Application for NBER Post-Doctoral Fellowship on Innovation Policy

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Research Proposal

While a vast literature has been written about cumulative innovation since Scotchmer (1991), innovation scholars have often focused upon the impact of intellectual property on research and development in the context of patenting and academic research. The role of copyright's distortion when innovation is cumulative remains largely unexplored, but could potentially be quite significant given the process behind creative works and art, wherein new works typically re-use, imitate, borrow, or appropriate from the past. Even though the breadth of copyright is narrowly defined compared to patent rights – copyright grants rights over the expression of an idea, not the idea itself – most copyright systems now grant the exclusive right to derivative works to the original creator, and such restrictions over freedom of expression have proven controversial in the legal literature (see e.g., Goldstein (1982), Gervais (2012)). While early copyright regimes were implemented to provide a legal restriction for simple cases of copying, such as piracy, the breadth of rights granted in modern copyright regimes significantly expands upon the nature of protection that began with the Statute of Anne in 1710. In fact, only with the U.S. Copyright Act of 1976 was a general right for authors to control derivative works enacted.

Recent trends in technology's influence on content creation as well as controversial court decisions emphasize the importance of studying copyright's role in cumulative innovation. Digitization has had a profound impact on the production and distribution of media goods (Waldfogel, 2012). Access to production software and cheaper hardware has eased entry into producing creative works, such as movies, music, and e-books, while the internet has opened distribution channels that circumvent a reliance upon record labels and film distributors. Such technological developments, according to Lessig (2008), enable a "remix culture," wherein digitization helps consumers to create their own derivative works as a reaction and interaction with the media provided by professional content industries. With the arrival of new platforms for monetizing amateur creative content

(e.g., YouTube, Bandcamp), I expect the distinction between professional and amateur creation to continue to blur.

Federal courts have also contributed to controversy around the scope of the derivative right. For example, in 2015, Pharrell Williams and Robin Thicke were successfully sued by the estate of Marvin Gaye for infringing upon the copyright of "Got to Give It Up." Even though no copyrighted element of the Gaye work was directly copied, infringement was successfully argued based upon the feel and sound of the Robin Thicke song resembling that of Gaye's work. With the reality in mind that new creative works are not created in a vacuum, it remains important to explore the economics of copyright and derivative works especially, given the purpose of copyright "to promote the Progress of Science and useful Arts."[1]

This proposal continues with three research projects that would be refined during the NBER post-doc, and concludes with ideas for future projects in the area.

1. Copyright and the Production of Hip-Hop Music

In the first project, I explore how the strengthening of upstream copyright policy, through federal court decisions, affects the rate and direction of re-use downstream in the music industry. A novel, self-collected dataset has been built that tracks re-use in commercial music through a phenomenon known as "digital sampling"[2]. Evidence from this study shows that re-use significantly declines once upstream rights are strengthened via the federal court, and that this effect manifests through a reduction in the intensive margin, with no significant apparent change in the propensity to sample, as shown in Figure 1. Additionally, I find that this effect on sampling disproportionately affected more prominent artists, with the drop in sampling being greater in magnitude for more promiment musicians. Evidence from this project also suggests that restricting re-use lead to a decrease in novel, previously unsampled, works being re-purposed in new songs - such that musicians are now drawing from a less diverse "pool" when they explicitly borrow from past work. While this project is one of the first to demonstrate how copyright affects re-use[3], it also provides evidence of how copyright may affect the actual content of new products.

2. Derivative Works, Complements or Substitutes?

The second study in progress examines how the introduction of downstream derivative works, such as sample-based music and "cover versions" of previously recorded music impacts consumption of the original, underlying work. Such an investigation helps us understand whether derivative works generally act as substitutes, or instead as complements for the previously released original work. This research is aimed at contributing

[1] U.S. Constitution, Article 1 Section 8

[2] *Digital sampling* refers to a practice in music where portions of past sound recordings, known as *samples*, are re-used in creating a new recorded work

[3] For others papers on re-use, see empirical work in Nagaraj (2014) and the theoretical paper Gans (2015)

to understanding the potential incentive effects of derivative works, but can also help inform the conversation around Fair Use.[4] Additionally, the results of this project are business strategy relevant, by providing content industry participants evidence of when permissive licensing may be profitable (or not).

This project builds upon the music sampling database described in the previous project, but also utilizes a new, unique panel dataset from an online music streaming service covering daily demand for music streaming at the musician-level. From this research, I have found preliminary evidence that, on average, the release of a derivative work significantly increases demand for the original work upon which it is based, as shown in Table 1. A matching difference-in-differences estimator is currently being implemented to identify the effect of releasing derivatives on the underlying work.

