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Copyright protection: not more but different
The decline in the marginal cost of copying and the improved quality of copies has led the industry to call for additional copyright legislation and enforcement. The purpose of this study is to assess this claim.

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Preface

Nowadays publishers face many challenges. The falling marginal costs of copying and the improving quality of copies has led the industry to call for additional copyright legislation and enforcement. However, the claim for increased protection is not as valid as it appears. First, in many markets for information goods competition between originals and copies is virtually non-existent or publishers can internalize part of the surplus created by copies. Second, in markets that experience network effects, both publishers and consumers might benefit from copying. Finally, publishers can use the decrease in costs to engage in (digital) business strategies such as giving away free samples, versioning and selling complementary products. The case for increased protection is further undermined by the fact that information goods industries often use market solutions, such as contractual agreements and technological devices, to protect their content. The challenge for policy-makers is to design a modern, flexible copyright regime that balances the interests of publishers and consumers. An extension of protection does not seem to achieve this goal.

This study is part of the larger study 'Publishers Caught in the Web?' which also includes the working papers 'Publishers Caught in the Web ?' (Working Paper 119), 'Magazine Publishing - A Quiet Life?' (CPB Working Paper 120) and 'Tackling the Journal Crisis' (CPB Working Paper 121).The broader aim of this study is to describe the characteristics and business strategies in the information economy, and more importantly, to suggest a new framework for assessing market performance.

It is no coincidence that this is study on electronic publishing is also available as CPB's first electronic publication. CPB is eager to exploit new possibilities of disseminating its research output. This Working Paper is available from:
http://www.cpb.nl/nl/pub/pubs/werkdoc_122/.

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1. Introduction

Information goods share a number of characteristics that set them apart from other goods. In this case study, we focus on two of the characteristics that were discussed in the General Framework.

First, a publisher[1] typically faces a *high fixed - low marginal cost* production technology. The publisher has to incur a high fixed cost to produce an original. After that, it is relatively cheap to bring additional copies on the market. It takes a lot of time and effort to record a new CD, but the reproduction of the CD is relatively cheap. Second, information goods are *non-rival*. Once the content is produced, it can be used by other consumers than the initial buyer without additional cost. You can listen to the CD a friend or relative has bought.

The non-rivalry of information goods, combined with the high fixed - low marginal cost character of production, creates a latent market failure: *underproduction*. The incentive to publish new content is lower than in the case of rival goods because the publisher cannot appropriate all the revenues from producing the good. This problem becomes even worse when others have access to copying technology that enables reproduction of content at (low) marginal cost. In the latter case, the publisher competes both with publishers who produce substitutes and with the copies made by consumers and/or producers. This competition forces the publisher to adjust his price downwards. As a result, the publisher will not be able to recoup his initial investment (i.e. the fixed cost). This reduces the incentive to produce new work and may hurt diversity.

Economic theory suggests three policy solutions to the problem of underproduction: subsidies, rewards, and the allocation of property rights (see the discussion in Ledyard (1987)). The government may *subsidize* the production of information goods to solve the problem of the missing market for the information good. This instrument is frequently used to stimulate the creation of works of art and science. Another solution to the underproduction problem might be to *reward* creators of information goods (Shavell and van Yperseele, 1999). The reward mechanism that can take the form of prizes or grants, is often advocated to stimulate R&D. Finally, the government can decide to allocate *property rights* - in this case intellectual property rights - to the publishers of the work that enable them to appropriate exclusively the benefits of the information goods.

[1]For the moment we assume that author and publisher are the same persons or that they have the same objectives. We will come back to this issue in section 3.5.

In this study, we will not discuss the pros and cons of the three mechanisms to solve the problem of underproduction[2]. Instead, we will focus on the changing role of a specific kind of intellectual property rights, copyrights. Copyrights give the publisher of a work exclusive rights to exploit his work. In allocating these rights, the government shields the publisher from competition by publishers and/or consumers who can copy this work (although the publisher still faces competition from close substitutes). The publisher is able to reap the benefits from the production of the information good for a certain period of time.

While it is clear that effective copyright protection may provide a solution to the problem of underproduction, it is equally clair that the introduction of a copyright regime (as well as the introduction of subsidies and rewards) may have unintended consequences (Ledyard, 1987). The allocation of intellectual property rights to publishers of information goods is equal to granting a temporary monopoly for the exploitation of the information good to the publisher. As such, the introduction of copyrights can result in *underutilization* which hampers the diffusion of the information good.

The solution to the latent market failure in markets for information goods therefore requires a balancing act by policymakers between two second-best solutions. When deciding on the terms on the specific terms of copyright protection (such as the length and scope of protection), the government faces a trade-off between *underproduction* and *underutilization*.

The copyright system that is in place today does not necessarily reflect this trade-off. Historically, much of the public debate about the role of intellectual property rights has not been concerned with issues of economic efficiency at all. Legal scholars and philosophers have traditionally shown interest in issues such as the moral rights of authors to the fruit of their creative efforts and the impact of intellectual property rights on free speech and democracy.

Another reason to suspect that the current copyright regime can be improved is the way (international) copyright legislation has adapted to changing circumstances. Copyright protection has increased both in scope and in length over the years. In many industries, incumbent publishers spent considerable amounts of time and money on lobbying for increased protection (David, 1993). This raises the issue whether this rent-seeking behavior is optimal from a society's point of view.

[2] For a comparison of the reward system with that of intellectual property rights, see Shavell and van Yperseele (1999).

Recently, economic considerations have become more important in policy discussions about the nature and scope of copyrights protection. David (1993) argues that economic analysis provides the most widely accepted interpretation and supporting rationale for public intervention. ‘At the very least, this approach provides a framework for identifying the major problems of allocative efficiency and the distributional issues that are a stake - *from the viewpoint of society as a whole* - rather than from the perspective of the various private (and national) interest abroad.’ (David 1993: 21).

The public debate about the optimal copyright regime has recently been revived as a result of developments in the markets for information goods. Technological innovations in the market for information goods enable consumers to make much cheaper copies (i.e. consumers face a decrease in the marginal cost of copying). The quality of these copies has often increased at the same time, often to the point that originals and copies are hardly distinguishable (e.g. MP3 files, copies of CDs). The use of digital media such as the Internet to distribute illegal copies of information goods have made traditional ways of copyright enforcement more difficult, leading some observers to describe the Internet as one "giant, out of control, copying machine" (Shapiro and Varian, 1999).

In short, the technological developments in markets for information goods are perceived to provide a challenge to the existing copyright system. The response of - in particular - music and software publishers and their copyright collectives has been to call for a wider scope for copyright legislation and an increase in the time and money spent on enforcement. Other observers, however, argue that copyright enforcement will never be the same: "Intellectual property law cannot be patched, retrofitted, or expanded to contain digitized expression ... We will need to develop an entirely new set of methods as befits these entirely new set of circumstances" (Barlow, 1994).

The purpose of this study is to assess the claim by representatives of the publishing industries that the scope and length of copyright protection should be increased and that more efforts should be put into enforcement.

To investigate this claim, section 2 provides a description of the most important aspects of the various copyrights and the relationship between copyrights and other intellectual property rights.

Section 3 continues by discussing the trade-off between underutilization and underproduction in an economic model of copyrights (the discussion is based on Landes and Posner (1989)). With the help of the model it is possible to identify the optimal copyright regime and the factors that are relevant for this regime. Starting from the standard model, four arguments are introduced why the optimal level of copyright protection is likely to be lower than predicted in the standard model. The (contractual)

relationship between author and publisher, and its implication for the optimal copyright regime is also discussed here. Section 3 concludes with a discussion of the effectiveness of copyright enforcement.

