

# The Economics of Copyright and Digitisation:

A Report on the Literature and the Need for Further Research



Providing Government with strategic, independent and evidence-based advice on intellectual property policy.



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STRATEGIC  
**ADVISORY BOARD**  
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Intellectual Property Policy, and carried out by**

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## Executive Summary

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The Strategic Advisory Board for Intellectual Property Policy (SABIP) has commissioned this report in order to inform its research agenda. The report undertakes a critical overview of the theoretical and empirical economic literature on copyright and unauthorised copying. On the basis of this literature, this report also identifies the salient issues for copyright policy in the process of digitisation, and formulates specific research questions that should be addressed to inform copyright policy.

Economists' theoretical work on copyright has generated a general framework in which to study the effects of copyright on social welfare. The literature identifies a number of costs and benefits associated with copyright. Digitisation is likely to affect the balance struck by existing copyright arrangements and empirical research is needed to capture the implications for the desirable level of copyright protection. So far, empirical studies provide partial answers at best but they may provide useful templates for further research. Progress seems possible, especially if better data becomes available.<sup>1</sup>

This report highlights two issues which are in particular need of further research in order to inform copyright policy:

1. How does digital copying affect the supply of copyright works?
2. Does the copyright system entail obstacles to desirable aspects of technological transition?

### ECONOMIC THEORY AND COPYRIGHT

Part I of this report surveys the theoretical literature on the economics of copyright. Copyright endows creators with temporary exclusive rights to their original creations – the rough equivalent of property. In practice, most of these rights are bought and commercialised by intermediary firms such as publishers.

Economic analysis is a tool to establish whether copyright achieves clearly defined, measurable objectives without excessive unintended consequences. The economic literature addresses copyright as a means of raising the supply of protected works closer to a socially desirable level. The focus is on total social welfare including user and consumer interests in access to a diverse supply. This contrasts with the natural rights argument for copyright, which emphasises a self-evident right of the creators in the output of their work. Yet, the economic perspective is not necessarily incompatible with natural rights arguments, as long as two points are accepted: first, copyright is not unconditional but subject

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<sup>1</sup> *Improving the quality of and access to data is, in itself, a matter that warrants attention from policy-makers.*

to trade-offs with other objectives and values, for example competition in the market; second, copyright has a clear purpose and it is worth discussing whether this function is carried out efficiently.

### Trade-offs and the need for empirics

A first essential insight of the economics of copyright is that copyright relates to a trade-off. On the one hand, standard economic theory predicts that in a free market, fewer creative works would be supplied than would be socially desirable. A copyright system may mitigate this problem. On the other hand, economic analysis implies that, like any statutory intervention, copyright entails costs in addition to its intended benefits. An important aspect of these costs is that copyright restricts the use of protected works, including use for follow-up creations. This leads to an underproduction-underutilisation trade-off, which various strands of economic theory specify differently. Standard welfare economics discusses market failures due to the characteristics of copyright works as quasi-public goods and the market power of copyright holders. A property rights approach takes the desirability of unambiguous property for granted and focuses on the reduction of transaction costs in order to approximate an efficient market outcome.

The justification of copyright and the specification of the desirable level of copyright protection bring up a complex question: what is the relation between the social benefit from bolstered supply due to copyright protection on the one hand and the access costs, administration costs and transaction costs that a

copyright system entails on the other? The answer requires a sense of proportion regarding the various costs and benefits that pure theory cannot deliver. Therefore, it is an empirical question whether a specific copyright system offers a net welfare gain under specific market conditions.

Though there are limits to pure theory, the theoretical literature on the economics of copyright does provide a foundation for empirical research and a number of useful further insights.

### Short-run and long-run effects

The short-run and long-run effects of copyright may differ substantially. In the short run, copyright benefits rights holders at the expense of users. In the long run, the benefits associated with any additional supply due to copyright protection may more than offset the access costs of users so that copyright *may* offer a net welfare improvement for all stakeholders (i.e. a Pareto improvement).

This long-run perspective provides no comprehensive, general case for copyright, however. Because users include follow-up creators, copyright is not unequivocally beneficial to creators and excessive copyright protection could even diminish the supply of copyright works. Even if one were to disregard consumer interests – for example in some natural rights perspectives – an efficient copyright system still has to strike a balance between divergent interests.

## Alternatives and criticisms of copyright

Economic theory suggests that a copyright system could provide an improvement in markets for quasi-public information goods. Recent contributions to the literature discuss a number of alternatives and criticisms of copyright, however.

One criticism of copyright is based on the notion that unregulated markets would eventually bring up business models that mitigate any harm from unauthorised copying. Suggested market solutions include first mover advantages, joint sale of complements, versioning, indirect appropriability and price discrimination or even network effects.

It has also been argued that alternative types of statutory intervention may be more efficient. Alternatives discussed in the literature include levies on copying technology, direct subsidies, or stipends and awards. All of these alternatives are problematic because they replace the market mechanism with central control at least in part. Nevertheless, considering persistent problems with copyright systems in many markets over recent years, some of these alternatives have been receiving greater attention.

Furthermore, many authors take a copyright system as given and discuss its shortcomings with a view to making gradual improvements. On this level, a first point of criticism is that copyright may not provide strong incentives to creators either because creativity is intrinsically motivated or because the bulk of copyright-related income goes to intermediaries. Second, copyright may inhibit the contestability of regulated industries and restrict technological change. Third, existing copyright

systems tend to provide standardised solutions for a wide range of heterogeneous goods and markets. Economic theory suggests that the efficient level of copyright protection differs according to product characteristics, but more flexible systems will generate greater transaction costs due to the additional complexity involved. There is thus a constant trade-off between flexibility and transaction costs, and the particular balance struck has been criticised.

## The effects of digitisation

The relative weight of the costs and benefits of copyright will change with changing market conditions so that the desirable level of copyright protection is likely to vary over time. It is certain that digitisation will continue to alter the cost structure and demand for many copyright works and that new related products and services will emerge. It is not exactly clear how this process is playing out and how it is affecting the desirable level of copyright protection.

Advances in copying technology play a central role in the economic literature on copyright. The diffusion of digital copying technology may be qualitatively different from previous advances in copying technology because the variable costs of generating and disseminating unauthorised copies are approaching zero.

There is a tendency in economic research on copyright to abstract from the broader implications of digitisation that play out in parallel to the diffusion of digital copying technology and to sideline induced technological change (adaptation). The potential for user innovation concerning new ways to disseminate and present copyright works is

rarely incorporated into the analysis. Where the potential for industry adaptation and user innovation in markets for copyright works is ignored, there may be a bias in favour of greater copyright protection.

### **The general approach to assessing the economic effect of copyright**

With the exception of authors in the field of law and economics, economists have usually been interested in the principles behind copyright rather than the details of the law. This approach has led to the development of a general framework in which to study the welfare effects of changes in the strength of copyright protection. Copyright strength has various dimensions, including the duration of rights, fair dealing exceptions, or the level of enforcement. The same set of questions arises whichever aspect of copyright systems is examined: first, what is the immediate effect on supplier income and user access? Second, what is the effect on supply of copyright works and innovative use over time?

An advantage of this general framework is that it can be applied to study the diverse range of markets regulated by copyright, without requiring changes to the basic principles of the investigation.

Overall, the economics of copyright has come a long way towards identifying the various effects of copyright protection and unauthorised copying on supplier profits and total social welfare. The theoretical literature does not however support general conclusions on the welfare effects of unauthorised copying independent of detailed knowledge on the market. Nor does it support specific conclusions on how to arrange the various aspects of copyright systems. Theory provides a

framework for assessments but it cannot replace empirics.

### **EMPIRICAL STUDIES ON THE ECONOMIC EFFECTS OF COPYRIGHT**

There is a need for empirical research because theory does not provide solid guidelines for copyright policy and digitisation is challenging old certainties. In recent years, a number of empirical studies have been undertaken and part II of this report surveys this literature. A large part of the empirical literature addresses the effects of unauthorised, digital copying.

### **The effects of file-sharing on the market for sound recordings**

Many empirical studies have addressed the short-run impact of file-sharing on revenues in the primary market for sound-recordings. While the majority of studies obtain a statistically significant negative effect, this is not a universal result and effect sizes scatter widely. A central problem is that the available data is of limited quality. Further studies seem desirable, in particular covering the UK.

Arguably, it is more important that future empirical efforts venture beyond the question of whether unauthorised copying harms the record industry as a whole. The few studies of digital copying that incorporate the benefits to consumers find that total social welfare has improved because benefits to consumers exceed the drawbacks to rights holders.

The central empirical question is whether over time the supply of copyright works diminishes because of unauthorised copying. This issue has not received much systematic attention.

### **The strength of copyright protection and the supply of copyright works**

According to the theoretical literature, the net effect of copyright on the supply of protected works is not entirely straightforward. Historical investigations of copyright's effect on authors' supply of works rarely support the view that copyright promotes either the number or the quality of works supplied. A few recent studies have addressed specific changes in the strength of copyright protection and their impact on supply. These studies have found no evidence that copyright term extensions or the diffusion of digital copying technology (that diminish the de facto strength of copyright protection) have affected supply significantly.

Econometric studies concerning the supply of copyright works face substantial difficulties. Data restrictions are a recurrent obstacle to robust quantitative research on copyright industries and decent data on the supply of copyright works is particularly hard to come by. It is also difficult to isolate the effects of changes in the copyright system and to address the potential for lagged effects. Furthermore, it is hard to assess the diversity and quality of supply, rather than just the sheer number of publications.

### **Gaps in the empirical literature**

In summary, the existing empirical literature does not yet provide comprehensive results that could guide copyright policy, for example on the question of to what extent it is worth fighting private, unauthorised copying. Hardly any of the relevant empirical questions have been covered exhaustively. Considerable progress seems possible, however.

Four gaps in the literature are of particular concern. First, the effect of digital copying on user welfare needs to be assessed more comprehensively. An important aspect of this would be covered in studies on the consequences of unauthorised copying for the legitimate supply of copyright works.

Second, several empirical studies on the effect of digital copying have found that major incumbents seem to suffer while fringe suppliers and newcomers may even benefit from the exposure. This might illustrate the extent to which 'one-size-fits-all' copyright arrangements favour some market participants over others and such unintended, distorting effects of the law may have to come under scrutiny.

A third, related point is that copyright regulates a diverse group of markets – from musical recordings to research articles – on the basis of similar principles. The case for copyright will differ between different markets and these differences could be explored more thoroughly.

Fourth, it has been argued that the transaction costs and market power associated with copyright systems might not only inhibit follow-up creativity

but also socially desirable aspects of technological innovation in the affected markets (in particular concerning new ways of disseminating works). Any obstacles to technological transition may be particularly problematic in the course of digitisation, as the expectation is that great productivity increases will be had from further applications of digital ICT in the production and dissemination of copyright works.

### ISSUES FOR FUTURE RESEARCH

Part III of this report gives a systematic overview of empirical questions related to the efficiency of copyright systems. It also suggests which questions should have priority in order to inform copyright policy in the process of digitisation.

#### An overview of empirical questions

##### (1) The effects of unauthorised copying

The most fundamental question is what the effects of unauthorised copying are in the first place. There are two ways to study the effects of digitisation/unauthorised copying in copyright industries; one examines costs, the other examines indicators of stakeholders' welfare. In both cases, short-run and long-run results are likely to diverge and thus need to be distinguished.

Digitisation is likely to change the relative costs of producing authorised and unauthorised copies, which will affect the short-run case against copying. Digitisation may also change the relation between the fixed costs of creation and the marginal costs of copying, and this will affect the case against

copying in the long run. The extent to which costs have changed has not been specified and surveys of suppliers are one way to produce some information.

Beyond the discussion of costs, the welfare effects of unauthorised copying for various stakeholders can be studied. In the short run, the question is whether any welfare loss from unauthorised copying for rights holders exceeds the benefits to users. In the long run, the key question is how the supply of copyright works is affected by unauthorised copying. Theory suggests that this is not a trivial question. Arguably, the long-run perspective is more important.

##### (2) The effects of copyright

If it is established that overall, unauthorised copying has greater adverse effects than benefits, the next question is whether copyright could improve the situation without excessive unintended consequences.

For many analytical purposes, it may be sufficient to treat unauthorised copying and copyright protection as two phenomena that are directly and inversely related. If copyright is just seen as a countermeasure to unauthorised copying, the welfare analysis of copyright protection can follow a very similar structure to that used in the analysis of the effects of unauthorised copying.

### Costs and benefits of a copyright system

	Benefits	Costs
<b>Short run</b>	Monopoly rents for rights holders and control of types of use	<ol style="list-style-type: none"> <li>1. Administration costs</li> <li>2. Transaction costs in trading rights</li> <li>3. Access costs to users</li> </ol>
<b>Long run</b>	Greater incentives for rights holders to supply copyright works	User innovation is obstructed by the costs associated with compliance

A complication is that copyright protection will entail some unintended consequences such as administration and transaction costs. The table below gives an overview of the various costs and benefits in the short run and in the long run.

One way to improve copyright systems is to seek out opportunities to reduce transaction costs and the costs of administering the system. This would require studies of the public and private costs in managing copyrights.

#### (3) Alternatives to copyright

Even if it is determined that unrestricted, unauthorised copying diminishes social welfare and that adequate copyright policy could improve the situation, the case for copyright policy is still not complete. In order to establish whether copyright policy is efficient, its consequences should also be compared to alternative types of intervention, for example levies on copying technology, direct subsidies to producers, or stipends and awards.

#### Key empirical questions at present

Many concerns regarding the copyright system and digitisation come together in one empirical question: *how is the supply of creative works affected?* The promotion of innovation and creativity is an explicit, central aim of copyright law. Empirical results on the impact of copyright on the supply of creative works provide an indication of the net effect of all the costs and benefits associated with copyright and unauthorised copying. In particular, studies of supply provide an indication of how consumers' long-run interests are affected. They also reflect the net effect on suppliers' incentives. This issue has not received nearly enough attention. One reason is that it is much harder to obtain decent data on the supply of copyright works than on industry revenues.

In the context of the numerous and substantial changes that the process of digitisation is bringing about for copyright industries, another issue that needs to be studied more thoroughly is the relationship between technological advances and copyright. This relationship may go both ways, with technological innovation affecting copyright and vice versa. Two central questions for copyright policy are: first, *are there opportunities to reduce the administration costs and transaction costs of copyright – in particular through the application of digital ICT – and could public policy encourage innovation in this respect?* Second, *how does the copyright system affect technological change in the regulated industries?*

### Sources of data

An obvious way to develop the evidence-base for policy-makers is to pick out specific research questions and to commission research. A complementary way to improve our understanding of copyright would be to improve the quality and accessibility of data on the copyright industries. In particular, copyright collecting societies could be persuaded to publish more information. This would provide a valuable complement to data published by trade organisations.



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## Acknowledgments

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This report draws extensively on the author's work with Ruth Towse and Paul Stepan, as presented for example in Handke, Stepan and Towse (2008) and funded by the Fundación Autor. I am grateful to the other two authors for their permission to draw on our common efforts. The report has also benefited greatly from a literature scan by SABIP as well as comments and suggestions from SABIP

and members of the SABIP Copyright Expert Panel, from IPO staff, as well as from the reviewers Sam Cameron (Bradford University), Rufus Pollock (Cambridge University and the Open Knowledge Foundation), Paul Stoneman (Warwick University) and Richard Watt (Canterbury University, NZ). All mistakes are undoubtedly mine.



## 1. Introduction

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Copyright plays a pivotal role in markets within the “literary, scientific and artistic domain” (WIPO, 1971): it defines the rough equivalent to property and thus who is entitled to reproduce a protected work, who may make it available to the public and who may modify it.<sup>2</sup> Copyright applies automatically and without prior test of the quality of an original publication. Within its domain, it applies to the bulk of all creations that have come into being over the last five to seven decades.<sup>3</sup> This includes a growing number of digital information goods and services and the copyright system is a major influence on the formation of so-called ‘digital’ markets.

Over recent years, much of the copyright regime has been brought into question. Rights holders have found it difficult to enforce their exclusive rights to digitally captured copyright works. Many users have ‘voted with their feet’ and circumvent copyright on the Internet or by forwarding copies of protected works on CD-Rs or DVDs to third parties. The response in most major markets has been to extend the scope of copyright law and to increase investments into enforcement measures – some of

these investments being public and some private. These measures have been accompanied by a divisive debate. At the time of writing there are even single-issue political parties concerned with so-called copyright ‘piracy’ that have won a seat in the European Parliament and that held a seat in the German Bundestag.<sup>4</sup>

The Strategic Advisory Board for Intellectual Property Policy (SABIP) has commissioned this report in order to inform its future research agenda. One task is to undertake a critical overview of the theoretical and empirical economic literature on copyright and unauthorised copying. On the basis of this literature, two further aims of this report are to: (1) identify the salient issues for copyright policy in the context of digitisation; and (2) formulate specific research questions that should be addressed in order to inform copyright policy.

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<sup>2</sup> Among legal scholars, there is a debate whether intellectual property rights such as those granted by copyright law should be referred to as ‘property’ or as a mere ‘privilege’.

<sup>3</sup> The duration is harmonised among EU member states to cover 70 years after the death of the author or 50 years after the publication date for performers’ ‘related rights’. A protracted move is under way to extend the duration of copyright entitlements in line with recent changes in the USA.

<sup>4</sup> The Swedish ‘Piratpartiet’ won 7.1% of the vote in the European election on 7 June 2009 which entitles them to at least one seat in the European Parliament. The German MP Jörg Tauss, an expert on information policy, was expelled from the Sozialdemokratische Partei Deutschlands (SPD) after allegations that he had downloaded improper content from the Internet himself and joined the German ‘Piratenpartei’ in June 2009.

In line with this commission, the first part of this report surveys the literature on the economics of copyright in order to identify the contribution it may make to the debate on copyright policy<sup>5</sup> and in particular whether any adaptation of the copyright system to the diffusion of digital information and communication technology (ICT) is warranted. The central insight in this literature is that copyright relates to trade-offs between competing ends and the main contribution of the economics of copyright in its current state is to define such trade-offs in principle.

The first part of this report also identifies substantial gaps in the literature. Many of the costs and benefits – and thus the overall welfare effect of copyright – in real markets remain ill-specified. Most importantly, there is hardly any information on the extent to which the supply of creative works depends on copyright protection. In addition, while the economics of copyright revolves around advances in copying technology, it largely ignores broader technological change and its implications for the desirable level of copyright protection. The influence that the copyright system exerts on technological innovation needs to come under scrutiny.

In its second part, this report provides an overview of the empirical literature within the economics of copyright. Especially with regard to the process of digitisation, existing studies do not as yet develop a solid basis for copyright policy and there is great need for further research.

The economic literature on copyright covers a considerable number of different approaches and research questions. The third part of this report seeks to present a systematic overview of different empirical questions and how these relate to one another. This section also seeks to identify a hierarchy within these questions. As complex as the interplay of the various effects of copyright may be, advances on a few central issues may go a long way to informing copyright policy.

### 1.1 Central definitions and terms

In this report, the expression ‘copyright works’ refers to all products covered by copyright law and ‘copyright industries’ refers to any industry that produces and sells copyright works.<sup>6</sup> The exact scope of these industries is thus subject to specific legal arrangements that may differ between different territories and that may change over time. The use of these two terms should not, however, be taken to mean that the exact scope of products covered by copyright law is economically justified.

The English expression ‘copyright’ covers both authors’ and performers’ rights and is used in this broad sense throughout the report. For convenience, this study frequently uses the term ‘copyright’ to refer to both copyright law per se and as a shorthand for the ‘copyright system’ that encompasses both the law as well as the measures to administer and enforce legal entitlements.

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<sup>5</sup> Other surveys of the quickly expanding literature on the economics of copyright include Raskind (1998), Gordon and Bone (1998), Towse and Holzhauser (2002), Haller (2005), Liebowitz and Watt (2006), and Handke, Stepan and Towse (2008). Copyright has also been included in more general surveys of the economics of IP by Besen and Raskind (1991), and Menell (1998).

<sup>6</sup> The Berne convention (WIPO, 1971: article 2, paragraphs 1 and 2) gives an enumerative definition of the kind of creations that are covered by copyright law.

'Digitisation' usually refers to the process of converting information into digital code. In this report, the term is used more broadly to refer to the application of increasingly powerful digital ICT for many purposes in the market for copyright works.

### 1.2 The economic perspective of copyright

There are two approaches to making the case for copyright systems (Hurt and Schuchman, 1966). The predominant justification of copyright in the Anglo-Saxon tradition is the utilitarian argument that copyright protection raises the supply of protected works closer to a socially desirable level. This perspective concentrates on total social welfare including user and consumer interests in access to a diverse supply. In many other important markets – including most continental European countries – creators' interests are privileged and copyright is justified in terms of the 'natural right' of creators in the output of their work or society's evident obligation to reward them.

Natural rights arguments often simmer down to the notion that an author's exclusive right to his or her creation is self-evidently just (Hurt and Schuchman, 1966). A main criticism of this position is that it provides few guidelines on how to resolve conflicts within the copyright system. For example, authorship may be contestable and creators often build on each other's efforts as well as expressions in the public domain. There may also be conflicts

between aspects of the copyright system and other values such as the freedom of expression (Hugenholz, 2001) or competition (Boldrin and Levine, 2002; 2005). It is hardly surprising then that any copyright system entails limitations to the exclusive rights of authors.

Economics deals with the question of how trade-offs between competing ends can be resolved. The economic approach to copyright is based on two notions: first, copyright is not unconditional but may be subject to trade-offs with other objectives and values; second, copyright has a clear purpose and it is worth discussing whether this function is attained efficiently. As such, the application of economics to copyright is not necessarily incompatible with the natural rights argument for copyright. In any case, the focus of this study will be the utilitarian concern for social welfare.

