ARE FIRMS EQUALS IN TERMS OF LEGAL PROTECTION ?

AN ECONOMETRIC INQUIRY INTO THE OUTCOME AND DURATION OF TRADEMARK LITIGATION

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ABSTRACT

The economic value of IP rights and the strategic use of IP litigation by competing firms strongly depend on the way IP rights are granted but also enforced by the courts. To illustrate the importance of court decisions in infringement suits, we try to assess whether firms are equals in terms of legal protection and whether some characteristics are more or less influential on the outcome of the trial. To do so, we develop a duration model with two incompatible events (the trademark's holder wins/looses the trial) as outcomes rather than one unique event. Indeed, our purpose is to examine in which context and/or for what type of firm, the legal protection offered by a trademark is the most valuable one. Our findings show that contrary to standard theory, the outcome and duration of the litigation process may be influenced by the characteristics of the parties. We also show that the legal value of a trademark for a plaintiff is strengthened by the importance of its trademark portfolio.

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I. INTRODUCTION

To have any value or meaning, intellectual property requires a mechanism to force others to do (or stop doing) something and to recover monetary damages for unauthorized use. IP litigation is that mechanism and in today's knowledge economy, it has become one of the primary legal tools available to promote or defend a business[3]. However, little information is available in sufficiently complete form to provide a true picture of litigation. While judicial cases of all types have stimulated a wide array of research aimed at assessing the empirical relevance of the complete and incomplete information models of litigation, IP rights remain somewhat isolated, so that our knowledge of how they are enforced remains tenuous. Such a lack of knowledge is however less and less acceptable. Indeed, from a theoretical standpoint, the costs and uncertainties associated to the solving of a legal conflict could reduce the incentives to innovate (Aoki and Hu, 1999). Moreover, recent studies stress that due to their lack of financial resources and legal experience, small businesses resent with a greater acuity the burden of costs associated to judicial disputes and are therefore reluctant to use the IP system (Cohen and alii, 1997).

Our paper attempts to address this gap in the literature by providing an empirical study of IP enforcement in French courts during the period 1999 to 2004. The main idea is to examine what lies behind IP litigation and more specifically to determine whether the value of legal protection of IP is more beneficial for some firms than others. Indeed, whereas standard economic theory tells us that there is a tendency for plaintiffs to prevail at trial with a probability of 50% (Klein & Priest, 1984), we reconsider this result and test whether the characteristics of the parties have an effect on the outcome and duration of the trial. If it is the case, this would mean that firms are not equal in terms of the legal protection of their IP rights.

Our analysis is directed at a particular type of IP rights, namely the much neglected trademarks[4] disputes. Indeed, despite the importance of court-based enforcement of IP, little is known about how trademark owners actually go about enforcing their registered trademarks in the courts. While there is a growing recognition that companies with a strong brand

[3] According to trademark laws, the issuance of a trademark does no more than confer a trademark right that is presumed valid in that the final responsability for validity or invalidity of the trademark resides with the courts. This residual uncertainty as to the validity and coverage of trademarks makes disputes inevitable.

[4] A trademark is a word, phrase, slogan, symbol or design which may be used to identify the source of goods or services. It acts like a badge and provides the holder with the exclusive right to use the mark for the holder's goods and services and prevent other persons or businesses from using the same mark for their own goods and services as a means of benefiting from the holder's existing business or goodwill. Trademarks facilitate innovation of new products and quality improvement, and are particularly important for firms when entering new markets.

reputation outperform the market with respect to shareholder return and risk (Madden, Fehle & Fournier, 2002), such enforcement has rarely been the subject of empirical studies. By contrast, there is a burgeoning empirical literature concerning patent litigation and enforcement[5]. This lack of analysis can be explained by the fact that trademark litigation cannot be empirically apprehended in the same fashion as patent disputes. Indeed, trademark data are seldom as available as their patent counterparts. While several proxies can be devised from patent data to assess the value of the patent, trademarks only provide the distinctive sign and the associated industry classes which are far more aggregated than patent technology classes. One of the originality of our paper is to fill this gap. By reading the judgements and thus obtaining detailed information about the nature of the case before the courts, we are able to present a more complex picture of this litigation than existing statistical reports on trademark enforcement.

Another originality of our paper is that we develop a duration model with two incompatible events (the trademark's holder wins/looses) as outcomes rather than one unique event to analyse the outcome and duration of a trial. Indeed, our purpose is to examine in which context and/or for what type of firm the legal protection offered by a trademark is the most valuable one. The idea is to examine the result of the litigation process to see whether some characteristics have more or less influence. At this stage, it is worth recalling that usually two problems emerge from conducting such an analysis. First, univariate analysis usually encompasses many drawbacks: what happens for instance if two variables are of opposite influence[6]? Second, such an analysis usually focuses on the probability to win but not on the benefits or costs of the trial which may be different according to the characteristics of the parties. To better address these two problems, we try to develop a model which deals with the influence of multi-variables on the probability of gains and on the duration of the trial. For this purpose, we build on the analysis of the rational decision to go to trial rather than to settle the case to infer information on the legal value of a trademark measured as the ration between the gain in case of victory and the opportunity cost of going to trial for a trademark owner. We then try to detect which variables influence positively or negatively this ratio.

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[5] Siegelman & Waldfogel (1999) look at the probabilities of victory for the patent holder, the informational context of the conflicts and the level of awarded damages. Lanjouw & Schankerman (2001) examine the characteristics of litigated patents and their owners. Their results underline the importance of firm's size and high-value patent. Crampes & Langinier, 2002 investigate how intensive the monitoring effort of a patentholder should be and how the reaction of the patentholder may influence the entry decision of an alleged infringer. Ziedonis, 2004 trace patterns of patent litigation for US semiconductor firms. Her results show that the high-propensity of small firms to be involved in patent-related lawsuits stems less from the bargaining disadvantages they face due to small patent portfolio and more from the fact that many small firms within the industry are technology specialists for whom exclusionary control over proprietary technology is important. Bessen & Meurer, 2005 address the origin of patent disputes.

[6] Let's say for instance the age of the trademark and the number of trademarks owned by one of the party.

This paper is organized as follows: Part II presents the dataset and some descriptive statistics. Part II also reviews the litigation course in France. Indeed, it is important to understand the specificities of the French litigation system (compared to common-law jurisdiction) as it may impact the set up of our model. Part III introduces the model. We first detail how to infer information on the value of the legal protection from the rational decision of a trademark owner to go to trial rather than to settle. The probabilities to win or loose after a given delay that are required to implement this inference procedure are then obtained as the result of a Bayesian learning process by the judge in charge of the case. In part IV, the estimation method is presented and the estimation results are discussed. We try to determine whether the outcome and duration of trials are influenced by the characteristics of the parties involved and/or the type of litigation at stake. We finally attempt to determine which trademark owners benefit most from the legal protection. Concluding remarks are given in Part V.

II. METHODOLOGY OF THE STUDY

II.1. The data

In order to test the issues at stake and establish the pattern of trademark enforcement actions brought before French courts and their outcome, we constructed a dataset comprising civil trademark enforcement decisions rendered by French courts in relation to registered trademarks for the period 1999 to 2004. This type of information is time-consuming to collect in a rigorous and reliable way in the absence of publicly available databases. Indeed, we had to read every decision reported in the *Annales de la Propriété Intellectuelle*[7] and in *Lexisnexis*© and to record information about those decisions in a custom-built database. This explains the limited number of cases analysed in this study (203 cases in total but a final sample of 43 cases due to a restriction to first instance proceedings). Information on trademark disputes includes basic information about the proceedings, including the type of cases, the people involved (parties, counsel and judges), the characteristics of the trademark (IPC classes assignments, date of registration, number of trademarks, etc), the case length (number of days elapsed between the issue date of the proceedings and the last decision date). These figures are of interest, in part, because the amount of time taken to resolve a case is a proxy for the cost of the proceedings.

