

# Sequential Musical Creation and Sample Licensing

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## **Abstract**

All musical creation builds on previous works, but using fragments of preexisting musical works can constitute copyright infringement. A recent case has strengthened copyright protection for samples of sound recordings, in particular, by lowering the size threshold for protection to zero. This paper describes a model of copyright holders' and samplers' incentives that captures an important inefficiency emerging from the sequential creation context. Bargaining may not divide the profit from the sample-based derivative work between upstream and downstream creators in a way that provides musicians in both groups with sufficient incentives to create. The model suggests that attempting to "maximize" the property rights of copyright holders to increase incentives for creation can backfire. Because the specific bargaining process, and not ex ante efficiency, dictates the results of licensing negotiations, copyright can discourage socially desirable creative works. An optimal system for regulating sequential creation would balance the incentives of upstream and downstream

creators, to the benefit of both groups. In light of this, the paper applies the model's insights to discuss proposals for copyright reform.

## 1 Introduction: Musical Appropriation, Borrowing, and Reference

Sampling is the practice of using sound recordings by other musicians (and, by implication, the underlying musical compositions) as part of new musical works that combine new elements with found elements.<sup>1</sup> Digital technology has made sampling much less costly and has contributed to sampling's proliferation as a musical practice, playing a significant role in genres like hip-hop, electronic, and art music. Sample-based music has enjoyed enormous commercial and critical success. But the copyright law of sampling has presented obstacles to this and other forms of sequential creation. In this chapter, I develop an economic model of sequential musical creation, along with various extensions of that model, to investigate how to design copyright law to handle the creation of derivative works most efficiently.

Many musical practices involve borrowing, appropriating, or taking from preexisting musical works; sampling is not unique in this regard. Covers are re-recordings of musical compositions that other musicians have recorded previously. Cover artists can tailor the composition to their own styles and make their own arrangements, but only up to a point. Quotation, allusion, and reflection of influences are less literal forms of borrowing. They involve taking from a prior work, creating music that evokes a prior work, or working in a musical style (or with some important musical ideas) previously devel-

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<sup>1</sup>See MARK KATZ, CAPTURING SOUND: HOW TECHNOLOGY HAS CHANGED MUSIC 138-41 (2004).

oped by others, respectively. Finally, almost every work uses basic musical structures, building blocks like notes, scales, chords, compositional forms, and instruments. Only the rarest of musical works fails to use techniques of appropriation, borrowing, or reference.<sup>2</sup> Under this conception, musical innovation involves combination and recombination of many elements—and perhaps addition of new elements—to produce a unique creation. Law has developed a number of doctrines to address sequential creation; I outline these in Section 2.

Economically, musicians’ production functions use preexisting musical works as inputs of production.<sup>3</sup> Section 3 explores the implications of assuming that samplers negotiate with licensors for the use of preexisting works, rather than taking input prices as given from a market—an assumption motivated by the fact that sample-licensing negotiations occur in the music industry. The parties’ inability to write *ex ante* contracts that allow both licensors and licensees to cover their costs results in what the patent literature calls the division-of-profit inefficiency. Circumstances exist in which samplers’ incentive problem results in derivative works not being created. This illustrates how copyright’s regime for sampling can backfire when it attempts to maximize copyright holders’ incentives rather than providing a balance.<sup>4</sup> When the derivative work is not created, the copyright holder in the preexisting work receives no licensing revenue, harming the creators of preexisting works that the stronger copyright regime was supposed to help.

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<sup>2</sup>*See, e.g.*, JOANNA DEMERS, *STEAL THIS MUSIC: HOW INTELLECTUAL PROPERTY LAW AFFECTS MUSICAL CREATIVITY* 31-70 (2006).

<sup>3</sup>For a model focused on complete duplication that also recognizes that creative works are inputs to subsequent creative works, see WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW* 71-84 (2003).

<sup>4</sup>*Cf.* JESSICA LITMAN, *DIGITAL COPYRIGHT* 77-86 (2001) (describing the shift in copyright’s overarching rationale from a bargain between creators and the public to an attempt to maximize creators’ incentives).

Section 4 extends the model of Section 3 to the multiple-licensor setting, to capture the situation in which sample-based songs are collages of many different, complementary samples.

Although the model of Sections 3 and 4 focus on the difficulties that can arise in sample licensing because of non-contractibility, Section 5 points out that the situation is not so dire for samplers. Musicians can adjust the samples they use, how many samples they use, or even alter their method of musical borrowing from sampling to “replaying” small pieces of compositions themselves (which reduces the licensing burden to one type of license). Musicians can also adjust the method by which they release their music to the public; in essence, they have choice over their particular business model. The tradeoffs involved can result in differently situated musicians making different business-model choices.<sup>5</sup> A consideration of copyright law’s policy toward sampling should take into account the flexibility that samplers have on the margins of both artistic choices and business models. In Section 6, I employ insights from the models discussed in this chapter to evaluate copyright’s policies and several prominent reform proposals.

Copyright law’s regime governing musicians’ use of other musicians’ work will play a large role in determining how preexisting musical works enter the production process, which works must be licensed in what situations, and how much licenses cost. The particular institutions and relationships involved in licensing negotiations will also play a significant role. By specifying a formal model of how law, institutions, and incentives interact in the context of sample licensing, I aim to provide a way to understand the economic forces at work. Ideally, such modeling could someday result in a model with both

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<sup>5</sup>A numerical simulation with calibrated assumptions about various music-industry parameters can illustrate how different business models become more and less attractive under which conditions. See Peter DiCola, “An Economic Model of Sampling, Cover Versions, and Musical Collage,” (working paper on file with author, 2006).

testable predictions and measurable variables—a tall order in the copyright context. In the meantime, a better understanding of the complex web of incentives involved in sample licensing might allow for a better design for copyright’s handling of sequential musical creation.

## 2 Copyright’s Regime for Sequential Musical Creation

This section provides some background in music copyright. It also explains the statutory provisions and judicial opinions that govern musical appropriation, borrowing, and reference in general, and sampling in particular.

### 2.1 Copyright Basics

Two kinds of copyrights apply, potentially, to any song or other piece of music: a sound recording copyright<sup>6</sup> and a musical composition copyright.<sup>7</sup> In popular songs and most classical pieces, the sound recording is a particular recorded rendition of an underlying musical composition, which includes the melody, chords, rhythm, structure, and lyrics. The two copyright holders in a song may be identical, but often they are distinct. The dual nature of music copyright means that the number of necessary licenses is generally at least double the number of preexisting songs used.

Musical compositions come with five exclusive rights: reproduction, distribution, preparation of derivative works, performance, and display. Sound

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<sup>6</sup>Sound recordings are defined as “a series of musical, spoken, or other sounds [except for movie soundtracks] . . . regardless of the nature of the material objects . . . in which they are embodied.” 17 U.S.C. §101 (2000). They were not protected under federal law until 1971, Sound Recordings Act, Pub. L. No. 140, 85 Stat. 39 (1971).

<sup>7</sup>The copyright code uses the term “musical work,” but does not define it except to say that lyrics are included. 17 U.S.C. §102(a)(2) (2000).

recordings come with the same first three rights, a limited performance right, and no display right.<sup>8</sup> A single action can infringe multiple rights at once. A song that includes samples can implicate both the reproduction and derivative-works rights of the sampled songs' copyright holders (as well as the copyright holders' distribution and performance rights if the sample-based song is marketed to the public, played live, or played on radio or television). Courts adjudicate infringement of the reproduction and derivative-works rights based on the "substantial similarity" test.<sup>9</sup> The cases in Section 2.2 will illustrate how that doctrine applies in the sampling context.

Recording artists often transfer their sound recording copyrights to record labels in return for financing and marketing their works, as well as advance and royalty payments. Composers and songwriters generally sign contracts with publishers to administer their copyrights, splitting the revenue. In addition, many composers belong to one of the performing rights organizations, ASCAP, BMI, and SESAC. These organizations administer blanket licenses for radio stations, concert venues, and others to perform their members' songs publicly.<sup>10</sup> In the models below, I will treat the sound recording copyright holders and the musical composition copyright holders in preexisting works as single entities. In reality such agents are more complex, but I assume that their profit-maximizing incentives are aligned sufficiently for the analysis to be meaningful.

Copyrights are subject to limitations and exceptions. For instance, courts have recognized a "de minimis" threshold, meaning that using very small portion of a copyrighted work will not necessarily constitute infringement.<sup>11</sup>

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<sup>8</sup>17 U.S.C. §106 (2000).

<sup>9</sup>See JULIE E. COHEN ET AL., COPYRIGHT IN A GLOBAL INFORMATION ECONOMY 353-94 (2002).

<sup>10</sup>For a primer on the music industry, see generally DONALD S. PASSMAN, ALL YOU NEED TO KNOW ABOUT THE MUSIC BUSINESS (2000).

<sup>11</sup>See Judge Newman's discussion in *Ringgold v. Black Entertainment Television*, 126

Another important limitation on copyright protection is the fair use doctrine, which gives infringement defendants an affirmative defense for activities “such as criticism, comment, news reporting, teaching, . . . scholarship, or research.”<sup>12</sup> Copyright is also limited in time, expiring 70 years after an author’s death.<sup>13</sup> Many other limitations to copyright, both broad and narrow, exist in the copyright code and in case law, but these are the most important provisions for the model in this chapter.

The limited nature of copyright means that samplers will often, but not always, require a license to use preexisting works. In particular, samplers can engage in non-infringing uses of copyrighted works, although such uses may be difficult, uncertain, and costly to identify. Samplers are also free to use works that were never copyrighted and works whose copyrights have expired. In the models of this chapter, non-infringing uses or works not under copyright have a licensing fee of zero, but they may come with information costs to verify their status as non-infringing.

## 2.2 Sampling Case Law

In 1991, *Grand Upright Music v. Warner Brothers Records* was the first published judicial opinion to establish that sampling was copyright infringement.<sup>14</sup> Rapper Biz Markie admitted to sampling the song “Alone Again (Naturally)” by Gilbert O’Sullivan. Judge Kevin Duffy’s opinion famously opened with the phrase “Thou shalt not steal,” and, given the admission

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F.3d 70, 74-76 (1997) (declining to find the defendant’s use de minimis).

<sup>12</sup>17 U.S.C. §107 (2000)

<sup>13</sup>17 U.S.C. §302(a) (2000). Copyrights lasts for 95 years after publication (or 120 years after creation, whichever comes first) for a “work for hire,” meaning a work either commissioned or performed by an employee within the scope of employment. *Id.* §§101, 302.

