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Constructing a New IPRs index

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Summary

Intellectual property is at the centre of the "new economy". The rationale of intellectual property law is to advance innovation and productive knowledge creation. The key purpose of Intellectual Property (IP) law is to appropriately assign the defend property rights on assets that might have economic value. The new Intellectual Property Rights (IPRs) index comes up to cover the gap of the currently existing indices and its uniqueness based on the fact of including all IP rights within our evaluation. Moreover, our index is constructed in such a way that all new developments concerning the various aspects of IPR laws can be easily incorporated in and having any time the most possibly accurate quantitative calculation of IP rights.

Contents

Introduction

Positive law and economics utilize economic analysis to predict the consequences of various legal rules and in general states that common law is effective, while normative law and economics make policy suggestions based on the economic consequences of a mixture of policies and in general states that the law should be resourceful.

Intellectual property is at the centre of the "new economy", also known as the "knowledge-based economy". The slogan "knowledge-based economy" portrays the new economic environment in which the creation and management of knowledge play a prevalent part in wealth creation, as compared with the traditional factors of production, explicitly land, labour and capital (WIPO, 2003). Policy makers should embrace strategies for upholding IPRs protection as well as management and development of IPRs resources. The significance of IPRs varies to a large extent; variables include as the technological nature of the activity and the nature of the economy. IPRs shape rent-seeking behaviours engendering negative outcomes on competence and likewise on innovation itself.

The key objective of intellectual property law is the making of new and improved works; whether technological or expressive. Another rationale for intellectual property law deals with a distinctive economic problem: ensuring the integrity of the marketplace. Finally intellectual property law is there to advance innovation and productive knowledge creation. The legal exceptionality established by intellectual property rights cuts down transaction costs, promotes dissemination of knowledge and inspires investment in valuable ideas consistent with the underlying principles of market economies (Scotchmer, 2004).

The aim of this article is to present a newly contracted IPRs index that could be used in evaluating the influence of IPRs upon various variables of any economy such as Foreign Direct Investment, trade, technology transfer, Research and Design etc. Table 1 at the end of this article shows the jurisdictions that are investigated in the preparation of the IPRs index. The new IPRs index is intended to cover gaps in the currently existing indices. Its uniqueness based on the fact of including all IP rights within our evaluation. The legal background of IP laws will be illustrated firstly. Secondly a concise reference to the existing indices will be presented. Thirdly, a detailed reference to the way of constructing our Index will follow. Finally conclusions will be drawn from the analysis.

Legal Background

The international tendency is undeniably toward improved minimum levels of substantive protection for intellectual property owners (Bird 2006). The present value of intellectual property drastically outweighs the value of physical property land, tangibles and intangibles together. A growing proportion of the GDP in developed countries is included now of informational goods such as software, movies, and databases. The IP protection has noteworthy consequence on this economic value and the laws regulating intellectual property in the information era are perceived as an input for economic growth. According to Shapiro and Hassett (2005) the value of IP in the United States in 2005 was estimated at 5 trillion US dollars, which accounted for almost 50 per cent of U.S. GDP.

The technological revolution of cyberspace and accompanied technologies resulted with a massive increase in informational commodities and intellectual creations that became prospective candidates for the safeguard of IP rights. Decentralization, user empowerment, and interoperability are engineering doctrines that have made cyberspace an unparalleled medium for innovation nowadays. Cyberspace governance at the moment is not totally adapted to the technology's remarkable public influence.

Digitization is influential to the rise of new technologies, business methods, the blurring of national and jurisdictional boundaries, and the liberalization of the innovative enterprise. Traditional intellectual property notions are challenged as never before. Given that biological diversity and genetic resources is the core of indigenous knowledge, intellectual property has motivated complicated ethical and usefulness based questions over the "propertization" of nature and culture (Wood, 2010).

The basis for the development of IPRs under international law dates back to 1833 within the adoption of Paris Convention, 1833 for protection of Industrial Property and the Berne convention was the first convention on copyright. The Convention Establishing the World Intellectual Property Organization (WIPO), concluded in Stockholm on July 14, 1967. The World Intellectual Property Organization (WIPO) is one of the specific agencies of the United Nations (UN) system of organizations. The task of WIPO is to advance through international cooperation the creation, distribution, use and protection of works of the human mind for the economic, cultural and social progress of people.

Intellectual property rights are granted by governments and operate within the territory where they are granted and one essential purpose of IPR is to reduce the costs of technology transfer (Maskus, 2004). A noteworthy deficiency in the function of the IP system associates to problems in enforcing IPR including the high cost of enforcement, sub-optimal regulation, conflicting priorities in tackling IPR infringements, and piracy and counterfeiting where copying and distribution is assisted by digitization and the cyberspace. Litigation costs appear to be chiefly problematic.

