

Ville Oksanen

Five Essays on Copyright in the Digital Era



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Ville Oksanen

**Five Essays
on Copyright in the Digital Era**

Foreword

“It’s this kind of association for hobbyist-thinkers. It should be obvious that we don’t ask for statements from all of them. I’m sure there are many associations we haven’t asked for statements,” said Liedes, explaining his ministry’s position...

“Our requests aim to approach those parties which are stakeholders. There are quite a few parties whom it is simply not possible to ask.”¹ (Karhu 2001)

Copyright law used to be niche legislation without much relevance outside publishing houses and record studios. The law had insignificant direct effects on normal citizens and as a consequence did not draw much attention from politicians. Even the legal profession was not that interested because there was relatively little money to be made in this (then) obscure area of law.

The author of this study entered “the scene” at the time the wind of change had started – first as an observer, soon also as an active participant. Interest in this subject was triggered by the fate of Anon.penet.fi, an anonymous remailing service run by Juhan “Julf” Helsingius. Helsingius was forced to close the service down after Finnish Police threatened to confiscate his server based on allegations from Scientologists that the service was used to distribute their copyrighted materials.

The case was widely discussed in SFNET and USENET and even led to the first Internet-related demonstrations—one of which the author was arranging in Helsinki. The author also had the chance to observe developments firsthand that led to court cases like RTC vs. NetCom that laid the foundation for first-generation copyright rules on the Internet.

1. Author’s free translation

One thing led to another and the author, together with his peers, founded Electronic Frontier Finland (EFFI) in 2001 to fight for freedom of speech and against over-reaching regulation of the Internet. One of the first cases undertaken by EFFI was national implementation of EU's Copyright in Information Society Directive. That process is not described here as it is sufficient to note that it raised many questions in the author's mind that this dissertation aims to answer; for example, why didn't Jukka Liedes believe that Internet users were valid stakeholders in the process?

The thank-you list for this work could be very long and I know I'm going to miss many people who should be on it, and for that I apologize.

First, I'm very lucky to have an amazing family (mom, dad, sister) who has always been there for me, even during the darkest hours. Without them, this work would not exist. Second, Pauliina—my love—has played a central role in this work. Without her threats to color my hair red if no progress was made, this work would never have been finished.

This dissertation owes a lot to my colleagues at HIIT, where I started my academic career. Jukka Kemppinen and Olli Pitkänen taught me a lot about the intrinsic details of the copyright system, among other things. As benevolent leader of the institute, Professor Martti Mäntylä both kept the administration from disturbing the actual work and offered insightful answers to my many questions. The months spent with Risto Sarvas at SIMS in Berkeley were, first of all, very fun but also helped me to understand a lot about other disciplines. Herkko Hietanen was always the person from whom I sought new perspectives on old questions – and great company on road trips and other adventures. Aura Soininen and Perttu Virtanen were the persons I turned to when I needed solid legal advice. Last but not least, Tommo Reti helped me understand how technology could and could not be used to solve copyright-related problems.

Three people played special roles in this dissertation. Professor Kalle Määttä was my original supervisor while I was preparing this work at University of Joensuu. In that role he helped me in countless ways and bought me many drinks while we discussed the fine details of the economics of IPRs. Unfortunately, as a result of the very cruel nature of academic funding, I had no other choice but to move the project to TKK. This is something I'm sorry about.

The second person is Professor Juha Laine. As my second supervisor he gently pushed me to finish this work while taking care of most of the practical arrangements. Finally and most significantly, Mikko Välimäki offered invaluable support for this work. For some odd reason, we share a passion for the strangest details of copyright; in other words, few people are genuinely excited about a just arrived used book, which describes the copyright system of the old Soviet Union. On other hand, we tend to disagree (often loudly) about the aforementioned details. As a result our relationship has been intellectually highly stimulating, and the articles in this dissertation would not exist without that or, of course, without his later detailed practical help.

Dissertation examiners professor Juha Karhu and Professor Matti Heimonen made a number of comments to a draft version of this work, which improved the outcome substantially. They also kept the time limit with admirable precision, of which I'm very grateful. Professor Giovanni Ramello accepted the invitation to act as the academic opponent of the work with full knowledge of the weather conditions he'll be facing in Helsinki.

A very special thanks goes also to TEKES. The articles in this dissertation were written mostly while the author was working at TEKES-funded MobileIPR, RIPOS, and OSSI-projects. Other crucial financial support

came from the Finnish Culture Foundation and the Business Education Fund, which helped the author survive periods of no project funding and also participate in international conferences. Finally, support from GEBSI helped to finalize the book.

A different but equally important support for this work was provided by professor Marjatta Leirisalo-Repo and her colleagues and doctor Ville Remes at Helsinki University Central Hospital. They kept me in good enough condition to complete this work by offering the best possible cutting edge care.

One more thing – thanks should also go to the PepsiCo, because without Pepsi Max this work would not exist.

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Original articles

The dissertation is based on five publications and a concluding first chapter. The abstracts of the publications are presented below. The full articles make up Appendixes 1-5.

Article 1

Ville Oksanen - Mikko Välimäki: Transnational Advocacy Network Opposing DRM - Technical and Legal Challenge to Media Companies. *Journal of Media Management* 3/2002 (Volume 4, Issue 3)

Organized transnational political and technological activism—here referred to as transnational advocacy networks—is playing an increasingly strong role in giving ideas of how one should behave and what to consume. This article analyses transnational advocacy networks that oppose digital rights management (DRM) systems and related regulations. We suggest the potential impact of this activity to the consumption of content products.

We start by defining and describing the most relevant advocacy networks. We provide the characterization of existing organizations and their work in both the United States and Europe. Then, we discuss four case studies where media companies have experimented with different strategies against DRM circumvention initiated and endorsed by transnational advocacy networks. Our argument is that because of the economics of copying from the Internet, it is not a sound strategy to use legal actions to remove any circumventing information from the Internet. Any circumvention information published on the Internet will be mirrored out of the reach of legal enforcement mechanisms. So far, the only working strategy seems to be to implement a DRM- system, which can be updated without user intervention after the security is breached. This might also be the most

efficient way to control the impact of transnational advocacy networks opposing DRM systems.

Article 2

Mikko Välimäki - Ville Oksanen: DRM Interoperability and Intellectual Property Policy in Europe,. *European Intellectual Property Review* 11/2006, (Volume 26, Issue 11), pp. 562-568.

Abstract

The article examines the scope of digital rights management (DRM) interoperability under EC copyright, consumer, and competition laws, and comments on the absence of specific interoperability provisions under European Parliament and Council Directive 2001/29, the situation under Council Directive 91/250, U.S. policy, and whether the French approach offers a potential way forward. Considers the extent to which EC competition law may be used to enforce DRM interoperability and whether consumer protection measures may achieve a similar result. Discusses whether interoperability should be recognized as a principle under the EC intellectual property regime and how this could be achieved.

Article 3

Ville Oksanen - Mikko Välimäki: Theory of Deterrence and Individual Behaviour - Can Lawsuits Control File Sharing on the Internet? *Review of Law & Economics* 3/2007 (Volume 3, Issue 3), 694-714

Abstract

The music and movie industries have recently added individual consumers as the target of the file sharing lawsuits. It is often questioned why the

industries use substantial resources to fight in the courtrooms instead of making better and more affordable products. In this article, we first analyze the reasons of the industry behavior, suggesting that the court strategy may be in fact more effective, at least in the short term, than it should be, based on pure economic calculations. We argue that lawsuits send in the first place a signal to individuals about the society's supposedly negative attitude towards file sharing. General deterrence from the threat of being sued is secondary because people are risk seeking in the face of making a decision between certain and probable loss. In conclusion, we maintain that the court strategy can be used indirectly to establish a social norm, which can have a long lasting effect on individual behavior.

Article 4

Ville Oksanen - Mikko Välimäki: Free Software and Copyright Enforcement - A Tool for Global Copyright Policy? *Knowledge, Technology & Policy* Winter 2006 (Volume 18, Issue 4), 101-112.

Abstract

One of the paradoxes of the free software ideology is its reliance on the legal institutions it was created to object. One could argue that Free Software Foundation is using copyright to enforce their free software licenses as aggressively as Business Software Alliance is enforcing its clients' copyrights. We will show that the reality is more complex and that there is a significant difference: the free software community uses primarily non-legal enforcement methods and trusts on social norms.

We argue that free software could be used as a tool to make copyright more accepted in the less developed world because of its positive connection with copyright and community based approach. We explain why strong

copyright is also in the interest of free software developers. The article concludes by suggesting that World Intellectual Property Organization should include free software into its development agenda.

Article 5

Ville Oksanen - Mikko Välimäki: Copyright Levies as an Alternative Compensation Method for Recording Artists and Technological Development. *Review of Economic Research on Copyright Issues* 2/2005 (Volume 2, Issue 2), pp. 25-39

Abstract

The idea of alternative compensation methods for recording artists has gained increasing popularity as Internet copying has started to seriously threaten record sales. Alternatives such as collective (blanket) licenses or levies to recording devices or Internet connections are not only promoted by cyber liberty organizations like Electronic Frontier Foundation but also by academics. We start this article by looking at the general theory of alternatives to copyright royalties and show that recording artist income is in practice not dependent on record sales. Music industry is much larger than the recording industry. Then we move forward and map the features of the current alternative proposals as well as their critiques. We end the first part of the article by presenting critique of the proposals and construct yet another iteration of a levy-based compensation method – this time with the users having the power to vote how the levies are distributed.

In the second part we analyze what our model would mean in Finland. We start this section by describing the current situation with the Finnish copyright law and the levy-system. We discuss shortly the governmental subsidies to the music industry. We then show what kind of changes would

be needed to implement our system and how the changes would be most likely against both EU copyright directive and WIPO copyright treaties. Not discouraged, we move on to calculate how the legislation would work in economic terms. In the end of this section we also aim to predict how the proposed model would affect the income of recording artists and the music industry at large.

In the third and final part we reflect the idea of a levy-based compensation method to the current predictions of technical advances in communication networks. We especially pay attention to two factors, which are the price of storage capacity and communication speed. We show that consumers do not need for effective music sharing any faster connections than they have now. The traditional copyright royalty model is seriously threatened by tremendous personal copying covering practically all the music ever created. We conclude this article by discussing what this will mean to the alternative compensation proposals and the music industry in general.

1. Introduction

“Copyright law is totally out of date. It is a Gutenberg artifact. Since it is a reactive process, it will probably have to break down totally before it is corrected” (Negroponte 1995, p. 58)

Nicholas Negroponte wrote this often quoted prediction more than a decade ago. A lot has happened during that decade to make the prediction seem likely to come true. However, there have been also significant developments that have seemed to take away its foundations.² A short answer to the question, “what is this dissertation all about?” could be given as “finding out how well Negroponte’s prediction is holding up.” In other words, this dissertation aims to give a detailed view of how well copyright law is working in the digital environment and how its future looks.

The main content of this dissertation, comprising five original articles, can be found in Appendixes I-V. The articles cover a relatively wide range of themes, with the common denominator being the process of adaptation of copyright to the digital realm. As required for this kind of dissertation, the articles are summarized in this first chapter together with some additional material considered essential or beneficial for the goal of the dissertation.³

This first chapter is divided into four parts. The work starts by giving the reader a primer on two central topics in the dissertation, i.e., an overview of technological developments that have changed once again the environment of copyright law work and the economic background of

2. The emergence of peer-to-peer technologies belongs without doubt to the first category and legislative efforts like the WIPO Internet Treaties and their implementations Digital Millennium Copyright Act (DMCA) and EU Copyright Directive (EUCD) to the second.

3. To follow the rules and the tradition, no new research or results as such are introduced in this introduction.

copyright and IPRs. The second section is about the more formal details (research questions and method) of this dissertation. Summaries of the original articles are provided in the fourth section. Finally, the chapter closes with concluding remarks that tie together the various ideas of the articles and of this chapter.

1.1. Copyright and Digital Technology

One of the most commonly heard fictions about copyright law is that it is a “technology neutral” form of legislation. In reality the development of copyright law has gone hand in hand with technological development. Of course, basic rights have remained relatively intact during its existence but there is continual need for new specific regulation of new technologies affecting the production and distribution of protected works. Of course, these changes have not always been easy or very timely since there have been powerful conflicting interests at play. For example, during the last century, the introduction of radio, TV, cable TV, copy machines, VCRs, and computers all necessitated long and heated processes to adapt this “technology neutral” law to the new technological realities. However, none of these processes has been as profound for the copyright system as the simultaneous effect of digitization and emergence of global information networks.

The magnitude of the change has been caused by three primary factors. First, rapid digitization has made it possible to make perfect copies of copyrighted works. Even though analog copying has been possible for quite some time, it did not pose as big a problem because serial copying was difficult as a result of at least some degeneration of quality between generations of copies. With digital copies, there is no such problem. The software industry faced this problem first by the very (digital) nature of

their product. Soon the music industry realized that it was in the same quagmire with its full digital non-copy-protected CD format. The movie industry was more cautious, but to no avail—DVDs offered perfect masters for digital copying after their sub-par copy protection was broken. Among traditional major copyright industries, only book publishers have so far avoided mass-scale digital copying of their products. However, that is only because most people still prefer the interface of traditional books over e-book readers.

The second factor is humongous development of silicon-based technology. The price of computers has gone down as fast as Moore's law has predicted. This had made it possible for ordinary households to get hardware that was formerly only in the domain of the wealthiest corporations. This has had twofold consequences. First, it gives consumers the tools needed to store and copy works from digital masters in mass scale. However, an even more profound change has occurred in regard to the production costs of works. A typical home laptop can nowadays act as a recording studio, film cutting tool, and photo lab. The rise of open source and free software has boosted this effect further, since it has made a lot of very powerful tools legally and freely available to users. This means that the production of the works has been “democratized”; i.e., a talented person does not necessarily need corporate backing to create professional-quality music or movies. This means that the traditional division between producers, users (i.e., corporate users such as TV companies), and consumers has lost most of its substance.