<sup>14</sup>780 F. Supp. 182 (S.D.N.Y. 1991).

of copying in fact, focused heavily on the copyrights validity.<sup>15</sup> The court did not analyze substantial similarity. But Judge Duffy did provide some rationale for his finding of infringement: the defendants lawyers had sought a license for using O’Sullivan’s composition and sound recording before the release of the Biz Markie album containing the infringing song. “Each defendant who testified knew that it is necessary to obtain a license—sometimes called a ‘clearance’—from the holder of a valid copyright before using the copyrighted work in another piece.”<sup>16</sup> This reasoning proves faulty. As the Supreme Court would hold three years later in *Campbell v. Acuff-Rose Music*, “the offer [to license] may simply have been made in a good faith effort to avoid this litigation . . . being denied permission to use a work does not weigh against a finding of fair use.”<sup>17</sup> The court in *Grand Upright* should have conducted a substantial similarity analysis and considered fair use, provided that defense counsel raised the latter issue. Despite these oversights, the case signaled to the music industry that samples should be cleared to avoid an infringement lawsuit.

More lawsuits ensued. *Jarvis v. A&M Records* involved a song by C&C Music Factory that sampled a composition by Boyd Jarvis.<sup>18</sup> The court considered the case as one of “fragmented literal similarity,”<sup>19</sup> and conducted an element-by-element analysis, rather than asking whether an ordinary ob-

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<sup>15</sup>*Id.* at 182.

<sup>16</sup>*Id.* at 184-85.

<sup>17</sup>510 U.S. 569, 585 n.18 (1994).

<sup>18</sup>827 F. Supp. 282 (D.N.J. 1993).

<sup>19</sup>The treatise that coined this phrase describes it as applying to situations in which “the similarity [between two parties’ works], although literal, is not comprehensive—that is, the fundamental substance, or skeleton or overall scheme . . . has not been copied; no more than a line, or a paragraph, or a page or chapter of the copyrighted work has been appropriated.” NIMMER ON COPYRIGHT §13.03[A][2] (2005). The treatise provides “no easy rule of thumb” but advises courts to consider the sample both quantitatively and qualitatively with respect to the “*plaintiff’s*” work. *Id.* (emphasis in original).

server would mistake the two songs. Rejecting the defendant’s motion for summary judgment, the court held that, as a factual matter, C&C Music Factory might have infringed by sampling a qualitatively important keyboard part and qualitatively important lyrical phrases from the work.<sup>20</sup>

In *Fantasy v. La Face Records*, the plaintiff accused TLC of infringing the song “Mr. Big Stuff,” a sound recording made in 1971.<sup>21</sup> La Face won on a motion to dismiss, because “Mr. Big Stuff” was recorded before the copyright code protected sound recordings and the statute of limitations on a common-law claim based on state protection of sound recordings would have expired.<sup>22</sup> The case bears mention because the exclusive right involved was the derivative-works right, according to the court’s analysis, not the reproduction or distribution rights. The court held that the statute of limitations would have run from the time of the final mixed version of TLC’s song, implying that the creation of TLC’s allegedly derivative recording was the relevant action for infringement, not the reproduction or distribution of copies of the recording.<sup>23</sup>

Marley Marl and his record company sued Snoop Dogg and his record company for infringing Marley Marl’s musical composition “The Symphony” in *Williams v. Broadus*.<sup>24</sup> The defendants argued that because Marl’s “The Symphony” sampled Otis Reddings song “Hard to Handle,” Marl’s song itself was an unauthorized derivative work. The court denied the defendants motion for summary judgment, holding that a genuine factual issue existed

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<sup>20</sup>Even though the lyrical phrases copied were quite short (for example, “ooh”), the court held that the phrases could have been arranged in an original manner in the plaintiff’s work, meaning that copyright protection could apply even to brief phrases.*Id.* at 292.

<sup>21</sup>No. C 96-4384 SC ENE, 1997 U.S. Dist. LEXIS 9068 (N.D. Cal. June 24, 1997).

<sup>22</sup>*Id.* at \*4-\*5, \*7-\*8.

<sup>23</sup>*Id.* at \*8. Whether the plaintiffs presented arguments based on reproduction and distribution is not clear; the broad language of the copyright code suggests they could have. See 17 U.S.C. §106 (2000).

<sup>24</sup>99 Civ. 10957 (MBM), 2001 U.S. Dist. LEXIS 12894 (S.D.N.Y. August 27, 2001).

whether a sample of two measures containing a five-note ascending pattern and a five-note descending pattern rendered “The Symphony” substantially similar to “Hard to Handle.”<sup>25</sup>

A unique and interesting case arose after the Beastie Boys sampled a three-note melodic phrase—C, D-flat, C, played on the flute over an overblown background C—from Newton’s composition “Choir.”<sup>26</sup> The Beastie Boys had licensed the sound recording from Newton’s record label. But they had not licensed the underlying composition from Newton himself, who owned the publishing rights. The Ninth Circuit affirmed the district court’s holding that the Beastie Boys’ use was *de minimis*, applying an ordinary observer interpretation of that exception to infringement.<sup>27</sup> The court isolated the compositional elements of Newton’s composition—the melody and background note, which appeared in the composition’s score—from the elements of Newton’s performance on the recording. The court held that the compositional elements were “no more significant than any other section” and were instead “ ‘a common building block tool.’ that ‘has been used over and over again by major composers in the 20th century.’ ”<sup>28</sup> *Newton v. Diamond* thus rests on the fundamental distinction between compositions and sound recordings, as well as the notion that some portions of copyrighted compositions are too small, basic, and idea-like to protect.<sup>29</sup>

Two years later, *Bridgeport Music v. Dimension Films* held that no de

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<sup>25</sup>*Id.* at \*15.

<sup>26</sup>*Newton v. Diamond*, 388 F.3d 1189, 1191 (9th Cir. 2003).

<sup>27</sup>*Id.* at 1193 (“To say that a use is *de minimis* because no audience would recognize the appropriation is thus to say that the use is not sufficiently significant.”).

<sup>28</sup>*Id.* at 1196 (quoting testimony defendants’ expert Dr. Lawrence Ferrara).

<sup>29</sup>A non-sampling case, *Jean v. Bug Music, Inc.*, 00 Civ. 4022 (DC), 2002 U.S. Dist. LEXIS 3176 (S.D.N.Y. Feb. 27, 2002), corroborates this, holding in a declaratory judgment for the plaintiffs that a composition with three identical words and three identical notes to a prior composition did not infringe.

minimis threshold applied to sound recordings.<sup>30</sup> “100 Miles and Runnin’,” a song by N.W.A., sampled two seconds from a guitar solo of the George Clinton song “Get Off Your Ass and Jam.” The two-second sample was a recording of three notes from a single chord played in rapid succession (what musicians call an arpeggio). “100 Miles and Runnin’ ” was used in the movie *I Got the Hook-Up* without a synchronization license for the sound recording.<sup>31</sup> The court read Section 114(b) of the copyright code, which explicitly excludes “entirely . . . independently created” works from the reach of the reproduction and derivative-works rights of sound recording copyrights,<sup>32</sup> to imply that any work not entirely independently created infringes.<sup>33</sup> From this the court concluded: “Get a license or do not sample.”<sup>34</sup> The court did not consider, nor explicitly cast aspersions on, the possibility of fair use.<sup>35</sup>

The Sixth Circuit supported its reasoning in *Bridgeport* with several policy arguments, many of them economic in character. First, the court reasoned, musicians have the option to play (or hires someone else to play) a new rendition of the notes recorded in the sample, avoiding the need to license the sound recording but potentially leaving the need to license the composition.<sup>36</sup> Second, the court asserted that substitutes in the market for sample licenses would constrain prices. Third, the court noted that sampling

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<sup>30</sup>410 F.3d 792 (6th Cir. 2005). In other words, the court held that, for sound recordings, the de minimis threshold is zero.

<sup>31</sup>The musical composition had received a synchronization license. *Id.* at 796.

<sup>32</sup>17 U.S.C. §114(b) (2000).

<sup>33</sup>*Bridgeport*, 410 F.3d at 800.

<sup>34</sup>*Id.* at 801.

<sup>35</sup>*Id.* at 805.

<sup>36</sup>See *infra* Section 5.1. This point also relates to the argument that sampling saves recording costs by obviating the need to pay musicians to re-record musical phrases. See Recent Case, 118 HARV. L. REV. 1355, 1361-62 (“When sounds are taken to ‘save costs’ and not as the building blocks of a new creation, it follows that the substantial-similarity requirement is unnecessary to further the goals of copyright.”).

(unlike, say, George Harrison’s subconscious copying of the Chiffons’ “He’s So Fine”<sup>37</sup>) is never accidental, and thus any costs—whether from licensing or litigation—are avoidable. Furthermore, a bright-line rule will promote licensing over litigation, a more efficient result. Fourth, even small portions of sound recordings are valuable, in the courts view, because they are “physical,” not “intellectual.”<sup>38</sup> The court reasoned, circularly, that nothing valuable can be used for free, and any sound used must be valuable—thus, no sound recording sample can be free. Fifth, the court cited judicial economy, since substantial similarity analysis can become complex and time-consuming. Sixth, and finally, the court argued that their ruling will not harm creativity. The pool of available works to sample remains large, since pre-1972 sound recordings cannot be federally copyrighted (though the court noted that state-law protection might apply). Moreover, the distributional effects on creators are neutral, in one sense, because “in many instances, today’s sampler is tomorrow’s samplee.”<sup>39</sup>

*Bridgeport* took an extreme approach to the de minimis threshold, basing its position on sanguine assumptions about samplers’ prospects for licensing their samples efficiently. While other circuits may reject this approach in the future, *Bridgeport* has effectively become the law of the land for the time being. Since most recordings are marketed nationwide, infringement plaintiffs will generally have the opportunity to file in the Sixth Circuit. The copyright policy of *Bridgeport* provides some of the motivation for this chapter’s analysis—how efficient is the interaction between samplers and the necessary licensors?

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<sup>37</sup>Bright Tunes Music Corp. v. Harrisongs Music, Ltd., 420 F. Supp. 177 (S.D.N.Y. 1976) (demonstrating that subconscious copying can satisfy the “copying in fact” element of substantial similarity analysis).

<sup>38</sup>*Bridgeport*, 410 F.3d at 802.

<sup>39</sup>*Id.* at 804.

### 3 A Model of Sequential Musical Creation

This section explores the assumption that samplers negotiate with licensors for the use of preexisting works, rather than taking input prices as given from a market. Suppose that a new piece of music requires using a digital sample of one preexisting piece of copyrighted music, in the sense that the new work will have no value without incorporating the sample.<sup>40</sup> The new work has potential social value  $q$  per year. The preexisting works are twofold, because of the duality of music copyright: first, a sound recording with value  $s$  per year; and second, musical composition with value  $m$  per year. In this simple setup, I will assume that the entirety of the derivative work's value is at stake—without the sample, the sampler's idea for a song would have no commercial value. This assumption could be relaxed without changing the basic insights described below.