While the number and length of cases is of interest to policy-makers, of even more practical interest is the outcome. The value of a registered trademark to its owner lies in its ability to

[7] One of the drawback of the cases reported in a set of law reports is that the editors of law reports select the case on the grounds of their importance as precedent, a matter not relevant to our aims.

stop rivals from using a substantially identical or deceptively similar trademark. To succeed in an action for trademark infringement, a trademark owner must establish that he does have a registered trademark (and if challenged, that the trademark registration is valid) and that the alleged infringer must have engaged in conduct amounting to infringement. For this reason, we collected data on the outcome of each decision ("outcome data") recording the outcome on infringement and validity, unfair competition, opposition proceedings[8] and non-opposition proceedings of each trademark in dispute. This distinction is important as there are several kinds of trademark disputes here the stakes and the issues of which are different. For each trademark enforcement decision we have also recorded, where applicable, the grounds on which a trademark owner failed, such as the non infringement grounds (i.e. the trademark was not used as a trademark or was not substantially identical or deceptively similar to the registered mark). Data in terms of awarded damages, number and cost of publication and ancillary sanctions were also collected. Finally, to complete our dataset, we have extracted from the *Datastream, Hoovers and Kompass* databases data on firms' characteristics (nationality, sector, date of creation, number of employees, turnover). While the dataset explored in this article presents several limitations[9], it allows us nevertheless to cast a look at trademark disputes.

II.2. Some Descriptive Statistics

Tables 1 and 2 provide some descriptive statistics on the trademark litigation course in France.

Insert Table 1

As stressed in Table 1, out of a total of 43 cases, the trademark's holder A is only successful in 44,19% of the cases (thus below the probability of 50% found by Klein & Priest, 1994). The average length of the first instance proceeding is of 424.05 days in case of victory for A and of 374.05 days when A is unsuccessful in proving validity/infringement.

Insert Table 2

Table 2 gives us the average value of the different variables. It allows us to give some insights on which characteristics presumably make it easier or not for A to win the litigation process.

[8] A registered trademark owner who becomes aware of an application for registration of a mark that will be, as they perceive it, too close to their own, may oppose registration of that mark, thus heading off at an early stage a dispute that might otherwise become a fully-fledged infringement suit. Such opposition proceedings are an important means by which trademark owners enforce their rights.

[9] There is no doubt that the cases that make it all the way to judgement are not a representative sample of all trademark disputes.

Interestingly, our descriptive statistics show that the proportion of trademark's holder A that are individuals rather than firms is higher in the subset of cases where A is successful (11%) compared with the subset of cases where A is unsuccessful (8%). Accordingly, being an individual rather than a firm seems to act in favour of A. In the same way, being an individual rather than a firm seems to act in favour of B. Regarding the nationality of the parties, non national and non European trademark's owners are clearly more often encountered in the subset of cases where A is unsuccessful. This result stresses the existence of a possible national bias. The cases where A has won are cases where the trademark(s) at stake are the oldest in average. However, cases where A lost are those where the trademark covers many classes. Finally, it turns out that the less favourable configuration for the trademark's holder is when both the turnover of A and B are large. In the same ways, cases where A looses are those where A has a larger size (as measured by the number of employees) than B.

As previously underlined, one of the main drawbacks with such an univariate analysis is that it disregards the joint effects of variables. Obviously, before inferring any conclusive remarks, it is necessary to get more robust statistical results and therefore to develop an econometric test. To do so, we need to model the duration and outcome of the litigation process. But first, it is important to understand the specificities of the litigation course in France which may impact the set up of our model.

II.3. The litigation course

It is perhaps commonplace to suggest that civil litigation in France is very different from litigation in common-law jurisdictions[10]. For example, to commence proceedings[11], the plaintiff must serve summons on the opposing party (the defendant). The plaintiff has to register the summons before the Court office. The claims have to be initiated within a short time (6 months) and should seem to be serious. The parties then exchange pleadings (there is no limitation in the number of written pleadings exchanged) and exhibits (including expert reports) under the control of a judge in charge of case management. An oral hearing takes place before the court issues its decision. However, it should be noted that the oral advocacy part of proceedings carries far less weight than in common-law jurisdictions and the matter is decided principally on the basis of the exchange(s) of written submissions prior to the trial. Compared say to the USA, there are no juries at Civil hearings. The judge managing the case controls the instruction of the procedure but the timetable is rather flexible. The pleadings are systematic. For all comparative intents and purposes, cross-examination of witnesses does not

[10] *Cf.* Figure 1 for a summary.
[11] The imitated firm proceed to a full trial. We do not examine out of court agreements.

exist either. The time taken for a matter to come to trial, i.e. with effect from the service of the writ or claim form, often depends on the geographical location within France (it is observable that the delays in many matters are often longest in the southern part of the country). However, it would not be unusual in most of France for a period of between 16 and 22 months to elapse between the service of the writ and the trial at First Instance. Finally, large scale punitive damages are never awarded, and what is more, class-actions do not exist.

In infringement cases[12], the first instance judgment usually decides only the validity and the infringement issues. Infringement can be proven by any means. The search and seizure ("*saisie-contrefaçon*") is the usual preliminary of nearly all infringement cases in France and an efficient measure to prove infringement. A search and seizure may be performed upon authorization of the Presiding judge of the local court, obtained *ex parte*. With this Court order, the bailiff can enter into the premises of any person which detains evidence of the infringement and, to perform the authorized investigations, he can be accompanied by any person(s) skilled in the art chosen by the patentee.

The appeal suspends the enforcement of the first instance judgment except for provisional measures and unless otherwise decided. It consists in a full re-hearing of the case as to the facts and the points of law. There is a possibility of bringing additional exhibits. The Court of Appeal decides *de novo*. The Paris Court of appeal also rules on a very specific type of litigation: appeals brought against decisions of the director of the French Industrial Property Institute (INPI). The appeal before the Supreme Court ("*Cour de Cassation*") consists in a review of the judgement of the Court of Appeal and is limited to the points of law only.

Insert Figure 1

III. THE MODEL

III.1. Inferring information from the decision to go to trial

Following a well known strand of literature, we assume that the decision to go to trial rather than to settle is the outcome of a rational trade-off made by the plaintiff A between the

[12] In legal terms, counterfeit trademark goods are defined in TRIPs as having two key features : the infringer uses an identical mark to the registered trade mark and the infringer uses the mark in relation to the same goods as those for which the trademark is registered. To win an infringement suit, a trademark owner must show there is a likelihood of mistake, confusion, or consumer deception by the defendant's use of the similar mark. The basic questions in a trademark infringement action tend to turn largely on issues of facts. The key factors are whether the marks are confusingly similar, and whether they are used on the same or "related" goods. This includes goods or services into which the trademark holder's business is reasonably likely to expand.

associated expected gains and losses. More precisely, we assume that the current situation, or *status quo* situation, corresponds to a duopoly since the trademark of the plaintiff A is counterfeited by the defendant B. If A wins the trial, his benefit compared to the *status quo* situation amounts to the sum of two terms. The first term is the discounted sum of the difference between monopoly and duopoly profit flows from the end of the trial onwards. If the current date is the date of end of the trial, this term is given by

$$B_A = \sum_{t=0}^{\infty} \frac{\pi_M - \pi_D}{(1+r)^t} \quad \text{or} \quad (\pi_M - \pi_D)\frac{r}{1+r} \tag{1}$$

where π_M and π_D respectively denote the monopoly and duopoly profit flows. r is the interest rate[13]. The second term is associated with the reimbursement of the discounted sum of the same difference between monopoly and duopoly profits flows from the date T where B started to counterfeit A's trademark to the date where the trial ends. It is given by the following damage expression:

$$D = \sum_{t=-T}^{0} \frac{\pi_M - \pi_D}{(1+r)^t} \quad \text{or} \quad B_A \frac{(1+r)^{T+1} - 1}{1+r} \tag{2}$$