The third factor is the development of communication technologies. As long as there was no inexpensive way to mass distribute works among consumers, the content industry had at least one card left up its sleeve. However, the Internet broke this final barrier. The key feature here has

actually been the very decentralized design of the Internet. The development of wireless communication has so far not been as important a factor, but as explained later in more detail, it will be.

A very good case for demonstrating this development is the Finnish amateur movie *Starwreck*, which is a “mashup” of the *Babylon 5* and *Star Trek* series. The quality of the full-length film—especially its digital effects—is similar to its commercial counterparts despite the fact that the effects and editing were done on home computers.⁴ The film is freely distributed over the Internet with the help of BitTorrent technology, sharing the burden of required bandwidth with the downloaders, which has been crucial since downloads number in the millions. The film is being sold as a commercial DVD even it freely available. Additional income for project has been created with the sale of different merchandize like T-shirts and keyrings and donations from the community. Both the creation, financing and distribution of the film in this fashion would have been impossible without these technological breakthroughs.

1.1.1. Peer-to-Peer Technology

As just noted, the role of so-called peer-to-peer (P2P) technologies has been central as an enabler of unlimited distribution of (commonly unlicensed) copies. This dissertation delves now into more detail in an effort to further understand the exact nature of this phenomenon.

The groundwork for P2P was created while the technical architecture of the Internet was being laid down during the early 1970s. The architecture was aimed to work in as decentralized a manner as possible. Thus the “intelligence” has to be located in the end-nodes of the system, which is totally opposite the functioning of “plain old phone networks,” which

⁴ The movie is available at <http://www.starwreck.com/>. One might say that the quality of acting leaves something to be desired.

rely on centralized control units (switching boards, etc.). Another critical design choice was a layered structure to separate the infrastructure from the services using it (see, e.g., Cerf 1974).

As Lessig (2001, pp. 44-48) and others have described in detail, without this “end-to-end” nature of the Internet, users would not have been able to empower themselves, since disrupting innovations like peer-to-peer technologies would have been blocked with very high certainty by the incumbents. However, it took more than two decades before the P2P-technologies and Internet itself were mature enough to break into the mainstream.⁵

Shawn Fanning’s Napster was therefore the first application to release the full potential of P2P in 1998. The design of the system was not fully distributed (see table 1), as the database of shared files was located in the central server. This made the system more controllable, which was reasonable from a technical and business perspective. It also made the system more vulnerable to legal attacks as it was easy to argue that the company had exact knowledge of what was being shared and also a means to stop the unlicensed sharing.

Apparently Fanning and his corporate backers believed they could negotiate a license for the service from the music industry and start charging users for connecting to the system. Since they already had the data on shared files, it should have been relatively easy to share the collected income with the rights-holders e.g. similarly as the income from radio broadcasts is being shared. However, at that point such a proposal had no chance of success in the corporate boardrooms of the Big Four. Instead, the record

5. It should be pointed out that Usenet-protocol, which describes a global, decentralized, distributed Internet discussion system, had already been created in 1979 by Duke University graduate students Tom Truscott and Jim Ellis. The system was arguably the first widely used P2P system and was also the target of the first major copyright litigation pertaining to the Internet (see Article 3 for more details).

companies sued Napster into oblivion.

As a result, file-sharing technologies moved away from centralized P2P to hybrid and pure p2p systems (see table 1). These systems were seen as more resistant to legal attacks since the companies behind the software had no direct control over what the users were doing. However, the music industry's successful court cases against Grokster and Sherman Networks (the creator of KaZaA) proved this theory effectively wrong (e.g., Ginsburg & Ricketson, 2006).

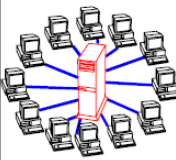
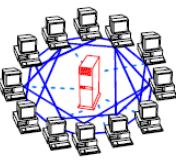
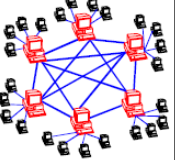
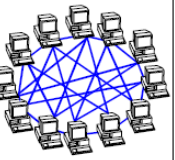
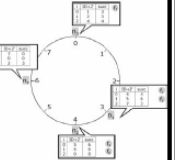
Client-Server	Peer-to-Peer			
<ol style="list-style-type: none"> 1. Server is the central entity and only provider of service and content. → Network managed by the Server 2. Server as the higher performance system. 3. Clients as the lower performance system <p>Example: WWW</p>	<ol style="list-style-type: none"> 1. Resources are shared between the peers 2. Resources can be accessed directly from other peers 3. Peer is provider and requestor (Servent concept) 			
	<i>Unstructured P2P</i>			<i>Structured P2P</i>
	<i>Centralized P2P</i>	<i>Hybrid P2P</i>	<i>Pure P2P</i>	<i>DHT-Based</i>
	<ol style="list-style-type: none"> 1. All features of Peer-to-Peer included 2. Central entity is necessary to provide the service 3. Central entity is some kind of index/group database <p>Example: Napster</p>	<ol style="list-style-type: none"> 1. All features of Peer-to-Peer included 2. Any terminal entity can be removed without loss of functionality 3. → dynamic central entities <p>Example: Gnutella 0.6, JXTA</p>	<ol style="list-style-type: none"> 1. All features of Peer-to-Peer included 2. Any terminal entity can be removed without loss of functionality 3. → No central entities <p>Examples: Gnutella 0.4, Freenet</p>	<ol style="list-style-type: none"> 1. All features of Peer-to-Peer included 2. Any terminal entity can be removed without loss of functionality 3. → No central entities 4. Connections in the overlay are "fixed" <p>Examples: Chord, CAN</p>
				

Table 1. Summary of characteristic features of client/server and peer-to-peer networks (Eberspächer et al., 2004)

However, even if the court cases succeeded against corporate backers of P2P, this did not end the development of the systems. P2P software has continued to flourish in different open source projects with no legal entity to sue. One might thus argue that the outcome was actually a classic pyrrhic victory for the content industry since with corporate entities it would have been possible to develop mutually beneficial licensing agreements (as Napster had most likely planned to do).⁶

It should be pointed out that P2P-technology is used nowadays for much more than unlicensed sharing of music and videos. For example the most popular voice-over-IP application Skype is using its users to route the traffic of the system. Similarly there are tens of projects and commercial entities that leverage P2P to offer streaming video services (e.g. SCVI.net, 2008a and SCVI.net, 2008b).

However, the early visions of the P2P super-distribution of commercial material have not realized. (see Soininen & al, 2003) For example, recently a company “Qtrax.com” claimed that it had secured licenses from the four major labels to start its service as “first legal p2p service” but the record companies disclaimed the information and the service is still unavailable. The fundamental problem with these services is that they compete directly with illegal services, which can offer their content free of DRM - and free of charge, too. (Kafka, 2008)

In addition, the picture in “pure” file sharing is more complex than what one can read from mainstream press. As described earlier in the case of Starwreck, P2P is widely used already today to distribute different legal content. The most classical example is the Linux distributions but

6. The action was recently awarded as “the biggest record-company screwup of all time” while Decca Records A&R exec’s decision not to sign Beatles was number 2. (Dolan, Eells & Goodman, 2008)

the list of uses and users is much longer. For example, it is possible to download with BitTorrent Richard Stallman's video lectures about new GNU General Public License. (Stallman, 2007). Similarly, Nine Inch Nails released their Ghost I and Slip-album in several Torrent-sites (Santo, 2008). Even traditional "pirate sites" like ThePirateBay host nowadays material from artists, which not only approve the distribution of their content but also rely on the support from the community as one of their sources of income.

1.2. Economics of Copyright

1.2.1. Economic Importance of Copyright Industries

This section discusses the economic importance of copyright industries for current society. It is intended that this also serve as an introduction to the field and hopefully create a foundation for the reader to understand what copyright-based industries actually are, on what kinds of rights the industry is founded, and why the political and economic stakes are very high.

To begin with, it is anything but easy to have good empirical results on the importance of copyright industries. The task is even harder if the results are comparable between different studies.

To raise the quality and usability of the studies, WIPO launched a project in 2002 to create a unified way of measuring the effect of copyright industries on Gross Domestic Product (GDP). The main part of the project took place in Helsinki in July 2002 and was chaired by Jukka Liedes.⁷ The outcome was the *WIPO Guide on Surveying the Economic Importance Contribution of the Copyright-based Industries*. Gantchev (2004, p. 6)

⁷ The other participants were Antonio Buainain, Ahmed Ghoneim, Robert Picard, Stephen Siwek, Jules Theeuwes, Jeremy Thorpe, Ruth Towse, and Richard Watt.

describes the content of the guide:

In a nutshell the Guide provides detailed recommendations on how to establish the share of copyright-based economic activities in the GDP, employment and foreign trade. To this end it describes various existing approaches to measuring GDP, considerations that need to be taken into account when establishing employment in the copyright-related sectors and their share in foreign trade.

Because copyright law is harmonized more or less internationally, the guide presents the relevant rights that form the basis of copyright industries, as presented in Table 2.

Right	Scope of the Market
Right of reproduction	Reproduction of the works in a material or non-material form. It might also cover the adaptation of works.
Right of distribution	Dissemination of physical copies; resale, sale and rental, and even lending of copies of such categories of works as musical works, including phonograms, audiovisual works, and computer programs. It might also cover the importation of copies.
Right of communication to the public	Relaying of works by any distant communication means. It might embrace a broad field of activities including the relaying of a performance to members of the public outside the place where the performance was made, the transmission by cable and the making available of works through digital networks.
Right of public performance	Live performances of works in the presence of the public (including by means of recording phonograms).
Right of broadcasting	Transmission of works through wireless and non-interactive means intended for public reception. It also embraces satellite transmissions intended for public reception.
Table 2. Copyright and the scope of copyright markets (Gantchev, 2004, p. 7)	

The guide also defines the relevant industries, as shown in Table 3. The idea has been to divide the industries based on the importance of the role of copyright as an asset.

Category	Definition	Industries
Core copyright industries	Industries that produce copyrighted works and other subject matter. Industries that would not exist without copyright.	Literature and press, music theater, film and video, photography, visual arts, radio and TV, software and databases, architecture, advertising, industrial design
Other copyright industries (partial)	Industries whose operations are related to production, distribution, and use of copyrighted works. Part of industry's output is copyright related. Industries that would be much smaller without copyrighted works and other subject matter.	Jewelry, furniture, household china and glass, clothing and footwear, toys and games, wall coverings and carpets, engineering
Non-dedicated support industries	Industries that rely remotely on copyright material but are still relevant as copyright generates some part of their business	Telephony, Internet, transportation, general wholesale

Table 3. Copyright industries (Gantchev, 2004; Picard & Toivonen, 2004)

Some studies have already applied the proposed methodology. How and Leo (2005) used it in Singapore. They found that the contribution was S\$8.7 billion (value added) and that the industry employed 118,600 workers in 2001, accounting for 5.7% of GDP and 5.8% of national employment. Similarly, Buainain et al. (2005) found that copyright industries generated approximately 6.74% of Brazilian GDP in 1998 and were responsible for 5% of total employment and occupation. Siwek (2006) updated the U.S. figures to show \$760.49 billion or 6.48% of the U.S. economy and 4.07%

share of the total workforce in 2004.⁸

However, the methodology suggested by the guide can be criticized. First, the actual relationship between rights assigned by copyright and their importance to different industries is anything but simple.⁹ For example, open source–based solutions have become more important in the software industry—is the income generated by copylefted products like Linux or MySQL excluded from the calculation? Similarly, the importance of patenting has risen steadily in certain fields of the software industry, especially in communication technology (e.g., patents on GSM standard) and also in graphical fields; how can this additional form of protection be accurately separated from the protection offered by copyright? The problems do not reside within the software industry; e.g., one can question the relevance of inclusion of database industries as a result of recent empirical research that shows that the protection offered by copyright may not play an important role in that area of business at all (DG Internal Market, 2005). Similarly, it is hard to see what advertising does among core copyright industries.¹⁰ On the other hand, retail gets typically the biggest single share of the “pie” of income from sales of copyrighted works¹¹ and thus its location could be challenged

Interestingly, the classification seems to miss one industry that is both large and truly benefiting from copyright, and that is the adult entertainment

8. For comparison, in 2007, farming, forestry, and fishing were 0.7%, manufacturing, extraction, transportation, and crafts 22.9%, managerial, professional, and technical 34.9%, sales and office 25%, and other services 16.5% (CIA Factbook).

9. The guide’s proposed methodology aims to solve this problem with surveys to measure the importance of copyright, but only for non-core copyright industries. Even if the core industries were studied with surveys, the author remains sceptical that any useful data could be collected because it is very hard for companies to estimate which factors affect their success in the markets.

10. Advertising agencies both use and create copyrighted material, but the actual protection offered by copyright is hardly an essential tool against competition since “ad piracy” really does not make sense as a concept.

11. E.g. retail gets on average 25% of the income from CD-sales (Article 5.)

industry.¹² This is partly understandable since the industry in question is illegal in many of WIPO's member states. However, its economic significance appears to be so huge that it should have a notable effect on the outcome. Unfortunately there is little dependable data available about the size of this industry. On a global scale, it is safe to estimate that we are speaking about tens of billions of dollars (more discussion: FPC, 2005).

