (for 21 years)-. Instead, if we take into account the second reform (TDRA), the firm will be considered treated if it possesses at least one famous trademark in 2005, and a trademark will be classified as famous if it was registered in 1994 or earlier (for 11 years) - and in 1984 or earlier (for 21 years)-.

For the identification strategy to be valid, the trends of treated and control firms would not have changed if the two reforms had not been implemented. Since there had been already an attempt to regulate dilution in 1988 with the TLRA, one could argue that the FTDA approved in 1996 was not totally unexpected by firms. However, the firms could not know in advance if they benefited or not from dilution protection because the status of "famous" trademark is to be decided by the judge.

That being said, here is the main specification of my difference-in-difference equation:

$$Y_{it} = \beta * postFTDA_t \ * \ famous1995TM_i + \gamma X_{it} + \theta_i + \phi_t + \eta_m + \epsilon_i t$$

where $Y_{it}$ is the response variable, which will be in turn R&D, flow of new patents registered per year, ROA, ratio of firm sales on total sales at the sector level; $postFTDA_t$ is the treatment, which is a dummy equal to 1 over the period when the FTDA was valid [11]; $famous1995TM_i$ is the treated, and it is a dummy equal to 1 if the firm possessed a "famous" trademark the year before the introduction of the law (in this case 1995) [12]; $X_{it}$ are firm-year controls; $\theta_i$, $\phi_t$ and $\eta_m$ are firm, year and sector fixed effects. In the regressions, the product between the treatment and the treated variables will be named $interactionFTDA$, so $interactionFTDA = postFTDA_t * famous1995TM_i$[13].

**Expectations** Depending on the theoretical view on trademarks considered, I can form different expectations. On the one hand, if the *positive* view (Klein and Leffler, 1981;Landes and Posner, 1987) prevails, I expect a positive impact of stronger trademark protection on the flow of new trademarks registered each year, innovation, profit and competition. On the other hand, if the *negative* view (Chamberlin, 1933) I expect a negative impact on the flow of new trademarks

[11] In case the reform considered is the TDRA, the variable is named $postTDRA_t$, and it is a dummy equal to 1 over the period when the TDRA was valid.

[12] In the case I consider the 2005 as the year before the introduction of the law where I measure if a firm possessed or not a famous trademark, the variable is called $famous2005TM_i$.

[13] When taking into account the second reform, the equation will be $interactionTDRA = postTDRA_t * famous2005TM_i$

registered each year, innovation and competition, but a positive impact on firm profit.

## 6 Results

Below I report results divided by response variable.

### 6.1 Effect on Innovation

Table 1 reports the impact of stronger trademark protection on the stock of new patents registered yearly (proxy for innovation). Column (1) uses firm, year and sector fixed effects, but no controls. Sector fixed effects are defined at the NAICS level. Since I am assessing the effect on the first trademark reform (FTDA), the period covered is restricted from 1989 up to 2002 (one year before the *Moseley v.* case. The period covered by the treatment goes from 1996 up to 2002. The coefficient for the explanatory variable $interactionFTDA_1$ is statistically significant and negative, meaning that stronger trademark protection had a negative effect on innovation. In column (2) I add some controls - the logarithm of sales, the age of firms, and the logarithm of the stock of valid trademarks currently hold by the firm. The magnitude of the coefficient for the explanatory variable decreases but the sign stays the same, and remains still significant a the 1% level.

**Table 1.** Regression table

| | (1) | (2) |
|---|---|---|
| | l_patent2 | l_patent2 |
| interactionFTDA_1 | -0.201*** | -0.0427* |
| | (-10.50) | (-2.19) |
| log_sales | | 0.0504*** |
| | | (11.03) |
| age | | -0.000771 |
| | | (-1.88) |
| l_stock_w | | 0.370*** |
| | | (39.35) |
| _cons | 1.229*** | 0.463*** |
| | (270.95) | (17.66) |
| *N* | 43512 | 41157 |

*t* statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

In table 2 I run the same regressions but this time using as treatment the second trademark reform (TDRA). For this reason, now the time period goes

from 2003 up to 2015. The period covered by the treatment is from 2006 up to 2015. The response variable is the same. Results go in the same direction as the ones in table 1, but magnitude are somewhat greater.