Some markets for information goods are characterized by network effects. In Section 4 we will discuss the notion of network effects and investigate what the impact of network effects is on the optimal level of copyright protection. The fact that consumers have a higher valuation for a good when the size of the market for this product is higher, makes copying less detrimental for social welfare. We draw on a number of more recent contributions in the economic literature to show that, in markets that experience these type of externalities, a decrease in costs of copying (or an increase in the share of illegal copies) might actually benefit publishers and society as a whole. By discussing standards for copyright enforcement and legislation, it seems therefore useful to make a distinction between markets with and without network externalities.

Even when network externalities are absent, the standard model makes a number of simplifying assumptions that might lead to a claim for increased copyright protection. One of the factors that is not taken into account in the standard model, but is very relevant for most information goods markets, is the reduction of distribution costs that occurs as a result of the technological developments described above. Lower (or even zero) distribution costs make it easier for publishers to use business strategies such as give away free samples, reveal parts and combine ads and content. In doing so, publishers can increase the size of the market they operate in. Section 5 discusses these strategies and their impact on the claim for increased copyright protection. We will focus in particular on three specific markets: books, music and software in order to illustrate the impact of new business strategies on the optimal copyright regime.

Finally, section 6 summarizes and concludes.

2. Copyright and other intellectual property rights

This section defines copyrights and discusses the differences between copyrights and other intellectual property rights.

2.1 Copyright defined

Copyright can be defined as the right of an author to control the exploitation of his intellectual creation. The word author is used here in a very general sense and refers to

writers, painters, sculptors, composers and so on (see also the General Framework)[3]. The term exploitation is also used in a broad sense and refers both to the right to make the work public (*openbaarmakingsrecht* in Dutch) as well as to the right to reproduce the work (*verveelvoudigingsrecht* in Dutch).

Copyright exists at the same time a work is created. Formally, no registration is needed (as, for example, in the case of patents). In practice, however, registration can have a number of advantages.

As a general rule, a work has to fulfill some requirements in order to be subject to copyright:

- The work has to exhibit a certain minimum of originality.
- It is not possible to claim copyrights on abstract entities such as thoughts; it is possible, however, to claim copyright on the expression of those ideas.
- In general, the subject of copyright must be the result of a creative process. In some cases facts (such as timetables, TV- and radio information etc.) can also be protected by copyright[4].

As is clear from the requirements listed above, the scope of copyright protection can be very broad and refer to as diverse works as books, newspapers, magazines, plays, musical works, sculptures, computer programs, and so on.

Copyright legislation in most countries is based on a combination of international treaties and country-specific legislation. The rights of Dutch authors abroad are protected by international copyright agreements. These treaties permit Dutch authors to reap the benefits of their works abroad and, on the other hand, protect foreign authors in the Netherlands. Chronologically, the most important copyright treatments are the Berne Convention for the Protection of Literary and Artistic Works (1886), the Universal Copyright Convention (UCC, 1952) and the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS, 1995). The TRIPS agreement is a comprehensive agreement between WTO-members on intellectual property (including copyrights and neighboring rights). The treaty provides the minimum rights that each participant must provide. The agreement specifies the subject that has to be protected, the rights that must be provided and the permissible restrictions on copyrights. The obligations of the Berne convention must be met (with the exceptions of moral rights),

[3] We abstract from the complications of joint authorship of works and the production of collections of other works and simply refer to single authors in the text.

[4] This is known in Dutch as "geschriftenbescherming".

but the TRIPS agreement also includes a number of additional requirements. As a result, TRIPS is sometimes referred to as "Berne-plus" . The TRIPS agreement also describes procedures, principles and provisions to guarantee the enforcement of intellectual property rights and dispute settlement procedures between the participating countries. Two other important treaties are the WIPO-treaties signed during the WIPO-conference in December 1996, which were signed by 51 and 50 countries respectively. This includes all E.C. member states and the United States.

In Europe, the European Community aims at harmonizing the national laws of member countries with respect to intellectual property rights[5]. In December 1997, the European Commission published the definitive version of a proposal for a E.C.-directive[6] regarding copyright and neighboring rights in the information society. This proposal is currently under discussion. The proposal aims at applying copyright in the digital environment by strengthening the rights and providing for protection against illicit circumvention of technical protection[7].

2.2 Copyright vs. other intellectual property rights

Copyright is a type of intellectual property right. In many respects intellectual property rights are similar to "normal" property rights, in the sense that they can be sold, exploited and protected (Strong, 1993:1). Intellectual property rights include - besides copyright - patents, trade secrets, trademarks (or brand names) and design right. *Patents* protect an invention for a limited period of time; a patent provides the owner of the patent with a monopoly right on an application. The duration of patents varies from country to country but lasts usually no longer than 20 years. A patent must be registered and the costs of the application can be high. *Trade secret* law protects all information that gives a firm some competitive advantage from being disclosed. The information must be kept secret by the firm. Otherwise, the protection by law is lost. An invention is a trade secret as long as it has not been published. *Trade marks* protect the sign under which the product or service is brought on the market. Firms can use trade marks to help consumers identify their goods. Trade marks are usually meant to protect the name, shape and color of a certain product.

[5] Examples of EC-directives include the EC-directive with respect to the rights protection of computer programmes (EC-directive 91/250, dd. 14 May 1991), coordination of regulations with respect to copyright and neighbouring rights on satellite and cable broadcasting (EC-directive 93/83, dd. 27 September 1993) and protection of databases (EC-directive 96/9, dd. 11 May 1996).

[6] COM (98) 249 def.; Publ. EG C 165/9, 30 May 1998.

[7] See for a Dutch view on the directive: Commissie Auteursrecht (1998), *Advies over Auteursrecht, Naburige Rechten en de Nieuwe Media,* Ministerie van Justitie.

Another important category of rights are the so-called *neighboring rights*. These rights are related to and similar to copyright and apply to performers, producers of phonograms, film producers and broadcasting organizations. In this study no special attention is paid to these rights.

There are certain overlaps between the different intellectual property rights. Software, for example, can be protected by a patent as well as by copyright. However, as can be inferred from the description of the different rights given above, there are also a number of differences in (i) the subject matter of the right, (ii) the scope of the protection and (iii) the procedures and formalities to apply for the right.

In practice, the legal system will try to restrict the overlap between the intellectual property laws by relying on the judgment of the courts (Elias, 1999). According to some observers it is a popular belief that copyright should only be applied to the "finer things in life such as poetry and creative prose ..." (Dam, 1995) while patents are relevant for more practical technical products. In the remainder of this chapter we will restrict our analysis to copyright. It is not our intention to give a complete picture of national and international copyright legislation, but rather to highlight some of the most important concepts that are relevant to the issue at hand[8].

2.3 Transfer of copyright and inalienable rights

As we have seen, the author is the first owner of the copyright; he can sell this right, or part of it, to others. Copyrights can be split up in, for example, certain means of reproduction, a certain group of users, a certain language, a certain period or a certain part of the work. The permission to publish a work without the transfer of copyright is referred to as *licensing*.

Some rights cannot be transferred or licensed, however. These inalienable rights, which are also referred to as moral rights (*droit moral*) protect the connection between the author and its intellectual creation and they serve to protect the author's honor and reputation[9]. Examples of moral rights are:

[8] We do not aim to give a full overview of the complex copyright legislation here but rather single out some important concepts for the remainder of the analysis. For more details about copyright legislation we refer to Spoor and Verkade (1993) (Dutch copyright), Bainbridge (1996) (UK copyright), Sheldon et al. (1999) (US copyright legislation). Useful web sites include: http://www.rulimburg.nl/~spinoza/, http://fairuse.stanford.edu/internet/ and http://www.law.com/lawnet/105.htm.