If the trademark's holder A decides to go to trial, A's objective is to maximise his expected gain with respect to an initial investment I_A that influences the duration and outcome of the trial due for instance to the more or less good reputation of the attorney he chooses. To keep things simple, we assume that this investment is only incurred at the beginning of the trial. The objective of A may then be described by the following maximisation program

$$\underset{I_A}{Max} \left\{ \sum_{\tau=0}^{\infty} \Pr_A^{\tau}(I_A, I_B) \frac{B_A(1+\delta)}{(1+r)^{\tau}} - I_A \right\} \tag{3}$$

where δ denotes the coefficient of B_A in (2). τ stands for the date at which the lawsuit is resolved in favour of A. The probability that A wins at date τ is denoted by $\Pr_A^{\tau}(I_A, I_B)$ and is influenced not only by the investment I_A made by A but also by the investment I_B made by the defendant B.

If the verdict goes against the defendant, the cost of a trial for B compared to the *status quo* is the sum of two terms. The first term is associated with the reimbursement of the

[13] Note that we assume that A's trademark will not be counterfeited again. Actually, introducing the possibility of new counterfeits as the outcome of an exogenous random Poisson process would just result in an increase of the relevant discount factor.

difference between monopoly and duopoly profit flows to the plaintiff. This term is given by the damage expression (2). The second term is associated with the loss of the duopoly profit flow from the end of the trial onwards compared to the *status quo*. This second term reads as

$$C_B = \sum_{t=0}^{\infty} \frac{\pi_D}{(1+r)^t} \qquad \text{or} \qquad \pi_D \frac{r}{1+r} \tag{4}$$

The objective of the defendant B is to minimise his expected total cost of the trial with respect to his own investment I_B that influences the duration and outcome of the trial. The corresponding minimisation programme is

$$\underset{I_B}{Min} \left\{ \sum_{\tau=0}^{\infty} \Pr_A^{\tau}(I_A, I_B) \frac{B_A \delta + \pi_D r/(1+r)}{(1+r)^{\tau}} - I_B \right\} \tag{5}$$

The solutions $\hat{I}_A(I_B)$ and $\hat{I}_B(I_A)$ to (3) and (5) define the reaction functions characterising the strategic choice of investment amounts. Let I_A^* and I_B^* be the associated Nash equilibrium. The plaintiff A prefers to go to trial if his objective function in (3) evaluated at I_A^* and I_B^* exceeds his expected gain S_A from settlement. Rearranging this condition, we obtain that A goes to trial if

$$\frac{B_A(1+\delta)}{S_A + I_A^*} \geq \frac{1}{\sum_{\tau=0}^{\infty} \frac{\Pr_A^{\tau}(I_A^*, I_B^*)}{(1+r)^{\tau}}} \tag{6}$$

The left hand side of (6) may be thought of as an index of return from trial if the verdict goes in favour of the plaintiff. Indeed it yields the ratio between the gross gain from the trial if A wins and the cost of the trial which is given by the sum of the direct cost I_A^* and the opportunity cost that amounts to the expected gain S_A from settlement. The right hand side of (6) yields the multiplicative coefficient for the transition from the gain if A wins (the numerator in the left hand side) to the expected gain whatever the outcome of the trial. As already outlined by Choi (1998) for instance, some information is revealed by the condition (6). Indeed, whereas we are generally not able to obtain data on the elements of the left hand side of (6), we are able to estimate the elements of the right hand side from data on the duration and outcome of trials. Assuming an *ex ante* distribution function for the left hand side, we can derive the *ex post* distribution from an estimate of the right hand side. This is illustrated by Figure 2 where the grey area distinguishes the part of the *ex ante* distribution function that is no more relevant according to condition (6). Moreover, if the right hand side

is estimated as both a function of the characteristics of the plaintiff and defendant and the characteristics of the case and/or of the trademark at stake, then we are able to determine for which trademark owners the value of the legal protection is the highest compared with its cost. Assume for instance that one of the characteristics positively influence the value of the threshold. Then the grey area in Figure 2 expands to the right so that the expected value of the left hand side (6) increases. This means that plaintiffs with a high value of this characteristic have a higher rate of return from legal suits.

Insert Figure 2

II.2. Trial as a duration model

In order to infer information from the decision to go to trial as described above, an estimate of the probability that the lawsuit is resolved in favour of the plaintiff at each given date τ is required. For this purpose, we analyse the length of a trial as a duration model, the main feature of which is that the end of the process depends on the realisation of one of two events rather than a sole event. Our point of departure for this duration model is a complete information framework. In such a context, the judge in charge of the case immediately knows whether the plaintiff A is in his right or, conversely, if the defendant B is in his right so that the duration of the trial is infinitely close to zero. Let W_A denotes the scenario where the verdict goes in favour of A and W_B denotes the scenario where the verdict goes against A and thus in favour of B. To deal with a more realistic approach where the trial lasts for a non infinitesimal period, we turn to an incomplete information framework. More precisely, we consider a discrete time framework and assume that between two consecutive dates the judge receives one information. Information consists on a message which may be of two types. It may be either a message of type M_A in favour of A or a message of type M_B in favour of B. Moreover, both types of messages are noisy. This means that between two consecutive dates a message M_A is received with probability $p_A > 1/2$ if the scenario W_A is the correct one in the complete information framework and with probability $1 - p_B < 1/2$ otherwise and, conversely, a message M_B is received with probability $p_B > 1/2$ if the scenario W_B is the correct one in the complete information framework and with probability $1 - p_A < 1/2$ otherwise. The conditional probabilities of the two types of messages are then as follows

$$\begin{pmatrix} \Pr[M_A/W_A] & \Pr[M_A/W_B] \\ \Pr[M_B/W_A] & \Pr[M_B/W_B] \end{pmatrix} = \begin{pmatrix} p_A & 1-p_B \\ 1-p_A & p_B \end{pmatrix} \qquad (7)$$

We are not interested as such in the probabilities of the two types of messages but rather in the probabilities of the two scenarios. With this aim in view, we denote by X_t the subjective probability associated with scenario W_A for the judge at time t. This probability describes the beliefs of the judge on the true scenario. The judge puts an end to the suit as soon as X_t takes a value outside the interval $]1-\overline{X}, \overline{X}[$ where $\overline{X}$ is an exogenously given threshold. The judge gives a verdict in favour of the plaintiff A if X_t exceeds the threshold $\overline{X}$ and, conversely, gives a verdict against A if X_t is lower than $1-\overline{X}$. The threshold value is exogenously determined and measures the degree of certainty required to end a trial. The higher $\overline{X}$, the higher the degree of certainty required. When starting a trial, the judge has no *a priori* on the true scenario so that $X_0 = 1/2$. The belief of the judge, and thus the value of X_t, changes from date to date due to the arrival of new noisy messages of type M_A or M_B. In order to obtain the new probability X_{t+1} given X_t we use Bayes' rule to compute the probabilities of the two scenarios conditionally on the type of message received between t and $t+1$ and the value of X_t:

$$\begin{pmatrix} \Pr[W_A/M_A] & \Pr[W_A/M_B] \\ \Pr[W_B/M_A] & \Pr[W_B/M_B] \end{pmatrix} = \begin{pmatrix} \dfrac{p_A X_t}{\Pr_A^t} & \dfrac{(1-p_A) X_t}{\Pr_B^t} \\ \dfrac{(1-p_B)(1-X_t)}{\Pr_A^t} & \dfrac{p_B (1-X_t)}{\Pr_B^t} \end{pmatrix} \qquad (8.a)$$

with

$$\Pr_A^t = p_A X_t + (1-p_B)(1-X_t) \qquad (8.b)$$

$$\Pr_B^t = (1-p_B) X_t + p_A (1-X_t) \qquad (8.c)$$

as the unconditional probabilities of receiving respectively a message of type M_A or M_B. The first line in (8.a) yields the new subjective probability X_{t+1} associated with scenario W_A if a message M_A is received between t and $t+1$ (first column) or if a message M_B is received between t and $t+1$ (second column). The second line in (8.a) yields the corresponding values for $1-X_{t+1}$.

