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Innovation: the impact of grace period to protect intellectual property

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Abstract

Firms protect their innovations by mobilizing mechanisms like patent and secret. Using these means of protection they aim to obtain value and knowledge (Hannah, 2005). Each means of protection present particularities according to the countries and legislations. Indeed, there are different requirements to hold a patent: 1) a patent holder must work on the invention within a specified time limit; 2) the patent application is kept secret until a patent is granted; 3) the rule of the "*first-to-invent*" (in The United States), or "*first- to-file*" (in most other countries in the world) can be applied. So we try to understand the impact of the grace period law to choose a mechanism to protect intellectual property. We focus on previous research on patent law (Harriel, 1996; Breesé, 2004, 2002; European Commission Research; 2002; IP Australia Patents Trade Marks Designs Plant Breeder's Rights, 2005), and recent data on intellectual property protection by firms, to analyze the impact of the grace period system in the world (particularly in Europe and America). We identify characteristics and advantages of the grace period and we identified the limits related to its application. Then we stress how firms can manage relationships to adapt to the laws restrictions using mechanisms to protect intellectual property. We show how institutions facilitate and limit firm's activities to protect their intellectual property. So to innovate and succeed in the market, firms must consider legal environment changes and environmental uncertainty relating to intellectual property law.

Introduction

To acquire information, firms need to innovate both from internal sources (their own in-house R&D activities) and from external sources (technical literature, patent databases, and customers), (Arundel, 2001: 616). The competitive context leads them to protect their intellectual property by using different kinds of mechanisms: patent, secret, copyright, and brand. Among these means, patent and secret have a particular importance. Indeed the Intellectual property (IP) refers to any intangible asset protectable contractually such as know-how, trade secret or secret and other intangible asset protectable by a law such as patent, copyright, trademarks, technical drawings, topography, etc.

Patent represents "legal instruments to protect IP by granting the patent holder a temporary monopoly position including the right to sue for infringement" (Hussinger, 2005: 22). Secret is defined as "a piece of information that is intentionally withheld by one or more social actor(s) from one or more other social actor(s)" (Hannah, 2005: 71). Secrecy may be rather applied for early-state inventions that will enter the market in a later period. Also secrecy allows firms to protect their process inventions which are not captured by the sales of new products (Hussinger (2005:23). So using secrecy an inventor can protect minor innovations

which do not satisfy criteria of patentability (Tirole, 2003:22). More generally, secret enables the company to keep an exclusive technological advantage and to have higher chances of success (Pfister, 2004: 172).

The protection of innovation necessitates considering laws based on intellectual property (IP) rights such as membership in international patent agreements (Park and Ginarte, 1997). Indeed, agreements focus on the Paris Convention of 1883 and Patent Cooperation Treaty of 1970 oblige firms to respect laws linked to the intellectual property. Furthermore, some countries impose conditions that inventions must be working by a certain period of time (grace period. However this condition can involve the loss of the protection.

Each of these means of protection (patent and secret) present particularities according to the countries and legislations. Indeed, there are differences according to the legislations to hold a patent: 1) a patent holder must work on the invention within a specified time limit; 2) the patent application is kept secret until a patent is granted; 3) the rule of the "*first-to-invent*" (in the United States), or "*first- to-file*" (in most other countries in the world) can be applied. These differences in the patent laws can have a significant impact on the ease of obtaining a patent, and may have the effect of discriminating against foreign firms. For example the cost of patent-filing in Japan for foreign applicants is the highest in the world (Oxley, 1999: 286-287).

Unlike patent which relies on disclosure regime, trade secret offers a perpetual protection (Stanley and Raskind, 1991: 24). Thus, when the regime of protection in one country is not positive to patent, some companies use secret as a means of protection (Tirole and al. 2003: 36). We try to understand the impact of the grace period law to choose a mechanism to protect intellectual property. We focus on previous research on patent law (Harriel, 1996; Breesé, 2004, 2002; European Commission Research; 2002; IP Australia Patents Trade Marks Designs Plant Breeder's Rights, 2005), and recent data on intellectual property protection by firms, to analyze the impact of the grace period system in the world (particularly in Europe and America). The existence of the grace period allows us to understand how institutions through patent law facilitate and limit a firm's activities and practices to protect intellectual property.

In the first part of our reflection, we identify the characteristics and advantages of the grace period. Then, we analyze the limits related to its application. At the end we stress how firms can manage relationships to adapt to the law restrictions based on the mechanisms of protection of the intellectual property.

Grace period: characteristics and advantages

The grace period aims to determine the property of the patent when two people make independently the same invention.