3. The Effects of Copyright Enforcement: Evidence from Sampling

Finally, a third project underway in this area examines the litigation aspect of derivative works. Using copyright infringement lawsuits filed by the publishing company Bridgeport Music as a source of variation, this project explores how firms' assertion of their intellectual property rights (IPR) portfolio impacts the future exploitation of said IPR in new products by other firms. Such a study is enabled through my dataset on digital sampling in music, which tracks the releases of music that contain samples of past recordings, and provides information on the specifics of what was sampled. Early evidence from this project suggests that a firm's assertion of rights through litigation reduces the rate at which their IPR is utilized in new products. The contribution of this project may not be limited to just the economics of copyright, but may further our understanding of intellectual property enforcement in general, even patent assertion against infringers.

Conclusion

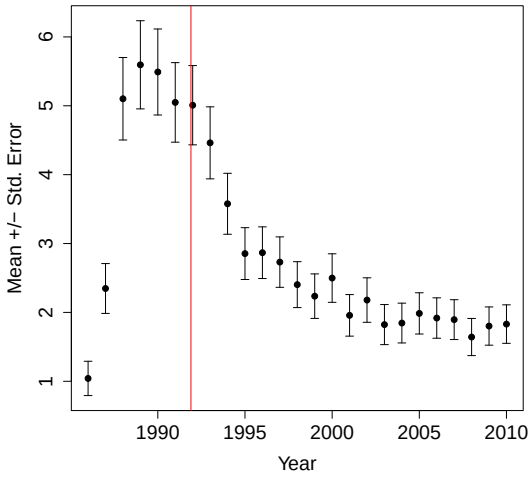
In addition to these ongoing copyright project, my general interests center on the economics of copyright and digitization's effect on media industries, particularly the music industry. Future research in the derivative works area is planned to focus on the quality of new works, by building a dataset measuring the quality of works to understand how restrictions over re-use may or may not impact the quality of new products. Additional work on copyright is planned to examine the Digital Millennium Copyright Act (DMCA), particularly the controversial takedown procedures – in order to understand firms' strategies when enforcing their IP, as well as understanding the tradeoffs of who benefits from the DMCA.

[4] In the U.S., one of four factors for determining fair use is the effect upon the original work's value

Figures and Tables

Figure 1: Sampling trends after federal court decision strengthing upstream rights (marked in red). Figure 1(a) show yearly poisson estimates of number samples per song, Figure 1(b) shows the propensity to sample as logit estimates. Note the propensity to sample does not change post-court decision, but the number of samples re-used *per song* significantly drops

(a) Samples Per Song



(b) Propensity to Sample

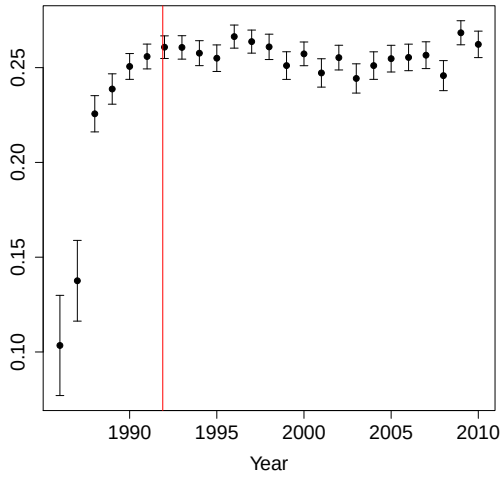


Table 1: Estimates of impact of derivatives on underlying works. The outcome measure, *listening*, is a normalized measure of demand for an artist at the day level, measured as: $\text{listening}_{it} = \frac{\text{total streams of artist } i \text{ in period } t}{\text{average streams in period } t \text{ for all artists}}$. The parameter of interest, δ, measures the change in listening that occurs after a derivative work is released. The positive estimates of δ provide preliminary evidence that derivative works, on average, increase listening to the artists of the underlying work. More refinements are needed to rule out potential selection effects.

	(1) listening	(2) listening	(3) listening
δ	4.220***	4.451***	0.515***
	(0.0378)	(0.0377)	(0.0300)
Constant	1.000***	1.976***	-0.244
	(0.00828)	(0.186)	(0.146)
Day FE	No	Yes	Yes
Artist FE	No	No	Yes
R^2	0.024	0.025	0.814
adj. R^2	0.024	0.024	0.813
F	12434.5	41.49	.
N	768583	768583	768583

Robust standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

References

Gans, Joshua S. 2015. Remix rights and negotiations over the use of copy-protected works. *International Journal of Industrial Organization*, **41**, 76–83.

Gervais, Daniel. 2012. Derivative Right, or Why Copyright Law Protects Foxes Better than Hedgehogs, The. *Vand. J. Ent. & Tech. L.*, **15**, 785.

Goldstein, Paul. 1982. Derivative rights and derivative works in copyright. *J. Copyright Soc'y USA*, **30**, 209.

Lessig, Lawrence. 2008. *Remix making art and commerce thrive in the hybrid economy.* Epic Publishing.

Nagaraj, Abhishek. 2014. Does Copyright Affect Reuse? Evidence from the Google Books Digitization Project. *Working Paper.*

Scotchmer, Suzanne. 1991. Standing on the Shoulders of Giants: Cumulative Research and the Patent Law. *Journal of Economic Perspectives*, **5**(1), 29–41.

