

**An economic analysis of public copyright licensing:
the case of Creative Commons**

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Introduction

Technological progress and the free market have created a vast, distributed network of knowledge production and manipulation. The ubiquity of consumer electronic devices for the capture and remix of digital information has created a platform for amateur (non-professional) content. Digital cameras, video recorders, PDAs, and all-in-one cell phones allow amateurs to be photographers, directors, and journalists. Widespread computing makes it possible to mash up and share these creations across the globe virtually free of technological barriers. The exponential growth of online communities like Wikipedia, MySpace, Flickr, and Facebook demonstrate enormous potential for value creation behind these amateur endeavors.

The field of economics ignores these developments to its own folly. While the valuation of amateur creative communities and bodies of content has proven difficult, there are great possibilities for new competitive advantage. The amateur content production platform described above significantly alters the strategic landscape firms must navigate. Tapscott and Williams (2006) have brought these findings to the popular press, showing how firms can leverage mass collaboration, and similarly how firms ignore the changed landscape at their own peril. In order for firms to make informed strategic decisions in the digital age, economics must understand the nature and purpose of peer production communities. The paper now turns to address this inquiry.

A key example is the case of open source software, which has been discussed in the economics literature. Open source software has been analyzed for the motivations of those producing it, the benefits of the software itself, and the benefits of the peer production process used to create it, among other topics studied. Enabled by public copyright licenses, peer production communities have sprung up around open source software projects. While this was an early example of the destabilizing influence of mass collaboration in the Internet age, it is by no means the only one. The same pattern of growth around software communities can be seen in other fields, such as music. The possibilities for economic value creation derived from peer production networks in these other fields has only begun to be tapped or even understood. For example, Jamendo¹ is an online platform and music community where all songs are free to download under various public copyright licenses; they have released over ten thousand albums as of June 2008.² Users are given the option to voluntarily donate to artists, and the Jamendo site has implemented an advertising revenue sharing model for artists as of January 2007.³

¹ <http://www.jamendo.com/en/>

² <http://creativecommons.org/weblog/entry/8383>

³ http://www.jamendo.com/en/static/help_revenueshare/

The author believes studying Creative Commons is the next step to understanding the new competitive landscape, and this paper is a first attempt at an analysis. Where open source applies only to the field of software, Creative Commons fills every other niche for copyrighted work: websites, scholarship, music, film, photography, literature, courseware, etc. Though Creative Commons has attracted attention from sociologists, international relations researchers, and anthropologists, so far economists have ignored the broader issue. There are important questions in this problem space, and economists have the skills required to find answers. What are the motivations of amateur and professional creators choosing to voluntarily waive some of their rights under copyright? Why do creators demand certain licenses in certain circumstances and not others? What is the effect of license choice on popularity, proliferation of material, commercial success, etc.? How do public copyright licenses affect the organization and efficacy of content-producing communities? How can these communities and the value they create be leveraged in a business context? What business models built around public copyright licenses work, and which do not?

The author proposes that economics moves toward a general treatment of open content, peer production, and public copyright licenses. The similarities and differences between open source and creative commons offer many opportunities to glean insight into their inner workings. Instead of studying each in isolation, there is more explanatory power in viewing these two as facets of a broader movement. This paper is an initial attempt to broach the subject.

Background

A brief introduction to copyright

Copyright is the intellectual property for artistic and creative works. The holder of a copyright is granted the right to exclude another's use of the work, in certain ways defined by statute. This allows the copyright holder to control the distribution and subsequent use or reuse of the work, with the intent of incentivizing art and culture by allowing artists and creators to monetize the fruit of their labor. Almost anything that shows some form of creative expression, and that is fixed in some physical form, is eligible for copyright. It is important to note that the work is not itself owned, but instead a legal monopoly is granted over use of the work.

When deciding optimal copyright policy, governments face tradeoffs. On one hand, strong copyright provides strong pecuniary incentives to creators. On the other hand, the subsequent legal monopoly causes deadweight losses by raising the price well above equilibrium levels (which, in the case

of information goods, is near zero). Conversely a weak copyright regime means artists cannot appropriate returns from their works, thus reducing the amount of artistic creation.

Suzanne Scotchmer (2004, p. 98) cogently summarizes the level at which the decision to produce creative works is made:

The most important decision made by a creator of copyrighted works is not whether to pursue a given “idea,” but whether to become an author rather than, for example, a carpenter. The margin at which incentives operate is in nudging potential creators toward a life of creativity, rather than in eliciting investment in any particular novel or symphony. The length and breadth of the intellectual property right, together with the fair uses that are granted, determine how profitable these creations are, and influence how many people become creators of copyrighted works.