The United State patent law follows the principle of the "*first-to-invent*" this means that the first inventor has all the rights, he has prior claim to the invention (Stanley and Raskind, 1991: 7).

The grace period grants the inventors a period of one year to apply for the patent after the first public revelation (UTRF, 2009: 1). Thus, the grace period of 12 months allows the inventor to obtain a lapse of time to apply a published or revealed invention. The timing of the publication submission and patent application can vary among patent applications with some filed before publication and some after (Muray and Stem 2007: 658). Consequently the risk of loss of its invention or its appropriation by the competition is lesser. The American law tries

to know who is the first to make the invention even if this latter was not the first to file. Unlike in the United States, all countries have not the regime of the one year (grace period).

In the European system, it is the principle of the first depositor which is applied "*first-to-file*": the property of the invention returns to the first inventor who applies for the patent. However, the grace period applies in certain European countries. With the introduction of the grace period any information revealed by the inventor before the patent, does not prevent its filing within one year after the disclosure. Previously it was permitted to keep secrecy before filing the patent: neither disclosure, nor sale (European Commission Research, 2002). Also, in the European system, the grace period allows the inventor who has filed his invention before the time to avoid penalty of the nullity of the patent. The European Commission is trying to standardize the law in all the States (Breesé, 2004, 2002).

In Australia, the grace period has been introduced by the IPCRC (Intellectual Property and Competition Review Committee) to resolve the problems of the inventors who publish their invention having filed a temporary request (IP Australia Patents Trade Marks Designs Plant Breeder's Rights, 2005: 7).

According to the countries and the legislation, the protection afforded by the law for a given invention is not the same. So, in order to benefit from their inventions, sometimes the inventors choose other means of protection such as the secret. Secret guarantees complete protection and serves as an incentive to avoid the disclosure requirements of the patent regime (Stanley and Raskind, 1991: 24). Thus, some inventors do not publish their invention; they decide to keep it secret. However, trade secret law includes subject matter which is sometimes not compatible with the grace period system.

The limits of the grace period

The duration of trade secret protection is limited only by the happenstance of independent discovery or by improper disclosure. This potential for perpetual protection serves as an incentive to avoid the disclosure requirements of the patent regime. Also, optimal administration of the trade secret laws requires more emphasis on the private and social costs and benefits of trade secret protection, and on economic efficiency, and correspondingly less concern with norms of fair commercial conduct (Stanley and al., 1991: 24).

Trade secret can be protected during licenses granted to the other companies by agreements of confidentiality. But it is difficult to have agreement on license related to information undisclosed. When information is revealed there is a risk because a buyer can seize of the invention without paying the license (Tirole and al. 2003: 41).

The existence of a grace period can make the secret more risky in comparison to the other means of protection of intellectual assets such as the patent (Denicolò and Franzoni, 2004; Kultti and al. 2007).

The principle of the ownership of the invention by the first one who applies for the patent (European system) limits the preservation of the confidentiality of the secret. So, when an innovation kept secret by a company is revealed by a competitor, she can apply for a patent. Consequently the company loses the benefits of its invention.

Another problem is the difficulty that can occur in the legal regime of intellectual property protection which creates externality. The regime of protection of each country influences global incitation to innovate and other countries. When, in a country it is not possible to patent, companies are encouraged to use the trade secret (Tirole and al. 2003: 36). Legal origin impacts the decision to protect by secret (Laporta and al, 1998). Indeed laws vary a lot across countries, in part because of differences in legal origin. Civil laws (French civil law countries) give investors weaker legal rights than common laws do. The quality of law

enforcement is the highest in Scandinavian and German-civil-law countries, next highest in common-law countries, and again the lowest in French-civil-law countries. The quality of law enforcement differs across legal families (Laporta and al, 1998: 1116; 1141). According to these authors legal families refer to legal scholars that typically identify three currently common families of laws within the civil-law tradition: French, German, and Scandinavian (Laporta and al, 1998: 1118). So, legal environment is relatively important in the choice of the intellectual property (IP) protection Mansfield (1994).

Furthermore, the grace period introduces ambiguity concerning the existence of industrial property rights. Third parties have to wait for a long time before knowing if an innovation presented publicly is protected or not protected. This situation represents a barrier to innovate because some inventors are forced to wait from the moment when the invention is publicly presented, until the moment when third parties can know of its existence and the impact of the rights before innovating. Another limitation for inventors is to remember the date of the first disclosure and the deadline of the grace period, which is a source of insecurity for them.

