

The Law and Economics Analysis of Intellectual Property: Paradigmatic Shift From Incentives to Traditional Property

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Intellectual Property is a very serious matter. Some estimates conclude that the current value of intellectual property significantly outweighs the value of physical property - land, tangibles and intangibles together. A growing percentage of the GDP in industrial countries is comprised now of informational goods such as software, movies, music, drugs and databases.¹ The scope of IP protection has of course significant effect on this economic value and the laws regulating intellectual property in the information age are perceived as a key for economic growth. Intellectual property law, therefore, has become of immense importance. It has seen in the last decade the most significant changes since its birth following the invention of printing. The field of IP law became also an important battleground for interest groups, politicians, and different voices in civil society. The borderless nature of informational goods highlights also national interests, which are reflected in internationalization of legal arrangements and institutions in this field and in growing controversies among nations and governments.

Until the last decade intellectual property law was a small branch of legal research and practice, focusing mainly on copyright, with a relatively small group of practitioners and tiny segment of scholarly writings. The technological revolution of the Internet and accompanied technologies resulted with a huge increase in informational goods and intellectual creations that became potential candidates for the protection of IP rights. Moreover, the new technologies shifted various individual conducts that had been

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¹ According to Idris (2004, Ch. 3) while in 1982, some 62 percent of corporate assets in the United States were physical assets, by 2000, that figure had shrunk to a mere 30 percent. Others assert that the value of IP in corporations of the industrialized countries amounts to more than two thirds of their total value (Greene 2001) According to Shapiro & Hassett (2005) the value of IP in the United States in 2005 is estimated at 5 trillion US Dollars, which stands for roughly 50% of U.S. GDP.

perfectly legal before the new information revolution to become formal infringements of IP laws. Copying, for example, is much more common in the course of the operation of computer related activities than in equivalent activities before the new information age. The changing realities require new conceptual thinking and implementation. The traditional doctrines, concepts and positive laws are ill equipped to treat the changing modes of informational goods.

The Economic Analysis of Law, or the Law and Economics movement, which can be defined as an application of economic methodology to explain and evaluate the formation, structure, process and impact of law and legal institutions (Salzberger 2008), has been emerging in recent decades as a dominant theoretical paradigm for legal academia and it is gradually capturing various segments of legal practice as well. Law and Economics is a methodology for both the explanation of legal rules, judicial decisions and their consequences (positive analysis) and the evaluation of legal rules and judicial decision and the prescription of the desirable ones (normative analysis). As the result of the growing importance of IP law, on the one hand, and the growing discourse of Law and Economics, on the other hand, it is not surprising that there has been a massive growth in the literature of Law and Economics of intellectual property in the past decade in both normative and positive realms.

This paper focuses on the normative analysis of IP rights. It identifies two major Law and Economics frameworks for justifying intellectual property: the incentives paradigm, which is founded upon the public good analysis of neo-classical micro-economic theory, and the tragedy of the commons literature, which is founded on the analysis of externalities. It further criticizes the dominant contemporary Law and Economics writings in this field as shifting to a new propriety paradigm which pre-assumes information to be an object of property, overlooking its fundamental differences from physical property and focusing on its management rather than on its initial justifications. Section 1 will provide a brief general survey of the normative sources of intellectual property; Section 2 will explain the main features of the incentives framework of normative Law and Economics and will elaborate on several points of critic; Section 3

will focus on the tragedy of the commons framework and will examine critically the shift to the propriety model; Section 4 will summarize and provide some tentative thoughts on the notion of property in light of the information revolution

1. THE NORMATIVE SOURCES OF INTELLECTUAL PROPERTY RIGHTS AND LAW AND ECONOMICS

There are two grand foundations for normative analysis and justification of intellectual property rights: deontological foundation and teleological one. The former can characterize the dominant source of IP legal discourse in the Civil Law world (Continental Europe), while consequential thinking is perceived to be the dominant foundation of IP law in the Anglo-American legal tradition. Within each of these domains one can identify two major theories of IP (Fisher 2001).

The deontological-based theories include natural law and natural rights justifications of IP. This paradigm is mostly outside the scope of Law and Economics, as it judges whether a law, decision or action is right or wrong on the bases of its intrinsic moral value without regard to its consequences in terms of individual subjective values or preferences. A natural law Lockean type justification to property rights, including IP rights, asserts that every person has a natural right to owe his or her self creations – whether they are physical or intellectual. This right cannot be compromised even if allocating such a right decreases the social welfare or utility, hinders a just distribution and alike. The same applies to the Kant-Hegel self-fulfilling or self-flourishing justifications for the protection of IP, which are also deontological in their nature and thus outside the realm of Law and Economics.

Teleological justifications can be analyzed within the Law and Economics discourse. Such is the Utilitarian theory of IP and its derivatives, but also the classical Republican one. The Utilitarian foundation of IP and its off springs justify intellectual property rights as far as granting such rights maximizes social utility or social welfare or individual preferences, or social wealth, or economic efficiency. There are significant differences

between each of these consequential goals, which will be partly addressed below, but all of them can be analyzed under the methodology of economics. The incentives theory is maybe the most common framework to analyze IP law within this paradigm.

A Republican theory of IP might be considered as the most complex one. The Republican goal in this context is to achieve an attractive and just society and culture (Fisher 2001), promoting “discursive foundations for democratic culture and civic association” (Netanel 1996). I argued elsewhere (Elkin-Koren and Salzberger 2007) that Republican thinking is not outside the scope of Law and Economics, but perhaps its most interesting challenge. This paper does not attempt to focus on Republican thinking, but for the sake of a complete theoretical map, and indeed as a critic of the current dominant direction of Law and Economics scholarship in this field, it might be beneficial to point the main argument in this context: From a Law and Economics perspective the primary difference between the classical Utilitarian (and derivative) justifications and the Republican one lies with the assumptions regarding individual preferences. While the Utilitarian approaches view individual preferences as given, or exogenous to the collective decision-making process, or to the market process, or to economic analysis, the Republican approach views individual preferences as endogenous to the analysis, i.e. that the legal arrangements themselves, as well as institutions and procedures, can affect the basic individual preferences in a way that will make them more other-regarding or co-operative, allowing the extension of the collective utility frontiers.

These very general and philosophical observations are important, for example, in the context of the heated debate between the pro-propertization advocates and the defenders of the public domain. The concept of the public domain exists beyond the specific IP context and is part of a Republican discourse. The public domain, like the public sphere is the place in which individuals meet each other, interact, exchange views and information and attempt to influence each others’ opinions and preferences. Thus, under an analytical framework which assumes endogenous preferences, the development and preservation of such public places are beneficial from welfare or utility maximization

point of view; once individuals change their preferences towards more other-regarding ones the collective is able to reach utility or wealth frontiers or other consequential goals, which were not available given the initial preferences. In the context of intellectual property the public domain is not only a place of free flow of information and opinions, it is also a production mean, and unlike the traditional production means of territory, labor and to a lesser degree – capital, the public domain is not rivalry or excluding. As I wrote elsewhere (Salzberger 2008) I think that this point regarding individual preferences is one of the most important criticism of the dominant Law and Economics literature in general, and it has far-reaching ramifications for an IP theory. Thus although this is not the focus of the current paper, it is a point to bear in mind while reading through it.

2. THE INCENTIVES PARADIGM

The incentive theory has been the main Law and Economics paradigm for the analysis of intellectual property until the recent shift to the propriety paradigm.² It rests upon two assertions: First, that information is a public good and thus without central intervention the investment in creative expressions and the resulting cultural and technological progress will be insufficient. Second, that property rights are the cheapest and most effective way for society to hold out these incentives (Andersen 2006). Let us elaborate on these two assertions under a critical eye.

2.1 The Need for Central Intervention

Economic theory has always been skeptical of government intervention in the market. Free and open markets, it has been thought, will function efficiently if not interrupted by government actions. Equilibrium of a free and competitive market will be utility maximizing, wealth maximizing and Pareto optimal. Therefore, a *prima facie* case for

² I use the term “paradigm” in the Kuhnian sense, meaning that Law and Economics writings pre-assume the basic truth of the incentives theory and after the paradigmatic shift pre-assume that intellectual creations are objects of property rights.

central or public intervention requires a demonstration of a failure of the free market (Cooter 1997). The incentives paradigm views the legal regime of intellectual property as a justifiable central intervention to tackle a public good failure of the market. Once intervention in the market is found to be required, the materialization of utility maximization, wealth maximization and Pareto optimality cannot be all guaranteed and a primer normative goal has to be set. This goal is in theory external to the Law and Economics analysis. In practice, however, Law and Economics literature has always been biased towards efficiency defined in terms of wealth maximization (e.g. Posner's leading book in the field first published in 1972).³

2.1.1 The Core – Public Goods Analysis

A pure public good is a commodity with two distinctive characteristics: non-excludability and non-rivalry. Non-excludability occurs whenever it is either impossible to exclude non-payers (free-riders) from using the good or service, or the costs for such exclusion are so high that no rational individual or firm will be willing to produce the good in the first place. Put slightly differently, the potential producer of non-excludable products, knowing that the competitive market price of the product will equal the (very low) marginal cost of production and thus would not cover the fixed cost, will not produce the product at all. Informational goods are thought to be non-excludable; they are easy to copy. The cost of creating multiple copies of a music composition, or a piece of software, or manufacturing a life-saving drug and distributing it, are often negligible. Therefore, in the absence of impediments on copying, the prices of works in a competitive market could fall to near zero (Geroski 2005). The marginal costs of exclusion, in lack of central intervention, are often greater than the marginal costs of provision, so it is inefficient to spend resources to exclude non-payers. Free riding of non-payers reduces incentives for investment in generating new information and innovations, and without government intervention information and innovations tend to be under-supplied.

³ For the classical debate about wealth maximization as the prime normative goal see "Symposium: Efficiency and Justice as a Legal Concern, *Hofstra Law Review* (1980) For a general critic of Law and Economics in this regard see Salzberger 2008

Non-rivalry means that the use of such goods by one user does not detract from the ability of others to use it. Tangibles, as well as real estate are usually rival goods, meaning that their usage by one person precludes others from using them. Informational goods are usually non-rival and therefore, once produced, it is in the general interest that they will be used by as many as possible. Information is not consumed by its usage; it cannot be used-up. Consumption of informational works does not exhaust the resource. The use of an idea, the reading of a text, or the implementation of a mathematical theory or a drug formula by one person does not prevent others from using it simultaneously or subsequently.⁴

The non-rivalous nature of informational goods means that there is no social loss associated with their usage, since no one else is deprived of that use. Therefore there is no need to allocate informational resources to the most efficient user. Quite the contrary; everyone can use informational goods simultaneously. Moreover, the use of informational goods is beneficial on top of the immediate value for the user, in that it engages readers, viewers and other users in a mutual productive experience. The consumption of information in this sense is nurturing the human capital that could then contribute to the production of more information. In economic terminology the consumption of informational goods, whether this is a cultural product, software or medication, creates positive externalities. Consequently, once these goods are created there is a benefit in their widest possible usage, in order to maximize welfare in society and as a basis for further innovation.