From a computational point of view, it is more convenient to use the process Z_t defined by

$$Z_t = \ln\left(\frac{X_t}{1-X_t}\right) \quad \Leftrightarrow \quad X_t = \frac{\exp(Z_t)}{1+\exp(Z_t)} \qquad (9)$$

Indeed, the stochastic process Z_t corresponding to the natural logarithm of the likelihood ratio of the two scenarios evolves according to the relatively simple following rule:

$$Z_t = \begin{cases} \Delta^+ Z & \text{with probability} \quad \Pr_A^t(Z_t) \\ \Delta^- Z & \text{with probability} \quad \Pr_B^t(Z_t) \end{cases} \tag{10.a}$$

with

$$\Delta^+ Z = \ln\left(p_A / 1 - p_B\right) > 0 \tag{10.b}$$

$$\Delta^- Z = -\ln\left(p_B / 1 - p_A\right) < 0 \tag{10.c}$$

and where the probabilities $\Pr_A^t(Z_t)$ and $\Pr_A^t(Z_t)$ are obtained by substituting the expression of X_t as a function of Z_t given in (9) in (8.b) and (8.c). The magnitudes of the positive and negative shocks differ from each other and only depend on the two probabilities p_A and p_B. The probabilities of these shocks correspond to the unconditional probabilities of the receipt of a message M_A and a message M_B and depend on p_A and p_B but also on the current value of Z_t. The process Z_t starts at the initial value $Z_0 = 0$ and increases with X_t for $X_t \in [0, 1]$. Therefore, the law suit ends in favour of the plaintiff A as soon as Z_t exceeds $\overline{Z} = \ln\left(\overline{X} / 1 - \overline{X}\right) > 0$ or in favour of the defendant B as soon as Z_t lies behind $-\overline{Z} < 0$. The main interest of the process Z_t is that it may be illustrated by the tree form in Figure 3 where the horizontal axis is associated with time while the vertical axis is associated with the value of the process.

Insert Figure 3

Accordingly, the process Z_t has $t+1$ possible values at time t which are referred to as $Z_t^i = i\,\Delta^+ Z + (t-i)\Delta^- Z$ with $i \in \{0, \cdots, t\}$. Thus Z_t^i exceeds $\overline{Z}$ if and only if $i > \left(\overline{Z} - t\,\Delta^- Z\right) / \left(\Delta^+ Z - \Delta^- Z\right)$. Conversely, Z_t^i lies behind $-\overline{Z}$ if and only if $i < \left(-\overline{Z} - t\,\Delta^- Z\right) / \left(\Delta^+ Z - \Delta^- Z\right)$. Let $\Theta(Z)$ be the dummy variable defined by

$$\Theta(Z) = \begin{cases} 1 & \text{if} \quad Z \in \left[-\overline{Z}, \overline{Z}\right] \\ 0 & \text{if} \quad Z \notin \left[-\overline{Z}, \overline{Z}\right] \end{cases} \tag{11}$$

The probability $\overline{\Pr}_\tau\left[Z_\tau^i\right]$ that the process Z_t takes the value Z_τ^i at time τ knowing that it has never taken values outside the range $\left[-\overline{Z}, \overline{Z}\right]$ before τ is given by

$$\overline{\Pr}_\tau\left[Z_\tau^i\right] = \begin{cases} P^-\left[Z_\tau^i + \Delta^+ Z\right] & \text{if} \quad i = \tau \\ P^-\left[Z_\tau^i + \Delta^+ Z\right] + P^+\left[Z_\tau^i + \Delta^- Z\right] & \text{if} \quad i \in \{1, \cdots, \tau - 1\} \\ P^+\left[Z_\tau^i + \Delta^- Z\right] & \text{if} \quad i = 0 \end{cases} \tag{12.a}$$

with

$$P^{+}\left[Z_{\tau}^{i}+\Delta^{-}Z\right]= \quad \Theta\left(Z_{\tau}^{i}+\Delta^{+}Z\right)\overline{\Pr}_{\tau-1}\left[Z_{\tau}^{i}+\Delta^{+}Z\right]\Pr_{B}^{\tau-1}\left[Z_{\tau}^{i}+\Delta^{+}Z\right] \tag{12.b}$$

$$P^{-}\left[Z_{\tau}^{i}+\Delta^{+}Z\right]= \quad \Theta\left(Z_{\tau}^{i}+\Delta^{-}Z\right)\overline{\Pr}_{\tau-1}\left[Z_{\tau}^{i}+\Delta^{-}Z\right]\Pr_{A}^{\tau-1}\left[Z_{\tau}^{i}+\Delta^{-}Z\right] \tag{12.c}$$

Indeed, if $i \in \{1,\cdots,\tau-1\}$ the process Z_t may reach the value Z_{τ}^{i} at time τ following either a negative shock from the value $Z_{\tau}^{i}+\Delta^{+}Z$ (with probability $P^{+}\left[Z_{\tau}^{i}+\Delta^{-}Z\right]$) at time $\tau-1$ or a positive shock from the value $Z_{\tau}^{i}+\Delta^{-}Z$ (with probability $P^{-}\left[Z_{\tau}^{i}+\Delta^{+}Z\right]$) at time $\tau-1$. If $i=0$, the process Z_t may only reach the value Z_{τ}^{i} at time τ following a negative shock from the value $Z_{\tau}^{i}+\Delta^{+}Z$ (with probability $P^{+}\left[Z_{\tau}^{i}+\Delta^{-}Z\right]$) at time $\tau-1$. Conversely, if $i=\tau$ the process Z_t may only reach the value Z_{τ}^{i} at time τ following a positive shock from the value $Z_{\tau}^{i}+\Delta^{-}Z$ (with probability $P^{-}\left[Z_{\tau}^{i}+\Delta^{+}Z\right]$) at time $\tau-1$. Accordingly, the probability $\Pr_{A}^{\tau}\left(I_{A}^{*},I_{B}^{*}\right)$ used in condition (6) for the plaintiff to prefer to go to trial rather than to settle is computed as

$$\Pr_{A}^{\tau}\left(I_{A}^{*},I_{B}^{*}\right)=\begin{cases} 0 & \text{if} \quad \tau<\overline{Z}\big/\Delta^{+}Z \\ \sum_{i=I}^{\tau}\overline{\Pr}_{\tau}\left[Z_{\tau}^{i}\right] & \text{if} \quad \tau\geq\overline{Z}\big/\Delta^{+}Z \end{cases} \tag{13.a}$$

with I the lower integer value above $\left(\overline{Z}-\tau\Delta^{-}Z\right)/\left(\Delta^{+}Z-\Delta^{-}Z\right)$. Similarly, the probability $\Pr_{B}^{\tau}\left(I_{A}^{*},I_{B}^{*}\right)$ that the defendant wins the trial at time τ is computed as

$$\Pr_{B}^{\tau}\left(I_{A}^{*},I_{B}^{*}\right)=\begin{cases} 0 & \text{if} \quad \tau<-\overline{Z}\big/\Delta^{-}Z \\ \sum_{i=0}^{J}\overline{\Pr}_{\tau}\left[Z_{\tau}^{i}\right] & \text{if} \quad \tau\geq\overline{Z}\big/\Delta^{+}Z \end{cases} \tag{13.b}$$

with J the higher integer value behind $\left(-\overline{Z}-\tau\Delta^{-}Z\right)/\left(\Delta^{+}Z-\Delta^{-}Z\right)$. These two last expressions serve as a basis for the estimation of the duration model.

