



# The market value of R&D, patents, and trademarks

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## ABSTRACT

This paper investigates the effects of trademarks on the market value of firms. The results show that trademarks have a positive effect on firm value. Next, the firms' market values are regressed on indicators of trademark value such as trademark seniorities, the number of oppositions filed, and the number of product and services classes covered. We found that they at least partially reflect trademark value.

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## 1. Introduction

Firms are organizations that combine a broad range of different assets and resources to develop, manufacture, and sell their products. Besides tangible assets such as property, plants and equipment, firms have intangible assets that become increasingly important. Intangible assets include, among others, knowledge assets, customer networks, brands, and reputation. Financial investors assess firms' tangible and intangible assets and form expectations about their future performance. Prior research has found that knowledge assets such as R&D investments and patents contribute to company values in financial markets (e.g., *Blundell et al., 1999; Cockburn and Griliches, 1988; Griliches, 1981; Hall et al., 2005*). With few exceptions (*Bosworth and Rogers, 2001; Greenhalgh and Rogers, 2006, 2007*), trademark rights were not considered in the discourse of evaluating the economic value of intangible assets. While patents are regularly and extensively investigated in the field of industrial organization, this is not the case for trademarks although related issues such as product differentiation, product positioning, brands, and advertising have been considered (*Cabral, 2000a; Church and Ware, 2006; Tirole, 2003*). *Graham and Somaya (2006)* and *Mendonça et al. (2004)* also note

that the paucity of research on trademarks is surprising given their importance for companies to protect their brands.

Trademarks are important to companies because they protect brands that enable consumers to identify the products of one company and to distinguish them from those of competing businesses (*Besen and Raskind, 1991; Landes and Posner, 1987*). Brands provide incentives for firms to offer products of a consistent and reliable quality (*Cabral, 2000b; Economides, 1988; Landes and Posner, 1987*). The importance of trademarks is documented in the immense number of trademark applications. At the end of 2007, over 640 000 applications for Community Trademarks (CTM) have been filed with the Office for Harmonization in the Internal Market (OHIM), of which approximately 420 000 became registered (*OHIM, 2007*).<sup>2</sup>

The objective of this study is to assess the economic value of trademarks while controlling for other intangible assets such as patents and R&D. A further aim of this work is to scrutinize the economic relevance of several trademark indicators expected to reflect trademark value. These indicators are obtained from publicly available trademark data and can thus be widely applied. They are: (i) Nice classes informing about the breadth of trademarks, (ii) seniorities reflecting the familiarity of the consuming public with

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<sup>2</sup> The CTM is valid in all member states of the EU. The CTM system was established by the Regulation No. 40/94 of the European Council (1993). According to this act, the OHIM which administers the CTM system commenced trademark examination operations in 1996.

trademarks, (iii) oppositions brought against rivals indicating the intensity with which a company protects its presumably valuable brand assets, and (iv) oppositions received from rivals reflecting third parties' honoring of the potential value of owned trademarks.

To analyze the economic value of trademarks, the market value approach (Griliches, 1981; Hall et al., 2005, 2007) is further developed to incorporate trademarks and their value indicators. The value indicators were initially presented by Von Graevenitz (2007), who used them to determine trademark opposition outcomes. To corroborate the applicability of these indicators to trademarks, reference is made to the patent literature since research in this area has already led to the development of several patent value indicators drawn from publicly available patent data. We compile a comprehensive dataset including the world's largest publicly traded corporations. In addition to annual accounting and financial data, firm-level intellectual property (IP) portfolios are constructed comprising both trademarks and patents. The IP rights considered in these portfolios are European Patents issued by the European Patent Office (EPO) and CTMs granted by the OHIM. European Patents and CTMs roughly cover the same geographical area.<sup>3</sup> Regarding patents, we use citations to account for the greatly dispersed patent value (Harhoff et al., 1999). The dataset employed to estimate the market value equation has the structure of an unbalanced panel and comprises 6757 observations of 1216 companies for the years 1996 through 2002.

The results indicate that R&D, patents, and trademarks are economically valued by the stock market. Investments into R&D and patents were both positively associated with Tobin's  $q$ . However, it was found that investors primarily value those patents that receive a lot of citations. The contribution of trademarks to firms' market values was very robust, too. Investors clearly assigned a higher value to companies with larger trademark portfolios. Trademark value indicators were found to add further value as demonstrated by the following observations. First, trademarks are found to be of higher value if they are well established as indicated by seniority claims. Second, companies that defend their trademark portfolio more vigorously are more highly valued. This renders trademark oppositions economically relevant and shows that companies, which lodge many oppositions against others, seek to protect the value of their brand assets. The results are claimed to be representative for large stock exchange-listed corporations. As an IP right, trademarks are registrable for the entire product and service space (Greenhalgh and Rogers, 2010). This is in contrast to patents, which are concentrated in technology-related industries.