Successful law enforcement is a key interest for any legal system and regulation and interference by the state to tackle market failures caused by externalities and/or informational problems. Successful protection of intellectual property rights depends both on the existence of intellectual property protection laws and the enforcement of the laws. Nowadays, the pattern and enforcement of intellectual property rights are at the centre of a deep conflict between legal rules and technology-defined network rules. It should be taken into consideration that the strength of protection granted by nation states is determined by the sum total of the different aspects of their intellectual property laws, and not by the particular characteristics per se; for some, aspects such as the length of protection may substitute for others such as the breadth of protection. Consequently, ideally, an analysis of the determinants of particular aspects of protection should be presented alongside that of protection as a whole. It appears that empirical evidence on the issue is thin and is not supportive of any generalization. Moreover, the impact of other forms of intellectual property, such as trademarks and copyright, should be incorporated in the index.

TRIPS

IPRs turned out to be an important matter of multilateral negotiations during the Uruguay Round of the GATT concluded to the Agreement on Trade-Related Intellectual Property Rights (TRIPS), signifying one of the pillars of the WTO structure that materialized from the Uruguay Round rebalancing the global policies backing information developers (Maskus 1998). The TRIPS Agreement includes a set of minimum principles for IPR protection and calls for all member countries to use the most-favoured-nation principle in IPR protection but IPR protection remains far from harmonized across nations. The TRIPS Agreement has established global minimum principles of intellectual property protection and enforcement and the substantive obligations under the Agreement have now been widely employed in national legislation, and so developing countries are facing greater pressure than before to strengthen intellectual property enforcement. Nonetheless, although TRIPS did not harmonize standards of protection among intellectual property systems the fact that there is a convergence of national laws regarding IPRs has to be taken into consideration that. Intellectual property enforcement is one of the major emerging challenges for developing countries to maintain a balance in their national intellectual property systems. As national legal systems vary widely among countries, so do the procedures and measures available for enforcement of intellectual property rights under the different national systems. An important development in the European Union is the adoption of Directive 2004/48/EC on enforcement of intellectual property rights in April 2004. The stated aim of the Directive was to 'approximate legislative systems so as to ensure a high, equivalent and homogenous level of protection in the Internal Market.'

Fields of Intellectual Property Protection

Patents, copyrights, and trademarks, establish limited property rights that allow entrepreneurs to acquire rewards for flourishing products and services. On the one hand, copyright and patent law both create property rights to capture information that is subject to the public goods problem. On the other hand, trademarks are not public goods. As innovation leads to potential new subject matter, patent and copyright must adapt to these innovations. The copyright and patent regimes are intended to interact with industry, not merely with individuals. There is a role for intellectual property acquisition to help individuals achieve economic independence and personal empowerment (Mtima 2009).

Patents

A patent is a time-limited, single right that is approved for an invention. This invention may be a new merchandise or process and the patent safeguards the owner / inventor from others who may utilize, deliver or sell the invention without the patent owner's approval. Patents are the strongest mode of intellectual property since they grant the power to exclude. A patent is a tool which is intended to encourage individual innovation whilst maintaining a minimal diffusion of knowledge within society at large. A general maximum length of twenty years allows innovators to benefit from a monopoly on their innovations and as a result raises their reasons to innovate. Moser (2005) argues that patent laws had a remarkable influence on the direction of inventions in such a way that inventors in countries without patent protection focused on a small set of industries where secrecy is central, while inventions in countries with patent protection are much more diversified.

The patent system is an answer to the problem posed by the public goods nature of innovation. From the act of invention itself, incentivizing innovation must be the key target of the patent system. Harmonization in the field of international patent law seeks to bring the intellectual property laws of nations into alignment for the gain of the common good.

Patent laws apply in a different way across industrial sectors depending on such features as the level of skill in particular fields (Burk and Lemley, 2003). Patents encourage one company to experiment more than others, consequently achieving rapid experimentation without sacrificing valuable transfer of knowledge. To grant protection, patent law involves a high hurdle of novelty, non-obviousness, and utility (Fromer 2009, Miller 2009). Most patent systems assert that ideas are not patentable but only practical applications of ideas. Bringing patents more in line with scientific norms on fields such as biotechnology/nanotechnology, business methods patents and software industry will help both patent law and the scientific community. The most recent trend favours a stricter standard for patents (*KSR Int'l Co. v. Teleflex Inc*., 550 U.S. 398 (2007)). In the USA patentability determinations have undergone considerable changes over the last few decades as the Federal Circuit moved towards a looser standard for patentability (*Bilski v. Doll*, 129 S. Ct. 2735 (2009)).