While the non-excludability character of informational goods provides the economic rationale for central intervention (such as IPR) to incentivize their creation, the non-rivalry nature of these goods justifies setting limits on the bundle of rights in scope and duration, in order to enable their usage by many as possible, generating greater collective

⁴ The tangible in which works are embodied, such as printed books and plastic CDs or pills, are not public goods. They would be subject to the rivalry suffered by other scarce resources. But this scarcity does not apply to the information contained in them.

welfare.⁵ Yet, even if we grant those rights for a limited period their owners enjoy monopolistic powers; they can set the price as they please. Owners will usually set the price that maximizes their profits, rather than a price, which equals their marginal or average cost of production (as in competitive markets). This would lead to collective deadweight social losses, which comprise of the potential users who value the informational product between its marginal (or average) cost and the monopolistic price, who would not purchase it. Consequently, works will be underused. These losses are particularly significant in the informational goods market, as these goods are the primary resource for further creation. IP law attempts to mitigate the later phenomenon through limiting not only the duration of rights but also their scope. It protects only certain aspects of works (i.e., *expressions* are protected by copyright but not *ideas*), and recognizes several privileged uses or exceptions (i.e., *fair use* under copyright law).

In addition to the two characteristics of public goods presented above, informational goods have three other features, which are not shared by other public goods and have not received sufficient attention by the Law and Economics literature. These features particularly characterize digital informational goods. First, informational goods are mutable. They could be modified to suit the user's preferences. Users can easily change a video file and remove parts of the movie or even mix different parts. A programmer can change codes in software according to the hardware requirements so it would better function in her work environment and a doctor can slightly change a formula of a drug to be better suited for a specific patient. Second, informational goods are selectable. The content can be accessed or copied. For example, one can deep-link an address of a website to his website, bypassing the homepage of the original publisher. Third, informational goods are combinatorial. Individual elements that produce greater value to the user can be recombined or sold separately. For example, a D.J. can easily mix two music files together turning the song to a different song; the same applies to a chef's recipe. These features make the economic analysis of informational goods more

⁵ It is noteworthy that not all forms of IP are analyzed solely in this framework. The economic rationales for trademarks, trade secrets and the right of publicity derive also from other type of market failure – lack or asymmetric information, which will not be discussed here.

complicated than the economic analysis of pure traditional public goods, such as defense or health.

2.1.2. Critique – Are Incentives Needed

The most important foundation of Law and Economics for justifying central intervention and thus IPR, as elaborated above, is the need to create incentives for the production of information, which is the result of information's non-excludable nature. Skepticism regarding the need for such monetary or centrally provided incentives for potential creators was expressed as early as 1970 by Harvard Professor and now US Supreme Court Justice Steven Breyer. Challenging the need for copyright protection, Breyer argued that creators have several advantages over competitors that offset the lower production costs of free riders (Breyer 1970). One such advantage is lead-time. If copies produced by the creator reach the market first, creators could sell original copies before they are confronted with competition by copiers. The need for incentives is of course a function of the easiness of copying; copyright did not exist prior to the invention of printing press by Gutenberg, and likewise it was expanded following the invention of photocopying. One can argue, therefore, that since digital technology made copying a lot cheaper, fast and widespread, even if Breyer's argument was sensible in 1970 it is not so anymore. Yet, the prime example discussed by Breyer in 1970 was a new and sophisticated technological product at the time - software.⁶

Let us than examine more carefully the general need to provide incentives to information creators by distinguishing between incentives on the individual creator's level and incentives on the organizational or on the institutional level. The incentives paradigm

⁶ Breyer used the software industry to demonstrate the significance of lead-time as a factor that can provide economic incentives to potential investors. Thus, he argued, application programs are sold, not directly "of the shelf," but in "packages." Those packages contain "copyrighted documentation manuals and a promise that the seller will install the program, iron out its 'bugs', update it as advances are made, and make adjustments from time to time to keep it compatible with others in the machine." A computer user is often buying services and expertise as much as he is buying a particular computer program. Thus, the copier's need to develop this support independently would often provide the initial programmer with sufficient lead-time to recover his development costs.

presumes that monetary incentives are a necessary condition for inducing creativity and innovation. This assumption involves an empirical claim that is based on shaky grounds - that monetary incentives (derived from IPR) would actually induce more creative and innovative activity, or that potential authors and inventors will not engage in the appropriate activity unless they are promised some monetary profits (Moore 2003, pp. 610-613). There is very limited empirical support for these propositions. There are many benefits that people derive from creative activity; there is a natural drive to create, creative passion, the need to express oneself and to communicate one's ideas and talents, to be acknowledged and to enjoy simply fun, pleasure and satisfaction. Most scientists, creators and inventors are motivated by the intrinsic satisfaction of investigation and discovery, and also by the recognition of their peers (Martin 1998, pp. 46-50) and the general public. Creativity provides socio-psychological rewards, which are a function of the cultural meaning associated with the act of creation. These include the benefits from acknowledgment and reputation, but also social relations such as a notion of belonging and friendship (Benkler 2006, 92-99). Poets, sculptures and musicians created monumental works of art long before there was any intellectual property system. Browsing the rich reservoir of users generated content on the Web nowadays is probably the best contemporary example of the human longing for creative self-expression. From blogs, through home-made video clips posted on YouTube, to pictures shared on Flickr and music distributed in MySpace, the Web demonstrates that creative activity is not all about money and many of the creators could have earned more money had they engaged in another work instead the time they dedicate for creation.

Moreover, empirical research suggests that monetary rewards can sometimes actually stifle creativity. Studies that explore creative motivations distinguish between external rewards, such as money, and inherent rewards, such as pleasure, curiosity and positive experiences of autonomy and competence. These studies show that intrinsic motivation is often undermined by extrinsic rewards and that people may become less creative when they are offered monetary rewards (Deci, Koestner, and Ryan 1999; Lawrence 2004). Likewise, the Cognitive Evaluation Theory (CET) focuses on the negative effects of monetary rewards and predicts that rewards given for achievements could sometimes

reduce the sense of autonomy of the creators (Cameron, Pierce, Banko and Gear 2005). Such rewards might actually reduce the quality of work (Kohn 1999, pp 136-138) or shift its direction. It has also been suggested that the exclusive rights accorded through intellectual property laws provide the creator with a control over the usage of her creation that can stifle creativity (Lessig 2001, p. 236; Vaidhyathan 2001).

So far we focused on the incentives of the individual creator operating alone to invent or create. But most creative activities nowadays are conducted within organizations – commercial or public institutions. There is a significant difference between the motivation of individual creators, and those of publishers and producers of content or knowledge-based products, or universities and research institutes. There are also differences between the incentives of these organizations and those of the individuals working there and between individual creators who do not work within organizations and those who are employees of the information industries. Although copyright discourse has always emphasized authors' rights, copyright law, in fact, serves the needs of the content *industry*. It provides a mechanism for securing monetary incentives to those who invest in the creative process, in the form of a set of exclusive rights to exploit the work. In the absence of sufficient return on investment it would be difficult to attract sufficient funds to be invested in rather expensive and risky enterprises such as the production of content or R&D in commercial enterprises. Innovation is risky since inherently there is a high level of uncertainty regarding its success. Underinvestment, so the argument goes, will consequently lead to undersupply of resources, and thus to less creative works and discoveries, which are beneficial to society. While a passionate poet is likely to write her poetry even if she lacks financial incentives, the book and music publishing industries would not necessarily publish her work and, in general, undersupply works, without the monetary incentives to do that. Without these industries, passionate creators would be unable to disseminate their artifacts to the public. Likewise, patent rights operate in the same manner with regard to inventions and technological advancements.

The institutional component complicates the simple and naïve picture portrayed so far. Research in a university or a public research institute is not the same vis-à-vis incentives to innovate as research in a commercial firm. Firms differ from each other in their organizational structures and profit distribution. The financial agreements with employees differ and might be crucial for the incentives to innovate on both the organization and the individual levels. Within organizations, for example, monetary rewards could be a dangerous motivator if improperly or inequitably managed. Studies have shown that employees are often lacking the proper motivation if they are "bought out" for limited rewards (Lawrence 2004).

Industries producing mass content are relatively new and were significantly strengthened during the twentieth century (Benjamin 1968, pp. 217-252). This model involves the production of a single prototype organized by firms and the distribution of mass copies to consumers. It is arguable that this mode of production was largely facilitated by the intellectual property regime itself. However, one can question the contribution of this content industry in relation to the contribution of old style individual creators working alone, for example in music, in visual arts and in other fields. Moreover, public research institutions and universities as opposed to private firms are funded by the government or the public and this funding itself might be sufficient to overcome the public good nature of its products, so a question arises as whether allowing these institutions also the benefits of IPR is justified.

The questions raised here are relevant today more than ever due to the new digital environment, which significantly reduces the cost of communicating and sharing works, enabling new modes of production and distribution of information (Benkler 2002; Litman 2004). This new environment might replace the 20th century content industry and further questions the need for monetary incentives in the form of IPR. Digital networks introduced new modes of production and distribution of information. In the area of software development, for instance, Linux was created by a community of users who volunteered to make a contribution to a grand project. Open source projects, such as

Linux, are comprised of the contributions of thousands of unorganized developers, located in different places around the globe, who voluntarily contribute to a common project without direct monetary compensation.⁷ The development of Free Software stands in sharp contrast to Microsoft Windows, which was written by employees of Microsoft and is protected by copyright, patent and trademark laws, prohibiting unauthorized copying, redistribution and modification of the software.

But software is by no means the only example of the new mode of production. Other online phenomena have similar attributes. Compare, for instance, the production of news by corporate employees of CNN, and news generated by subscribers of newsgroups, in which individuals contribute news items that are rated by their peers over time for credibility and reliability; or the well-established encyclopedias versus Wikipedia, which is constructed on individual efforts of many who do not operate for any monetary incentives.⁸ A recent online trend is the one of weblogs and video sharing. People all around the world are uploading their own private contents to the web in the form of video files, audio files or even online diaries. The users export themselves to the world and produce content without asking (and in most cases without thinking) about intellectual property issues. Another example, are the online communities of translations for movies or TV shows. Translations into English, Spanish, Italian, Russian and Hebrew are very common on file-sharing software such as eMule and Torrents clients.

As contended by Benkler (2002), the digital network environment opens up opportunities for new modes of production and distribution of information. The information economy, he argues, introduces a new radically decentralized type of production mode, which is the

⁷ GNU/Linux operating system and Apache server software, which were developed in a common non-proprietary regime, are increasingly gaining popularity and are considered more stable than comparable commercial programs (Gillen, Kusnetzky and McLarnon 2003). Linux runs on about 29 million machines (according to LinuxCounterSite 2005) and the number increases rapidly.