IV. ESTIMATION METHOD AND RESULTS

IV.1. Estimation method

Prior to describing the estimation method, note that a key feature of the process Z_t is that it only depends on two parameters, namely p_A and p_B. However, it is assumed that the plaintiff and the defendant may at least partly influence the duration and outcome of the trial and, thus, the probabilities $\Pr_{A}^{\tau}\left(I_{A}^{*},I_{B}^{*}\right)$ and $\Pr_{B}^{\tau}\left(I_{A}^{*},I_{B}^{*}\right)$. In order to take into account this assumption, we thus have to assume that the two parameters p_A and p_B are themselves influenced by I_{A}^{*} and I_{B}^{*}. This means that each protagonist is able to make messages in his favour less noisy and messages in favour of the other protagonist more noisy. Finally, since we do not directly observe the investments made by the two protagonists, we suppose that

they are functions on the one hand of both observed characteristics of the plaintiff and defendant and characteristics of the case and/or the trademark at stakes and, on the other hand, of some unobserved factors intrinsic to each case. Since p_A and p_B are probabilities, we use a logistic functional form to make sure that they take values inside the range $[0, 1]$. Hence, for each case $n \in \{1, \cdots, N\}$ we have

$$p_A^n = \exp\left(\sum_{k=1}^{K} \alpha_k \, v_k^n + \varepsilon_A^n\right) \Big/ 1 + \exp\left(\sum_{k=1}^{K} \alpha_k \, v_k^n + \varepsilon_A^n\right) \tag{14.a}$$

$$p_B^n = \exp\left(\sum_{k=1}^{K} \beta_k \, v_k^n + \varepsilon_B^n\right) \Big/ 1 + \exp\left(\sum_{k=1}^{K} \beta_k \, v_k^n + \varepsilon_B^n\right) \tag{14.b}$$

where v_n^k ($k \in \{1, \cdots, K\}$) are variables measuring one of the K characteristics of protagonists or of the case, α_k and β_k ($k \in \{1, \cdots, K\}$) are real parameters to be estimated. $\{\varepsilon_A^n, \varepsilon_B^n\}$ is a two dimensional random vector with a null expected value and a variance covariance matrix given by

$$\Omega_{A\,B} = \sigma_A^2 \begin{pmatrix} 1 & \rho\,\gamma \\ \rho\,\gamma & \gamma^2 \end{pmatrix} \tag{14.c}$$

where ρ and γ respectively stand for the coefficient of linear correlation between ε_A^n and ε_B^n and the ratio (σ_B/σ_A) between the standard deviations of the two random terms. ε_A^n and ε_B^n typically capture the influence of unobserved factors that are specific and/or common to each equation. Specific factors may correspond to unobserved characteristics of the parties while common factors may results from unobserved characteristics of the case. ρ measures how much common to the two equations (14.a) and (14.b) are the unobserved factors. For estimation purposes, expression (14.a) and (14.b) are rearranged as

$$\ln\left(p_A^n / 1 - p_A^n\right) = \sum_{k=1}^{K} \alpha_k \, v_k^n + \varepsilon_A^n \tag{15.a}$$

$$\ln\left(p_B^n / 1 - p_B^n\right) = \sum_{k=1}^{K} \beta_k \, v_k^n + \varepsilon_B^n \tag{15.b}$$

The parameters α_k and β_k ($k \in \{1, \cdots, K\}$) in equations (15.a) and (15.b) may be estimated by a maximum likelihood method for given values of ρ and γ. This concentrated likelihood is then computed for each element in a grid of values for ρ and γ. The estimated values of these two parameters are finally obtained as the combination in the grid that maximises the concentrated likelihood. A crucial step prior to this estimation is to obtain values for p_A^n and p_B^n and thus for the dependant variables. For this purpose, note that the likelihood of the outcome and duration of case n is

$$L_n = \prod_{\tau=0}^{\infty} \left(\Pr_A^{\tau}\left(p_A^n, p_B^n\right)^{w_A^n} \Pr_B^{\tau}\left(p_A^n, p_B^n\right)^{1-w_A^n} \right)^{w_\tau^n} \qquad (16)$$

where w_A^n is a dummy variable taking value 1 if the verdict is in favour of A and value 0 if B wins the trial while w_τ^n is a dummy variable taking value 1 is the trial ends at date τ and value 0 otherwise. The two values used for p_A^n and p_B^n in (15.a) and (15.b) are those that maximise the likelihood (16). Since we do not have an analytical expression of the probabilities $\Pr_A^{\tau}\left(p_A, p_B\right)$ and $\Pr_B^{\tau}\left(p_A, p_B\right)$, this maximisation is based on numerical methods. More precisely, the probabilities $\Pr_A^{\tau}\left(p_A, p_B\right)$ and $\Pr_B^{\tau}\left(p_A, p_B\right)$ have first been computed for each element $\{p_A, p_B\}$ of a grid a values generated for p_A and p_B taking values from 0.5 to 1 with a step equal to 0.05. We then used the *ListInterpolation* instruction on *Mathematica® 5* to obtain $\Pr_A^{\tau}\left(p_A, p_B\right)$ and $\Pr_B^{\tau}\left(p_A, p_B\right)$ as functions of p_A and p_B. Note that in order to make these two expressions relatively smooth functions of p_A and p_B we have assumed that the basic time period separating two dates in the duration model was one month but we have divided this period on a daily basis so that 30 messages of type M_A or M_B are received on each time period. Figure 4 displays the resulting graphic of $\Pr_A^{\tau}\left(p_A, p_B\right)$ as a function of p_A and p_B for $\tau = 4$ months.

Insert Figure 4

IV.2. Estimation results

The estimation method described above has been implemented to the dataset introduced in part II. The values of p_A^n and p_B^n that maximise the likelihood of the outcome and duration of each case in the database are reported on Figure 5. The mean of p_A^n amounts to 0.648919 and its standard deviation is equal to 0.160028 while the corresponding values for p_B^n are respectively 0.752394 and 0.0896362. Thus, the trials considered in our database are generally characterised by messages in favour of the plaintiff that are noisier than those in favour of the defendant. Although Figure 5 exhibits a slightly upward linear relation between p_A^n and p_B^n, their correlation coefficient only amounts to 0.0489139.

Insert Figure 5

The estimation results for equations (15.a) and (15.b) are reported in Table 3. The grid of values used to estimate ρ and γ is the grid obtained by assuming that ρ and γ respectively take values between -1 and 1 and $0.1\,\sigma_B^{OLS}/\sigma_A^{OLS}$ and $10\,\sigma_B^{OLS}/\sigma_A^{OLS}$ where σ_A^{OLS} and σ_B^{OLS} are the standard deviations obtained when estimating equations (15.a) and (15.b) separately by an ordinary least square method. Estimation results show that the correlation between the

random terms of equations (15.a) and (15.b) is not statistically significant. Indeed, the value of the Chi square statistic for a likelihood ratio test of the restriction $\rho = 0$ is clearly less that the critical thresholds at any conventional significance level. As a result, estimation results for all the other parameters are almost identical to those obtained with a separate estimation of the two equations by ordinary least squares. A possible explanation is that unobserved characteristics of the two parties and/or of the case either affect the value of p_A or the value of p_B but do not have a simultaneous influence on p_A and p_B.