The *KSR* decision heightened the standard for patentability by introducing several "common sense"-based obviousness rationales (*KSR International Co. v. Teleflex Inc*., 550 U.S. 398 (2007)). *KSR's* market-incentive rationale has been expanded to foreclose patent protection to those who identify future needs (*Friskit, Inc. v. RealNetworks, Inc.*, 306 F. App'x. 610 (Fed. Cir. 2009)) and exploit untapped niche markets (*Rothman v. Target Corp*., 556 F.3d 1310 (Fed. Cir. 2009)).

As US law shows patent law has never fully established what its technological assumptions are (*Microsoft Corp. v. i4i Ltd. P'ship*, 131 S. Ct. 2238, (2011)). A "technological arts test" for patent law would be unclear as "technological arts" and "technology" are both ambiguous and ever changing; nor has patent law reached a viable standard for adaptation to relevant technological changes. Patent's failure to address its technological assumptions and reach a feasible, adaptive standard has the prospective to make it obsolete in the future.

Business-method software is one of the fastest-growing categories of new patents, and software patents represent 15 per cent of all patents (Bessen and Hunt, 2007). Again as US Law illustrates an abstract idea termed as a "process" is not patentable (*Bilski v. Kappos*, 130 S. Ct. 3218, 3223, 3231 (2010)). The lack of inventiveness in newly granted business method patents raises the question as to the degree of inventiveness required in other 'fields of technology'. Moreover, business methods show the difficulty patent law has with adapting to technology. It is worth mentioning here that *Bilski v. Kappos* shows judicial disagreement over whether business method is patent-eligible subject matter. While *Bilski* did not overturn *State Street*'s holding that business methods are patentable, its new standard is drastically more difficult for a business method to satisfy.

Trademarks

A trademark is a distinguishing sign showing that particular goods or a service is created or provided by a particular person, group or business. Trademarks take many structures, plus mixture of words, letters and numerals as well as drawings or symbols. J. Thomas McCarthy (2008) argued that without trademark protection, "[t]he result would be a race to produce inferior products, rather than competition to produce better ones." Trademark law protects the source identification and information transmission purpose of marks so reducing the risk consumers will be misled into buying products they do not want.

Trademark protection offers encouragement to owners to invest in their trademark not only by improving the quality of the merchandise but also in other ways, such as advertising. Trademarks have generally been seen as areas of intellectual property law with their own exclusive purposes which means that trademark protection is not justified by an incentive theory, but the market experimentation justification joins them to patent and copyright law (Lemley, 1999). Given the continuous broadening of trademark protection during the last decades, and the increasing influence of cyberspace technology, it is desirable to use this elasticity at the national level. As an intangible asset, the economic capability of trademarks used to be underestimated. Until recently, trademarks were not even incorporated in the corporations' annual financial statements.

The source indicators protected by trademark law, in contrast to many patented inventions and copyrighted works do not need the additional nudge of legal exclusivity to motivate their creation. Trademarks reduce transaction costs by giving consumers succinct and consistent ways to identify goods and services in the marketplace. Trademarks function as authoritative linguistic short hands, permitting producers to transmit a host of ideas about product characteristics, performance, and price, often with a single word or image. Trademarks give producers a purpose to preserve consistent quality.

Another very different rationale for trademark law focuses not on protecting consumers, but on protecting trademark holders from misappropriation of the value of their marks. Trademark law firstly serves the interests of the market broadly facilitating the efficient and truthful exchange of information necessary for a functioning market providing incentives for competition on the basis of quality. Secondly, trademark law serves the interests of consumers by protecting them from confusion. Finally, trademark law serves the interests of trademark holders by protecting them against misappropriation of goodwill. Modern trademark law is moving towards a property rights regime (Heimes 2011).

Fundamentally, trademark protection supports economic competence by reducing search costs for consumers and so permitting them to distinguish quality products through symbols or names. Accordingly, a trademark has an indirect function as a guarantee of quality. Nonetheless, there are circumstances where trade-mark protection can be too broad (generic name or symbol) escalating the cost of business for rival companies such that economic effectiveness is harmed in the aggregate. Famous trademarks' dynamic expands beyond the value of the products or services with which they are mainly related because they might get hold of secondary associations in the mind of the consumer, transferring "loyalty between products,

services and categories over time and to separate it from tangible production" (Beckman and Pletcher 2009 – 2010, Lockridge 2010).

Copyrights

Copyright is the right given to creators for their literary or artistic works encompassing works such as, books and e-books, plays, newspapers, computer programs, databases, films, musical compositions, paintings, photographs, sculpture, architecture, advertisements, maps etc. Copyright does not embrace ideas, processes or procedures, mathematical concepts or methods of operation. The protection obtainable by copyright is for the expression only. The target of copyright is to preclude the unlawful use or piracy of any literary or artistic work by a third party. Copyright is not unlimited. Over the years it has extended to cover the length of the creator's life and an additional 70 or 50 years for signatories of the WIPO treaties relating to Copyright. The idea behind copyright is that, without exclusive rights, copyrighted goods would not be produced in adequate quantity and quality, leaving society the poorer.