The term of copyright in the United States was initially fourteen years, renewable for another fourteen. In 1831, the maximum term was extended to 42 years; in 1909, to 56 years. From 1962 to the present, Congress has extended the term of both existing and future copyright eleven times (Lessig 2003).⁴

The scope of copyright and the number of formalities placed on it are also important. For example, prior to 1989 a copyrighted work had to be clearly marked with the copyright symbol (©) or the word “Copyright,” followed by the year of first publication, followed by the name of the copyright holder. In 1989 Congress enacted legislation to conform to the provisions of the Berne Convention, essentially making copyright automatic upon the creation of a work. In order to bring copyright suit in federal court a work must still be registered with the copyright office, but this registration can take place at any time after a work’s publication.

At the margins, changes like these both increase the incentive to create and increase the deadweight loss of monopoly on society. This deadweight loss is not just that some consumers of creative works will value a particular work at greater than its marginal cost but less than its price; the more important deadweight loss occurs because of the need for new creative works to build on past creative works. Creative works are different from normal economic goods because of their iterative nature, and the need to build upon the past (Khan 2005). By continually extending the duration and scope of copyright, Congress has made it more difficult to continue this iterative process of creativity.

⁴ The so-called Sonny Bono Copyright Term Extension Act, passed by Congress in 1998, extended the term of existing and future copyright by twenty years, bringing the former term of life of the author plus fifty to life of the author plus seventy years.

A number of prominent economists⁵ filed an amicus brief before the Supreme Court in *Eldred v. Ashcroft*, the case which challenged the Congress's extension of copyright terms (Akerlof 2002). The amici found that, since extension provides at most a very small benefit to innovation and significantly increases the social cost of monopoly, it was unlikely that the benefits of copyright extension outweigh the cost. Additionally, term extension reduces innovation by restricting the production of new creative works that make use of existing materials. Lessig (2004) argues much the same case: that the current US copyright regime is overly restrictive, not only unnecessarily extending legal monopolies but also restricting the ability of amateur creators to build upon past works. He calls for reform of the copyright regime to restore balance between private incentivization and the public good.

History and explanation of Creative Commons

This section provides a background for our discussion of Creative Commons (CC). A brief summary⁶ of the inception of free and open source software (FOSS) provides context for the subsequent movement in which CC formed. This paper assumes that the reader has a passing familiarity with FOSS so that a comprehensive history is unnecessary; for a longer account of the history of FOSS, see Lerner and Tirole (2002). Thereafter the paper addresses the motivations behind the CC organization and CC licenses, and concludes with an explanation of the licenses themselves.

When the field of computer software was new in the 1960s and 1970s, most software was produced in an academic or corporate research setting, and code was freely shared. Programmers swapped code informally and restrictions on “intellectual property” were few. In the 1980s this grew problematic when AT&T threatened litigation over its purported ownership of UNIX intellectual property. Richard Stallman of the MIT Artificial Intelligence Laboratory formed the Free Software Foundation (FSF) in response to the increased “privatization” of software. The FSF promotes principles of freedom in software – the freedom to use, modify, and redistribute code – and introduced the first public copyright license: the GNU⁷ General Public License (GPL). The GPL included terms such as 1) the source code must be made freely available at nominal cost, and 2) all code modifications must be licensed under the terms. This second provision is known as “copyleft” because where copyright restricts intellectual property to be private, copyleft keeps intellectual property public. Later projects

⁵ George A. Akerlof, Kenneth J. Arrow, Timothy F. Bresnahan, James M. Buchanan, Ronald H. Coase, Linda R. Cohen, Milton Friedman, Jerry R. Green, Robert W. Hahn, Thomas W. Hazlett, C. Scott Hemphill, Robert E. Litan, Roger G. Noll, Richard Schmalensee, Steven Shavell, Hall R. Varian, and Richard J. Zechkauser.

⁶ Adapted from the summary found in Lerner and Tirole (2005).