A striking result in Table 3 is that p_B is better explained by observed variables than p_A. This means that the strategic investments made by the two protagonists are intended to affect (increase for A and reduce for B) the noise on messages in favour of the defendant rather than to affect the noise on messages in favour of the plaintiff. Indeed, almost half of the variance of the dependent variable in equation (15.b) is explained by the model whereas this part is slightly inferior to one third for equation (15.a). This results also stresses the role of unobserved intrinsic characteristics of the cases to determine the value of p_A. Another striking result is that the variables that significantly affect the value of p_A differ from those that significantly affect the value of p_B. This in line with the absence of a significant correlation between the unobserved factors affecting p_A and p_B. As regards p_B, there is a significant and negative impact of the fact that the case is a case of counterfeit, of opposition proceedings or of non opposition proceedings rather than a case of unfair competition[14]. Accordingly messages in favour of the defendant are less noisy for the first three types of cases compared with the last type. p_B is also significantly and negatively affected by the fact that the defendant B is an individual rather than a firm and by the fact that B has an extra-European nationality. Finally, the bigger A in terms of employees compared to B, the noisier the messages in favour of B. By contrast, the only two variables that have a significant and positive impact on p_A are the age of the trademark at stake and the number of trademarks owned by the plaintiff. The higher these two variables, the less noisy are the messages in favour of the plaintiff. Otherwise stated, it seems that it is *ceteris paribus* easier for a trademark owner to present his arguments to the judge if his trademark is an old one and if he possesses a large trademark portfolio. In this sense, we are able to conclude that the legal value of a trademark for a plaintiff is strengthened by the importance of its trademark portfolio (number of trademarks and age of the trademark at stake). However, the results displayed in Table 4 partly confirm these conclusions.

[14] The sum of the corresponding dummy variables does not yield 1 because a same case may be coded with 1 for several of the dummies (for instance for unfair competition and counterfeit)

Table 4 displays the estimation results for elasticity or quasi elasticity (evaluated at the sample mean) of the threshold on the right hand side of (6) with respect to the explanatory variables used in equations (15.a) and (15.b)[15]. Since these elasticities and quasi elasticities are highly non linear functions of the estimated parameters α_k and β_k ($k \in \{1, \cdots, K\}$), their estimates have been computed by using a Monte Carlo simulation method with 5000 random draws for the vector of α_k and β_k. The resulting distributions of elasticities and quasi elasticities generally exhibit a strong asymmetry, thus leading to high values of their standard deviation distribution and complicating the interpretation[16]. As a result, the focus is made on those elasticities or quasi elasticities with respect to variables that have a significant impact in Table 3. The significant and negative impact on p_B of the fact that the case is a case of counterfeit, of opposition proceedings or of non opposition proceedings outlined in Table 3 plays in favour of A and logically induces a positive expected quasi elasticity of the threshold in (6) with respect to the corresponding variables. Table 4 also highlights that an increase by one percent of the age of the trademark induces a rise of 0.023% of the threshold in the right hand of conditions (6). Similarly, an increase of one percent of the number of trademarks in the portfolio of the plaintiff results in an increase by 0.34% of the critical threshold. These two results are in line with the positive impact on p_A already detected in Table 3. The age and importance of the trademark portfolio thus implies an increase of the rate of return expected from going to trial for an infringed trademark owner. The impact of the ratio between the number of employees of the two parties is more ambiguous. Indeed the estimated elasticity is close to zero with a high value of the standard deviation and a distribution that does not seem to clearly range on one side or the other with respect to zero. There is also an ambiguous result as regards the fact that B is an individual and the fact that B has an extra-European nationality since the associated quasi elasticity exhibits a positive expected value but most of the distribution lies on the negative side.

Insert Table 3

Insert Table 4

[15] A quasi elasticity measures the variation of the threshold (in percent) that results *ceteris paribus* from setting a dummy variable at 1 rather than 0.

[16] The student statistics is no longer relevant to assess whether the estimates are significantly different from zero. It also appears that the expected value of the elasticity or quasi elasticity may be negative whereas more than half of the distribution is associated with a positive value and conversely.

V. CONCLUDING REMARKS

It is now well known for firms that along with intellectual property reward comes IP risk. Indeed, if IP are an opportunity for firms to boost their bottom lines, they also constitute an exposure for firms that may face an IP litigation suit and have to pay high damage awards or worst may have their IP rights be declared invalid. This explains, in part, why many SMEs are willing to subscribe an insurance against loss due to infringement of their IP rights[17]. This also explain why both the European Commission and Member States have recently introduced measures intended to improve and step up the fight against counterfeiting but have also strengthen the means of enforcing IPRs rights[18]. However, our paper suggests that the judicial system may not be so neutral as supposed. Indeed, contrary to standard theory, we show that in France the outcome and duration of the litigation process may be influenced by the characteristics of the parties. We also show that the devise of a trademark portfolio strategy strengthens the legal value of each peculiar trademark. Indeed, the return on the legal protection as defined by the ratio between the gain in case of trial victory and the opportunity cost of the trial increases with the importance of the trademark portfolio. In other words, if firms want to avoid the expense, inconvenience and confusion that occur from the fact that a trademark right is only "presumed" to be valid, they should recognize that a comprehensive, well-crafted and cost-effective trademark portfolio can be of substantial value and is likely to reward them with positive returns for years to come.

[17] *Cf.* the study for the European Commission (January 2003), Patent litigation insurance : the possible insurance schemes against patent litigation risks.
[18] *Cf.* Directive 2004/48/EC of the European Parliament and of the Council of 29 April 2004 on the enforcement of intellectual property rights.

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Figure 1
The first instance proceedings