**Table 2.** Regression table

| | (1) | (2) |
|---|---|---|
| | l_patent2 | l_patent2 |
| interactionTDRA_1 | -0.306*** | -0.127*** |
| | (-12.47) | (-5.06) |
| log_sales | | 0.0327*** |
| | | (5.07) |
| age | | -0.000448 |
| | | (-0.79) |
| l_stock_w | | 0.356*** |
| | | (27.94) |
| _cons | 1.915*** | 0.966*** |
| | (220.47) | (21.58) |
| *N* | 31845 | 30871 |

*t* statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Now I follow the same approach but I change the proxy for innovation (the response variable). R&D is firm expenditure which has been extensively used in the literature as proxy for innovation. I first analyze the impact of the first trademark reform (FTDA) on R&D expenditure. Fixed effects and controls - in column (2) - are the same as in the previous tables. Stronger trademark protection seems to have a negative impact also on this second proxy for innovation, since coefficient is negative and statistically significant. Results are reported in table 3.

For the TDRA results are unfortunately not completely satisfying. While the coefficient for $interactionTDRA_1$ is negative and statically significant in column (1), the magnitude is substantially smaller. Furthermore, in column (2) the magnitude decreases almost to zero, and more importantly, the coefficient is not statistically significant anymore. I tried (unsuccessfully) to change or substitute controls, but results do not change.

To sum up, there is probably enough evidence to claim that the two trademark reforms - FTDA and TDRA - did have an impact on innovation of firms, and that this impact is negative. The reason behind this finding might be that those firms, which possessed famous trademarks and therefore could benefit from stronger protection, did not have the incentive to innovate because they didn't

**Table 3.** Regression table

| | (1) l_rd | (2) l_rd |
|---|---|---|
| interactionFTDA_1 | -0.261*** | -0.132*** |
| | (-18.18) | (-9.88) |
| log_sales | | 0.204*** |
| | | (67.33) |
| age | | -0.0000863 |
| | | (-0.30) |
| l_stock_w | | 0.0555*** |
| | | (8.71) |
| _cons | 2.223*** | 1.237*** |
| | (663.12) | (74.70) |
| *N* | 28215 | 28214 |

*t* statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

**Table 4.** Regression table

| | (1) l_rd | (2) l_rd |
|---|---|---|
| interactionTDRA_1 | -0.0530*** | -0.000146 |
| | (-3.80) | (-0.01) |
| log_sales | | 0.160*** |
| | | (50.10) |
| age | | -0.000586 |
| | | (-1.85) |
| _cons | 2.949*** | 2.129*** |
| | (622.95) | (120.72) |
| *N* | 22235 | 22235 |

*t* statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

feel anymore threatened by other competitors. Hence, they spent less in R&D and registered less patents.

### 6.2 Effect on Profit

Table 5 and table 6 report respectively the results for the first (FTDA) and the second reform (TDRA). I follow the same approach as for innovation. In both cases, in column (1) the coefficient for the explanatory variable is not significant - despite being very close in the TDRA case (p = 0.05) -; however, when I add controls, it turns significant and maintain the positive sign. Therefore, while those firms benefiting from the stronger trademark protection did not innovate over this period, they were capable of increasing their profit.

**Table 5.** Regression table

| | (1) roa | (2) roa |
|---|---|---|
| interactionFTDA_1 | 0.00536 | 0.0297** |
| | (0.52) | (2.85) |
| log_sales | | 0.0751*** |
| | | (30.74) |
| age | | 0.000284 |
| | | (1.30) |
| l_stock_w | | -0.0255*** |
| | | (-5.07) |
| _cons | -0.106*** | -0.430*** |
| | (-42.16) | (-30.68) |
| *N* | 41147 | 41135 |

*t* statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

### 6.3 Effect on Competition

Finally, I try to observe any effect at the market level. Therefore, I try to measure if those firms owning famous trademarks had their market share increased during the period covered by the treatment. The response variable is the logarithm of the market share of a treated firm, where market share is defined as the sales of the treated firm over the total sales at the sector level (NAICS 4-digit). Unfortunately, results are not significant for the first reform (FTDA), for this reason they are not reported. Instead, table 7 reports outcomes for TDRA: magnitudes are tiny but positive and statistically significant.