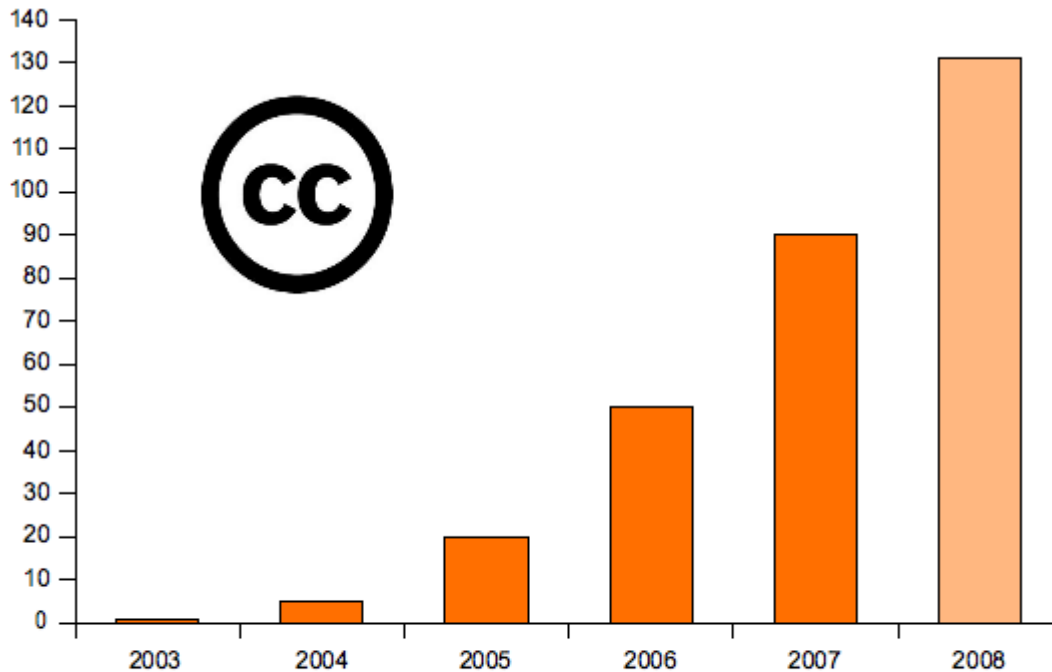
⁷ GNU is a recursive acronym for “GNU’s Not UNIX”

would develop other public copyright licenses, like the Berkeley Software Distribution (BSD) license which specifies the software can be freely copied and modified, but contains no copyleft provision. The expansion of the Internet saw FOSS participation and adoption accelerate, and in the late 1990s Eric Raymond and Bruce Perens (among others) coined the term “open source” to bring free software principles to a more pragmatic audience.

Thus the first examples of public copyright licenses were in the FOSS world, about the software space. Copyrighted works, however, have a much broader range, such as websites, scholarship, music, film, photography, literature, courseware, etc. As previously discussed, copyright extends to any act of creativity fixed in a medium. The CC organization was founded to address these shortcomings: in effect, to extend the principles of FOSS to artistic works generally, and to address the expanded scale and scope of copyright law described in the previous section. Launched in December 2002 as a not-for-profit organization, CC is dedicated to increasing “the amount of creativity (cultural, educational, and scientific content) in ‘the commons’ – the body of work that is available to the public for free and legal sharing, use, repurposing, and remixing.”⁸ CC provides a standardized set of public copyright licenses for creators to grant certain permissions over their works while retaining others. There are four distinct terms and six standard licenses derived from them, summarized in Appendix A. In addition to the legal deeds, CC licenses provide easily-recognized symbols for branding purposes; the purpose is to not only make them legally accessible, but also that such works should be easily recognized.⁹

⁸ Quoted from the Creative Commons press kit (<http://creativecommons.org/presskit>).

⁹ The Creative Commons organization also aims at license information being machine-readable. A major ongoing effort is in creating tools and standards for adding CC license metadata to media files, so that CC license-aware editing programs will be able to (for instance) automatically attribute the creators of the works they are remixing.



Minimum estimated CC licensed works
 2003-2007: End of year
 2008: Midyear

Figure 1: CC licensed works, 2003-2007. Source: <http://wiki.creativecommons.org/Metrics>

Adoption of CC licenses has proceeded rapidly since their creation in December 2002. Various efforts have attempted to estimate the number of outstanding works licensed with CC; one current estimate is 90 million works as of December 2007 (Phillips 2008). Figure 1 above shows estimated growth in the number of CC licenses over time, from 2003 to mid-year 2008, at which time there are estimated to be over 130 million licensed works. The Attributor Corporation¹⁰ has been another source of license data (see Figure 2). (The discrepancy in number of works found in the figures is probably due to the Attributor data not heavily searching the online photo-sharing site Flickr.)