Copyright laws must expand as technology develops to accomplish an adequate balance between private rights and public interests. One of the most challenged issues in the field of intellectual property law is the level to which legally created rights may be restraining, rather than encouraging, scientific research. Although IP rights are intended to promote scientific progress, over proliferation or distortion of an optimal arrangement of rights generate bottlenecks that hamper the flow of research. Copyright over original and derivative works encourages creativity by increasing the odds of appropriating the benefits of the creations. Copyright can supplement other rights, such as patent rights, where the ideas are not protectable but the expression is pure computer and mathematical algorithms or where stronger copyright may be unfavourable to economic efficiency in case of reducing the incentive of rivals to create, or the owner's enticement to produce new creations.

Copyright law is expected to keep unsettled as new issues arise and technology continues to develop (Gasaway 2009 – 2010). To be eligible for copyright protection, a work must be "original" but comparatively simple works are entitled to copyright protection so long as the required quantum of originality is current (McDaniel and Juo 2009). There is a tendency copyright law to involve a lower threshold of originality. Digitization and the internet permitted immediate perfect replication and so IPRs had to grow. In the USA in 2005, the U.S. Supreme Court expanded the Copyright Act to embrace a form of liability it had never before acknowledged in the context of copyright, providing technology that stimulates copyright infringement (*MGM Studios v. Grokster, Ltd*, 545 U.S. 913 (2005)). Moreover, copyright law present, under the judicially developed merger doctrine, that property rights under copyright law are denied when an un-protectable idea cannot be separated from protectable illustration of the idea (*Mercantile Exch., Inc. v. Intercontinental Exch., Inc*., 497 F.3d 109 (2007)).

New technologies regularly disrupt copyright law around the world, challenging the law to adjust to new market contours. International norms shift and develop over time. The internet has tested copyright markets and copyright law because the internet has a dark side embodied in its broadly realized capability for unlicensed, but always perfect, copies and streams of copyrighted works. Moreover, the internet makes

prospective copyright infringers of us all. Copyright law should promote copyright commerce requiring not just readily divisible and transferable rights, but also information about those rights. The abundance and ready substitutability of copyright goods systematically press toward competitive prices.

Finally, the concise analysis of the legal background of law concerning IPRs shows a continuous development of the legal regulation and enforcement of IPRs which means a need for continuous alteration of a legal index regarding the protection of IPRs.

Existing Measuring Outcomes

Measurement problems are prevalent in the area of IPR protection due not only to the features of the systems of laws, regulations, and enforcement but also to the fact that their quality is very difficult to be assessed due to their continues' alteration as described earlier. Maskus (2000: 15) notes that "it is difficult to capture the economic incentives afforded by a system of laws, regulations, and enforcement, such as IPRs, in a meaningful international index". Whilst it may be somewhat easy to categorize relevant laws and regulations, i.e., IPR protection on the books, real enforcement is almost impractical to judge objectively. However it is possible to adjust any formal index by including, as part of an IPR index, the ranking of the legal systems and hence evaluate objectively to a great degree the real enforcement of laws.

Various IPR indices (indexes) based mainly on laws in force have been developed by scholars in order to be used for a quantitative analysis of the impact of IPR on various economic aspects such as FDI, growth, trade and development. Among the indexes , we find the index of Rapp and Rozek's (1990) which is based on an evaluation of individual countries' patent laws with the guidelines proposed by the US Chamber of Commerce's Intellectual Property Task Force. The Ginarte-Park's index (*IP-GP*) (1997) ranges from 0 to 5, with higher values signifying stronger patent protection taking into account five aspects of patent laws – extent of coverage, duration of protection, membership of international property rights agreements, provisions for loss of protection once granted, and enforcement mechanisms. Park and Lippoldt (2008) utilize four measures of IPRs: an index of patent rights, an index of copyrights, an index of trademark rights, and a survey rating of IPRs. Anumber of scholars have looked at the construction of IPRs' indices (Lesser (2002), Smarzynska (2004), Sherwood (1997), Lee and Mansfield (1996), the Property Rights Alliance (PRA), 2007/2011 etc) utilizing various factors in measuring IPRs protection. Based on the fact that the existing IPRs indices seems not to be totally accurate and effective, there is room for improving the present approaches, producing a new more effective IPRs index.