According to the seminal European Directive on Copyright in the Information Society (DIR 2001/29/EC, §4), the official aim of copyright is to promote "innovation and creativity" in the regulated sector.<sup>7</sup> The desire to safeguard copyright entitlements is a driving force behind attempts to insert a greater degree of control into information exchanges online. With this directive, the EU has begun to regulate central issues of copyright (especially relating to the digital environment) on the supra-national Union level. The directive does not mention the protection of the 'natural rights' of creators.

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<sup>7</sup> *The basic argument for copyright is similar in the USA, where copyright is noted in the constitution as an optional means to 'promote the progress of science and the useful arts'.*

The economic literature on copyright emphasises efficiency and addresses copyright in a rather abstract manner. Economists often study the ‘strength’ of the copyright system in a generic way, as a representative of a number of dimensions in copyright law. The idea is that the basic trade-off between costs and benefits of copyright protection follows the same principle whether the concern is with the duration of copyright entitlements, the specific aspects of creative works that fall under copyright provisions, the level of enforcement, or the range of ‘fair dealing’ exceptions. For changes in each of these dimensions, the same questions arise: what is the immediate effect on supplier income and user access? What is the effect on the supply of copyright works and innovative use over time? The relative weight of these effects may differ substantially over time and between different copyright industries. That the analysis follows the same principle does not mean that it will always bring up similar results.

‘Efficiency’ covers a wide range of topics concerning the economic justification of copyright. Equity matters have been largely ignored. The literature says little about the distribution of royalties (for example between authors, performers and publishers) or about the costs of running a copyright system (who pays for the administration of copyright, for example). Nor does the literature pay much attention to distribution effects which favour some economic agents at the expense of others. That said, econometric studies could be employed to evaluate policy measures that seek to attain greater equity if the objectives can be measured quantitatively.



**PART I – A SURVEY OF THE ECONOMIC  
LITERATURE ON COPYRIGHT**

## 2. The Basics Economics of Copyright

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Copyright endows creators with temporary exclusive rights to their original creations – the rough equivalent of property. Some intermediary firms in the copyright industries are primary rights holders and creators often pass on large parts of their copyright entitlements to firms that specialise in the exploitation of such rights (for example publishers and record companies). In practice, intermediary firms hold and commercialise the vast majority of copyrights.

The most conventional economic rationale for copyright is that it provides an incentive to produce creative works, where this incentive would otherwise be below a socially desirable level. Copyright is seen to rectify market failure due to the partial non-excludability of copyright works and the distinctive cost-structure of copyright industries.

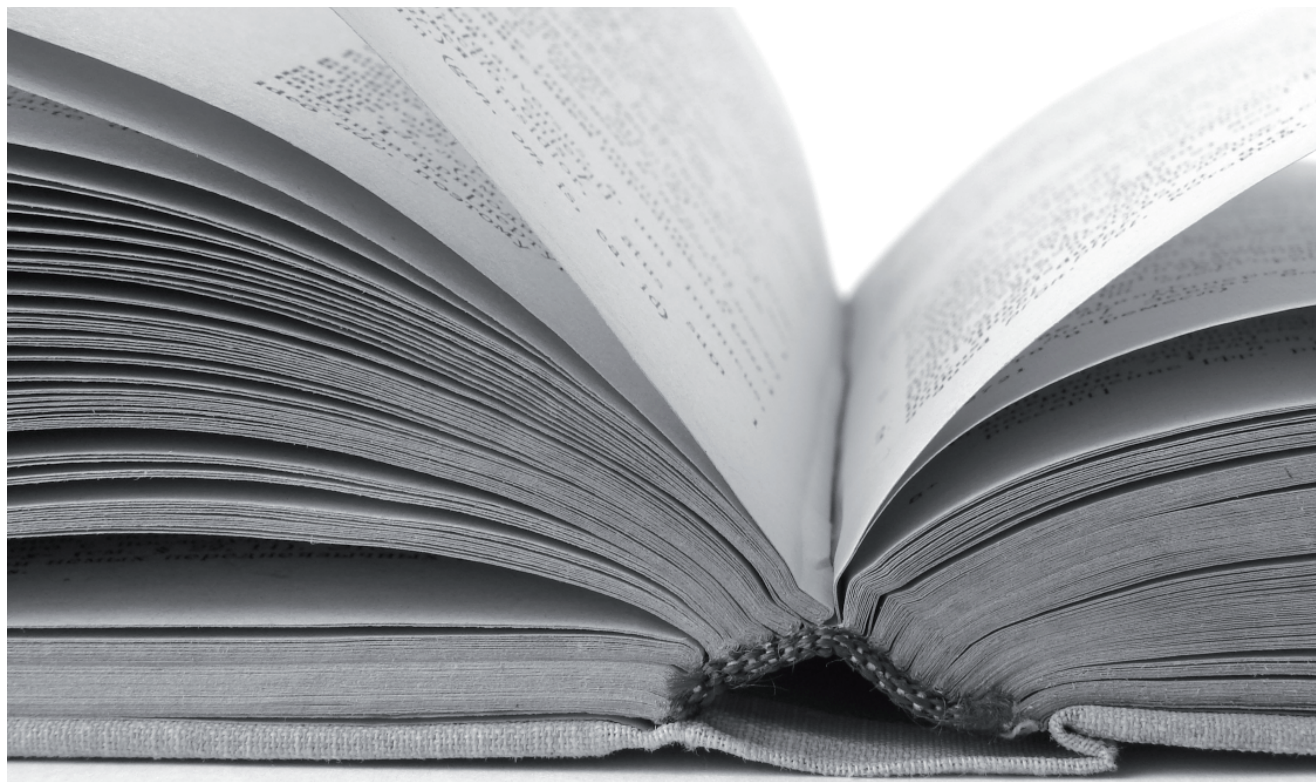
Like any form of state intervention, copyright also creates costs. On the one hand, a copyright system entails administrative and enforcement costs that create a ‘dead-weight loss’ (Watt, 2000), meaning that they use up resources without producing a marketable product. This includes the transaction costs in trading copyright. On the other hand, copyright is traditionally regarded as establishing a monopoly that enables right holders to charge higher prices than they could under competition (Plant, 1934). If copyright is associated with higher prices, the copyright system generates access costs: it excludes those potential consumers who

would be willing to pay above the marginal cost of production but not as much as the price being charged. From this perspective, copyright policy deals with a trade-off between the ‘underutilisation’ and the ‘underproduction’ of copyright works (Novos and Waldmann, 1984). This trade-off is the focus of many studies and it is sometimes presented as a trade-off between consumer and producer interests. However, copyright can also exclude creators who are deterred from building upon prior works because they are unwilling to pay the price the copyright holder demands or incur the costs of obtaining the necessary permissions. It follows that “(p)aradoxically, too much copyright protection can reduce the number of new works created” (Landes, 2002: 13).

Some of the costs associated with the copyright system increase with the strength of the rights defined and the strength of enforcement (Watt, 2000; Landes, 2002). At the same time, economic models assume that copyright protection is subject to decreasing returns. In other words, there are limits to the desirable level of copyright protection, which is consistent with a number of existing exceptions and limitations to copyright.

Beyond this most conventional conceptual model, reviewing the literature on the economics of copyright can be challenging. Different analytical approaches have been taken – for example neo-classical price theory, welfare economics and the property rights approach – and many writers on the subject interweave different approaches. The scope of studies ranges from the general case for a copyright system to the desirable level of the strength of copyright protection and to discussions of specific aspects of copyright law and regulations.

Another important distinction is that between purely theoretical work and formal modelling on the one hand and empirical studies on the other. Finally, substantial changes in copying technology and the copyright industries have taken place over the last decade, which may make it necessary to reconsider some of the earlier conclusions about copyright.



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## 3. The Evolution of the Economics of Copyright

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### 3.1 Copyrights as (temporary) monopolies

Early comments on copyright by economists in the 18<sup>th</sup> and 19<sup>th</sup> century hinged on the notion of a statutory monopoly and the opportunity it affords rights holders (authors and others) to raise prices, so that their revenues and incentives to invest in the creation of copyrightable works would be increased (Hadfield, 1992). In this perspective, copyright is in essence a trade-off between the ‘remuneration of authors’ and the ‘evil’ of monopoly. The first systematic economic analysis of the matter by Plant (1934) also addresses copyright as a monopoly and introduces several related issues that the economics of copyright now refers to in terms of moral hazard, rent-seeking and business models (Landes and Posner, 2003). Abhorrence of monopoly has permeated economic thinking so that economists’ attitudes to copyright have often been sceptical or ambivalent and the institution remains contentious today. However, the economic rationalisation of copyright has been refined after Plant.

### 3.2 Refinements of the argument for copyright

In general, there are two ways in which the argument in favour of copyright has been refined over the 20<sup>th</sup> century. First, copyrights are not perceived as pure monopolies anymore, which qualifies their disadvantages. Second, theoretical

concepts related to the benefits of copyright have evolved so that these benefits are understood in more precise and widely accepted terms.

#### Monopolistic competition rather than monopoly

Products that fall under copyright legislation are often prime examples of differentiated, monopolistically competitive goods (Chamberlin, 1933; Yoo, 2005). They are heterogeneous and tend to have many close substitutes. Even though an effective copyright system prevents competitors from marketing virtually identical products, the market power of rights holders is restricted by the possibility of imitation and the presence of close substitutes. A rights holder who enjoys exclusive rights to one of thousands of related copyright works – which satisfy the same need in similar ways – does not have a complete monopoly. Therefore the social costs of copyright due to monopolistic pricing are curtailed.

#### Copyright works as quasi-public goods

Copyright can also be justified as a means of organising the private financing of public goods (Demsetz, 1970; Liebowitz and Watt, 2006). This line of reasoning has developed into the prevailing justification for copyright since the 1970s and draws on contemporary theories of public goods (Samuelson, 1954) and information goods (Arrow, 1962). Information goods differ from most tangible goods because they tend to have

some characteristics of public goods. On the one hand, public goods are non-excludable: exclusive (property-) rights to using them cannot be enforced. On the other hand, public goods are non-rival: use by one individual does not inhibit use by others.

Markets for public goods exhibit a particular type of market failure. Since a perfect public good benefits anyone, regardless of whether they invested in the production of the good, there are deficient incentives for rational individuals to participate in the production costs. Users can act as free riders and hope to benefit when others provide a public good. In a free market, free-riding leads to an insufficient supply of public goods.

Copyright works are rarely perfect public goods but they are regularly hard to exclude and important aspects of them are non-rival. That is, they are 'quasi-public goods' (Bone and Gordon, 1998). When copyright works are hard to exclude, they tend to give rise to positive externalities. Part of their value arises in their use by those who do not contribute to the production costs so that the market value of such copyright works does not reflect their full social value.

An effective copyright system increases the excludability of protected works. Copyright aims to put rights holders in a position in which they can inhibit use not authorised by them. Rights holders may thus be able to raise revenues that are closer to the overall value of the protected works they supply.<sup>8</sup> From this perspective, copyright fosters pecuniary incentives to supply protected works. In contrast to subsidies, copyright is a means of countering the underproduction of quasi-

public information goods that retains much of the co-ordination mechanism of the market, albeit a monopolistically competitive one. The copyright monopoly allows the copyright owner to charge a price above the cost of making and marketing copies of the work until such time as the copyright expires. Thereafter the work enters the public domain and becomes a public good in the economic sense that it is non-rival and non-excludable.

### The distinctive cost-structure of copyright industries

For information goods such as copyrightable works, the fixed costs of producing the original first copy tend to be high, while the variable costs for reproducing and marketing it are often very low (Pethig, 1988; Landes and Posner, 1989). For example, the costs of shooting a film are often in the millions of Euro, while a copy of a finished film in the conventional end-use format (say a DVD) can be produced for less than a Euro. This cost-structure entails two further rationalisations for copyright.

First, it aggravates the incentive problems due to the characteristics of copyright works as quasi-public goods. The higher the fixed development costs in comparison to the variable reproduction costs, the greater the cost advantage to free-riders. Of particular interest is the disadvantage to those suppliers who invest in the development costs relative to suppliers who do not. Free-riding commercial users do not have to redeem the costs of producing the original first copy and they can offer copies based on the pure reproduction

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<sup>8</sup> *Transaction costs in a market for copyright may restrict the benefits of copyright for rights holders.*

costs. What is more, free-riders can avoid the need to test the uncertain market for new copyright works (Towse 2000: xvi). Under the specific cost-structure of information goods, creators and those compensating them will thus find it particularly hard to recoup development costs. The supply of new copyright works will fall below the socially desirable level. Copyright is a means of protecting those investing in the development costs from commercial copycats. In contrast, the positive externalities from free-riding that directly benefit end-consumers are often tolerated (see section 5).

### Increasing returns

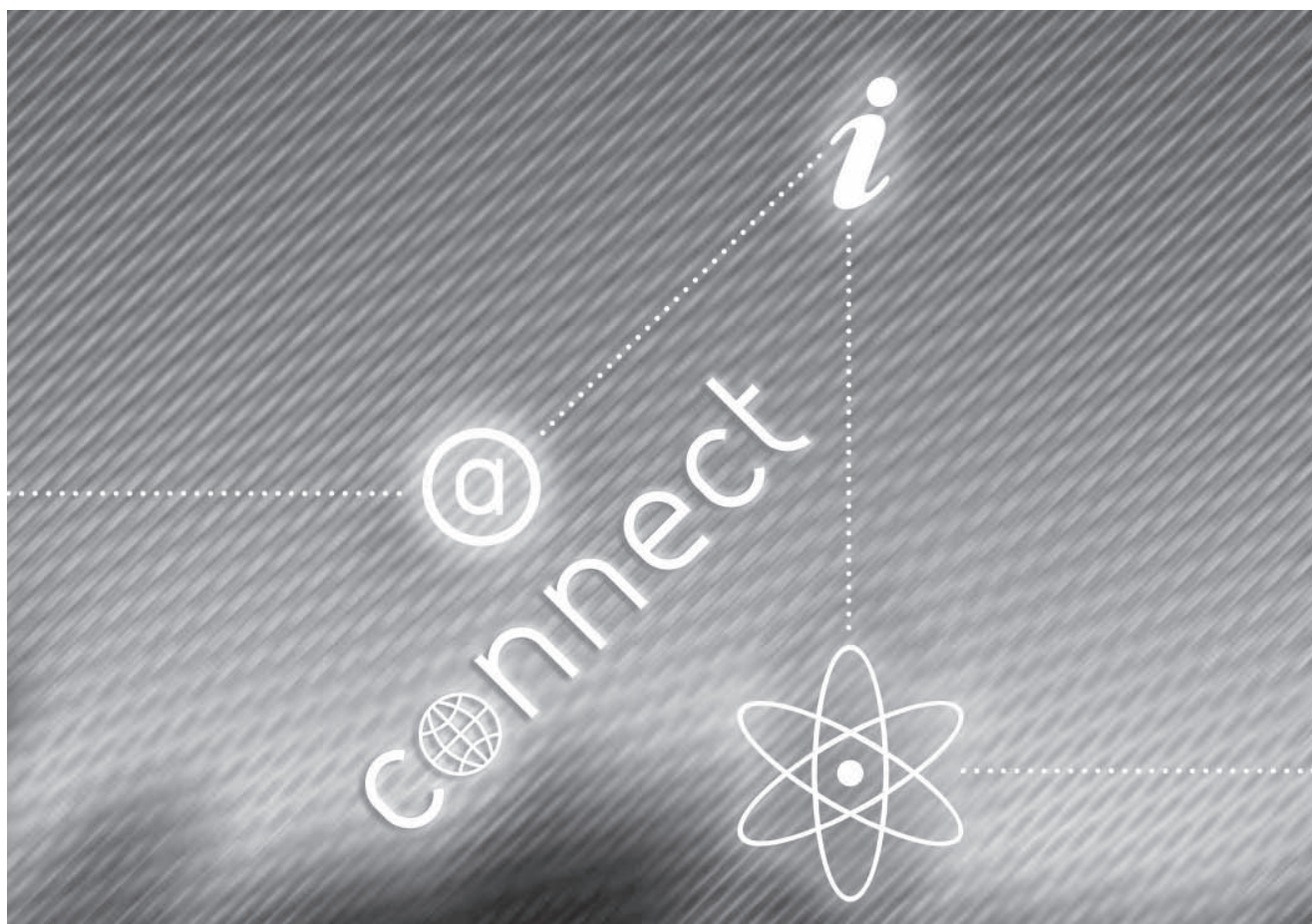
The typical cost structure in copyright industries underpins a further development in the rationalisation of copyright: the application of the concept of increasing returns to scale (Shapiro and Varian, 1999). Increasing returns is a feature of the underlying production function for a given state of technology, which means that efficiency increases as more units are produced. For many information goods, the marginal costs of producing another copy virtually never rise. Thus, the average costs fall with every expansion of the number of copies supplied. For the economic understanding of markets for information goods, it is an important insight that therefore, in a free market, a profit-maximising pricing mechanism cannot be based on marginal costs. Digital information goods are an extreme example of low and non-increasing marginal (re-)production costs.

One of the implications of increasing returns to scale is what economists call a 'natural monopoly'. A natural monopoly is a situation in which a monopoly supplier is able to supply the market

more efficiently than if there were competition between several smaller suppliers. Government regulation can mitigate the adverse effects of a natural monopoly. For example, regulators may require the monopoly producer to introduce a two-part tariff that approximates marginal cost pricing combined with some other charge covering the fixed development costs. That, however, has not happened in many copyright industries (except, perhaps, in the special case of broadcasting). Price discrimination could likely achieve the same result through the market, as will be discussed below (Shapiro and Varian, 1999; Boyle, 2000).

So far, it is not clear whether increasing returns in markets for digital information goods will prove to be strong enough to result in a natural monopoly. Countervailing factors in markets for copyright works include product differentiation, the typical volatility of demand for specific products and low fixed costs, at least in some markets for copyright works. In volatile and contestable markets, monopolies which are stable over time whilst exerting a great influence on prices might not be feasible.

Where the conditions of a natural monopoly do prevail, copyright would be less of a restriction to competition. Copyright would rather just ensure that those investing in creativity are the first to enjoy an eventual monopoly. Digital information goods would be under a dual monopoly: on the one hand, the statutorily created copyright; on the other, the spontaneous market development of the natural monopoly. Furthermore, policy-makers may use copyright policy not only to foster incentives for innovation and creativity but also to regulate markets that tend towards natural monopolies.



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## 4. Specific approaches Within the Economics of Copyright - Is There a General Case for Copyright Law

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The 'big question' in the economics of copyright is whether public investments in the copyright system are justified in terms of promoting total social welfare. In much of the economic literature, the focus is on the rationalisation of copyright on an abstract level. Much of the argument makes no distinction between exclusive rights of reproduction, the making available, distribution or modification of a copyright work. The distinction between authors' and performers' rights is not of interest, either. What is more, for the sake of clarity, even the 'strength' or 'level of protection' of the copyright system are discussed in a generic way, subsuming under these terms the threshold requirements for its application, its scope, duration and the effectiveness of enforcement (cf. Towse and Holzhauser, 2002). Arguably, many relevant insights are still to be had on this abstract level, which helps to keep the complexity of the argument manageable.

There are two main theories by which this big question has been approached: welfare economics and property rights. An important difference is that the latter approach tends to take the need for unambiguous property rights for granted.

### 4.1 Welfare economics and cost-benefit analysis

From the early contributions to the field one can see that copyright has always been somewhat ambiguous for economists. Some economists oppose copyright on the grounds that the market

could work well without it. Those who accept the case for copyright recognise that it has both costs as well as benefits to society as a whole. Welfare economics is often used to discuss copyright, as it deals with questions that involve trade-offs.

### Pareto optimality fails to provide a suitable guiding principle

In standard welfare economics, maximum social welfare is characterised by Pareto optimality – a situation in which there is no possible reorganisation of resources that can improve welfare for one member of the society without making another worse off. Welfare economics of this type is based on the insight in general equilibrium theory that if every market in the economy were free and perfectly competitive, markets would lead to a unique Pareto optimal distribution of resources. Under the additional assumption of decreasing returns, a stable and efficient equilibrium would be achieved by market forces. Pareto optimality cannot be achieved where market failures prevail in the market itself or any related market.

Reasons for market failures include the presence of unpriced goods (e.g. public goods or externalities), market power, missing markets (e.g. the lack of insurance covering risk or of forward markets), or transaction costs. In applied economics there is a tendency to focus on the removal or mitigation of market failure, for example by lowering distorting

taxation, through competition policy, or by establishing unambiguous property rights. One attraction of this type of approach is that it seems to provide an option to discuss efficiency separately from any normative statement on equity. Paretian welfare economics might be seen to provide a general guideline for policy – the need to minimise market failure – that requires no detailed statement on the relative value of divergent interests among stakeholders. Pigovian welfare economics deals with partial equilibria in individual markets, which ranks slightly lower on a scale of implausibility than a general equilibrium (cf. Blaug, 1997).

However, this shortcut of Paretian welfare economics is hardly useful as a guideline for copyright policy. On a general level, Lipsey and Lancaster (1956) demonstrated that a partial removal of a distortion is not automatically welfare-improving and thus no adequate general guideline for policy in the real world of inevitable market distortions. In the case of Intellectual Property (IP), there is a very specific reason why a ‘first best solution’ – a unique optimal allocation of resources as envisaged in Paretian or Pigovian welfare economics – cannot be achieved: IP does not remove market failure. It counteracts a market failure due to the quasi-public good characteristics

of protected works and in the process it introduces other market distortions, due to the market power of rights holders or the transaction costs entailed in an IP system.<sup>9</sup> In other words, the statutory creation of copyright may ‘privatise’ the public good feature but it introduces a monopoly element and transaction costs, which interfere with the state of a perfect, competitive market as a necessary condition for welfare efficiency.