¹⁰ <http://www.attributor.com/>

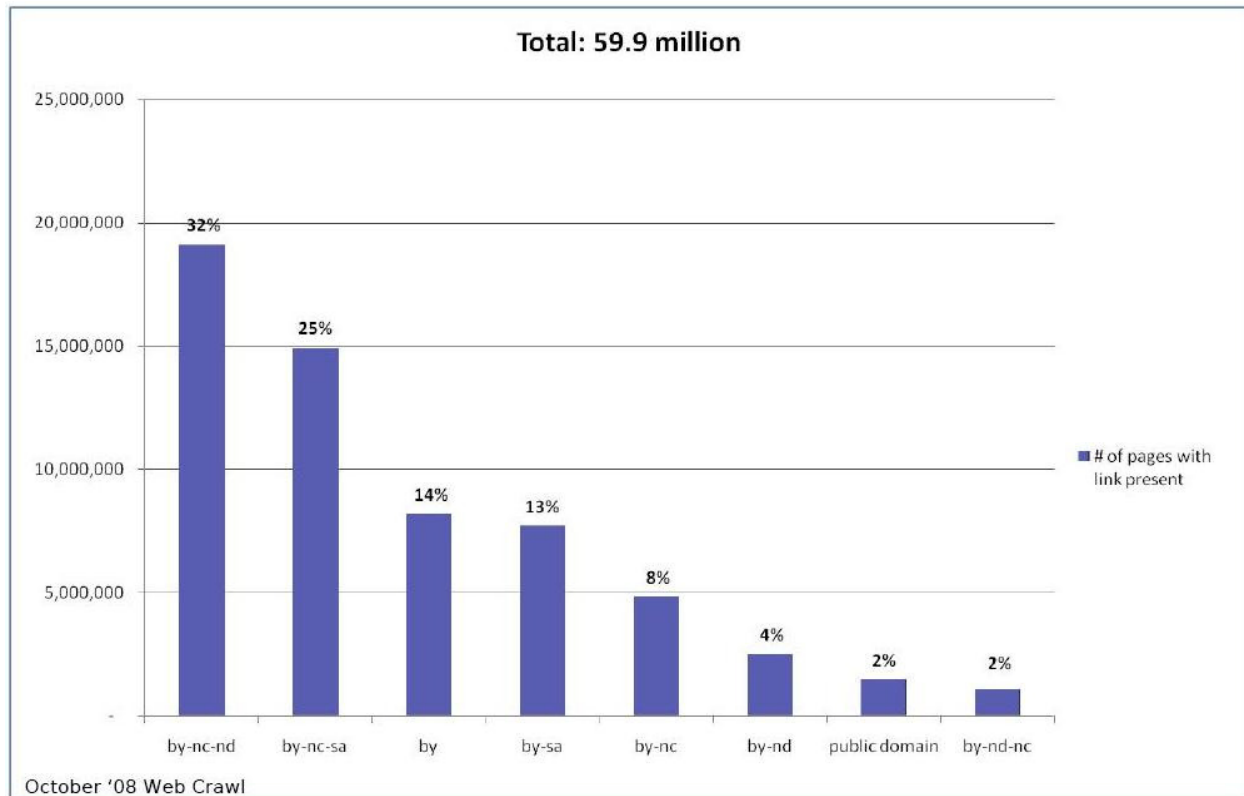


Figure 2: Total outstanding license statistics, October 2008.

Source: Presentation by Rich Pearson at the CC Tech Summit 2008

Terminology

Seemingly every discussion of FOSS or of free culture raises a number of terminological issues. These linguistic concerns shall be addressed and put to rest before the paper continues.¹¹ Thereafter all additional terms are explicitly defined.

The terms “free software” and “open source software” highlight two different philosophies within what are otherwise similar movements. At a high level, free software focuses on philosophical or moral freedoms granted to its users through free software copyright licenses. “Open source” was coined to differentiate itself from the ethical considerations endemic to free software, and instead to highlight the benefits of the peer-production model. It is no wonder, then, that the economics literature almost

¹¹ For an example close to the Rensselaer campus, the professors of a class on open source software contacted Richard Stallman to set up a speaking engagement. Stallman strenuously opposed the course title, which contained the term “open source software” rather than “free software”, and so refused to visit RPI during the semester in which that class was offered. RPI expects to host his lecture in January 2009.

exclusively uses the term “open source.”¹² This paper uses the term “free and open source software” (FOSS), which is a term used to refer to both movements without making philosophical judgments. The intent here is to include both communities without marginalizing either, and to abstract away from details which may cloud the paper’s analysis. When one community must be distinguished from the other, either “free software” or “open source software” is used. FOSS licenses and FOSS community shall refer to the copyright licenses and the community who uses those licenses to produce FOSS software, respectively.