Assume that the new piece of music definitely infringes both copyrights in the original song. If the sampler fails to license the preexisting work from both copyright holders, then he or she will be found liable and that his or her payoff in such a case would be negative.

Musicians have fixed costs of production, which include the costs of capital (e.g. recording equipment) and labor (e.g. session musicians). The fixed costs of production to specific to each of the three works are:  $c_{DW}$  for the new, sample-based work;  $c_{SR}$  for the preexisting sound recording; and  $c_{MC}$  for the preexisting musical composition.

The parameters of copyright law and the related parameters describing

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<sup>40</sup>The model presented here in the preamble and in Section 3.1 is an adaptation of the model by Jerry Green & Suzanne Scotchmer, *On the Division of Profit in Sequential Innovation*, 26 RAND J. ECON. 20 (1995). See also the helpful presentation in SUZANNE SCOTCHMER, INNOVATION AND INCENTIVES 135-42 (2004). The assumption that the derivative work loses all its value without the sample will be relaxed later in the chapter.

the consequences of monopolistic control over copyrighted works are as follows: Copyright holders earn a fraction  $\pi$  of the social value of their works. Copyright has a duration  $T$ . Society experiences deadweight loss  $l$  every period a work is under copyright. The social discount rate is  $r$ , i.e. the interest rate.

Thus, the total, present-discounted social value will be positive for each of the three works under the following conditions [the “positive social value conditions”]:

- For the new, sample-based derivative work:  $q \left( \frac{1}{r} - lT \right) - c_{DW} > 0$
- For the sampled sound recording:  $(s + q) \left( \frac{1}{r} - lT \right) - c_{SR} - c_{DW} > 0$
- For the sampled musical composition:  $(m + q) \left( \frac{1}{r} - lT \right) - c_{MC} - c_{DW} > 0$

### 3.1 Division of profit: The source of inefficiency

Bargaining among the sampler and the samplees takes place according to the three-person licensing game described in Appendix A. As a result of bargaining, the parties split  $q$  roughly  $\frac{1}{3}, \frac{1}{3}, \frac{1}{3}$ . As Appendix A demonstrates, the Nash solution is approximated as the subjective discount factor approaches unity.

With respect to new, sample-based works, society will lose out on works that have positive social value when:

$$q \left( \frac{1}{r} - lT \right) - c_{DW} > 0 \quad \mathbf{but} \quad \left( \frac{q}{3} \right) \pi T < c_{DW}$$

When the sampler’s one-third share of the profit from the derivative work is not great enough to cover the fixed costs of producing the work, then the derivative work will not be produced.

This is partly a result of the three-way split of the derivative work’s profits. But at its root, it is a result of the institutional setting; samplers

typically do not seek out licensors until their sample-based works have already been created. This makes the case of ex ante licensing, more relevant in the patent context of Scotchmer and Green, unusual in this context. Only ex post licensing is realistic in the music industry, when songs generally have to be created and heard to be evaluated. If ex ante licensing were possible, then the costs as well as the revenues of the derivative work could be shared among the original sound recording copyright holder, the original musical composition copyright holder, and the sampler.

With respect to the original, preexisting works—and, by implication, the sample-based work as well, since the sample-based work requires the original—society will lose out on two works that, collectively, have positive social value when:

$$(s + q) \left( \frac{1}{r} - lT \right) - c_{SR} - c_{DW} > 0 \quad \text{but} \quad s\pi T + \left( \frac{q}{3} \right) \pi T < c_{SR}$$

or when:

$$(m + q) \left( \frac{1}{r} - lT \right) - c_{MC} - c_{DW} > 0 \quad \text{but} \quad m\pi T + \left( \frac{q}{3} \right) \pi T < c_{MC}$$

The logic of these equations is similar. If one of the original creators cannot cover its costs—even with the help of receiving one-third of the revenue from the derivative work—then neither the original nor the derivative work will be produced.

### **3.2 Separation in time between sampled work and sample-based work**

There can be as much as several decades separation between the preexisting song and the sampled-based song. Consider Public Enemy’s sampling of James Brown. Public Enemy was working in the late 1980s, sampling tracks by James Brown that date back to the 1960s. Then again, there could also

be relatively little separation in time. For example, the collagist Girl Talk, in its 2006 track “Minute by Minute,” sampled a 2005 track by The Game featuring 50 Cent, “Hate It or Love It.” Let the expected separation in time be denoted  $\tau$ .

Suppose the original, sampled works are created at time zero, so at the stage of these works creation, their incentives are now structured differently. From a time-zero perspective, this changes the profitability criteria above to:

$$s\pi T + \frac{1}{(1+r)^\tau} \left(\frac{q}{3}\right) \pi T < c_{SR}$$

for the sound recording, and:

$$m\pi T + \frac{1}{(1+r)^\tau} \left(\frac{q}{3}\right) \pi T < c_{MC}$$

for the musical composition. If either of these inequalities holds, then the original creators will not produce the sampled song—also eliminating the opportunity for the sample-based song to be produced. The larger  $\tau$  gets, the less likely it is that the licensing revenue from the sample-based work will push the original song’s creators’ incentives over the edge, making the difference between the original, preexisting works being created or not. For simplicity of notation, and because this point would carry less weight in a more realistic model allowing for the possibility of multiple licensees, I will drop the  $\frac{1}{(1+r)^\tau}$  term in the subsequent variations of the analysis.

### 3.3 Adjustment to sample length is possible

Copyright law’s “de minimis threshold” embodies the idea that some infringements are so small that the law should not recognize them as infringements.<sup>41</sup> Instituting such a threshold allows the law some breathing room,

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<sup>41</sup>I start by modeling the concept of the de minimis threshold because it was the subject of the recent *Bridgport* decision and because it lends itself straightforwardly to quanti-

which could have important benefits in terms of samplers' incentives and in terms of avoiding the transaction costs of licensing.<sup>42</sup> The de minimis threshold will also have the consequence of providing some samplers with the incentive to shorten their samples, to take advantage of copyright law's choice to limit its own reach.

To capture this concept mathematically, suppose that copyright subsists in any fraction [measured in time] of a musical work  $\bar{y} \in (0, 1)$ . Each sampler, in the one-sample set up, will have a desired sample length  $y^*$ . The new, sample-based work has an associated loss function  $L(y)$  which measures the proportional loss in value from adjusting the length of a sample downward from  $y^*$ . This loss function has the form:

$$L(y) \equiv \left( \frac{y^* - y}{y^*} \right)^{\frac{1}{\lambda}}$$

with  $y^* \in (0, 1)$  denoting the desired sample length and  $\lambda \in (1, \Lambda)$  for some large, finite  $\Lambda$  parameterizing the degree of distaste for moving away from the most desired sample. Higher  $\lambda$  means more distaste for deviations from the optimum. As a consequence of this functional form,  $L(y) \in (0, 1)$ .<sup>43</sup> There is an implicit—and admittedly imperfect, since it puts the qualitative dimension of sample choice aside—assumption that shorter samples contribute less to the value of the derivative work, and thus it is most desirable to decline to compensate the tiniest samples.

Given this loss function, the commercial value of the new, sample-based work is now  $q \cdot [1 - L(y)]$ . Under what circumstances will the musician reduce

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tative modeling. I leave aside the more complex issue of fair use until Sections 5 and 6.

<sup>42</sup>Transaction costs are incorporated in a more complicated variation of the model in Section 4.

<sup>43</sup>I assume that the licensor never wishes to grant (and the licensee never wishes to use) a larger sample than desired. Thus, there is no need for a quadratic, i.e. two-sided, loss function.

the sample and avoid the licensing fees? Whenever  $q \cdot [1 - L(y)] \geq \frac{q}{3}$  (the musicians approximate share of the profits after licensing)—that is, whenever  $L(y) \leq \frac{2}{3}$ . The  $y$  that makes this equation hold with equality will depend on the sampler’s particular parameters  $y^*$  and  $\lambda$ , and implicitly depends on the equilibrium of the three-person bargaining game.

As a result of making the sampler’s decision problem more flexible, we now have three cases:

1. The sampler need neither license nor adjust he sample, because  $y^* < \bar{y}$ . If the sampler’s desired sample length is below the de minimis threshold of copyright law, the sampler will earn  $q\pi T - c_{DW}$  whenever that expression is positive. The only danger of social loss is whether  $\frac{q}{3}\pi T$  was needed to incentivize the preexisting sound recording or musical composition.
2. The sampler can alter the sample, even though  $y^* \geq \bar{y}$ , to make the chosen  $y < \bar{y}$ . In this case, all we need for the sample-based work to be created is:

$$q \cdot [1 - L(y)]\pi T \geq c_{DW}$$

For this to be true, we need  $y^*$  to be between  $\bar{y}$  and  $(\frac{1}{1-(\frac{2}{3})^\lambda})\bar{y}$ . [To see this, set  $L(\bar{y}) = \frac{2}{3}$ .] Again, the harm to social welfare involves any original, sampled works for which  $\frac{q}{3}\pi T$  was needed to incentivize the preexisting sound recording or musical composition.

3. The sampler would rather license than alter the sample because  $y^* > \bar{y}$  and  $L(\bar{y}) > \frac{2}{3}$ . Then the original inequalities hold from the simplest case above (the case without adjustment of samples).

### 3.4 Three different copyright regimes

Determining the optimal level of  $\bar{y}$  requires an analysis of what works are gained or lost to society under different scenarios, corresponding to different levels of  $\bar{y}$ . In each of the three scenarios, there are up to three cases to analyze, corresponding to different ranges of the sampler's value of  $y^*$  in relation to  $\bar{y}$ . Throughout the discussion, I mean to refer to works with positive social value.<sup>44</sup>

**No copyright over derivative works.** This corresponds to  $\bar{y} = 1$ . Under that condition, any value of  $y^*$  puts us into case (1) above. No sample of any length necessitates obtaining a license. Socially valuable derivative works are not created whenever  $q\pi T < c_{DW}$ . Nor are they created if either  $s\pi T < c_{SR}$  or  $m\pi T < c_{MC}$ , since the creators of the original, sampled song cannot make a positive profit.