Thus copyright can only ever be a ‘second best solution’. This implies that there is no universal rule to establish whether copyright is more welfare-enhancing than its alternatives (Lipsey and Lancaster, 1956; Blaug, 1997; Lipsey, 2007). At any time, the market is likely to diverge so much from a competitive equilibrium that in order to establish the overall welfare effect of copyright, the complexities of identifying and weighing costs and benefits cannot be avoided.<sup>10</sup> There are two reasons for this: first, copyright is not necessarily a step towards an ideal market, since it counteracts one market failure while fostering others; second, it is not clear whether a copyright policy that would move markets for copyright works closer to a perfect equilibrium would be welfare-enhancing in the presence of distortions in related markets.

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<sup>9</sup> Coase (1960:21) addressed this problem in general when he observed that conventional welfare economics focuses on removing deficiencies, while ignoring changes “inevitably associated with the corrective measure [...] which may well produce more harm than the original deficiency.”

<sup>10</sup> Nevertheless, Posner (2005) states that in general the optimal term of copyright is the period of time over which the discounted future revenues from the copyright are equal to the discounted future costs due to the copyright. By itself, this principle would imply that every copyright work should have its own duration (Landes and Posner, 1989). Landes and Posner (1989; 2003) emphasise however that in practice there must be a uniform term to minimise costs of disputes, etc. See section 6.1.

### **Cost-benefit analysis**

That said, many writers on the economics of copyright have adopted a welfare approach that seeks to identify the relative costs and benefits of this institution to society at large (e.g. Novos and Waldman, 1984; Hollander, 1984; Johnson, 1985; Besen, 1986; Besen and Kirkby, 1989; Koboldt, 1995; Bensaid and Lesne, 1996; Watt, 2000). Sometimes this takes the shape of specifying the divergent interests of different types of stakeholders. This literature has contributed greatly to the recognition of the various countervailing factors that need to be accounted for in order to assess the overall effect of copyright on social welfare. There is considerable overlap with the literature on the economics of copying, which will be reviewed below. Some of these studies assess the welfare gains and losses associated with unauthorised copying relative to the Pareto-optimal outcome of a perfectly competitive market. This approach is misleading (Towse and Holzhauser, 2002; Landes and Posner, 2003). As argued above, copyright cannot attain Pareto optimality. The literature on markets for information goods recognises network effects, increasing returns or even natural monopolies, and public good characteristics as attributes of the ‘information economy’. Due to such distortions, it is virtually impossible to derive general, unchanging conclusions on the justification of public regulation such as copyright.<sup>11</sup>

Furthermore, the market conditions associated with market failure may change over time, for example due to technological developments. Technological change is itself a market ‘failure’ in the sense

that it makes a static equilibrium, as envisaged in neo-classical economics, unattainable. In the contemporary copyright industries, technological changes may shift the ground in various ways. For example, the diffusion of digital copying technology among users aggravates any problems with the quasi-public good characteristics of reproducible cultural products. The same copying technology and other ICT-applications may also help suppliers to reduce costs and establish new markets or to make the administration of copyright more efficient. In an online market with few geographical boundaries, increasing returns and network effects may become stronger at the same time as the market becomes more contestable. The conclusions of economists writing before digitisation – when the only means for unauthorised copying was resetting type or photocopying for printed matter, or VHS and audio tapes for television and music reproduction respectively – are therefore at a considerable disadvantage when viewed in retrospect, however valid the analysis was at the time.

### **4.2 The property rights approach**

Another approach to the economic analysis of copyright is the property rights approach. This perspective often has its origin in the so-called Coase theorem, which states that, subject to the cost of transacting, property rights will be traded in a free market so as to be allocated to the most valuable use (Merges, 1995). The conjecture is that as long as there are property rights, there is no need for state intervention because any disputes can be settled by negotiation and compensatory payments or, if that fails, through the courts. This approach

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<sup>11</sup> *In order to assess changes to the copyright system, the proper comparison is the situation without this change, not a perfect market.*

obviates the need for social welfare analysis and plays a significant role in law and economics. Copyright is seen as a means to 'propertise' literary, dramatic, musical and other creative works, so that they can be used optimally (Posner, 2005). From this perspective, efficiency improvements would be had mainly from instituting property and minimising transaction costs in the market for copyright.

Beyond the Coase theorem, property rights approaches to copyright may express the problem of rewarding creators simply in terms of the economic case for property (Depoorter and Parisi, 2003). The 'tragedy of the commons' has come to exemplify the need for unambiguous property rights. Where a good is commonly owned by rational, self-interested individuals, no one has an incentive to invest in its preservation and improvement. Where everyone attempts to 'free ride' on the investment of others, a stalemate results in which no improvement can be achieved. The 'tragedy of the commons' assumes implicitly that agents play a non-cooperative game, in which there is no third party or social control mechanism that forces individuals to act according to the common good. Economic efficiency then requires the establishment of property rights in order to create sufficient incentives for the creation of value.

Although copyright is a form of state intervention, in a property rights approach the emphasis tends to be unequivocally on minimising the need for any other type of state intervention. Copyright's merit is presented in terms of establishing property rights where they otherwise would not exist so that a market can operate.

However, neither the Coase theorem nor the 'tragedy of the commons' make a comprehensive case for copyright. Regarding the Coase theorem it must be made clear that copyright does not only define the rough equivalent to property. Copyright also gives rise to transaction costs, which challenge any efficiency as envisaged in the Coase theorem. Potential users need to identify rights holders, acquire rights and ensure compliance with copyright, which may be a serious problem for innovative types of use not anticipated in standard agreements. Rights holders need to monitor use and fight infringements. Both parties need to negotiate prices and terms of use. Transaction costs are particularly problematic where works have a low value to many individual users. Under these circumstances, large parts of the market may not be catered for because transaction costs exceed willingness-to-pay (Gordon, 1982; Besen, Kirby and Salop, 1992).

Furthermore, some of the 'tragedy of the commons' argument does not apply in relation to copyright, since the protected works tend to be non-rival. Non-rivalry of copyrightable content implies that there is no need to ration use in order to avoid depletion (cf. Lessig, 2002; Landes and Posner, 2003). Instead, for information goods, unrestricted access to existing works is economically efficient (Arrow, 1962). The problem with unrestricted access is not depletion but insufficient incentives to invest in the supply of new information goods. This analysis is consistent with the insight in other contributions to the economics of copyright that copyright relates to a trade-off between countervailing objectives. By itself, the case for property provides no general solution to this dilemma.

In spite of its limitations, the property rights approach has raised several widely debated questions in the economics of copyright. For example: how rival are copyright works? Should copyright come to emulate conventional property rights by dropping its temporal limitations (Romer, 2002)? A most relevant contribution of this literature is that it draws attention to transaction costs in trading copyright and encourages a discussion on how these costs could be reduced.

#### **4.3 Summary: Short-cuts, dead-ends and the need for empirical research**

In summary, the economics of copyright does not construct a cogent and comprehensive case for copyright. Neither welfare economics nor any property rights approach provides a conclusive, general justification for copyright in principle. That is because any effective copyright system generates transaction costs and market power.

Copyright thus entails costs and benefits that need to be traded off against each other. The theoretical economic literature on copyright develops an overview of the types of costs and benefits of copyright and unauthorised copying. To inform policy, these effects need to be gauged under specific market conditions.

Especially in the current context of digitisation, the cost-benefit approach of balancing welfare gains and losses has little credibility unless it is based on relevant empirical measures. Changes to market conditions through technological change may affect the relative significance of the costs and benefits of copyright and thus the argument for copyright. The diffusion of digital ICT and its application to a great number of purposes in the copyright industries is widely expected to have far-reaching effects, but it is far from clear exactly how the case for copyright is altered in the process.

Furthermore, most of the discussions in copyright policy are not about adopting or abandoning the entire copyright system but rather about piecemeal changes to the various aspects of its strength, such as, for example, the level of investment in enforcing legal entitlements. In the literature reviewed so far, the focus has been on the justification of copyright in general. For questions about the desirable strength of the copyright system, even smaller changes in market conditions matter.

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## 5. The Economics of Copying - Why Would There be a Need to Curtail Unauthorised Use?

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Landes and Posner (1989) distinguish between the economics of copyright and the economics of copying. Whereas the economics of copyright focuses on the effects of copyright law, the economics of copying deals with the economic effects of unauthorised copying. These two issues are obviously related, since the possibility of unauthorised use including copying is the *raison d'être* of copyright. The difference is that the economics of copying revolves around the underlying problems in markets for information goods, and not around the specific solution that copyright policy may provide. That is, the economics of copying takes a broader view and is useful to reflect on alternatives to copyright policy.

A fundamental point in the economics of copying is that the development of copying technologies over time has made copying easier and cheaper. In the course of this development, and through broader technological changes, the relative costs of creating, reproducing and consuming copyright works are also changing.

One issue of interest in the economics of copying is the relation between rights holders' cost of generating copies and the cost of unauthorised copying. Where the costs of unauthorised copying exceed the costs of authorised copies – say because there are economies of scale in copying – unauthorised copying may lead to a welfare loss

(Besen, 1986; Landes and Posner, 2003). Arguably, this effect is less acute where the cost of (digital) copying is extremely low. Some even claim that the marginal costs of copying are approaching zero with the diffusion of digital copying technology, but this point should not be exaggerated. The variable costs in terms of time and knowledge for the user are not negligible and the fixed costs of ICT hardware and Internet access will continue to restrict copying. This basic analysis raises a point that is still often overlooked in the public debate: ICT firms are likely to benefit where unrestricted copying boosts the demand for their products. The extent to which ICT firms appropriate the value of copyright works is hard to assess because ICT products and services are usually used for a variety of purposes.

Another central issue in the economics of copying is the relation between the fixed costs of creating the original, first expression of a work and the marginal cost of making unauthorised copies (O'Hare, 1985; Pethig, 1988; Pollock, 2007). The issue has been introduced above in the section on the distinctive cost structure of copyright industries.

This section presents five further central insights developed in the economic literature on copying over the last twenty-five years. The related discussion of the shortcomings of copyright systems and alternatives to copyright is presented in a separate chapter below.

## 5.1 The underproduction and underutilisation trade-off

Novos and Waldman (1984) considered the welfare effect of copying as a cause for underproduction and of copyright as cause for the underutilisation of protected works. In their model, consumers are indifferent to the distinction between a 'legitimate' and an 'illegitimate' copy and hence are only interested in the costs of obtaining a reproduction. Based on this assumption, the authors find analytical support for the underproduction hypothesis but very little support for the underutilisation argument. However, as will be discussed below, empirical studies on digital copying have consistently found that most consumers do have a higher willingness to pay for authorised copies, which puts the validity of Novos and Waldman's results into question.

## 5.2 Short-run and long-run considerations and product variety

Johnson (1985) noted that technological changes were making unauthorised copying by consumers cheaper and he discussed whether or not copying should be restricted. In contrast to most of the preceding literature, he addresses diverse tastes and incorporates product differentiation (imperfect substitutability) and consumer preference for product variety into his formal model. In his model, consumer welfare is affected by the number of publications (with diminishing marginal utility) and not just by the price of copies.

One of Johnson's (1985) results is of particular interest. He finds an important difference in the welfare effects of unauthorised copying in the short run as opposed to the long run.

In the short run, unauthorised copying makes copies available to consumers at lower costs. Total consumption and consumer surplus increases. However, unauthorised copying harms suppliers of authorised copies, since it displaces demand for authorised copies and reduces rights holder revenue. Therefore, in the short run, an indicator of the costs of unauthorised copying is its adverse effect on rights holder revenue. To make the case for public investment in counter-measures such as strengthened copyright protection, the costs of unauthorised copying need to be weighed against consumer benefits from extended access to existent works. In this short-run analysis, copyright policy trades-off rights holder and consumer interests.

In the long run, the situation may be quite different. Over time, consumers who favour product variety may be worse off due to unauthorised copying. This is because suppliers will respond to falling revenues with a reduction in the number of new publications. In the long run, additional indicators of the costs of unauthorised copying are thus any adverse effects on supply. The scale of these long-run costs depends on the responsiveness of supply to any falls in rights holder revenues and consumer valuation of product variety.

To make the case for copyright in the long run, supplier surplus and the social value of any additional works supplied because of copyright protection need to be weighed against the access costs of copyright. This additional consideration for the long run has two important implications: first, the net social costs of unauthorised copying in the long run may be much higher than in the short run; second, in the long run, rights holder and consumer interests in copyright protection may even converge.

### 5.3 Indirect appropriability

As an alternative to public intervention in the market for information goods such as copyright, Liebowitz (1985) introduced the idea of indirect appropriability. He demonstrated that the supplier may sometimes overcome the adverse effects of unauthorised copying on sales revenue through market means, in particular by using price discrimination.

Price discrimination occurs when suppliers ask different prices from different consumers for the same product. It can work where monopolistic suppliers know how different types of consumers differ in their willingness-to-pay and if they can segment the market. Liebowitz studied the impact of photocopying on the market for academic journals and concluded that copying did not harm journal publishing because publishers were able to increase their revenues by using price discrimination. This was possible because publishers supply two distinct markets: that of individual subscribers and that of libraries. Copies in libraries are often photocopied, which should reduce demand for individual subscriptions. Libraries also tend to be willing to pay a much higher price than individual subscribers. Publishers reacted to photocopying by raising the price of library subscriptions. Liebowitz provided empirical evidence that, in the case of journal publishing, greater revenue from library subscriptions fully compensated for lost sales to individuals who would have purchased the journal issue without the possibility of photocopying. Publishers were therefore compensated indirectly for unauthorised copying.

Besen (1986) utilised the idea of indirect appropriability to elaborate on different effects that private copying may have in different markets. In his model, consumers choose to copy if the costs of private copying are lower than the retail price of an authorised copy. As a rule, rights holders enjoy some market power, i.e. they have some control over the prices they can charge for authorised copies. One precondition for this is that unauthorised copying does not provide perfect substitutes for authorised copies. In Besen's analysis, the effect of private copying on producers' pricing decisions is ambivalent. Under some conditions they might raise the price of the original in order to profit from indirect appropriability. Consumers who plan to copy will be willing to pay the higher price when they purchase, while consumers who do not partake in copying will be excluded. If the price of authorised copies is only a little higher than the private costs of copying, publishers might bring it down to the level of the private cost of copying and hence compete with the copier. Where the price is reduced, consumers are generally better off and producers worse off.

### 5.4 File-sharing, indirect appropriability and rights holders' profits

Fourteen years on, Varian (2000) revived the discussion on indirect appropriability with a view to (file-)sharing and renting of information goods. He identifies scenarios in which sharing would lead to an increase in the producer's profit. Varian gives an example from the eighteenth century when libraries were first established. Beforehand, only richer people had the chance to read books, since only they could afford to buy them. Sharing enables the producer to cater for a segment of the

market that otherwise would be neglected. In his analysis, people can share or buy, depending on the individual taste and budget.

In Varian's (2000) analysis, there are three scenarios in which profits will increase due to sharing. First, when the transaction costs of sharing are lower than the marginal costs of production, suppliers could incur additional revenues from selling to a group of sharing consumers in which each individual has a willingness-to-pay below production costs. Second, when consumers do not value repeat consumption, renting at a fee below the purchase price may include low-value consumers. (It seems that in these two scenarios, problems for the supplier may arise when consumers with a higher willingness-to-pay share or rent, too.) A third situation in which sharing will benefit the consumer refers to the practice of price discrimination as discussed above.

Of course, the implications of 'sharing' (where several consumers make use of the same physical copy) may be different from those of copying (where new copies are generated). In a later paper, Varian (2005) models the effects of copying on pricing decisions by a (temporary) monopolist supplier. He treats unauthorised copying like a competitor entering the market. The monopolist reacts by changing his price-setting strategy. Using this model, Varian formally analyses the different cases described by Besen (1986), discussed above. Varian (2005) also developed an overview of business models that could allow suppliers of copyright works to operate profitably in spite of intensive unauthorised copying. The optimal price-setting strategy by rights holders depends on the specific market conditions. Some of these business

models are based on the principle of indirect appropriability through price discrimination, others go beyond price discrimination. A short summary of business models will be presented below (section 6).

In 2005, the Review of Economic Research in Copyright Issues (RERCI) published the results of a symposium on indirect appropriability, inviting Liebowitz and his contemporary writers to comment on the progress of this concept and to restate their ideas, particularly since, in the interim, the advent of digitalisation had changed the nature of copying. Liebowitz (2005b) argued that the concept seemed in retrospect to have been important in its time for showing that not all copying was necessarily damaging to producers but that the concept had limited application and had been taken too far by some economists. Johnson and Waldman (2005) concur that the idea is limited. They argue that where the market is flooded by perfect copies, the price will be driven down to the cost of making copies. Thus the market will fail to compensate creators and cover other fixed costs of production. On the other hand, Johnson (2005) shows that novel pricing strategies have developed in the presence of digital copying and suggests that these could help to overcome some of the problems of copying.

## 5.5 Network effects

Network effects – also referred to as network externalities – occur where the benefit of a good increases with the number of consumers using the same kind of good. Illustrative examples are communication technologies such as telephones. The more individuals use a compatible device, the greater the benefit of a telephone for each user.<sup>12</sup> Like increasing returns that operate on the supply-side, demand-side network effects are associated with economies of scale and, if strong enough, they may establish a natural monopoly.

Takeyama (1994) addressed the network externalities that arise from unauthorised reproduction of IP and their impact on social welfare. Her argument is related to the concept of indirect appropriability, discussed above. Consumers who benefit from network externalities will have a greater willingness-to-pay. If producers manage to appropriate some of this additional

willingness-to-pay, they may be compensated for the displacement of demand due to unauthorised use. Therefore, so the argument goes, producers may well be willing to tolerate unauthorised use that increases the network of users. Takeyama found that in the presence of network externalities, unauthorised copying could not only raise rights holder profits but also might cause an unambiguous Pareto improvement to social welfare (see also Bensaid and Lesne, 1996; Economides, 1996). She went even further, suggesting that due to network effects there might be an increase in social welfare even in the absence of indirect appropriability as described in Liebowitz (1985) and Besen (1986). Liebowitz and Margolis (1995) found these types of arguments highly exaggerated. One central objection is that network effects might not bolster overall demand if they are more important in determining which copyright works are consumed but less important in determining how many works are consumed.



<sup>12</sup> Where cultural products are concerned, network effects (or other bandwagon effects) are invoked to explain hits and superstar-effects.

## 6. Law and Economics - The Economic Analysis of Specific Legal Doctrines

Economists have a tendency to ignore the legal detail of copyright law and differences between jurisdictions. In much of the economics of copyright, the interest is not copyright law per se but simply that it is a means to control copying. By contrast, the discipline of law and economics pays considerable attention to the intricate details of copyright doctrines. The field of law and economics is essentially inhabited by academics trained in law, who use the tools of economics to explain specific legal doctrines. This section surveys basic issues in the law and economics literature on copyright. Examples of topics addressed in this literature are: the principle that expressions rather than ideas are protected, which makes it easier to establish the validity of claims; the author's rights in derivative works (such as translations, musical arrangements, film scripts based on a book); the work for hire doctrine, which allows investors to become the original rights holders where they instigate a creative project; the duration of the copyright term; and the exceptions and limitations to copyright for private study and academic research, parody, criticism, etc., known as 'fair use' in US law and 'fair dealing' in the UK.<sup>13</sup>

The law and economics literature draws on several means of economic analysis, including price theory, welfare economics and public choice

theory. However, Coasean economics has had a fundamental influence and the property rights approach as well as transaction cost economics are both widely used. The work by Landes and Posner (1989; 2003; also Landes, 2002) provides an illustrative example. They do not base their analysis on the concept of market failure, which plays a central role in mainstream welfare economics. They emphasise that copyright works are imperfect public goods and, when specifying the costs of copyright, they do not refer to market power. Instead, in their model, users' surplus decreases with increasing copyright protection because it becomes more costly to copy and because follow-up creators have greater costs. Overall, Landes and Posner (2003) place the focus on the optimal balance between the positive and negative incentives to creativity entailed by copyright, at which the creative output is maximised. To achieve that, the law must strike a balance between the protection of an author and the costs that copyright imposes on other authors, such as the costs of developing novel, non-infringing means of expression or of obtaining permission to use the copyright works of others (rights clearance costs). In their application of the deductive method of marginalist price theory, this equilibrium is to be found when the marginal cost of extra protection by copyright equals the marginal incentive increase it provides to authors.

<sup>13</sup> On the application of economic theory to 'moral rights', 'performers' rights' and 'resale rights', see Towse (2006).

## 6.1 The desirable strength of copyright protection

Landes and Posner's (1989) seminal model yields specific policy considerations concerning the scope and duration of copyright law and the fair use exception, which are different aspects of what they refer to as the 'strength' of protection. One of their conclusions is that economic efficiency indicates that there should be greater copyright protection for works that have greater social value. More generally, their analysis implies that copyright should be 'tailor-made' to each work rather than 'one-size-fits-all'. However, they argue that a 'tailor-made' regime has overly high transaction costs and therefore that copyright term has to be uniform. The transaction costs entailed by a copyright system have further implications for Landes and Posner's analysis. The costs of tracing copyright owners increase with the duration of copyright, providing a brake on the desirable length of the copyright term. Finally, the optimal strength of protection is greater the more protection increases authors' supply and the lower the costs of administering copyright.

## 6.2 The duration of copyright

Interestingly, Landes and Posner (2002; 2003) have recently changed their view on the duration of copyright, coming to favour indefinitely renewable copyright. They observe that the vast majority of copyrights are not worth renewing and that the costs of tracing works and other transaction costs therefore would not be excessive. Copyright could

thus play an analogous role to trademarks, which can last indefinitely when renewed. Landes and Posner (2003) argue that indefinite renewability could reduce rent-seeking behaviour as witnessed in the so-called Sonny Bono extension to the US copyright term for corporations (for example, by the Disney Corporation). Lobbying to acquire economic benefits from the state, such as stronger copyright laws that favour copyright-holders, is analysed by public choice theorists as rational economic behaviour relating to political matters; potential gainers will expend an amount of money on lobbying up to the value they expect to gain from it. If copyright were indefinitely renewable, no further extensions of the copyright term would be possible and there would be no incentive for rent-seeking concerning the duration of protection.