The author has chosen the term “public copyright licensing” as an umbrella term to refer to FOSS licenses and CC licenses together, as well as other similar copyright licenses.¹³ This term was chosen first because it contains the similarities between the licenses: FOSS and CC are copyright licenses offered for free to the public, rather than negotiated between private parties. By avoiding the use of the words “free” or “open,” ideological debates like those described above can be avoided. Similarly, some in the software field reject terms such as “free/open content licensing” because they feel the term “content” should not or does not apply to software. Hopefully “public copyright licensing” can be deemed an acceptable middle ground.

“Copyleft” is the idea of using copyright law to remove restrictions from works and ensure that the works remain similarly unrestricted in subsequent copying and modification. Essentially, a work licensed with a copyleft requirement must have derivative works licensed under the same or a similar license. With CC licenses, the same concept is called “ShareAlike.” The former term will be used to refer to software licenses and the concept in general. These licenses are sometimes called “viral” copyright licenses because of the way a work under copyleft can “infect” other works it is mixed with.

Last, “software” will be distinguished from “content” or “works” throughout this paper. “Software” shall refer to computer code and related works, with all other works (websites, scholarship, music, film, photography, literature, courseware, etc.) comprising “content” or “works.”

Demand for public copyright licenses

This section begins the author’s effort to move economics toward a generalized treatment of copyright licensing. In economics, copyright – and intellectual property rights generally – is traditionally

¹² The author opines that using “open source” in a paper about both the free software and open source software communities shows a lack of rigor. This is particularly true when examining the motivations of FOSS developers, where a large proportion say they are motivated by ethical or political concerns.

¹³ The Free Art license, used on the Jamendo music community website, is another example. It is the English-language version of a French license, which was the first public copyright license dedicated to works of art.

analyzed through the lens of how to extract maximum profits from licensees. Pecuniary motives are still important, of course, but they are not the whole story. Recent innovations in public copyright licensing, where the public has access to easy-to-use licenses at near zero cost, means that copyright licensing decisions are no longer endemic only to profit-maximizing firms and those who can afford lawyers. Indeed some creators specifically eschew attempted monetization of their work in deference to other preferences.¹⁴ This opens up a whole new problem space ripe for economic analysis. Economics can treat creators of artistic works as rational actors with preferences to model and demand functions to estimate.

Similarly, copyright licenses themselves are treated as a means to an end, both in practice and in academic analyses. While this certainly makes sense in the former case – no one but copyright lawyers would treat copyright licenses as important in their own right – researchers ignore important information by glossing over copyright licenses. In the open source literature, for example, FOSS licenses are treated as essentially homogeneous: the object of inquiry is the software being produced and the programmers producing it. In this paper’s analysis the copyright license is itself of interest.



Figure 3: Continuum between full copyright (left) and public domain (right), with CC licenses in the middle.

A simple, informal model will underlie the discussion of copyright license demand throughout rest of this paper. Imagine the “copyright licensing space” (see Figure 3 above) as a one-dimensional continuum between the public domain (no rights reserved) and default copyright (all rights reserved). Each point along the continuum represents some bundle of rights reserved by the copyright holder, with the remaining rights free for public consumption. Copyright law specifies those rights comprising the point at the maximum extreme. This simple model assumes each individual creator prefers a single point on the copyright licensing continuum; *ceteris paribus*, her utility is maximized when she can choose a copyright license corresponding to this desired point.¹⁵ The creator’s preference for a preferred copyright license point is assumed to be exogenous, with the understanding that the motivations

¹⁴ President-elect Barack Obama’s transition project illustrates a recent example. Their website, change.gov, launched the day after the general election with an “all rights reserved” copyright policy. By December 1, 2008, the transition team had adopted the CC Attribution 3.0 license for the site. The Obama-Biden Transition Project is organized as a non-profit organization under U.S. federal tax code 501(c)(4).

¹⁵ Conversely, releasing her works under a copyright license corresponding to a different point will decrease her utility. It is conceivable that utility decreases proportional to the distance between the chosen point and the desired point.

discussed in the next section somehow map onto this preference. Under this model, public copyright licenses allow creators to choose a point along the continuum close to their preferred point at very low cost – otherwise they would have to hire a lawyer.