The Newly Constructed Index

The assessment of the quality of a country's legal system is based on the quantification of the quality of several legal procedures. Taking into consideration the real conditions of implementation and enforcement of this legal system, implementation of laws is often exceptionally different from the rationale behind a law's design. One difficulty in empirical IPR research has been in constructing measures of IPR protection because there is a need for a more accurate and objective rather than subjective translation of legal texts into figures.

All the legal analysis discussed above has been taken into consideration in the effort to construct a new index concerning IPRs. Thus, the changeability of legal theory and the new laws coming into force all the time along influence the outcome and consequently our index. Moreover, all the national laws in force by the end of 2010 of the 79 investigated jurisdictions have been examined and used in the ranking of the various factors taken into account in constructing our index as presented below. The existing IPR indices appear not to take into consideration either more types of IP rights or the real level of enforcement of IPR by the legal systems. To fill that gap a new index as described below expresses more realistically the real degree of IPR protection for the examined legal systems.

The main IPR Index is formed by the combination of the following parts:

ZekIPR Index= Membership in International Treaties + INDEX OF PATENT RIGHTS + INDEX OF COPYRIGHT+ INDEX OF TRADE-MARK RIGHTS + Legal System & Property Rights Rating (Rank) of countries

The sum of these five values gives the overall value of the IPR index for every country. The index takes on values from zero to one for every one part of it and so the best result for a country could be five. The index is based on the national and international laws in force at the investigated countries (table 1) by the end of 2010 and the resulting IPRs. It is worth mentioning here that the US law was the key legal system which has been used as the testimonial in the evaluation of all other legal systems. US law is regarded as the most advanced law concerning IPRs protection. As seen earlier in this article nearly all the new developments on IPRs law have taken place first in the US jurisdiction. Table 2 shows analytically the ranking of the factors utilized in the constructing of the index and particularly the ranking of the factors of every part assembling the index.

Regarding the first part of the index the WIPO-Administered Treaties (Entry into force of treaty for contracting party) plus the IP-related Multilateral Treaties (Entry into force of treaty for contracting party) such as UPOV Convention, TRIPS Agreement, Cartagena Protocol on Biosafety and Convention on Biological Diversity are part of the index in order to show the level of protection of IPRs by various countries and at the same time their openness concerning the acceptance and entry into force laws for harmonization and convergence of IPRs' protection not mentioning further regulation of already protected IPRs or new IPRs not regulated by laws already in force. It has to be stated that there are many other IP-related Multilateral Treaties (Entry into force of treaty for contracting party) which are not part of the index because I consider that the included ones based on their importance express in a great degree the IPRs protection by the examined countries. The chosen WIPO-Administered Treaties plus the IP-related Multilateral Treaties are incorporated in order to have not only a more spherical coverage of the regulation of IPRs but also the internationally converged coverage of the regulation of IPRs. While every sub-part of this part takes on a value of 1/28, the index takes on values between zero and one for this part of it.

Concerning the second part of the index referring to patents the evaluation of the elements of this part is based on the text of the laws plus the case law where the text

of the law does not give a clear answer. The view of patentability of various types of patents as established in US and EU law is the basis for the evaluation of the sub-elements of this part of the index for every country and so, in accordance with the range of patentability established in every country, every sub-element takes a value from 0 to 1. The chosen sub-elements illustrate a clear picture of the regulation of patents by a country's law allowing a comparison between various laws and so adding more trivial elements will make the comparability more difficult without altering significantly the evaluation of the laws because there is a convergence between the laws introduced by the countries due to the fact that many countries were part of the colonies of the UK, France, Netherlands, Spain, Portugal and Belgium.

Regarding the third part of the index referring to copyright the evaluation of the elements of this part is based on the text of the laws plus the case law where the text of the law does not give a clear answer. Every sub-element takes a value from 0 to 1. The chosen sub-elements illustrate a clear picture of the regulation of copyright by a country's law allowing a comparison between various laws and so, again, adding more trivial elements will make the comparability more difficult without altering significantly the evaluation of the laws.

Concerning the fourth part of the index referring to trademarks the evaluation of the elements of this part is based on the text of the laws plus the case law where the text of the law does not give a clear answer. Every sub-element takes a value from 0 to 1. The chosen sub-elements illustrate a clear picture of the regulation of trademarks by a country's law allowing a comparison between various laws and so, again, adding more trivial elements will make the comparability more difficult without altering significantly the evaluation of the laws.

The fifth part of the index uses the Index of Legal Effectiveness by *Economic Freedom of the World* which is a composite score of judicial independence, impartial courts, security of property rights (tangible and intellectual), and integrity of the legal system. This has been used in this index in order to add into the index the aspect of the degree of the actual ability of the examined legal systems to apply accurately the IPRs laws. This Index of Legal Effectiveness is used in order to be more objective and achieve a degree of certainty about the value of the legal systems called to apply the international and national laws concerning IPRs rather than using a more subjective index in ranking the legal systems of examined countries. It is worth mentioning here that the enforcement component of IPRs as expressed by the national laws is already taken into account in the three parts of the index referring to national laws of patents, copyright and trademarks.