In addition, one should be careful about the kinds of conclusions that can be drawn from the results. For example, Ruth Towse (2004, p. 79) is skeptical that the results would be misappropriated by the copyright industries:

... I know no economic doctrine that says "size counts." Yet that is precisely the interference that I know is going to be drawn from the data on the copyright-based industries. Indeed, the majority of cases, the finance for the research that produces these data comes from interested parties who have an established record of intentionally or unintentionally misusing the data. They have then gone on to persuade policy-makers of the strength of their case for increased copyright protection based on two numbers: the growth rate of the 'copyright industries' and their share in GDP. This is what I have called "data for advocacy"...

Finally, it should be pointed out that the methodology has since been adapted in a recent study (Rogers & Szamosszegi, 2007) to count the value of industries that rely on copyright exceptions and limitations (i.e., fair use) instead of on rights. The outcome is somewhat predictable¹³ - these industries are much larger than the copyright-based industries:

The research indicates that the industries benefiting from fair use and other limitations and exceptions make a large and growing contribution to the U.S. economy. The fair use economy in 2006

12. This might also be a wrong conclusion since most of the adult entertainment belongs also to other categories, e.g., film. However, the guide is unclear about this question.

13. It fits very well into Towse's dim view of the real goals of this kind of study, too.

accounted for \$4.5 trillion in revenues and \$2.2 billion in value added, roughly 16.2 percent of U.S. GDP. It employed more than 17 million people and supported a payroll of \$1.2 trillion. It generated \$194 billion in exports and rapid productivity growth. (Rogers & Szamosszegi, 2007, p. 27)

However, the study should show that a balanced approach to the economic models is needed. If only the rights-based side is taken into account, the policy suggestions may very well be detrimental to the general welfare of society. As the next section will show, there has indeed been lot of work in this area among economists.

1.2.2. Economics of IPRs

The author of this study is usually not fond of speaking about Intellectual Property Rights (IPRs) in general terms because the copyrights, patents, trade secrets, and trademarks share few things in common. Unfortunately, since it is more or less a standard approach in the literature, a short overview of the economic rationale of IPRs follows.

The logic in this discourse is typically that, first, economic growth is a key element for societal development. Similarly, innovation has been seen as a main driving force for economic growth. Schumpeter (1942) was among the first economists to link economic progress to the contribution of creative entrepreneurs.

In a landmark article, Kenneth J. Arrow gave reasons that perfect competition might fail to allocate resources optimally in the case of invention and IPRs might be needed:

We expect a free enterprise economy to under invest in invention and research (as compared with an ideal), because it is risky, because the product can be appropriated only to a limited extent, and because of increasing returns in use. This underinvestment will

be greater for the more basic research. (Arrow, 1962, p. 15)

A “logical” conclusion from this basis is quite often that stronger IPRs result in more innovation and increased social development.

This conclusion, however, is not universally accepted; it is used mostly in the rhetoric of trade organizations like the Business Software Alliance (BSA) and other interest groups close to the IPR owners’ industries. Academic research has constantly voiced skepticism over a one-eyed view of IPRs and numerous studies have been conducted to get some verifiable conclusions. Some economists stress general economic problems associated with state intervention, others admit that IPRs may be needed to create markets but criticize their ill functioning and non-efficient property rights distribution from artists’ perspective (the current rights distribution favors the IPR industry).

Douglas Clements is in the first category of critics and summarizes the recent critical economic discussion in his article “Creation Myths” (Clements, 2003). His conclusion is that the scholars criticizing the current scope of IPRs may have a case, the contribution to the public good of innovations possibly does not justify the current system because “attendant damages of inefficiently high prices, low quantities, and stifled future innovation” may outweigh the benefits.

Boldrin and Levine (2003) take similar, but even stronger position¹⁴:

...allowing the government to grant monopolies is extremely dangerous- and we should require clear and compelling evidence before doing so. Since theoretical argument is insufficient to settle the point, since empirical evidence is almost non-existent,

14. They explain their position and review very large amount of empirical research in their book “Against Intellectual Monopoly”. A version of the book is available from: <http://www.dklevine.com/general/intellectual/againstfinal.htm>.

and since anecdotal evidence strongly suggests that intellectual property reduces rather than encourages innovation, there should be a strong presumption against patents and copyrights. It is our view that they should be abolished pending strong and persuasive evidence that they actually do some good.

Scalise analyzes the question from different angle in his book *Intellectual Property Protection Reform* (1999). He essentially accepts Arrow's basic tenets and goes on to argue that the level of optimal IPRs depends heavily on the level of economic development of the country. Obviously, in less-developed countries the rules should be more flexible and not globally uniform in contrast to the main ideals behind IPR harmonization efforts. The United States is actually a good example of this; the country has been very selective in its choice of protected IPRs. (see e.g., Nowell-Smith, 1968, pp. 64-85).

The question whether "one size fits all (countries)" is currently being discussed at WIPO as a part of the so-called development agenda process. It was also heavily debated during the World Summit for Information Society. The main protagonists in this discussion are Brazil and India, which see the current system as harming their economic interests. They are supported at least partly by the least developing countries and, furthermore, by a large and relatively diverse group of nongovernmental organizations (see Geneva Declaration, 2004).

The origins of this current debate can be traced back to the process that led to the World Trade Organization's (WTO) TRIPS agreement. That treaty introduced strict new rules on IMPs and, most importantly, an effective way to ensure compliance through WTO's general dispute resolution process. In other words, if a country does not follow the duties set forth in TRIPS, an offended country may seek penalties, which may take the

form of trade sanctions.¹⁵ The developing countries felt that they were strong-armed into accepting the treaty, which disregarded their national interests, e.g., health care and education (see Drahos & Braithwaite, 2002 for more detail about the process; May, 2000 and Maskus, 2000 for more general discourse). As a consequence, since then they have sought ways to balance the situation with direct effects on negotiations processes in various international organizations.

It should be noted that this discussion is nothing new. A similar process has taken place several times before. For example, during the nineteenth century, the question of optimal national IPR policy was heavily debated by different governments in Europe (see Penrose & Machlup, 1965 for more details)

1.2.3. Copyright and Economics

The discussion of economic rationale of copyright is somewhat older than copyright itself. The most simplified form of the idea has been the same during the last three centuries¹⁶: In order to have an economic incentive to produce new works, the authors must be protected against direct copying; otherwise, they wouldn't be able to get back the sunken costs of creating the work.¹⁷ This protection has been given in the form of a temporary monopoly that should be balanced against society's need to disseminate works.¹⁸

15. Interestingly, a country may also seek penalties against "traditional" free trade violations and be rewarded with an option to partly disregard the IPRs owned by the companies from the offending country. This is basically the only viable option for very small countries like Antigua and Barbuda for questioning the politics of countries like the United States.

16. It should be pointed out that this is true only for Western World, the situation is different in other cultures (e.g. Alford, 1997).

17. This of course assumes that the sunken costs are higher than the cost occurring to the copyist when he starts producing competing copies.

18. This presentation is prone to several corrections that we further elaborate in this chapter.

Netanel (2008, p. 81) differentiates three separate ways copyright is supporting creativity and acting “as an engine for free speech”. The first one is “production function”, which is in line with the just mentioned justification. Secondly, copyright has also “support function” i.e. it makes it possible to for authors and publishers to rely on markets without patronage and governmental support (and influence).¹⁹ Thirdly, there is also “expressive function”, which bolsters the relevant actors societal status and thus encourages active participation to public discourse. However, as Netanel points out, there are also reasons to believe that none of these functions are generally valid. On the contrary, in many situations the actual outcome could be opposite compared to expected outcome.

Watt (2004) offers seven factors that separate it from other tangible creations and which should not be forgotten in the economic analysis of copyright. They can be summarized as follows:

1. Without copyright, its subject matter would be public good. A public good is typically defined in the following way: A good that is both nonexcludable and nonrival. A good is nonexcludable if it is not possible to prevent anyone from consuming the good once it has been made available to the public. A good is nonrival if one person’s consumption of that good does not reduce the quantity available for consumption by someone else. It should be obvious that (non-protected) content fulfils that description easily. If one person is playing a song, it does not prevent other persons playing the same song. For the composer of that song it is very costly to monitor who is using his work at any particular time and even harder to prevent others from playing it.
2. The right is typically divided into smaller subcategories. A consumer

19. For a good overview of different alternative models for copyright, see Liebowics & Watt, 2006.

who buys a CD, does not get full copyright to it but instead a right to use that copy for his personal purposes. If he wants to use the material in a film that he will publish on the Internet, he has to acquire a totally different set of rights from the rightholder(s). This feature is especially prominent in computer software, which is currently typically licensed, not sold as physical media.

3. A copyrighted work normally has to be fixed to a “delivery good” (CD, book), which is then sold to the consumer. This physical object is subject to normal property rights belonging to tangible creations.²⁰ However, in the digital environment the difference between delivery good and original work is nonexistent.²¹
4. An important factor is the dualistic nature of the term *copy* itself. It may mean a copy of the original “master work” or, alternatively, the opposite of an original, i.e., a work made without the consent of the copyright holder’s permission.²²
5. Another factor is the special nature of the process required to create the original work and the copies. The creation of the original work typically causes high fixed costs, but from that point the costs are miniscule. For example, the production of a Hollywood film requires tens or hundreds of millions of dollars. The cost of copying the DVD in which that film is stored is less than a dollar, even for the physical copy, and even less if the copy is made digitally (i.e., to a hard drive). In other words, the marginal cost of producing one extra copy approaches zero and consequently the market price should follow. This means that it is hard or even impossible to get the sunken costs back without some kind of artificial restrictions

20. Quite naturally, since it is possible to exclude free riders and typically only a limited number of consumers can use a certain physical copy at the same time.

21. However, a technical protection measure may transform a digital copy to a form that shares the same features as its physical copy, i.e., only one consumer can use and possess it at the same time.

22. Watt uses the latter meaning in his writings, but in this study the meaning are (hopefully) always distinguished by adding “legal” or “unauthorized” in front of the term.

in the market. In addition, the very low marginal cost makes it very profitable to produce unauthorized copies and, often, also expensive to police for the copyright holder. This situation is only heightened by digital technology.

6. The area has gone through relatively rapid and constant technological development during the last century. The inventions of radio and TV, LPs, cassette tapes, CDs, DVDs, photocopiers and others have all caused severe stress to existing business models and regulation.
7. High transaction costs and externalities plague copyright system. Attempting to correct for one externality normally only gives rise either to a new externality (faced by the other party), or to further transaction costs. (Watt 2004, pp. 153-155)

Another important point is that authors and publishers should not be considered as single entities. In many cases their incentives are quite separate. Figure 1 offers a (simplified) presentation of possible motivating factors. The author has many possible economic incentives for the creation of a work. The importance of different factors has varied historically and is also based on the field in which the author is working.²³ The publisher has typically only one source of economic incentive—making a profit from sales.²⁴ Another way to look at it is that the creation of the work and the distribution of the work are two separate stages that may or may not have an economic link. In typical discourse about the economic effects of copyright this separation is blurred.

23. It should be noted that there are many noneconomic factors. For example, a person who is writing a political pamphlet to market his ideas does not necessarily need any auxiliary economic incentives.

24. As noted, this is a simplified description; e.g., there are also non-commercial publishers that have other than purely economic incentives. Advertisements could also be used instead of selling the work.

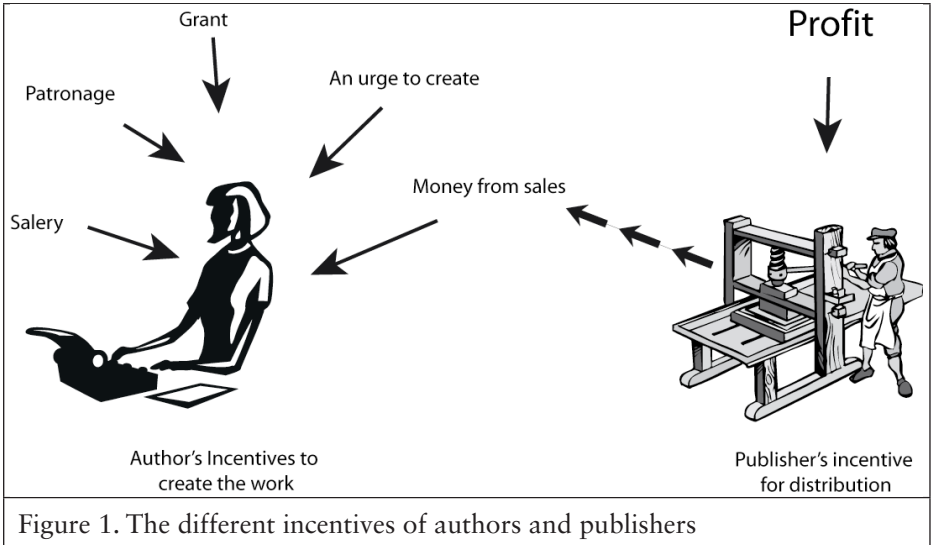


Figure 1. The different incentives of authors and publishers

Moving on, the rationality of copyright requires that the economic incentives cannot be produced in any less expensive ways. As Landes and Posner (1989) formulate in their seminal article:

For copyright law to promote economic efficiency, its principal legal doctrines must, at least approximately, maximize the benefits from creating additional works minus both the losses from limiting access and the costs of administrating copyright protection.

