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MITIGATING INNOVATION RISKS CONCERNING INTELLECTUAL PROPERTY INSTRUMENTS

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Abstract

As protection of innovation is possible using a variety of intellectual property instruments, the current paper aims at emphasizing the vulnerabilities of these instruments in order to facilitate the right choice in terms of protection, exploitation and dissemination of innovation. Based on a review of the intellectual property instruments and their related risk factors, the study identifies and formulates specific proactive strategies which arise from the fact that an instrument alone does not allow for effective protection, exploitation and dissemination and oftentimes the owners of innovation should combine traditional and alternative instruments. Therefore, the results of this analysis represent a helpful tool for managers in the decisional process.

1. Introduction

Protection of intellectual property is essential in a global economy in which progress by innovation occupies the central agenda of all development policies. In essence, humanity's progress lies in the capacity to create and invent culture and technology. In this context, the legal protection of „creation” regardless of its nature encourages innovation and future commitment of resources with such purpose. Intellectual property allows technological transfer and thus facilitates market operations, this being in fact one of the most important roles of intellectual property. Therefore, public and private organizations are encouraged to engage in technology transfer, not just by licensing or other voluntary contracts, but also by elaborating innovative approaches to promote technology development, direct investment, sales and dissemination of technology and forms of cooperation. Because of their quality of being subject to transactions and transfer, intellectual property rights facilitate the creation of new markets for innovation. (Torun, Cicekci, 2007).

The importance of intellectual property was first emphasized in two treaties of the World Intellectual Property Organisation (WIPO), respectively in 1883 the Paris Convention for Intellectual Property Protection and in 1886 the Berne Convention for Literary and Artistic Work Protection. Over a century later in 2012, it was recorded the highest rate of patent application in the last 18 years, comprising 9.2% upturn compared with the previous year, showing the world's continuously increased interest in protecting intellectual property. A sharp improvement was also registered in terms of utility models applications, meaning an increase of 23, 4% when compared with previous year. This ascending trend was noticeable in the case of classes of goods and services specified in trademark applications. Regarding industrial design, the number of applications also registered a world record with 17% improvement year-on-year as seen in Figure 1 (WIPO, 2013). It should be also noted that worldwide the most employed intellectual property instruments are patent, utility model, trademark, industrial design and copyright (Mirësi, 2013; WIPO, 2012; WIPO, 2013).

The aim of choosing an intellectual property instrument lies in the high vulnerability of innovation regarding its exposure to risks such as: unauthorized production, use, distribution or trade, theft, illegal imitation, full disclosure of innovation's technical secrets or unwillingly allowing third party to patent the innovation etc. The identification of specific risks regarding a particular innovation allows for, but is not limited to, choosing the suitable intellectual property instrument in order to mitigate these risks and such, to allow the owner of innovation to efficiently exploit the results of his creation. Therefore,

managing innovation risks is crucial when dealing with intellectual property infringement due to the importance of preventing the occurrence of undesired events with negative impact on the valorisation of innovation. Risk management process comprises a series of stages which need to be undertaken, starting from a complete identification of risks, followed by a qualitative and/or quantitative analysis and evaluation and finally addressing it to the accountable person in order to formulate a report and communicate it to key stakeholders (Institute of Management Accountants, Enterprise Risk Management, 2007; Smith & Merrit, 2002; Hall, 1998; PMI, 2004; Stamatelatos, 2011).

The lessons learnt during this process are highly important as they may help an organization to seize opportunities and be better prepared for mitigating risks. With regards to innovation, failing to correctly identify potential risks and to choose proper mitigating strategies may result in an inefficient outcome of its exploitation. Therefore, risk management aims to protect not only “the added value” of an organization, but also “its future opportunities”, favouring a sustainable growth (European Federation for Welding, Fundamental for Risk Management, 2014).

2. Method

The method employed in the current study comprises a theoretical overview with regards to the risk factors related to the most employed intellectual property instruments, i.e. copyright, patent, utility model, trademark and industrial design.