Motivations from free and open source software

This paper takes a different approach to copyright licenses than does the open source literature in economics. Where the literature either abstracts away from the licenses themselves or treats them as essentially homogeneous, this paper examines why certain licenses are chosen over others. Not all FOSS licenses are created equal: there are around a dozen frequently used licenses, each offering slightly or radically different terms (see Appendix B for a table of common FOSS licenses and their terms). The literature examines the binary choice of programmers either choosing to contribute to open source or not. But by treating the license itself as a good (with proprietary licenses included), the same decision can be studied in greater detail, and these analyses can be applied to fields outside of software.

Economists have posited and studied a range of motivations behind contributions to open source projects. These are broadly categorized into extrinsic motivations (when benefits accrue indirectly based on work done) and intrinsic motivations (where the work itself is a benefit). Extrinsic benefits include job signaling (Lerner and Tirole 2002), developing software that the programmers themselves need (Johnson 2002), and self-development of their own skills (Ghosh 2005). Intrinsic benefits include play value or *homo ludens* payoffs (Lakhani and Wolf 2003), and gift culture surrounding FOSS (Zeitlyn 2003).

Some of these motivations are directly applicable to a broad range of artistic works. Take as an example the case of an amateur photographer posting images to Flickr. She may be interested in a future career as a photographer, and posts photos online as a means of signaling her skills. Perhaps in this case she would choose a NonCommercial license so that others cannot monetize her work without permission. Or she may enjoy photography for its own sake (*homo ludens* payoff) or want others to have access to her photographs (gift culture). In these cases perhaps she chooses a relatively free license like BY or BY-SA.

The Creative Commons case studies project

The CC organization has an interest in measuring the adoption, use, and successful utilization of CC licenses. In support of this end, and in collaboration with Creative Commons Australia, they launched

the CC case studies project in June 2008.¹⁶ “This wiki project aims to examine the motivations and outcomes of CC license adoption in a variety of different situations and highlights the work being done by the creators and content aggregators in the CC community” (Phillips 2008). As a wiki project, anyone from the community can add or modify case studies; over twenty case studies were added during the first month after the project launch.¹⁷ Each case study contains information about the type of license used, the type of media created, and whether the project curates or creates material.

The case studies project provides body of qualitative data which this paper uses to study the adoption of particular CC licenses. These case studies can be used to examine the demand for particular CC licenses in the absence of quantitative data. Future studies will focus on quantitative results, once a body of quantitative data regarding CC license adoption and results can be found or produced. Unless otherwise noted, information in the following summaries is drawn from the CC case studies wiki.

Jonathan Coulton

Jonathan Coulton,¹⁸ an American singer-songwriter based in Brooklyn, NY, uses the Internet and CC to promote his music via free downloads and other promotions. As of December 2008, Coulton is unsigned and “engaged in an experiment to see whether or not it’s possible to make a living as an independent musician.”¹⁹ A former computer programmer who graduated Yale, he became active as an artist in 2005. Coulton began a project called “Thing a Week” in an effort to gain publicity for his music, where he wrote and released one song per week on his website – all available for free and licensed under CC. His best-known works include “Flickr”, “Code Monkey”, and “Still Alive”.²⁰ All his music is available to stream from his website for free; digital copies are available for purchase, as are physical CDs through an online distributor; t-shirts, books, and games are sold in a merchandise section. He notes that some of his songs have been downloaded hundreds of thousands of times, and that 45% of his income in 2007 was from paid digital downloads.

Coulton licenses his songs under the CC Attribution-NonCommercial 3.0 license. Explains Coulton, “I give away music because I want to make music, and I can’t make music unless I make money, and I won’t make any money unless I get heard, and I won’t get heard unless I give away music.” This

¹⁶ The case studies project is hosted at <http://wiki.creativecommons.org/Casestudies>

¹⁷ Blog post “The Case Studies Project Keeps Growing” by Greg Grossmeier, at <http://creativecommons.org/weblog/entry/8504>

¹⁸ <http://www.jonathancoulton.com/>

¹⁹ <http://www.jonathancoulton.com/faq/#Who>

²⁰ “Still Alive” was the theme song for Valve’s popular 2007 video game *Portal*, and was made available for free download in the Xbox 360 game *Rock Band*.

demonstrates both an intrinsic desire to create and a desire to improve his reputation through free publicity. He considers it important for musicians to reserve the right to commercially license their content when an opportunity presents itself, and the NonCommercial aspect of the license preserves his ability to do so. He settled on the BY-NC license after experimenting with licenses incorporating the ShareAlike provision: he found it was too difficult to monitor people's relicensing to determine whether they were "sharing alike," and so abandoned that license. Coulton has also noted difficulties with commercial content licensing which public copyright licenses have not yet fully addressed. When businesses contact him to license his content commercially, he finds it cost-prohibitive to hire a lawyer to negotiate a contract for uses that will likely not earn much money. For these cases he suggests a boilerplate solution, similar to CC licenses, which would enable default commercial license terms.