Waldfogel, Joel. 2012. Copyright Protection, Technological Change, and the Quality of New Products: Evidence from Recorded Music since Napster. *Journal of Law and Economics*, **55**(4), 715–740.

Jeremy Watson

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Education

Ph.D. Strategy & Innovation, Boston University, 2017 (expected).

Dissertation Committee: Timoty Simcoe (chair), Iain Cockburn, Megan MacGarvie, Michael Meurer

B.S. Biochemistry, Georgia Institute of Technology, 2011.

Employment

Research Assistant, National Bureau of Economic Research 2011–2016.

Research Assistant, Georgia Institute of Technology 2009–2011.

Research

Working Papers

Copyright and the Production of Hip Hop Music, 2016

Forking, Fragmentation and Splintering (with T. Simcoe), 2016

Selected Works in Progress

Derivative Works: Complements or Substitutes?

The Effects of Copyright Enforcement: Evidence from Sampling (with T. Simcoe)

The Nature of Pharmaceutical Innovation (with L. Branstetter, C. Chatterjee, M. Higgins)

Resource Allocation Rules In Optical Astronomy (with T. Simcoe)

Teaching

Lecturer: SI422 Strategy, Innovation, and Global Competition (2015) (Evaluation: 4.52/5)

Teaching Assistant: SI422 Strategy, Innovation, and Global Competition (2013,2014)

Conference Presentations

2016 Roundtable for Engineering Entrepreneurship Research, Georgia Institute of Technology

Copyright and the Production of Hip Hop Music

Invited Doctoral Consortia

2016 NBER Digitization Tutorial (Stanford)

2014 Strategy Research Initiative PhD Bootcamp (IESE New York)

Personal

Born on October 11, 1989.

United States Citizen.

Last updated: December 1, 2016

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December 6, 2016

Dear Scott, Josh, Nick et al,

I strongly support Jeremy Watson's application for the NBER Innovation Policy Post-doctoral fellowship.

Jeremy is in his 5th year of the PhD program at the Boston University Questrom School of Business. He is well positioned to complete his PhD by June 2017, but chose not go on the market this year in order to develop his papers more fully.

Jeremy's research examines the influence of copyright policy on music production. In his most developed paper, Jeremy studies how the "Grand Upright" decision changed sampling practices in hip-hop music. Sampling is the practice of extracting and re-using short bits of previously recorded music as part of a new work. Jeremy scraped his sampling data from the music-fan web site whosampled.com. It is a very interesting data set, not least because sampling provides a far more direct measure of re-use than the citation-based proxies that many of us routinely employ.

The Grand Upright case established that rights to all sampled music must be cleared, and as one might expect, Jeremy finds a sharp drop in the rate of sampling following the decision. More interestingly, he finds that all of the action occurs at the *intensive* margin. That is, while the share of new songs containing a sample stays roughly constant, there is a large drop in the number and variety of samples per new track.

In the paper, Jeremy argues that the explanation for this result is rooted in the transaction costs of clearing large numbers of rights per song.

The empirical design of this paper is essentially a pre-post comparison, and for that reason, Jeremy is unlikely to use it as his job market paper. However, he does use cover songs (which operate under a statutory licensing regime) and self-samples (for which rights need not be cleared) as set of placebo tests. Given the magnitude and timing of his results, I personally find them convincing.

Jeremy's second music and copyright paper studies the impact of sampling (and also cover songs) on demand for the original work. His measure of demand comes from Spotify "plays" data. The empirical design is a straightforward matched sample difference-in-differences regression that exploits the very large set of potential control songs on Spotify. Jeremy has the data in hand, and is currently working on the analysis for this paper, which I believe he intends to use on the job market. The findings should speak to a core question in the law of copyright damages, namely, whether derivative works are substitutes or complements for the original.

Finally, Jeremy and I have a working paper entitled "Fragmentation, Forking and Splintering" that considers why some network effects markets "fail to tip" and whether we should be concerned about that outcome. Our analysis is grounded in a series of case studies of railroad gauge, modem, instant messaging and operating system standards. Jeremy did much of the background research for these cases.

Jeremy is very easygoing, and a pleasure to work with. I am confident that he would perform all of the duties associated with the post-doctoral fellowship with minimal supervision. If you would like to hear more,

In conclusion, I would like to suggest that Jeremy is the type of applicant who would truly benefit from this position. He is well trained, and has good ideas, but needs a little more time, and some encouragement to put himself out there. Spending a year

at the NBER, and helping to coordinate some IPE events, might really help him sharpen his thinking and become a more effective self-promoter. In short, I think the social returns of choosing an applicant like Jeremy are higher than if the post-doc goes to whomever is the star of this year's job market.

If you would like to hear more, please drop me a line. And thanks so much for your work in organizing this.

Sincerely,