**Complete copyright over derivative works.** Next consider the consequence of  $\bar{y} = 0$ . Here, only case (3) is relevant, because there is no de minimis threshold and thus there is no reason in this simple setup for the sampler to alter the sample length. Society *gains* creative works with respect to the no-copyright scenario when both original artists cross the profitability threshold:

$$s\pi T < c_{SR} < [s\pi T + \left(\frac{q}{3}\right)\pi T] \quad \mathbf{and} \quad m\pi T < c_{MC} < [m\pi T + \left(\frac{q}{3}\right)\pi T]$$

and sampling is still profitable:

$$\left(\frac{q}{3}\right)\pi T > c_{DW}$$

Society *loses* socially valuable sample-based works because of the need to license when creating the derivative work slips below profitability:

$$\left(\frac{q}{3}\right)\pi T < c_{DW} < q\pi T$$

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<sup>44</sup>See the end of the preamble to Section 3 for the three positive social value conditions.

Therefore, there are benefits and costs from moving between a regime of no copyright at all to a regime of complete copyright.

**Copyright over derivative works with a de minimis threshold.** Now suppose that  $\bar{y}$  is strictly greater than zero, but is still less than one. The particular costs and benefits of moving to this intermediate level of copyright protection determine the optimal level of  $\bar{y}$ .

**Case (1):**  $y^* \leq \bar{y}$ . Among sample-based works with  $y^*$  below the de minimis threshold, we *gain* any works for which the following relations hold:

$$\left(\frac{q}{3}\right) \pi T < c_{DW} < q\pi T; \quad m\pi T > c_{MC}; \quad \mathbf{and} \quad s\pi T > c_{SR}$$

We *lose* both the original, preexisting work and the sample-based works for which the following relations hold:

$$c_{DW} < \left(\frac{q}{3}\right) \pi T$$

meaning that the sample-based work would have been profitable, had the original works come into being;

$$m\pi T < c_{MC} \quad \mathbf{or} \quad s\pi T < c_{SR}$$

meaning that without licensing revenue, at least one of the copyright owners of the original song will not make a profit; and

$$m\pi T + \left(\frac{q}{3}\right) \pi T > c_{MC} \quad \mathbf{and} \quad s\pi T + \left(\frac{q}{3}\right) \pi T > c_{SR}$$

meaning that with the licensing revenue, the copyright owners of the original song *would* have made a profit, and thus seen fit to produce the original work.

**Case(2):**  $\bar{y} < y^* \leq \left(\frac{1}{1-(\frac{2}{3})^\lambda}\right) \bar{y}$ . In this adjusted-sample case, we first need to revise the positive social value conditions slightly, to reflect the derivative work's decline in value:

- Derivative work:  $[1 - L(\bar{y})]q \left(\frac{1}{r} - lT\right) - c_{DW} > 0$
- Original recording:  $\{s + q(1 - L(\bar{y}))\} \left(\frac{1}{r} - lT\right) - c_{SR} - c_{DW} > 0$
- Original composition:  $\{m + q[1 - L(\bar{y})]\} \left(\frac{1}{r} - lT\right) - c_{MC} - c_{DW} > 0$

Assuming that those conditions hold, we can now discuss the socially valuable works that would be gained or lost as compared to the complete-copyright scenario. Among sample-based works with  $y^*$  lying between the de minimis threshold and the largest sample length  $y$  that is worth incurring the loss  $L(y)$  to adjust, we gain sample-based works for which:

$$\left(\frac{q}{3}\right) \pi T < c_{DW} < [1 - L(\bar{y})] \cdot q\pi T$$

which specifies that the derivative work, which was not profitable if the full sample was licensed, would be profitable with an adjusted sample. For this gain in the number of sample-based works created to occur, it also must be true that both

$$m\pi T > c_{MC} \quad \mathbf{and} \quad s\pi T > c_{SR}$$

which guarantees that the original, sampled song will still be created, even without the licensing revenue.

As in Case (1), we *lose* both the original, preexisting work and the sample-based works for which the following relations hold:

$$c_{DW} < \left(\frac{q}{3}\right) \pi T$$

meaning that the sample-based work would have been profitable, had the original works come into being;

$$m\pi T < c_{MC} \quad \mathbf{or} \quad s\pi T < c_{SR}$$

meaning that without licensing revenue, at least one of the copyright owners of the original song will not make a profit; and

$$m\pi T + \left(\frac{q}{3}\right) \pi T > c_{MC} \quad \mathbf{and} \quad s\pi T + \left(\frac{q}{3}\right) \pi T > c_{SR}$$

meaning that with the licensing revenue, the copyright owners of the original song *would* have made a profit, and thus seen fit to produce the original work. These conditions for losing the original work are the same as in case (1) because, regardless of the sampler’s particular  $y^*$ , the requirement for a work to be lost is that it was being made before and that it will no longer be licensed thanks to the de minimis exception and the ability to adjust sample length downward.

In addition, society could lose some value from samples being adjusted in derivative works that were already being made under the complete-copyright scenario. For this to occur,  $c_{DW}$  would have to be less than  $\left(\frac{q}{3}\right) \pi T$ , so that the work was getting made in the complete-copyright scenario. But if it’s also the case that  $[1 - L(\bar{y})] \cdot q\pi T > \left(\frac{q}{3}\right) \pi T < c_{DW}$ , then the sampler will adjust the sample to make more profit. In that event, society gets only the fraction  $[1 - L(\bar{y})]$  times the original social value of the sample-based work. That loss in social value must also count in the ledger when assessing the gain and loss from introducing a de minimis threshold  $\bar{y}$  greater than zero.

**Case(3):**  $y^* > \left(\frac{1}{1 - \left(\frac{2}{3}\right)^\lambda}\right) \bar{y}$ . In this event, no works are gained or lost, nor is any social value lost, with respect to the complete-copyright scenario. No sampler with a  $y^*$  this high will find it profitable to adjust their sample; he or she will either license the sample or choose not to produce the sample-based work at all.

### 3.5 The optimal threshold for copyright protection

With this framework, policymakers can roughly assess whether instituting a positive de minimis threshold for copyright protection is a good idea, as compared to the complete-copyright regime announced in *Bridgeport Music v. Dimension Films*. The works gained and lost in cases (1) and (2), along

with the social value lost from adjusted samples in case (2), can be tallied up and totaled, at least in principle, to guide this choice about the design of copyright law.

The previous section focused on comparing the complete-copyright regime to a regime with some positive de minimis threshold. Policymakers may also wish to perform a comparison to the no-copyright regime, which could be outlined in analogous fashion. But it seems unlikely that setting  $\bar{y} = 1$  is a viable policy proposal. While it is an interesting theoretical exercise to contrast the net social benefits of the no-copyright and complete-copyright regimes, the pressing question is whether the de minimis threshold should have a value like “one percent of the sampled work’s duration” as opposed to zero.

Admittedly, estimating the benefits and costs of setting  $\bar{y} > 0$ , outlined for cases (1) and (2), would be very difficult to do with precision. The calculation would depend on a large number of parameters: the joint distribution of  $(q, y^*, \lambda, c_{DW})$  among sample-based works, the joint distributions of  $(m, c_{MC})$  and  $(s, c_{SR})$  among preexisting works, and the values of  $\bar{y}, \pi, T, \text{ and } dl$ . In addition, the calculation would depend on assumptions about the equilibrium of the three-person licensing game, that is, about the division of profits from licensed sample-based works, among other assumptions about economic behavior, such as profit maximization on the part of musicians. Moreover, to this point we have assumed—unrealistically—that each sample-based work corresponds to only one musical composition and sound recording, and that a given musical composition or sound recording is sampled only once.

Despite these difficulties and simplifications, it seems preferable to structure the discussion in some way. Some general conclusions might be drawn about which regime the cost-benefit calculation would be likely to recommend. In contrast to Green and Scotchmer’s concerns in the patent context about whether basic research will occur, the copyright context suggests that

policy makers should have concerns about balancing the incentives of both upstream and downstream creators (rather than having a primary concern on just the upstream creators).

In the music context, *ex ante* licensing does occur, as when copyright holders hire other musicians to remix their songs. But many samplers do not know in advance which samples, sounds, and combinations of sounds will occur to them and sound good together. With *ex post* licensing, the creator of the derivative work typically has no opportunity to share their costs with the copyright owners of the original work. This is especially true in light of the distance in time that can often occur between samplee and sampler, described in Section 3.2. This makes possible a number of situations in which samplers' incentive problem results in derivative works not being created. In those instances, copyright's regime for sampling can backfire. When the derivative work is not created, the copyright holder in the preexisting work receives no licensing revenue. This endangers the preexisting work's creator's ability to solve his or her incentive problem.

A positive *de minimis* threshold gives copyright law a mechanism to put some derivative works outside the reach of copyright, alleviating the incentive problem for some creators of derivative works and potentially providing some balance. While not perfect, sample length is an attractive policy lever because it is objective, not requiring private parties or judges to engage in aesthetic assessments to understand the reach of copyright law. But the *de minimis* threshold may entice some samplers to alter the samples they use from their desired lengths. That consequence has both advantages and drawbacks, in terms of the number of works created and the value of the works created. With a relatively small *de minimis* threshold, however, both these effects will be relatively small. Based on the simple model presented so far, it seems likely that some positive *de minimis* threshold would have broad social benefits.

## 4 Extending the Model to a Multiple-Licensors Setting

In this section, I examine whether the basic insight of Section 3—concern about the incentives that creators of derivative works face in the music industry—holds up, becomes more severe, or lessens when more realistic features are added to the model. To begin, suppose that samplers use portions of multiple preexisting songs to create new derivative works. Now, instead of a sampler and two original creators, there could be many licensors whose permission the licensee must purchase. Many sample-based works fit this description, with multiple samples per track.

One way to model these interactions would be to extend the three-person licensing game described in Appendix A to  $n$  persons. Since the equilibrium of that game approached the Nash solution, a shortcut would be to say that each player in the game receives a payoff of  $\frac{1}{n} \cdot q$  from the licensing negotiations.<sup>45</sup> But this shortcut would not capture any subtleties regarding the differences among copyright holders. In this model, a relatively important sample with two copyright holders would receive five times less licensing revenue than a relatively trivial sample with ten copyright holders—an undesirable implication.

Rather than extending the simple licensing game of Appendix A, this section proposes transplanting the wage-bargaining model of Lars Stole and Jeffrey Zwiebel to the licensing setting with multiple licensors.<sup>46</sup> This framework allows for more flexibility that will capture the subtleties of the multiple-licensors context described above. It also allows for some variations and exten-

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<sup>45</sup>See, e.g., Vijay Krishna & Roberto Serrano, *Multilateral Bargaining*, 63 REV. ECON. STUD. 61 (1996).

<sup>46</sup>Lars A. Stole & Jeffrey Zwiebel, *Intra-firm Bargaining Under Non-binding Contracts*, 63 REV. ECON. STUD. 375 (1996).

sions that capture more of the details of copyright law. Section 4.1 describes how the model works; Sections 4.2 and 4.3 examine the implications of market imperfections and competition among samples, respectively, using this newer model of the licensing game.