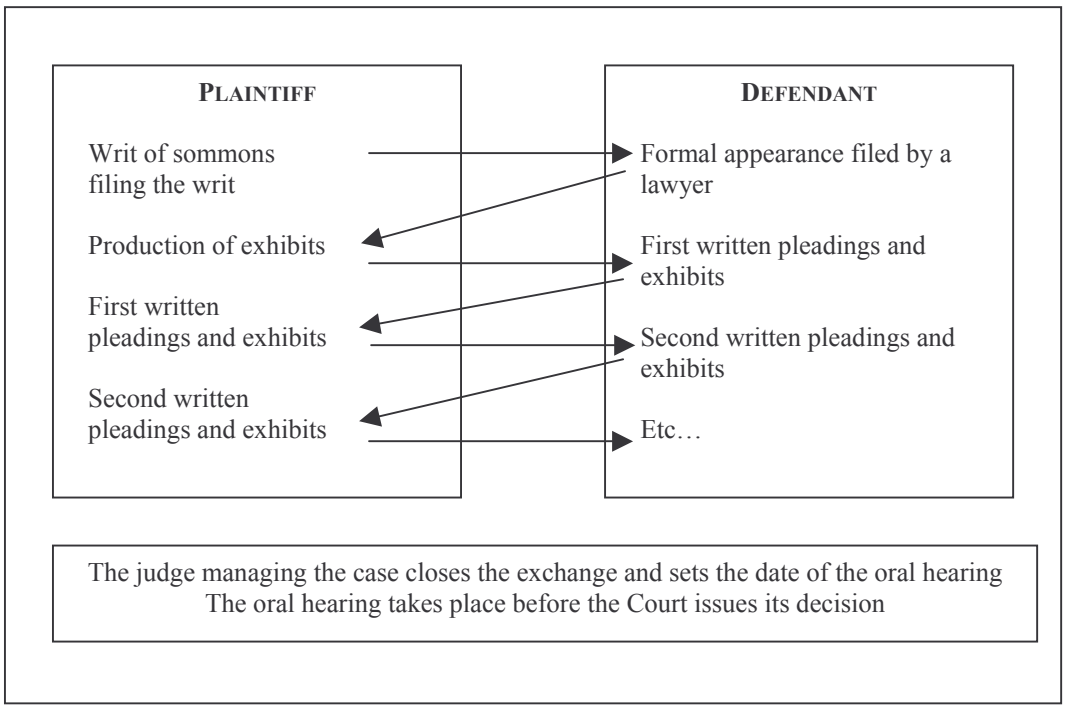


Figure 2

Inferring information from the decision to go to trial

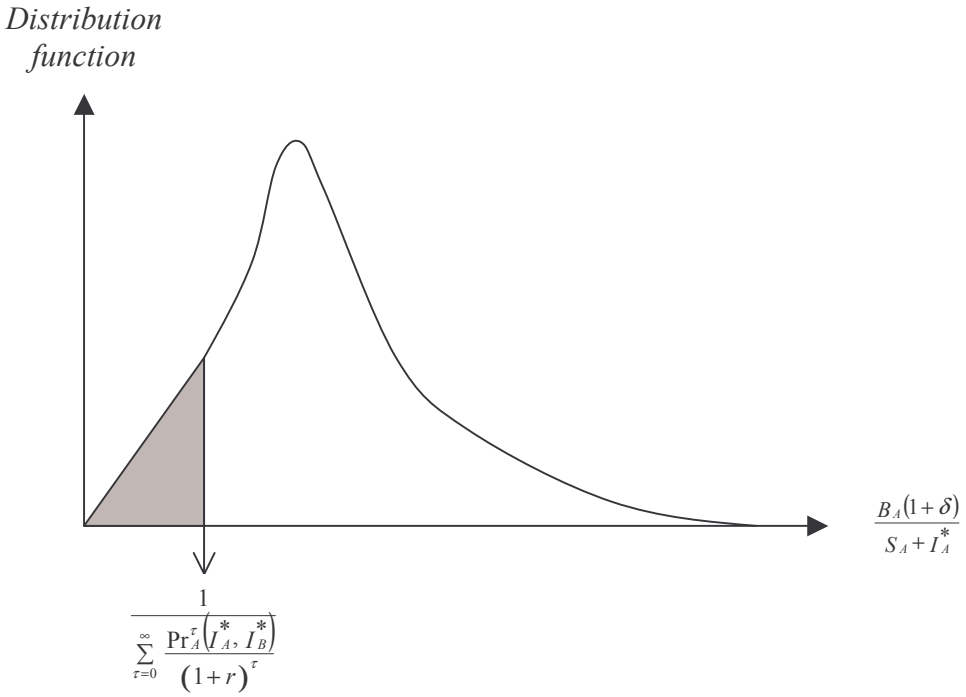


Figure 3

The tree form evolution of the process Z_t

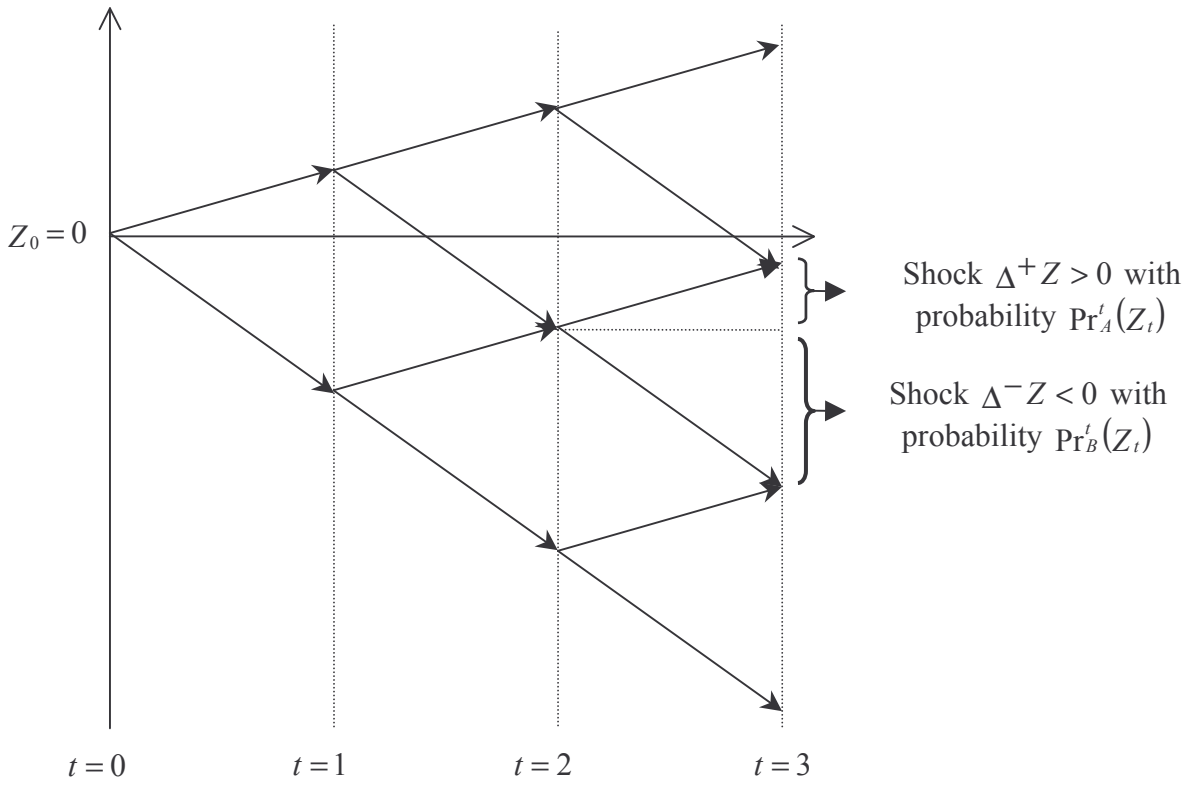


Figure 4

$\Pr_A^{\tau}(p_A, p_B)$ *as a function of* p_A *and* p_B *for* $\tau = 4$ *months*

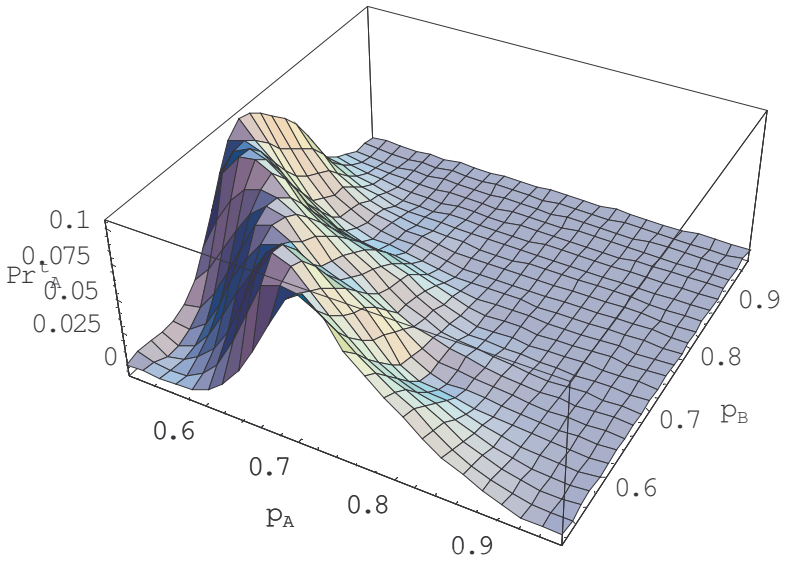
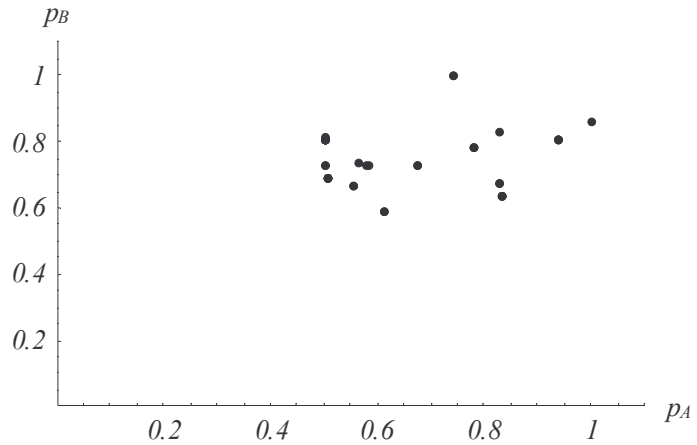