[9] For a discussion see Rushton (1998).

- The paternity rights; the rights to be recognized as the creator of a work;
- The integrity rights (*droit au respect*); the rights to object to the manipulation of the content of his creation or a change in the title;
- The rights of repentance; the rights to make changes in existing works. This right can only be used when the work is altered in such a way that it will harm the honor or the good name of the author;

Copyright restricts the way in which people other than the copyright owner of an information good can use the good. But not all uses, i.e. reproductions and making available to the public, can be prohibited on the basis of copyright law. There are a number of legal exceptions. The copyright limitations vary from country to country. An example is that it is generally allowed to include short citations from the work of other's in one's own work. Also, often copying of a work is allowed when only a small part of the content is copied, when copies are made for educational use, when the copying does not affect the market of the information good to a considerable extent and when a copy is only made for personal use or made available to a small circle of family and friends.

In summary, copyright legislation consists of an intricate sets of rights and an number of restrictions on and exemptions of those rights. In the following two sections we will focus on the rights to make the work public and to reproduce it when we discuss the economic literature on copying and copyright.

3. Economic models of copyright

Economists have developed models to describe the trade-off between underproduction, underutilization and the costs of enforcement of the copyrights regime. In this section, we discuss the model developed by Landes and Posner (1989). This model predicts that copyright protection should be increased if the marginal cost of copies decreases. After describing the model, we provide a number of arguments why this is not necessarily the case.

3.1 Introduction

The discussion about the optimal copyright regime has been largely dominated by legal scholars and practitioners. Given the explicit trade-off involved in choosing the optimal copyright regime that is recognized by legal analysis it is perhaps no wonder that economists have started investigating this issue. While it cannot replace the legal approach completely, economic theory provides an explicit framework to investigate the impact of alternative copyrights regimes on market structure and welfare. This framework might be valuable to consider the impact of a copyright regime in the case of rapidly changing conditions, as we demonstrate later in this study.

The economic literature on intellectual property rights is primarily concerned with patents and innovation, but a number of contributions have paid attention to the issues related to copyright. Landes and Posner (1989) make a distinction between the *economics of copying* and the *economics of copyright*. The first branch of the literature - and the most voluminous - considers the impact of the availability of copies on the demand for originals, the profits of the publisher and social welfare in various settings. The economics of copyright considers the impact of copyright protection and the costs of enforcement on the trade-off between limiting access and to the original and incentives to produce new work. In section 3.2, we will use the model developed in Landes and Posner (1989) to analyze the mechanisms behind this trade-off. In the next section, we will discuss a number of arguments that have been proposed to modify this view of optimal copyright protection. These arguments go back to (amongst others) the seminal article by Arnold Plant (1934), who claimed that being first in the market allows authors to capture a good deal of the potential revenue[10] (for a discussion see Liebowitz (1986)). In section 3.4 we pay attention to the distinction between authors and publishers, a distinction that is often assumed away in economic analysis. Section 3.5 discusses the effectiveness of enforcement and enforcement costs. Finally, section 3.6 provides a discussion and concludes.

3.2 An economic model of copyright

The model we will refer to as our standard model has the following ingredients[11]. Publishers incur fixed costs to produce content but can reproduce this content at marginal cost; this assumption is equivalent to the "high fixed, low marginal cost" assumption we have used throughout this study. The level of copyright protection affects the fixed costs of the producer (in the terminology of Landes and Posner "the costs of expression"). Copiers supply copies up to the point where price equals marginal cost. This marginal cost of copying increases in both the number of copies and the level of copyright protection. Taking account of this behavior by copiers, publishers maximize profits. If we assume that publishers differ with respect to their fixed costs, the number of works in the market will be determined by the marginal author that equals (gross) profits to this fixed cost.

We can now consider the impact of a change in the *level of copyright protection on the number of works*. An increase in the level of copyright protection has two effects in the model: 1) it increases the gross profits of each publisher; (ii) it increases the fixed costs of each producer. The latter effect can be interpreted as an enforcement tax that

[10] Other early contributions include Hurt and Schuchmann (1966) and Breyer (1970).

[11] For details see Landes and Posner (1989).

increases in the number of works produced. At low levels of copyright protection it is likely that the first effect will dominate the second; at high levels of copyright protection the second is likely to dominate the first. As a result, the number of works increases at low levels of copyright protection and decreases at high levels of protection. Too much copyright protection raises the fixed costs of production to such a level that many publishers cannot recoup their fixed costs (even in the case they have complete protection for their work).

An implication of the model is also that the *price per copy* is greater the less elastic the demand for copies, the less elastic the publisher's supply curve and the larger the publisher's share in the total number of copies produced. The first relationship relates to the price elasticity of demand for the information good; if consumers react strongly on price changes, the publisher has to set his price at a lower level than in the case where this price elasticity is low (and hence the demand for copies less elastic). The slope of the publisher's supply curve is also important in determining the optimal price set by the publisher. If other suppliers react strongly to an increase in price and react by entering the market, this is likely to erode the profits of the publishers that are already in the market. We come back to the slope of the supply curve of the publisher when discussing the relationship between author and publisher in section 3.4. Finally, the fact that the price of copies is higher when the publisher's share in total copies is higher is, not surprisingly, related to the relative prices of originals and copies.

An examination of the relationship between the *level of copyright protection and the gross profits* of publishers learns that gross profits increase up to the moment when copiers start making copies. Additional copyright protection will provide no further benefits because there are no competitors to exclude in this case but it does raise the price of copyright protection.

The most important welfare implications of this model can be summarized as follows (Landes and Posner, 1989: 343 - 344):

1. The optimal amount of copyright protection is higher for classes of work that are more valuable socially (the value of a work is defined here as the social welfare per work minus the cost of creating the work);
2. Increasing copyright protection above the optimal level leads to the production of more works, but to a lower welfare per work (as a result of higher fixed costs/higher administrative and enforcement costs) which results in a lower level of welfare.
3. If over time, growth in income and technological advances enlarge the size of the market for any given work, and the cost of copying declines, copyright protection should expand.

Our standard model suggests that copyright protection should indeed expand as a result of a decline in the marginal cost of copying and provides therefore support for the claim by copyright holders that copyright protection should be increased as a results of recent technological developments[12]. To make a full assessment of the desirability to expand copyrights, we need to compare the current copyright situation with the optimal level, as predicted by the model. Given the lack of empirical work in this area, this is an extremely difficult task.

In most Western countries, copyright protection has a duration of 70 years after the death of the author. Simple discounted cash flow calculations suggest that for most of this period future revenues are irrelevant.

3.3 But ...

The model developed by Landes and Posner (1989) gives an idea of the trade-offs involved in choosing the optimal copyright regime. A long list of authors have, however, criticized the assumptions of the standard model by pointing to the specific characteristics of the markets for information goods.

In this section we will discuss four of these characteristics: (i) the passage of time; (ii) the possibility that publishers internalize part of the value created by copies by charging higher prices for their originals; (iii) the use of price discrimination and other business strategies and (iv) the "superstar" phenomenon.

Many information is only valuable when it is new (e.g. newspapers, magazines and so on). Since copying takes time, this reduces the value of copies in markets for information goods where "time is money". The *passage of time* can be said to provide an additional layer of protection for the publisher and provides an argument for a reduced protection in these type of markets (Breyer, 1970).

[12] Koboldt (1995) determines the optimal copyright regime in a model with constant marginal cost of producing copies and imperfect substitutability between originals and copies. The model by Landes and Posner (1989) has increasing marginal cost of copies; imperfect substitutability is proxied by assuming that an original is equal to a number of copies. According to Koboldt (1995) this introduces an additional element of limit pricing by the incumbents. However, the model by Koboldt (1995) does not include the feedback mechanism caused by the costs of enforcement of the copyright system. We feel that Landes and Posner (1989) is a more appropriate model to represent the standard model.