During the grace period, competitors can use incorrect and illegal methods to discover information related to the trade secret: industrial espionage, corruption, taking the place of the agent of a supplier, breaking an explicit contract (McCarty and al. 2004: 619).

Industrial espionage (such as theft) involves obtaining secret information via electronic listening or listening on telephone line. The information maintained secretly can also be discovered through the corruption of an employee: breaks of the trust of his employer and disclosures of secret information. The explicit contract which consisted in maintaining the confidentiality can be also broken through its disclosure or its use by an employee.

Resorting to these methods during the grace period is often made for technologies which are easy to copy and which are not appropriate for protection by trade secret. This is the case in the IT (information technology) domain where a code distributed under a given shape can be easily decompiled (secret code in interpreted language or Java byte code). To decompile consist to transform or to covert an executable program code into some , some form of higher-level programming language so that it can be read by a human. So, the owner of the secret (code) does not arrange any recourse against third parties capable of de-compilation and which use available information publicly. The identification of the author is sometimes difficult. Indeed it is impossible to identify and to know the third party who made the secret public, he is unknown (Reminder, 2009: 422).

Means to protect intellectual property in relation to the law and competition

In the two first parts, we noticed that the protection of intellectual property is limited by patent law and illegal methods of the competitors to access a firm’s innovation during the grace period. How can firms improve the protection of the intellectual property in relation to the law and the competition?

To protect their specific investments when legal protection is weak, firms will tend to adopt stronger contractual governance that includes higher levels of term specificity, contingency adaptability, and contractual obligatoriness (Luo, 2005: 214). Term specificity refers to the extent to which contractual terms are clearly specified. Contractual obligatoriness explains how joint venture parties are legally bound to the contract (Luo, 2005: 209). Also, firms must consider governmental interference which is identified by changing regulatory rules and policies unexpected and the unpredictability of the regulatory environment. (Luo, 2005: 214). So, they can adapt to the law principles and reduce illegal methods used by competitors to acquire their innovation.

Another means to optimize the protection of the intellectual property is to consider the environmental uncertainty. Environment is defined as "the totality of physical and social factors that are taken directly into consideration in the decision-making behavior of individuals in the organization" (Duncan, 1972: 314). So firms try to reduce environmental uncertainty which represent the lack of information or uncertainty of relationships in internal environment and/or external environment. Duncan (1972) defined internal environment as relevant physical and social factors within the boundaries of the organization or specific decision unit that are taken directly into consideration in the decision-making behavior of individuals in that system. And external environment is considered as relevant physical and social factors outside the boundaries of the organization or specific decision unit that are taken directly into consideration (Duncan, 1972: 314).

Environmental uncertainty contains two dimensions: environmental complexity and variability (Duncan, 1972; Daft et al., 1988; Auster and Choo, 1993). According to Duncan (1972), to measure environmental complexity firms must consider numerous environmental factors in decision making. In a variable environment the factors change frequently and rapidly. So when firms making a decision regarding the choice of intellectual property protection mechanisms of a new technology and/or knowledge, it is necessary verify a set of factors. These factors concern: organizational personal component, organizational functional and staff units' component, supplier component, competitors' component, socio-political component, technological component. By considering these factors, they must verify for example "how often this factor has been important in the decision making in their internal or external environmental change? ". We built a questionnaire that allows identifying these different factors (Table). So firms apply the environmental scanning which is "the activity of gaining information about events and relationships in the organization's environment, the knowledge of which would assist management in planning future courses of action" (Auster and Choo, 1993: 194). For the firms environmental scanning can be conceived of as a key step in the process of organizational adaptation. Its can allow them to reinforce their organizations and to face the competition (Hambrick, 1982: 159).

To summarize, when firms have knowledge about their legal environment (jurisdictions, penalties, secret agreements, etc.) they can choose the best means to protect their intellectual property (secret and or patent) and adapt to the grace period restrictions.

Table: Questionnaire for measuring environment uncertainty to choice intellectual property (inspired by Duncan, 1972: 315)

When making a decision regarding the choice of IP protection mechanisms of a new technology and/or knowledge, you consider the followed factors:	**If "yes", how often has this factor been important in the decision making in their internal or external environmental change?**
(Organizational personal component)	
Our previous technology Yes ☐ No ☐	click here
Our employees' educational and technological background Yes ☐ No ☐	click here
Individual member's involvement and commitment Yes ☐ No ☐	click here