⁸ Another example is the creation of categories for classifying online Web pages. While Yahoo is a commercial directory in which categories are created by paid employees, the Open Directory is run by volunteers, each editing a sub-category. The contributions of all individual editors is merged into an Open Source directory that everyone is free to use, and is indeed used by some of the major search engines, including Google.

commons-based peer-production of information. These social and economic phenomena reflect a non-proprietary regime where content is developed through collaborative efforts without any claim for exclusive rights in it. Production of information, knowledge and culture, Benkler maintains, no longer requires management by the hierarchy of firms, or the price signals of the market. When projects are modular in the sense that they can be divided into small independently produced components, they can rely on non-monetary motivations of individuals. Large-scale collaborations will be possible as long as diverse motivations can be pooled and merged into a single effort. The low cost of communicating and processing information makes such coordination and integration cost-effective in a way that was unavailable before. The development of such powerful informational products, which are non-rival and non-excludable, without any apparent monetary compensation and any guaranteed return for financial investment, is challenging the incentives paradigm and its basic premise – the need for monetary incentives for informational, technological and intellectual creation.

From an economic analysis perspective the new mode of production can be analyzed in two frameworks. The First is the Coasian theory of the firm (1937), which views the creation of the firm as a substitute to nexus of contracts in the market, where the transaction costs involved in the hierarchical nature of a firm are lower than the costs of transacting within markets. The new technological frontiers decrease transaction cost significantly and thus shift back productive activity from firms to the market. The second economic framework for the analysis of this new mode of production is the division between work and leisure. The atomization of efforts can shift activities that were regarded in the “old” world as work, to activities that are regarded by individuals in the “new” world as leisure (Elkin Koren and Salzberger 2005, pp. 62-63). Both these frameworks point at a decreasing need for central intervention in order to provide monetary incentives to create.

The new world does not only enable new modes of production; it also enables new modes of dissemination and distribution. Online dissemination of informational works of all

sorts is made directly by individuals, using their personal computers to convey their ideas or share informational works with other individuals using the same protocols. Users of Gnutella-based file-sharing systems are capable of making files available for downloading by other users, by simply placing files at a designated directory on their personal computers. Electronic delivery of information involves low costs, and does not require any large investment in the production of copies and the establishment of distribution channels. Digital networks diminish the role of some traditional intermediaries, such as the recording or publishing industries, while introducing new intermediaries, such as search engines or P2P software. In this environment various forms of intellectual property, such as copyright law, do not promote but actually create obstacles to the development of such alternative modes of production and distribution. The new technological possibilities have a significant effect also on the distribution of physical products and services, including of course information-based products such as drugs, which means that re-thinking of traditional laws have to be conducted from this perspective not only with regard to copyright protected materials but also in the patent protection realm.

Independently from the new production and distribution modes, the new digital environment has also a significant bearing on the non-excludability character of informational goods, which is a prime source of the Law and Economic incentives paradigm. New technologies not only enable easier and cheaper copying but also enable much easier and cheaper exclusion. The Internet enhances the ability to exclude and control the distribution of information to the extent that makes significant fractions of it no longer a public good. The nature of information in the Internet and also in other digital platforms such as DVDs, computer games, electronic books and alike allows the application of cost-effective self-help technical measures to control its consumption and use. Such means allow information that used to be non-excludable in the past to be excludable today. Indeed, the creation of digital copies involves very low cost; yet distribution of copies protected by IPR is no longer the sole way of generating profits. Technical ways to prevent copying and to charge a fee for it are widely more available. In addition, the new digital environment facilitates a shift from selling copies to charging for

access. The new technological frontiers, for example, enable collecting a fee for access to a website and charging per-use of the information provided. It allows temporary entrance permits and restrictions of usage of information to on-line individual use, blocking the possibilities of copying information or forwarding it, and more (Bell 1998, Dam 1998).

The development of self-help exclusion measures is likely to encourage users to develop counter code breaking and hacking tools. This, in turn, is likely to lead to sophistication of the exclusion tools and a continuous technological race between the two sorts of devices. Such a race may divert funds that might otherwise be invested in more productive directions. This infertile race might cause resources waste and may require central intervention, which is very different from government intervention within the traditional public goods framework. Here the government will not be called upon to provide the public good or the legal means to enable its production by private firms. Central intervention may be required here to halt or control the technological race between exclusion tools and their counter technologies.⁹

To sum-up, the extent to which information today is a public good meriting incentives in form of central intervention is debatable. It depends, among other factors, on the technological state of the art, which is changing at a rapid pace and this pace is not only the cause but also the result of IPR regime. Traditional Law and Economics theory (e.g. Coase's both key theorems) assumed technology to be exogenous factor in market analysis and in economic based justifications for central intervention. This cannot be the case anymore, and in this sense economic theory is under-developed. Consequently, the public good analysis may not be very conclusive in determining when government intervention is necessary and to what extent, and it is even possible that incentives in the form of contemporary IP laws in fact achieve the opposite goal - suppressing innovation and creation. The fact that the principles of copyright law, patent law and other forms of

⁹ The American DMCA legislation provides an example how the combination of traditional IPR rationale with regulation of a technological race between exclusion means and anti-exclusion means should not be conducted. This legislation includes a prohibition on anti-circumvention activities. However, when interpreted by the courts this clause was extended to prohibition to anti-circumvention of non-protected IPR activity (*Lexmark International Inc.* 387 F.3d 522; *Chamberlain Group Inc.*, 381 F.3d 1178), further restricting the availability of information.

IP have not been revisited in light of these technological developments (and, in fact, in some fields, notably copyright, protection was actually amplified in recent years) and that Law and Economics analysis has not recommended a shift of balance (in terms of duration of protection, exceptions etc.) ought to raise some question marks. These observations and the indeterminacy of economic analysis as to the right amount of incentives needed to overcome the traditional public goods problem might be a possible explanation for the shift of the Law and Economics literature to the propriety paradigm of IP.

2.2 Central Intervention in Form of Intellectual Property Rights

So far we discussed and questioned the need for monetary incentives in order to generate creation and innovation. In this section, under the assumption that incentives are needed, we will discuss different forms of incentives and will examine the second premise of the Law and Economics incentives model according to which intellectual property rights are the optimal method of central intervention (Moore 2003, pp. 610-613). Unlike the deontological rationales for IP, which focus on the natural right to be granted ownership on self created ideas and thus have a first order type justification in favor of IP rights, the starting point of the incentives paradigm is a market failure of public goods, which in the case of information and ideas is also a public production means. The Law and Economic justification for IP rights is, therefore, of a second order nature. In other words, one thing is to examine whether such a market failure does exist; a separate issue is the desirable remedy to correct this failure.

2.2.1 Different Legal Forms of incentives

Central intervention to correct a public good failure in the market of informational goods can take other forms than intellectual property rights. Central production of information and ideas, direct sponsoring of these activities in the form of research institutions and universities and cultural institutions, a prize system and liability or other sort of legal

rights (not necessarily propriety) are alternative solutions.¹⁰ This seems to be a trivial point, but on a closer look of the existing literature it is not so. Each of these remedies has advantages and disadvantages. For example, while direct government production or funding of creation has the dangers of hidden or explicit political agendas or, more broadly, a threat from the vantage point of democratic and liberal values, direct subsidies of government for creation activities, instead of granting IP rights, will bring to a greater public domain which enhances the sources for future creations. IP rights have the danger of limiting production means and can create a backfiring effect, constraining the frontiers of intellectual production. In addition, one can argue that IPR have no less dangers from liberal and democratic perspectives by enhancing the powers of mega corporations that replace democratically elected officials.

It seems that economists prefer IP rights to government own creation activities or subsidies, because the former is thought to facilitate trade and therefore the value of the informational goods will be determined by market forces. If no free market activity in ideas and creations will take place, how will we be able to determine how much creation to finance? How many subsidies to grant and to whom? However, this is not such a trivial issue. First, in order for IP to be traded in competitive markets there is a need for an initial central intervention to define those rights in the first place – scope, duration etc. This definition itself is not a result of free market activity, and of course it will have a decisive impact on the future market outcome regarding the actual objects of the rights. Second, IP regime creates monopolistic powers and thus the real market value of protected creations cannot be detected by the sheer operation of the market. Third, giving inventors control over all the positive externalities associated with their inventions encompasses control

¹⁰ Abramowicz (2004, p. 68) proposed an incentive mechanism in the format of a patent prize system by considering a variety of design issues, such as delayed vs. immediate payouts, funds vs. open-ended program, and tradable vs. non-tradable rewards. Recently, David Leonhardt, a journalist in the New York Times, published an article calling for the comeback of prizes as a reward for innovation (Leonhardt, 2007). He reminds us that in the 18th century prizes were a common way to reward innovation but nowadays they are replaced by grants that reward money upfront. The worthless merit of the grants is that they are easier to be monitored by government bureaucrats. Leonhardt argues that grants are a failure and his bold example is that governments all around the world have handed grants and subsidies for finding various alternative energy source but nobody ever found such a source. Leonhardt suggests a resort to the prize system

over improvements and new uses that might be made out of their works. As a result, there will be fewer incentives for future improvers to invest in developing the first generation technology, i.e., the original invention. Competition on improving the first generation technology will be stifled (Lemley 2005, pp. 1060-1062),

Furthermore, granting subsidies for creation can be conducted on the bases of competitive variables, and the end product of this activities – the actual products and services - will be traded competitively in markets and therefore will generate much more competition than the trading of IP protected products and services, which are monopolized by their holders. Indeed, most basic research is funded with no direct connection to its market value and patents usually do not cover it. Nevertheless, we are witnessing in recent decades increasing attempts by research institutions to commodify their research products, which of course brings to the shrinkage of the public domain, as well as to motivating basic research to more immediate practical directions. As will be explained below, this sort of patents' extension cannot be easily justified by candid economic analysis.

It is important to emphasize that from a Law and Economics perspective not only that an ex-ante grant and an ex-post prize systems are substitutes to each other, they are both substitutes to an IP regime and to central production. In other words, incentives to invent and create can be formed by either an IP regime or by a grant or prize system, and to have both regimes is inefficient, or at least the scope of IP rights to those who can enjoy prizes and grants should be different from the scope of IP rights for those who are not entitled to compete for them. This point is different from the question whether it is justified at all to provide incentives for government funded research institutions, which might not suffer from the public good failure of the market in the first place. The fact that universities rank very high in the statistics of patent applications and patent revenues is inconsistent with economic analysis. Government funded research and information production should not enjoy the same IP protection as private enterprises – individuals or firms, because they enjoyed already monetary incentives by direct government funding for their creative activity.