Therefore, the focus lies on the first stage of risk management process, i.e. identification of specific risk factors which can be mitigated by traditional and alternative intellectual property tools (as depicted in Table 1 and Table 2) and secondly, the identification and comparative analysis of the risk factors arising from the limitations of the intellectual property instruments in terms of:

- Cost of protection: the cost occurred by the innovation owner when securing its innovation with an intellectual property instrument;
- Exploitation: quantifies the success of the market uptake of an innovation, respectively its direct valorisation (by its owner through direct commercialisation of the innovation) or indirect valorisation (through transferring the rights over the innovation, e.g. licensing or assignment tools);
- Dissemination: the communication of new knowledge and results of the research & development activities to the public through specific channels and with different intensity;

- Exclusivity: the usage of the innovation solely by owner authorization;
- Management: the intellectual property instrument may require a proper administration at high level, low level or none at all;
- Innovation type: it is important as the protection secured by the intellectual property instrument is more effective for radical than incremental innovation;
- Impact on the market: the innovation may highly influence the current status of the market, respectively the state of the art, or it may have limited or no effect at all;
- Timespan of protection: the intellectual property instrument offers protection for a period of time ranging from a few years to indefinite time span.
- Intellectual property infringement: depending on the instrument employed to protect intellectual property, the innovation is subject or not to intellectual property infringement, i.e. unauthorized use or commercialization by a third party.

Intellectual property consists of various and complex specific legal forms (instruments), the most utilized being summarized in Table 1 (traditional instruments) and Table 2 (alternative instruments).

3. Results

As long as there will be different levels of development from a country to another, fluctuations of intellectual property effects with respect to costs and benefits must be correlated to the degree of economic, industrial and technological development of a country, as well as with the complexity and strength of the adopted intellectual property system in terms of internal implementation of international regulations in the field. The strength of intellectual property rights of each country depends on the characteristics of demand, market structure and other forms of regulation in the fields of business and competition. If intellectual property rights are poorly developed, there are not enough stimulants for creation; thereby, the economy is subject to slower growth, a more limited culture and lower product quality. If intellectual property rights are excessively present, it leads to a restriction in access to the results of innovation; therefore, the economy is subject to inadequate dissemination of new information, which may even lead to monopoly situations. To put it into perspective, if protection is poor, the result is loss of innovation, if protection is too severe, it generates a surplus of inventors and sacrifices the benefits associated with consumer access. The balance between the intensity of national intellectual property protection systems is therefore essential, particularly with respect to the

fact that access to protected technologies is necessary to facilitate incremental innovation and artistic creation, this being in fact the manner in which the greatest proportion of innovation takes place. (Maskus, 2000; Falvey, Foster and Memedovic, 2006).

Intellectual property instruments although designed to protect innovation against a series of risks, i.e. innovation risk mitigation strategies, they are also subject to a range of vulnerabilities. In fact, regardless to whether the innovation owner chooses a traditional instrument of intellectual property or an alternative one, it should be noted that none of them individually offers a complete protection, but may cover a series of specific risks which these tools may prevent from occurring and/or mitigate as they materialize.

For instance, even if patenting enables the innovation owner to directly exploit it and preserve total exclusivity, the exceeding costs for using this particular tool and for managing it, to which is added the time limitation, may influence the owner's decision toward a different intellectual property instrument. As shown in Table 3, all tools taken into consideration present different weaknesses, e.g. the same protection is not suited for all types of innovation, dissemination and diffusion involve extra costs, the exclusivity doesn't apply solely to the entitled person, exploitation can oftentimes be done indirectly by unauthorized third parties or the impact recorded on the market is very low. Therefore, mitigating risks associated to intellectual property instruments cannot be accomplished by a single tool, as in this day and age a complete protection for innovation does not exist. To meet this limitation there are strategies for risk detraction, which consist of combining the traditional and alternative intellectual property instruments in order to fill in the gaps of a particular tool in terms of innovation protection, costs and valorisation. Therefore, such a strategy would be combining defensive publication with patenting of a core technology. As such, once a core technology is patented, the related improvements and other potential applications arising from it are then defensively published in order to reduce the risks of someone else obtaining a dominant patent and of wasting resources. Furthermore, the innovation owner may use the patenting procedure as defensive publication, i.e. applying for a patent and paying the related fees until the invention is published and then abandoning the patent application without obtaining the patent. This strategy reduces the costs of disseminating the invention, while allowing the inventor to both stop others from patenting it and to attract potential customers wanting to use and understand more about the invention. In this context another strategy emerges, that is utilizing the commercial secret in conjunction with either