Publishers might also anticipate the fact that copies will be made from their products and *charge a higher price for the originals* they produce, recognizing an opportunity to appropriate revenues from copying other than through the copyright system (Liebowitz, 1985).

Publishers can also use various business strategies to increase revenues (see also the General Framework) such as *price discrimination* to appropriate revenues from various market segments or at different points in time. The paperback version of the book that appears half a year later than the hardcover version, but you only have to pay half the price is an example of such a strategy. Price discrimination push copies "out of the market", and therefore reduces the need for copyright protection.

Finally, the model by Landes and Posner (1989) assumes that there is no uncertainty about the quality of a product. Adler (1985) shows that if consumption requires knowledge, a phenomenon might arise of "stars" (earlier, Rosen (1981) has termed this phenomenon the "*economics of superstars*"). If consumers can save on search costs by choosing a popular artist, patronizing him or her might be the optimal choice even though the quality of his work is similar to that of other artists. In markets with "superstars" the most popular artist has a degree of monopoly power that can take the place of copyright protection.

Compared to the standard model that was discussed in section 2, the four points of criticism listed above suggest a reduced need for copyright protection in:

- markets where "time is money";
- markets where it is possible for publishers to internalize the value of the original due to the possibility of copying;
- markets where price discrimination between market segments or over time is possible;
- markets that are dominated by "superstars".

3.4 Author and publisher

So far, we have assumed that the author acts as his own publisher. This is clearly an unrealistic assumption in many markets for information goods. Think of the (often conflicting) roles of musician and the music publisher, the author of fiction and his publishing house and so on.

Towse (1999) discusses the different incentives faced by authors and publishers and argues that the two might differ in (i) time preferences (ii) risk and (iii) reputation. Authors are likely to have a shorter time horizon, be more risk-averse and more

concerned with reputation than are publishers. Besides these differences, publishers tend to have more information about the chances of success of a new work being published. In other words, there is asymmetric information between author and publisher.

The distinction between author and publisher is important in order to estimate the impact of copyright legislation on the incentives to produce new work. As discussed in the economic model of copyright above, the price elasticity of supply is an important determinant of the number of works on the market. This is likely to be true for publishers but not necessarily so for authors who might have other motives such as "appear in print", producing good quality or reaching a wider audience. A side-effect of a too high level of copyright protection might therefore be that it simply redistributes revenues from authors to publishers and does not affect the incentive for authors in itself.

An important factor in determining the long run supply elasticity of new works is the contractual relationship between author and publisher. This relationship can take the form of royalties (where the author gets a certain percentage of the sales revenue), sometimes combined with a lump sum advance, or a buy-out. Where author and publishers share the risk equally in a royalty agreement, the system of buy-out shifts the risk to the publisher. A final option is that an author is the publisher of his/her own work (through the Internet, for example).

As suggested by Towse (1999) and in the discussion above, the pattern of contractual relationships in a specific industry might shed some more light on the supply elasticity for new works. As we have seen in the discussion of our standard model, if authors have little incentive to come on the market with substitutes for the information goods from the incumbent firm(s) this reduces the need for a high level of copyright protection. The consideration of the author-publisher relationship therefore provides an additional argument for a "low" degree of copyright protection.

3.5 Enforcement of copyright and piracy

The economic model discussed above assumes that the chosen level of copyright can be enforced at a certain cost to the publisher. In fact, the standard model assumes that in the optimum, copies will be driven out of the market.

In practice we observe that piracy, counterfeiting and bootlegging in many markets for information goods appears to be widespread. Representatives of the publishing industry use loss estimates to make this point and at the same time to plead for increased copyright protection.

The American Business Software Alliance (BSA), for example, claims that: "A new kind of crime, the illegal copying and distribution of software, movies, books and music over the Internet threatens US jobs. Piracy may take place on a single computer, but its effects ripple through the economy. An estimated 38 percent of all software programs used worldwide in 1998 was pirated, at a market value of $ 11 billion and a loss of 109,000 American jobs. (...) Without adequate copyright protection, thieves can pilfer software and other creative products at will and in staggering volume." (http://www.bsa.org/policy/copyright/intro_c.html) The response of the BSA and many other interest organizations of the information goods industries is to call for a wider scope for copyright legislation and increased levels of copyright enforcement (often at a supra-national scale).

Apart from the fact that exact figures about piracy rates are by definition unavailable, a careful study of the assumptions behind the revenue and job losses suggest that BSA has simply calculated the estimated number of pirated software programs and multiplied these programs by the retail price of these programs.

This method of calculation ignores the fact that a lot of the pirated software would never been bought in the first place were it sold at retail price, even when the publishers used some type of price discrimination scheme. Therefore the calculations by BSA and similar reports by other right holders overestimate the real extent of the lost revenues. (We will come back to this point when we discuss network effects in the next section.)

Besides the periodic "piracy reports" by representatives of the industry, there is unfortunately little serious empirical work on the (cost) effectiveness of alternative copyright regimes. If installing a copyright regime increases costs for publishers considerably, but does little or nothing to defer consumers from illegally using the information good under study, clearly the need for such a stringent type of copyright protection is undermined.

In a study about the effectiveness of international copyright conventions in the music industry, using international data for a cross-section of countries, Burke (1996) finds that the level of audio software counterfeiting is not influenced by the level of copyright protection. In other words, copyright conventions have not been effective in reducing counterfeiting. This result holds even when the duration of copyright convention membership and the specificity of the articles of the convention is taken into account. Burke (1996) concludes that the ‘extensive efforts and copious attention to detail by international legal experts are not sufficient to effectively curtail counterfeit activity and are indeed secondary in importance to the socio-economic environment in which these laws are applied.’

3.6 Discussion and conclusions

In this section we have introduced an economic model of copyright in the tradition of the law and economics literature. An economic approach to copyright regimes can provide insight into the factors that determine the optimal level of copyright protection and the related trade-offs. These insights might be helpful when deciding on the scope and length copyright should have.

A higher level of protection increases the number of works at low level of protection and decreases the number of works at high levels of protection. In the first case the additional revenues gross increase more than the additional costs of protection, where by assumption additional costs outweigh additional gross profits at high level of protection. Additional copyright protection leads to a decline in profits once copies are driven out of the market.

An, for our purposes, important implication of the model is that copyright protection should be expanded when the marginal cost of copies declines. This in line with the prediction made by other studies on the economics of copying and the economics of copyright (see Appendix 1 for an overview of these studies).

A number of authors have criticized the literature by pointing to a number of characteristics of markets for information goods and business strategies used by publishers in these markets. In markets where information has "news value" the need for copyright protection is lower than in the standard model, especially if copying takes time. This is also true for markets where the publisher can internalize part of the value of copies by charging a higher price of markets where the publishers uses price discrimination. In both cases, the publisher can appropriate part of the revenues of the information good which reduces the need for copyright protection. A final argument provided in the literature is that in markets where knowledge of the market is important, a single artist/publisher is often dominant. In markets characterized by "superstars", copyright protection is less important because most consumers do not know about substitutes for the products of the "superstar".

Besides these four points of criticism, the economic model also does not allow for a distinction between authors and publisher. The two may differ with respect to their time horizon, their risk attitude, the importance they attach to reputation and the information they have on their chances to succeed in the market. The distinction between author and publisher is important for the purposes since a higher level of copyright protection might lead to little or no incentive to produce more work by authors but merely to a redistribution of revenues to the publisher. This point further undermines the case for a high level of copyright protection.