In the early days of copyright economics, a comparison was made between existing copyright regime and no copyright at all. Interestingly, in two ground-breaking articles this category also included quite extensive empirical evidence to support their claims. Plant (1934) analyzed the U.S. publishing industry in the 19th century and his conclusions were quite negative for copyright:

The conclusions concerning the necessity for copyright which emerge from this survey may now be summarised .. In the first place, expectation of direct reward explains only a part of the total

output of literature, just as it fails to account for more than part of the inventions which are made. Secondly, just as professional inventors continue to be paid for their services in fields in which the patent system does not apply, so also have professional authors in modern times been remunerated for their writings, whether by payment of a lump sum or by way of royalty on the sale of copies, in a country in which they were unprotected by copyright law... More authors write books because copyright exists, and a greater variety of books is published; but there are fewer copies of the books which people want to read. (pp. 191-192)

Breyer (1970) investigated the journal business as part of the process of renewal of U.S copyright law. His conclusion about the general benefits of copyright for books is rather bleak:

The preceding analysis also indicates that the case for copyright in books considered as a whole is weak. It suggests that to abolish protection would not produce a very large or a very harmful decline in most kinds of book production. And abolition should benefit some readers by producing lower prices, eliminating the cost of securing permission to copy, and increasing the circulation of the vast majority of books that would continue to be produced... In sum, it is difficult to do other than take an ambivalent position on the question of whether current copyright protection—considered as a whole—is justified.²⁵ (Breyer, 1970, p. 132)

Unfortunately, the habit of using real data to check the validity of proposed models has since ceased to a large extent. Instead, most published material is strictly formal mathematical models whose relevance to the real world

25. Breyer also makes interesting comments about the legislative process, which could as well describe more recent efforts: “The hearings reveal little critical analysis of industry claims that protection is needed. They show little awareness of the possible harms of extending protection. Rather, the data amassed at the hearings is unsifted, often irrelevant, fact and opinion, and many critical facts about affected industries are missing. Of course the hour is late; the revisors have long been hard at work. Yet one cannot escape the conclusion that more empirical work and more thoughtful analysis is needed before the Copyright Law is significantly revised.”

can be questioned (e.g., Liebowitz, 2005, p. 5).²⁶

A quick primer on this theoretical discussion follows. The main cost of limiting access is caused by deadweight loss. In theory, the right holder will produce too few copies and sell them at too high price, causing a social loss. This is typically illustrated in macroeconomics books in a fashion similar to Figure 2:

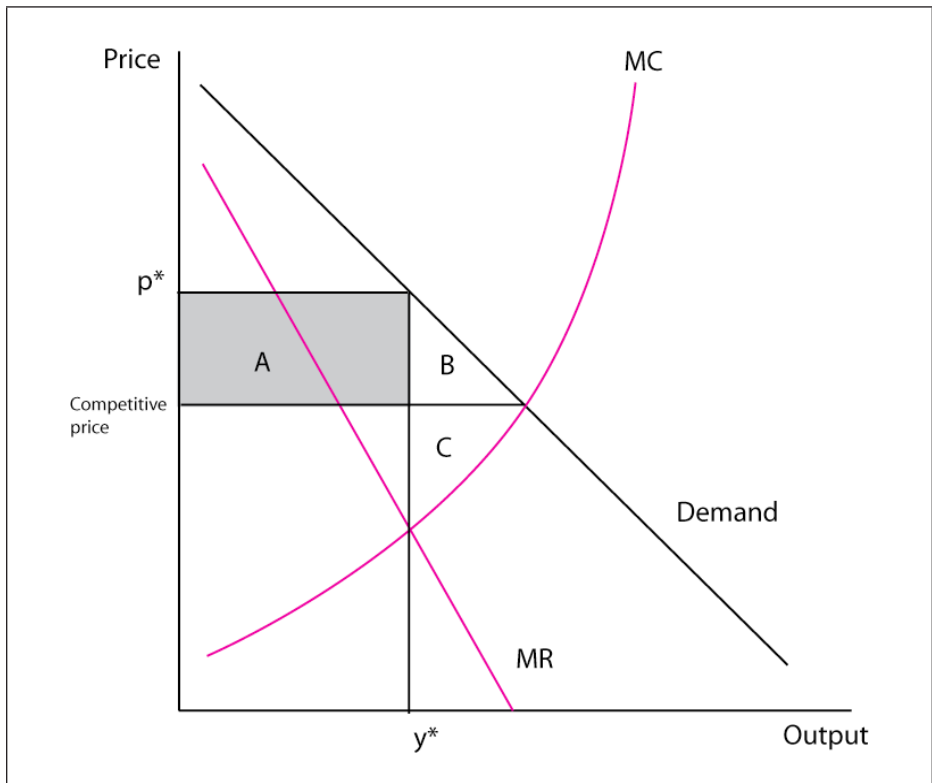


Figure 2 - Deadweight loss of monopoly

²⁶ There are naturally certain exceptions. The question of the effects of unlicensed copying in both the real world and P2P networks has attracted quite a bit of empirical research lately (see Png, 2006 for a good summary).

The deadweight loss in the diagram is $B + C$. Area A is the transfer of wealth from consumers to the right holder. The situation is somewhat worse if we are speaking about fully digital products since the marginal cost of producing extra units approaches zero after the first unit (y^*) moves toward the intersection of demand and the x-axis.

However, it is rare that the right holder is really in a position to charge the full monopoly price i.e. has a full market power. There are several reasons for this. First, in many cases other products exist in the market that are at least partial substitutes. For example, Adobe Photoshop is competing with commercial products like CorelDraw, shareware products like Paintshop Pro and open source products like GIMP. Arguably, none of these offer the same value proposition as Photoshop but they still limit Adobe's pricing choices.

Another source of competition comes from unauthorized copying. The higher the cost of the original, the more attractive it is to get a copy from a black market source (or from a P2P system of choice). Of course, the right holder aims to limit this copying by using the enforcement tools but this also causes costs to him and therefore optimization goes multidimensional. This question has been studied quite intensively in the literature (e.g. Oz, 2001, pp. 65-77; Handke, 2006, Posner, 2005 pp. 62-63). The general conclusion is that unauthorized copying may have positive welfare effects for society and in certain specific cases even to the right holder (see Watt, 2000, pp. 33-37).

Watt (2004) also heavily criticizes the use of statistics of unauthorized copying done by the trade associations. In these reports the number of unauthorized copies is typically multiplied by the market price and the result is a loss to the industry. In the case of BSA's (2006) piracy study, they argue that actual loss is even larger than lost sales because of the loss of addition services, etc. Watt points out that

- At most that is the loss of revenue, not loss of profit since the cost of producing and distributing the copies does not occur
- Not all copies are lost sales—there are few useful empirical data available but in the case of the record industry, the actual substitution is in the range of 25-40%
- The price of works would rise without competition from unauthorized copying and that would reduce consumer surplus and overall social welfare
- Unauthorized copying adds to the social welfare of consumers since it allows the consumption of goods at lower prices
- The often cited loss of jobs may not occur—the jobs just change places, from the developed world to those countries in which the unauthorized copies are made.
- Even if the unauthorized copying is harmful, its effects are hard to estimate without knowing the exact money flows of a particular industry. If the loss is equally shared with the artists in a certain area, unauthorized copying hits the marginal artists the hardest, but they might be better off anyway doing something else. On the other hand, if the damage is caused mostly to superstars, the effect is small because those persons are likely to have very low marginal utility of money.

The recent literature also takes some other questions into account. For example, Liebowitz (2002) argues that in those cases where “indirect appropriability”²⁷ is possible, the harms of unauthorized copying can be ameliorated. He also depicts three other situations in which unauthorized copying may not be harmful for the owner of the copyright. The first obvious one is a person who would not have purchased the product even if copying had been impossible. Another is “exposure effect.” The copyright holder actually sells more because the unauthorized copies work

²⁷ The term basically means a situation in which the price of the work can be higher for copies that will be used for unauthorized copying.

as free advertising for his other works or services. The third case is strong network externalities. A typical example of this could be office software, where the value of the software rises for all users if more people are locked into its file formats; that is, they need the software to exchange documents (Liebowitz, 2002, p. 149).

Another example could again be Adobe Photoshop: after a person learns to use it, he or she is less willing to use an alternative since that would mean investing time in learning. In this case the value of other products effectively goes down.

However, Liebowitz does not support the idea that these cases are the norm. Instead, he argues that the economic interests of a copyright holder are in most cases harmed by unauthorized copying. He also indicates that his earlier points are being stretched too much by other economists:

It currently appears to be the case that for a majority of economics papers on the subject (though this claim is rather casual since I have not done a count of these papers), pirating is treated as an activity that should be embraced by the party being pirated, if they are farsighted and enlightened enough. Theoretical models now abound in the literature ‘demonstrating’ all the ways that the producer of a product might benefit from piracy. Economic articles on this subject would seem to imply that it is almost always a terrific idea to have third parties providing free copies of your product. And these articles generally conclude that society would almost always be better off in such a situation. (Liebowitz, 2005, p. 5)

Other problems also exist with the current standard approach used in economics. For example, Ruth Towse lists the following “sins” that are common in theoretical articles:

- Ignoring moral rights;

- Ignoring the difference between copyright and the neighbouring rights;
- Ignoring the distributional effects of copyright;
- Making the assumption that artists and publishers, sound recording makers, broadcasters and all the other businesses share the same common goals. (Towse 2006, p. 568)

Towse argues that these factors are taken into account more in cultural economics, which is an application of standard economics to cultural phenomena with a wider perspective than pure IPR-based modeling. For example, government grants and labor are factors that often have much more profound effects on the earnings of artists than copyright-based income.

Finally, it should be kept in mind that the economic analysis of copyright law has real life effects outside the academic circles. Especially the courts in the United States routinely rely on economic theories and thus getting good briefs from economists is essential for the parties. For example in *Eldred v. Ashcroft* seventeen leading professors of the field²⁸ wrote against the rationality of the copyright extension. However, even if the majority Supreme Court did not disagree, it still concluded that:

In sum, we find that the CTEA is a rational enactment; we are not at liberty to second-guess congressional determinations and policy judgments of this order, however debatable or arguably unwise they may be.

In addition, certain judges are very prone to the use of economics in their argumentation. Judge Richard Posner is perhaps the well-known person

28. George A. Akerlof, Kenneth J. Arrow, Timothy F. Bresnahan, James M. Buchanan, Ronald H. Coase, Linda R. Cohen, Milton Friedman, Jerry R. Green, Robert W. Hahn, Thomas W. Hazlett, C. Scott Hemphill, Robert E. Litan, Roger G. Noll, Richard Schmalensee, Steven Shavell, Hal R. Varian, and Richard J. Zeckhauser. There's five Nobel Prize winners in the group.

in this sense. Below is an illustrating example from *Ty, Inc v. Publications International Ltd*²⁹:

Granted, there is some question how, if Beanie Babies collectors' guides are indeed a complement to Beanie Babies (and they are), and Ty has a monopoly of Beanie Babies (and it does), Ty can get a second monopoly profit by taking over the guides market. The higher the price it charges for guides, the lower will be the demand for such guides and hence for collecting Beanie Babies and so the less effective will Ty's strategy of marketing Beanie Babies as collectibles be. This is the sort of question that has engendered skepticism among economists about the antitrust rule against tie-in agreements. But there is an answer here: Ty wants to suppress criticism of its product in these guides.

²⁹. The question in the case was is it legal to use actual photos of Beania Babies in Beanie Babies Collector's Guide.

2. Research Questions and Methods

2.1. Research Questions

There used to be a time when it was possible to write a comprehensive study of copyright. Today, that would be utterly impossible. It would also be a waste of resources since there is already a lot of existing, good quality research. For a person with a passion for basically all aspects of copyright, setting a clear focus is thus one of the hardest tasks. There are so many interesting details, dark alleys of knowledge and unknowns, that have to be discarded in the name of clarity, that it is purely painful. Because this dissertation is based on five articles that were written during a relative long period of time, the focus still remains quite wide.

As explained at the beginning of this chapter, the main goal of this dissertation is to determine whether copyright has a future. To answer this question, the work seeks to address the following three questions:

- Do technical protection measures (TPMs) help to solve the impending demise of copyright?
- Is the legal enforcement of copyright possible in current or future digital environments?
- What is the role of social norms in the future of copyright?

The reason for these three questions is the following. First, the (once) prevailing vision of copyright in the digital environment was based on the idea that without technological protection measures right holders would not release their content to digital distribution. Because the TPMs would be broken sooner or later, they should also be protected legally to prevent users from benefiting from the inevitable circumvention. The first questions aims to answer the question of how correct this vision has been.

The second question is also quite profound. If a right cannot be enforced, it ceases to exist in practice. In other words, if the copyright holders cannot prevent most of unlicensed use of their works (e.g., copying or making available to public), the economic rationale of copyright disappears.

The final question continues from the point where enforcement stops. Even if legal enforcement of a right is not feasible, it is still possible that the people might follow the rule anyway. The dissertation asks this might be the case with copyright.

2.1.1. Terminology

The discourse about copyright and other rights aiming to foster innovation is filled with politically loaded words and phrases. This rhetorical fight, which has been going on longer than copyright has actually even existed, makes it hard to write neutral and at the same time exact scientific text. In some cases an author has no other option but to choose between two equally loaded terms. That choice positions the author on a certain side of the trenches in the reader's mind. A classic example is the choice between the terms "users' rights" and "copyright restrictions." Another term, which immediately classifies the author, is "theft" if applied to the act of unauthorized copying. After the stigma has been established, it makes it hard to convey any information to people on the other side.

Certain copyright scholars, especially Neil Netanel (2006) and Peter Jaszi (1996) have even argued that the choice of language has partly dictated

the path of development in copyright.³⁰ One has to admit that the proponents of stronger copyright have been able to create very persuasive “memes”³¹ starting from use of the term “pirate,” which was first used back in the era when actual pirates still roamed the open seas. This is not surprising considering that creative talents have mostly been on their side. Some other more memorable examples include the use of environmental terminology during the 1970s:

... the unprecedented technological progress [in photocopying] of the last decade harms the environment the same way DDT affects wildlife, and if the condition is permitted to continue it may go well beyond the point of no return. (Narsi, 1976, p. 14)

The late Jack Valenti’s (1982) much quoted testimony on VCR’s derivative effects:

I say to you that the VCR is to the American film producer and the American public as the Boston Strangler is to the woman home alone.