defensive publication, patent or utility model, i.e. the commercial is not entirely revealed when the invention becomes public which conditions its use by additional information provided for the interested parties solely by the inventor itself. There is also the option for open access (OA). OA represents a particular form of publishing allowing for free online access to research articles, thus being an efficient model for fast dissemination of knowledge and scientific progress. OA comprises Green OA, i.e. immediate or delayed open access provided by author through self-archiving, and Gold OA, i.e. immediate open access provided by the publisher. Another efficient strategy would be to enforce contract law and competition law instead of intellectual property law by opting for keeping the invention a secret. This is particularly efficient in the case of technologies with items of tangible property. (Boettiger, S., Chi-Ham, C., 2007; European IPR Helpdesk, 2013).

4. Discussion

Intellectual property has various legal instruments which protect intellectual creation, having different objects of protection, different duration as well as different fields of application. The role of these instruments is to allow society to create a balance between the interests of investors and consumers with respect to different types of intellectual work, respectively between insuring the benefits of innovation and return on investment and access to knowledge. Furthermore, the purpose of intellectual property rights is that of preventing copying and unauthorized imitation of technical and/or artistic creation, whilst allowing public exposure for the creation and the creator, thus generating a certain public image, as well as stimulating future innovation and improvement of general knowledge.

The modern view on intellectual property instruments has replaced the classical approach due to a new direction towards cost reduction and innovation valorisation enhancement. As the budget for R&D both at public and private level has recorded a severe shortage since the beginning of the economic crisis regardless of the entity who conducts the research, a stronger relation between universities/research centres and private companies active in the same industry would definitely improve the quality of future innovative products. The everyday more stringent need for alternative sources of finance has significantly stimulated universities and research centres to explore intellectual property more efficiently. Therefore, these legal entities are focusing more nowadays on seizing the opportunity and preventing risk occurrence by acknowledging the particular vulnerabilities of intellectual property instruments and by mastering strategies and alternative instruments to fill in identified limitations. The

exposure of the innovation owner and the innovation itself to risk factors such as information leakage regarding technological secrets, lost of exclusivity and limited protection for radical innovation, needs to be restricted and controlled as much as possible.

As future direction of research, a more comprehensive analysis of the traditional and alternative intellectual property instruments should show potential for designing modelling strategies to meet the increasing needs for the protection, valorisation and dissemination of the innovation.

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References:

- [1] Boettiger, S., Chi-Ham, C. (2007). *Sharing the Art of IP management, ipHandbook of Best Practices*. Retrieved from:
<http://www.iphandbook.org/handbook/ch10/p01/>
- [2] European IPR Helpdesk (2013): *Patenting v. publishing*. Retrieved from:http://www.iprhelphdesk.eu/sites/default/files/newsdocuments/Patenting_v._publishing_0.pdf
- [3] European Federation for Welding, Fundamental for Risk Management. Retrieved from:
http://www.ewf.be/media/documentosDocs/doc_16_ewf-644-08-fundamentals-of-risk-management.pdf
- [4] Falvey, R., Foster, N., Memedovic, O. (2006). *The role of intellectual property rights in technology transfer and economic growth: Theory and evidence, Working Paper*. Vienna: United Nations Industrial Development Organization
- [5] Hall, E. (1998). *Managing risk-Methods for Software Systems Developmentk*. Reading: Addison Wessley Longman
- [6] Institute of Management Accountants, Enterprise Risk Management (2007). *Tools and Techniques for effective implementation*. Retrieved from:
http://www.stjohns.edu/sites/default/files/document/s/academics/tobin/enterprise_tools_and_techniques.pdf
- [7] Maskus, K. E. (2000). *Intellectual Property Rights In The Global Economy*. Washington: Peterson Institute for International Economics.
- [8] Mirësi, C. (2013). An Overview on Intellectual Property Rights Protection and Benefits. *The*