**Table 6.** Regression table

| | (1) roa | (2) roa |
|---|---|---|
| interactionTDRA_1 | 0.0917 | 0.123* |
| | (1.96) | (2.54) |
| log_sales | | 0.0870*** |
| | | (7.06) |
| age | | -0.000566 |
| | | (-0.52) |
| l_stock_w | | 0.0133 |
| | | (0.55) |
| _cons | -0.192*** | -0.700*** |
| | (-11.39) | (-8.17) |
| *N* | 30862 | 30862 |

*t* statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

**Table 7.** Regression table

| | (1) firm_mkt_sh_4 | (2) l_mkt_sh_4 |
|---|---|---|
| interactionTDRA_1 | 0.00347** | 0.00206** |
| | (3.06) | (2.59) |
| _cons | 0.0602*** | 0.0510*** |
| | (151.98) | (183.44) |
| *N* | 28050 | 28050 |

*t* statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

## 7 Robustness Checks

In this section I try to perform two kinds of robustness check. In the first instance I perform the same regressions I have done above but using a finer definition for "famous" trademark. In the second instance, I operate two placebo tests.

### 7.1 Finer Definition for "Famous" Trademark

Since the law does not explicitly define the requirements for a trademark in order to be considered "famous", I arbitrarily chose one renewal as requirement, therefore the trademark has to be at least 11 years old. The ratio behind this choice is that only those trademarks which are successful - and hence famous - are renewed, because it is a costly operation. Now I increase to minimum duration of life for a trademark in order to be considered famous: from 11 to 21 years (two renewals). Unfortunately this has a cost: there are not anymore enough treated firms with regard to the first trademark reform (FTDA). Out of 5,334 firms, I am left with only 59 treated firms - so 59 firms possessing at least one famous trademark the year before the introduction of the law - which is 1995 -, therefore there is not probably enough statistical power to obtain significant results. The reason behind this incredibly low number of treated firms has to do with the long term growth trend of trademarks. Before the eighties, trademarks (and patents) were not that popular, so the stock of valid marks possessed by firms and the flow of new marks registered each year were of small sizes. Since now the requirement is 21 years, and the count for the requirement starts in 1995, it means that a trademark has to be registered in 1974 or before in order to be considered as "famous". To give an idea, less than 20,000 trademarks were registered each year by the universe of US firms during the sixties. That number more than tripled in the eighties. In the sample the difference is even more striking: from 1270 marks registered per year in 1965 to more than 9000 in 1985. Instead, I don't find the same problem with the second trademark law reform (TDRA) because, since the TDRA was implemented in 2006, the first year from which a mark might be considered "famous" is 1984, a time when trademarks were booming.

Results are in line with the original series of regression: negative and significant coefficient both for R&D and patents at 1% level (table 8 and 9), and positive and significant at 5% for ROA when I add controls (table 10). Regarding market share, this time the coefficient is positive and significant only for the normal form and not for the logarithmic.

### 7.2 Placebo Test

Aiming at reinforcing the findings, I perform two types of placebo test. Firstly, I run the regressions using as treatment the TLRA, a trademark law reform approved in 1988 where the part of legislation against dilution was removed before the introduction. For this reason, I expect no effect at all on patents, R&D and ROA because this law did not strengthen trademark protection. Secondly,I run again the same regressions using as fake treatment the period 2003-2005,

**Table 8.** Regression table

| | (1) l_rd | (2) l_rd |
|---|---|---|
| interactionTDRA | -0.127*** | -0.0471** |
| | (-7.23) | (-2.81) |
| log_sales | | 0.154*** |
| | | (48.00) |
| age | | -0.000575 |
| | | (-1.83) |
| l_stock_w | | 0.0712*** |
| | | (10.41) |
| _cons | 2.950*** | 2.013*** |
| | (829.89) | (94.84) |
| *N* | 22235 | 22235 |

*t* statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

**Table 9.** Regression table

| | (1) l_patent2 | (2) l_patent2 |
|---|---|---|
| interactionTDRA | -0.354*** | -0.184*** |
| | (-11.71) | (-6.07) |
| log_sales | | 0.0328*** |
| | | (5.10) |
| age | | -0.000460 |
| | | (-0.81) |
| l_stock_w | | 0.358*** |
| | | (28.35) |
| _cons | 1.875*** | 0.950*** |
| | (288.53) | (21.93) |
| *N* | 31845 | 30871 |

*t* statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

**Table 10.** Regression table

| | (1) roa | (2) roa |
|---|---|---|
| interactionTDRA | 0.104 | 0.130* |
| | (1.82) | (2.24) |
| log_sales | | 0.0865*** |
| | | (7.02) |
| age | | -0.000558 |
| | | (-0.51) |
| l_stock_w | | 0.00870 |
| | | (0.36) |
| _cons | -0.179*** | -0.669*** |
| | (-14.35) | (-8.07) |
| *N* | 30862 | 30862 |

*t* statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

**Table 11.** Regression table

| | (1) firm_mkt_sh_4 | (2) l_mkt_sh_4 |
|---|---|---|
| interactionTDRA | 0.00277* | 0.00158 |
| | (2.08) | (1.69) |
| _cons | 0.0630*** | 0.0530*** |
| | (217.18) | (260.19) |
| *N* | 30871 | 30871 |

*t* statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

time in which the dilution protection was weakened with respect to the FTDA thanks to the decision of the Supreme Court. Only in 2006 the situation will be restored with the introduction of the TDRA. In this case, I expect instead positive impact on the treatment on patents and R&D, and negative on ROA.