Valenti’s more recent comparison between P2P and the so-called global war on terror:

³⁰ “The rhetoric and economic theory of real property are increasingly dominating the discourse and conclusions of the very different world of intellectual property. The shift begins with simple rhetoric--talking about intellectual property rights as aspects of a broader system of property. But its implications go far beyond that. The temptation to move from rhetoric to rationale seems almost irresistible. Courts and commentators adopt--explicitly or implicitly--the economic logic of real property in the context of intellectual property cases. They then make a subconscious move, one that the economic theory of property does not justify: they jump from the idea that intellectual property is property to the idea that the IP owner is entitled to capture the full social value of her right. This leads them to an almost obsessive preoccupation with identifying and rooting out that great evil of the modern economic world--free riding.” (Lemley, 2005)

³¹ Meme can be defined as “a cultural unit (an idea or value or pattern of behavior) that is passed from one generation to another by non-genetic means (as by imitation); memes are the cultural counterpart of genes” (wordnet.princeton.edu/perl/webwn).

We're fighting our own terrorist war...the great moat that protects us, and it is only temporary, is lack of broadband access. (Harmon 2002)

Finally, EMI executive J. F. Cecillon's "instant classic" from Creativity. Online.fi-event:

Public domain means pillage, rape and murder.

This kind of hyperbole makes rational discourse often hard and may easily lead to strong polarization of the different actors (Logie, 2003). In particular, Professor Lawrence Lessig has been advocating a more neutral approach³² (e.g., Lessig, 2003b) but his message has not gained much popularity.

However, an undeniable fact is that the author of this dissertation stands firmly with the user-right side in the academic field. Therefore, it should come as no surprise that this dissertation prefers certain pro-users' right terms and avoids other terms that the author feels carry too much suggestive weight. However, in one place the author has given in: The term "intellectual property rights" has been used instead of a term that was used before IPR but that is already unfortunately mostly forgotten:³³ "intellectual monopoly privileges" (IMPs); hopefully, one day, somebody braver will revitalize use of this term.

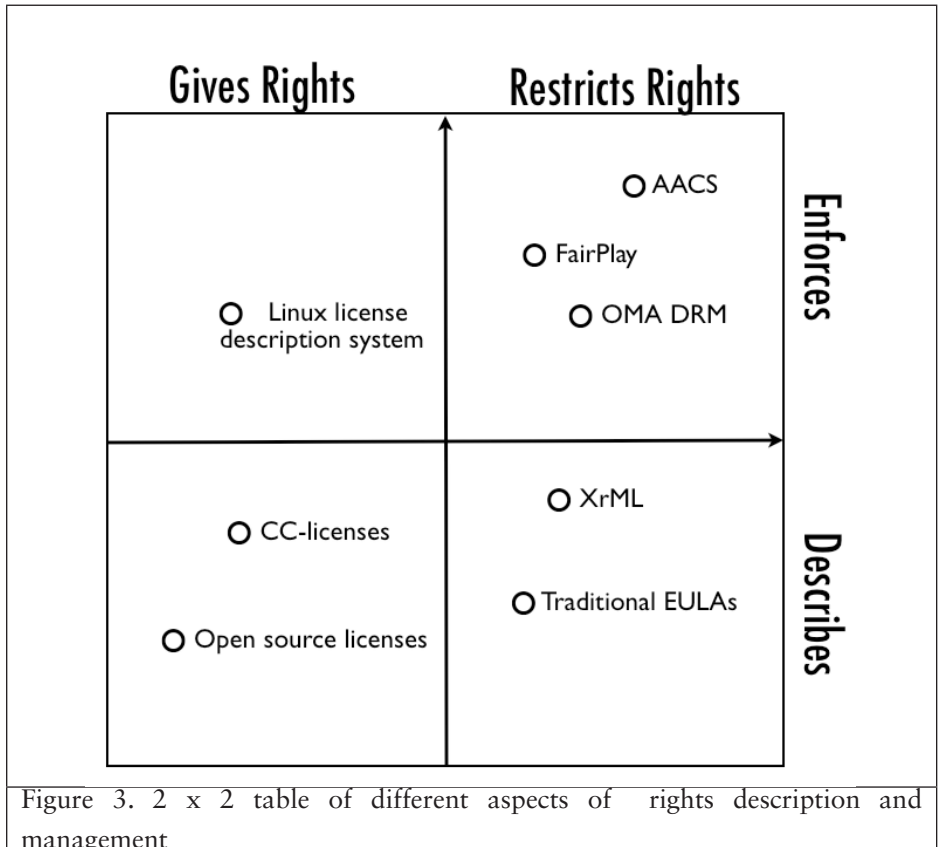
2.1.2. Digital Rights Management / Technical Protection Measures

The terms Digital Rights Management (DRM) and Technical Protection

32. This has been one of the key selling arguments for Creative Commons, which uses the slogan "some rights reserved."

33. The change of terminology did not happen by accident. Instead, it was a deliberate project done by French patent proponents (Penrose & Machlup, 1950).

Measures (TPMs) are used widely in this work.³⁴ These terms are often used as synonyms, but it is also possible to define them separately. For example, Still (2007) believes that any digital description of rights means DRM. In other words, DRM would mean not only “traditional” copy protection systems (upper right corner in figure 3) but also right description languages like XrML and traditional end user license agreements (lower right corner). In addition, open licensing models like Creative Commons and Open Source would belong to the scope of DRM (lower left corner).



34. It should be pointed out that Richard Stallman and the Free Software Movement oppose both terms. For example, they call DRM “Digital Restriction Management.”

The author of this dissertation disagrees with this approach. Expanding the meaning this wide just muddies the discourse and makes precise arguments basically impossible. Instead, it would be better to use some term for this all-inclusive licensing and management and keep DRM for systems that belong to the group in the upper right corner of figure 3. A definition of that group could be written as follows:

- (a) A technical system used to secure and distribute protected media files. The rights are typically defined during the protection step and issued as a usage license to consumers; or
- (b) A system used to control access to an online service.

However, as the reader will notice, the term “Technical Protection Measures” is introduced and used in Article II instead of DRM. The main reason is that TPM is less likely to cause confusion. In addition, it is also used nowadays almost exclusively in European copyright regulation and discourse. This is also the reason the term is used in this chapter.

2.2. Research Methodology

The author of this study believes strongly that no single approach can give comprehensive answers for any questions pertaining to copyright. In particular, the classical normative legal approach—while very useful in certain circumstances—is currently not a powerful enough tool to give much new understanding to the questions at hand.

The author therefore finds it quite refreshing that the most recent Finnish doctoral theses pertaining to copyright have used mostly other methodologies than the classical normative approach. Pitkänen (2005) uses a wide combination of different methodologies, including a scenario-based

approach, and Välimäki's (2005) dissertation is also multidisciplinary, i.e., his methods include history, economics, and law. Huuskonen (2006) uses a similar approach, e.g., law and economics combined with historical analysis. Turunen (2005) uses (apparently) communication theory. Virtanen (2005) mixes law and technology, and law and economics, in a normative approach. Leppämäki's (2006) approach is based on law and philosophy. Still's work (2007) is a combination of law and technology³⁵ and a normative approach with a strong "De Lege Ferenda" section. Perhaps the boldest work is that of Kimppa (2007), who uses normative ethics, philosophy, and computer science to question the whole existence of IPRs. The biggest exceptions are Kontkanen's (2006) and Sorvari's dissertations (2005), which are good examples of a very traditional normative approach, including its strong points—and some weaknesses.

This study's multidisciplinary approach is closest to the approaches of Välimäki and Huuskonen. However, the dissertation uses an even wider scale of diverse methodologies, listed in table 4. A more detailed discussion of the different methodologies can be found in the relevant articles and is not repeated here.

Article	Methodologies used	Research questions
1. Transnational Advocacy Network Opposing DRM: Technical and Legal Challenge to Media Companies	Transnational Advocacy Network Theory, descriptive.	Question 1
2. DRM Interoperability and Intellectual Property Policy in Europe	Normative Approach, De Lege Ferenda	Question 1

³⁵ She describes her method as an "information law approach" (oikeusinformatiikka).

3. Theory of Deterrence and Individual Behaviour: Can Law-suits Control File Sharing on the Internet?	Historical, Law and Economics, Behavioral Law and Economics	Question 2
4. Free Software and Copyright Enforcement: A Tool for Global Copyright Policy?	International Political Economics	Question 3
5. Copyright Levies as an Alternative Compensation Method for Recording Artists and Technological Development	Normative Approach, Law and Economics, Law and Technology	Question 2
Table 4. Methodologies		

A large part of the source material for this study comes from Anglo-American tradition. The reason for this is that first U.K and now the United States are leading the development of both copyright legislation and information technology. Furthermore, scholars in the United States are using much more law and economics as their standard approach, which means that there is simply more material produced. In addition, the author would argue that the leading scholars in the field are currently based mostly in the United States, with certain small but important exceptions.³⁶

It is a common suggestion among more traditional circles of Finnish legal scholars that material from the United States should not really be used in Finland. That would make more sense in a normative approach because of differences in the legal cultures. However, in the areas of law and economics and law and technology, the field is more unified. Naturally the differences in legal cultures have to be understood; i.e., blind acceptance of foreign “legal memes” is never a good idea. Still, the argument that uses economics efficiency as one of the key principles of good regulation is a nearly perfect fit for copyright, which is supposed to be first and foremost,

36. For example, Bernt Hugenholtz and his research unit do leading edge research on questions pertaining to EU copyright legislation

a tool for maximizing social welfare.

2.2.1. Behavioral Law and Economics

One of the more interesting areas in the field of law and economics is its behavioral form. In this dissertation it is covered extensively in Article 3. Because this methodology is generally not well known, a brief introduction to its basics is appropriate. The basic notion of behavioral law and economics can be described in the following way:

The task of behavioral law and economics, simply stated, is to explore the implications of actual (not hypothesized) human behavior for the law. How do “real people” differ from Homo economicus. (Jolls, Sunstein & Thaler, 2000).

The difference is that people have only bounded mental capabilities. To be exact, behavioral law and economics differentiates three kinds of “bounds”:

- Bounded rationality;
- Bounded willpower; and
- Bounded self-interest (Jolls et al., 2000, p. 14)

Bounded rationality is caused by the limitations of our brains. We don't have perfect memory and we can't make instant perfect calculations or estimations for any truly complicated questions. To overcome these problems, we have learned to use different strategies like mental shortcuts and rules of thumbs. These are predictable but the outcomes often differ from the outcome predicted by rational choice theory (Jolls et al., 2000, pp. 14-15).

Bounded willpower deals with the fact that people are often ready to

knowingly sacrifice their long-term interests in order to get short-term gratification. A typical example could be a large chocolate bar—a person may eat it at once even if she knows that she'll feel ill afterwards both mentally and physically. Often, people also recognize their limitations and take actions to mitigate the problem. For example, a person may choose not to get a credit card to avoid unnecessary spending. These actions may consequently have effects on demand of supply. (Jolls et al., 2000, p. 15)

Bounded self-interest is closely related to the notion of altruism. However, in behavioral law and economics it is understood more widely and in particular also includes actions that are totally spiteful. A very simple but powerful example is the so-called ultimatum game:

In this game, one player, the Proposer, is asked to propose an allocation of a sum between herself and the other player, the Responder. The Responder then has a choice. He can either accept the amount offered to him by the Proposer, leaving the rest to the Proposer, or he can reject the offer, in which case both players get nothing. Neither player knows the identity of his or her counterpart, and the players will play against each other only once, so reputations and future retaliation are eliminated as factors. (Jolls et al., 2000, p. 21)

Standard economic theory would suggest that the Proposer should recognize that the Pareto optimal solution for her is to give the smallest possible amount to the Responder. However, in empirical tests this has been proven unrealistic. Instead, Responders typically reject any offers of less than 20% of money in the game. The Proposers seem to anticipate this and typically propose a substantial share, i.e., ordinarily 40–50% (Jolls, et al., 2000, p. 22)

Behavioral law and economics has been able to identify certain common biases and heuristics that are typical for most people. These are summarized in tables 5 and 6.

Bias	Description
Extremeness Aversion	When choosing between different options, people have a strong tendency to avoid extremes. For example, in a restaurant, people tend to order dishes that are in the middle of the price range. In empirical tests it has been shown that adding a third option (upper or lower end) changes the outcome significantly even if nobody chooses that option.
Hindsight Bias	People tend to think that things they know that have already happened, happened inevitably.
Optimistic Bias	People think that bad things happen only to other people, not to themselves. Even if they factually know a likelihood, they don't recognize it in their actions in practice.
Status Quo Bias	People prefer status quo over change. If the reference point is changed, the outcome of the same experiment can be completely different. For example, a change is accepted much more easily if it can be framed as a way to restore earlier status quo. For example, an environmental law is accepted more easily if it "restores air quality to its earlier stage" than if it is said to "improve the quality of air."
Table 5. Different biases (Sunstein, 2000, pp. 3-4)	

Heuristics are tools used to get shortcuts to solutions to mental problems.

Heuristics	Description
Availability	People believe that risks are more severe “when an incident is readily called to mind or ‘available’.” For example, terrorist attacks could be perceived to be much more likely than house fires in relative terms. This is important, for example, from an enforcement perspective; i.e., highly visible enforcement makes people overestimate their likelihood of getting punished.
Anchoring	People make probability judgments by first coining an anchor value to which they then try to make adjustments. A typical example is jury awards. A juror first guesses what could be a standard award and then makes small adjustments based on the facts of the case.
Case-based Decisions	It’s often hard to calculate expected costs and benefits for different offered alternatives. Thus, if possible, people will use their earlier experiences as a guide, i.e., look for earlier cases and reason from them to the current case.