It is probable that no index completely captures the overall nature of IP protection in a region. However, this, index compounding the various indexes such as Membership in international treaties regarding IPR, Patents index, copyright index, trademarks index and the Legal System & Property Rights Rating specified in the Economic Freedom of the World 2010 Annual Report, should provide a better picture revealing the approximate real level of IPR protection. Account has to be taken of the fact that the ranking of countries based on the IPR laws is not static but is instead constantly changing because of the continuous introduction of new IPR laws or the emergence of new fields of IPR needing regulation. An Indicative example is the index prepared

every year by the Property Rights Alliance showing the variation in countries' valuation concerning IPR.

It is indicative that our index is altered by merely taking into account the Legal System & Property Rights Rating (Rank) of countries (*Economic Freedom of the World: 2011 Annual Report*, Area Economic Freedom Ratings (Ranks), 2009) which is closer to the real raking of the systems in 2010 rather than the one published by the *Economic Freedom of the World: 2010 Annual Report*, Area Economic Freedom Ratings (Ranks), 2008. To that extent the following indices have been used: firstly ZEKIPR= Membership in International Treaties + INDEX OF PATENT RIGHTS + INDEX OF COPYRIGHT+ INDEX OF TRADE-MARK RIGHTS + LR1 Legal System & Property Rights Rating (Rank) of countries (*Economic Freedom of the World: 2010 Annual Report*, Area Economic Freedom Ratings (Ranks), 2008) and secondly ZEKIPR1= Membership in International Treaties + INDEX OF PATENT RIGHTS + INDEX OF COPYRIGHT+ INDEX OF TRADE-MARK RIGHTS + LR2 Legal System & Property Rights Rating (Rank) of countries (*Economic Freedom of the World: 2011 Annual Report* , Area Economic Freedom Ratings (Ranks), 2009)

The way that the index is constructed allows a second one to be composed by merely removing the fifth part concerning the ranking of the examined legal systems. The second IPR index is formed by combining the following parts and based on the analysis of the content of the national and international laws in force as described above and specified in table 1 without taking into account the evaluation of the legal systems enforcing the laws:

> ZEKIPR2= Membership in International Treaties + INDEX OF PATENT RIGHTS + INDEX OF COPYRIGHT+ INDEX OF TRADE-MARK RIGHTS

Finally, the investigation and evaluation of the international treaties and national laws in force by the end of 2010 concerning patents copyrights and trademarks of the examined countries according to the above mentioned framework gives the outcome as illustrated in Table 3.

Conclusions

The key purpose of IP law is to appropriately defend property rights on assets that might have economic value. Technologies such as biotechnology/nanotechnology and cyberspace have created new products having economic value for the new economy that need an IPR protection.

The development of cyberspace and consequently the impact upon of IPRs continues to cause changes in the IPRs and the emergence of new ones. Digitization is influential to the rise of new technologies, business methods, the blurring of national and jurisdictional boundaries, and the liberalization of the innovative enterprise. Traditional intellectual property notions are challenged as never before. There is an effort to take into account cyberspace development regarding IPRs in the index by inserting as a component cyberspace which means that the IPRs index fulfils this demand indicating its effectiveness and accuracy. Moreover, as mentioned earlier the index is constructed in such a way that all new developments concerning the various aspects of IPR laws can be easily incorporated in and having any time the most

possibly accurate quantitative calculation of IP rights.

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Table 1: List of investigated countries

Albania	Lithuania
Algeria	Luxembourg
Argentina	Malaysia
Armenia	Malta
Australia	Mexico
Austria	Mozambique
Azerbaijan	Netherlands
Belgium	New Zealand
Brazil	Nicaragua
Bulgaria	Nigeria
Canada	Norway
Chile	Pakistan
China	Panama
Croatia	Paraguay
Cyprus	Peru
Czech Republic	Philippines
Denmark	Poland
Ecuador	Portugal
Egypt	Republic of Korea
Estonia	Romania
Finland	Russian Federation
France	Serbia
Georgia	Singapore
Germany	Slovakia
Ghana	Slovenia
Greece	South Africa
Guyana	Spain
Hungary	Sweden
Iceland	Switzerland
India	Thailand
Indonesia	Trinidad and Tobago
Ireland	Tunisia
Israel	Turkey
Italy	Uganda
Japan	Ukraine
Jordan	United Kingdom
Kenya	United States of America
Latvia	Uruguay