Finally, the need for increased protection is often advocated by representatives of the publishing industry that show impressive losses in terms of revenue and employment. These estimates are generally overstating the true losses because they do not take account of the fact that piracy creates a new audience for information products which would normally not buy the goods at retail price. The little empirical work that has considered the effectiveness of copyright legislation suggest that, at least for the music industry, international copyright legislation is not very effective. This weakens the point for a strong level of copyright protection further.

Concluding, the discussion in this section suggests that an economic approach to copyright might be a useful way to examine the trade-offs in choosing the optimal copyright regime. Specific characteristics of markets for information goods and the effectiveness of copyright protection have to be taken into account when deciding on this level in practice. Based on our discussion of the literature, there is reason to assume that policymakers should be careful to impose a too high level of protection.

In the next two sections, we will argue that to assess the claim by representatives of the information goods industry that the scope of copyrights should be widened, a more careful study of the business strategies of publishers is needed. The traditional economic models of copyright are useful to illuminate the basic trade-off between underproduction and underutilization but at the same time make a number of simplifying assumptions that make these models inappropriate to assess the mentioned claim satisfactory, even when the mentioned points of criticism are taken into account.

One of the elements that is missing in the traditional models is the existence of network effects. As will be discussed in the next section, network effects are relevant in markets for information goods where consumers have a higher valuation of an information good when more consumers have bought it. Legal or illegal copies of an information good may add to the "network" of consumers of a certain good and therefore alter the basis trade-off described above. It can be shown that under certain conditions, illegal copying may be beneficial both for the profits of the firm and for social welfare.

Even without the presence of network effects, the claim for increased copyright protection that is based on the traditional economic models of copyright may be misleading because these models ignore the fact that a decrease in copying and distribution costs offers opportunities for publishers to engage in the business strategies which were described in the General Framework or re-position themselves as intermediaries in the information economy. Ignoring these type of business strategies may lead to a call for over-protection where it is not in the interest of the consumer. We will discuss these strategies and their implications further in section 5.

4. Copyright in markets with network externalities

Besides the characteristics of the market and the existence of network effects, the standard model ignores the fact that the decrease in cost of copying also provides new opportunities for publishers. This section describes potential business strategies that publisher might engage in and describes alternatives to copyright protection such as contractual and technological layers of protection, that help publishers appropriate revenue from their information goods.

4.1 Introduction

So far, we have only discussed copyright regimes in markets for information goods that have no hardware-software characteristics or network effects. The trade-off for policymakers might be quite different from that in "traditional" markets when network effects are present. In this type of markets, publishers take account of the fact that creating a large market shortly after the introduction of a new good creates a higher willingness to pay for the product in the following periods (see also the General Framework). As a result, publishers use aggressive strategies to obtain a higher market share especially in the case that they are competing for a monopoly standard (as in the case of so-called "tippy" markets).

The trade-off between the incentives for authors/publishers and monopoly profits is affected when copies can be made and bought, especially if copyright protection is imperfect. Illegal copies can be an additional way to increase the market size and thereby the interchangeability of, for example, software. This, in turn, might lead to a higher valuation of (legal) products.

In section 4.2, network effects will be defined and various related concepts will be discussed.

4.2 Network effects and related concepts

Economides (1996) defines a network externality or positive consumption externality as an externality that causes the value of a unit of a good to increase with the number of units sold. A distinction can be made between *direct* network externalities that are created through the direct effect of a number of buyers on the quality of the product and *indirect* effects that are caused by things such as the greater availability of complementary goods when the network of buyers increases[13].

[13] See Liebowitz and Margolis (1994) for a critical appraisal of the literature on network effects.

Liebowitz and Margolis (1994) show that the consequences of internalizing direct and indirect network effects are quite different. Indirect network effects generally are pecuniary in nature and should therefore not be internalized by the producer because, in that case, they impose deadweight losses. When we refer to network effects or network externalities in the remainder of this study, we refer to direct or non-pecuniary externalities.

Another classification of network effects is given by Bensaid and Lesne (1996). These authors mention three type of network effects:

- *metaphorical network externalities:* these arise when the users of a good benefit from the same additional services and common expertise;
- *"word of mouth" externalities:* these arise from the fact that when a product has more users more information about its quality becomes available so search costs are lowered and reservation prices are increased. This type of externalities seems to be especially relevant for information products where the quality cannot be learned by a superficial inspection of the product (e.g. experience goods).
- *learning by doing externalities:* these originate from the fact that when a product has more consumers the quality of the product is likely to be improved by further updates. This type of externality is particular relevant in the software market.

After the introduction of a new product into a market with network externalities, consumers base their decision whether or not to adopt the new product on both the stand alone benefits (which are likely to be larger for the new product compared to the old product) and the network benefits (that are likely to be larger for the new product compared to the old product). In many instances, the adoption of a new product is hindered because of incompatibility of the new product with the network of the old product even though the adoption of the new product might be welfare enhancing (the literature on adoption includes amongst others Farrell and Saloner (1985), Katz and Shapiro (1985; 1986), Choi and Tum (1997) and Economides (1999)). This phenomenon is called *excess inertia*.

4.3 Network effects and copyright

The introduction of any type of network effects in a market for information goods where copying is possible, changes the basic trade-off for policymakers in setting the copyright regime. Analytically, we can make a distinction between a static and a dynamic environment.

In a *static* environment - see for example Conner and Rummelt (1991), Takeyama (1994) and Shy and Thisse (1999)) - the introduction of network externalities implies

that the size of the market positively influences the willingness to pay of individual consumers to pay for the information good. The monopolist publisher will of course take account of this characteristic of the market when deciding on the price for the information good.

The implication of network effects can be illustrated when one considers how different levels of copyright protection will influence the outcomes in the market. Reducing copyright protection will result in more (illegal) copying. However, if the network effects are strong enough to substantially increase the valuation of consumers when copyright is reduced and enough pirates start using copies a decrease in copyright protection can lead price and profits for the publisher to rise. The exact nature of the result will therefore depend on the relationship between the size of the market and the willingness to pay of consumers, the degree of quality difference between originals and copies and the size of high valuation consumers vs. low valuation consumers.

The static models of markets for information goods with network effects suggest that the optimal level of copyright protection is typically lower in markets with network effects than in other markets. Reducing copyright protection might enhance profit and welfare under certain conditions (see Takeyama, 1994). A too high level and scope of copyright protection, based on the traditional model might therefore hurt welfare.

Considering the same issue in a *dynamic* context, makes it possible to study the adoption path of new information goods and the pricing strategies of publishers over the life cycle of the information good (e.g. Takeyama (1997)).

Willemsen en Hakfoort (1999) are the first to examine network externalities in a two-period model of copying. They assume that a profit maximizing monopolist produces a durable information good that exhibits network effects. Consumers, who differ in their valuation of the quality of copies, can either (i) buy an original in the first period; (ii) wait and buy an original in the second period or (iii) buy/make a copy in the second period. It is assumed that there is a linear relationship between the size of the market (including copies and taking account of the fact that the information good is durable) and the valuation of the information good and this valuation differs among consumers over a continuous range. Based on this, three regimes can be distinguished.

In the first regime, the market is divided up between consumers that buy originals in the first period and consumers with a lower valuation that buy copies in the second period. In the second regime, there are three groups of consumers (depending on their valuation): consumers that buy a original in the first period, consumers that buy an original in the second period and consumers that buy a copy in the second period. In the third regime, there are only consumers that buy originals in the first period. The

monopolist chooses which regime is relevant by setting his price for originals in the first and the second period. This choice is based on the strength of network effects, the difference in quality between copies and originals and the size of the intertemporal discount rate.

