



## Trademarking status and economic efficiency among commercial banks: Some evidence for the UK



Meryem Duygun<sup>a</sup>, Vania Sena<sup>b,\*</sup>, Mohamed Shaban<sup>a</sup>

<sup>a</sup> School of Management, University of Leicester, United Kingdom

<sup>b</sup> Essex Business School, University of Essex, United Kingdom

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### ABSTRACT

As competition in the banking sector has intensified over the last two decades, commercial banks have started to use trademarks to differentiate their products and services from those offered by their competitors. Less clear are the implications of the trademarking activities on the commercial banks' performance. In this paper, we compare the cost and profit efficiency of trademarking and non-trademarking banks in the UK, over the period 2001–2013 using stochastic frontier methods. We use Propensity Score Matching techniques to identify a sample of non-trademarking banks which share the same characteristics as the trademarking banks to ensure that variations in the efficiency between the commercial banks in our sample can be attributed to their trademarking status only. We then explicitly test the hypothesis that trademarking and non-trademarking banks share the same cost and profit frontiers. We cannot reject the hypothesis of a common cost and profit frontier. We also find that trademarking banks tend to be more profit efficient than non-trademarking banks while there is no significant difference between the cost efficiency scores of trademarking and non-trademarking banks.

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### 1. Introduction

Since the nineties, the European banking sector has been substantially deregulated and liberalised so to better integrate the national banking markets and improve their competitiveness (Cetorelli, 2004). Researchers agree that the deregulation process did increase competition across the industry along several dimensions (Cetorelli, 2004). For instance, the deregulation of interest rates and the abolition of credit ceilings intensified price competition while the lifting of the restrictions on cross-border activities allowed national and foreign banks to compete directly.

As a result of the more competitive environment they had to face, commercial banks across Europe started to compete not only by altering the price of their products but also by offering a wider range of products and services, so to be able to attract new customers (Goddard et al., 2001). At the same time, they also started to make a more extensive use of trademarks<sup>1</sup> in an attempt to differentiate their products and services from those offered by their competitors while at the same time signalling their quality and

distinctiveness. This increasing trademarking activity among banks is well documented for the UK. For instance, Greenhalgh and Rogers (2006) reported a surge of the trademarking activity in the financial services sector at the same time as the sector started to grow and competition intensified.

Despite the extensive use of trademarks among banks, very little is known about the actual impact of the trademarking activity on their performance. A couple of studies have focused on the association between the trademarking activity of commercial banks and their market value and have discovered that there exists a positive association between the value of the Tobin's  $q$  among commercial banks and their trademarking activity (Gonzalez-Pedraz and Mayordomo, 2011; Greenhalgh and Rogers, 2006; Greenhalgh and Rogers, 2006). However, trademarking may affect other dimensions of a bank's performance. For instance, by signalling the quality of the products offered by a bank, trademarks may help boost their demand with a positive impact on the bank's profits and possibly its profit efficiency. Equally, trademarks associated to products that allow a bank to reduce its costs may contribute to improve its cost efficiency. However, in spite of its potential importance and interest, so far there has been no research on the role that trademarking can play in improving the economic efficiency of a commercial bank.

\* Corresponding author. Tel.: +44 01702 368600.

E-mail address: [vsena@essex.ac.uk](mailto:vsena@essex.ac.uk) (V. Sena).

<sup>1</sup> A trademark is defined as any sign (a word, a logo, a phrase, etc.) which makes the goods or the services offered by a firm distinctive.

Against this background, the purpose of this paper is to fill this gap in the banking literature and compare the economic efficiency of trademarking and non-trademarking banks so to quantify the gain in efficiency a bank may experience as a result of its trademarking activity. Our analysis is conducted on an unbalanced panel of UK commercial banks, observed over the period 2001–2013 and we use the so-called “frontier” approach to the measurement of economic efficiency (Kumbhakar and Lovell, 2000).

Traditionally, the banking literature has focused on the concept of cost efficiency (Berger and Mester, 1997); however, as the main objective of a bank is to maximise its profits, fulfilling this goal requires that not only costs are minimised but that revenues are maximised as well. As pointed out by Maudos et al. (2002), computing profit efficiency, therefore, may be more interesting than just estimating cost efficiency. For instance, higher levels of profit inefficiency than of cost inefficiency may suggest some inefficiency either due to the wrong choice of output or to the mispricing of output (Berger and Mester, 1997; Rogers, 1998; Maudos et al., 2002). For these reasons, in our analysis we will focus on both cost and profit efficiency.

Comparing the efficiency (either cost or profit efficiency) of trademarking and non-trademarking commercial banks poses interesting challenges. The use of frontier analysis requires that the units under observation share the same frontier so that (in our case) differences among the efficiency scores of the two groups can be simply attributed to their trademarking status. However, it can be argued that trademarking banks may have access to a better technology which allows them to produce more innovative products and/or services which may boost their profits (or reduce their costs) and make them more profit (cost) efficient. If so, imposing a common (cost or profit) frontier to both trademarking and non-trademarking banks without controlling for their trademarking status may not be acceptable. At the same time, to be able to attribute changes of the banks' performance to their trademarking status only, we need to ensure that the trademarking and non-trademarking banks we analyse share the same characteristics (apart from for the trademarking status) in such a way that variations in efficiency among the two groups of banks can only be attributed to whether they trademark or not.