Recent extensions in the duration of some copyrights in the EU, EFTA and the USA were debated extensively among economists (see e.g. Akerlof et al., 2002; Liebowitz and Margolis, 2005; Png and Wang, 2009; and in particular for the UK Gowers Review, 2006). In principle, the economic analysis of the desirable duration of copyright takes the same structure as the economic analysis of the strength of copyright in a broader sense (with a greater need for dealing with the discount rate for uncertain future income). There have been a few attempts to evaluate copyright term extensions empirically and these studies are reviewed in section 12.1.

### 6.3 Fair use exemptions to copyright law

An important topic in law and economics is the 'fair use' doctrine, which provides certain exemptions and limitations to copyright – e.g. use for academic purposes, review or parody. The term 'fair use' is a feature of US law. Similar exceptions and limitations to copyright are in place in the UK and in other legal systems but these have received less attention from leading authors in the law and economics literature.

In the US and the UK, exceptions and limitations are evaluated on a case-by-case basis. By contrast, in European countries exceptions and limitations to the author's exclusive rights are specified in the statutes, which stipulate situations in which the exclusive right of authors or subsequent rights holders to authorise use is limited and lists exceptions where copyright material can be used without the author's explicit consent and often without payment.

Gordon (1982) pioneered the application of transaction cost economics to the US fair use doctrine. According to Gordon, the underlying economic rationale is that a market can fail to develop – what economists call a missing market – when transaction costs of obtaining copies exceed the value of copies to individual users. This problem is virulent in markets for copyright, where transaction costs tend to be high in comparison to many users' willingness-to-pay (Besen, Kirby and Salop, 1992). On the one hand, transaction costs for copyright works tend to be high for several reasons: the enforcement costs of exclusive rights for intangible, non-excludable information goods are regularly higher than for tangible property that can

literally be fenced in. Many markets for copyright works are also very complex: a great number of creators and other rights holders supply an even greater number of differentiated products that include an array of rights; the pricing of copyright works is notoriously difficult; there are also often many users with different characteristics. On the other hand, many users have a low willingness-to-pay. Under such circumstances, transaction costs are particularly likely to lead to missing markets. Collecting societies have been explained as organisations that reduce the average transaction costs in the market for copyright (Handke and Towse, 2007).

According to Landes and Posner (1989), an excessively strong copyright regime that tolerated little fair use would raise transaction costs and copyright-based earnings. Excessive protection would transfer rents from users to artists and raise the costs of creation to artists that seek to build on previous works. This could, in the long run, lead to a reduction in the supply of creative works. An excessively weak regime, on the other hand, would not provide sufficient incentive to look for means of charging and therefore would reduce both transaction costs and earnings. It would also ease what Landes and Posner called 'productive' (as compared to 'reproductive') fair use of copyright material for creating new and derivative works and benefit consumers. Fair use regulations within copyright law must balance these opposing tendencies. This analysis has been particularly important in the recent discussion on whether or not downloading of copyrighted material from the Internet by private individuals should qualify as 'fair use' (Klein, Lerner and Murphy, 2002).

## 6.4 Technical enforcement measures and fair use

There has been some concern that the balance struck by fair use/fair dealing exemptions will be offset where self-help systems such as digital rights management (DRM) and in particular technical protection measures (TPMs) come to play a greater role in the administration of copyright.<sup>14</sup> One example of TPMs are programmes incorporated into digital copies, which either control access (say, for example, area codes on DVDs) or obstruct unauthorised copying.<sup>15</sup> In principle, privately-run technical measures to control access and copying of copyright works may provide an elegant solution to many of the problems that have arisen in the course of digitisation. First, rights holders are the direct beneficiaries of copyright protection and it would make sense to have them finance the costs of enforcement, since they are best informed about the level of investment in copyright protection that is efficient from their perspective. Second, technical measures that obstruct unauthorised use could prevent enforcement through costly litigation. Third, rights holders would probably gain greater flexibility to adapt the level of protection to their own needs.

One problem with DRM/TPMs relates to the potential for strong economies of scale and network effects in the market for such IT techniques (similar to those found in computer software or operating systems). The implication is that suppliers of such services will probably gain some market power.

There may be the need for regulation where essential services related to the management of copyrights are provided by a small number of for-profit firms.

Another problem with TPMs is that rational rights holders cannot be expected to sustain fair use exceptions that are not in their best financial interest but socially efficient. It may cost considerably more to incorporate fair use exceptions – or even the limited duration of restricted access – into technical measures and no practical solutions have yet been introduced to the market. The digital millennium copyright act in the USA and the EU Directive on copyright in the information society have been criticised for aggravating the problem since they outlaw any circumvention of TPMs, even where traditional fair use exceptions used to apply. The widespread application of TPMs may thus threaten to offset the balance between copyrights holders' interests and the interest of the general public as enshrined in fair use arrangements (e.g. Foroughi et al., 2002; Erickson, 2003; Marsnik, 2004).

Another problem with TPMs is that, so far, few initiatives have withstood the strains of the market. Ambitious initiatives by major rights holders and ICT firms have repeatedly run into insurmountable obstacles. At the time of writing, there is little debate around DRM/TPM initiatives compared to recent years. It seems likely, however, that DRM/TPM solutions to the challenge of digital copying

<sup>14</sup> DRM refers to the application of advanced 'digital' information and communication technologies to administer all types of copyright. DRM can also refer to the narrower task of the administration of copyright for works that are distributed as binary (i.e. digital) code.

<sup>15</sup> Another example of TPMs is 'watermarking', which does not influence the functionality of digital copies but may aid the identification of the source of unauthorised copies.

will be back on the agenda in the near future. In that case, regulators need to take account of the implications for fair use.

## 6.5 Moral rights

Moral rights refer to the authors' rights to attribution and to inhibit uses and modifications of their creations that might compromise the authors' reputation or the integrity of their work. Moral rights are an integral part of the copyright system but they have received little attention in the economics of copyright (Towse, 2006). Moral rights tend to be justified in terms of natural rights arguments that creators have a self-evident right in the output of their work. Nevertheless, it seems that the incentives provided by moral rights could be studied in much the same way as those provided by economic rights and that they also relate to an underproduction/underutilisation trade-off.

The specialised literature on cultural economics discusses non-pecuniary incentives in the cultural sector (e.g. Throsby, 1994; Towse, 2001). Within the economics of copyright, Hurt and Schuchman (1966) already contrasted the position of authors who may have other reasons than pecuniary gains to supply creations, and publishers who are more exclusively motivated by pecuniary rewards. If intrinsic motivation plays an important role in motivating creativity, the maximisation of pecuniary returns to rights holders should not be equated with the maximisation of incentives to create.

Moral rights may cater for aspects of the intrinsic motivation of authors, for example by inhibiting use that would diminish the author's peer recognition or that runs counter to values they hold dear. The possibility that moral rights encourage creative supply is one reason why empirical studies on the effects of copyright should focus on the link between copyright protection and the supply of creative works rather than on suppliers' pecuniary profits. This point will be further developed below.

However, the distinction between moral and economic rights<sup>16</sup> might be somewhat artificial. Rushton (1998) argues that moral rights entail direct and indirect pecuniary benefits to authors. In the Anglo-Saxon legal system, moral rights are usually just a part of the bundle of rights that authors can sell to intermediaries, for example a publisher.

In contrast, in many continental European countries moral rights (in particular modification rights) are often inalienable and not waivable. That is, they cannot be sold or dropped in return for some compensation. In the abstract, the inalienability of some copyrights places a restriction on authors as it means they have one less right to trade. In practice, some authors may be in a very weak bargaining position with intermediaries and in such a situation, inalienable moral rights might help authors strike a compromise between the commercialisation of their creations and retaining some control over the integrity of their work that they could not bargain for otherwise.

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<sup>16</sup> In this context, the expression 'economic rights' refers to rights that lead to some type of pecuniary income to rights holders.

## 6.6 Other research on the nuts and bolts of the copyright system

There are inherent limitations to the economic analysis of the details of copyright law. To disentangle the economic effects of highly complex legal arrangements and isolate the import of increasingly minute details is challenging to say the least. As argued above, pure theory is often limited, and empirical multivariate analysis requires very good data on all relevant intervening factors, which is rarely approximated well in studies of the copyright industries. Thus it might not be reasonable to expect conclusive theoretical or clear econometric results on very specific aspects of copyright policy.

As a rule, econometric studies will be most useful to study the impact of sudden and substantial changes to the copyright system, rather than gradual and minute alterations. Econometric studies will also be especially useful to evaluate the impact of copyright reforms ex post. Economic studies will not replace the need for some personal judgements where detailed suggestions for copyright reform are concerned.



## 7. Alternatives to Copyright and Criticisms of Copyright Law

arguments that are used to make the economic case for copyright law. Whatever the economic rationale supporting copyright, there have always been authors who have challenged the case for copyright. On the one hand, it has been argued that unregulated markets would eventually approximate a reasonably efficient solution without statutory intervention. On the other hand, it has been argued that there are alternative types of statutory intervention that may be more efficient. Furthermore, even when taking a copyright system as a given, specific aspects of this institution have been criticised because they may diminish the contestability of regulated markets and restrict technological change.

### 7.1 Market solutions to unauthorised copying – the adaptation of business models

The most fundamental objection to copyright is that the regulated markets would function without any statutory intervention. Suggested market solutions to the threat of unauthorised copying include first mover advantages (Boldrin and Levine, 2002; 2005), joint sale of complements, versioning (Varian, 2005), indirect appropriability and price

discrimination (Liebowitz, 1985) or even network effects (Takeyama, 1994). Liebowitz (1985) and Johnson (2005) document examples of firms that develop new business models and manage to operate profitably in spite of unauthorised copying.<sup>17</sup>

Boldrin and Levine (2002; 2005) argue that freedom of contract and first mover advantages provide a sufficiently strong basis for a competitive market of ideas. Though describing themselves as conservative economists, they contend that well-defined property rights are less important than unhindered competition. They argue that IP has come to mean not only the right to own and sell ideas but also the right to regulate their use. This contrasts with the situation in many other markets. For example, no one selling potatoes could limit their use and consequently sue the inventor or producer of chips for using potatoes without a licence. To Boldrin and Levine, existing copyright arrangements create a socially inefficient monopoly and they claim that what is commonly called IP should rather be called 'intellectual monopoly'. This view appears to be diametrically opposed to the natural rights or *droit d'auteur* approach taken in continental Europe.

<sup>17</sup> *These market solutions need not erode the case for copyright altogether, when they only allow producers to mitigate parts of any problem associated with unauthorised copying.*

## 7.2 Alternative statutory intervention

Other authors concede that there is a general case for public innovation-enhancing measures in markets for 'literary, scientific and artistic' works but they investigate alternatives to copyright. Where there are alternative options, an unregulated market is not the sole point of reference determining the desirability of a copyright system. The effects of a copyright system also have to be compared to the effects of alternative statutory intervention.

For information goods, Arrow (1962) assumes that exclusive property rights cannot provide an efficient solution because these types of goods tend to be non-excludable and non-rival. Copyright works that can be reproduced as digital code without loss of value approximate the state of a perfect public good, for which Arrow suggests public provision or the public compensation of producers. Plant (1934) came to a similar conclusion before the contemporary theory of public goods had taken shape.

Economists have since begun to study a range of transfer mechanisms at the disposal of public policy-makers: (1) levies on copying technology such as CD-Rs or computers (Farchy and Rochelandet, 2002); (2) direct subsidies to producers (Plant, 1934; Hurt and Schuchman, 1966); or (3) stipends and awards (Shavell and van Ypersele, 2001). Shavell and van Ypersele (2001) argue that an optional system of stipends and awards (which they assume could also be organised privately) could replace part of the IP system and that a combination of both options could be more efficient than a copyright system as the only public innovation enhancement policy.

What is more, aspects of copyright works may also fall under other types of IP or other types of IP could provide an alternative to copyright in the future. The latter option has not received much attention in the literature.

An obvious problem with levies, public subsidies and even awards is that they are bound to replace the market mechanism with central control at least in part. The administration of levies would likely give rise to a natural monopoly with the associated inefficiencies or the need for continued regulation (see Handke and Towse, 2007). Further problems with such systems concern the determination of an adequate price (or range of prices), the bundling up of repertoire into a single blanket licence or more flexible bundles, and the distribution of receipts. Levies are unlikely to bring about either an efficient or a flexible solution (which does not mean that they would necessarily be inferior to existing 'second-best' arrangements). It is however unclear whether public authorities have the expertise to devise efficient solutions.

In most major markets, copyright collecting societies have some expertise in the centralised administration of copyright on behalf of a large number of rights holders. One question is whether collecting societies provide good examples for policy-makers and may even provide a solution as reasonably efficient administrators of levies and subsidies. The impression is that collecting societies are relatively slow to develop structures that support digital markets and to make use of advanced ICT in order to improve the efficiency of their operations. Collecting societies are undoubtedly restricted by the need to negotiate new terms with all members when they want to innovate.

Einhorn (2002) argues for public intervention into the pricing policy of collecting societies in order to promote the uptake of new business models, which would require the swift introduction of reliable standards and/or low prices, at least while new models are being developed. On the other hand, Merges (1996) and Snow and Watt (2005) have argued for minimal state intervention concerning collecting societies for the time being. Where markets exhibit lock-in effects and where there are missing markets, intervention may make most sense as a temporary catalyst.<sup>18</sup>

Concerns with digital copying have been a central issue in the record industry for over a decade. More extensive statutory intervention should have become more appealing over this period and there are several alternatives to public investment in copyright enforcement. Where such alternatives are put into practice, policy-makers need to remain sensitive to overlap with the copyright system and unintended consequences. A specific example concerns academic journal articles. These copyright works are regularly publicly financed – in line with Plant's (1934) and Arrow's (1962) recommendation – but the copyrights regularly end up with private, for-profit publishers, who may favour greater restrictions to access than either the authors or the public authorities who cover most of the costs of production.

### 7.3 Specific issues with the copyright system

Several economists have also discussed specific shortcomings of the existing copyright system, without necessarily challenging the case for copyright in general.

#### The relationship between creators and intermediaries

There have been complaints that the current copyright system does not act as an incentive to creators but that it just protects business interests that exploit copyright. A more moderate position is held by Towse (2001), who argues two points. First, the greater economic power of corporations in comparison to that of individual artists (creators and performers) means that the artists are unlikely to get a good deal. Her evidence suggests that copyright does not yield much in the way of earnings for artists other than for a small minority of superstars and that the bulk of revenues generated by copyright ends up with intermediaries (see also Kretschmer, 2002; Gayer and Shy, 2006). Second, artists and creators are not only motivated by pecuniary reward, which may lead to conflicts with for-profit intermediaries. If peer recognition motivates creators, they might have a preference for wide distribution of their output beyond the level at which pecuniary returns are maximised.<sup>19</sup>

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<sup>18</sup> More permanent standard setting may be required for natural monopolies, which seem to exist in certain aspects concerning the administration of copyright (Handke and Towse, 2007).

<sup>19</sup> Peer recognition is also usually involved in prizes, and moral rights may allow authors to avoid use that would damage their reputation.

Where digitisation lowers the fixed costs of recording, reproduction, distribution and effective promotion, creators may find it easier to go it alone. There is limited evidence that disintermediation does take place but the mere possibility may strengthen the negotiating position of creators against intermediaries. What is more, falling fixed costs may lower barriers to entry and thus increase the rivalry between intermediaries in the copyright industries. By contrast, even greater integration of markets seems feasible with the emergence of digital markets. If copyright hinders the adoption of new business models and technological innovation (see below), it may sustain the status quo.

### The contestability of the markets for copyright works

Another issue related to divergent interests in the industry is that some unauthorised copying may actually favour fringe suppliers and newcomers over larger, incumbent rights holders, thus making the market more contestable. An interest in the contestability of the market in the presence of unauthorised copying has sprung from empirical results, which will be discussed below in section 13.2.

One related theoretical argument is the following (cf. Klein, 1998; Peitz and Waelbroeck, 2006). Many copyright works have the attributes of experience goods: that is their value cannot be judged adequately before purchase and experiencing the good through consumption.

What is more, there is usually a multitude of close substitutes available and many consumers will restrict their search costs by focusing their searches on products that are marketed under familiar brands.<sup>20</sup> Basic economic theories of demand under incomplete information suggest that incumbents enjoy greater market power in markets for experience goods, where little pre-purchase information is available (Nelson, 1970). Online sampling may allow for more complete product searches and thus the desirable extent of sampling will look different depending on suppliers' positions in the industry. Sampling makes it easier for fringe suppliers and newcomers to receive some attention and to compete with incumbents who market established brands.<sup>21</sup> Incumbents who market their products under well-established brands will probably prefer less sampling to take place than newcomers and fringe-suppliers.

In addition, more complete product searches would make market selection more reliably approximate an 'optimum'. The 'frictionless market' hypothesis suggests that the Internet may host a much more efficient market for information goods because it allows for more effective product searches and lower costs of reproducing and distributing such goods. For an early discussion of the (limited) empirical evidence for the 'frictionless market' for copyright works online see Brynjolfsson and Smith (2000).

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<sup>20</sup> For most copyright works, a presence in the mass media tends to be essential for generating substantial sales. The traditional mass media cover only a small fraction of the total works supplied. Programmers in the mass media are more likely to include works that are associated with strong brands, which may exaggerate the concentration of the market.

<sup>21</sup> This will only be the case where online samples – including unauthorised copies – are imperfect substitutes for authorised copies so that sampling may lead to subsequent purchases.

In any case, there seems to be a tendency in the economic literature on copyright to ignore concerns for market power of major intermediary rights holders and the contestability of markets. This contrasts with a number of anti-trust cases brought against the suppliers of copyright works such as sound recordings and newspapers over recent years.

### Inflexibility

A further criticism of the copyright system concerns its inflexibility (e.g. Shavell and Ypersele, 2001). The copyright system leaves rights holders with little option to vary copyright protection, for example if they prefer to grant free access to parts of their repertoire for a limited time in order to develop markets.

It seems hard to imagine that a 'one-size-fits-all' copyright system would provide an efficient solution across the entire range of copyright works from recordings of popular music to newspaper articles and academic research papers. The situation in some particularly dynamic markets regulated by copyright such as video games and other types of computer software has received relatively little attention from economists. These markets have been affected by digital piracy since their inception. They may require more attention because of their growing economic significance and because they may illustrate the shape that industries for information goods take in the permanent presence of digital copying.<sup>22</sup>

What is more, fringe suppliers and newcomers may favour a lower level of protection and lower prices for use than well-established incumbents (see above). Landes and Posner's (1989; 2003) formal analysis implies that it would be optimal to devise a tailor-made level of copyright protection for every copyright work. Incomplete information and transaction costs have, however, rendered this solution impractical.

There is not necessarily a binary choice between a single, 'one-size-fits-all' copyright system and a tailor-made system. For example, 'some rights reserved' (rather than 'all rights reserved') is the buzz phrase of the Creative Commons initiative. Creative Commons seek to establish a more flexible solution to the definition and management of rights, giving rights holders scope to claim only parts of the rights entailed in copyright law, so that a multitude of different licences becomes feasible. Creative Commons licenses aim to provide suppliers with greater flexibility and users with greater freedom. Paradoxically, even though such a fragmented system of copyright would imply that many uses would no longer require an explicit license agreement, it could come to increase some transaction costs. After all, the complexity of a more flexible system would probably increase considerably and users would have to establish what type of arrangement applied for each specific work.<sup>23</sup> A similar objection was raised by Landes and Posner (2003) regarding the custom-made duration of copyright for works. Technical protection measures could help to reduce transaction costs and reduce the costs of flexibility.

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<sup>22</sup> See for example Rodriguez Andres (2006) on the effectiveness of copyright protection as a means to inhibit software 'piracy' (as well as the relationship between income and unauthorised copying) or Bessen (2005) and von Krogh and von Hippel (2006) on open source software, which is produced without having recourse to many of the conventional aspects of copyrights or other types of IP.

<sup>23</sup> Under a Creative Commons licence, different logos are used to signal various types of copyright arrangements.

This situation is reminiscent of the so-called ‘anti-commons’, the antithesis of the ‘tragedy of the commons’. Anti-commons refers to a situation in which property rights are so de-bundled, and ownership or control is so scattered, that the transaction costs to coordinate the various rights holders become too high to allow for profitable use of the property (Depoorter and Parisi, 2003). Recent extensions to the coverage of copyright and specifically to the types of producers who are entitled to copyright may have aggravated this problem.

### Copyright and technological innovation

Last but not least, a number of authors have argued that the statutory monopoly that copyright entails could hold back new types of use (e.g. David, 1993; 2004; Boldrin and Levine, 2002; 2005). The criticism that the copyright system restricts technological innovation is of particular interest in the current period of swift technological change in many copyright industries. This issue is central in the following section.



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## 8. Static and Dynamic Effects of Copyright

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In economics, the distinction between static and dynamic effects is crucial. Static analysis focuses on allocative and productive efficiency in the short run. It may describe the equilibrium state of an industry in a given, constant environment and with a given state of technology. It may also elaborate on the effects of an isolated, clearly defined change to this equilibrium, holding all other things equal. By contrast, dynamic analysis allows for induced changes such as endogenous innovation and technological change over time, often as the result of conscious efforts to adapt to changing market conditions (e.g. Nelson and Winter, 1983). Many of the formal models that economists use are static, often for no better reason than that dynamic models are very difficult to formulate (Liebowitz, 2005b; 2006).