Venezuela	Zimbabwe
Zambia	

Source: G Zekos PhD thesis on economics at University of Peloponnesus

Table 2: Constructing parts of our index

1. Membership in International Treaties

Membership in International Treaties	Signatory	Not Signatory
W - WIPO Convention	1/28	0
P - Paris Convention	1/28	0
B- Berne Convention	1/28	0
PCT - Patent Cooperation Treaty	1/28	0
PLT - Patent Law Treaty	1/28	0
MI -- Madrid Agreement (Indications of Source)	1/28	0
MM- Madrid Agreement (Marks)	1/28	0
MP - Madrid Protocol	1/28	0
H - Hague Agreement	1/28	0
GH - Geneva Act of Hague	1/28	0
N- Nice Agreement	1/28	0
LI - Lisbon Agreement	1/28	0
RO- Rome Convention	1/28	0
LO - Locarno Agreement	1/28	0
IPC - Strasbourg Agreement	1/28	0
PH- Phonograms Convention	1/28	0
VC - Vienna Agreement	1/28	0
BP- Budapest Treaty	1/28	0
S - Brussels Convention	1/28	0
NOS - Nairobi Treaty	1/28	0
TLT - Trademark Law Treaty	1/28	0
WCT - WIPO Copyright Treaty	1/28	0
WPPT - WIPO Performances and Phonograms Treaty	1/28	0
SG - Singapore Treaty	1/28	0
U - UPOV Convention	1/28	0
TRIPS - TRIPS Agreement	1/28	0
CPB- Cartagena Protocol on Biosafety	1/28	0
CBD- Convention on Biological Diversity	1/28	0

Plus 2. THE INDEX OF PATENT RIGHTS based on statutory provisions:

(1) Coverage	Available	Not Available
– Patentability of Pharmaceuticals	1/6	0
– Patentability of Chemicals	1/6	0
– Patentability of Mechanics	1/6	0
– Patentability of Biotech-Nanotech	1/6	0
- Patentability of software	1/6	0
- Patentability of Business Methods	1/6	0
(2) Restrictions on Patent Rights	Does Not Exist	Exists
– Working Requirements	1/3	0
– Compulsory Licensing	1/3	0
– Revocation of Patents	1/3	0
(3) Duration of Protection	Full	Partial
Full duration is 20 years from the date of application	1	
(4) Enforcement	Available	not available
- Litigation	¼	0
- Arbitration	¼	0
- Infringement-damages	¼	0
- Injunctions	¼	0

Plus 3. THE INDEX OF COPYRIGHT based on statutory provisions:

(1) Coverage	Available	Not Available
– Literary works	1/5	0
– Sound Recordings	1/5	0
– Cinema	1/5	0
– Broadcasting	1/5	0
-Cyberspace	1/5	0
(2) Restrictions on Copyright	Does Not Exist	Exists
-Licensing Schemes	¼	0
- Compulsory Licensing	¼	0
- Government Use	¼	0
- Private Use	¼	0
(3) Duration of Protection	Full	Partial
Full period is 70 years after the death of the author	1	
(4) Enforcement	Available	not available

-Litigation	¼	0
-Arbitration	¼	0
-Infringement-damages	¼	0
-Injunctions	¼	0

Plus 4. THE INDEX OF TRADE-MARK RIGHTS, based on statutory provisions:

(1) Coverage	Available	Not Available
– Service Marks	¼	0
– Certification Marks	¼	0
– Collective Marks	¼	0
-Domain names	¼	0
(2) Restrictions on Trademark Rights	Does Not Exist	Exists
– Renewal Proof of Use	¼	0
– "Linking" Requirements	¼	0
– Restricted Licensing	¼	0
– Lack of Protection for Well-known Marks Due to Non-use	¼	0
(3) Duration of Protection	Full	Partial
The full duration of 10 years, the international norm	1	
(4) Enforcement	available	not available
-Litigation	1/4	0
-Injunctions	1/4	0
-Infringement-damages	1/4	0
-Arbitration	1/4	0

Plus 5

Legal System & Property Rights Rating (Rank) of countries by *Economic Freedom of the World: 2010 Annual Report (*http://www.freetheworld.com/release.html)

LR1= Legal System & Property Rights, *Economic Freedom of the World: 2010 Annual Report*, Area Economic Freedom Ratings (Ranks), 2008, Like all the ratings in the index, these are values out of 10; 10 is the highest possible rating and zero is the lowest. A higher rating indicates a greater degree of economic freedom
LR2= Legal System & Property Rights, *Economic Freedom of the World: 2011 Annual Report* , Area Economic Freedom Ratings (Ranks), 2009, Like all the ratings in the index, these are values out of 10; 10 is the highest possible rating and zero is the lowest. A higher rating indicates a greater degree of economic freedom.