- Macrotheme Review, Volume 2 (Issue No. 3),*
pp 81-91.
- [9] OSIM (2010). *Proprietatea Intelectuala, instrument de afaceri pentru IMM-uri [Intellectual Property, business instrument for SME]*. Bucharest: Editura OSIM, ISBN: 978-973-7618-63-4.
- [10] PMI Project Management Institute. (2004). *A Guide to the Project Management Body of Knowledge (PMBOK Guide)*. Retrieved from: <http://www.cs.bilkent.edu.tr/~cagatay/cs413/PMBOK.pdf>.
- [11] Smith, P., Merrit, G. (2002). *Proactive Risk Management-Controlling Uncertainty in Product Development*. New York: Productivity Press
- [12] Stamatelatos, M. (2011). *Probabilistic Risk Assessment Procedures Guide for NASA Managers and Practitioners*. Retrieved from: <http://www.hq.nasa.gov/office/codeq/doctree/SP20113421.pdf>
- [13] Torun, H., Cicekci, C. (2007). *Innovation: Is the engine for the economic growth?* Retrieved from: <http://www.tcmb.gov.tr/yeni/iletisimgm/Innovation.pdf>
- [14] World Intellectual Property Organization - WIPO (2012). *WIPO IP Facts and Figures, Economics & Statistic Series*. Retrieved from http://www.wipo.int/export/sites/www/freepublications/en/statistics/943/wipo_pub_943_2012.pdf
- [15] World Intellectual Property Organization - WIPO (2013). *WIPO IP Facts and Figures, Economics & Statistic Series*. Retrieved from http://www.wipo.int/export/sites/www/freepublications/en/statistics/943/wipo_pub_943_2013.pdf

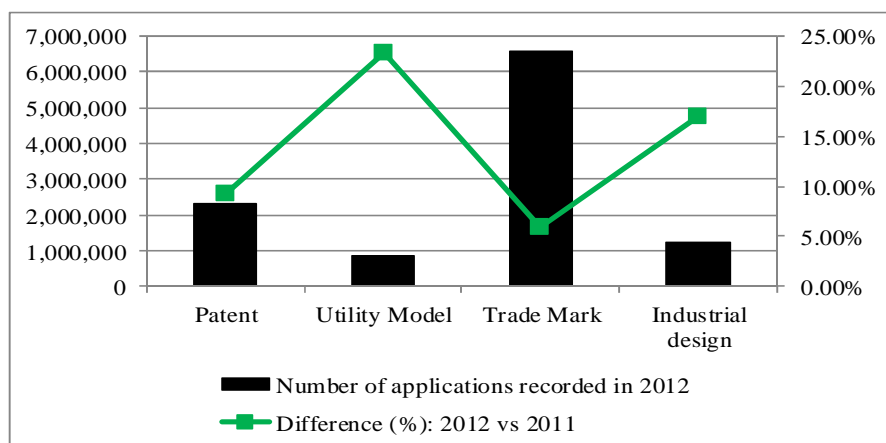


Figure 1. Number of applications for intellectual property instruments recorded in 2012 (WIPO, 2013).

Table No.1

Traditional most employed intellectual property instruments and the risks factors mitigated by these tools (Adaptation from Boettiger, S., Chi-Ham, C., 2007; European IPR Helpdesk, 2013).