Nine Inch Nails

Nine Inch Nails (NiN) is an American industrial rock band, founded in 1988 by Trent Reznor who remains NiN's only official member. Reznor writes, records, and produces NiN's albums himself, and then assembles a backing group of musicians when the band tours. NiN achieved critical acclaim and popularity before adopting CC licensing, with eight major studio releases and two recordings winning Grammy Awards. In twenty years NiN has sold over twenty million albums worldwide, and in 2004 *Rolling Stone* magazine placed them 94th on its list of the 100 greatest rock artists of all time.²¹

Trent Reznor has clashed with the music industry on many occasions²² which led to his announcement in 2007 that NiN would split from its label and release future works independently. In 2008, NiN released the album *Ghosts I-IV* followed by *The Slip* under CC licenses. *Ghosts I-IV* comprises thirty-six tracks divided into four parts, with the first part offered for free download and the entire album available for purchase at different price points. For example, 2500 copies of an "ultra-deluxe limited edition" version of the album on vinyl were sold for \$300 apiece. *The Slip* was released in the same fashion, this time with the entire album being available for free download. For these independent releases, NiN chose the CC Attribution-NonCommercial-ShareAlike 3.0 license. The band's use of the NonCommercial term allows it to monetize its work without wholesale competition from free riders. The ShareAlike term encourages fans to remix the band's work, contributing to a community around NiN which subsequently adds value to the brand.

²¹ Information from Wikipedia: http://en.wikipedia.org/wiki/Nine_Inch_Nails

²² A full discussion is outside the scope of this summary. A more complete list of incident can be found on Wikipedia, at http://en.wikipedia.org/wiki/Nine_Inch_Nails#Corporate_entanglements

The case of Nine Inch Nails demonstrates that CC licenses are more than just a way for previously unknown artists to increase their popularity. Trent Reznor is a successful artist who used CC as part of a strategy to continue his success as an unsigned artist. As someone who had previously clashed with the music industry, Reznor sought a new business model which that would give him independence from the traditional big names in music. As a result he has been an innovator and early adopter of this model and his innovation has yielded great success. For example, the limited edition vinyl versions of *The Slip* sold out in a matter of days, earning him profit equivalent to selling hundreds of thousands of CDs under traditional business models.²³ NiN also received substantial positive press attention, demonstrating that well-established artists can also use CC licensing as part of a strategy to increase their popularity and distribution of their work.

Cory Doctorow

Cory Doctorow is a science fiction novelist, technology activist, blogger, co-editor of the weblog Boing Boing, and a contributor to Wired, Popular Science, Make, the New York Times, and many other newspapers, magazines, and websites. A proponent of CC since its inception, Doctorow's novels are published by Tor Books and are simultaneously released on the Internet under a CC license. Doctorow's latest novel, *Little Brother*, spent a total of six weeks on the New York Times Bestseller List, and was released BY-NC-SA.

Doctorow's first novel, *Down and Out in the Magic Kingdom*, was published in January 2003 and was the first novel released under a CC license. Originally it was released under BY-ND-NC, which does not allow for subsequent modifications to the work. In March of 2003, however, it was re-released under BY-NC-SA to allow for derivative works such as fan fiction. Says Doctorow, "Not only does making my books available for free increase the number of sales that I get, but I also came to understand it artistically as a Science Fiction writer that if I was making work that wasn't intended to be copied, then I was really making contemporary work."²⁴

His support and use of CC licenses also stems from his dislike of onerous restrictions creative works. From his personal website's bio page, written in 2006, he states, "I believe that we live in an era where anything that can be expressed as bits will be. I believe that bits exist to be copied. Therefore, I believe that any business-model that depends on your bits not being copied is just dumb, and that

²³ http://wiki.creativecommons.org/Nine_Inch_Nails_The_Slip

²⁴ http://wiki.creativecommons.org/Cory_Doctorow

lawmakers who try to prop these up are like governments that sink fortunes into protecting people who insist on living on the sides of active volcanoes.”²⁵

Releasing books under CC licenses is an interesting case. Many have found that digital downloads of books and physical copies are largely complements, since adequate ebook readers are not yet widely prevalent and printed type has greater contrast and is thus easier to read than computer screens. Because of this, consumers tend to use digital book downloads as a means of sampling a book to determine if they are interested in purchasing a physical copy. Doctorow recognizes this dynamic and believes that his digital release of books has caused him to sell more copies than he would have otherwise.