Interpersonal behaviour styles Yes ☐ No ☐	click here
(Organizational functional and staff units component)	
- Technological characteristics of organizational units Yes ☐ No ☐	click here
- Interdependence of organizational units in carrying out their - objectives Yes ☐ No ☐	click here
- Intra-unit conflict among organizational functional and staff units Yes ☐ No ☐	click here
- Inter-unit conflict among organisational functional and staff units Yes ☐ No ☐	click here
(Organizational level component)	
- Organizational objectives and goals Yes ☐ No ☐	click here
- Integrative process integrating individuals and groups into contributing maximally to attaining organizational goals Yes ☐ No ☐	click here
- Nature or the organization' knowledge and technology Yes ☐ No ☐	click here
(Client component	
- Our clients' products Yes ☐ No ☐	click here
(Supplier component)	
- New materials suppliers Yes ☐ No ☐	click here
- Equipment supplier Yes ☐ No ☐	click here
- Product parts suppliers Yes ☐ No ☐	click here
(competitors component)	
- The number of our direct competitors Yes ☐ No ☐	click here
- Our competitors' activity Yes ☐ No ☐	click here
(Socio-political component)	
- Government regulatory control over the industry Yes ☐ No ☐	click here
- Public political attitude towards industry Yes ☐ No ☐	click here
- Relationship with trade unions with jurisdiction in the organization Yes ☐ No ☐	click here
(Technological component)	
- Meeting new technological requirements of own industry and related industries in production of products and service Yes ☐ No ☐	click here

- Improving and developing new products in the industry Yes ☐ No ☐	click here

(Organizational personal component)	**How often has this factor been important in the decision making in their internal or external environmental change?**
Our previous technology Yes ☐ No ☐	click here
Our employees' educational and technological background Yes ☐ No ☐	1. Never
Individual member's involvement and commitment Yes ☐ No ☐	1. Never
Interpersonal behaviour styles Yes ☐ No ☐	1. Never
(Organizational functional and staff units component)	
- Technological characteristics of organizational units Yes ☐ No ☐	1. Never
- Interdependence of organizational units in carrying out their - objectives Yes ☐ No ☐	1. Never
- Intra-unit conflict among organizational functional and staff units Yes ☐ No ☐	1. Never
- Inter-unit conflict among organisational functional and staff units Yes ☐ No ☐	1. Never
(Organizational level component)	
- Organizational objectives and goals Yes ☐ No ☐	1. Never
- Integrative process integrating individuals and groups into contributing maximally to attaining organizational goals Yes ☐ No ☐	1. Never
- Nature or the organization' knowledge and technology Yes ☐ No ☐	1. Never
(Client component	
- Our clients' products Yes ☐ No ☐	1. Never
(Supplier component)	
- New materials suppliers Yes ☐ No ☐	1. Never
- Equipment supplier Yes ☐ No ☐	1. Never
- Product parts suppliers Yes ☐ No ☐	1. Never

(competitors component)	
- The number of our direct competitors Yes ☐ No ☐	1. Never
- Our competitors' activity Yes ☐ No ☐	1. Never
(Socio-political component)	
- Government regulatory control over the industry Yes ☐ No ☐	1. Never
- Public political attitude towards industry Yes ☐ No ☐	1. Never
- Relationship with trade unions with jurisdiction in the organization Yes ☐ No ☐	1. Never
(Technological component)	
- Meeting new technological requirements of own industry and related industries in production of products and service Yes ☐ No ☐	1. Never
- Improving and developing new products in the industry Yes ☐ No ☐	1. Never

Conclusion

By analyzing patent law in different areas (America and Europe), we show that the grace period law related to the system of the "first-to-invent" (in US) allows firms to protect their invention by secret and to avoid costs related to patent protection. But the grace period system is not applied in all the countries in the world. For example European firms don't take advantage of the grace period such as the protection of their invention during a period of time.

The regime of protection of each country influences global incitation to innovate in other countries. When, in a country it is not possible to patent companies are encourages to use trade secret For example the control of the price of medicines in Europe decreased on half the level of price in America (Tirole and al. 2003: 36). The existence of the grace period in intellectual property law encourages some firms to use illegal methods and to exploit the inventions of their competitors.

Although the strategy of the grace period regulates relationships between firms in a competitive market, harmonization is necessary. Indeed, the harmonization of the firms' practices which working in the same business sectors would enable benefiting more from the grace period law to protect their intellectual property by secret.

To sum up, legal environment components (patent laws, trade secret laws, origin of laws, sanctions, etc.) persuade firms to protect their innovations by secret or patent when these components are less restrictive for them. To gain a competitive advantage in an innovative context, firms try to scan an environment considering all of the factors of environmental uncertainty.