Table 6. Different heuristics (Sunstein, 2000, p. 5)

Behavioral law and economics can also be directly applied to public choice theory, which will be described in more detail in the next section. Decision makers are merely humans, with similar bounded rationality, willpower, and self-interest as the rest of us. Similarly, bureaucrats use the same heuristics in their decisions as “normal people.”

As an example of these processes, many efforts to prevent further terrorist attacks after 9/11 presumed that terrorists would be likely to use the exact same methods. This is a clear case of availability heuristics; the likelihood that a similar attack will succeed is basically very close to zero because fellow passengers will now try to kill anyone who tries to hijack a plane with box-cutters or similar relatively benign weapons. Still, completely obtuse,

tight rules were set to prevent sharp objects from entering planes.³⁷

Behavioral law and economics has also faced some criticism. For example, Richard Posner is highly skeptical whether behavioral law and economics has anything positive to add to law and economics. His strongest criticism is aimed at bounded rationality:

One might have thought that behavioral economics had at least one clear normative implication: that efforts should be made through education and perhaps psychiatry to cure the cognitive quirks and weakness of will that prevent people from acting rationally with no offsetting gains. Even if as I believe the sunk-costs fallacy has biological roots, it should not be impossible to educate people out of it. Behavioral therapy has enabled many people to overcome their fear of flying, which I suspect has more tenacious biological roots...All their suggestions for legal reform are of devices for getting around, rather than dispelling, our irrational tendencies—which, fortunately, they exaggerate. (Posner 1999)

The author of this study believes that Posner is underestimating the biological roots of bounded rationality. It has been proven that even if test subjects know beforehand the likely mistake they are about to make, they are still very prone to make it. Thus education is not the solution but instead getting better information about a phenomenon and drawing consequent relevant and practical conclusions.

Another stinging criticism is offered by Mitchell (2002):

...Behavioral law and economics bases its model of bounded rationality on a very limited set of empirical data and draws unsupported conclusions about human nature from this partial

37. For example, there are several reports that pilots were prevented from taking nail-cutters onto the plane. It is hard to see how this can be an effective measure against hijacking even if we forget the fact that pilots typically have axes and other powerful equipment in their possession inside the cockpit and, more importantly, full control of the plane itself. For more general discussion, see Mueller (2006).

data set. Behavioral law and economics scholars simplify and overgeneralize findings on human cognition and rationality to make these findings seem simultaneously important and simple enough to be incorporated into legal policy. Remarkably, despite the amazing breadth and boldness of many of the empirical claims made by advocates of behavioral law and economics, the validity of these empirical claims has largely gone untested within the legal academy.

These arguments are harder to rebut as large part of behavioral law and economics is indeed based on test made in “laboratory” environments instead of using real empirical data. However, that is something that could be solved by doing more research. In addition, as the general knowledge about the inner workings of human brains improves, it will inevitably sharpen the understanding the limitations and their applicability further.

2.2.2. Methodology for Further Research: Public Choice Theory

If there is one thing the author of this dissertation regrets, it is not using more public choice theory to analyze the legislative processes pertaining to current copyright regulation. For example, Article 3. would have benefitted most likely from additional analysis from this perspective. However, as explained earlier, it is just not possible to do everything at once. In hopes of fostering further research, this section about this little-known methodology (at least in Finland) is included here.

The term public choice theory is a bit misleading, because there is no single theory but, rather, a wide range of approaches that aim to use different tools from economics to model the decision-making of public bodies. The strongest common factor between the approaches is that the different actors (politicians, bureaucrats, voters, lobbyists, etc.) are seen as

rational Homo economicus who aim to maximize their own welfare. As a consequence, governmental decision-making is as prone to failures as markets are.

Indeed, one of the motivating factors for the theory has been a deep skepticism toward governmental decision-making. It has been seen as a counter force for the Keynesian approach, which prefers governmental interventions for solving problems. (Shawn, 2002)

James Buchanan describes the theory more modestly:

It is nothing more than common sense, as opposed to romance. To some extent, people then and now think about politics romantically. Our systematic way of looking at politics is nothing more than common sense. (The Region, 1995).

The history of public choice can be traced back to two seminal works, Buchanan and Tullock's *The Calculus of Consent*³⁸ and Olson's *Logic of Collective Action*.³⁹ The theory has since been expanded to all different aspects of public decision-making. For example, its premises have been used to explain the strategies of dictators, monetary policy, optimal forms of EU governing structure, and even the nature of public school music

38. Buchanan has a fascinating explanation for where he got the ideas for his work: "I spent a year in Italy (1955-56). It changed my perspective on politics because I think a lot of Americans, of my generation anyway, still had a romantic view of politics. Italians, for me at least, served the function of introducing a lot of skepticism, a lot more questions. Had I not spent that year in Italy, I might not have ever really been able to come to the critical realistic view of politics as I did" (The Region, 1995).

39. In the beginning the approach was known as "Study of Non-Market Decision Making," but it was soon renamed to the more general "Public Choice." Buchanan does not particularly like the name: "Then we had a meeting in Chicago in 1967. At that time we sat around and nobody was happy with the title. We needed a name. Somebody came up with Public Choice, which really doesn't fit very well descriptively because a lot of people think of it as a public opinion polling thing. We get questions about that. But at least it caught on" (Ibid.).

(Langbein, 2004). Its success culminated in 1986 when Buchanan received the Nobel Prize in economics.

Felkins differentiates public choice into five subcategories:

- Constitutional, Democratic Government
- Voting
- Political Manipulations
- Rent Seeking
- The Realities of Collectives

In the first three categories the main focus is on the structure of political decision-making. The first category deals with the high-level setup of the government and often has a strong normative motivation. For example, Buchanan has been arguing for constitutional amendments that would forbid or sanction a deficient budget, to counter the natural proclivity of democracies toward deficits. The work done by bureaucrats belongs in this category (e.g. Niskanen's classical article "The Peculiar Economics of Bureaucrazy", 1968). Lemieux summarizes the topic:

Bureaucrats are assumed to maximize the size of their bureaus' budgets because they can thereby increase their real remuneration in terms of perks (larger offices, better expense accounts, etc.), lower risk of missing their objectives, recognition, etc. Thus, the bureaucrats will produce more than the politicians (and, presumably, the citizens) want, or at a higher cost. (Lemieux, 2004)

The second category consists of different studies that try to explain the behavior of citizens in different votes. Voting is generally a hard nut to crack for economics since it carries the assumption that no rational voter would vote, as the likelihood that the outcome depends on his or her single vote is basically nil. Much work has been done to overcome this paradox.

Political manipulations deal with questions like vote transfers, wealth transfers, interactions with constituencies, and “log rolling,” Shawn (2002) explains log rolling with the following example:

An urban legislator votes to subsidize a rural water project in order to win another legislator’s vote for a city housing subsidy. The two projects may be part of a single spending bill. Through such log rolling both legislators get what they want. And even though neither project uses resources efficiently, local voters know that their representative got something for them. They may not know that they are paying a pro-rata share of a bundle of inefficient projects! And the total expenditures may well be more than individual taxpayers would be willing to authorize if they were fully aware of what is going on.

Rent seeking is perhaps the most interesting area of research for this study. The origins of the theory were laid during the early seventies while the economists started to model the interaction between private actors and bureaucrats and also, the problems with the governing of the developing countries (e.g. Krueger, 1973). A more recent definition from Gunning (2003) defines it as follows:

Rent seeking consists of legitimate, non-voting actions that are intended to change laws or administration of laws such that one individual and/or group gains at the same or greater expense to another individual or group.

In other words, rent seeking consists mostly of different legal ways of lobbying. It is seen as detrimental to the health of the society since the political system has few defenses against this kind of non-market profit making. In addition, the race for the rents seems to be often economically

wasteful for both participants and general welfare. (e.g. Tullock, 1981).

Rent seeking is close to the problem of collective action. At first glance it would seem that different interests should balance each other out in the political process. If interest group A is lobbying for something that will cause costs for group B, it would be in the interest of group B to commence to counter-lobbying. However, this is the case only if the groups share similar internal structure and resources (e.g., two industry lobbying organizations).

Olson's work (1965) laid the foundation for research on collective (non-) action. His basic argument was that even if counter-lobbying made sense for individual members of a group, free-riding and costs of monitoring often make it an impossible choice as it would be more expensive than just accepting the loss without taking any action.

Later research has sought to determine why this has not always been the case. For example, environmental lobbying groups have been able to overcome this problem and fight effectively against industry lobbyists in certain cases, such as Vuotos-dam in Finland. Similarly, anti-software patent activists were able to beat industry lobbyists as the matter was decided in European Parliament. It seems that the primary way to overcome the problem is to create institutional structures that either make determining and punishing free-riding easy or alternatively offer other incentives for participation. Olson's very traditional example of this is insurance offered to farmers by their union. A more current example could be the automatic monthly payment systems used by NGOs like Amnesty International and Greenpeace that lower the transaction costs for participation and thus make it easier for consumers to stay involved.

Copyright legislation is often used a prime example of public rent seeking. Posner (2005, pp 72-72) expands the view to the IPRs in general:

Perhaps most important from a public choice perspective in explaining the expansion of intellectual property rights is the asymmetry of interests between owners of such rights and would-be copiers. Since the owners' principal costs are sunk, almost all the revenue from their sale of copies goes directly to the bottom line, giving them a very large stake in extending their rights. In contrast, would-be copiers, since they will not have exclusive rights once a work is pitched into the Intellectual Property: public domain, can expect only a competitive return, and so they have less incentive to challenge intellectual property rights in the legislature than the owners of such rights have to defend them. This asymmetry of interests is probably the reason for the practice of extending copyright and patent terms retroactively, despite the fact that such extensions offer almost no incentive for creating additional intellectual property.

Indeed, the documented experiences from the regulative processes in the U.S. support strongly this view. For example, Disney funded much of the lobbying for Sonny Bono Copyright Act, which extended copyright from 50 years to 70 years. Littman (2001) basically shows that in practice the whole legislative process has actually been “outsourced” to stakeholders. The political actors don’t want to act before the major players have reached some kind of compromise and if this is not possible, let the courts to try to solve the situation.⁴⁰ The problem for the public has been that they were not considered to be a stakeholder and thus nobody is looking after their interests in the negotiations.⁴¹

McGowan (2006) has interesting criticism on this “standard” approach. He argues that since the goal of the copyright system is maximize general

40. See Lardner, 1987 for very entertaining description how the fight on legality of Video Recorders took place in Congress.

41. The situation has slightly changed lately due to the fact that the major consumer groups (like BEUC) have taken copyright on their agenda.

welfare and not consumer welfare as such, the interests of the content industry may well work as an adequate proxy for optimal regulation strategy. Thus, even if this causes transfers of income from consumers to right holders that is not a problem as long as the general welfare grows.

Another type of criticism comes from Kapczynski (2008).⁴² She argues that public choice theory cannot explain the recent developments in IPRs i.e. the considerably stronger consumer resistance against the expansion of rights in both international and domestic levels. Instead, she suggests that “frame mobilization” might offer better way to systematize and explain the current situation. The discipline “investigates how social actors engage the field of ideas to theorize their interests, build alliances, mobilize support, and discredit their opponents.”

The author of this dissertation partly agree with Kapczynski. As explained in the Article 1. and 4., framing is very central variable in IPR-related questions. However, the author also believes that public choice theory should not be counted out so fast – it offers very valuable insights to mechanics of copyright regulation especially combined with behavioral law and economics. An interesting test case could be a study on Finnish copyright regulation to see which of the theories predicts the outcomes more precisely.

42. The article contains also excellent references to the general framework of different research paradigms (e.g. Rational Choice Theory) on the area. She also refers to Keck & Sikkink (1998).

3. Summary of the Articles

The original articles are arranged in this dissertation such that the “red line of the story” is as visible as possible. Therefore the author has not used the normal notion of chronological order. We start the discussion of Digital Rights management with articles 1 and 2. The remaining three articles tackle the question of enforcement from different angles. The last article, however, focuses mostly on the future of copyright and alternatives for current systems.