Figure 5

Values of p_A^n and p_B^n that maximise the likelihood of the outcome and duration of each case



nb: several points may overlap, causing the increase of the point size

Table 1: basic statistics

	Cases in which the trademark's holder A wins the trial	Cases in which the trademark's holder A looses the trial	Total
Number of cases	19	24	43
% of cases	44,19%	55,81%	100,00%
Average length (in days)	424,05	374,50	396,40

Table 2: average value (or % of occurrence) of variables

	Cases in which the trademark's holder A wins the trial	Cases in which the trademark's holder A looses the trial	Total
Duration (in days)	424.05	374.50	396.40
Dummy variable equal to 1 if A is an individual, 0 otherwise	11%	8%	9%
Dummy variable equal to 1 if B is an individual, 0 otherwise	11%	38%	26%
Dummy variable equal to 1 if A is a non national but European firm, 0 otherwise	16%	13%	14%
Dummy variable equal to 1 if A is a non national and non European firm, 0 otherwise	16%	33%	26%
Dummy variable equal to 1 if B is a non national but European firm, 0 otherwise	11%	8%	9%
Age of A (in years)	51.00	55.33	53.42
Age of the trademark at stake (in days)	4633.11	3810,08	4173.74
Number of trademarks owned by A	1.00	2.00	1.67
Number of IPC classes of the trademark at stake	1.31	4.00	2.83
Turnover of A (in €)	2310052393	5428370623	4069103702
Turnover of B (in €)	145590551	2519911557	1258553523
Ratio between the turnovers of A and B	140.33	844.26	533.22
Number of employees of A	19691	43468	31989
Number of employees of B	22910	8967	16374
Ratio between the number of employees of A and B	1047.29	2137.65	1655.86

Table 3: Estimation results

	Dependant variable: $\ln\left(p_A^n/1-p_A^n\right)$			Dependant variable: $\ln\left(p_B^n/1-p_B^n\right)$		
	Estimated coefficient	Standard deviation	t-stats	Estimated coefficient	Standard deviation	t-stats
Intercept	-36.1575	27.5855	-1.31074	66.5889 **	22.395	2.97339
Dummy variable equal to 1 in the case of counterfeit, 0 otherwise	-10.6763	25.541	-0.418007	-43.0756 **	20.7352	-2.07742
Dummy variable equal to 1 in the case of unfair competition, 0 otherwise	6.7673	28.0539	0.241225	-6.56399	22.7753	-0.288207
Dummy variable equal to 1 in the case of opposition proceedings, 0 otherwise	-5.95635	32.5679	-0.18289	-49.6389 *	26.4399	-1.87742
Dummy variable equal to 1 in the case of non opposition proceedings, 0 otherwise	-1.58415	24.8928	-0.063639	-47.7328 **	20.2089	-2.36197
Ratio between the turnovers of A and B	-0.0013032	0.0128355	-0.101531	0.0132844	0.0104203	1.27485
Ratio between the number of employees of A and B	-0.000227936	0.00485648	-0.0469344	-0.0066396 *	0.00394268	-1.68404
Turnover of A (in €)	$1.6865*10^{-9}$	$2.32818*10^{-9}$	0.724385	$2.26371*10^{-9}$	$1.8901*10^{-9}$	1.19766
Number of employees of A	0.00003499	0.000342695	0.102102	-0.00002921	0.000278213	-0.104994
Dummy variable equal to 1 if A is an individual, 0 otherwise	10.9448	30.8625	0.35463	-18.7929	25.0554	-0.750054
Dummy variable equal to 1 if B is an individual, 0 otherwise	8.42416	23.4283	0.359572	-39.5362 **	19.02	-2.07866
Age of A (in years)	-0.140833	0.203044	-0.693609	-0.185831	0.164839	-1.12735
Age of the trademark at stake (in days)	0.00248784 *	0.00131809	1.88745	0.000146655	0.00107008	0.137051
Number of trademarks owned by A	30.0152 *	16.4751	1.82186	-5.30417	13.3751	-0.39657
Number of IPC classes of the trademark at stake	-0.63943	0.871365	-0.733825	-0.0754425	0.707408	-0.106646
Dummy variable equal to 1 if A is a non national but European firm, 0 otherwise	-19.1528	29.011	-0.660192	33.3268	23.5522	1.41502
Dummy variable equal to 1 if A is a non national and non European firm, 0 otherwise	-13.7042	25.6147	-0.535012	11.7349	20.795	0.564312
Dummy variable equal to 1 if B is a non national but European firm, 0 otherwise	26.5993	35.0667	0.758535	-50.3951 *	28.4685	-1.77021
R^2 (with OLS)		0.290461			0.454189	
Estimated ρ			0.018115			
Estimated γ			1.07157			
Log likelihood (global model)			-424.746			
Log likelihood (with $\rho = 0$)			-424.751			

**: significantly different from zero at 5%
*: significantly different from zero at 10%

Table 4: Elasticities or quasi elasticities (for dummy variables) of the critical threshold $1\Big/\sum_{\tau=0}^{\infty}\frac{\Pr_A^{\tau}\left(I_A^*, I_B^*\right)}{(1+r)^{\tau}}$

With respect to	Expected value at sample mean	Standard deviation	Percentage of simulated values with a negative sign
Dummy variable equal to 1 in the case of counterfeit, 0 otherwise	251.538	8352.58	79.06%
Dummy variable equal to 1 in the case of unfair competition, 0 otherwise	5262.4	38584.1	61.54%
Dummy variable equal to 1 in the case of opposition proceedings, 0 otherwise	7.81802	278.834	91.88%
Dummy variable equal to 1 in the case of non opposition proceedings, 0 otherwise	29.1804	1926.55	85.44%
Ratio between the turnovers of A and B	0.00216617	0.0550176	59.44%
Ratio between the number of employees of A and B	-0.0022821	0.0508238	36.38%
Turnover of A (in €)	0.0265204	0.259048	70.10%
Number of employees of A	0.00945993	0.153073	51.50%
Dummy variable equal to 1 if A is an individual, 0 otherwise	118.641	4734.16	79.18%
Dummy variable equal to 1 if B is an individual, 0 otherwise	18.0769	541.231	73.72%
Age of A (in years)	-0.00563167	0.140419	32.38%
Age of the trademark at stake (in days)	0.0235558	0.268389	70.00%
Number of trademarks owned by A	0.349794	4.63917	66.12%
Number of IPC classes of the trademark at stake	-0.00186166	0.0423776	38.18%
Dummy variable equal to 1 if A is a non national but European firm, 0 otherwise	1862.42	21359.9	83.84%
Dummy variable equal to 1 if A is a non national and non European firm, 0 otherwise	3306.23	37992.2	77.40%
Dummy variable equal to 1 if B is a non national but European firm, 0 otherwise	62.6839	3544.83	78.20%