In table 12 I report results for the first placebo test. Now the specification for the independent variable is $interactionTLRA = postTLRA_t * famous1987TMi$ As expected, the coefficient is never significant. That is perfectly fine because those firms possessing famous trademarks did not receive additional protection in 1988 with the TLRA, so there is no impact on any of the response variables.

**Table 12.** Regression table

| | (1) | (2) | (3) |
|---|---|---|---|
| | l_rd | l_patent2 | roa |
| interactionTLRA | -0.0329 | 0.00678 | -0.0152 |
| | (-0.73) | (0.11) | (-0.47) |
| log_sales | 0.211*** | 0.0544*** | 0.0732*** |
| | (71.01) | (12.25) | (31.64) |
| age | 0.000379 | 0.000393 | -0.0000316 |
| | (1.35) | (0.98) | (-0.15) |
| l_stock_w | 0.0656*** | 0.379*** | -0.0270*** |
| | (10.86) | (42.52) | (-5.82) |
| _cons | 1.149*** | 0.401*** | -0.406*** |
| | (74.11) | (16.31) | (-31.72) |
| *N* | 29671 | 43414 | 43388 |

*t* statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 13 reports outcomes for the second placebo test. The independent variable is $interactionCOURT = postCOURT_t * famous2002TMi$. This time the coefficient in column (3) - ROA - is negative and significant: it makes sense because those firms owning famous trademarks cannot benefit anymore from stronger protection. For the same reason, they need to start innovating again, therefore the coefficient for patents is positive and significant. The coefficient for R&D is almost zero and not significant. This appears puzzling and I don't have a clear explanation for that. Maybe R&D are long term investments and firms need more time to start investing in this kind of innovation.

**Table 13.** Regression table

| | (1) l_rd | (2) l_patent2 | (3) roa |
|---|---|---|---|
| interactionCOURT | -0.000463 | 0.165*** | -0.106* |
| | (-0.03) | (6.46) | (-2.17) |
| log_sales | 0.155*** | 0.0322*** | 0.0869*** |
| | (48.08) | (5.00) | (7.05) |
| age | -0.000395 | 0.0000875 | -0.00117 |
| | (-1.26) | (0.16) | (-1.09) |
| l_stock_w | 0.0744*** | 0.354*** | 0.0106 |
| | (10.81) | (27.86) | (0.43) |
| _cons | 1.996*** | 0.910*** | -0.636*** |
| | (96.27) | (21.50) | (-7.85) |
| *N* | 22235 | 30871 | 30862 |

*t* statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

## 8 Conclusion

In this paper I tried to study the role that trademarks play in firm strategy. Specifically, I analysed the impact that stronger trademark protection might have on firm's profits and innovation. Following Heath & Mace (2020)'s approach, I use two trademark law reforms - the FTDA and the TDRA - as sources of exogenous variation for my diff-and-diff strategy. Results are in accordance to the theoretical prediction of Chamberlin (1933): when firms have already a privileged position in the market (larger and with famous trademarks with respect to their competitors), trademarks do not seem to foster competition and innovation if the law on trademark protection were to strengthen. Those firms which benefited from additional protection innovate less - less investments in R&D, less registrations of patents - but at the same time they were able to increase profits - higher ROA. Furthermore, those firms succeeded in getting a larger share of the sector of the market. What is not clear is how this treated firms were able to increase profits despite their lacking willingness to innovate. Did they exploit their reputation? Is this advantage which treated firms benefit from going to last in time or is it going to fade out? Moreover, how the portfolio of trademarks changes when such reforms are introduced? Does the firm extend its already famous trademarks or does it come up with new marks? The USPTO Trademark Casefiles dataset can possibly help explain part of this questions. There is also space for policy implications: if such reforms have this effect on the industry dynamics, the policymaker should have this on top of her mind when thinking about changing the intensity of trademark protection, because she could guess in advance which will be the winners and the losers.

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