Article	DRM	Enforcement	Music/Movies	Software
Transnational Advocacy Network Opposing DRM: Technical and Legal Challenge to Media Companies	Yes	Yes	Yes	No
DRM Interoperability and Intellectual Property Policy in Europe	Yes	No	Yes	Yes
Theory of Deterrence and Individual Behaviour: Can Lawsuits Control File Sharing on the Internet?	No	Yes	Yes	No
Free Software and Copyright Enforcement: A Tool for Global Copyright Policy?	No	Yes	No	Yes
Copyright Levies as an Alternative Compensation Method for Recording Artists and Technological Development	No	Yes	No	No

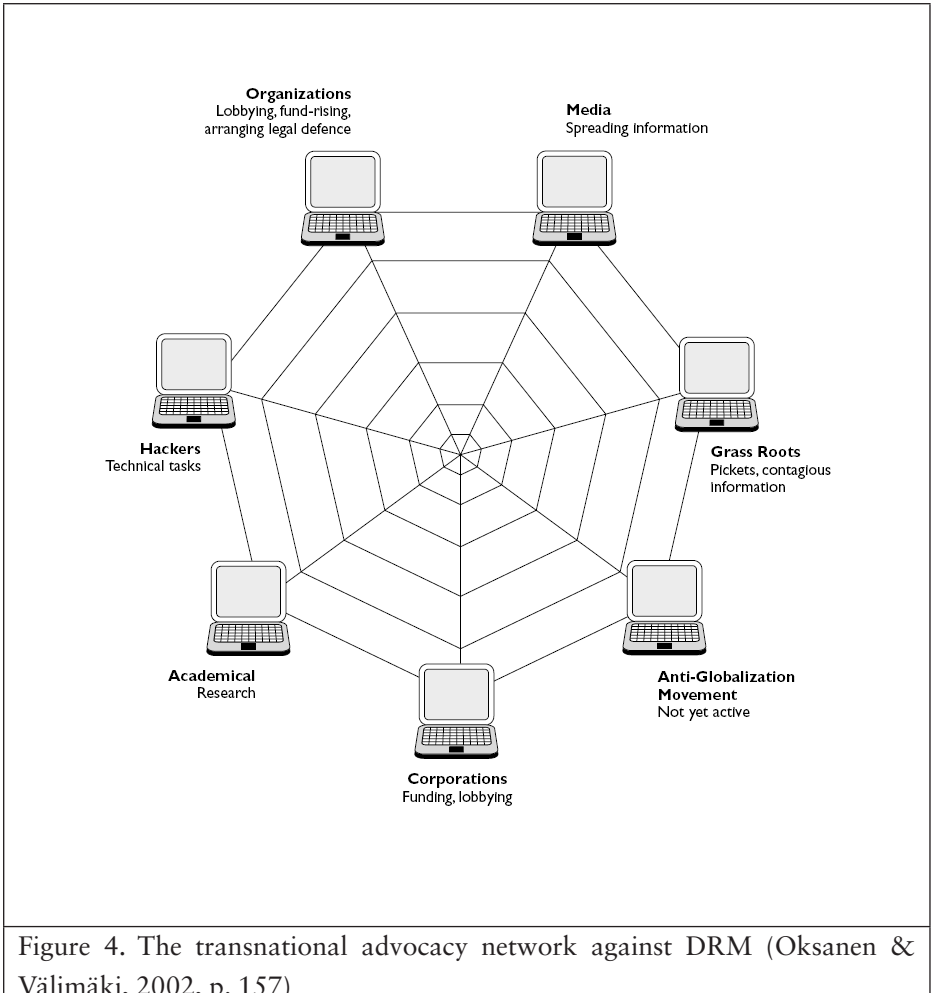
Table 7. Summary of covered topics.

3.1. Article 1. Transnational Advocacy Network Opposing DRM: Technical and Legal Challenge to Media Companies

3.1.1. The Main Content of the Article

The goal of the first article is to create a formal framework for analyzing the forces that oppose digital rights management. In addition, the article investigates how successful these groups have been in their actions and under what conditions. The basic premise of the article is that the anti-DRM forces are similar to other loosely connected advocacy networks that share a common goal. Earlier examples of this kind of network are human rights advocacy networks in Latin America, environmental advocacy networks, and networks working against violence against women. As can be seen in figure 4, we categorized the participants of transnational advocacy network into six classes:

1. Non-governmental organizations like the Electronic Frontier Foundation or Free Software Foundation;
2. IT-oriented media like Slashdot;
3. Hackers, i.e., persons who break DRMs;
4. Academics, i.e., persons who do research on either DRMs or copyright law;
5. Corporations, i.e., commercial entities that would benefit from the demise of DRMs;
6. Real grassroots activists.



The article then describes how the different actors work. In the case of the anti-globalization movement, the article speculates that cultural differences make it unlikely that they will truly join the cause. So far this perception has proven to be true.

The second part of the article is dedicated to actual DRM-hacking cases. The presented cases are DeCSS and Jon Johansen, Adobe eBook and Dmitry Sklyarov, and Microsoft Media Player and Sony Aibo the Robotic

Dog. The first conclusion from the cases is that once information has been leaked to the Internet, it is impossible to remove it. The more the right holder fights to suppress the leak, the more attention it gets and the more widespread the distribution becomes. The worst strategy of all is to sue the individual developer, as a grassroots uproar is then inevitable. If the company makes no active public moves and just updates the systems against the hack, the information typically does not spread outside the core hacker circles.

The article concludes by applying Keck and Sikkink's (1998) measure of success for transnational advocacy networks:

1. Issue attention, agenda setting, and information generation;
2. Discursive change, or establishing prescriptive status of norms;
3. Procedural changes, such as treaty ratification or cooperation within international organizations;
4. Changes in policies;
5. Influence on behavior of state and non-state actors.

The article argues that an anti-DRM network has reached at most level 2. However, since the article has been written, there has been clear development of international organizations, especially at WIPO, and currently the level should be as high as 5.

3.1.2. Contributors to and contributions of the article

This article was written by the author. Mikko Välimäki's contribution was limited in this case to general commenting, stylistic editions, and extensive proofreading.

The biggest contribution of the article is extension of theory on transnational

advocacy networks of anti-DRM forces. To our knowledge, nobody has done it before and even today our work is unique in its category. The article was also the first to describe how the process of DRM-hacking typically goes (figure 5) and is still fully valid five years after publication. The article also expanded “Streisand Effect”⁴³ to DRM i.e. the more aggressively to right holder tries to remove certain information, the larger distribution it will get.

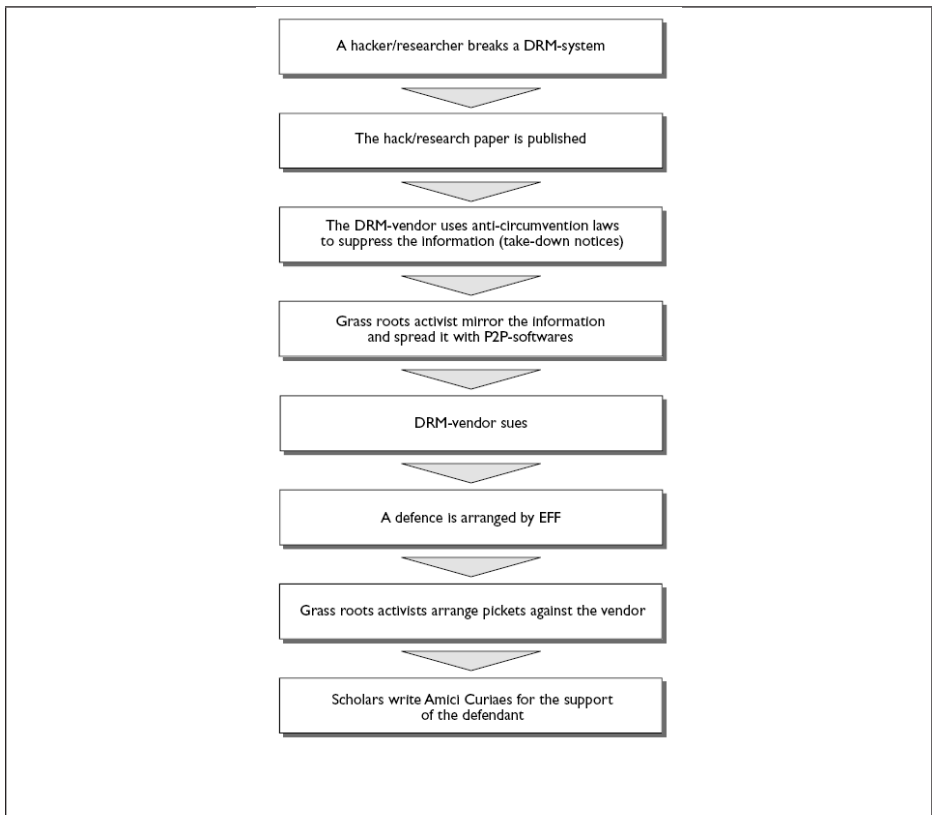


Figure 5. A typical process in a DRM-hacking case (Oksanen & Välimäki, 2002, p. 160)

43. The term was not known at the time the article was written. See more info Greenberg, 2007. The article includes information about recent breach of HD-DVD, which follows closely our model.

3.2. Article 2. DRM Interoperability and Intellectual Property Policy in Europe

3.2.1. The Main Content of the Article

The article covers three major themes. It first investigates in detail the current state of copyright legislation and court practice regarding DRM in the EU and United States pertaining to interoperability. The recent French interoperability law is also covered in this section. The French law would have introduced a true framework for full DRM interoperability. The text of the first version was written by local free software activists and would have introduced very far-reaching duties, e.g., giving full information compatibility information without a chance to ask for royalty payments. However, the law was watered down considerably in the French Senate, which was lobbied heavily by the media industry. The final version is rather meaningless since its requirements are seldom met:

- A regulatory authority will mediate interoperability requests; it has the power to impose fines of up to 5% of the global turnover if its decisions are not followed
- DRM provider can however escape interoperability requests (1) if it has acceptance from all copyright holders to keep the format secret and noncompatible, or (2) if there is a security risk that the DRM could be then unusable because it would be generally circumvented
- Licensing terms for interoperability information must be nondiscriminatory and may have reasonable royalties; obviously the regulatory authority will finally decide whether the DRM provider can prevent open source implementations.

The second part of the article is dedicated to competition law and interoperability. The article explains the current state of EU-level

regulation, which is based on the European Court of Justice's Magill and IMS Health decisions. The article also covers a recent French case against Apple iTunes, in which the outcome was as follows:

In its decision, the council noted that it was still too early to define markets for DRM and thus it was unclear whether Apple's FairPlay was in a dominant position in that market. The council especially mentioned Microsoft's WMA standard as a competitor that might be in a more powerful position. Further, even though Apple might have had dominance in the markets for portable players (iPod), it did not abuse that market power since there were multiple sources to get music to iPod. iTunes downloads were only a minor share of the total.

The third part of the article covers the recent entry of consumer protection authorities to the digital markets. The article explains how the Norwegian Consumer Ombudsman has started a process to force Apple to open up its FairTunes-DRM.

3.2.2. Contributors to and Contributions of the Article

The author of this dissertation wrote the sections about the United States and Consumer Protection Law and also contributed to other sections, especially to the conclusions of the article.

The main contribution of the article is its discussion of how DRM-interoperability could best be achieved by using the aforementioned three legal tools. To our knowledge, nobody had tried to compare these three approaches regarding interoperability. Our conclusions are summarized in table 8.

Legislation	Pros	Cons	Forum for changes
Copyright law	Strikes to the root of problem, prone to extensive rent-seeking	Very hard to change	WIPO, EU
Competition law	The active role of courts makes rent seeking more difficult compared to fully political process	Very slow, only against already dominant players	EU
Consumer protection law	Quick, potentially very powerful	Only in consumer relations	Member countries

Table 8. Pros and cons

However, since this article was published, the Microsoft case was decided by the Court of First Instance. As we had hoped in the article, the court agreed with the Commission and considerably expanded the duty of disclosure of information required for creating interoperable systems. However, the case may not be widely applicable on a general level, because it is tied to the specific facts of the case. For example, Thomas Vinje (one of the main litigators in the case), argues that Apple was not affected by the decision:

The relevant market is the online sale of music. It's basically music stores. And there's no lock-in there. There's no platform protected by an applications barrier to entry. Apple has a whatever, 70% market share, it's been tremendously successful. It doesn't have any way of locking customers in. I mean, they can choose. I could choose to go buy a Samsung player, for example, and download music from plenty of other places than the Apple store. And so the circumstances are totally different. There's no platform, there's no 95% market share over a long period, 10–15 years, protected by an applications barrier to entry. So the Commission said, "We're not going to pursue this case, because Apple doesn't have a dominant position." (Daly, 2007)

3.3. Article 3. Theory of Deterrence and Individual Behaviour: Can Lawsuits Control File Sharing on the Internet?

3.3.1. Main content of the article

The article is divided into two relatively separate parts. The first one is historical. We show how the Internet has been used for distribution of (allegedly) copyright infringing works, as long as there have been tools to do so. The discussion and the arguments remain surprisingly similar; only the scope has changed. We also document in detail the first major net-based copyright fight: *Scientology vs. Alt.Religion.Scientology*. That case laid the foundation for some of the core principles of current Internet regulations. For example, Internet operators were protected against copyright infringement claims as long as they acted as mere “pipe” between their customers. The case also made it abundantly clear that once certain information ends up on the Internet, it is practically impossible to remove it with either technical or legal means.

The second part of the article analyzes the effectiveness of the music industry’s lawsuits against P2P file sharing. We first create a simplified formula to describe different factors affecting users’ decision to participate in file sharing. Here we use the assumption from “traditional” law and economics that a rational user stops file sharing only if the costs exceed the benefits. Here the outcome is that risk of being sued is so small that it does not prevent participation. Both the collected anecdotal evidence and real data from companies that track P2P traffic seem to support this conclusion; i.e., lawsuits have not had a radical effect on file sharing

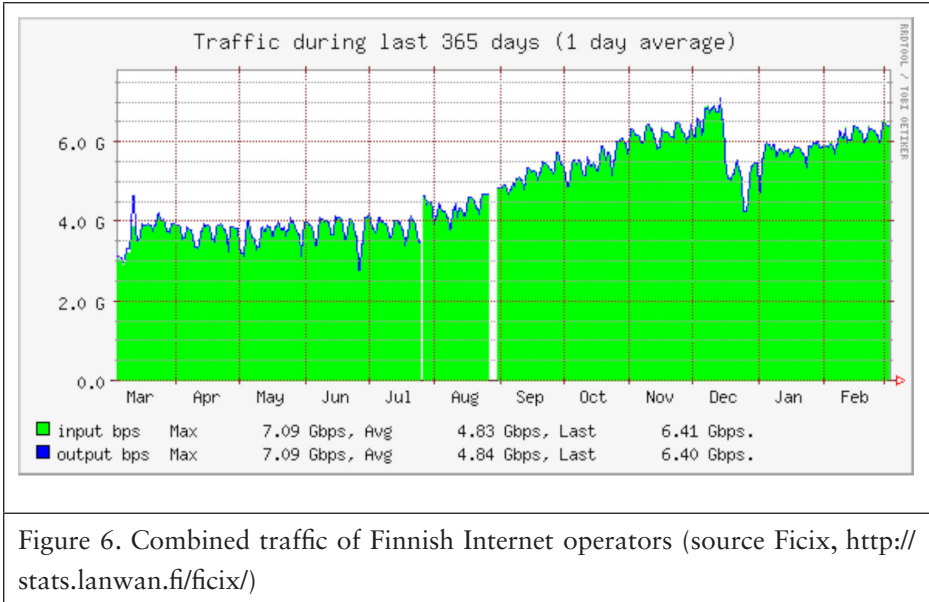
However, as described in 3.1.2 and in the article, we argue that assumption that a person would act fully rationally is wrong. Therefore the article describes the kinds of changes that should be made to the basic assumptions.