Liability rules are another possible remedy to the public goods market failure in information and ideas. Calabresi and Melamed (1972) highlighted the distinction between the question whether to allocate an entitlement and to whom, and the separate question as to the desirable method of its protection. They set up the framework for choosing between property and liability rules. The choice, according to their model, should depend on the structure of transaction costs. The entitlement to your own ideas (either as a first order justification or a second order one) can be protected by property rules that prohibit others from making use of these ideas, or by liability rules that do not ban such usage, but entitle the creator to compensation. Which of the two remedies is more desirable? According to Calabresi and Melamed, property rules should be preferred when negotiation costs are lower than the administrative costs of an enforcement agency or a court determining the value of the entitlement. In such a case, central intervention ought to be minimal, as following the construction of the legal rule, the parties are likely to negotiate for the efficient end-result, adhering to or bypassing the initial allocation of the entitlement. By choosing a property rule, entitlements will change hands through a voluntary exchange in the market, where the government's sole function will be to prevent bypassing of the market through injunctions and criminal law. Liability rules ought to be preferred when the cost of establishing the value of an initial entitlement by negotiation is higher than that of determining this value by an enforcement mechanism. In addition, liability rules might be preferred in order to avoid bargaining costs. Lack of information or uncertainty as to the cheapest avoider of costs is likely to point us, according to Calabresi and Melamed, in the direction of liability rule as well. Liability rules involve additional central intervention by a state organ deciding on the objective value of the entitlement. In this case, if the creator has the entitlement, she has the right to be compensated, but she cannot prohibit others from using it.

One of the features of information and ideas is the uncertainty as to their value and its possible changing value over time. Granting property rights in informational goods means that speculators can make fortune by purchasing them for modest price and then enjoying huge profits on their future market value. If this is the case, property rule does

not achieve at all its purpose of providing sufficient (but not more than that) incentives for creation. In addition, unlike tangibles, the apparatus of registering IP rights (patents, trade marks, designs etc.) encompass significant transaction costs and when registration is not required (copyright), it is sometimes very difficult to locate the owners of IP. The costs of trading copyright might be very high, as, for example, is illustrated by Lessig (2004, pp. 100-107) when he discusses the process of clearing rights before engaging in an artistic creation which is based on various previous creations. Informational goods, as we mentioned, are non-rivalous, and this means that granting monopolistic property rights on them might be less efficient than enabling everyone to use them, subject to appropriate compensation paid ex post. Liability rules can, therefore, become interesting competitors to traditional intellectual property rights. Using them means an enhancement of the public domain, because those who want to use the entitlements protected by them cannot be prohibited; they just have to pay for the usage.¹¹

When discussing liability rules, Calabresi and Melamed referred to compensation calculated in terms of the losses for the entitlement holder, but their framework of analysis can by no means include also compensation on the bases of the gains made by the party who used the entitlement. The legal framework for this possible approach is unjust enrichment or restitution law, which may suit better the application of their model to the analysis of entitlements in information (Elkin Koren and Salzberger 2000). Such a regime, in which the entitlement holder would not be entitled to prevent usage by others but rather will be entitled to the gains made by others using the entitlement, eliminates the monopolistic effects of IPR, enables much wider usage of the information and thus might be more efficient than the traditional regime of IP. Since in any case the enforcement of

¹¹ Caroline Nguyen (2004) goes even further in her suggestion of the "Compensated IP Proposal". In her opinion the current IP system is over-incentivizing. The circumstances of artificially high prices and low supply create significant monopolistic deadweight loss and generate unintended consequences that undermine social progress. Nguyen's suggestion of "Compensated IP Proposal", in contrast, "retains financial incentives for producers but lowers them to a merely sufficient level, transferring much producer surplus to consumers. The Compensated IP Proposal contains two components: creators of intellectual products receive cost-based compensation from the government for their products and in exchange their products immediately are granted to society for unrestricted use. Inventors retain all public credit and recognition for their work. This system would alleviate desert-based objections to current IP practices while satisfying utilitarian calls for financial incentives to encourage research and development."

IPR through legal proceedings is much more costly than the enforcement of property rights in tangibles and real estate, the additional costs in administrating such alternative regime, if any, might be negligible in relation to the gains from such a system.

2.2.2 Incentives by IPR – Critic

Intellectual property laws seek to secure incentives by providing creators with a set of legal rights of property, which allow the creators to trade their works and inventions in the market. This regulatory scheme creates several difficulties from a Law and Economics own perspective. **First**, securing incentives by enabling exclusion leads to a paradox (Lunney 1996, pp. 556-570). The incentives paradigm assumes that granting property rights will induce the production of the most useful and social beneficial inventions. Less crucial creations and inventions will have appropriate substitute products and therefore IP rights for these will not create a monopolistic power and their owners will have to sell them at a competitive market price range. However, the most useful inventions, which do not have substitutions, have the pinnacle justification for a broad access. The more utility is driven from any particular invention, the stronger the need to make it accessible to as many users as possible in order to maximize social welfare. This is a direct consequence of the non-rivalry nature of intellectual creations. Granting intellectual property rights to extremely useful inventions such as critical drugs in order to stimulate their production generates a monopoly power to the right holders that most likely will limit access to those critical inventions for which we sought to maximize access. In other words, those creations that have substitutes will be priced at near free economic market price, thus IP protection is not needed for their creation in the first place or will not make a real difference. Granting IP rights to those creations that are really path breaking, unique and essential will create monopolistic power of the creator and thus will not get to the wide population who is in real need for them. Hence we have a paradox.

Consider incentives in the pharmaceutical industry. When a company invests to develop a new drug for headaches it will be one drug among many in the market and thus despite

the property rights granted to the company it will not be able to set its price much above the competitive market price due to the existence of substitutions. It will thus be broadly available for use by many. In contrast, the AIDS Health crisis requires large investments in research and development of new cure. Once a medicine becomes available social welfare maximization would mandate making it accessible to as many infected patients as possible. If the drug, however, is the property of its inventors (or the investors) and does not have substitutes, it will be sold at a monopoly price, and only a few will be able to purchase it. This is the reason for the objection raised by global health activists to patent legislation that prevents the production of life-saving drugs at marginal cost. Yet, the pharmaceutical industry argues that without patents AIDS drugs would have not been invented at all. If AIDS drugs or any other drugs for fatal diseases will not receive the full patent protection, the industry argues, it would lack sufficient incentives to invest in those drugs, and R&D efforts would be diverted into more promising markets, such as anti-aging drugs.¹² This is exactly a two sword-edges argument: incentives by IPR will direct

¹² The most notable example for this conflict over AIDS drugs occurred in South Africa, which has one of the highest percentage of HIV patients in the world. Six million South Africans, one in eight, are HIV positive, with 1,500 new cases reported every day, and it is one of the poorest populations in the world where the average annual income in South Africa is \$2,600 (Scherrer 1999). While the patented drugs, which were produced in South Africa, costs almost 3\$ per patient per day, a generic version of the drug, produced in Brazil, costs only 1.55% of this price per patient per day (Lewis 2002). In 1997, the South African government of Nelson Mandela passed the Medicines and Related Substance Control Amendment Act. The purpose of the act was to enable the government to make the HIV drugs treatment more affordable by allowing Parallel importation of patented drugs from countries where the drug company sells the drugs more cheaply, and by permitting the use of generic version of the HIV drugs treatment as a substitute for the patented drugs. South Africa defended this legislation by relying on its government's obligations under its own constitution to ensure a right of access to health care, and its obligations under international human rights law to respect, promote and fulfill the fundamental human right to the highest attainable standard of health for its people.

In response to this legislation the Pharmaceutical Manufacturers Association of South Africa (PMA) and numerous pharmaceutical companies began in February 1998 legal proceedings against the government to block the law, alleging that its provisions were in violation of the South African Constitution and of the World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs). The case was scheduled for hearing on 5 March 2001, and the South Africa government agreed not to implement the legislation until the court case is decided. In February 1999, US Vice President Al Gore, commented in a memo that the protection of pharmaceutical patents should be "a central focus" in upcoming talks with South Africa's government officials. Gore explained that the South African government has to assure it would "not undermine legal protections" for patent holders (Scherrer 1999). In April 1999 the US even went further and placed South Africa on a trade "watch list". Moreover, Mr. Gore, as chairman of the U.S./South Africa Bi-national Commission, threatened sanctions against South Africa if it went ahead with the law (Scherrer 1999). However, after a furious demonstration against the PMA, it announced on 19 April 2001, that it was unconditionally withdrawing its legal action against the government (AIDS Legal Network).

R&D into directions of profit maximization. A decrease of the rich will attract much more investment and efforts than a decrease of the poor.

From an economic analysis perspective, the AIDS example raises further conceptual and theoretical problems. When legislation is geared to maximize wealth (or welfare or utility) by the right balance between creating incentives to overcome non-excludability and restricting them due to non-rivalry, what should be the territorial unit for such maximization? If maximization of wealth is conducted on the level of South Africa, the legislation proposed by the SA government (see footnote 12) might have been justified. If maximization of wealth is conducted on a global level, the outcome might be different. Any wealth maximizing legislation for a certain jurisdiction creates externalities to other jurisdictions if the intellectual creations cross the jurisdictions borders, and it is the nature of intellectual creations to cross easily geographical borders.

A **second** problem of IP rights as the optimal method to create incentives is connected to the first but with broader implications on related markets. Rendering exclusivity in informational goods gives right holders strategic advantage in informational markets and allows them to exercise control over informational goods far beyond the carefully defined list of rights and the economic purposes they were design to serve. The incentives paradigm focuses on the proper scope of incentives. It overlooks, however, the overall effects of intellectual property rights. Intellectual property laws have turned out to be major means of expanding market power, reducing competition and concentrating control over production and distribution of information and derivative goods and services.¹³ This

¹³ Consider, for instance, copyright law. The fundamental copyright is the exclusive right to copy or the right to exclude copiers. Yet, copyright law in recent years became a vehicle of control, and copyrights are being claimed for accomplishing strategic ends (Elkin-Koren 2002; Litman 2006, pp. 77-88). Copyrights had been used strategically in order to increase barriers on entry (which are otherwise low) and to reduce the risks of competition. Thus, even when royalties were offered, copyrights were the bases for substantiating control over distribution channels, such as cable retransmission of broadcast, Internet television streaming and the legal campaign against P2P distribution architecture. For example, in 2000 Several copyright holders in the USA, such as the National Football League ("NFL"), National Basketball Association ("NBA"), Twentieth Century Fox Film Corporation, Disney Enterprises, Inc., Metro-Goldwyn-Mayer Studios Inc., Universal City Studios, Inc., Time Warner Entertainment Company, L.P., ABC, Inc., CBS Broadcasting Inc., and Fox Broadcasting Company, launched a civil action in the USA against iCraveTV and TVRadioNow Corp., private Canadian companies (*iCraveTV*, 53 U.S.P.Q.2d 1831).

legal strategy often allows right holders to expand their market power and accumulate control over other markets. As Lawrence Lessig described it, strengthening copyright law will stifle technological advancement, and the opposite - strengthening technology will weaken the right holder control (Lessig 1999, pp. 125-126). In real property the legal protection is necessary in order to create incentives to produce and protect the right of possession. In intellectual property law, in contrast, there is a need only to generate sufficient incentives to create. Thus, with regards to intellectual property there is a need only for less than perfect control, while in real property the law must provide perfect control to the owner. Intellectual property law, therefore, should include built-in limits on the power of the right holders to control the use of their works (Lessig 1999, pp. 133-134).