An increase in the importance of the network effects will lead the monopolist to increase his price in both the first and the second period. This will in turn lead to higher profits for the publisher. An increase in the quality of copies will lead the publisher to decrease his price in both the first and the second period leading to a decline in the discounted value of profits. Finally, an increase in the discount rate will lead the publisher to increase his price in the first and the second period. The effects on profits are ambiguous in this case and dependent on the relevant regime.

Although the paper does not address the issue of copyright protection directly, the paper by Willemsen en Hakfoort (1999) shows that the existence of network effects leads to a different price-setting behavior by the monopolist and as a result a different adoption path of the information good. Improved technology of copying (or cheaper copies) will erode the profits of publishers despite the fact that they will try to lower prices to keep the market share for originals. Again, the adoption path of the information good is affected.

4.4 Implications for copyright protection

Perhaps the best example of a market for information goods that is characterized by network effects is the market for software. In this market, consumers benefit both from the direct and the indirect benefits of a larger market for the product. The direct network effects result from the possibility of being able to exchange programs based on the software while the indirect effects arises from the greater availability of complementary goods such as user guides. In the classification of Bensaid and Lesne (1996), software is also characterized by metaphorical network externalities and learning-by-doing externalities.

The existence of network externalities in the market for other information goods is less clear. However, one can argue that information goods such as books, CDS and movies experience what Bensaid and Lesne (1996) call "word of mouth"externalities. In this case, the fact that more consumers have read a certain book, listened to a certain CD or went to see a certain movie provides more information about the quality of these experience goods (see also the related literature on "herding") and therefore increases the value of this good to the consumer. Word of mouth externalities might, for example, arise in markets for "superstars" where costs are incurred by consumers when they search for a product they like.

In markets with network effects that are also characterized by hardware-software standards, firms that compete for standards (such as Betamax vs. VHS or MS-DOS vs. Macintosh OS in the past) do in fact compete for a monopoly in the future. This will lead them to employ a number of sometimes aggressive strategies as described in the General Framework. When markets "tip" to one standard (such as in the case of MS-Windows), the winning firm in fact already obtains a monopoly on this standard. Employing a too high level of copyright protection might in this case lead dynamic inefficiency by preventing future competitors from entering the market either by reducing the level of innovation or by "trapping" an industry into an obsolete or an inferior standard.

In summary, when considering the impact of network effects on the optimal level of copyright protection policymakers need, again, to examine the nature of the market at hand. In markets such as the market for software and markets that exhibit "word of mouth" externalities, one must be careful not to impose a too high level of copyright protection. According to Menell (1998) "copyright law should not stand in the way of competitors seeking to develop interoperable computer systems and products." Menell (1998) argues that the analysis of whether copying is fair use should be based on the market realities at the time of competition. Going beyond this level of copyright protection "would risk extending monopoly power well beyond what is needed to encourage innovation, undermine the realization of network externalities, and impede innovation in complementary markets."

The fact that markets exhibit network externalities has implications for the optimal level of copyright protection. An important conclusion from the literature is that a too high level of copyright protection in these markets has negative welfare effects even if a certain amount of copies are made illegal because it can cause underutilization.

5. The changing role of publishers

5.1 Introduction

In the previous sections, we have discussed the characteristics of the optimal copyright regime in the case that policymakers choose to solve the underproduction problem by allocating property rights. But is it really necessary for the government to intervene at all?

The models that were discussed in section 3 and 4 tend to ignore the fact that the decrease in the cost of copying might also lead to lower cost of distribution and marketing of information goods. This means that developments in copying technology do not necessarily leads to a disincentive for publishers to put new works on the market

(as predicted by the standard model); these developments also offer opportunities for publishers to engage in new types of business strategies.

The incumbent publishers have reacted to the developments in copying technology in two ways. First, publishers have (increasingly) engaged in business strategies that make use of the decrease in marketing and distribution costs. These strategies are described in section 5.2. Second, publishers use contractual and technical devices to enable them to appropriate (more of) the revenues of their content and thereby to solve the underproduction problem. Section 5.3 overviews these strategies for the markets for music, books and software. Section 5.4 discusses the policy implications of these two lines of strategies and section 5.5 concludes.

5.2 Making use of lower copying and distribution costs

While traditional economic models of copyright stress the disincentive caused by a decrease in the costs of copies for the publisher to produce new works, these models do not take account of the fact that decreased costs of copying and decreased costs of distribution also offer opportunities for producers of information goods.

This allows the publisher to make use of a number of business strategies mentioned in the General Framework (see also Shapiro and Varian (1999)) such as:

- *give away free samples:* this strategy makes use of the "experience good" nature of the information good. By allowing potential customers to experience (part of) the information good, they are able to advertise their products through media such as the Internet in a much more efficient way, reaching a wider audience and creating demand for the hard copy product;
- *versioning:* the digital reproduction of content makes it easier on the one hand to copy the product, but on the other hand allows the original publisher to price discriminate more effectively between different groups of consumers by selling a version for "dummies", a "light" version, a "family" version and a "luxurious pro" version of their product.
- *selling complementary products:* by digitally interacting with consumers, the publisher can sell complementary products more easily.

It is not clear from the outset that the decrease in copying costs will cause a problem of underproduction as implied by the basic model. A number of examples from the history of information goods gives credence to this point[14]. With the arrival of the circulation

[14] See Shapiro and Varian (1999).

library in 18th century England, the complaint was raised that the availability of cheap copies would hurt the market for originals directly and that the incentive to produce new work would be affected. Contrary to these expectations, the wider availability of books opened up the market for an audience that was not able to enjoy books before. The demand for content increased as a result.

At the time of the introduction of the xerox machine there were similar doubts about the impact of the availability of cheap copies on the demand for originals. Again the complaints that were raised by the industry were proved wrong by the market. If there was a noticeable effect on the demand for originals, it was a positive one. Finally, the introduction of prerecorded video tapes in the 1980s created a larger demand for movies in stead of the opposite. In economic terms, the introduction of cheap copies allowed the movie companies to employ effective price discrimination and cater to the demand for "repeat-view".

All these examples indicate that the availability of cheap copies did not diminish the demand for the originals by publishers. Rather, it opened up a whole new audience for the information good.

Simply assuming that the markets for information goods operate in a similar way to markets for physical goods - with corresponding business strategies - might lead to overemphasize the losses caused by improved copying technology for the publisher and a demand for increased protection which might be unwarranted (Boyle (1997)). A more likely view than the one proposed by the basic model in which the incentive to produce new work will diminish is that the industry adapts to an environment in which the costs of copies and distribution decrease and uses appropriate strategies to adopt a new role.

Incumbent publishers are also forced to adjust to the new circumstances because the decreased cost of distribution and marketing have lowered entry barriers to the market considerable. In the market for music, for example, artists such as Public Enemy and Anna DiFranco have already started publishing their own music through the Internet in order to keep maximum control over their products. According to these artists, this enables them to publish more work than if they would sign with a music publisher that maximizes revenues. If this trend towards disintermediation continues, music publishers (and publishers in other markets for information goods) will have to re-invent themselves to be able to still create value added.

5.3 Alternative protection mechanisms

Besides employing business strategies to adjust to the new environment, publishers also use alternative protection mechanisms such as contractual agreements and technological devices to appropriate more of the revenues of their content. We consider the use of new business strategies and the two alternative protection mechanisms in the markets for music, books and software.

For **music**, i.c. CDs, the availability of digital copying techniques such as MP3 has made it possible to download music from the Internet. MP3 is easy to use and allows consumers to choose beyond the album format; they can pick any song they like and download it. According to Jones (1999): "Since MP3 opened the floodgates and showed people how easy and flexible digital music downloads can be, the record industry has faced a big challenge in creating a system that matches MP3's ease of use *and* controls distribution and copyrights."