To address these issues, we use the following procedure. First of all, we use a class of matching models called Propensity Score Matching (PSM) – first proposed by Rosenbaum and Rubin (1983) – to identify among the non-trademarking banks a subset of banks whose main characteristics are similar to those of the trademarking banks. This procedure involves the estimation of a bank's trademarking propensity (propensity score) over a set of bank's characteristics. A non-trademarking bank is then selected as a match to the trademarking bank, using the radius matching method proposed by Deheja and Wahba (2002).

Second, we run a formal test of the common frontier assumption; to this purpose, we estimate the stochastic frontier model proposed by Greene (2005) which allows inefficiency to vary over time while at the same time allowing to disentangle inefficiency from the bank's fixed effects. When estimating the frontier models, we will formally test whether trademarking and non-trademarking banks share a common cost (profit) frontier by introducing a dummy variable controlling for the trademarking status in the frontier models and then testing whether it is significant or not.

Our results show that: (a) the assumption of a common cost and alternative profit frontiers for trademarking and non-trademarking banks cannot be rejected (although there exists some circumstantial evidence that the assumption of a common alternative profit frontier may be rejected for the period before 2008); (b) trademarking banks tend to be more profit efficient: the mean score for the trademarking banks is 0.90 while the average score for non-trademarking banks is 0.83. The mean cost efficiency of

trademarking banks (which is 0.99) is not significantly different from that of the non-trademarking banks (0.97).

The structure of the paper is the following. Section 2 reviews the small empirical literature on trademarking and firms' performance. Section 3 focuses on the empirical methodology as well as the data-sets and the measurement of the variables. The empirical results are presented in Section 4. Finally, Section 5 offers some conclusions.

## 2. Trademarking activity and performance

As mentioned above, a trademark is defined as any sign (a word, a logo, a phrase, etc.) which makes distinctive the goods or the services offered by a firm and, therefore, it allows consumers to differentiate among several goods. The key requirement for a new trademark to be registered is the novelty of the sign itself, which must not be similar to any other registered trademark. Once a trademark is successfully registered, the owner has the exclusive rights to use the trademark for the goods (or services) the sign refers to. To obtain a trademark, a UK-based firm faces two options: (a) it can file a trademark registration with the UK Intellectual Property Office (UKIPO) which offers protection only in the UK or (b) it has to apply for a more expensive Community Trademark which has the advantage of covering all the EU countries. In both cases, applications for trademarks are examined and published allowing a period of time for objections before the trademarks are fully registered. Trademark rights must be maintained through the actual use of the trademark. If they are not used, they may be removed from the register after a certain period of time.

In spite of the fact that they are widely used by firms to complement patents when protecting their intellectual property, economists have suggested that there may be other reasons which explain the widespread use of trademarks among firms. For instance, Landes and Posner (1987) suggest that firms which engage in constant product differentiation use trademarks to guarantee the commercial origin of a good (or service) and to increase their customers' loyalty. More specifically, trademarks can facilitate consumer choice in the case of *experience goods* (frequently bought goods) and may signal the quality of goods which are not bought frequently (*search goods*). In this respect, trademarks are especially important for firms from the service sectors, as customers cannot test the products before buying them and therefore, they may need additional information about the quality of the product (Elliott and Percy, 2006).<sup>2</sup>

In spite of the fact that they are widely used, the empirical literature on trademarks is very small. Empirically, only a handful of studies have investigated whether there is a link between the trademarking activity of a firm and its performance which is typically proxied by either its stock market value or its productivity.<sup>3</sup> In the former case, researchers have extended the approach used by Hall (2000) to estimate the contribution of a firm's intellectual property to its market value and have directly tested whether the stock of trademarks (jointly with other types of intangible and tangible

<sup>2</sup> Trademarks are more represented in the consumer goods sector than in the intermediate goods sector (Mainwaring et al., 2004). A number of studies have also noted that the amount of trademarks related to services (service marks) have been growing rapidly during the last decade (Schmoch, 2003; Jensen and Webster, 2008; Loundes and Rogers, 2003).

<sup>3</sup> A couple of studies have focused on the impact of trademarking on firms' profitability. Krasnikov et al. (2009) have found that the stock of trademarks owned by a firm is positively correlated with their cash flow, Tobin's *q*, return on assets and stock returns while it negatively correlated to their cash-flow variability. Equally, Griffiths et al. (2011) have analysed the determinants of financial profitability for a sample of nearly 2700 Australian firms observed from 1990 to 2006 and they find that both patent and trademark stocks are key contributors to profits.

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