References

1. Auster, E., Choo, C.W., (1993), Environmental scanning by CEOs in two Canadian industries, *Journal of the American Society for Information Science*, Vol. 44 N°.4, pp. 194-203.

2. Breesé P., de Kermadec, Y., (2004), La propriété intellectuelle au service de l'innovation, Nathan, Paris, 159p.
3. Breesé, P., (2002), Strategies de la propriété industrielle : Guide des entreprises innovantes en action, Edition Dunod, 345p.
4. Denicolò V., Franzoni, L. A. (2004), Patents, secrets, and the first-inventor defense, *Journal of Economics & Management Strategy*, Vol. 13, N°3, pp. 517-538.
5. Duncan, R.B (1972), Characteristics of Organizational Environments and Perceived Environmental Uncertainty, *Administrative Science Quarterly*, Vol. 17, N° 3, September, pp. 313-327.
6. European Commission Research (2002), Expert Group Report on Role and Strategic Use of IPR (Intellectual Property Rights) in International Research Collaborations, Final Report, April.
7. Hambrick, D.C. (1982), Environmental Scanning and Organizational Strategy, *Strategic Management Journal*, Vol. 3, pp. 159-174.
8. Hannah, D.R., (2005), Should I Keep a Secret? The Effects of Trade Secret Protection Procedures on Employees' Obligations to Protect Trade Secrets, *Organization Science*, Vol. 16, No. 1, January-February, pp. 71-84.
9. Harriel, K., (1996), Prior User Rights in a First-to-Invent Patent System: Why Not? IDEA, *The Journal of Law and Technology*, Vol. 36, N° 4, pp 543-566.
10. Hussinger, K. (2005), Is Silence Golden? Patents versus Secrecy at the Firm Level, Governance and the Efficiency of Economic Systems (GESY), Discussion Paper N°37.
11. IP Australia Patents Trade Marks Designs Plant Breeder's Rights, (2005), Review of Patent Grace Period, August.
12. Kultti. K., Takalo, T., and Toikka, J. (2007). Secrecy versus patenting. The RAND *Journal of Economics*, Vol. 38, N°1, pp. 22-42.
13. La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R.W., (1998), Law and Finance, *Journal of Political Economy*, Vol. 106, N°6, pp. 1113-1155.
14. Luo, Y., (2005), Transactional Characteristics, Institutional Environment and Joint Venture Contracts, *Journal of International Business Studies*, Vol. 36, N°2, March, pp. 209-230.
15. Mansfield, E., (1994), Intellectual Property Protection, Foreign Direct Investment, and Technology Transfer, Discussion Paper Number 19, IFC (International Finance Corporation), The World Bank, Washington, D.C.
16. McCarthy JT, Schechter, R.E, Franklyn, D.J, (2004), Mccarthy's Desk Encyclopedia Of Intellectual Property (Hardcover), Bureau of National Affairs; 3rd edition, november, 736p.
17. Muray F., Stem, S., (2007), Do formal intellectual property rights hinder the free flow of scientific knowledge? An empirical test of the anti-commons hypothesis, *Journal of Economic Behavior & Organization*, Vol.63, pp 648-687.
18. Oxley, J.E., (1999), Institutional environment and the mechanisms of governance: the impact of intellectual property protection on the structure of inter-firm alliances, *Journal of Economic Behavior & Organization*, Vol.38, pp 283-309.
19. Pfister, E., (2004), La divulgation volontaire des innovations Une modélisation théorique, *Revue économique*, Vol. 55, N° 2, mars, pp. 165-186.
20. Reminder, B., (2009) Brevet, Innovation et Intérêt Général. Brevet : Pourquoi et pour quoi faire ?, Actes de Colloque de Louvain-la-neuve, Organisé par la Chaire Arcelor, De Boeck et Larcier, 608p.

21. Stanley, M.B., Raskind, L.J., (1991), An Introduction to the Law and Economics of Intellectual Property, *The Journal of Economic Perspectives*, Vol. 5, N.1, pp. 3-27.
22. Tirole, J., Henry, C., Trommetter, M., Tubiana, L., Caillaud, B., (2003), Propriété intellectuelle, Rapport du Conseil d'analyse économique (CAE), N°41, La Documentation Française.
23. UTRF: University of Tennessee, Research foundation, (2009), The Impact of Public Disclosure on Patent Protection, University of Tennessee, Ideas to Enterprise.
24. Park, W.G., Ginarte, J.C., (1997), Intellectual property rights and economic; Contemporary Economic Policy, Vol. XV, July, pp. 51-61.