Conclusion

In the past decade, the number of amateur creators has exploded, fueled by cheap digital technology and prevalent information networks like the Internet. Likewise the size and scale of online communities has grown exponentially, multiplying the strategic opportunities for firms savvy to the new competitive landscape. Because of the expanded scope of copyright in the digital age, and thanks to the availability of public copyright licenses, amateurs have been choosing how they want their works to be licensed.

The three case studies above all involve professional artists who make a living from their work, and all three use NonCommercial CC licenses. All three believe that they benefit from allowing fans to remix their work, though only two incorporate the ShareAlike term into their license choice. These creators are pioneers of new business models in music and literature which both disrupt existing business models and provide greater freedom and opportunity for professional creators.

Future research

This paper merely scratches the surface of what could be a promising vein of research into public copyright licensing. First and foremost there is a need for quantitative data on license usage: which licenses are being adopted, using what terms, for which media, etc. CC launched a metrics project in mid-2008, and in time this may help fill the need for data. Once quantitative data is found, economists can work to build theoretical models that explain the demand for public copyright licenses, CC and FOSS alike.





²⁵ http://wiki.creativecommons.org/Cory_Doctorow

There is also a place for qualitative data in future research. For example, surveys to communities such as Flickr and Jamendo may be able to elucidate the motivations behind the choice of NonCommercial and ShareAlike terms, much like surveys of the FOSS community were undertaken to determine their motivations for participation.

Whatever the direction of future research, it is clear that issues surrounding amateur creation and public copyright licenses will remain important for the foreseeable future.







Appendix A: Creative Commons licenses and conditions

Table 1: Conditions

Symbol	Name	Abbreviation	Description
	Attribution	BY	Others can copy, distribute, display, and perform the work, but only if they give credit.
	Non-Commercial	NC	Others can copy, distribute, display, and perform your work for noncommercial purposes only.
	No Derivative Works	ND	Others can copy, distribute, display, and perform only verbatim copies of the work.
	Share-Alike	SA	Derivative works are only allowed under a license identical to the original license used.

Adapted from <http://creativecommons.org/about/licenses>, licensed CC-BY 3.0

Table 2: Licenses

Symbol	Name	Abbr.	Description
	Attribution	BY	The most permissive license offered; others can distribute, remix, tweak, and build upon the work, even commercially, as long as they give credit for the original creation.
	Attribution Share-Alike	BY-SA	Same as BY, with the added condition that derivative works are licensed under BY-SA. Akin to the copyleft provision in GNU Public License or similar FOSS licenses.
	Attribution Non-Commercial	BY-NC	Others can remix, tweak, and build upon your work for non-commercial purposes, as long as they give credit.
	Attribution No Derivatives	BY-ND	Allows for commercial or non-commercial redistribution, as long as it is reproduced unchanged and in whole, with credit given.
	Attribution Non-Commercial Share-Alike	BY-NC-SA	Others can remix, tweak, and build upon the work for non-commercial purposes only, as long as they give credit and license their new creations under BY-NC-SA.
	Attribution Non-Commercial No Derivatives	BY-NC-ND	The most restrictive license, often called “free advertising” license; work cannot be changed or used commercially.

Adapted from <http://creativecommons.org/about/licenses/meet-the-licenses>, licensed CC-BY 3.0

Appendix B: List of common free and open source licenses

Name	Projects used	GPL compatible?	Copyleft?	Notes
GNU General Public License (GPL)	GNU, Linux kernel, MySQL	yes	yes	
GNU Lesser General Public License (LGPL)	glibc	yes	yes	Less restrictive than GPL, used for easier combination with differently-licensed projects
MIT license	X windowing system	yes	no	Also called the X11 license
Berkeley Software Distribution (BSD) license	FreeBSD, OpenBSD	yes	no	
Apache license	Apache web server	yes - GPL v3	no	

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