From a Law and Economic perspective, the last point demonstrates again the problems of territorial maximization unit and externalities, but it touches on additional problems. Copyright and other forms of IP are limited to control copying of the work and not usage or enjoyment. Whether certain usage or enjoyment of the creation involves copying is a question of technology. Designing the optimal copyright arrangements, which would maximize wealth (once we agree about the maximization unit) in terms of duration of

iCraveTV had streamed copyrighted programs, such as professional football and basketball games as well as programs such as "60 Minutes," "Ally McBeal," and "Star Trek Voyager," framed with advertisements obtained by iCraveTV, to computer users in the United States over the Internet. The streaming technology allowed iCraveTV to capture United States programming from television stations in the US, convert these television signals into computerized data and stream them over the Internet from their website. Any Internet user could have accessed iCraveTV.com by simply entering three digits of any Canadian area code, one of which is provided to the user on the site itself, and by clicking two other buttons.

The American court ruled that although the streaming of the plaintiffs' programming originated in Canada, subject matter jurisdiction exists because acts of infringement were committed within the United States. The fact that United States citizens receive and view iCraveTV's streaming of the copyrighted materials constitutes at least public performances in the United States. Therefore, the court ruled that iCraveTV violated the plaintiffs' rights to perform their works publicly and to control the authorization for others to do so. In addition, iCraveTV's have also engaged in contributory infringement by making the plaintiffs' copyrighted programming available on the Internet with the knowledge that third parties could and would further infringe the plaintiffs' copyrights by further transmitting (and publicly performing) the programming. The irreparable harm that the Plaintiffs are likely to face, according to the court, constitutes loss of control, which Congress vested with the copyright holders of the copyrighted materials. The court further held that Plaintiffs had lost the ability to offer particular outlets, exclusive rights in particular programs or series, and a loss of customers' good will. Other strategic suits were aimed at controlling the format of distribution to govern access to creative works.

right and list of exceptions, strongly depends on the current state of technology. Technological changes will alter the optimal legal arrangement. In our times, when technology changes so rapidly, it is practically impossible for the law to adapt itself with each technological advancement, in addition to the fact that the course and pace of technology changes are crucially affected by the law itself and by IP legislation in particular (Elkin-Koren and Salzberger 2005, Ch. 8)

A similar problem characterizes patent law. As many commentators observed, the economic value of patents is not confined to the expected value that could be extracted from each patent. Patents reward innovators by granting a patentee the right to exclude others from practicing the patented invention. However, unlike copyright, in order to be granted IPR, registration has to be applied for and not all applications for registration are approved. Moreover, as Lemley and Shapiro (2005) assert, a patent does not provide absolute exclusion, but rather presents a legal right to try to exclude. The patent right is therefore a probabilistic property right. Since according to empirical data the vast majority of patents that are issued are never litigated, and roughly half of those patents that are fully litigated are found to be invalid, most patents represent highly uncertain or probabilistic property rights.¹⁴ In this sense, patents are a mixture of a property right and a lottery. Inventors who are uncertain of the value of their ideas *ex ante* file to patent many of them, knowing that most of the resulting patents will turn out to be worthless but

¹⁴ Lemley and Shapiro argue that inventors have strong incentives to file a patent application very early in the invention process, since they have a limited time from the commercialization of the product and disclosure of an idea till the deadline for patent application. In the US this time period is only one year. In Europe there is no such grace period, and hence the incentives to file a patent application as soon as possible are even stronger. As a result, many inventors file patent applications without any clear idea of whether the invention will be a commercial success, and in some instances whether the category of invention is even patentable at all (Lemley and Shapiro 2005, p. 77). The expected outcome of the vast patent application every year and the early phase of their filling is that the examination process in the Patent Office (PTO) is not broad and deep. The overwhelming majority of patent applications in the United States, at least 85%, ultimately result in an issued patent (Lemley and Shapiro 2005, p. 79). Only a small percentage of the patents materialize to be of economic value. Among those even a smaller portion are enforced or reach litigation. On the average only 1.5% of all patents are ever litigated and only 0.1% is litigated to trial (although the litigation rates is 6% in biotechnology). Out of the patents litigated to a final determination (appeal, trial, or summary judgment), 46% are held invalid (Lemley and Shapiro 2005, pp.80). As one can realize the cost involved in registration are huge in proportion to the actual usage of the vast majority of registered patents.

hoping that a few of the resulting patents will pay off big time (Lemley and Shapiro 2005, p. 81). In fact, research shows that the expected value of many individual patents is small. Industry participants do not consider patents an effective appropriation mechanism. Patents are even considered inferior to other methods, such as lead-time, learning curve advantages and even secrecy (Cohen, Nelson and Walsh 2000; Levin, Klevorick, Nelson and Winter 1987, pp. 793-802).

The costs of patent registration and litigation on average outweigh their value.¹⁵ It seems therefore that filing for patents is serving functions other than securing incentives to create or invest. Indeed, patents are being used strategically, often in aggregation, in order to defend against hostile acquisitions and patent wars, to prevent competitors from entering a market, and to maintain a strategic market lead.¹⁶ A strategy for using patents as a source for revenues, which has been developing over the last several years, is reflected by organizations that license but do not commercialize patents which function for the sole purpose of asserting patents against potential infringers. A recent case, which exemplifies this pattern, was the one of Intel in 2004. In that case, a patent licensing company purchased a patent for \$50,000 and then sought \$7 billion from Intel for alleged infringement by the company's Pentium II semiconductor. Although the court dismissed the case, Intel was forced to pay \$3 million in legal fees (Landers 2006).

¹⁵ Wagner and Parchomovsky (2005) compared the average cost of patent application and the value of the average patent in the US. They estimated that the cost of filing a patent application with the PTO, including attorney, filing, issue and renewal fees, is between \$10,000 and \$30,000. The average cost of patent litigation is \$799,000 for each party through the end of discovery, and \$1,503,000 through the end of trial and appeal. However, on the value side, empirical data shows that the value of a patent is pretty low. A study from 1986 found that 90 percent of the patents in France, Germany, and the U.K. have a value of less than \$25,000 (Pakes 1986, p. 774). A more recent study from 1998 reinforced that conclusion. In this study it was estimated that the average pharmaceutical patent value is \$4,313. It is \$4,969 for chemical patents, \$15,120 for mechanical patents and \$19,837 for electronics patents (Schankerman 1998). Despite the high private cost of patent protection and the relatively low expected value of individual patents, Wagner and Parchomovsky (2005, pp. 11-17) found that the number of filings in the U.S. (and worldwide) continues to increase. What can be the explanation?

¹⁶ Clarisa Long (2002, pp. 627-637) asserted that the prime value of patent rights is in their function as credible signals. The patents are used to credibly convey information about the invention and the inventors to those she calls observers, i.e., the non-owners. The signals are necessary since otherwise the observers will probably not invest in gathering that information themselves. In this sense the value of the patents is the reduction of the informational asymmetries between patentees and third parties.

A possible economic theory explanation for filing for patents despite the negative cost-benefit calculus is behavior under risk. Patents are essentially lottery tickets. Unlike gambling, though, filing for patents manifests a risk-averse attitude in a similar way to buying insurance. However, unlike insurance, big companies who file for many patents and win from time to time can set the price of the winning patent in such a way that it covers all the huge expenses of the vast majority of unsuccessful patents. In other words, the costs are shifted to the consumers. Pooling is a mechanism to decrease the risk even further. According to this defensive theory the acquisition of patents is a kind of an arms race. In addition, competing firms use patents as bargaining chips to negotiate with competitors and to secure certain niches in the marketplace. The assumption in the base of this theory is that courts harshly enforce the patent rights, and hence the possibility of patent litigation threats towards competing firms (Hall and Ziedonis 2001, pp. 105-107).

The differences between Copyright and Patent are the consequence of the significant costs involved in getting patent protection, while copyright is granted automatically with no cost at all. These costs themselves raise the question whether IP is the optimal way to generate incentives to create and invent. However, the effects of granting IP rights in both realms are similar. According to all these empirical findings and explanations, the inter-relations between patents and copyright, on the one hand, and incentives to create, on the other hand, remain very vague, and it seems that the effects of granting patents and gaining copyright are beyond the incentives to create the immediate protected creation or innovation.

A **third** point of criticism against IPR system as the optimal system to secure incentives relates to its increasing role in de-facto impeding production of content and creation by individuals and communities. This is the result of increasing transaction costs of both obtaining IPR and licensing them, in addition to the actual prices, well above the marginal cost, of existing works, which are an essential resource for producing new works. We discussed above the increasing cost of operating the patent apparatus, which outweighs in average their value. Similarly, the costs associated with licensing copyrighted materials has increased expeditiously in recent years whereas the intellectual

proprietary regime is covering more and more informational works and affords protection to types of works, or new aspects of works, that used to be in the public domain. For instance, copyright and neighboring rights today enable protection for facts and mere data. The bundle of rights defined by copyright was expanded in recent years to cover a wider range of uses, for example, the right to prevent unauthorized access to works in digital format, the protection of novel subject matters (such as data and databases) and all of this for an extended duration. Another semi-concealed expansion is anti-circumvention legislation, which protects the use of Digital Rights Management (DRM) systems to govern the use of works and physically limit access and usage even for information not entitled directly to copyright protection or for which such protection had expired (17 U.S.C. § 1201). The expanded coverage of IPR reduces the volume of works that are freely available to build upon (Lessig 2004; Boyle 2003; Karjala 1997). Some characteristics of the digital environment also bring informational works to be less available. For instance, overlapping rights held by different right holders make it more costly to secure a license to use a copyrighted work (Lemley 1997). Overall, expansive copyrights, supplemented by extra protection under other bodies of law, which is supported by mainstream Law and Economic scholars, under the emerging propriety paradigm, create new barriers to accessing preexisting materials.

Licensing is becoming more expensive not only for users but also for the right-holders. It may require legal counseling regarding the scope of copyright protection, the legal definition of authorized uses and the legal language used to describe them. Right holders are more likely to incur the cost of licensing when they expect to benefit, i.e., when they license the work for commercial use. They may be reluctant, however, to incur the high cost of licensing for non-commercial uses. Consequently, licensing costs may prevent the use of works that would otherwise become available, thus impeding access and subsequent creation. The high transaction costs associated with the copyright system create a chilling effect and reduce the level of desirable uses. It also has an increasingly unequal distributive effect. Licenses are more affordable and accessible to businesses, which roll over the costs to consumers. It creates a more notable chilling effect on

creation by individuals. This inequality is likely to have far-reaching ramifications on the nature of future culture and society

The increasing propertization and IP-involved transaction costs were the main forces motivating several movements that try to bypass the rigid IPR system. Notable examples are the free software movement and Creative Commons. Free Software is an innovative legal framework attempting to address the impediments on access created by intellectual property and is based on contracts. Free software is protected by copyright, but is subject to a license called General Public License (GPL). The GPL basically licenses the unlimited copying, redistribution and modification of the software. The license is a ‘Viral Contract’, aiming its application to future users in an attempt to make whole commitments run with this digital code (Radin 2000). It includes a viral provision requiring that any derivative work that contains free software or derives from it, will be subject to the same license. GPL annuls the need for license fees and the burden of negotiating. This subversive use of copyright law does not utilize the proprietary regime for generating “incentives” (or rather profits), but for creating an alternative non-proprietary regime, often referred to as copyleft. Creative Commons uses the same principles to a much broader range of informational creations. The initiative develops an infrastructure, legal and technological, that arguably could overcome the impediments to accessing creative works, for the purpose of reducing the chilling effect on creativity caused by the high cost of licensing. The automated licensing platform allows authors to retain copyright in their respective works, and authorize as many uses of the work as they choose. The hope is that such a mechanism would make it easier for right holders to share their works under more generous terms. Yet, in contrast to the GPL, Creative Commons' licensing scheme includes a wide variety of licenses. Every license that goes beyond absolute exclusion is considered to be a sufficient instrument for promoting, sharing and reuse.