### 8.1 Are the economics of copyright static or dynamic?

The distinction between static and dynamic analysis of copyright was made clearly in Johnson (1985), discussed above. However, static and dynamic effects are easily confused (Towse and Holzhauser, 2002) and many writers seem to slip all too readily from static to dynamic reasoning, as noted by Landes and Posner (2003). The main research stream in the economics of copyright blends static and dynamic arguments in a noteworthy manner. In the short run, the benefits of copyright accrue to

the rights holders who can raise prices. The short-run interest of consumers is the cheap and easy access to existing copyright works, which copyright restricts. In a consistent application of static, short-run analysis of the welfare effect of copyright, this institution is thus addressed as trading off the interests of producers and consumers (Johnson, 1985; for an empirical study based on this reasoning, see e.g. Rob and Waldfoegel, 2005). Taking into consideration Landes and Posner's (1989) concern for the cost of copyright protection on follow-up creations, it might be more appropriate to speak of a trade-off between the interests of rights holders and users. There are three types of users who may be adversely affected by copyright: first, end-consumers; second, creators seeking to incorporate aspects of copyright works into their own creations; third, organisations that wish to incorporate copyright works into other types of product. Overall, in the short run, copyright seems to benefit rights holders over users.

The conventional justification of copyright does go beyond static analysis at one point. It is argued convincingly that over time, copyright may benefit users because the expectation of copyright protection motivates investment in creativity and innovation and thus increases future supply. These dynamic incentive effects deflate the case

against copyright due to the welfare loss of users in the short run. It is even possible that rights holder and user interests do converge in the long run. Over time, an adequate level of copyright protection could increase the welfare of producers and users simultaneously. That would be the case if consumers gained more from increased future supply than they lose from current access restrictions due to copyright and the transaction costs entailed by the copyright system. The short-run benefits to users from unrestricted copying would be unsustainable. According to this understanding, the case for copyright tends to be much less ambiguous than in a consistently static analysis. Analysts seeking to justify copyright as a whole might thus be spared the task of trading off user and rights holder welfare.

The benefits of copyright's innovation-incentivising effect for users play a central role in the economics of copyright. As will be discussed below, empirical studies on the impact of digital copying rarely even address any trade-off between the interests of rights holders and users. At the same time, other time-dependent consequences like endogenous technological change are excluded in most contributions to the economics of copyright.

Arguably this constitutes a noteworthy blend of static and dynamic components in economic models of copyright/unauthorised copying. The benefits of copyright are discussed in a dynamic context, including concern for the long run. The costs of copyright are only discussed in static terms. This reflects a strong judgement on what matters (rights holder interests and the benefits of

copyright-induced innovation) and what does not (the immediate benefits of unrestricted copying and use as well as the benefits of unrestricted user innovation).

## 8.2 Blending static and dynamic analysis and its problems

As argued above, the blending of static and dynamic reasoning in the conventional rationalisation of copyright is problematic (cf. Towse and Holzhauser, 2002; Landes and Posner, 2003). On a general level, once the assumption of a static, competitive equilibrium is dropped (where suppliers manipulate only the quantity they supply of a given good and where innovation and technological change is absent), we may lose much of the precision with which maximisation problems can be solved in neo-classical economic theory. The central challenge that arises in the dynamic analysis of copyright is to determine what the future innovative output motivated by copyright policy is worth. This is a very difficult question. Much of the economic literature has sidelined the issue and little is known about the extent to which copyright fosters innovation in real markets.

### Copyright and the supply of copyright works

The effect of copyright on supply in practice is not well understood: this constitutes probably the most fundamental gap in the entire literature. The issue has been contentious in the past. The upheaval associated with a process of digitisation has only complicated the matter.

In the current context, including the widespread use of digital copying technology, the relationship between copyright protection/unauthorised copying and the supply of copyright works has not been specified. Empirical studies by economists have focused almost entirely on the correlation between supplier revenues and unauthorised copying. Such studies do not cover the full transmission mechanism from unauthorised copying to supply of copyright works because they neglect the elasticity of supply to revenues (in other words, they do not consider how sensitive the supply of creators is to a drop in copyright-related earnings). As Landes and Posner (1989; 2003) have pointed out, the question of whether copyright protection fosters the supply of protected works due to the stifling effect copyright may have on follow-up creation is not a trivial one.

### Other dynamic effects of copyright

The effect of copyright on supply in regulated markets has another dimension. There are two ways in which the supply of copyright works may improve over time. On the one hand, new copyright works (or content) with beneficial attributes may be introduced to the market. New products will be advantageous if they are superior substitutes for previously available products (if only because they are better adapted to current preferences or because consumers value novelty) or if they fill a niche that was previously not catered for. Second, new ways of delivering and presenting copyright works may be introduced which have one of the aforementioned beneficial attributes or that facilitate

access, for example by making existing works available more conveniently and at lower costs.<sup>24</sup>

A number of authors have argued that the statutory monopoly that copyright entails could hold back new types of use (e.g. David, 1993; 2004; Boldrin and Levine, 2002; 2005). On the one hand, a copyright system may require protracted negotiations between a number of rights holders before new services that make use of copyright works can be introduced to the market (Merges, 1996; Einhorn, 2001; Depoorter and Parisi, 2003). On the other hand, intellectual property rights may be used strategically by incumbents to sustain barriers to entry (Kim, 2007; Bhattacharjee et al., 2007) or to extend their market power concerning copyright works into related markets. Where this occurs, copyright entails dynamic costs over and beyond what is acknowledged in much of the literature.

Much of the theoretical literature on copyright does not incorporate the dynamic costs of copyright (an important exception being Landes and Posner, 1989). The decision to include copyright's dynamic benefits but not dynamic costs in the welfare analysis makes a strong assumption about their relative importance. The implicit assumption is that the dynamic benefits of copyright are so much larger than the other dynamic aspects of the market that little explanatory power is lost by including the former and excluding the latter.<sup>25</sup>

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<sup>24</sup> Handke (2008; following up on Caves, 2000) introduced the terms 'content creation' and 'humdrum innovation' to distinguish these two types of innovation in the cultural industries. See Stoneman (forthcoming) for a more general distinction between 'hard innovation' and 'soft innovation'.

<sup>25</sup> We assume here that the objective of the welfare analysis is to produce valid predictions on net effects throughout society in order to provide adequate guidelines for policy.

Nevertheless, user innovation may be restricted because of copyright. Just as rights holders may restrict their innovation investment where unauthorised copying makes them worse off, users are likely to restrict their innovation investment under the restrictions of copyright. For example, a follow-up creator who generates a new arrangement of an existing recording cannot legally make this work available to others without the permission of the copyright holders. Due to the transaction costs involved in arranging for permissions, it is possible that no agreement takes shape, even in cases where both the follow-up creator and the original rights holder would have profited from such an arrangement. The equivalent point may be made for technical inventors, for example a firm introducing a new distribution channel for musical recordings.

Due to the potential for dynamic innovation costs of copyright for follow-up creators and other users, it is not satisfactory to model the costs of copyright as an instant dead-weight loss that has no dynamic effects (cf. Towse and Holzhauser, 2002). This holds in particular when dynamic effects are addressed for the countervailing benefits. Otherwise, the likely result is a bias in favour of copyright protection.

### **8.3 The structuralist-evolutionary perspective**

A consistent dynamic approach is that taken in economic theories of technological change, or 'structuralist-evolutionary economic theory' as Lipsey et al. (2005) call it. Schumpeter (1942)

provides the general insight that perfectly competitive firms in the static sense have neither the means nor the incentive to innovate and therefore a growing economy must be propelled by firms that enjoy market power and those that strive to attain it. From this perspective, competition refers to an evolutionary process in which firms wrestle with one another for dominant positions in the market through technological innovation. Successful enterprises enjoy super-normal profits until a superior innovator replaces them in a process of creative destruction. Capitalist economies grow in a perpetual process of creative destruction, which becomes more intense during periods of radical technological change.

At first sight, the temporary market power that copyright may foster appears less objectionable from this perspective than in mainstream economic theory. However, in order to sustain incentives to innovate, it is essential that the market stays contestable. If dominant firms are guaranteed a permanent monopoly or if they can obstruct market entry by innovators, neither incumbents nor newcomers may have sufficient incentive to invest in the uncertain process of innovation. Taking a closer look, structuralist-evolutionary perspectives address a number of critical issues concerning the welfare effects of copyright in a relatively coherent manner, including the possible adoption of new business models, the effects of copyright on technological innovation (and not just content creation), and gradual change in inter-firm rivalry in the course of technological change.

### Basics of structuralist-evolutionary theory

Evolutionary economic theories pay greater attention to differences between suppliers<sup>26</sup> as well as developments over time than mainstream economic theories of monopolistic competition do. Notions of a static equilibrium, perfect information and thus perfect rationality are rejected.<sup>27</sup> Innovation and technological change are regarded to be the main drivers of economic growth rather than the optimal allocation of given resources at a constant state of technology (Schumpeter, 1942; Solow, 1956). The desirability of technological change is emphasised, even if long-run productivity increases come at considerable costs of change. The capacity to innovate – to change and adapt – is seen as an essential aspect of firms' or economies' competitiveness. What is more, economic agents are seen to be in constant interaction with a mutable environment. Economies are subject to frequent and not perfectly predictable changes that require adaptation. Economic development comes about through a continuous process of variety creation and its reduction through market selection. From this perspective, technological change is a continuous and uncertain process that is path-dependent and open-ended.<sup>28</sup> No optimum is ever achieved, nor would a perfect equilibrium be desirable, since it precludes investments in innovation (Schumpeter, 1942).

### Broader technological change in the copyright industries

In the copyright industries, the pervasive use of digital information and communication technology is bringing substantial cost reductions and productivity increases (Varian, 2005; Liebowitz and Watt, 2006). Digitisation is also associated with the rise of new products and services. A few recent economic studies of copyright have raised the notion of creative destruction and how it could be related to the impact of digital copying (Ku, 2002; Tschmuck, 2003; Liebowitz, 2006; Handke, 2006). It has also been suggested that radical technological change with digitisation will erode the market power of incumbents and make structural change in copyright industries more likely (Caves, 2000:174 and 201ff.; Alexander, 2002; Tschmuck, 2003), since, as a rule, small firms “have some comparative advantage in the earlier stages of inventive work and the less expensive, but more radical innovations, whereas large firms have an advantage in the later stages and in the improvement and scaling up of early breakthroughs” (Freeman and Soete, 1997: 234; cf. Klepper, 1996; Breschi and Malerba, 2001).

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**26** *Diversity of economic agents is a logical underpinning of any discussion on product differentiation.*

**27** *Instead, since actors are clearly unable to know about – and make strategic choices on – all possible options, they operate under “bounded rationality”, which is co-determined by firms' past experiences (e.g. McKelvey, 1994).*

**28** *Uncertainty in economic development means that there can be situations in which two rational agents of identical faculties and preferences might take different decisions when faced with the same choice (Rosenberg, 1998; Lipsey et al., 2005). Technological change as the main source of growth over time is understood to be not just risky in the sense that there are several known alternative outcomes for which probabilities can be determined. Instead, technological change is seen as fundamentally uncertain: not all possible outcomes can be identified and the probability of imaginable outcomes cannot be specified (Lipsey et al., 2005; Lipsey, 2007).*

### Implications for normative assessments of copyright

Mainstream economics and structuralist-evolutionary theories diverge fundamentally in their assumptions about market conditions and the industry's ability to cope with change. Applied to the debate on digital copying, a major difference is that mainstream analyses often assume that the copyright industry operated in a state close to a competitive, static equilibrium before it was hit by a surge of unauthorised copying. This assumption facilitates a normative assessment. If the assumption is that the *modus operandi* prior to an increase in unauthorised copying was efficient, any deviation from it is likely to be welfare-decreasing. Once it is established that the net effect of a surge in unauthorised copying is damaging to existing suppliers, counter-measures seem desirable. Given the capacity of new copying technologies, many analysts suggest that a continued erosion of the copyright regime would threaten the very existence of economically viable content industries and therefore believe it is essential that copyright law be strengthened. Copyright enforcement is seen as *the* central challenge to the industry today.

From a structuralist-evolutionary perspective, there are several caveats (Handke, 2006). First, the effects of other ongoing technological change might overlap with the effects of unauthorised copying. Significant broader technological changes could create additional difficulties in isolating and correctly assessing the short-run impact of unauthorised copying.

Second, any successful adaptation to changed market conditions – beyond efforts to enforce exclusive rights – would mean that some of the adverse impacts of unauthorised copying would be temporary and that positive impacts could become more significant over time as suppliers learn to handle these developments better. Adaptation would mean that mainstream studies that do not allow for adaptation overestimate the long-run damage brought by unauthorised copying.

A third point raised by the structuralist-evolutionary perspective is that technological change may have to be treated as endogenous, which leads to a more complex argument. Ongoing broader technological changes within the industry and efforts to adapt to the presence of digital copying technology are likely to be linked and might come to reinforce each other, in particular where any technological change diminishes barriers to entry, increases competition and incentives to innovate. Roughly speaking, this is consistent with the prediction of theories of radical technological change (e.g. Abernathy and Utterback, 1975; 1978; Freeman and Perez, 1988; Klepper, 1996). If technological change occurs and these developments have asymmetric effects on various types of market participants, it would be desirable to distinguish between the destruction due to unauthorised copying on the one hand, and, on the other, any adverse effects on incumbent firms due to increased competition with emergent markets for close substitutes (cf. Michel, 2005; Liebowitz, 2006), with legitimate new market entries, or with particularly innovative competitors.

Fourth, specific aspects of copyright systems might even be at odds with the desirable levels of competition and swift technological change as discussed above.

That said, there are few systematic applications of economic theories of innovation and technological change to questions concerning copyright. What is more, a process of pervasive, radical technological change is hard to identify as it unfolds, because such a process is defined by its outcome and because technological change entails uncertainty. Handke (forthcoming) develops a diagnostic test for creative destruction – studying the number of works supplied, the number of market entries by specialised suppliers, and measures of innovation intensity – and finds ample evidence that the German record industry is undergoing such a process after the mass diffusion of digital copying technology (see also Handke, 2006).

Copyright will almost certainly affect technological change in the record industry. If the record industry is undergoing a process of swift, radical technological change and creative destruction, this has fundamental implications for copyright reforms that seek to accommodate for the diffusion of digital copying technology. In a context of radical technological change, policies targeted at preserving traditional business models may be counterproductive. Copyright policy should rather seek to accommodate technological transition and ensure that the productivity increases from swift technological change are fully exploited.



## 9. Summary Part 1

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The economics of copyright is rooted in a utilitarian understanding of this institution. In the economic literature, copyright is seen as a means of fostering incentives to supply copyright works. It is contentious whether existing copyright systems achieve this aim and compensate for the inevitable costs of public intervention by steering the supply of copyright works closer to a socially desirable level more efficiently than either an unregulated market or alternative public measures would.

A first essential insight in the economics of copyright is that copyright relates to a trade-off of countervailing objectives. Economic theory predicts that, in a free market, the supply of copyright works would be deficient. A copyright system mitigates this problem but at the cost of restricting the use of copyright works. This leads to an underproduction-underutilisation trade-off (also referred to as an access-incentive trade-off).

Various strands of economic theory specify this problem differently. Standard welfare economics discusses market failures due to the characteristics of copyright works as quasi-public goods and the market power of copyright holders. A property rights approach takes the desirability of unambiguous property for granted and focuses on the reduction of transaction costs in order to approximate an efficient market outcome.

The theoretical case for copyright has advanced with detailed applications of theories of public goods and information economics that address the distinctive cost-structure and the potential for increasing returns in copyright industries. The economics of copying has further advanced the understanding of various scenarios in which unauthorised copying may or may not benefit rights holders or society at large – sometimes with counterintuitive results.

There is no universal justification for copyright on the basis of economic theory, since any conceivable copyright system entails substantial costs in addition to its benefits. Whether copyright leads to greater social efficiency can only be determined on the basis of a careful assessment of market conditions (which is the purpose of the economics of copying) and an assessment of specific legal doctrines (which is the purpose of law and economics) as well as the assessment of the administration of rights in practice.

The justification of copyright and the specification of the desirable level of copyright protection thus relate to a complex empirical question: what is the relationship between the social benefit from bolstered supply due to copyright protection on the one hand and the access costs, administration costs and transaction costs that a copyright system entails on the other? Thus whether a copyright system offers a net welfare gain is an empirical question.

By itself, formal-deductive reasoning is not suited to resolving such trade-offs because it is mute as to the proportion of the costs and benefits it identifies.

Beyond this point that relates to the limitations of pure theory, the economic literature provides a number of further useful insights.

On the one hand, the short-run and long-run effects of copyright differ substantially. In the short run, copyright benefits rights holders at the expense of users. In the long run, the user benefits of any additional supply due to copyright protection may more than offset the access cost to users due to copyright. In that case, copyright would offer a net welfare improvement for all stakeholders (i.e. a Pareto improvement).

On the other hand, under some circumstances, unauthorised copying may even increase rights holders' revenues or profits. In the past, copyright holders have demonstrated considerable ingenuity in adapting their business models so as to sustain their profitability in spite of unauthorised copying.

Furthermore, the relative weight of costs and benefits will change with changing market conditions so that the desirable level of copyright protection is likely to vary over time. The diffusion of digital copying technology may be qualitatively different from previous advances in copying technology because the variable costs of generating and disseminating unauthorised copies approach zero.

Advances in copying technology play a central role in the economic literature on copyright. Nevertheless, there is a tendency in economic research on copyright to adopt a highly abstract

analysis and to sideline endogenous technological change (adaptation). It seems likely that industry adaptation and the broader implications of digitisation require greater attention in order to arrive at valid policy implications.

Digitisation has much wider implications in the copyright industries than simply more intensive unauthorised copying. On the one hand, falling costs and altered cost-structures may change the case for copyright and they will certainly affect the desirable strength of copyright protection. On the other hand, the copyright system is likely to affect the speed and direction of technological change.

The nuts and bolts of copyright policy – for example the exact duration of copyright or the scope of fair use exceptions – have mainly been addressed in the law and economics literature. The challenge is to translate state of the art economic research on unauthorised copying and the justification of copyright protection that operates on a general level into practical policy suggestions concerning specific aspects of the copyright system. There has not been enough work in this respect.

Overall, the economics of copyright has gone a long way towards identifying the various effects of copyright protection and unauthorised copying on suppliers' profits and total social welfare under specific market conditions. The literature does not, however, support general conclusions on the welfare effects of unauthorised copying independent of detailed knowledge on the market. In order to make the economic case for copyright, there is dire need for empirical research.

## **PART II – EMPIRICAL STUDIES**

Pure theory supports neither general nor very specific recommendations for copyright policy. Furthermore, the upheaval associated with digitisation challenges established positions. Under these circumstances there seems to be an urgent need for empirical research.

Empirical studies have not featured much in the economics of copyright. One reason for this is probably that they do not form part of the intellectual tradition of studying the law. Another may be a lack of relevant data. In economics more generally, however, empirical studies have always occupied an important position as a means of testing theories. Recently, empirical studies of copyright have become more prominent. Three distinct areas have received particular attention: first, macroeconomic studies of the size and importance of copyright-based industries; second, microeconomic studies of the economic effects of file-sharing aided by networks such as Napster, Kazaa, Gnutella or the Pirate Bay; third, a few studies have been conducted into the relationship between the strength of the copyright system and the supply of copyright works.

As will become apparent below, none of these issues have been dealt with exhaustively. Results on very similar questions diverge widely. There are methodological complications and – perhaps more importantly – data limitations that further research needs to tackle. What is more, the empirical literature has focused on specific aspects of the effects of unauthorised copying/copyright protection, leaving others unspecified. The literature covers rights holder/supplier revenues more thoroughly than consumer welfare. It has begun to address the relationship between copyright protection and the supply of copyright works in real markets (with unclear results), and this issue should play a much more central role in the debate on copyright. Furthermore, most empirically-minded economists working in the field have abstracted any effect of the copyright system on technological change – for example the adoption of authorised digital distribution – and the way in which specific aspects of the copyright system may affect the contestability of the regulated markets.



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## 10. The Size and Importance of Copyright-Based Industries

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Macroeconomic studies of copyright-based industries are straightforward in their intention: they seek to measure the 'economic significance' of copyright. In practice these studies often measure the contribution to the national income of those industries producing goods and services that have a strong copyright element.<sup>29</sup>

There are controversies about which industries to include in such studies. It is, however, clear that calculations should use value-added rather than turnover (WIPO, 2003). Towse (2004) notes that there is a tendency to exaggerate figures and that results are often used for advocacy purposes. Nevertheless, it is reasonably consistently found that the industries regulated by copyright (cultural and software industries) represent around 5 per cent of gross domestic product in the most developed economies and that over recent years they have regularly grown more rapidly than the economy as a whole. That said, only the US has a general export surplus from international trade in copyright works.

However, no straightforward inference on the economic benefits of copyright can be drawn from these studies. The role copyright plays in stimulating production cannot be inferred because there is no causality implied by such measures. Many of what are now called the creative industries developed with copyright protection from their inception. What we do not know is what historians call the counterfactual: what would these industries look like without copyright?

The relatively sudden erosion of copyright protection due to the diffusion of digital copying technology may provide a rare opportunity to infer on causality – a 'natural experiment' as Liebowitz (2004) has called it. The basic aim is to isolate the impact of sudden and substantial changes in unauthorised copying. So far, this opportunity has been seized in a number of studies on the effects of file-sharing on the revenues of copyright industries, almost all of which have studied the record industry. Furthermore, a number of surveys have been conducted to study consumer behaviour and attitudes regarding copyright and digital copying. Finally, a limited number of studies have addressed the relationship between the strength of copyright protection (mainly the duration of rights) and the supply of copyright works.