Traditional Intellectual Property Instruments (TIPI)	Description	Risk factors mitigated by TIPI
Copyright	<i>It provides protection for artistic and scientific work, including phonograms, media creations and electronic software. It does not require formal registration entering into force at the moment of the initial dissemination.</i>	<i>Unauthorized reproduction of the original expression of the artist. Complicated registering procedure of the copyright.</i>
Patent	<i>It provides protection for an invention which brings progress beyond the state of the art, respectively for a process, equipment and/or product exhibiting novelty, inventive step and industrial applicability. It can protect also living organisms either invented or discovered. It provides recognition and material reward; it contributes to the enhancement of world's knowledge technical patrimony.</i>	<i>Unauthorized production, use, distribution, trade by a third party without owner's involvement in the exploitation benefits.</i>
Utility model	<i>It provides protection for incremental innovation as the degree of novelty required is lower than of the patent.</i>	<i>Unauthorized production, use, distribution, trade by a third party without owner's involvement in the exploitation benefits.</i>
Trademark	<i>It protects words, signs, colours, combination of colours and any graphic representation which enables the user to distinct between particular goods or services on the market.</i>	<i>Illegal imitation; Use by a third party without owner's approval; Difficulty for the consumer to identify a product or a service already successfully tested.</i>
Industrial design	<i>It provides protection for particular designs of a wide industrial variety of products, instruments and structures, in terms of design features and aesthetics with no functionality.</i>	<i>Reproduction and use for commercial purposes by a third party without owner's approval.</i>

Table No. 2

Alternative intellectual property instruments and main risks factors mitigated by these instruments (Adaptation from Boettiger, S., Chi-Ham, C., 2007; European IPR Helpdesk, 2013).

Alternative	Description	Main risk factors mitigated by AIPI
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Intellectual Property Instruments (AIP)		
Defensive publication	Particular form of publication by “prophylactic disclosure” of an invention, thus blocking any third party from patenting it. Defensive publication can be mainly performed by: <ul style="list-style-type: none"> - Publishing in scientific journals or specific electronic databases; - Patenting a core technology and publishing the related and alternative improvements/ applications of same core technology; - Patent application filing and abandonment at the stage when the invention is being published by the intellectual property office. 	Full disclosure of innovation’s technical secrets is mitigated by keeping the commercial secret partially unrevealed; <p>Allowing third party to patent the innovation is mitigated by destroying the novelty requirement once put in the public domain.</p> <p>Allowing third party to register a dominant patent mitigated by defensively publishing the related and alternative improvements/ applications of same core technology.</p>
Open access	Particular form of publication which provides free online access to research articles. It is a very efficient dissemination system and enhances the scientific progress, while redirecting the publishing expenses from reader to author/ editor.	Restrictive access for users to innovative scientific knowledge is mitigated by providing free access for reproduction and use.
Commercial secret (Exploitation of the innovation utilizing commercial contracts)	It provides protection for a wide range of confidential information regarding operations, data bases, algorithms, business strategies and plans, research and development activities etc.	Full disclosure of invention is mitigated by keeping the commercial secret and revealing it only to partners through commercial contracts.
		Infringement of intellectual property rights is mitigated by relying exclusively on the commercial law and completion law.

Table No.3
Empirical comparison of the innovation risk factors related to traditional and alternative intellectual property instruments

Risk factors	Intellectual property instruments							
	Traditional				Alternative			
	C	P	UM	TM	ID	DP	OA	CS
Cost of protection (High - H/Medium – M/Low - L)	L	H	M	M	L	M	L	L
Exploitation (Direct - D/Indirect - I)	D/I	D/I	D/I	D/I	D/I	D/I	D/I	D/I
Dissemination (Chargeable-C/ Free of charge-F)	C	C	C	C	C	F	F	C
Exclusivity (Yes - Y/No - N)	Y	Y	Y	Y	Y	N	N	N
Management (Yes Required-Y/ Not required-N)	Y	Y	Y	Y	Y	N	N	Y
Innovation type (Incremental - I/	NA	I/R	I	I	I	I/R	I/R	I/R

Radical – R/Not applicable NA)

Impact on the market (High - H/Medium – M/Low - L)	H	H	M	L	L	M	L	L
Timespan of protection (years)	>100	20	4-10	∞	5-15	0	0	0
Intellectual Property Infringement (Yes - Y/No - N)	Y	Y	Y	Y	Y	Y/N	N	N

Legend: C= Copyright; P= Patent, UM= Utility model; TM= Trademark; ID=Industrial design; DP=Defensive publication; OA=Open access; CS= Commercial Secret.

Note: Table No.3 represents an empirical comparison based on literature sources (*Boettiger, S., Chi-Ham, C., 2007; European IPR Helpdesk, 2013; OSIM, 2010*).