## 4.1 Applying the Stole and Zwiebel model

Suppose that licensing negotiations are not binding e.g., they involve conditional, tentative, or provisional price quotes until negotiations with all licensors are finished. With this assumption, the model by Stole and Zwiebel of multilateral but pairwise bargaining between a firm and its workers can apply to the licensing setting. The model allows for complementarity between samples and for differences in the costs of doing without different samples.

In the Stole and Zwiebel model, a firm sits at the center of negotiations among many individual workers (or classes of workers). To apply this to the licensing context, I make an analogy between the firm's position in wage negotiations and the sampler's position in licensing negotiations. Just as Stole and Zwiebel assume that production cannot happen without the firm's participation, I will assume that the particular derivative work cannot be created without the sampler who conceived of it.

The procedure in the wage bargaining model proceeds as follows: The firm negotiates with each worker one by one, in an arbitrary order. Each negotiation session involves either an alternating-offers game with risk aversion and exogenous probability of negotiations breaking down<sup>47</sup> or an alternating-offers game with impatience.<sup>48</sup> Both firms and workers can potentially demand renegotiation of the wage at any time until production actually occurs.

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<sup>47</sup>Ken Binmore, Ariel Rubinstein, & Asher Wolinsky, *The Nash Bargaining Solution in Economic Modelling*, 17 RAND J. ECON. 176 (1986).

<sup>48</sup>Ariel Rubinstein, *Perfect Equilibrium in a Bargaining Model*, 50 *Econometrica* 97 (1982).

When a pairwise negotiation fails and a worker decides to leave the firm, there are two consequences: first, the worker who quits cannot return to the firm at any point; and, second, renegotiation occurs, in the original negotiating order, with every worker who had previously successfully negotiated a wage. Stole and Zwiebel formalize this as an extensive-form game, and demonstrate that a unique subgame perfect equilibrium exists.

I will assume that an extensive-form game with the same rules transpires between the sampler-licensee and the licensors. In particular, I will apply the multi-asset version of Stole and Zwiebel’s model, which allows the copyright owners of each song—including both the sound recording copyright holder(s) and the musical composition copyright holder(s)—to be grouped together, allowing for samples of different values to the new, sample-based derivative work. Thus, the licensee negotiates with the copyright holders for a particular song, one by one, then proceeds to the next song’s copyright holders, one by one, and so on. Renegotiations occur with all agreed licensors whenever a particular negotiation breaks down. Since the rules of the game are identical by assumption, I can apply Stole and Zwiebel’s solution directly.

The requirement that renegotiation is always possible—that no binding contracts are written until the derivative work is produced—is a strong assumption. It describes a setting in which licensors offer price quotes, but no final agreements are made, which may be too extreme a characterization of the sample clearance process. But it does better reflect the one-on-one, tiny-market situation of sample licensing than the opposite extreme: the assumption of thick, robust, anonymous, no-negotiating markets for samples.

## 4.2 Equilibrium in the multiple-licensor model

The  $n$  creators of the preexisting songs are grouped by song. Let  $\bar{x}_i$  denote the number of copyright holders for sampled song  $i$ , and let  $x_i$  (without the

bar) denote the number of those copyright holders who agree to sell a license to the sampler, with  $i \in (1, n)$ . So, for example, in the model of Section 3,  $n = 1$  and  $\bar{x}_1 = 2$ , the sound recording copyright holder and the musical composition copyright holder.

Samplers have a production function that takes preexisting musical inputs and turns them into new, sample-based works. Specifically, using the  $n$  preexisting songs, the sampler has a function  $F(x_1, x_2, \dots, x_n)$ , with  $F(\cdot) \in [0, 1]$ . The production function measures the fraction of the derivative work's potential value that the sampler is able to realize by obtaining the necessary licenses. Other inputs to production, like capital and labor, are represented, as in Section 3, as part of constant fixed costs  $c_{DW}$ .

To illustrate how this production function works, consider the model of Section 3 as an example. In that setup, without contracts with both licensors, the derivative work could not be made, so  $F(2) = 1$  and  $F(1) = F(0) = 0$ .

But the model with multiple licensors allows for the sampler to realize a portion of the derivative work's value by obtaining the rights to sample some songs but not others. Consider a new example with two samples, each with two copyright holders (one each for the sound recording and the musical composition). Suppose that, without the first sample, the derivative work would lose two-thirds of its value. But without the second sample, the derivative work would lose only half its value. Then the production function  $F(x_1, x_2)$  would take on the following values:

$$\begin{aligned}
 F(2, 2) &= 1; \\
 F(2, 1) &= F(2, 0) = \frac{1}{2}; \\
 F(1, 2) &= F(0, 2) = \frac{1}{3}; \text{ and} \\
 F(1, 1) &= F(1, 0) = F(0, 1) = F(0, 0) = 0.
 \end{aligned}$$

The sampler has a vector of desired sample lengths,  $(y_1^*, y_2^*, \dots, y_n^*)$ , and a vector of levels of distaste for shortening each sample,  $(\lambda_1, \lambda_2, \dots, \lambda_n)$ . The new, multi-sample loss function is:

$$L(y_1, y_2, \dots, y_n) \equiv \prod_{i=1}^n \left( \frac{y_i^* - y_i}{y_i^*} \right)^{\frac{1}{\lambda_i}} \cdot I_{y_i > 0}$$

where  $I_{y_i > 0}$  is an indicator function for whether the length of sample  $i$  is greater than zero. The indicator function is included to avoid deducting value for the derivative work twice, since the production function also accounts for samples not being used.

In light of the de minimis threshold  $\bar{y}$ , the sampler optimizes before bargaining, deciding which of the  $n$  potential samples to shorten, if any. As a result of this optimization, the sampler will have some number of  $k$  samples which he or she has either decided to shorten or which already had desired lengths  $y_i^* < \bar{y}$ . The sampler need not negotiate with the copyright owners of those  $k$  samples.

The sampler plays the Stole and Zwiebel bargaining game described above with the remaining  $n - k$  samples' copyright owners. Denoting the vector of licensors  $x_i$  as  $\mathbf{x}$ , the licensing fee  $\tilde{w}$  paid to each licensor is determined by the following series of difference equations:<sup>49</sup>

$$\Delta_i F(\mathbf{x}) - \tilde{w}_i(\mathbf{x}) - (x_i - 1)\Delta_i \tilde{w}_i(\mathbf{x}) - \sum_{j \neq i} x_j \Delta_i \tilde{w}_j(\mathbf{x}) = \tilde{w}_i(\mathbf{x}) - \underline{w}_i$$

$$\forall \mathbf{x} \leq \bar{\mathbf{x}} \quad \text{and} \quad \forall i = 1, 2, \dots, n - k$$

where  $\Delta_i F(\mathbf{x}) = F(x_1, x_2, \dots, x_i, \dots, x_{n-k}) - F(x_1, x_2, \dots, x_i - 1, \dots, x_{n-k})$  and  $\underline{w}_i$  denotes the payoff to the licensors for song  $i$  if negotiations break down. In words, these difference equations mean that the loss in the derivative work's value from not reaching an agreement with a marginal licensor,

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<sup>49</sup>Stole & Zwiebel, *supra*, at 392

minus the licensing fee savings from losing that licensor,<sup>50</sup> is equal to the licensing fee received by that licensor, minus that licensor's payoff in the event of negotiations breaking down.

The system of difference equations describes a unique set of licensing fees  $\tilde{w}_i$  for a given  $F(\cdot)$ . For example, in the two-song example with the production function specified above,  $\tilde{w}_1 = \frac{1}{5}$  and  $\tilde{w}_2 = \frac{13}{90}$ .<sup>51</sup> This leaves the sampler with a share of  $\frac{14}{45}$  and a final payoff of  $(\frac{14}{45}) q\pi T - c_{DW}$ . The payoffs are not the same as the simple  $n$ -person bargaining game; the licensee receives more than  $\frac{1}{5}$  of the profits from the derivative work. But, importantly, the sampler receives less than the  $\frac{1}{3}$  received in the one-sample model.

The bottom line, beyond demonstrating the existence of a unique subgame-perfect equilibrium, is that determining the licensing fees and the licensee's payoff allows for the kind of case-by-case scenario analysis conducted in Section 3.4. Instead of three players each receiving  $\frac{1}{3}$  of the profits, the payoffs are more complex. But it is possible to generalize about how the presence of multiple licensors will affect the conclusions reached in Section 3.5.

In the multiple-licensor model, the larger number of copyright owners of preexisting works means that more incentive conditions must be met for the sampled songs to be created in the first place. On the other hand, since the licensors' share of the proceeds decreases as the number of samples increases, it becomes less likely that sample-license revenue will push many creators to produce their work as opposed to refraining from doing so. Since the sampler's share of the proceeds from the derivative work declines as

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<sup>50</sup>These savings come in three categories: (1) the fees that were being paid to the licensor with whom an agreement is not reached; (2) the resulting difference in the licensing fees paid to the remaining copyright holders in the same song in which that licensor held a copyright; and (3) the resulting difference in the licensing fees paid to the copyright holders in all other sampled songs.

<sup>51</sup>This result holds under the assumption that the licensors receive a payoff of zero if they do not successfully negotiate a license. That is,  $\underline{w}_i = 0 \quad \forall \quad i$ .

the number of licensors increases, all else equal, the incentive problem for samplers using multiple samples is more severe.

Implementing a de minimis threshold  $\bar{y} > 0$  would tilt the balance in favor of samplers, since it allows them to avoid negotiating with (and paying licensing fees to) a group of licensors for  $k (< n)$  samples. But the presence of multiple licensors also implies that some licensors would actually benefit from a positive de minimis threshold. This will occur when the following two conditions both hold:

1. Paying all licensors would make producing the derivative work unprofitable for the sampler—in which case, with  $\bar{y} = 0$ , the sampler would simply refrain from making the new work; and
2. Paying for only  $n - k$  of the samples, while  $k$  samples either (a) have desired lengths  $y_i^*$  below  $\bar{y}$  or (b) could be profitably shortened to  $\bar{y}$ , would be profitable and allow the derivative work to be made if  $\bar{y} > 0$ .

This complication makes it harder to perform the cost-benefit analysis of whether a positive de minimis threshold would be desirable. But it also makes it very difficult to argue that creators do not benefit from having a de minimis threshold. In the multiple-licensor model, some copyright holders in preexisting works would benefit, while others would not.

### **4.3 Information costs, transaction costs, and refusals to license**

Up to this point, the models have contained sanguine assumptions about the efficiency of the sample clearance system. But the core inefficiency explored so far—the division of profit between the original creators and the derivative work’s creator—is in actuality accompanied by market frictions. Some of these frictions are standard, but others are specific to the sample-licensing

context. This sub-section addresses some of these frictions, and explains how they fit into the models described above.