Another challenge to the music publishing industry is the wide availability of re-writeable CD-ROMS that also can store music files. CD-Rs can be bought for a few guilders and can store a lot of music. According to Inen (1999), this has created a whole piracy "industry" where new CDs are copied and then sold to friends and colleagues. The Dutch band *De Kast*, for example, claims that illegal copying of their CDs reduces regular sales by about 40 %.

The reaction of the music industry and their copyright collectives has been twofold. First, the industry and copyright collectives are using new techniques to detect illegal copying over the Internet. In the US, for example, this has led to the conviction of a number of offenders (in most cases students) who were posting MP3 files on the Internet (often from the campus of their university (Sullivan (1999)). Possible violations can be detected by the heavy data exchange that is needed from the server.

Second, the industry is trying to develop new business strategies that take advantage of the new technologies. One of these strategies is to develop a safety standard that protects MP3 files (and files in other formats) from being illegally copied. The problem at the moment is that the industry is still working out which standard to choose from the 20 competitors or so that propose a new standard. Similar to the downloadable MP3 files, the system also has to be interoperable so that the files can be played at a MP3 player and it should be easy to use (Sullivan (1999)). Besides the development of a new standard, record labels are in the process of using digital rights management systems that allow them to securely distribute and track files as they are transmitted over the Internet and to the portable players.

As already mentioned, the possibility of singer/songwriters to sell their material via the Internet suggests that markets can be entered without the use of the marketing, advertising, retail and distribution efforts of a music publisher. Some successful artists who have already used this venue to sell their music are David Bowie, Public Enemy (who even provide their songs for free) and Anna DiFranco[15].

Against this background, the most likely new role of music publishers will be to reduce search costs by offering a complete catalogue of music files on the Internet and to use their expertise of the market to develop new talents (see also Inen (1999)).

In the market for **books**, the main impact of new digital technology has been (i) the reduction in pre-press costs - authors can now hand in digital text or data files which can be easily manipulated - (ii) the possibility to use new business strategies to market and distribute books (e.g. through the Internet). Providers such as amazon.com provide search options for the customer, inform the customer of new books on topics of their interest, reward frequent customers with vouchers, and so on. Initiatives to distribute novels in digital form have so far not been very successful.

Compared to the music and the software industry, the changes in the market for book publishers have not affected the basic trade-off in how to set the level of a copyright protection. One can argue whether the market for books exhibits "word of mouth" externalities as mentioned in the classification of Bensaid and Lesne (1996) but this effect in unlikely to be strong. (Although there is the example of the two textbook authors who bought a million copies from their own book, making it to the tops of the sales list, and consequently sold an unheard amounts of books (Monteiro and Moraga-González, 1998)). The main changes in the market structure of the industry will occur in the production of the book and in the distribution channel, where digital bookstores such as amazon.com and barnesandnoble.com have become serious competitors for physical bookstores.

The market for **software** has been affected by the decrease in the cost of copying. Piracy of software is estimated by the Software Information Industry Association (SIIA, 1999) to be around $ 11 billion in 1998 for business application software around the world. Piracy is as high as 87 % in Bolivia and El Salvador, 93 % of in Russia and other former Soviet States, 95 % in China and 97 % in Vietnam.

[15] In the case of David Bowie, the sale of his new CD in the autumn of 1999 on the Internet before it went to the shops was met by the Dutch music retailer Free Record Shop by a ban on the sale.

As in the case of the music publishing industry, software publishers have turned away from the traditional copyright protection system and towards alternative means of protecting their rights: (i) licenses and contracts on copyright and (ii) technological devices to protect software from copying. After buying the software users agree to a contractual relation with the software publishers by opening the package in which the software is wrapped or by clicking a button with "I agree" (the so-called "wrap" and "click" licenses). An alternative way of rights management is to use technological devices such as periodically renewable passwords, digital watermarks and devices that only allow a limited number of copies for personal use. The latter option depends less on the enforcement of the system. However, experience shows that technological devices for the protection of software are often the subject of "hacking".

The software publishing industry is the ultimate example of how the new business strategies described in the General Framework can be used in the digital age: giving away free content and samples, versioning, selling complementary products are all used in this market.

Table 1 compares the three markets with respect to the existence of network externalities, the use of technological devices as an alternative to copyright protection and the use of contractual devices as an alternative to copyright protection.

Table 1 *Use of technological and contractual devices in the markets for music, books (novels) and software*

	music	***novels***	***software***
network externalities	maybe ("word of mouth" externalities)	maybe ("word of mouth" externalities)	yes
use of technological devices as an alternative to copyright protection	yes, digital watermarks (planned: SDMI and digital right management systems)	no	yes, digital watermarks, renewable password, limited ability to copy
use of contractual devices as an alternative to copyright protection	no	no	yes, licenses and contractual agreements

The market for novels is the most traditional market for information goods of the three, in the sense that this market still relies on copyright legislation and not on other protection mechanisms. This could change, however, if downloadable books become more popular.

In the market for CDs technological devices are employed as an alternative for copyright protection. These include devices such as digital watermarks. The industry is planning to (further) develop digital right management systems that may take the place of the copyright legislation system. If the market for music exhibits network externalities, they are of the "word of mouth" variety; this is however debatable. For this market, the underproduction problem is (partly) solved by the technological devices that solve the non-rivalry character. The decrease in the cost of copying and distribution has lowered the entry barriers to this market, which takes the place of the copyright system in solving the underutilization problem by "keeping pressure" on incumbent publishers.

Finally, the market for software is characterized both by the use of technological and contractual alternatives for the copyright system. This market also exhibits network effects. In this market, the copyright system has really been reduced to "protection of last resort".

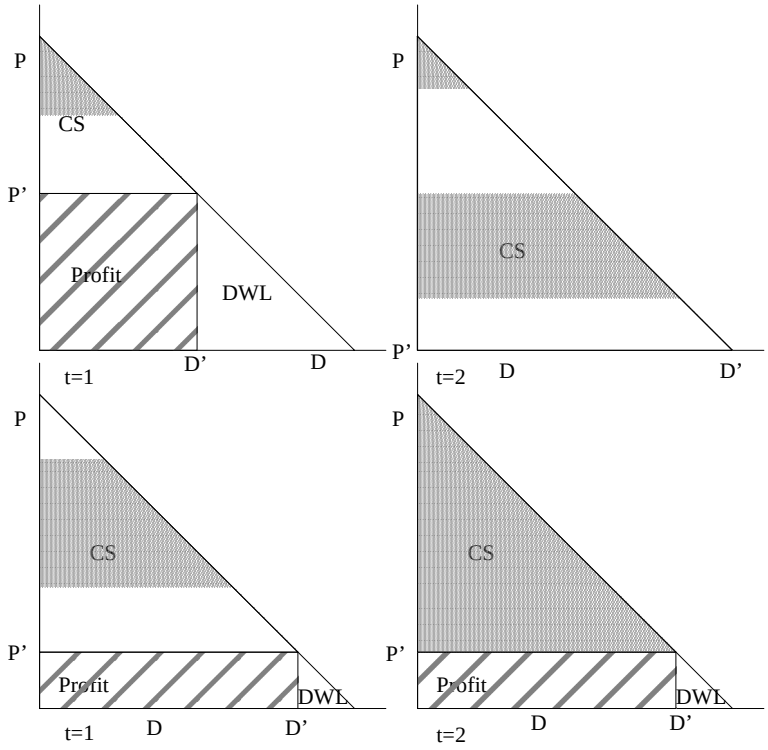
5.4 Policy implications of the changing business strategies

The developments in the markets for music and software show that publishers in these markets increasingly turn to other means of protection for their rights than the traditional copyright legislation. The use of technological devices in the music and software market and the use of licenses and other contractual agreements in the software markets ("code" and "contract") have the potential to make copyright and its statutory limitations redundant (Hugenholtz, 1996).