From a Law and Economics perspective, these new developments can be analyzed in the framework of the Coase 1960 theorem. Coase argued that inefficient legal rules will be bypassed by individuals attempting to achieve efficient allocation of entitlement, but this

will happen only when there are no transaction costs. The Internet and related new technologies can be characterized, at least partially, as reducing transaction costs (Elkin-Koren and Salzberger 2003, Ch. 7) and therefore enabling to bargain in the shadow of inefficient IP laws. Those recent development can therefore be explained not only in terms of altruistic behavior and political agenda but also in terms of traditional economic theory. Nevertheless, they point to the inefficiency of the current IPR regime.

The **last** point of criticism against IPR system as generating incentives is more philosophical and a broader criticism of the economic methodology. It has to do with the inability to determine what is the desirable or optimal level of creation or innovation incentives ought to aim at. No doubt that as a result of extending IPR we witness a vast expansion of the entertainment industries, as well as High Tech related industries. Without this expansion we might not have had some of the mega production Hollywood movies. But, do these movies really represent efficient level of informational and artistic production? Are they comparable to great artistic masterpieces that were created under much more limited copyright regime or prior to copyright protection? Equivalents can be drawn to patents motivated industries and the enormous number of new gadgets, which last in our life shorter and shorter periods because the legal regime and IPR incentivize to replace them with new ones. The same questions can be even asked with regard to the pharmaceutical industry, which generally speaking, is geared to a worthy and important cause - improving our health, but it can be argued that it produces many insignificant products, motivated by generating profits from IP. These grand questions are a good point to conclude this section.

3. THE TRAGEDY OF THE COMMONS AND THE PROPRIETY MODEL OF ECONOMIC ANALYSIS OF INTELLECTUAL PROPERTY

Alongside the incentives-public goods paradigm for the analysis of intellectual property there was always another Law and Economics framework for analyzing IPR, which is also a major pillar of economic analysis of property rights in general. It originated from the veteran “Tragedy of the Commons” literature, which was shifted to justify property

rights in land and tangibles, applied to intellectual property. This framework has been emerging in recent years as the dominant paradigm for economic analysis of IPR, and can be titled “the proprietary approach to intellectual property”. This new approach focuses on the management of intangible assets once created rather than on stimulating investments in creative activities and inducing innovation (e.g. Kitch 1977; Wagner 2003) and thus it implicitly overlooks basic foundations of the teleological normative justifications for granting intellectual property rights in the first place.

This section will briefly discuss the tragedy of the commons, which is the oldest and major Law and Economic framework for the **positive** analysis of property in general, and land law in particular. We will, subsequently show how this analytical framework was extended to explain intellectual property, transformed to be its dominant **normative** analysis (as opposed to positive analysis) and how it entrenched the view of Law and Economics scholars that any intellectual creation is to be considered as property.

3.1 The Tragedy of the Commons as a Source for Property Rights and for Intellectual Property Rights

Parallels were drawn between the English enclosure movement, the process of fencing communal land and turning it into private property, which lasted from the 15th to the 19th centuries, and the recent trend of commodification of information and the expansion of intellectual property rights (Boyle 2003a). From a Law and Economics perspective the first enclosure movement is treated mainly in context of the tragedy of the commons model, which is dominated by positive analysis (explaining the emergence of property rights rather than justifying it). Although the term tragedy of the commons is attributed to Hardin (1968) it was, in fact, Harold Demsetz (1967) who first offered this theoretical framework to analyze the emergence of property rights.

Demsetz held that property rights are established in response to the demands of interacting individuals for adjustment of existing relationships to new cost-benefit possibilities. Thus, “the emergence of new private or state-owned property rights will be

in response to changes in technology and relative prices” (Demsetz 1967, p. 349). His analysis begins with a state of nature – a world lacking property rights, thus rejecting the Natural Law concept of property rights (and by derivation the Natural rights concept of intellectual property). In the state of nature, land, and everything on it, is owned by no one, or rather by everyone. This can be an optimal and static equilibrium if every individual can use and produce from the land everything he or she is seeking for. Population growth and density may change this equilibrium. So does an increase in demand, which is beyond the consumption needs of the local population. Once such circumstances occur, a clash between individuals over the land and what is on it will take place, which will lead to over-consumption and a tragedy of the commons – bringing all individuals to a worse-off situation. Rational individuals, therefore, will agree on the establishment of individual property rights.¹⁷

It is important to emphasize that Demsetz provides us with a positive analysis of the development of property rights, which is also a dynamic analysis portraying the process of propertization (and, as we shall see later, de-propertization). In contrast to the public goods analysis of the incentives framework, his description precedes property rights granted by a legal system in the framework of a modern state or central government, which is called upon to intervene in the market activities. Individuals will act in accordance with their own interests to create agreed upon rules, in a similar way to

¹⁷ Demsetz compared the creation of property rights among the Native Americans in the Northeast and in the Southwest. When hunting was primarily for purposes of food and the relatively few furs that were required for the hunter’s family, Demsetz wrote, “Hunting could be practiced freely and was carried on without assessing its impact on other hunters... There did not exist anything resembling private ownership in land.” (Demsetz 1967, p. 351). But the fur trade changed that equilibrium. First, the value of the furs to the Indians increased considerably. Second, and as a result, the scale of hunting activity rose sharply. Without collective agreed upon rules this change meant exhausting resources in the present and creating shortage for the future. So the tribes developed territorial hunting and trapping rights to make sure that the resources were cared for prudently and to enhance long-term availability of animals to hunt. Why have the indigenous peoples of the American Southwest not developed similar institutions? Demsetz cites two reasons. First, in their areas there were no animals of commercial importance comparable to the fur-bearing animals of the north. Second, those animals that did populate the Southwest were primarily grazing species that tended to wander over large tracts of land, making it difficult to associate them with specific land boundaries and to allocate limited rights of hunting them to specific individuals or groups. “Hence both the value and cost of establishing private hunting lands in the Southwest are such that we would expect little development along these lines. The externality was just not worth taking into account,” wrote Demsetz (1967, p. 352).

Hobbes' (1660) general description of the shift from the state of nature to the emergence of the State and central government. Implicitly the description of Demsetz (similarly to Hobbes') is also his normative analysis (Frischmann 2007). In other words, Demsetz endorses the market creation of property rights because it fulfils the efficiency criterion, defined probably in terms of welfare and utility maximization as well as Pareto optimality. His theory is based on equilibrium between normative and positive analyses (Demsetz 2008), which is not the case for the analysis of the incentives model.

Subsequent literature transformed the positive analysis of the "tragedy of the commons" to an externality-type market failure analysis that provides also a predominant justification for central intervention by the government. Such is Hardin's argument in favor of privatizing the commons (Hardin 1968). When too many individuals are privileged to use a resource, such as a lake, they will tend to overuse it. This is because each individual will bear only the benefits of consuming the resource, such as maximizing fishing, but will not bear the full cost of such a use, namely exhausting the fishery. In other words, individuals do not internalize the negative consequences that their consumption may have on the resource and, therefore, the separate action of each individual may bring to collective over-consumption of the resource. In microeconomic theory this phenomenon is regarded as a negative externality, which requires intervention in the market. Although externalities and public goods failures of the market can overlap, the example above is not a pure public good problem because it does not involve the failure to produce the good in the first place.

On a first glance the application of the "Tragedy of the Commons" to intellectual property seems straightforward. Overuse of land and its resources in the absence of property rights are equivalent to overuse of innovations and intellectual creations, which is likely to bring about crucial decrease in their production in the absence of intellectual property rights. Moreover, current developments in intellectual property laws are in line with Demsetz's theory, according to which the emergence of new property rights will take place in response to a technological change. Beside legal changes, the use of DRMs, self-help technological means and contractual arrangements for expanding control over

the use of increasingly valuable informational goods reflect a response to the instability introduced by information technologies and new legislation.

However, several major differences ought to be pointed and looked upon more carefully when we apply Demsetz' theory to the contemporary analysis of the expansion of intellectual property and its effects on the commons or on the public domain and as a general framework for the positive and normative analysis of IPR. **First**, in contrast to land and other physical resources, informational goods do not exist in nature; they are human created. Intellectual property rights, therefore, would not be primarily established to prevent over-consumption, but to enable production (and perhaps, as we shall see bellow, profit making). Indeed, as we shall see later the embracement of Demsetz by the propriety paradigm overlooks this difference and emphasizes the fact that informational goods can also be overconsumed.

Second, unlike land and tangibles, which are limited resources, informational goods do not have capacity limits. The functions of property rights in the case of information would not be to prevent over-consumption, but to incentivize creation and perhaps to optimize value (or profits), functions which are very different from the traditional tragedy of the commons analysis. In addition, as we discussed extensively in the previous section, information is non-rivalous; its use or consumption does not prevent others from parallel consumption. This implies again that the purpose of rights is different from property rights in land or tangibles. Indeed, the non-discretionary adoption of the tragedy of the commons framework to intellectual creation has an inherit bias to overlook the fundamental issues of creation and progress in favor of the questions of management and value or rather profit maximization. Discussing value and profit maximization while ignoring who is entitled to them (pre-assuming that it is the inventor) is a distorted approach from a teleological normative reasoning which Law and Economics claims to embrace.

Third, although Demsetz attributes an important significance to technological changes and their impact on the creation and modifications of property rights, his analysis

assumes technology to be an exogenous variable in the process of the emergence and transformation of property rights. Since technological changes today are much more rapid and dynamic it is problematic to ignore them as an essential endogenous variable in the analysis of intellectual property. As we argued elsewhere, technological development cannot be considered exogenous to the legal analysis (Elkin-Koren and Salzberger 2004). That is because the availability and cost of exclusion measures and the ability to exploit resources efficiently may depend, among other things, on legal rules defining the scope of property rights. The ease with which information technologies could be shaped and modified and the rapid pace of technological changes suggest that in the information environment it is necessary to consider the long-term impact of legal rules on the availability and nature of technologies and the directions in which they develop and vice versa, an analysis which is likely to take a different form and direction to the traditional tragedy of the commons.