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<sup>29</sup> *Studies on the 'economic significance' of copyright are promoted by the World Intellectual Property Organisation (Gantchev, 2004). The Review of Economic Research on Copyright Issues (RERC) devoted its first issue to these matters (RERC, 2004).*

## 11. The Impact of File-Sharing on Industry Revenues and Consumption

With the rapid diffusion of powerful new copying technologies such as file-sharing networks as well as CD- and DVD-burners from the late 1990s, there has been a dramatic shift in the possibilities of private copying. The marginal costs of making high-quality private copies and disseminating them have fallen substantially for users of widely available digital ICTs.

The public debate on so-called ‘piracy’ via digital copying technology (mainly file-sharing networks) coincides with a boom in the economic literature on copyright. The case of the record industry has received most of the attention because in several major markets for sound recordings – in particular the USA and Germany – the explosive growth of file-sharing since 1999 has coincided with substantial reductions in sales of authorised copies. Economists seem to have taken the lead regarding quantitative empirical studies of the impact of file-sharing on the record industry. In order to gauge the economic effects of digital copying, micro econometric studies are needed. The following section provides a rough overview of published studies to date. For other surveys see Michel (2004), Peitz and Walbroek (2004), Liebowitz (2005a), Watt and Liebowitz (2006), and a very recent working paper by Oberholzer-Gee and Strumpf (2009).

### 11.1 The impact of file-sharing on sales of authorised copies and industry revenues

So far, empirical studies have mainly focused on the question of whether file-sharing harms the record industry by decreasing sales.<sup>30</sup> These studies address one aspect of what Johnson (1985) would call the short-run harm of copying: the adverse impact of unauthorised copying on the revenues of rights holders. Results have been considered in court cases against Napster and its successors in the US (see, e.g. Fine, 2000) and this issue continues to be of practical importance for ongoing reforms of copyright legislation and for the businesses concerned. Nevertheless, these studies do not address the full range of impacts that digital copying may have and their limitations are discussed below.

Empirical studies of the harm of unauthorised copying have taken different angles. One standard empirical approach has been to correlate measures of file-sharing with sales of authorised physical copies while controlling for simultaneous changes to a range of other factors that might have influenced sales. Some authors investigate differences between geographic entities such as countries or cities. Others compare the impact

<sup>30</sup> See Hui and Png (2002) for a recent study of offline ‘piracy’ and Cameron (1988) on the impact of VCRs on cinema attendance in particular.

of file-sharing on the sales of different genres or on individual records. Some researchers use survey data on consumers' purchasing behaviour in the context of file-sharing (for a categorisation of studies see Liebowitz, 2005a). Several studies combine investigations of two or more of these units of analysis. This report will first introduce studies based on accumulated sales figures in chronological order according to their publication date.<sup>31</sup> Second, some studies that are based on consumer surveys are introduced. Unless otherwise stated, the studies refer to U.S. data.

Liebowitz (2004) investigated alternative explanations for falling full-length CD sales, including income and demographics, album prices and prices of related goods and services. He concluded that alternative factors cannot explain all of the reported falls in sales so that file-sharing appears to explain some sales reductions. Peitz and Waelbroeck (2004) analysed the International Federation of the Phonographic Industry (IFPI) data on CD sales and data on mp3 downloads from IPSOS-Reid. In their cross-section study of 16 major markets they found a significant correlation between downloading and falling CD sales. They also attempted to gauge the substitution effect of mp3 downloads for CD purchases on the basis of U.S. survey data, concluding that mp3 downloads appear to explain falling record sales in 2001. Based on their elasticity calculations, however, downloads seemed to explain only a fraction of sales decreases in 2002. Zentner (2005) correlated IFPI data on music sales with various data-sets on the number of Internet users and peer-to-peer

usage in 65 countries between 1997-2002. He found that sales fell more in countries with wide Internet usage.

Liebowitz (2008) worked with U.S. census data on Internet use, record sales and other demographic variables to compare the impact of file-sharing in 99 American cities. In a draft version of his article available online, he concluded that "file-sharing has caused the entire decline in record sales that has occurred and also appears to have vitiated what otherwise would have been fairly robust growth in the industry." Boorstin (2004), who had used similar data, came to the different conclusion that file-sharing was not the cause of declining sales. He observed that Internet access correlates with higher purchases of CDs for consumers aged 25 and over and with lower CD purchases for consumers aged between 15 and 24.<sup>32</sup>

Oberholzer-Gee and Strumpf (2007) investigated the effect of downloading on sales of individual recordings. They used data on the weekly number of downloads via one server that hosted parts of a file-sharing network and correlated these with weekly album sales from Nielsen Soundscan. They compared various recordings and studied the effects of changes in downloading on sales of authorised copies. Oberholzer-Gee and Strumpf (2007:1) famously concluded that "downloads have an effect which is statistically indistinguishable from zero". This study has been criticised at length by Liebowitz (2007a; 2007b).

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**31** *Many of these studies were widely read prior to publication as authors on digital markets for information goods seem to be especially keen to make their work available online.*

**32** *For early attempts to study the impact of file-sharing by comparing changes in sales of different musical genres that are more or less popular on file-sharing websites, see Liebowitz (2008) and Zentner (2005).*

Moving on to studies based on consumer surveys, Hong (2004) made use of the U.S. Consumer Expenditure Survey. Using Internet access as a proxy for downloading, he attributed around a third of the total reduction of sales in 2000 (ca. 7.6%) to “Napster” and concludes that other factors played a significant role. Michel (2004) also used computer ownership as measured in the same survey as a proxy for downloading. He concluded that file-sharing may explain a reduction in sales of up to 13% between 1999 and 2003.

Rob and Waldfogel (2006) conducted their own survey on the downloading and purchasing behaviour of 500 U.S. college students. They found that downloads substituted for purchases of authorised copies at a rate of 0.2 or more. Their survey produced a number of insights regarding consumer welfare and willingness-to-pay that will be discussed below. Zentner (2006) used music sales data by IFPI and data from a European consumer mail survey by Forrester to establish the impact of downloading on purchasing behaviour. He suggested that, for individual users, “peer-to-peer usage reduces the probability of buying music by an average of 30%”. Conversely, Gopal et al. (2006) surveyed 200 students and found a positive relationship between online sampling and the reported propensity to purchase authorised copies. Finally, in a recent report for Industry Canada (based on data from Decima Research), Andersen and Frenz (2007) found no significant correlation between file-sharing and purchases of either CDs or authorised downloads in Canada.

That is, results diverge considerably, even for the relatively narrow question of whether file-sharing harms rights holders of musical works by displacing sales. The two extreme results for the U.S. market are virtually no effect on the one hand (Oberholzer-Gee and Strumpf, 2007), and the reversal of what could have been “robust growth” into a severe recession on the other (Liebowitz, forthcoming). Many studies suggest that file-sharing displaced some demand but that other, incompletely specified, factors must play a role in explaining falling sales.

More recently, a couple of studies have appeared on the impact of digital copying on the market for feature films. Here the results are similarly diverse. A student survey by Rob and Waldfogel (2007) found a negative impact of “unpaid consumption of movies” on paid consumption. By contrast, Smith and Telang (2009) reported that increased broadband Internet penetration has actually boosted DVD sales considerably according to their analysis of secondary data from Nielsen Videoscan.<sup>33</sup> It remains to be seen whether studies of other copyright industries – for example newspapers, academic journals, literature, or video games – produce a more consistent pattern and whether the situation varies between different copyright industries.

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33 See also Bounie, Bourreau and Waelbroek (2006).

## 11.2 Technical problems in gauging the effect of file-sharing

Why would results on the impact of file-sharing on sales scatter widely? One explanation lies in the numerous technical difficulties encountered in doing detailed quantitative analysis of unauthorised digital copying, which may lead to distorted results.

### Data limitations

First of all, many empirical studies use secondary data on sales and so-called piracy. Often, this data is supplied by trade organisations such as the RIAA (Recording Industries of America Association) or the IFPI (International Federation of the Phonographic Industry) in the case of the record industry. These sources are interested parties and campaigners for more intensive copyright protection. Some researchers have voiced objections as to the validity of their data (Liebowitz, 2004). Where data from interested parties is used, it is important that comprehensive documentation of the underlying methods be made available. This is regularly not the case, which is one of the main problems in producing credible empirical research on copyright industries. It seems highly desirable also to base policy-making on the analysis of official data – which is not always available due to inconvenient industrial classification systems for the purpose of studying the copyright industries.<sup>34</sup>

Furthermore, valid data on file-sharing appears to be particularly hard to come by. Liebowitz (2006) demonstrates how various measures of downloading diverge considerably. The use of

proxies for file-sharing, such as Internet access or computer ownership, may also create problems. Oberholzer-Gee and Strumpf (2007) used data on actual file-sharing activity but had to content themselves with a minuscule fraction of total interactions that went through a particular server. Measuring so-called ‘piracy’ in consumer surveys could introduce a downward bias as respondents might be reluctant to report illegal activities or may give strategic answers (Oberholzer-Gee and Strumpf, 2007). Specialised academic surveys of file-sharing, valuation of authorised copies and purchasing behaviour have to date been of relatively modest size and even some of the most reputable surveys on the matter are based on convenience samples (e.g. Rob and Waldfogel, 2006). These studies may not allow for generalisations on consumers at large. In short, there are difficulties with the available measures of file-sharing for the purpose of detailed quantitative analysis.

### Market ‘distortions’ besides unauthorised copying

A further fundamental challenge to any of these studies is that the record industry may not have been in a state that resembles a static, competitive equilibrium when file-sharing struck.

On the one hand, the record industry is highly concentrated into a few major multinational firms. A relatively recent out-of-court settlement concerning allegations of price fixing by the distribution divisions of the major record companies in the U.S. (Federal Trade Commission, 2000) and several

<sup>34</sup> *Indeed, there is a poor correlation between industrial codes such as SIC-codes, which were designed with primarily the manufacturing industries in mind, and more ‘creative’ industries.*

objections to further merger activity between majors by competition authorities in the European Union illustrate concerns with market power.

On the other hand, the record industry seems to be undergoing structural changes with continued merger activity among the major companies, increasing importance of media tie-ins as a source of income and authorised online services growing rapidly to name but a few volatile aspects (see Alexander, 2002; Tschmuck, 2002; Bockstedt et al., 2005). Under such circumstances it seems particularly difficult to isolate the effect of file-sharing. It can be extremely hard to identify and account for all simultaneous changes to other factors that might have influenced sales and individual judgments on which factors matter and which do not inevitably affect the specification of explanatory models and their interpretation.

What is more, the industry may react to changes in the market environment with deliberate adaptation. Such measures may take shape over several years, which puts them beyond the time horizon of most studies. Ultimately, controlling for intervening variables is simply an attempt to develop a counterfactual idea of what sales would have been without file-sharing. Considering the unpredictable volatility of record sales in the past (e.g. Chapple and Garofalo, 1977; Burnett, 1996) this appears to be a challenging endeavour at best.

Empirical studies of the impact of file-sharing thus often conclude by pointing out factors that have not been covered fully in the quantitative analysis. These often include the growth of new information and entertainment services such as mobile telephony and video games. Many authors

have also discussed the possibility that sales of authorised downloads may reinvigorate the record industry. It has further been argued that part of the sales decline could mark the end of replacement purchases of CDs for vinyl records. If that were the case, it would be misleading to use historical peak levels of sales preceding the emergence of file-sharing as a point of reference. What is more, file-sharing is not the only new copying technology. CD-burners, for example, are either excluded or addressed as complementary to file-sharing networks. In the German market – for which IFPI reported the most severe falls in sales in any of the major markets – mass-diffusion of CD-burners and falling sales preceded file-sharing (Tschmuck, 2003). CD-burners and other copying technology besides file-sharing might merit attention in their own right.

Last but not least, many suppliers of recorded music do not solely operate in the primary market, where authorised copies are sold to end-consumers. They often incur revenues from the secondary market where copyrights are licensed to professional users – say advertisers or video-game producers who wish to make use of a song – and often also from live performances. Where exposure in one market boosts demand in others, rights holders who are not specialised in the primary market might be compensated in secondary markets for falling sales of authorised copies (cf. Takeyama, 1994; Tschmuck, 2003). Changes in additional sources of income to rights holders thus need to be included in the analysis.

In any case, the effect of file-sharing on authorised sales remains contentious. Results and their interpretations vary considerably and none of the

existing studies seems sufficiently conclusive as to settle the issue single-handedly.

### **Studies of unauthorised copying and rights holder revenues are insufficient to support policy implications**

Beyond the technical difficulties in gauging the effect of file-sharing on the record industry's revenues, it is important to recognise the limitations of such studies as a guideline for copyright policy. Even if an exact measure of the adverse effect of unauthorised copying on rights holders were known, this would not be sufficient. Public policy strives to maximise total social welfare, which implies that it needs to account for user as well as rights holder interests when shaping the copyright system. As previously discussed, short-run welfare analysis requires a trade-off between rights holder and user interests (Johnson, 1985). Obviously, end-consumers might benefit considerably from the availability of vast existing catalogues of works online at very low cost (Silva and Ramello, 2000). So, indeed, might commercial users, including IT and telecommunication firms who sell the necessary technical infrastructure.

In a rare example of an empirical study that adopts a consistent short-run approach, Rob and Waldfogel (2005) estimate that consumers' short-run welfare gains from file-sharing are considerably higher than the related losses for rights holders. They emphasise, however, that their study does not account for the long-run costs to consumers due to weaker incentives for creativity. Another recent study on behalf of several Dutch ministries also finds that consumers' welfare gains from file-sharing outweigh the costs to rights holders (TNO, 2009).

The conventional understanding of copyright extends on this short-run analysis by incorporating the long-run benefits of copyright protection for users. It is argued that in the case of file-sharing, any short-run benefits to users from unrestricted copying may be unsustainable as the supply of new works may dry up. While it is possible that user interests converge with rights holder interests over time, it cannot be taken for granted that they always do. This would only be a general rule if two assumptions hold: first, if the short-run benefits to users from digital copying were always negligible; second, if copyright did not restrict user innovation. Arguably, neither of these two assumptions stands up in real markets. What is more, there is no hard evidence on the sensitivity of supply to unauthorised copying that could be related to immediate user welfare gains from unrestricted copying.

Therefore, in order to inform copyright policy, it is not sufficient to establish that so-called 'piracy' harms existent rights holders. Reasonably accurate estimates of any costs of unauthorised copying for rights holders need to be related to potential welfare gains to users as well as the administration and enforcement costs of copyright protection. It is hardly surprising then that even the authors of empirical studies that identify substantial harm to the record industry from file-sharing are divided over the issue of whether their results justify increased efforts to foster the copyright system.

What is more, the effects of file-sharing might not be homogenous between rights holders (see below), and digital copying may be associated with more extensive product searches and greater contestability of the market (see chapter 7). Finally, any adaptation of the copyright industries – for

example through the development of new business models – might diminish the long-run costs of unauthorised copying.

### 11.3 Studies of consumer behaviour related to file-sharing

The impact of file-sharing on demand for authorised copies depends on the substitutability between authorised and unauthorised copies and relative costs (including search costs and the risk of penalties). On the basis of a survey of college students, Rob and Waldfogel (2006) observe that within their sample, unauthorised downloads were valued less than purchased copies. On consumer valuation of downloads, see also surveys by Holm (2001) and Rochelandet and Guel (2005), as well as experimental studies by Mafioletti and Ramello (2004) and Gosh et al. (2005). These studies concur with Rob and Waldfogel (2006) that downloads are not valued as highly as authorised copies. This implies two things: first, there is some scope for rights holders to obtain sales at prices above the costs of making unauthorised copies. Second, the harm to the industry cannot be calculated by multiplying the number of unauthorised downloads with retail prices of either CDs or authorised downloads.

The efficiency of policy measures against copyright infringement requires further attention (Zentner, 2006; Watt, 2004). Blackburn (2004) found that some types of prosecution of infringers affects

unauthorised copying strongly but this may well be just a short-run effect. Mafioletti and Ramello's (2004) findings from experimental research imply that lawsuits against copyright infringers reduce unauthorised copying but do not "necessarily" have an effect on sales of authorised copies, because the willingness-to-pay often falls below the retail price.

An additional pattern identified in some surveys is that different types of consumers differ in the effect that access to digital copying technology has on their purchases of authorised copies, depending for example on their financial and time constraints. Therefore, surveys of students such as Rob and Waldfogel (2006) may not allow for generalisations about the impact of file-sharing on the market for authorised copies, since this part of the population tends to have more spare time and less spending power than average. Related questions that future surveys could address would be: do young professionals, who have used file-sharing during their education, start purchasing more authorised copies when their financial and time constraints change? And how is the overall appetite for music affected by exposure to unauthorised copies?

As mentioned above, a problem for any assessment of consumer behaviour through surveys will be that the issue of copyright has become highly politicised and divisive over the last decade. Many respondents to related surveys may thus be strategic about the information they reveal.

## 12. The Supply of Copyright Works and Changes to the Copyright System

Past empirical investigations of copyright's effect on 'authors' supply' rarely support the view that copyright promotes supply (Towse and Holzhauser, 2002). Very few empirical studies have been published on the impact of (changes in) the copyright system on the supply of copyright works – or in other words the elasticity of supply to copyright protection. Khan (2004) finds no substantial impact on the number of full-time authors with the implementation of the U.S. International Copyright Act of 1891.<sup>35</sup> With the diffusion of digital ICT, very substantial changes in the market can be expected so that studies covering more recent years are required.

### 12.1 Copyright term and the supply of copyright works

Two relatively recent studies address the impact of copyright term extensions on the supply of copyright works. Landes and Posner (2003) investigated the number of optional U.S. copyright registrations to test for an effect of the term extensions in 1962 and 1998. They found no significant effect after either of these two events. A working paper by Png and Wang (2009) used data from 26 major economies to test for an effect

of copyright extensions during the 1990s on the quantity of movies supplied. Contrary to their results in previous versions of the paper, in the current version they found that term extensions from author's life plus 50 to author's life plus 70 years had no significant effect on the supply of movies. The latter paper provides a good primer on the complexities involved in isolating the effects of what is probably a relatively minor change in the copyright system and thus the regulated market. It also illustrates the difficulty of acquiring valid data. The research design of panel studies may be promising for overcoming data limitations in national markets.<sup>36</sup>

Pollock (2009) developed a dynamic model of the welfare effects of copyright that he uses to calculate the 'optimal' level of copyright protection. He includes estimates of the discount factor for suppliers and the rate of cultural decay among other things. Pollock finds that the adequate level of copyright duration is probably in the area of 15 years. While the purpose of Pollock's (2009) study and methods employed differ substantially from Png and Wang (2009), it also illustrates the complexity of tracing the dynamic effects of copyright as well as data limitations.

<sup>35</sup> For a study that compares various states before the general adoption of copyright in Europe, see Scherer (2009).

<sup>36</sup> In order to control for lagged effects and underlying trends over time (among other things), time series analyses are preferable over two-stage regressions in order to identify the effect of unauthorised copying / copyright. The problem is that usually there are not nearly enough data points available for national markets to enable state-of-the art time series analyses. Panel studies such as that by Png and Wang (2009) are an alternative under these conditions. See also Handke (forthcoming) for an application of a simplified time series analysis that requires fewer data points to support basic insights.

## 12.2 Digital copying and the supply of copyright works

In stark contrast to the copious attention given to the impact of file-sharing on some copyright industries' revenues, the effects on the supply of copyright works have not received much systematic attention. Handke (forthcoming) applied a simplified time-series intervention analysis to study the impact of digital copying on the supply of sound recordings in Germany. The starting point of the intervention is the emergence of Napster in June 1999, which coincided with the beginning of a severe recession in the primary market for sound recordings. On the basis of IFPI data, he found that the number of new titles released on physical sound-carriers in Germany and the overall number of different titles marketed (excluding imports and the second hand-market) expanded after 1998 and that there was no evidence for a significant change in the growth rate of supply compared to the pre-Napster period.

## 12.3 Welfare and policy implications – when is more better?

The sheer number of different titles made available provides some indication whether copyright fosters the supply of creative works. It may not support

definite conclusions on social welfare and desirable copyright policy, however. Three complications are particularly prominent.

First, in cultural policy a diverse supply of copyright works is usually considered to be highly desirable, but diversity is a tricky concept. The sheer number of product variants may be a crude measure of diversity. The literature on cultural diversity distinguishes between three dimensions of this concept: variety as the sheer number of different works supplied; balance as the distribution of market shares across different units of analysis; and disparity as the extent to which the different units of analysis differ between each other (see van der Wurf and van Cuilenberg, 2001; Benhamou and Peltier, 2007; and more generally Stirling, 1998; Weitzman, 1992). Studies of the variety of supply could be complemented by studies of balance and disparity in future research on the impact of copyright on supply.<sup>37</sup>

Second, standard economic analysis asserts that greater product variety is not generally desirable. Product differentiation may be socially desirable where consumer preferences are differentiated or where consumers appreciate variety. In the economic literature on product differentiation, product variety has decreasing utility and comes

<sup>37</sup> *Notions of 'quality' are not of central concern in economic studies, since economic analysis assumes that the voluntary interaction between sovereign economic agents in functioning markets will approximate a solution that cannot be improved upon. From this perspective, policy-makers should intervene to remove market failure but not interfere directly with production and consumption decisions. Whether this position is sustainable for cultural policy is contentious among economists that specialise in the cultural sector. Furthermore, see Peterson and Berger (1975), Dowd (1992) and Alexander (1996) on studies that attempt to measure the diversity of supply beyond measures of variety.*

at the cost of repeated fixed development costs. A related point is that many economic models of monopolistic competition and product differentiation imply that, even in the absence of other market failures, unregulated markets tend not to reliably approximate an 'optimal' level of product differentiation (e.g. Lancaster, 1966; Salop, 1979). It is not clear whether this is more than a technical debate and whether there are any reasonable alternatives to the market mechanism for approximating an efficient level of product differentiation. In any case, from this perspective more variety is not always better.<sup>38</sup>

A third complication is that greater product diversity within a market does not automatically imply greater consumer choice throughout society or greater diversity in the types of works that are actually consumed. To give consumers greater choice, appropriate distribution networks and retail outlets need to be available. For consumers to benefit from greater choice, effective sources of pre-purchase information are required. Stirling (1998) distinguishes between 'diversity of supply' and 'diversity of consumption' to express this point. In the contemporary copyright industries, the emergence of digital distribution channels

(distributing authorised or unauthorised copies) has increased access for users, expanding consumer choice beyond anything conceivable on the basis of the traditional, bricks-and-mortar infrastructure. For Internet users, there are many more titles available at any given point in time and access is less costly. This is the case without any expansion in the total variety or diversity of works supplied throughout the market. Whether greater choice and increased accessibility will come to mean more diversity in the works consumed remains to be seen.