Is there a reason to fear that the private means of protecting rights (contractual agreements and technological devices) will be too restrictive if left to the incumbent publishers?

To address this point, we must consider the situation where publishers are at liberty to set their own terms and conditions for the copyright regime. In that case, they implicitly or explicitly make a trade-off between the quantity of sales and the revenues (excluding illegal copies) from sales. An important point to recognize is that relaxing the terms and conditions of use of the information good might increase the value of the good to consumers and hence their willingness to pay. Allowing "home use" of software, for example, besides "office use" might lead to a higher valuation of a software program. Extending the period of use has the same effect.

Figure 1.1 (based on Gilbert and Shapiro (1990))



In Figure 1.1 below we illustrate the trade-off between the scope of protection (e.g. the fair use conditions) and the length of protection[7]. It is assumed that there are two periods, that demand is linear and that marginal cost is zero. In figures 1.1 and 1.2, it is assumed that copyright holds for only one period, but that the scope of copyright is extensive. By extending the length of the copyright period, but reducing the scope, welfare is increased but the total profit of the producer is left intact. The implication of this is that producers might well be indifferent between outcomes that maximize social welfare and those that do not.

An implication for government policy is that one must be careful that the alternatives to copyright protection chosen by firms are not too restrictive. In the case that the incumbent firms develop a standard that is not available to potential entrants (e.g. a new standard for the distribution and play of music files) there is also a possible case for competition policy.

But what about the level of copyright regime? Should this be adapted as a result of the new business strategies in the markets for music, books and software? Above we have argued that the demand for strong(er) copyright protection is weakened by a number of characteristics of markets for information goods and the adoption of network effects.

Compared to the standard model, the role of copyright protection is further reduced when we consider the business strategies that publishers employ in the markets discussed above. Formal copyright legislation is still important, but often acts as a "protection of last resort". According to Menell (1998): "the limitations of traditional copyright law may be of little significance as a result of new opportunities to circumvent copyright law through technological and contractual means". After technological devices and contractual agreements have failed, publishers can turn to the legal system.

Although its formal role may be diminished, copyright law will continue to play a useful indirect role in enhancing the appropriability of investments in markets such as that for software. However, a too strong protection of the "right of use" might give publishers an unnecessary lead because competitors or potential entrants cannot profit from interoperability with these standards. This is particularly true for markets with network effects (such as software). This, in turn, can impede innovation and possibly lead the industry to adapt an inferior standard.

Finally, the public debate about copyright in digital age pays surprisingly little attention to enforcement costs - that were included in the standard model discussed in section 2 - and the distribution of these costs. The use of the Internet as a distribution channel has decreased the costs of copying and distribution, but has also led to a lower costs for the detection of larger piracy operations (Shapiro and Varian, 1999). There are other reasons to assume that there are natural bounds to the level of piracy. In markets where "news" is important, for example, potential consumers of illegal copies lose interest after a while.

6. Summary and conclusions

In this case study, we have investigated the claim made by representatives of information goods industry that, in an era with decreased costs of copying and an increased quality of copies, copyright protection should be extended and time and money spent on copyright enforcement should be increased. The hypothesis that the increased attractiveness of copies provides a disincentive to produce new work is supported by the standard economic model (based on Landes and Posner (1989)) that was discussed in section 2.

A more careful look at the characteristics of the markets for information goods learns, however, that many of these markets have characteristics that makes competition between originals and copies irrelevant or that publishers can internalize part of the revenue created by copies. In markets that are characterized by network effects, copying can be both profit and welfare enhancing. In all these cases, increasing copyright protection has either no or adverse effects on welfare.

The standard model does also not take account of the fact that the decrease of copying and distribution costs might also provide new opportunities for the publishing sector. We have discussed various business strategies that publishers might engage in, to take advantage of the decrease in cost. It is not clear beforehand that the decrease in cost will hurt the profits of publishers although they might have to make them to reconsider their role in the value chain. Again, this point suggest that policymakers should be careful to increase the level of copyright protection.

Finally, we have discussed the issue of the relevance of the copyright system versus other methods of rights management. According to some observers, traditional copyright protection becomes redundant in the digital age and will be replaced by "contract" (such as licensing agreements) and "code" (technological devices that provide publishers discretion in setting the length and scope of copyright protection) as enforcement of copyright protection becomes more difficult and costly. The use of contract and code makes it possible for publishers to make goods rival, solving the latent market failure that is the result of the high fixed - low marginal cost characteristic combined with the non-rivalness of information goods. Copyright legislation remains "protection of last resort".

All this suggest that the claim for an increased level of copyright protection is not warranted. Rather than increasing copyright protection even further, policy makers should pay attention to the adverse side-effects of these type of restrictions on the efficiency of markets for information goods.

An important policy lesson from this study is that, for markets that experience network externalities (such as the software market), copyright legislation or contractual agreements should not be too tough on the "right to use". This might give incumbent firms an unnecessary lead because potential entrants cannot profit from interoperability; this can hinder innovation and lead to the adoption of an inferior standard.

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Appendix 1: Economic models of copying and copyright

	substitutability of c-copies	***cost of c-copies***	***welfare effects***	***remarks***
Novos & Waldmann (1984)	perfect	varies across consumers	Underproduction is reduced but no support is given for under utilisation	Producer decides over quality.
Johnson (1985)	perfect	varies across consumers	In the short run the consumers surplus increases and profits decrease unambiguously by copying. But lower profits prevent the production of new information goods	Product differentiation explicitly modeled
Landes & Posner (1989)	perfect	increasing	Welfare per work is increased but profits decrease. So the long-run welfare effects are ambiguous	
Phetig (1988)	imperfect	below those of o-copies	Welfare effects are ambiguous	
Koboldt (1995)	imperfect	constant and above that of o-copies	Copyright will increase profits and lower the consumers' surplus in the short run. Up to certain level of copyright, protection enhances total welfare but after this level has been reached welfare will decrease. A minimum and maximum level of protection can be found in between which the optimum is located.	For some levels of copyright protection the producer uses limit prices.

Takeyama (1997)	imperfect	constant; may or may not be equal to that of o-copies.		Two consumer types focusses on the intertemporal aspects
Besen & Kirby (1989)	perfect or imperfect	constant or increasing	With constant marginal cost, copyright reduces the consumers' surplus and increases profits. Total welfare effect is undetermined. When marginal cost of c-copies are increasing welfare effects depend on crucially on relative costs. Generally the producer is able to appropriate some surplus of c-copies the consumers. Long run effects not considered.	Copies are shared Deals primarily with the short run
Bakos & Brynjolfsson & Lichtman (1999)	perfect or imperfect	All marginal costs are equal to zero		Copies are shared among consumers. The number of users that share an o-copy is determined exogenously.

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Abstract

The falling marginal costs of copying and the improving quality of copies has led the industry to call for additional copyright legislation and enforcement. The claim for increased protection is not as valid as it appears.

First, in many markets for information goods competition between originals and copies is virtually non-existent or publishers can internalize part of the surplus created by copies. Second, in markets that experience network effects, both publishers and consumers might benefit from copying. Finally, publishers can use the decrease in costs to engage in (digital) business strategies such as giving away free samples, versioning and selling complementary products.

The case for increased protection is further undermined by the fact that information goods industries often use market solutions, such as contractual agreements and technological devices, to protect their content. The challenge for policy-makers is to design a modern, flexible copyright regime that balances the interests of publishers and consumers. An extension of protection does not seem to achieve this goal.