**Information costs.** In order to take advantage of the de minimis threshold, samplers must make or solicit a legal assessment of each of the  $n$  sample they wish to use in their work. This takes time, money, or both. Although the de minimis threshold provides a relatively bright-line rule compared to, say, fair use, samplers may need a copyright lawyer's opinion to determine how to categorize each sample. For example, a sample of very short length that comes from a distinctive part of the sampled song might or might not fall below the de minimis threshold. An expert opinion could help make that adjustment and reduce the risk of litigation.

For the  $n - k$  samples for which the sampler chooses to seek licenses, there is an additional information cost of identifying the various licensors for a sampled song and determining how to contact them. Understanding the sample clearance system and hiring lawyers or sample clearance professionals who have relationships with licensors can present barriers to entry for sampling musicians.<sup>52</sup>

Information costs function as variable costs, increasing in the number of samples. They enter the models above as an addition to the fixed costs of creating a derivative work,  $c_{DW}$ . Therefore, samplers whose songs involve larger collages of preexisting works will face a higher threshold of profitability because of information costs (and not only because of the need to pay a larger number of licensors).

**Transaction costs.** Licensing negotiations themselves have associated

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<sup>52</sup>See KEMBREW MCLEOD & PETER DICOLA, ET AL., CREATIVE LICENSE: DIGITAL SAMPLING AND THE LAW, Ch. 4 (manuscript submitting for publication, on file with author, 2007).

costs, as well, in terms of time and money. Using a sample clearance professional usually costs on the order of \$500 per clearance.<sup>53</sup> Beyond the direct costs of engaging in negotiations, protracted discussions can result in record-release dates being delayed.<sup>54</sup>

Both samplers and licensors bear transaction costs when negotiating over licenses. In that sense, transaction costs exacerbate both sides of the fundamental division-of-profit inefficiency, by reducing the “pie” of profits available as proceeds from the derivative work. Policies or private institutions that can reduce transaction costs—such as instituting a *de minimis* exception to circumvent the need for negotiations in the case of every single sample—can have an all-around salutary effect on the division-of-profit inefficiency. I will discuss policy implications further in Section 6.

**Refusals to license.** Granting copyright holders economic rights in samples of their works also means granting them a kind of moral right to deny permission on any grounds: financial, moral, or aesthetic. Some copyright holders, especially famous musicians like the Beatles, Led Zeppelin, and Prince, have established widely understood policies of refusing to license any samplers. These artists’ policies may come from a desire to protect the economic value of the original works or from an artistic or ideological desire to control the way the public views the original works. Chuck D of Public Enemy, a group that has used samples without permission, has described a desire to deny other musicians permission to use samples of *his* work in contexts he disagrees with, for instance, on political grounds.<sup>55</sup>

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<sup>53</sup>See *id.* (quoting sample clearance expert Danny Rubin).

<sup>54</sup>Interview with music lawyer Whitney Broussard, May 23, 2006 (on file with author).

<sup>55</sup>See Benjamin Franzen & Kembrew McLeod, *Copyright Criminals: This Is a Sampling Sport* (documentary film, to be released in 2008).

Despite the difficult artistic, moral, and political issues presented by refusals to license, it is possible to describe their economic effect. The Stole and Zwiebel model presented above can accommodate not only the licensing fees obtained when all potential licensors agree to license, but also the licensing fees obtained when some of the potential licensors do not agree to license.

Take the example described in the previous subsection, with two samples owned by two copyright holders each. Suppose that one of the licensors of the second sample refuses to license, but the other licensors all agree. In that case, only  $\frac{1}{2}$  the value of the derivative work can be realized, or  $(\frac{1}{2})q\pi T$ . The licensing fees are  $\tilde{w}_1 = \frac{1}{6}$  for the two copyright holders of the first sample and  $\tilde{w}_2 = 0$  for those of the second, since one of them refuses to allow the second sample to be used. This leaves the licensee with a share of  $\frac{1}{6}$  as well  $(\frac{1}{2} - 2 \cdot \frac{1}{6})$  and a final payoff of  $(\frac{1}{6})q\pi T - c_{DW}$ . All parties' payoffs are lower in this event than if all licensors had agreed to license the sampler's derivative work.

Refusals to license harm all other parties to the licensing negotiations over a derivative work—not only the licensee, but also the other licensors. A smaller “pie” means that both the licensee and other licensors are less likely to cover their fixed costs and produce their music. A realistic assessment of the sample clearance must take this potential economic inefficiency into account, even if it comes in the name of providing musicians with a kind of moral right over uses of their work by other musicians.

## 4.4 Competition among samples and the royalty stacking problem

The analysis so far has treated each preexisting song as a unique input for the sampler. But it could be the case that samples can serve as substitutes for other samples, at least to some degree, and that samples compete with each other as a result. This would shift the modeling concept away from bargaining and toward more traditional price theory. I have described models of multilateral bargaining over a fixed “pie” which is limited by the total profits available from the derivative work. Without multilateral bargaining, the licensing fees demanded by the multiple licensors could easily exceed the value of the derivative work (let alone the amount the sampler can afford to pay while still producing the derivative work at a profit).

Many models of monopolistic competition could apply to this market for samples. A spatial model like Salop’s (1979) would array samples on a circle and predict that each licensor would earn a premium above marginal cost based on the distance of the “nearest” sample on either side. If samples have non-negotiable prices, then licensees would maximize their profits based on samples’ relative prices. With a positive *de minimis* threshold (or other limitations to copyright protection), samplers would still assess which licenses had to be purchased.

It does appear that a common pricing structure across samples has developed. There exists a fairly standard sliding scale of buyouts (lump-sum payments) and royalty rates that copyright holders tend to charge.<sup>56</sup> This standardized pricing structure can price multi-sample songs out of existence. If five copyright holders each demand an input price of twenty-five percent of the proceeds from a sample-based derivative work, then the sampler will be

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<sup>56</sup>PASSMAN, *supra*, at 306-08; Whitney Broussard, Comment, *Current and Suggested Practices in the Licensing of Digital Samples*, 11 LOY. L.A. ENT. L.REV. 479 (1991).

forced to alter the work or refrain from producing it. The “royalty stacking” problem can result when samplers conceive of derivative works that use as few as two different preexisting, copyrighted works.

Lemley and Shapiro discuss royalty stacking in an analogous patent setting.<sup>57</sup> Rather than the division-of-profit problem, their model is focused on the holdup problem, and how the presence of multiple licensors could make it worse.<sup>58</sup> Lemley and Shapiro provide a thorough discussion of the market inefficiencies associated with royalty stacking, which include higher consumer prices for the derivative work.<sup>59</sup> These are additional costs of maintaining a licensing regime for portions of copyrighted works. Designing a copyright law with limitations like the de minimis threshold could mitigate the royalty-stacking problem by reducing the number of necessary licensors.

## 5 Incorporating Samplers’ Full Array of Options into the Model

The models of Sections 3 and 4 suggests that copyright law acts as a strong constraint on samplers’ creativity. Samplers have, in the models, had some flexibility in their actions. If a positive de minimis threshold exists, musicians can shorten their samples. And in the context of multiple licensors, musicians can choose to use fewer samples—although this may dissipate too large a fraction of the derivative work’s value to be profitable. In this section, I explore more ways in which samplers can react to copyright’s licensing regime.

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<sup>57</sup>MARK A. LEMLEY & CARL SHAPIRO, PATENT HOLDUP AND ROYALTY STACKING (working paper 2006).

<sup>58</sup>*Id.* at 15 (“Not surprisingly, the existence of such ‘royalty stacking’ exacerbates the holdup problem... As a first approximation, the magnitude of the problem is multiplied by the number of patents that read on the product.”)

<sup>59</sup>*Id.* at 17-19.

Some of these options temper the conclusions of the previous sections. Yet other actions available to samplers raise new causes for concern about the wisdom of copyright's policy with respect to derivative works.

## 5.1 Replays and cover versions

The models of licensing negotiations presented so far have treated the preexisting song's copyright holders symmetrically. Alterations to the more flexible model of Section 4 are necessary to highlight the differences in how copyright law treats sound recording copyright holders and musical composition copyright holders. As it happens, failing to obtain a license from one type of copyright holder in a song leaves the sampler with other options with regard to that song's other type of copyright holder.

Even if a sampler cannot or chooses not to license from a song's sound recording copyright holder, he or she can still strike a deal with the song's musical composition copyright holder(s). By obtaining the rights to use the underlying composition, the sampler would gain the ability to perform what is called a "replay," which simply involves playing a portion of the composition himself or herself, or hiring other musicians to do so. Replays can substitute for digital samples. They generally fail to be perfect substitutes, since the particular characteristics of a sound recording (especially one recorded in a different musical era) can be difficult to match. But they do provide samplers with an additional option, whether in the face of a refusal to license or just in avoidance of a licensing fee.

Cover versions of songs are akin to replays, except that instead of a replaying portion of the song, the creator of the derivative work records a rendition of the entire song. If the cover version does "not change the basic melody or fundamental character of the work" and the cover artist meets certain administrative requirements, then the cover artist can obtain a compulsory

license for use of the composition.<sup>60</sup> The statutory rate is currently 9.1 cents per copy sold. Parties often negotiate a different agreement to avoid the statutory reporting requirements, but the compulsory nature of the license operates in the background, eliminating the licensor’s ability to refuse outright and setting a benchmark for the licensing fee. The compulsory license for covers presents a kinked incentive to creators: it can be cheaper and easier to cover an entire composition than it is to replay ten seconds’ worth of a composition (since the ten second’s worth is likely to exceed the de minimis threshold).

On the other side of music copyright’s dual nature, samplers may have an additional option when the musical composition copyright holder refuses to license or when the license would be too expensive. Although the Sixth Circuit rejected the de minimis threshold for sound recordings in *Bridgeport Music v. Dimension Films*, the de minimis threshold still exists for musical compositions and may still exist in other circuits. The models of Sections 3 and 4 envisioned a de minimis threshold that applies to both sound recordings and musical compositions. But even if the threshold exists only for musical compositions, samplers would still have the option of shortening samples and obtaining one license (or set of licenses) instead of two (or two sets of licenses).

The model of Section 4 can be modified to deal with this complexity by expanding the production function  $F(\cdot)$  to include an argument for each type of copyright holder in each song. So, in the two-sample example, instead of  $F(x_1, x_2)$ , we would have:

$$F(x_1^{MC}, x_1^{SR}, x_2^{MC}, x_2^{SR})$$

with the superscripts “MC” and “SR” denoting separate variables for the number of musical composition copyright holders and sound recording copy-

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<sup>60</sup>17 U.S.C. §115(a)(2) (2000).

right holders for song  $i$ , where  $i = 1, 2$ . The multi-asset version of Stole and Zwiebel’s model can accommodate this formulation.