The remainder of this study is divided into five sections. Section 2 provides information about trademark law and information about trademarks as IP rights to protect marketing assets. Section 3 presents the market value approach. Drawing on previous studies on the market valuation of knowledge assets, it describes the method used to estimate the economic value of trademarks using financial and accounting data. Section 4 presents the data and describes the variables while Section 5 reports the results of estimating the market value equations. Section 6 concludes.

<sup>3</sup> The CTM has been created as a pan-EU IP right through Council Regulation 40/94. This regulation established a unitary trademark system with a single procedure and unified rules for the EU territory. The situation is comparable to patents. The European Patent Convention (EPC) resulted in setting up the EPO and a gradual harmonization of national patent laws. It is important to note that a European Patent is not a unitary pan-EU right but rather a bundle of national patent rights. Interestingly, the EPC is not – as with setting up the OHIM – a European initiative but a multilateral treaty. Thus, the countries covered by the EPC are not coterminous with the territory of the EU so that Switzerland, for example, is embraced by European Patents but not by CTMs.

## 2. Background information about trademarks

This section provides background information about trademarks and discusses what trademarks measure. The first part introduces trademark law; the second part discusses the function of trademarks as a means to protect brands and marketing assets; the third part compares trademarks with patents; the final part summarizes.

### 2.1. Trademark law

Trademark law has three main requirements for establishing a valid trademark right (European Council, 1993, Art. 4, and Art. 7). First, a trademark can be any sign that is capable of being represented graphically. Naturally, words and graphical signs (e.g., logos or symbols) fulfill this condition. Three-dimensional shapes, colors, and even sounds are, in principle, also registrable as long as they can be graphically represented (Mendonça et al., 2004). The second requirement is distinctiveness, which means that customers are able to recognize a sign as being a trademark and distinguish it from other trademarks within an appropriately defined product category (Besen and Raskind, 1991; Landes and Posner, 1987). Thus, the concept of distinctiveness ensures that a sign, for which protection is sought, is neither identical nor too similar to other already existing IP rights (Besen and Raskind, 1991; European Council, 1993, Art. 8). The third requirement concerns absolute grounds for refusal and, for example, guarantees that generic words or signs cannot be registered (European Council, 1993, Art. 7).<sup>4</sup> Trademarks can be viewed as direct commercial links between a company and its actual and prospective customers (Economides, 1988; Malmberg, 2005; Phillips, 2003). A prominent example is *Intel*. With its slogan *Intel Inside*, it built a strong and direct connection to its end customers thereby bridging downstream distributors (Afuah, 1999).

The rights conferred by valid trademark registrations endow owners with legal instruments to preserve their trademarks' exclusivity (European Council, 1993, Art. 9). These rights primarily allow a trademark holder to prevent others from counterfeiting or taking unfair advantage of the trademark. Moreover, to maintain the distinctiveness of an existing trademark, owners can file oppositions if they find that a third party's trademark application is too similar or even identical to their own (European Council, 1993, Art. 8, and Art. 42; Phillips, 2003; Von Graevenitz, 2007). A successful opposition leads to the rejection of a hostile trademark application. Trademark registrations are valid for 10 years and must be renewed thereafter. However, unlike patents, they can be renewed over and over. Once a trademark is registered, a competitor can file an application for a cancellation at the trademark office. The statistics of OHIM (2007), however, show that this instrument is much less frequently used compared to oppositions, which are filed *before* a trademark is granted.<sup>5</sup>

### 2.2. Trademarks as a means to protect brands and marketing assets

We argue in this paper that trademarks serve to protect brands and marketing assets. The American Marketing Association (1960) defines a brand as a "name, term, sign, symbol, or design, or a combination of them, intended to identify the goods or services of one seller or group of sellers and to differentiate them from those of

<sup>4</sup> Thus, the word *Apple* does not qualify for registration as applied to food because it is a generic term with regard to this product category. Yet, it is eligible for protection when used for computers.

<sup>5</sup> From 1996 to 2006, the OHIM recorded 3861 applications for cancellations, whereas it recorded 108 838 oppositions during the same period.

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