The first and perhaps most important factor here is that individuals tend to favor a substantial probability of larger loss to a certain limited loss.⁴⁴ This means that even if the cost of file sharing is more expensive (in terms of legal risk) than buying the music legally, the users will still download the music. However, there are several other factors. For example, people overestimate those risks, as they got a lot of publicity. However, once a risk becomes “too ordinary,” people will underestimate it. In addition, costs and benefits of participating and getting caught, in terms of a person’s reputation, should be taken into consideration. The article then looks for anecdotal evidence of these factors. At least among technology-oriented users, file sharing seems to carry very little social stigma. The reputation of record and movie industries is so low that there is just no social norm against violating their rights.⁴⁵

Finally, the article describes how a very widely publicized police raid of the biggest BitTorrent site in Finland had only short-term effects (figure 6), which can be explained by the fact that users had merely to find a new service to continue their habit.

44. The counter-argument for this is that people still buy insurances and that is almost analogical situation. However, the framing here is perhaps different enough to explain situation - insurances aim to sustain status quo that is not the case with illegal downloading. However, this contradiction is something that should be possible to study empirically to find out how people behave in “real world”.

45. The situation has most likely only worsened since the article was written. For example, The Consumerist found in its nonscientific vote that RIAA was the worst company in America in 2006. It beat the previous year’s winner, Halliburton Corp.



3.3.2. Contributors to and Contributions of the Article

The article was otherwise written by the author, but Mikko Välimäki wrote the section about Finnreactor. Välimäki also contributed to the introduction and conclusions.

The article makes two major contributions. The most important one is the application of behavioral law and economics to file sharing. To our knowledge, our article was the first to take this approach. We show that as long as the content industry cannot establish a strong social norm against file sharing, court cases alone won't work. The industry seems to have realized this at least partially but as long as their reputation is as bad as it is, there is not much they can do. For example, harsher penalties are unlikely to work because they would be solemnly against what people currently consider fair and consequently only worsen the situation.

Secondly, the article documents in detail one of the most interesting aspects of the history of copyright on the Internet, i.e., the struggle of Scientology to prevent distribution of their secret course materials. That case, which happened before modern P2P technology, already offered strong evidence that it is very hard to suppress dedicated net users from distributing “forbidden” material by technological or legal means.

3.4. Article 4. Free Software and Copyright Enforcement: A Tool for Global Copyright Policy?

3.4.1. Main Content of the Article

The article is divided into three parts. It starts by introducing the reader to the history of free software. The article shows how informal enforcement has been very effective in protecting adherence to free software licenses. The most common tools used against violators are:

- Pressure in online discussions;
- E-mails from “volunteer legal counsels“; and
- Threat of negative publicity

The formal enforcement of licenses in court is not favored by most of the projects. This is due partly to the fact that free software developers have strong and negative ideological views toward default copyright rules; i.e., they consider the current system to be something that unnecessarily limits the freedom of users and developers.

In the second part of the article we show how trade-related enforcement of traditional copyright in software is pushing developing countries toward free software. The reason is quite understandable: increased enforcement

makes proprietary software more expensive, as the option of pirated versions is not available while free software remains “free as beer.” Thus countries like China, Vietnam, and Brazil increasingly favor free software in their procurement processes.

In the third part of the article we discuss the political aspects of the situation. The article shows how WIPO has not covered free software as certain member states (especially the United States) have so far opposed it.

3.4.2. Contributors to and Contributions of the Article

The article was written by the author. Mikko Välimäki contributed some comments and section 2.1. about the history of GNU GPL.

There are three main contributions of the article. First, it demonstrates that it is possible to establish a strong social norm to “respect copyright holder’s rights” and enforce it (mostly) by informal means. This is especially important (see the previous article) as the traditional enforcement of copyright is likely to become harder (see the next article).

Second, the article shows that developing nations act rationally and use free software as a tool to limit the negative effects of increasing copyright enforcement. The companies pushing for more enforcement act similarly rationally and use lobbying to minimize the movement toward free software. We thus lay the foundation for further research into how this “game” proceeds.

Finally, we are most likely first to suggest that WIPO could actually use free software as an example of why copyright is something that is actually good to enforce. Even if the ideological background of the free software

movement is hostile toward the general notion of intellectual property rights, the community is still willing to protect the rights of software authors.

3.5. Article 5. Copyright Levies as an Alternative Compensation Method for Recording Artists and Technological Development

3.5.1. The Main Content of the Article

The article is divided into three sections. It first describes alternative solutions that are available for selling copyrighted works. Special attention is given to models that extend a system of levies to the Internet. These systems are based mostly on the idea that P2P traffic is monitored or sampled to get statistics; these could be used to distribute the money collected from ISPs and/or hardware vendors. The main critique of the proposed system is introduced as well as our own model, which would allow users to vote on how their money would be used and would be based only secondarily on collected statistics.

In the second part we analyze whether it would be possible to introduce such a system into Finland. The question is divided into two parts: economical and legal. We conclude that with the current broadband user base it would be easy to collect enough money to offset revenues from CD sales. However, the current legal framework is unlikely to be interoperable with such a system and at least EUCD and the Finnish copyright act would have to be changed first.

In the last part we use some very simple calculations to show that the road of traditional copyright enforcement is going to end soon. We identify the

rise of storage capacity and wireless transfer speed as two main disruptive technologies. In our statistic model the “effective” fines for preventing private file sharing (which is still legal, at least in Finland) in a few years could be as high as 100 billion euros!

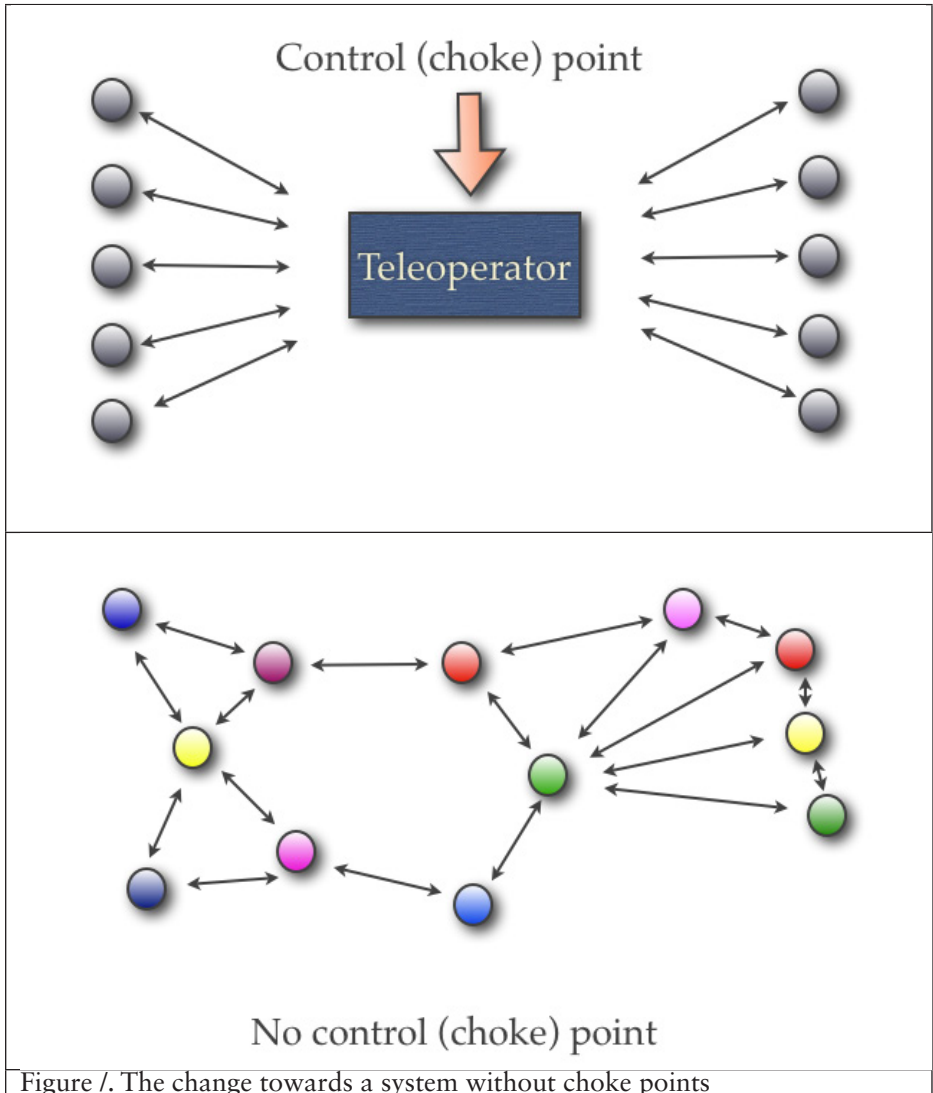
3.5.2. Contributors to and Contributions of the Article

The article was otherwise written by the author of this dissertation; Mikko Välimäki wrote section 3.1. and added the voting component to the levy model.

The article makes two main contributions. First, it shows that from a purely static economic perspective, it would be possible to establish a fully levy-based system to Finland. However, current legislation makes it impossible. Even if the legal problems were solved, many questions would remain open, such as who would decide the sum of collected money and on what grounds it could be changed.

The second contribution is our brief look toward the future. The current copyright discourse is badly stuck at the current technological level even if it is still relatively easy to predict the development with a 5–10-year perspective. Considering that most of the legislative processes pertaining to copyright tend to take several years anyway, we found it odd that nobody seems to be concerned about what is just around the corner.

We show that traditional enforcement of copyright will be next to impossible, because users will be able to bypass the current choke points (as seen in figure 6) by using distributed mobile “mesh” networks or “sneakernets,” i.e., portable hard drives capable of transferring extreme large amounts of content.



4. Conclusions

The main outcome of this dissertation can be summarized in one sentence; however, the justifications for it require slightly longer discussion. The first article shows that digital rights management is very hard to implement in order to protect content without annoying users. It is even harder to create protection that would survive attacks from dedicated hackers. The only real option is to create a system that is possible to update after a breach. However, that does not help if the already distributed works can be released from the DRM envelope after a breach. For example, AAC3 protection, which is used in both HD-DVD and Blue Ray discs, has already been broken a few times; as a result, the already published titles are completely vulnerable to copying.

In addition, there is a strong push in the markets against DRM. Apple, the biggest music retailer, is already selling some of its material without DRM, and its current main competitors, eMusic and Amazon, are offering all their music without DRM. The distribution of films is still in the early stages compared with music, but there is already at least plans to offers movies without DRM. Furthermore, the European regulative push (based on both competition law and consumer protection law) against non-interoperable DRM systems is making future investments less profitable since it is much riskier to use DRM to tie customers to a single vendor.

Therefore, there seems to be a strong case that DRM won't save copyright, and the answer to research question one is *no*.

The second option, stronger enforcement, is also unlikely to work. First, it alienates the people from the content industry. As described in Article 1, the “martyrs” who can give human face to the struggle are very efficient

tools for advocacy, and mass-scale court cases inevitable create them. Furthermore, forthcoming technology will make enforcement on a practical level extremely hard. Content will spread from hand to hand (or from one mobile terminal to other). If a person is able to store a year's worth of music in his or her pocket and share it with peers, enforcement against this kind of behavior would require such strong privacy-violating measures that even our terrorist-scared society is not ready to accept them.

The answer to the second research question is therefore that enforcement is already very hard and it will basically become futile in the future for certain categories of works, i.e., anything that can be consumed at home without interaction with the outside, including movies, music, etc.

If technical protection measures and enforcement are not going to rescue copyright, what is left on the table? One common answer is to extend the current levy system. This might actually work for a while but there are some caveats. For example, what would be a fair levy for a hard drive that can hold 10 terabytes of information that could be anything from free software, family HD videos, porn, and music to the full content of the Library of the Congress? In addition, if everything goes as planned for a "ubiquitous society," everyone will have more storage capacity than there is information to store. As a consequence, any levy system would soon turn into a flat governmental tax that would somehow be distributed to the content creating class. This kind of "socialized" content production is actually a real possibility but a very problematic one. Even in the Soviet Union the production of creative content was not part of the centralized system (Newcity, 1978).

We are now ready to move to the final outcome of this dissertation. The copyright system is quickly vanishing as a way to financially support content production, at least in certain categories of works, i.e., music and movies. New models to support creative works will emerge only if a

strong social norm that requires “giving authors what authors’ are due” can be established. No technical or legal solution will help if this cannot be achieved and soon. The change has to happen first and foremost in the hearts of the people but reasonable business models don’t hurt, either.

This means basically that people have to learn to support the creative class because they *want to do it*, not because it is dictated by the law.⁴⁶ If we look to the history of creative production, it is possible to make the case that this is indeed possible. During most of history, patronage has played a central role as a way to ensure a livelihood for artists. Considering that the cost of making both music and movies has come down considerably during the digital revolution, there is also a lot less need for capital. The change won’t happen easily, but in the end most people want to do the right thing—even if that would be irrational from the perspective of classical economic theory.

46. A person who is more familiar with philosophy might say that the copyright system should work in such a way that it fulfils Kant’s Categorical Imperative (see Kimppa, pp. 24-25).

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