Accounting for replays, cover versions, and shortened samples shows that samplers can realize greater profits from their derivative work. Whenever the derivative work does not lose too much value when the sampler uses replays or shortens samples, samplers will benefit from having more options. The copyright holders of the sampled works both gain and lose from samplers’ flexibility. Because of replays, musical composition copyright holders have more leverage when their corresponding sound recording copyright holders refuse to license or demand excessive fees. They still have something to offer with their one type of license. But sound recording copyright holders will see lower licensing fees as a result of replays, at least in the Stole and Zwiebel framework, since the sampler stands to lose less when the sound recording copyright holder walks away from the bargaining table.

## 5.2 Business model choice

Samplers also have flexibility in their approach to copyright law, licensing, and the marketing of their music. Throughout the models of Sections 3 and 4, samplers have sought to observe copyright law and to release their works commercially. I call this the “commercial recording” model, in which musicians sign with record labels and publishers to seek the largest audience possible. Call the sampler’s profits from this model  $\Pi^{Com}$ . Suppose that the social value per year of a commercially released work is now denoted  $q^H$ , with the superscript  $H$  for “high.” Then, in the multiple-licensor model of Section 4 with sample adjustment as well as information costs  $\iota(n)$  and transaction costs  $\theta(n - k)$ , the sampler’s profits in the commercial recording model are:

$$\Pi^{Com} = [1 - L(\mathbf{y})] \left( 1 - \sum_{i=1}^{n-k} \tilde{w}_i x_i \right) q^H \pi T - c_{DW} - \iota(n) - \theta(n - k)$$

If alternative business models are possible, samplers will compare  $\Pi^{Com}$  to the profits resulting from other choices and choose the profit-maximizing business model.

**Underground recording** Some samplers opt out of the major-label and major-publisher system, selling sample-based works in small physical quantities or on the internet. For some musicians, transgressing the boundaries of copyright law may provide additional artistic satisfaction or even contribute to the value of the work.<sup>61</sup> Suppose that this “underground” approach produces a derivative work with value  $q^L$  (with  $L$  denoting “low”) per year. Then the profits in the underground recording business model are given by:

$$\Pi^{UG} = q^L \pi T - c_{DW} - pJ$$

where  $p$  denotes the probability of being both detected and sued for copyright infringement and  $J$  denotes the expected value of an infringement judgment against the sampler. Notice that the loss function, the licensing fees, the information costs, and the transaction costs—all terms associated with complying with copyright law and obtaining licenses—are absent from the underground recording profit function.

**Noncommercial recording.** Other samplers might be willing to refrain from selling their sample-based recordings commercially in the hopes of building up name recognition. More publicity—perhaps the result of free distribution of CDs at live performances or of MP3 files over the internet—generates the possibility of greater commercial sales in future periods. Then the noncommercial recording profit function becomes:

$$\Pi^{NC} = -c_{DW} + \left( \frac{1}{1+r} \right)^\xi \Pi^{Com}(q_\xi^H)$$

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<sup>61</sup>See Peter DiCola, *An Economic View of Legal Restrictions on Musical Borrowing and Appropriation*, in *Con/Texts of Invention* (forthcoming edited volume, 2008).

where  $\xi$  denotes the anticipated number of time periods until the commercial-recording model becomes profitable, and the dependence of  $\Pi^{Com}$  on  $q_\xi^H$  is meant to signify that the commercial value of the sampler's future work at time  $\xi$  will be different, possibly increased by the sampler's attempts at publicity during the current period.

**No recording.** Finally, samplers may choose not to record, but to pursue other options like touring (live performances) or composing for other recording artists. Call the corresponding profit function  $\Pi^{Tour}$ . This can be considered the musician's outside option in the case that none of the recording-based business models are profitable.

With those specifications for the four profit functions, samplers simply choose the most profitable business model and earn the payoff:

$$Max\{\Pi^{Com}, \Pi^{UG}, \Pi^{NC}, \Pi^{Tour}\}$$

For each sampler, this choice will depend on their particular individual values of many parameters:  $q^H, q^L, \mathbf{y}^*, \lambda, \mathbf{x}, \pi, c_{DW}, p, J$ , and  $\xi$ . A higher value of  $q^L$ , for instance, makes the underground recording option more attractive, all else equal. But a higher value of  $J$  (the expected size of an adverse infringement judgment) makes that option less attractive.

The sampler's decision will also depend on industry-wide parameters like the duration of copyright  $T$ , the level of information costs  $\iota(n)$ , the level of transaction costs  $\theta(n - k)$ . Finally, the decision will depend on the behavior that each sampler expects from the licensors of the samplers he or she wishes to use.

Samplers having a choice of business models means that, in even more instances than outlined in the models of Section 3 and 4, samplers may not provide licensing revenue to the copyright holders in preexisting works. To that extent, samplers' choice of business models decreases the welfare of

copyright holders in sampled works. It can also undermine these upstream creators' incentives to create, and thus (as throughout) cost society both the original and the derivative works. Since the problem of samplers' incentives is probably more grave than the problem of the original creators' incentives (as argued in Section 3.5), however, the variety of business-model options available to samplers is beneficial, from the perspective of incentives to create derivative works.

From the perspective of strict observance of copyright law, the underground recording model presents thornier problems. But it is probably the case that any intellectual property regime will have imperfect enforcement or leaks. In this case, society may be better off for having those leaks in copyright.

## 6 Assessing Potential Copyright Reforms

Over the past decade, copyright policy has become much more controversial, leading to a wide array of reform proposals. Many leading scholars have developed solutions that speak to the issue of sample licensing. The models described above provide a unified framework to assess these proposals.

### 6.1 A de minimis threshold for sound recordings

I have emphasized this policy lever throughout the analysis. The existence of a tradeoff between aiming to satisfy the incentive constraints of original creators and, on the other hand, the incentive constraint of samplers, suggests that the ruling in *Bridgport* is too extreme. Others have argued that the decision is wrong as a matter of statutory interpretation.<sup>62</sup> But the division-

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<sup>62</sup>See, e.g., Leslie A. Kurtz, *Digital Actors and Copyright—From The Polar Express to Simone*, 21 SANTA CLARA COMPUTER & HIGH TECH. L.J. 783, 793-95 (2005).

of-profit model shows that establishing a de minimis threshold for sound recordings would alleviate the incentive problem for creators of derivative works in just the cases where they have appropriated or borrowed the least amount of material from preexisting works.

A de minimis threshold for copyright protection should be based on objective factors. In particular, I advocate a de minimis threshold based on the duration of the portion used from the copyrighted song, which is how I have characterized the de minimis doctrine in the analysis. The policy could be articulated in percentage terms; for example, if the de minimis threshold were one percent of a copyrighted work, then samples of duration less than or equal to 2.4 seconds from a four-minute song would not rise to the level of copyright infringement. Basing the threshold on the length of the whole song, incidentally, avoids the problem of having different thresholds for sound recordings and musical compositions.

Introducing subjective factors, such as the aesthetic importance of the portion sampled to the original work, will only keep the courts busy delineating where the de minimis threshold lies.<sup>63</sup> The goal should be to create a relatively bright-line rule to avoid adjudicating infringement cases involving very small samples (on the order of one or two percent of the copyrighted song).

Clarifying legislation to overrule *Bridgeport* would be the best way to implement a de minimis threshold for sound recordings that exactly parallels the de minimis threshold for musical compositions. Otherwise, since most recordings sold all over the U.S., the law of the Sixth Circuit could stand as the de facto rule until other circuits have a chance to reject *Bridgeport*.

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<sup>63</sup>In a related point, the de minimis threshold for copyright protection should not be confused with colloquial uses of the term “de minimis” (meaning “trivial”) in substantial similarity and fair use analysis. Andrew Inesi, *A Theory of De Minimis and A Proposal For Its Application in Copyright*, 21 BERKELEY TECH. L.J. 945 (2006).

Moreover, other circuits could decide to follow *Bridgeport* when given the chance. Such an outcome would tilt copyright’s incentives too far in the direction of original creators, at the expense of samplers and collagists.

## 6.2 Fair use

In *Campbell v. Acuff-Rose*,<sup>64</sup> the Supreme Court stated that “transformative” uses of preexisting works, even in commercial works that use a large portion of the preexisting works, can be deemed fair.<sup>65</sup> The plaintiff, Roy Orbison’s publishing company, alleged that 2 Live Crew’s song “Pretty Woman” infringed Orbison’s composition of the same name. The Court held that 2 Live Crew’s song was a “parody,” which the court distinguished from “satire,” which would have a lesser chance to be fair use.<sup>66</sup> *Campbell* does involve sampling, since 2 Live Crew’s song included samples from the original, in addition to a reworking of the Orbison song’s lyrics. But Orbison’s record label was not a plaintiff in the suit, so the question of whether 2 Live Crew infringed Orbison’s sound recording of “Pretty Woman” was not before the Court, potentially limiting the applicability of *Campbell* to future sampling cases.

With that caveat, the doctrine of fair use does offer a way to better handle sampling. Justice Souter’s opinion indicates that parody does not exhaust the list of “transformative” uses.<sup>67</sup> Defendants in subsequent infringement cases, when arguing fair use as an affirmative defense, have characterized their works as parodies,<sup>68</sup> rather than arguing for other categories of “trans-

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<sup>64</sup>510 U.S. 569 (1994).

<sup>65</sup>*Id.* at 579.

<sup>66</sup>*Id.* (“[P]arody has an obvious claim to transformative value.”).

<sup>67</sup>*Id.* at 583 (discussing “other types of comment and criticism that traditionally have had a claim to fair use protection as transformative works”); *id.* at 594 (referring to “transformative use, *such as* parody” (emphasis added)).

<sup>68</sup>*See, e.g.,* SunTrust Bank v. Houghton Mifflin Co., 268 F.3d 1257 (11th Cir. 2001)

formative” works, such as “retellings” or “collage.” Given the opportunity in future sampling cases, courts should instead find that digital sampling and collage can also be “transformative.” This would give the law additional breathing room and, with a predictable enough fair use doctrine, could alleviate some of samplers’ incentive problems.

The benefits of clarifying the meaning of transformative fair use are limited, however, by the case-by-case nature of fair use, the subjective nature of the doctrine, and the great expense involved in vindicating fair uses against deep-pocketed infringement plaintiffs. But a promising area of research has been to assist particular creative communities in establishing norms of fair use.<sup>69</sup> An effort to establish norms of fair use among musicians would be a worthwhile project to explore.