For the moment, even very basic studies on the impact of unauthorised digital copying on the sheer number of works supplied could provide valuable information for copyright policy. In the future, it will also be desirable to study the effects of unauthorised copying on other aspects of the diversity of supply.

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<sup>38</sup> *Evolutionary theories of innovation provide another argument related to the desirable level of product variety. From a dynamic perspective, greater variety offers greater scope for combinatory innovation. Thus socially efficient levels of product variety may be higher than those estimated on the basis of static models.*

## 13. Other Empirical Studies on the Impact of Copyright

### 13.1 Copyright and technological innovation

Most of the literature on copyright focuses on the creation of new copyright works. A small number of authors have also voiced concern that excessive copyright systems hold back technological innovation associated with the dissemination and commercial use of 'artistic and literary' works, similar to the debate on other forms of intellectual property. David (1993; 2000; 2004), for example, uses historical analysis to evaluate the economic impact of copyright in various industries and in changing technological conditions, arguing that the copyright (and patent) regime has created obstacles to technological innovation and change. Related questions have mainly been addressed on the basis of descriptive, historical studies. Boldrin and Levine (2005b) address the issue in their ambitious criticism of what they refer to as 'intellectual monopolies'.

### 13.2 Unauthorised copying and contestability

Some empirical studies have produced evidence that digital, unauthorised copying has asymmetric

effects on creators, contrasting well-established incumbents on the one hand and fringe suppliers or newcomers on the other. Blackburn (2004) found that sales of publications by previously well-known artists are diminished as file-sharers substitute purchased copies for downloads. On the other hand, file-sharing appears to boost record sales for previously unknown artists. They seem to gain more from the additional exposure of their works than they lose due to a substitution effect. Bhattacharjee et al. (2007) further found that releases by smaller record companies exhibited longer survival times in the charts after the emergence of file-sharing networks.

For the German record industry, Handke (2006) documented a large number of market entries by small, independent record companies in the presence of digital copying. He provided further evidence in a later study (Handke, forthcoming) of a boom among 'indies' and a process of Schumpeterian creative destruction after 1998.<sup>39</sup> It is not clear, however, whether such a process of fragmentation is causally linked to digital copying or whether it is due to other changes in the market that coincide with alterations in the de facto strength of copyright protection.

<sup>39</sup> Creative destruction refers to a process in which innovative suppliers generate productivity increases or new superior products, gain competitive advantages and win over market share at the expense of more conservative suppliers, which leads to productivity increases throughout the industry (Schumpeter, 1942).

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## 14. Conclusion Part II

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Despite considerable progress, the existing empirical literature does not yet provide a solid grounding for determining whether, and to what extent, it is worth fighting private, unauthorised copying in its newest guise of digital copying. Judging by the considerable interest the issue has received during the last few years, further studies on the effect of digital copying on demand for authorised copies are likely to be produced. It remains to be seen whether better data and research coverage of more recent years will at least resolve the issue of whether digital copying has a detrimental effect on rights holders.

The inclination may be to go with the majority of studies and to accept that file-sharing has harmed the record industry. The few studies that incorporate the benefits to consumers tend to find that social welfare has improved nevertheless.

Most of all, future efforts need to go beyond the narrow question of whether unauthorised copying harms specific copyright industries as a whole. For example, the significance of digital copying for user welfare and the consequences of current developments for the legitimate supply of copyright works seem to merit more attention. So do heterogeneous effects of copyright on various types of producer and on the contestability of markets, as well as on technological innovation in the copyright industries. What is more, copyright regulates a diverse group of markets on the basis of similar principles, which may yield very different results. In short, there are a range of unexplored empirical questions that are most relevant in terms of future copyright reform.



## **PART III – EMPIRICAL QUESTIONS**

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## Part III - Empirical Questions

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The theoretical literature on the economics of copyright raises a plethora of empirical questions concerning copyright reforms. So far, only some of these questions have been investigated systematically and existing studies have not identified many reliable patterns. The existing empirical literature also appears to be somewhat unbalanced. Many more studies address the effect of unauthorised copying on supplier revenues rather than its benefits to consumers/users, for example. What is more, the upheaval associated with the process of digitisation challenges traditional positions.

This section lays out a number of empirical questions that should be addressed to inform copyright policy in this context. It deliberately emphasises questions related to additional costs and benefits of unauthorised copying and copyright protection in order to encourage a more balanced assessment. It also discusses some of the methodological challenges in existing studies that may inform future research.

At the outset, an obvious point is that relatively few empirical studies have addressed the British market. An option would thus be to replicate some of the most cogent studies for the UK.

This overview of empirical questions begins with three fundamental and rather wide-ranging questions that build on each other. First, the most fundamental question is what the effects of unauthorised copying are in the first place. Second, if it is established that, overall, unauthorised copying has greater adverse effects than benefits, the question becomes whether statutory intervention could improve the situation without serious unintended consequences. Third, copyright policy is just one measure available to policy-makers and alternatives to copyright might require some attention.

## 15. What are the Effects of Copying in the First Place?

The most fundamental question for copyright policy does not address copyright directly. If copyright is primarily a measure to inhibit unauthorised use/copying, the first question is what the effects of unauthorised copying are. This is the topic that the economics of copying deals with.

### 15.1 Changes in cost structure

Two basic questions raised in this literature concern cost-structures. The first is: *what is the relation between the costs to rights holders of generating copies and the costs of unauthorised copying?* In the past, the assumption was often that unauthorised copying was more costly. In that case, unauthorised copying decreases welfare because it results in a greater dead-weight loss.<sup>40</sup> Whether this argument holds with the diffusion of digital copying technology is not clear.

A second basic question in the economics of copying is: *what is the relation between the fixed costs of creating the original, first expression of a work and the marginal costs of making copies?* Under the complexity of real markets, the problem with unauthorised copying may be greater, the greater the fixed costs of creation relative to the costs of copies.

The economic literature tends to assume that, in the course of digitisation, the costs of unauthorised copying have fallen substantially. However, even for file-sharers, the cost of unauthorised copies is not zero, due to search costs and the fixed costs of Internet access and hardware.

What is more, the costs for suppliers should also have fallen with the application of increasingly sophisticated digital ICTs. Some of the literature assumes implicitly that suppliers' costs are constant. In the course of digitisation, this may be an invalid assumption.

Information on costs in markets for copyright works is quite sparse (e.g. Caves, 2000). Regulators' lack of information about costs is a reasonably familiar problem in the economic literature on public regulation of markets (Weitzman, 1974; Baron and Myerson, 1982). In the copyright industries, the situation may be particularly unclear because of extreme product differentiation, the impossibility of marginal-cost pricing due to the cost-structure of suppliers and non-standard forms of employment, among other reasons.

<sup>40</sup> There can be incentives to conduct unauthorised copying even if it is cheaper to generate and deliver authorised copies. One reason is that by unauthorised copying, consumers might be able to appropriate any rights holder surplus. (This distribution effect between rights holders and consumers is not of interest in the conventional economic analysis that focuses on efficiency rather than equity.) Furthermore, retail prices for authorised copies need to exceed production costs so that suppliers can recoup the fixed costs of creation.

Surveys of suppliers and consumers seem to be the most direct way to produce at least some indication of trends in costs over recent years. However, data on the number of market entries or the number of publications relative to suppliers' revenues may be more readily available. This type of data may support inferences on trends in costs.<sup>41</sup>

## 15.2 Estimating the net welfare effects of digital copying

Following Johnson (1985), the effects of unauthorised copying can be categorised into costs and benefits as well as short-run and long-run effects.

### Short-run analysis

Regarding the short-run costs of unauthorised copying, the question is: *to what extent does unauthorised copying diminish revenues to creators/rights holders?* The conventional expectation is that unauthorised copying will displace demand for authorised copies. In the

extreme, prices of copies will approximate the marginal costs of generating copies (very low) and suppliers will not be able to recover the up-front costs of creating valuable content (which are high). There have been a relatively large number of studies on the extent to which file-sharing has diminished revenues to creators. These studies have been surveyed above.

One issue that has not received as much attention is that of the short-run benefits to consumers from unauthorised copying and facilitated access. Here the question is: *what is the value to consumers of facilitated access due to unauthorised copying?* This question forms the logical counterpart to rights holders' welfare losses in the short run.<sup>42</sup> It needs to be incorporated into any analysis of the short-run effects of unauthorised copying on social welfare. Since consumers' valuation of unauthorised copies is not expressed in direct payments, this value may be quite hard to gauge. Surveys adopting methods of contingent valuation have been employed by a number of authors (see the discussion of 'consumers and file-sharing' above).<sup>43</sup>

<sup>41</sup> Product differentiation complicates the matter considerably. Different cultural products are by definition imperfect substitutes for one another and it is a strong assumption that more different titles reflect greater total value, since the average value per work could change.

<sup>42</sup> Two commentators on earlier drafts to this report argued that there is simply no economic case for copyright in the short run. This argument is based on some standard assumptions, including equal weight of the interests of rights holders and users as well as uniform costs. In that case, any benefit to rights holders from copyright protection results in proportional costs to users. What is more, like any type of state intervention, copyright generates administration and transaction costs, which result in a 'dead-weight loss'. Copyright would thus certainly decrease total social welfare in the short run. However, there are probably economies of scale in the production of copies (see section 5). Unauthorised copying (which typically implies several suppliers for copies of the same title) may thus be associated with inefficiencies, which may exceed the costs of running a copyright system. Therefore, it seems not to be a universal result that copyright diminishes social welfare in the short run, although this may be likely in the case of digitalised copyright works where the costs of copying are very low and the administration and transaction costs of copyright tend to be high.

<sup>43</sup> Contingent valuation (CV) methods are usually based on surveys that ask for the subject's willingness-to-pay. For some goods, the market may not reveal total value, for example if they have characteristics of a public good. In that case, the preference stated in CV studies may provide a complement to assessments of market value.

### Long-run analysis

There are compelling reasons to assume that the short-run benefits of unauthorised copying to consumers may not be sustainable. Where unauthorised copying displaces demand for authorised copies, supply will dry up. Therefore, the long-run perspective that allows for adaptation over time is a very important complement to any short-run analysis.

The long-run costs of unauthorised copying concern the following question: *to what extent does the supply of copyright works diminish due to unauthorised copying?* The elasticity of supply to falling revenues (or other effects of unauthorised copying) has not been specified. Without such a measure, the long-run aggregate welfare effect of unauthorised copying on consumers cannot be determined.

It is hard to quantify the social value lost due to diminished supply in the presence of unauthorised copying. A more manageable way to produce relevant information would be to study developments in the quantity and diversity of supply in the presence of digital copying. The methodological challenge is to isolate the effect of digital copying from other factors. One method of doing so is to use multivariate regression analysis. Another would be the use of 'intervention analyses' (the study of the impact of particular events on a time series) around major breaks in copyright protection on the basis of stochastic time series analysis, for example by calculating an autoregressive integrated moving average model and comparing the mean and trend of a time series before and after a break. In the long run, there is also a logical complement

to the welfare costs of unauthorised copying: *to what extent does unauthorised copying facilitate innovative use?* User/consumer innovation has not been addressed in economic studies that deal with digitisation and copyright. This appears to be a serious oversight. An illustrative example of user innovation is user-generated content, which often draws on copyrighted material without formal clearing of rights.

Another issue that arises from a more comprehensive, long-run perspective is: *to what extent do copyright industries manage to adapt to the presence of digital copying technology?* In the past, copyright industries have demonstrated great ingenuity in order to sustain profits in spite of unauthorised copying. The literature on indirect appropriability and business models suggests a number of possibilities that rights holders/suppliers may explore to mitigate any adverse effects that recent advances in copying technology may have. What is more, digitisation may bring substantial cost reductions for suppliers that may mitigate their cost disadvantages in comparison to free-riders.

An immediate way to establish that substantial user innovation and adaptations of business models do occur would be to describe illustrative cases. Case studies should address success stories as well as failures in order to identify obstacles to innovation and how they may be overcome. Developing a measure of the total effect of unauthorised copying on consumer/user innovation and the value generated in the process is a daunting task. The importance of new business models may be measured more easily than consumer innovation, by studying the market share of innovative products, processes and suppliers.

### **Summary and outlook concerning the welfare effects of unauthorised copying**

The taxonomy of questions related to the welfare implications of unauthorised copying should have demonstrated that unauthorised copying may affect social welfare in a number of contradictory ways. A reasonable assessment then needs to stay sensitive to the full range of effects in order to avoid systematic bias of results.

There is a tendency in the literature to emphasise the economic costs of unauthorised copying. The potential for adverse short-run effects of copying on suppliers' revenues has received the most attention in the empirical literature. Short-run benefits from greater access have received far less attention.

The long-run perspective is arguably the more important. So far, it is regularly taken for granted that unauthorised copying entails severe long-run costs in terms of diminished supply. Here, it seems important that theoretical arguments are verified empirically by testing whether there is any evidence that unauthorised copying diminishes supply and to measure the scale of this effect. What is more, the literature tends to sideline the possibility that unauthorised copying may bring long-run benefits in terms of user innovation, which may require much greater attention in order to complete the welfare analysis.

The effects of file-sharing and the mass-use of other digital copying devices have played out for roughly a decade in a 'natural experiment'.

Time-series data on the supply of copyright works over this period may be available from industry associations and in particular copyright collecting societies. Similar time-series data on the consumption of copyright works may be harder to find but data on media usage might allow for some inferences.

In all of this, it needs to be clear that the long-run consequences of unauthorised copying are very hard to measure. It will be hard to identify when the full impact of unauthorised copying has transpired, which may take a long time. During this period, other changes may interfere and the upheaval associated with digitisation in the copyright industries may make it particularly hard to isolate the effect of specific phenomena. A particularly critical point in cross-sectional regression analysis is that it tends not to fully capture any adaptation of the industry that may mitigate the effects of any adverse shock over time. Here, studying a longer time period – for example, several years after the emergence of file-sharing networks – may add important information.

Whether the net welfare effects of unauthorised copying can be calculated in terms of a single model seems doubtful, not least because of the difficulty of obtaining adequate data on even the most central variables. A pragmatic way of coping with effects that are particularly hard to measure precisely would be to estimate the welfare effects of unauthorised copying without them, while studying other effects separately and keeping in mind in the interpretation of results that a lack of information on these issues will create a bias.

## 16. What is the Net Welfare Effect of Copyright?

### 16.1 Copyright as a counter-measure to unauthorised copying

For many analytical purposes, it may be sufficient to treat unauthorised copying and copyright protection as two phenomena that are directly and inversely related. If copyright is just seen as a countermeasure to unauthorised copying, the welfare analysis of copyright protection can be built upon the structure used in the analysis of the effects of unauthorised copying. One complication is that copyright protection entails some unintended consequences such as administration and transaction costs.

The table below provides an overview of the various welfare effects of a copyright system. In

the short run, the benefits of copyright protection accrue to rights holders who can raise some monopoly rents. The short-run costs of copyright are the administration costs and transaction costs that may fall on any of the stakeholders as well as access costs to users/consumers.

In the long run, the benefits of copyright protection are greater pecuniary incentives to supply copyright works and perhaps greater incentives due to the protection of 'moral rights'. Whether copyright does foster the supply of protected works in practice is an empirical question. Thus not even the direction of the effect of copyright on supply is a trivial question. That is because the short-run costs of a copyright system may inhibit user innovation, including follow-up creations but also novel ways of disseminating existing works.

#### Costs and benefits of a copyright system

	Benefits	Costs
Short run	Monopoly rents for rights holders and control of types of use	<ol style="list-style-type: none"> <li>1. Administration costs</li> <li>2. Transaction costs in trading rights</li> <li>3. Access costs to users</li> </ol>
Long run	Greater incentives for rights holders to supply copyright works	User innovation is obstructed by the costs associated with compliance

Where copyright is simply addressed as a counter-measure to copying, the empirical questions raised in studying the welfare effects of copyright are equivalent to those formulated for research on the effects of unauthorised copying. In this perspective, the nuts and bolts of the copyright system are not addressed.

## 16.2 Unintended consequences

The main addition as we move from an analysis of unauthorised copying to the analysis of copyright are unintended consequences that statutory intervention will almost inevitably entail.

### Administration costs

The administration costs of a copyright system will typically fall on rights holders and public agencies. These administration costs create a dead-weight loss to society. It follows that the accumulated private benefits from copyright protection would have to exceed these administration costs for public investments in copyright protection to be justified (cf. Thorpe, 2004; Watt, 2004). A problem may arise where public authorities take on the bulk of the administration costs, while rights holders enjoy most of the direct benefits from protection. It might then be in the interest of rights holders to call for greater protection – and thus greater public expenditure on enforcement and other aspects of the administration of rights – than they would rationally pay for themselves.

In order to incorporate administration costs into the welfare analysis, the question is: *how much do public authorities spend on the upkeep of the copyright system?* A related issue is *how do the public agencies involved decide on the appropriate level of investment?* These are important questions in particular when governments seek to get more directly involved in the administration of copyright. The HADOPI-bill in France is a case in point, where public authorities plan to conduct relatively great parts of the monitoring and enforcement of copyright.<sup>44</sup>

Next to the efficiency of policy measures, the appropriate level of public investment in running a copyright system is a central issue in copyright policy. It needs to be addressed on the basis of a balanced view of the various costs and benefits of copyright – including all stakeholders. There are two reference points for the evaluation – the welfare effects of inaction and the welfare effects of alternative measures aimed at fostering the supply and use of ‘artistic and literary’ works.

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<sup>44</sup> The French Government passed a bill in early 2009 called the “Haute Autorité pour la Diffusion des Œuvres et la Protection des Droits sur Internet” (High Authority for the Diffusion of Art Works and the Protection of (Copy)Rights on the Internet), which sets out to create a government agency charged with inhibiting unauthorised copying on the Internet. The prospective penalty is the interruption of Internet services to the alleged offender.

### Transaction costs

In line with the main focus of the property rights approach, transaction costs may be of particular concern. Many markets for copyright works are complex. A great number of creators and other rights holders supply an even greater number of different products that include an array of rights. It is challenging to enforce exclusive property rights to copyright works. The pricing of copyright works is notoriously difficult and there are also often many users with different characteristics. As a result, the transaction costs that accrue just for the purpose of finding potential trading partners and negotiating the terms of trade can be very high. For rights holders, the fixed costs of administering any bundle of copyright thoroughly among all users can be very substantial. Rights holders need to set up procedures to monitor use, to prosecute copyright infringements and to establish the willingness-to-pay of various users. Users need to identify rights holders and avoid conflict. Both rights holders and users need to negotiate the terms of use including the price. Transaction costs are particularly problematic where copyright works have a relatively small value to many users (Besen and Kirby, 1992). Such a scenario requires many transactions and sometimes transaction costs might even exceed the market price for a licence to use a copyright work. In this case, no market will develop and both rights holders and potential users will lose out (Hollander, 1984; Besen and Kirby, 1992).

In this area, the most relevant question seems to be: *where does the copyright system result in avoidable transaction costs?* Of particular interest is the relation between transaction costs and the willingness-to-pay of potential users.

In the context of digitisation and technological change, transaction costs may be especially problematic. In a relatively stable market environment, routines develop in the market for copyright that may drive down transaction costs to some extent. An extreme case in point is the collective administration of rights. Collecting societies administer certain types of copyright for virtually all copyright works under blanket licences that stipulate standard prices and terms of use, reducing transaction costs substantially in comparison to individual administration of rights.

Where a market is characterised by great innovation intensity and some organisational inertia, new products and types of use may be developed that are not anticipated and catered for efficiently during an initial period. Obstacles to innovation could be studied in case studies of both successful and failed innovative projects or in surveys of rights holders and users.<sup>45</sup> Kretschmer (2005), for example, interviewed a small sample of creators and found that the copyright system restricted the creation of 'transformative works'.

<sup>45</sup> Many economists writing on copyright oppose public intervention on the grounds that voluntary transactions in markets are the best way to approximate an efficient solution. It would be a slight paradox to call for hefty public investments in copyright protection at the same time. Others have called for public intervention to overcome market failure due to lock-in and missing markets. A pragmatic way to deal with such market failures could be to introduce temporary interventions that work as a catalyst for a limited duration.

### Inflexibility and asymmetric effects on different types of supplier

A further, quite fundamental criticism of the copyright system is that it tries to regulate a number of quite different markets on the basis of the same basic principles, which may often lead to inefficiencies. The general question that arises in this context is: *what are the differences between the various markets regulated by copyright and are these adequately reflected in copyright policy?* It may be inappropriate to infer from findings in one copyright industry (say the relatively well researched case of file-sharing and the market for sound recordings) to another that has a different cost structure and fulfils different social needs (say academic research). It may thus be necessary to address and compare the economic characteristics of different copyright industries more systematically than the economic literature has done so far.