Source: G Zekos PhD thesis on economics at University of Peloponnesus

Table 3: Calculations of the value of our indices

Country	ZEKIPR2	ZEKIPR	ZEKIPR1
Albania	3.313186813	3.843186813	3.858186813
Algeria	2.991758242	3.437758242	3.449758242
Argentina	3.113736264	3.558736264	3.558736264
Armenia	3.385714286	3.934714286	3.932714286
Australia	3.394505495	4.225505495	4.216505495
Austria	3.465934066	4.306934066	4.294934066
Azerbaijan	3.342857143	3.982857143	3.938857143
Belgium	3.365934066	4.057934066	4.048934066
Brazil	3.170879121	3.695879121	3.696879121
Bulgaria	3.614285714	4.135285714	4.127285714
Canada	3.101648352	3.929648352	3.916648352
Chile	3.028571429	3.738571429	3.748571429
China	3.285714286	3.923714286	3.920714286
Croatia	3.578571429	4.143571429	4.133571429
Cyprus	3.262637363	3.946637363	3.945637363
Czech Republic	3.392857143	4.035857143	4.031857143
Denmark	3.507692308	4.381692308	4.357692308
Ecuador	3.085164835	3.489164835	3.480164835
Egypt	3.257142857	3.801142857	3.806142857
Estonia	3.550549451	4.271549451	4.267549451
Finland	3.401648352	4.267648352	4.268648352
France	3.694505495	4.425505495	4.439505495
Georgia	3.228021978	3.735021978	3.741021978
Germany	3.587362637	4.404362637	4.403362637
Ghana	2.997802198	3.538802198	3.546802198
Greece	3.371978022	3.985978022	3.933978022
Guyana	2.762637363	3.228637363	3.240637363
Hungary	3.514285714	4.142285714	4.162285714
Iceland	3.2	4.043	4.031
India	3.014835165	3.607835165	3.586835165
Indonesia	3	3.444	3.44
Ireland	3.328571429	4.120571429	4.113571429
Israel	3.250549451	3.840549451	3.847549451
Italy	3.657142857	4.224142857	4.233142857

Japan	3.443406593	4.192406593	4.190406593
Jordan	3.028571429	3.684571429	3.659571429
Kenya	3.040659341	3.497659341	3.497659341
Latvia	3.5	4.159	4.142
Lithuania	3.314285714	3.972285714	3.962285714
Luxembourg	3.328571429	4.163571429	4.155571429
Malaysia	3.036263736	3.660263736	3.690263736
Malta	3.057142857	3.812142857	3.806142857
Mexico	3.442857143	3.984857143	3.948857143
Mozambique	3.013736264	3.415736264	3.424736264
Netherlands	3.514835165	4.336835165	4.327835165
New Zealand	3.043956044	3.941956044	3.923956044
Nicaragua	3.235714286	3.677714286	3.671714286
Nigeria	2.94010989	3.36010989	3.33210989
Norway	3.337362637	4.217362637	4.216362637
Pakistan	2.858791209	3.262791209	3.262791209
Panama	3.028021978	3.567021978	3.539021978
Paraguay	3	3.353	3.364
Peru	3.214285714	3.763285714	3.757285714
Philippines	3.042857143	3.506857143	3.499857143
Poland	3.413736264	4.007736264	4.038736264
Portugal	3.491208791	4.172208791	4.159208791
Republic of Korea	3.379120879	4.055120879	4.040120879
Romania	3.571428571	4.157428571	4.158428571
Russian Federation	3.573076923	4.146076923	4.146076923
Serbia	3.571428571	4.045428571	4.039428571
Singapore	3.271978022	4.109978022	4.101978022
Slovakia	3.492857143	4.116857143	4.088857143
Slovenia	3.578571429	4.180571429	4.199571429
South Africa	3.136263736	3.769263736	3.752263736
Spain	3.748901099	4.404901099	4.393901099
Sweden	3.465934066	4.312934066	4.310934066
Switzerland	3.644505495	4.488505495	4.488505495
Thailand	2.892857143	3.486857143	3.466857143
Trinidad and Tobago	3.278571429	3.797571429	3.797571429
Tunisia	3.25	3.914	3.928
Turkey	3.421428571	3.982428571	3.980428571
Uganda	2.799450549	3.267450549	3.284450549
Ukraine	3.58021978	4.08021978	4.05421978
United Kingdom	3.494505495	4.305505495	4.314505495
United States of America	3.401648352	4.151648352	4.131648352
Uruguay	3.221428571	3.780428571	3.787428571
Venezuela	2.907142857	3.198142857	3.171142857

Zambia	2.862637363	3.450637363	3.450637363
Zimbabwe	2.9	3.272	3.251

Source: G Zekos PhD thesis on economics at University of Peloponnesus