Fourth, Demstetz portrays the emergence of property rights as the result of market activities without the intervention of the state or central government. In his description property rights are the result of social norms. This fact enables him to ignore the public choice aspects of the emergence of new property regimes. Collective action problems, interest groups and rent seeking are absent from the analysis. This is not the case with the “second enclosure movement” and in the emergence and scope of IPR in general. We must take those differences on board when applying Demstetz's observations to current debates regarding changes in intellectual property laws. Put differently: unlike Demstetz' original theory of property in which positive analysis is in an equilibrium with normative analysis, the same cannot be concluded with regard to intellectual property. This is partly due to the fact that while land and what is on it are essential for everyone and thus their over-consumption will have a tragic effect across the board, the production of informational goods is limited to relatively a few (and even fewer who make their primary living out of them) and consumed by many. Hence there is a small likelihood that intellectual property rights will be established by spontaneous collective action rather than by a central government or by spontaneous individual self-help means. This

difference has significant consequences not only on normative analysis but also on the positive analysis of the emergence of IPR.

These differences point to a conclusion that the theory of Demsetz certainly cannot help us in the justification of IPR and their ideal prescription, as it is used by the propriety paradigm (see below). It remains, however, a powerful positive theory in explaining changes in that realm. The changes, however, do not reflect only propertization, the main thrust of Demsetz, but also de-propertization, and in the context of IP it might even be more relevant in explaining the later. According to his rationale, if governments (or for this sake any other central decision-making bodies, including courts) intervene in the market of property rights, as is the contemporary situation regarding IP rights, market activities can bring to de-propertization. The phenomena of open source, creative commons and other activities of enhancing the public domain can be understood as market responses to the inefficient expansion of property rights by central agencies.¹⁸ Some of the variables specified by Demsetz can fit the description of the new mode of production of informational goods.

For example, Demsetz referred to the analysis of corporations as an alternative structure of property rights, stating that “the interplay of scale economies, negotiating cost, externalities, and the modification of property rights can be seen in the most notable ‘exception’ to the assertion that ownership tends to be an individual affair: the publicly-held corporation” (Demsetz 1967, pp. 357).¹⁹ Benkler (2002) emphasizes the peer production mode as an alternative to production within a firm. However, if we focus on the property rights aspects of this new production mode, the analogy between corporations and the market-driven enlargement of the public domain can be of great

¹⁸ Demsetz himself hinted at this direction by asserting that “The greater are diseconomies of scale to land ownership the more will contractual arrangement be used by the interacting neighbors to settle these differences. Negotiating and policing costs will be compared to costs that depend on the scale of ownership, and parcels of land will tend to be owned in sizes which minimize the sum of these costs” (Demsetz 1967, p. 357).

¹⁹ “We assume that significant economies of scale in the operation of large corporations is a fact and, also, that large requirements for equity capital can be satisfied more cheaply by acquiring the capital from many purchasers of equity shares. While economies of scale in operating these enterprises exist, economies of scale in the provision of capital do not. Hence, it becomes desirable for many ‘owners’ to form a joint-stock company” (Demsetz 1967, pp. 357).

interest. In other words, Demsetz' 1967 statement regarding the nature of corporation can actually, with small modifications, describe the property rights aspect of the peer production process emerging today (Elkin Koren and Salzberger 2004, pp. 62, 130-136). The decreasing transaction costs and contract forming costs are bringing to greater production outside firms and back into the markets. However, the atomization of joint work efforts enabled by the new technologies creates new type of market activity not seen in the pre Internet revolution. As we shall see below the Law and Economics took Demsetz' theory in a totally different direction

3.2 The Paradigmatic Shift of Law and Economics from the Incentives to the Propriety Paradigm

One of the main arguments of this paper is that the mainstream Law and Economics literature has been shifting in recent years from the incentives paradigm to the propriety one. An early sign of this shift can be found in focusing on incentives to improve instead of incentives to create and innovate. Edmund Kitch, for example, in a paper from 1977, argued that patent rights are necessary as a mean to encourage efficient usage of existing works rather than the creation of new works. We should grant patents in advance of an invention, he argued, making patent a right to "prospect" a particular field for an invention. Kitch's theory lies on two basic assumptions. The first assumption is that creators will not invest in putting their invention to efficient use unless they obtain exclusive rights to the invention. Without exclusive rights the inventors will fear their investment will result in unpatentable information appropriable by competitors. The second assumption is based on the presumption of perfect information, perfect rationality, and zero transaction costs. According to this second assumption the exclusive patent right should lead to an efficient licensing to both users and potential improvers.

Kitch's argument reappeared in a somewhat different form as a supporting argument for the *Sonny Bono Copyright Term Extension Act* (CTEA), which added twenty more years

to the already long copyright term. The American Congress obviously could have not justified retroactive extension on the ground that it would encourage dead people to produce more works (Lamley 2004, p.133) so the justification shifted to the maximization of value of existing creations in a similar way to the tragedy of the commons argument. According to this argument extending intellectual property rights is necessary to give existing copyright owners incentives to preserve films they had already made, and to distribute books they had already created. The rationale behind the law was to prevent a work from entering the public domain. Such prevention is necessary, according to the argument, because once a work entered the public domain it is "orphan" and no one has any incentive to take care of it.

The shift from the incentives paradigm to the propriety paradigm is best exemplified when we compare the 1989 work of two Law and Economics icons – William Landes and Richard Posner - with their recent work (Landes and Posner 2003, 2003a). The early writings of Landes and Posner focused on the market failure of public goods as the main justification for IP rights. The focal point of their public goods analysis was that since the marginal costs of copying a work or a creation are minimal (almost zero) the market price of a non propertied work will be so low that it will not cover the initial investment of its creator and thus new works would not be developed. Only propertization of such works, they argued, will grant sufficient incentives for their creation in the first place. Landes and Posner (1989) portrayed copyrights (and by extension other types of IP) as a mechanism to enhance incentives to create, but also acknowledged that the benefits should be outweighed with the administrative costs of registration and enforcement and, more importantly, with the benefits of wide access to information, which is the main source for new ideas and creations. They wrote: "...beyond some level copyright protection may actually be counterproductive by raising the cost of expression... Creating a new work typically involves borrowing or building on material from a prior body of works... The less extensive copyright protection is, the more an author, composer, or other creator can borrow from previous works without infringing copyright and the lower, therefore, the costs of creating a new work" (Landes and Posner 1989, pp. 332). This is the prime

reason for limiting the duration of intellectual property as opposed to real property, which is exclusive and rivalrous in its usage.

In their later paper, however, Landes and Posner (2003) change their analysis and advocate for an indefinitely renewable copyright, instead of IP rights limited in duration. It is puzzling how in this recent article the authors ignore the major reason, mentioned in their earlier piece, for limiting the duration of IP – that propertization, while, on the one hand, provides incentives for creation, on the other hand, limits the sources for new creations and thus is likely to reduce such creations. Instead they specify six other reasons, connected mainly to transaction costs, for limiting the duration of IP and argue that these reasons are not convincing anymore. The main thrust of their later argument disputes or at least overlooks the first difference we mentioned above between land and informational goods – the public good nature of the latter, which would prevent a tragedy of the commons even if there is no propertization. Posner and Landes argue that this is not correct because overuse of ideas, images, literary characters etc. will decrease their value and hence their usage is, in fact, rivalrous. Surprisingly (maybe not if one thinks about the context of the *Sonny Bono Copyright Term Extension Act*), their main example is Disney's Mickey Mouse, on which they write: "If because copyright had expired anyone were free to incorporate the Mickey Mouse character in a book, movie, song, etc., the value of the character might plummet. Not only the public would rapidly tire of Mickey Mouse, but his image would be blurred, as some authors portray him as Casanova, others as catmeat, others as an animal-rights advocate, still others as the henpecked husband of Minnie". (Landes and Posner 2003, pp. 487-488).

Posner and Landes' point is similar to Demsetz' qualifications regarding the potential effects of new ideas and creations on old ones, and in this sense the differences between land and informational goods might not be so big. However, they ignore the network effect of informational goods, which is likely to balance the decreasing value of wider usage of the creation. Wider usage of informational goods improves connectivity. If more people use the same software or communication technique than everyone can benefit more

from this software or communication platform. Similarly, it can be more generally argued that widely shared heroes, symbols, stories and alike enhance the total value of these cultural icons for society in contrast to Posner and Landes description, which in fact focuses on the value or profit for the producer rather than the total value for society in large. Their emphasis on the value to the producers reveals the paradigmatic shift and the presumption that intellectual creations are to be considered as property. More importantly, in their later paper Landes and Posner ignore the main point - the contribution of the ideas and creations in the public domain to the development of new ideas and creations, which is the main characteristic of informational goods, distinguishing them from tangibles and real estate. In this sense the major difference between the informational public domain and the physical public sphere or commons is that the former is not only a common pool for non-rivalous consumption but also a common production mean, which can foster Pareto improvement not only in consumption but also in production.

Supporting the retroactive extension of copyright, Landes and Posner also endorse Kitch's argument that incentives are needed in order to encourage the investment in creations' distribution and promotion. They write: "Recording companies differentiate their product by promoting the performer or artist who has signed an exclusive contract with the company. Because a recording company can, for example, copyright the Chicago Symphony Orchestra's recording of Mahler's *first Symphony*, it has an incentive to promote that version; it has little incentive to promote the public domain work of an unknown composer, since it could not appropriate the benefits of its promotional efforts, as distinct from benefits that might accrue from a recorded performance of the unknown composer's work by a popular performer" (Landes and Posner 2003a, pp. 230). They go further to contend that incentives are also needed for promoting not only marketing efforts, but also persistent improvement of the good in order to preserve its value. They emphasize that their support of the copyright extension is based on the traditional incentive-based argument for property right, but with a 'new twist'. Incentives are not exhausted in the initial creation of the intellectual property goods. The incentives are further necessary to "maintain the value of the property and also to resurrect abandoned or otherwise unexploited intellectual property." The example they use again is the most

popular mouse ever, Mickey Mouse. Disney Corporation has spent over the years enormous amounts of money refurbishing the Mickey Mouse character, "both by subtle alterations in the character and by situating it in carefully selected entertainment contexts in an effort to increase the appeal of Mickey Mouse to the current generation of young children". While using this example Landes and Posner bother to state that it seems unlikely that only most recent version of the character retains commercial appeal (Landes and Posner 2003A, pp. 231-233).