A similar problem may occur where newcomers and fringe suppliers prefer lower levels of copyright protection, for example because they are seeking to establish themselves in competition with incumbents who market their output under strong brands. Here, some broad questions could be: *are there systematic differences between different types of supplier regarding the desired strength of copyright protection and how are these reflected in copyright policy? Do digital ICTs lower the costs of managing more diverse and flexible copyright arrangements? If so, has it become efficient to allow rights holders greater choice than a 'one-size-fits-all' system of copyright?* The Creative Commons initiative has experimented with greater flexibility in copyright. Its success or failings may provide some empirical evidence on the feasibility of greater diversity.



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## 17. Is Copyright the Most Efficient Means to Mitigate Market Failure?

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Even if it is determined that unrestricted, unauthorised copying diminishes social welfare and that adequate copyright policy could improve the situation, the case for copyright policy is still not complete. That is because the adequate reference for establishing the efficiency of copyright policy is not only an alternative situation where no intervention takes place. Copyright policy should also be compared to alternative statutory intervention, for example levies on copying technology, direct subsidies to producers, or stipends and awards.

Concern for alternative measures to mitigate market failure in the copyright industries cannot be dealt with by a single empirical question. Ideally, the welfare effects of alternatives could be studied in a similar way to those of a copyright system. Regarding copyright, it may be feasible to study the effects of substantial changes in the copyright system over recent years in terms of a natural experiment due to the sudden and substantial

changes that have occurred. For alternative measures to foster the supply of copyrightable works, this may not be the case.

An immediate step forward might be a meta-study of the literature on various measures aimed at fostering the supply of 'literary and artistic' works, scrutinizing these for their applicability and likely benefits in the current market environment. This might produce examples of best practice and guide future research into specific alternatives or initiatives complementary to copyright protection available to policy-makers.

## 18. The Nuts and Bolts of the Copyright System

One of the great advantages of the economic approach to copyright is that it developed a general framework in which to study the various dimensions that make up the ‘strength’ of the copyright system – such as the duration of entitlements, the threshold level for their application, or the level of enforcement.

For empirical assessments, policy changes provide important opportunities for evaluations *ex post*, even though *ex ante* predictions may often be more desirable for policy-makers. In addition, there may be opportunities for comparative empirical research where there are substantial differences in the copyright system between units of analysis that

are otherwise reasonably similar. However, due to the increasing harmonisation of copyright systems among highly developed economies, cross-country comparisons may no longer be very useful to study the effects of specific copyright arrangements. Furthermore, the more minor changes and differences become, and the more mutable the market environment, the harder it will be to develop a valid measure of effects. This is one reason to focus economic research on a few central and contentious questions. One such question is the effect of digital copying on supply. Another is where there are avoidable obstacles to technological innovation associated with the copyright system.



## 19. Copyright and Radical Technological Change During Digitisation

An alternative approach to conventional economic research is the use of structuralist-evolutionary theories of economic development that tend to focus on technological change and innovation. Digital ICT seems to enable great productivity increases in any information industry. So far, the process of digitisation has brought about upheaval in some copyright industries. Considering this, it has often been argued that copyright industries are undergoing a period of radical technological change that might entail a process of Schumpeterian creative destruction. That is, innovative suppliers generate productivity increases or new superior products and win over market share at the expense of more conservative suppliers. Handke (2006; forthcoming) provides some empirical evidence for creative destruction in the German record industry in the presence of digital copying.

A process of radical technological change devalues large parts of the traditional infrastructure and makes great productivity increases feasible at the short-run costs of change. During such a process, the ability to cope with change is a strong determinant of competitiveness.

The first question that arises in this perspective is: *are copyright industries exhibiting a process of radical technological change?* An answer can be approximated on the basis of data on the number of market exits and entries and changing market shares of newcomers and incumbents. In addition, measures of industry-level or firm-level innovation

intensity (for example the adoption rates of new processes or the share of new products in total output) and changes in costs can be used to analyse developments. Useful secondary data on industry-level innovation is often available. Firm-level data will probably have to be produced in surveys. Even more ambitious, cross-country comparisons could help to identify best practice and the consequences of technological change.

Where copyright industries do go through a period of swift, disruptive technological change, adequate copyright policy may look quite different from that required during more stable periods. According to structuralist-evolutionary theories of economic development, the basic considerations are the following.

### 19.1 Promoting transition

It has been argued above that during a process of radical technological change, copyright policy should be concerned with promoting transition. This would include the identification and possible removal of any obstacles to desirable innovative projects created by the copyright system. Related questions are thus: *are new, more efficient ways of supplying copyright works held back by market failures associated with the copyright system? Could public authorities do anything to mitigate such problems without serious, unintended consequences? Overall, how best can copyright policy accommodate rapid transition in order to reap the full benefits of new technologies?*

Surveys of innovative users may be required that address specific problems in the process of searching for suitable copyright works, identifying and contacting rights holders, negotiating terms of use and reporting the results of use. It might be possible to identify and revise aspects of the copyright system that obstruct innovation – or to devise other public measures that could function as a catalyst for new business models.

### 19.2 The past provides no specific guidelines

The economic literature implies that the desirable level of copyright protection changes with changing market conditions. Where radical technological change (beyond the diffusion of digital copying technology among end-consumers) alters the market conditions fundamentally, the aim of copyright policy should not be the preservation or reinstatement of the levels of protection that existed in the past – say immediately before the diffusion of copying technology – even if a specific version of the copyright system has been efficient in the past.

### 19.3 Preparing for the unforeseen

The literature on technological change usually emphasises the uncertainty and open-endedness of this process. Once basic assumptions about a given state of technology are released, it becomes much harder to derive more than probabilistic predictions. Devising adequate public interventions

in order to promote technological innovation can be extremely challenging (e.g. Edquist, 1994; Lipsey et al., 2005) and Lundvall (2001) recommends humility and flexibility as guiding principles for policy-makers.<sup>46</sup> One way of dealing with uncertainty would be to avoid policies that are difficult to adapt or reverse. Another would be to monitor events continuously in order to identify unforeseen developments that might require policy adaptations. The latter point will be expanded upon in the next section.

### 19.4 Continuous monitoring of events

One implication of the uncertainty and complexity of technological change is that theory provides no replacement for systematic and continuous monitoring of events in the market for copyright works in order to inform policy (Lipsey et al., 2005). Ultimately, an exact model of technological change with great predictive power will remain elusive. To deal with a short horizon for predictions, regular monitoring and continuous feedback between observations and policy revisions may be necessary.

Furthermore, at least in the short run, there are strong and strongly divergent interests in the copyright system among different types of stakeholders – such as major rights holders, fringe suppliers, end-consumers, commercial users or even Internet service providers. Certainly, the ‘innovation and creativity’ that copyright

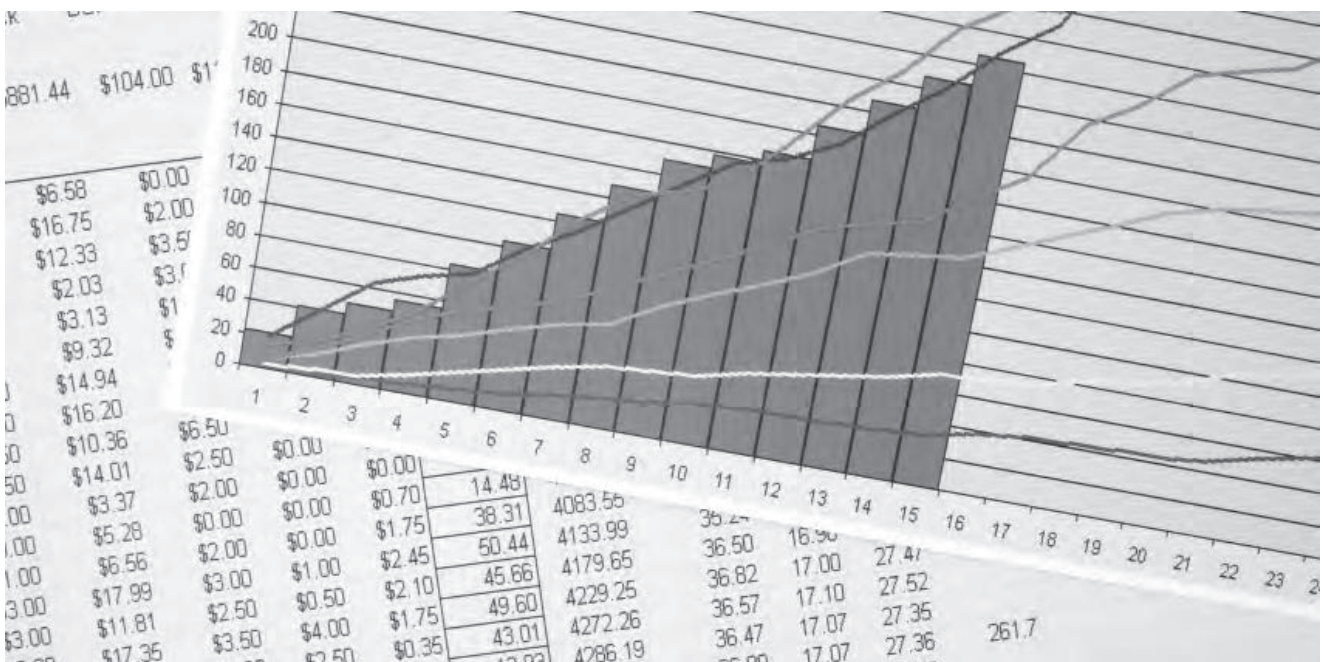
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<sup>46</sup> Collingridge (1980), for example, points to a dilemma for policy-makers concerning the timing of interventions: in the early stages of technological change, great uncertainty makes it hard to avoid unintended consequences and policy failure. At later stages, once relatively specific solutions have started taking shape, policy-makers may often lack power over further developments. Another dilemma for policy-makers may be that during a process of creative destruction, the losses related to the traditional infrastructure may be more visible for a while than the gains from effective innovation.

policy seeks to maximise should include radical innovations. Radical change will not usually be in the short-run interest of existing market leaders, who have more to lose in the uncertain process of radical technological change. On the other hand, newcomers and suppliers of complements associated with a new technological trajectory may disregard adverse consequences of their actions for incumbents. It then seems likely that policy-makers will find it hard to establish a realistic assessment on the basis of reports from industry insiders alone. They will probably be exposed to contradictory requests and recommendations as well as biased reports from stakeholders. In particular, it seems hard to avoid some overreliance on advice from experts who have vested interests in the status quo. To mitigate such problems, independent studies should continue to be an important source of information in addition to reports from within the industry.

### 19.5 Structuralist-evolutionary theories and mainstream economics of copyright

In practice, the structuralist-evolutionary perspective does not necessarily conflict with the more conventional economic literature on copyright. Many points raised in this approach have also been expressed in other parts of the literature albeit in a more scattered manner – for example the pre-eminent need for empirical research, the need to review old certainties due to digitisation, or concerns for the effect of the copyright system on technological innovation. One difference is that the role of formal analysis is minor in much of the specialised literature on innovation and technological change (Lipsey et al., 2005).



## 20. Sources of Data

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### 20.1 Secondary data

Empirical economic research can only produce valid results where adequate data is available. As discussed above, that is regularly not the case where copyright industries and unauthorised copying are concerned and data limitations cannot always be compensated for with methodological sophistication. Therefore, a central challenge in promoting relevant economic research would be to make better data available.

Official statistics are often problematic, for example because industrial classification systems do not make it possible to separate copyright-related activities.<sup>47</sup> Second, official statistics may not fully capture small firms, specialised fringe markets and semi-professional activities or user-generated content that seem to play a relatively great role in some copyright industries. Third, the classification of multi-product firms in official statistics is problematic, for example for a firm operating as a music distributor, record company and live booking agency at the same time. Furthermore, reclassifications of firms may obscure the evidence on trends over time.

Png (2006) gives an overview of sources that assemble data on the number of copyright works supplied. Arguably, industry statistics (including those commissioned by copyright-holders or their representatives) need to be complemented by other sources of data. Trade organisations have incentives to emphasise developments that are consistent with their members' agenda. What is more, economic research tends not to discuss the underlying methods of data collection and processing where secondary data is used. For the purpose of producing valid results, this practice sits uncomfortably with the complexity of methods and the precision of reported results. Often there is no alternative because underlying data-collection methods are simply not available or the information is not quotable. Where market-research firms and consultancies are involved, methods are regularly proprietary, which compounds the problem. If important aspects of the quality of data are beyond scrutiny this represents a fundamental problem for credible empirical research on the economics of copyright.

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<sup>47</sup> For example, the category '92.31 Artistic and literary creation and interpretation' covers all manner of creators – photographers, authors, musicians, etc.

Finally, the accessibility of existing data for the purposes of research is often restricted. A largely untapped treasure is that of collecting societies' databases. Due to the financial incentives for membership and where the fixed costs of membership are low (including administrative efforts), collecting societies should provide a good proxy for some key figures on copyright industries, for example: (1) the number of creators and intermediaries who acquire copyright; (2) the number of copyright works newly registered with the collecting society and the total number of works administered; (3) the concentration of the market in terms of use; (4) the total amount of copyright-based royalties and their distribution amongst rights holders.

Whether policy-makers can encourage copyright collecting societies to make more extensive data available is a political and legal question. A relatively modest option would be to mediate co-operation between collecting societies and specially-commissioned researchers. If data were to be made available to the general public, there would be a greater probability that developments not yet acknowledged by policy-makers would be addressed.

## 20.2 Primary data and multi-method research

In any case, many issues may require the protracted process of producing primary data through case studies, interviews, surveys, or even experiments. Economists have applied surveys of consumer behaviour with some useful results. Research on the supply-side has largely used secondary data of varying quality for the purpose at hand. In the face of the data limitations mentioned above, further surveys of suppliers with more complete documentation of the underlying methods would be a useful addition to existing research.

Supplier attitudes to intellectual property have been covered in recent versions of the regular UK Innovation Survey. It would make sense to include copyright industries in these surveys or to conduct a stand-alone innovation survey among British copyright industries. Some suggestions on how to adapt innovation surveys to the idiosyncrasies of cultural/creative industries are found in Handke (2008). Finally, there might be some scope for interdisciplinary and multi-method research to complement causal inferences from quantitative studies and to address the finer points of copyright and how it affects firms' activities.

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## 21. Conclusions Part III

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There are a great number of empirical questions related to the copyright system and digitisation. A major task will be to set priorities and this process requires a degree of personal judgement. Criteria for prioritising specific questions in future research include the following considerations: (1) What are the most fundamental issues? (2) Where is existing information particularly sparse? (3) Which issues are most amenable to empirical research?

### 21.1 Criteria for setting priorities in future research

#### What are the most fundamental issues?

The overview of empirical questions presented above suggests that there is a hierarchy of questions. An evidence-based approach to copyright policy could develop in a sequence of four steps. First of all, the consequences of unauthorised copying in real markets need to be assessed. Second, the net welfare effects of copyright – as a counter-measure to unauthorised copying – under these circumstances are of interest, including the unintended consequences of regulation. Third, if copying is found to be harmful and copyright appears to be an effective means to improve the situation, the prospective results of copyright policy should still be compared to alternative statutory intervention, not just to the results of inaction. Finally, specific aspects of the copyright system can be evaluated, but for minute detail, empirical research may be limited and more suitable to evaluating changes ex post.

#### Where is existing information particularly sparse?

Part II of this report provides an overview of existing empirical studies on the economic effects of copyright. Even the most fundamental questions (for example the effects of unauthorised digital copying) have not yet been documented exhaustively. Those issues that have attracted considerable attention – e.g. the effect of file-sharing on record industry revenues – remain contentious and further research seems desirable.

A particular challenge for policy-makers seems to be to develop a more balanced approach, which takes account of the full range of costs and benefits of unauthorised copying among all stakeholders. For example, surveys should target rights holders and users in order to enable a balanced assessment of the effects of unauthorised copying and the existing copyright system. Even where rights holders are concerned, surveys should address the relative weight of the benefits and costs of copyright protection and unauthorised copying. At the moment, there is still a tendency to focus on rights holders' benefits only. The costs of copyright for follow-up innovation and for consumers require greater attention.

### Which issues are most amenable to empirical research?

Empirical research on copyright is most promising where there is good data available and reasonable natural experiments occur due to sudden and substantial changes to the copyright system. Where these conditions are not met, it may be exceedingly hard to isolate the effect of copyright due to the lack of counter-factual information.

The diffusion of digital copying technology probably constitutes a major break in the intensity of unauthorised copying and many empirically minded economists have been working on the impact of file-sharing on record industry revenues, which is consistent with the basic selection criteria suggested in this report. First, the effect of unauthorised copying on rights holder revenues is a fundamental aspect of the rationalisation of copyright. Second, this effect is not trivial. Third, the case of the record industry is relatively amenable to research, since the emergence of file-sharing networks constituted a reasonably sudden change in the de facto level of copyright protection on which some data became available.

However, results on the impact of unauthorised copying on industry revenues are insufficient in order to make the case for copyright (see in particular section 11.2). In addition to industry revenues, the supply of copyrightable works needs

to be studied. A key challenge is to acquire reliable data on measures of supply. Major changes in copyright law and key judicial rulings may also entail researchable effects.<sup>48</sup> Cross-country comparisons are another research design that could help to identify the effect of variations in copyright systems. Due to the harmonisation of copyright arrangements throughout the major markets and the roughly simultaneous and global diffusion of copying technology, there may however be few opportunities to devise robust cross-country comparisons.<sup>49</sup>

### Research on specific aspects of copyright policy

Of course, it might well be the case that a copyright system is taken for granted (because the short-run costs of change preclude more fundamental alterations, for example) and that the focus will be on making gradual changes in order to adapt the system to digitisation. In that case, a pragmatic consideration in order to set priorities is the following: *which aspects of the copyright system could be manipulated more easily by policy-makers if that was deemed desirable?* This is a legal and political question, not just an economic one.

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<sup>48</sup> A study by Baker and Cunningham (2006) created an index of (changes in) copyright protection, which is a more ambitious measure of the strength of copyright protection but which also raises substantial problems with the selective inclusion and weighting of different items.

<sup>49</sup> Two further problems with cross-country comparisons are: first, there are considerable variations in copyright related activities between different countries that may not be due to differences in copyright systems; second, the direction of causality between the strength of the copyright system and economic activity in the regulated markets may be unclear since societies that accumulated relatively substantial copyrights are more likely to gain from strong copyright arrangements.

The theoretical economic literature provides a general framework that can be applied to studying any specific aspect of the copyright system. Empirical research could be used to assess the consequences of changes to the copyright system *ex post* and under some circumstances, it might even be desirable to conduct deliberate experiments.

Be that as it may, it makes most sense to discuss the details of a copyright system if there is a well-supported case for copyright to begin with. According to the economic literature, it is not entirely certain that unauthorised use is welfare decreasing or that an adequate copyright system would solve the problem without excessive unintended consequences. Research on these fundamental issues cannot be replaced by a discussion of gradual changes to specific aspects of the copyright system.

## 21.2 Central questions at present

Based on these considerations, it seems reasonable to focus future research on two issues. First, many concerns regarding the copyright system and digitisation come together in one empirical question: *how is the supply of creative works affected?* The promotion of innovation and creativity is an explicit, central aim of copyright law. Studying it could provide a good indication of the net result of all the costs and benefits associated with copyright and unauthorised copying. Results will give an indication of how consumer interests are affected. Results will also reflect the net effect on incentives to suppliers.

The effect of copyright on the supply of creative works in real markets has not received enough attention. The reason may be that it is much harder to get reliable data on the supply of copyright works than on industry revenues. There will be other difficulties in research on the supply of copyrightable works. For example, it will be hard to isolate the effect of copyright-related issues from broader trends in the diversity of supply. It will also be hard to proceed from the basic number of works to an assessment of diversity and quality of supply. For the moment, even rather straightforward assessments of absolute changes in the variety of supply over recent years would be helpful.

In the context of the numerous and substantial changes that the process of digitisation is bringing to copyright industries, another issue that needs to receive greater attention is the relationship between technological advances and copyright. This relationship may go both ways, with technological innovation affecting copyright and vice versa. Two central questions for copyright policy are thus: first, *are there opportunities to reduce the administration costs and transaction costs of copyright – in particular through the application of digital ICTs – and could public policy encourage innovation in this respect?* Second, *how does the copyright system affect technological change in the regulated industries?* The expectation is that large productivity increases will be gained from technological innovation regarding copyright works and the related media infrastructure. There are some concerns that the copyright system as it is does not strike a particularly good balance between incentivising rights holders and enabling

user innovation. Next to the conventional concern for promoting the supply of copyright works, it may be worthwhile seeking out where there are obstacles to swift technological change. This could, for example, relate to lock-in and transaction costs that inhibit experimentation and the adoption of new business models. This could also concern barriers to competitive entry by innovators.

### **21.3 Improving the general framework for research related to copyright and digitisation**

For policy-makers, an alternative to picking out specific research questions and commissioning research is to address the bottleneck of data on copyright industries. The Intellectual Property Office or other public authorities could of course start to collect and disseminate data themselves. Another way to go about this would be to encourage collecting societies to make more comprehensive reports on their activities available. This could avoid unnecessary duplication of efforts and encourage independent research.

### **21.4 Promises and limitations of empirical research on copyright and digitisation**

As argued above, the existing economic literature provides a general framework for establishing the case for a copyright system and for evaluating specific changes to copyright strength. As it is, the empirical literature does not provide definite, practical answers to policy concerns, but achieving some improvements seems possible and highly

desirable. That said, in the current context of uncertainty about the effects of the copyright system and the consequences of technological change, a complete solution may not be available any time soon. Economic studies will probably not produce very precise guidelines about the desirable level of copyright protection across its various dimensions in the near future. In line with much of the literature on innovation and technology policy, a pragmatic approach may be most promising. First, it should be possible to develop reasonable, evidence-based assessments as to whether society is in any way worse off as digitisation unfolds in the copyright industries and whether copyright policy could be improved under current market conditions. Second, gradual and reversible alterations to the copyright system should be preferred. These can then be evaluated and further evolved according to the observed results.

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