Ironically, the new propriety paradigm, not only ignores the initial normative justifications for intellectual property rights, it also undermines some fundamentals of competitive market theory. As Mark Lemley (2004) justifiably writes, competition and the invisible hand is what drive the market to efficiency. The meaning of Kitch's argument and its successors is that only one skilled firm in the market can reach the efficient outcome, and for doing so society must provide it with the adequate incentives. The fact that goods in a particular market were protected as the result of exclusive rights in the past, either patent rights or copyrights, does not mean that their initial inventors are the most efficient producers forever. On the contrary, granting one company the exclusive right to make these goods would likely to result in an increase in the price and a decrease in the supply. Even if a manager is necessary for efficient distribution of intellectual property goods, it does not mean that the creator is the best and adequate manager. Creators are often terrible managers. They frequently misunderstand the significance of their own inventions and the uses to which they can be put. Moreover, even if creators have the perfect management skills, their successors, the ones who will hold the exclusive right later on, may not be as good. According to Lemley, empirical evidence strongly supports the intuition of the market. A comparison of copyrighted works from the 1930s with public domain works from the 1910s and 1920s reveals that far more public domain works than copyrighted works are currently distributed to the public, and generally at a somewhat lower price. Twice as many books published in 1920s (and therefore in the public domain) are in print today compared with books published in 1930s.

4. SOME CONCLUDING REMARKS

The incentive paradigm had been the main Law and Economics paradigm for the analysis of intellectual property. Its starting point is the identification of information as a public good, which means a market failure. Free and competitive market will not produce or will under-produce information because of its non-excludable nature. Thus, central intervention is required, and the optimal way for intervention according to the incentives paradigm is by intellectual property rights. However, informational goods as public goods are also non-rival, and this means that once these goods are produced, economic efficiency would seek for their maximized usage. This is the reason that intellectual property rights are limited in scope and time and contain various exemptions and exceptions.

This paper examined critically several of the premises of the incentives paradigm and discussed several alternative mechanisms to create incentives, emphasizing that IP rights are only one among various **substitute** mechanisms. One of the major disadvantages of IPR is the paradox they generate: those creations that have substitutes will be priced at near free economic market price, but perhaps the IP protection is not needed for their creation in the first place. Granting IP rights to those creations that are really path breaking, unique and essential will create monopolistic power of the creator and thus will not get to the wide population that is in real need for them. We showed, further, that rendering exclusivity in informational goods gives right-holders strategic advantages in informational markets and allow them to exercise market control far beyond the carefully defined list of rights and the economic purposes they were design to serve. We also examined several possible objects of incentives and different groups that they serve: incentives to create versus incentives to disseminate and distribute, incentives to create versus incentives to disclose, and incentives to create and innovate versus incentives to improve. Each of these targets, activities and groups justifies a different form and scope of IP rights in order to secure the desirable incentives, if needed at all. We paid a special attention to new technologies, which generate also new modes of production and

distribution and question the suitability of the traditional IP regime to this changing environment.

Be that as it may, the incentives paradigm, due to its recognition in the two opposing consequences of informational goods that have to be mitigated and optimized, cannot be characterized as a-priori pro propertization and anti commons or anti public domain. The question it should have highlighted is the right extent of IP, and by derivation of the public domain, or the right mixture that will maximize society's wealth or wellbeing. However, the phrasing of this question in the context of the contemporary policy debates leaves two important factors that were not addressed by the core model – the definition of society for which we are seeking to maximize welfare and the definition of a time frame for such maximization – in addition to the more conventional measuring problems. These two factors are less crucial (but not absent) in the analysis of old property – tangibles and land - as physical property is connected to specific territory, save exceptional externalities; and it usually has a relatively long-term value. Informational products have no geographical barriers (or minor geographical barriers of language) and their term of value can change significantly from news items with momentary value to major scientific breakthroughs or major ideas with a long term, even eternal, effect. In addition, the new property is mostly hypothetical or pre-creation and thus the impact of current IP laws is crucial for future creation of potential property.

Indeed, the debate between the developing world countries and the industrialized world regarding patents on medications exemplifies the two crucial factors of territory and time span. If the departure point of this debate is incentives to promote efficiency (even when phrased in terms of wealth maximization) the question of the unit for which we seek to maximize wealth is the first question to be asked. Should we maximize wealth for the traditional national state or for the whole world? This question is crucial when international treaties, such as TRIPS are deliberated. It is clear why American IP laws do not take into account their impact on the dying people in Africa, save some minor potential wealth effects of the decreasing population in Africa on Americans' wealth (such

as the decreasing export to Africa). Similarly, it is clear why a country which is mainly an importer of intellectual creations, rather than a producer, will find it more efficient for its members to set a low degree of IP protection. But it is not clear why the American rules fit the global environment.

Similarly, different time units for wealth maximization will have a significant impact on the cost-benefit analysis of propertization. If, for example, maximization calculations are conducted on a momentary or short time span, than most intellectual property ought to be in the public domain – the price of medications should be their marginal production cost, because the potential effect on future creation is not taken on board, as well as past incentives to create. If the time unit for such maximization is long, than the incentives to create should be taken on board. But how long should this time unit be? And how can we possibly predict the impact of today's regulation on future creation, especially in an environment in which technological progress (which itself depends on the current IP regulation) is so rapid? The growing pace of technological change decreases even the relevancy of the few empirical studies on the impact of IP laws on cultural and scientific progress. For the new property, therefore, the two questions – whose wealth we are seeking to maximize and what is the time frame for such maximization – become highly important. The lack of a solid analytical framework and empirical abilities to discuss these two variables – time and space - can be viewed as one of the reasons for the paradigmatic shift from incentives to pre-assumed property. The easy solution taken by contemporary Law and Economics literature was to abandon the incentives framework altogether and resort to the a-priori assumption that information is property.

This paradigmatic shift was facilitated by resorting to traditional economic analysis of physical property, where Demsteez' 1967 theory was a major anchor. The shift, however, overlooked various differences between physical property and information, as well the positive nature of the tragedy of the commons analysis. The incentives framework is a pure normative analysis, while the tragedy of the common emerged originally from a positive analysis. In this sense, the tragedy of the commons framework for property rights

can be presented as creating an inner equilibrium between positive and normative analyses. Once central intervention is required in the information markets, such equilibrium cannot be envisaged. Intellectual property rights have to be created by lawmakers and their distributional effects exposes them to manipulation by interest groups, social choice problems and other public choice obstacles. Economic analysis, therefore, cannot predict that the desirable (optimal) solutions will be indeed implemented on the basis of the same fundamental assumptions of the Law and Economics framework, especially the assumption of rational, self-maximizing, behavior. This point is especially important in the context of the debates about the current expansion of IPR laws. While the supporters of IP extension and enlargement comprise relatively small and powerful groups of people which are likely to get well organized (because the costs of organization will be lower than the expected benefits from such organization), the supporters of a greater public domain encompass many individuals whose individual gains from organization is likely to be smaller than the immense organization costs, thus their likelihood to influence the decision-makers will be much lower than that of the IP lobbies. The legislative results, therefore, are likely to reflect a bias (in terms of the optimal point according to the Law and Economic theories) towards the pro-IP camp.

Applying the property framework to information raises additional and, to my mind, fundamental questions regarding the meaning of property right, in general, and whether the justifications for the legal definition of this right when tangibles or land are involved are intact when we apply it to informational and intellectual creations. These questions have not been addressed yet by Law and Economics and I want to conclude this piece by placing them on the discussion table. Property right, or ownership, is an established legal concept, but, in fact, this right is an abstract concept, which includes a bundle of particular rights related to its object. The five main components of private ownership are access, withdrawal, management, exclusion and alienation (Ostrom 2000). In other words, when the law recognizes the right of property it implicitly acknowledges different exclusive rights of the owner to access the property, to use it, to manage it, to transfer it to others, to exclude others from using it and to destroy the property. All the economic benefits that

result from these activities belong to the owner. There is no obvious reason to consider automatically the whole bundle of rights as one legal concept.

Indeed, the rulings of American courts regarding natural resources, such as oil, gas and waters, developed a more complex allocation of rights. For example, courts ruled that, while individuals have the right to drill on their private property and that the retrieved oil is owned by them in the sense of usage, transfer and exclusion (although its source is a common pool below all the private properties around), they are not allowed to alienate the oil and will be liable in damages for doing so (Epstein 1985, p. 221). This ruling, in fact, creates a right that includes exclusive access and withdrawal, common management and no right to alienation. This is an exception to the general perception of full private property as thick and integral concept. It is possible that transaction costs were the main reason in the past not to break up the concept of property into its different components, or rather to group those rights under a common legal title in the first place. In the new information environment transaction costs are significantly lower (Elkin-Koren and Salzberger 1999). More sophisticated and fine tuned enforcement measures are available by innovative technologies. It might be an interesting exercise to examine the justification of each of these components separately and their optimal degree of propertization. For example, the optimal duration of each of this rights might be different. While restrictions on access are the most heavy-handed measure vis-à-vis the implications on the flow of ideas and the sources for new creations, management, exclusion and alienation are less harmful. On the other hand, from the point of view of the individual incentives to create, allowing greater access (for example by a wide definition of fair use and its extension beyond copyright) might pose a minor disincentive to create in comparison to allowing management, transfer or alienation.

The broadening of the objects of traditional property to intellectual objects has an effect also on the old property. Let us assume that the government changes the designation of particular common land into private property. This piece of land is subsequently purchased by an individual who builds on it an architectural masterpiece. This new

building is privately owned in the sense that no one can enter the building, use it, sell it, or eliminate it, save its private owner or under her permission. But the pleasure of viewing the building for the rest of the community, the inspiration it creates, its contribution to future architectural plans should be regarded according to the new paradigm also as part of the owner's property. Why should we distinguish between the economic benefits an owner is entitled to when a physical object is their source, and the equivalent benefits when their source is an idea or non-physical creation? The new architecture masterpiece can be the source for new ideas in architecture, the source of inspiration of poets and writers and, in general, a source for utility enhancement for members of the community and even the cause for an increase in the monetary values of the private properties of the neighbors. All these benefits cannot be claimed, under present legal doctrine, by the private owner of the new building, thus they are things, which belong to the public domain. This example demonstrates that property is not necessarily the antonym of the public domain, because it is very possible that had this piece of land been kept in common ownership or declared *res nullius*, everyone could have made any physical use of it, but the total welfare or utility of the community would have been lower.

From a Law and Economics perspective (defined broadly on the bases of utility maximization or narrowly on the bases of wealth maximization), property rights are a mechanism to increase the total utility/wealth of the population and in this path we can resort to Demsetz and his externalities analysis of the emergence of property rights or to the public goods analysis of the incentives model, and portray the public domain as comprising also positive externalities from private property. However, if we expand the traditional objects of property to include all economic benefits that can be extracted from information, ideas and other intellectual creations, the result would be a decrease in total utility or wealth not only in the traditional realm of IP but also as a consequence of indirect modifications of the extent of property rights in tangibles and land. Under a restricted definition of IP, in the framework of the traditional Law and Economics paradigm, the public domain, an important source for new creations and thus for welfare enhancement, cannot be regarded as an antonym of private property. As our example above shows, under this framework, propertization or commodification can in fact enlarge

the public domain. Under the propriety paradigm, which pre-assumes that everything of value is an object of property, this is not the case, and the essential goal of economic analysis might be altogether frustrated.