### 6.3 Creative Commons licenses

Creative Commons offers two “flavors” of licenses specially designed to address sampling,<sup>70</sup> Sampling Plus and Noncommercial Sampling Plus. Both licenses allow users to “sample, mash-up, or otherwise creatively transform this work,”<sup>71</sup> but the latter only allows those activities for noncommercial (holding that Alice Randall’s *The Wind Done Gone*, a retelling of Margaret Mitchell’s *Gone with the Wind* from the perspective of a former slave, was a parody and thus a fair use).

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<sup>69</sup>See PATRICIA AUFDERHEIDE & PETER JASZI, UNTOLD STORIES: CREATIVE CONSEQUENCES OF THE RIGHTS CLEARANCE CULTURE FOR DOCUMENTARY FILMMAKERS (2004), at <http://www.centerforsocialmedia.org/rock/finalreport.htm> (last visited Feb. 1, 2006).

<sup>70</sup>Creative Commons, Choose Your Sampling License Options, at <http://creativecommons.org/license/sampling> (last visited July 3, 2007).

<sup>71</sup>See Creative Commons, Sampling Plus 1.0, at <http://creativecommons.org/licenses/sampling+/1.0/> (last visited July 3, 2007).

purposes.<sup>72</sup> Both licenses prohibit use in advertising for anything but the derivative work itself. For reasons not explained on Creative Commons' website, both licenses allow noncommercial file sharing of the entire work.<sup>73</sup> This makes the Creative Commons sampling licenses a useful tool for those artists interested in employing the noncommercial recording business model described above in Section 5.2. But it makes the Creative Commons option less attractive for artists seeking to release their recordings commercially, at least until file-sharing systems develop a revenue model for creators.

#### **6.4 Alternative compensation systems and compulsory licenses**

William Terry Fisher has proposed changing copyright law to an alternative compensation system, in which creators register their copyrights, make their works freely available, and receive revenue (based on estimates of their work's popularity) from a government-run system of taxation.<sup>74</sup> His proposal includes a method for distributing some of the revenue for derivative works to the creators of the original works. On the example registration form he provides, musicians would answer the question How much (measured by duration) of the material in the recording you are registering consists of material taken from other registered recordings?<sup>75</sup> Musicians check one of six boxes: None, Less than 5%, Between 5% and 25%, Between 25% and 50%, Between 50% and 95%, and Between 95% and 100%. The musician would

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<sup>72</sup>See Creative Commons, NonCommercial Sampling Plus 1.0, at <http://creativecommons.org/licenses/nc-sampling+/1.0> (last visited July 3, 2007).

<sup>73</sup>See *id.* (specifying that users are free to “perform, display, and distribute copies of this whole work for noncommercial purposes (e.g., file-sharing or noncommercial webcasting)”).

<sup>74</sup>WILLIAM W. FISHER, PROMISES TO KEEP: TECHNOLOGY, LAW, AND THE FUTURE OF ENTERTAINMENT 199-258 (2004).

<sup>75</sup>*Id.* at 206.

then provide the registration numbers of the works sampled.<sup>76</sup>

Fisher's proposal would drastically reduce the information costs  $\iota(n)$  and transaction costs  $\theta(n-k)$  outlined in Section 4.3, since it eliminates the need for licensing negotiations. Creators of derivative works would have no need to censor their own ideas based on fears of expensive licensing fees. A less dramatic shift in the law could accomplish something similar, if portions of copyrighted works were subject to a compulsory license akin to the compulsory license for cover versions. Samplers would pay the copyright holders of the works they sampled, but samplers would no longer need to seek permission. For those who favor giving artists a greater degree of control over subsequent uses of their work, this presents a major drawback of compulsory licenses.

In terms of the models presented here, an alternative compensation system or a compulsory license would have to set the statutory rate correctly in order to properly address the division-of-profit problem. Since the statutory rate could not be tailored to suit each situation with a sampler and a group of licensors, it is unclear how the statutory rate could avoid getting that balance wrong—perhaps even more wrong than the status quo of private negotiations. Moreover, a statutory rate would prevent parties from distinguishing between aesthetically important samples and relatively trivial ones. In the end, alternative compensation systems and compulsory licenses present all the classic tradeoffs between government price-setting and private transactions. Until and unless empirical data can demonstrate a crisis of derivative works being thwarted by the sample licensing system—which I would not rule out—it makes the most sense to give more limited reforms an opportunity to alleviate sampler's incentive problem.

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<sup>76</sup> *Id.*

## 6.5 Expanded property rights

This reform has relatively few advocates outside the *Bridgeport* court, but some scholars have argued that Congress and the courts should strengthen copyright protection and augment its enforcement efforts, in order to better facilitate market transactions.<sup>77</sup> The Sixth Circuit’s theory was that stronger property rights would generate clarity and spark a more efficient licensing system.<sup>78</sup> The court’s analysis makes some valid points about the economic forces at work, but those points have limited value when other, countervailing forces are ignored. Most importantly, the court’s analysis ignored the core inefficiency at work: the two-sided incentive problem that would exist even in a frictionless, perfect-information environment.

## 6.6 Transaction-facilitating institutions

Transaction-facilitating institutions—like the music industry’s performing rights organizations ASCAP and BMI<sup>79</sup>—are an appealing private-sector initiative to alleviate inefficiencies in intellectual property regimes.<sup>80</sup> Like compulsory licenses, they reduce information costs and transaction costs. But blanket-licensing systems also suffer from not being able to tailor the licensing fees to individual situations.

An intermediate solution would be to establish a database with which samplers could verify the names and contact information of the copyright holders for the preexisting works they sample. Such a database might also serve an authentication function, to verify the validity of copyrights, perhaps

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<sup>77</sup>For the classic presentation of this view, see Harold Demsetz, *Information and Efficiency: Another Viewpoint*, 12 J.L. & ECON. 1 (1969).

<sup>78</sup>*Bridgeport Music v. Dimension Films*, 410 F. 3d 792, 801 (2005).

<sup>79</sup>See *supra* Section 2.3.

<sup>80</sup>See, e.g., Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations*, 84 Calif. L. Rev. 1293 (1996).

through a collaboration between the music industry and the Copyright Office. Reducing the information costs of knowing who to bargain with could alleviate sampler's incentive problem to some extent, even if the division-of-profit problem would remain. Besides, not all of the policy proposals listed here are mutually exclusive. For instance, it would make a great deal of sense to create an authentication database to reduce samplers' information costs while also establishing a de minimis threshold to reduce the number of licensing negotiations necessary.

## 7 Conclusion

This chapter has addressed the problems facing creators of derivative works in the music industry, particularly those musicians engaged in sampling or collage. Specifying a model of the division of profit between the copyright holders of preexisting works and the creator of a prospective derivative work, I have attempted to isolate what I see as the fundamental inefficiency involved. Because of factors the separation in time between the original work and the derivative work, I have argued that society has reason to be concerned about both samples' and samplers' incentives at the same time, for the sake of both groups. Extending the model in many different ways, to include multiple licensors, market frictions, and monopolistically competitive pricing of samples, demonstrates that certain institutional features of the music industry exacerbate the division-of-profit problem. On the other hand, the wide array of artistic and business-model choices available to samplers can mitigate samplers' incentive problem—although it may endanger the creation of the original, sampled works. The appropriate policy solution to the inefficiencies involved in sample licensing is probably a combination of establishing a de minimis threshold for copyright protection in sound recordings, clarifying fair use, and developing an authentication database to reduce

information costs.

## A Appendix: A three-person licensing game

Three people bargain to divide a pie of size  $q$ . Player 1 is the licensee, while Players 2 and 3 are the licensors. Their positions are asymmetric. Player 1 deals with each other player in bilateral negotiations. Players 2 and 3 act simultaneously during each round and cannot communicate to strategize or collude. But all parties have complete information about the structure of the game and the potential payoffs.

Negotiations continue indefinitely. The discount factor is the same for all players and is  $\delta \in (0, 1]$ . Deals are binding once made but no bankruptcy allowed. So if the pie is not produced, no money is owed. The breakdown payoff for each player is zero.

When a deal is accepted early, the player gets paid in terms of that period's dollars, with no further discounting, even if the game carries on and the pie is not produced until a later period.<sup>81</sup> If one bilateral deal is made between two players (say, Player 1 and Player 2) but the other bilateral deal (between Player 1 and Player 3) is not, then the remaining two players engage in the alternating-offers game of Rubinstein,<sup>82</sup> which splits the pie  $(\frac{1}{1+\delta}, \frac{\delta}{1+\delta})$  between the first offeror and the first offeree.

Game play proceeds as follows:

1. In round one, Player 1 simultaneously solicits offers from Players 2 and 3, resulting in the following payoffs for (Player 1, Player 2, Player 3):  $(qa_1b_1, a_1, b_1)$ . Players 2 and 3 each make their offers. There are

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<sup>81</sup>See Suchan Chae & Jeong-Ae Yang, *An N-Person Pure Bargaining Game*, 62 J. ECON. THEORY 86, 89 (1994).

<sup>82</sup>See Rubinstein, *supra*.

four possible scenarios, based on the offers made in the first round of bargaining.

- (a) If Player 1 accepts both offers, then the game ends, with payoffs equal to:  $(qa_1b_1, a_1, b_1)$ .
- (b) If Player 1 accepts 2s price but rejects 3s, then we have a bilateral game between 1 and 3, in which 1 makes the first offer. The remaining pie size is:  $\delta qa_1$  and the resulting payoffs are:  $\left(\frac{\delta q - a_1}{1 + \delta}, a_1, \frac{\delta^2 q - \delta a_1}{1 + \delta}\right)$ .
- (c) If Player 1 rejects 2s price but accepts 3s, then we have a bilateral game between 1 and 2, in which 1 makes the first offer. The remaining pie size is:  $\delta q - b_1$  and the resulting payoffs are:  $\left(\frac{\delta q - b_1}{1 + \delta}, \frac{\delta^2 q - \delta b_1}{1 + \delta}, b_1\right)$
- (d) If 1 rejects both 2 and 3 price quotes, then we reach round two.

2. In round two, a similar 3-person game to round one is played for a pie size  $\delta q$  and with the difference that player 1 make the first offers. In the event that the game reaches round two, there are four scenarios:

- (a) Both Players 2 and 3 can accept, ending the game with payoffs:  $(\delta(qa_2b_2), \delta a_2, \delta b_2)$ .
- (b) Player 2 could accept while player 3 rejects. This launches a bilateral game between Player 1 and Player 3, with Player 3 making the first offer and a pie size of  $\delta^2 q \delta a_2$ . The resulting payoffs are:  $\left(\frac{\delta^3 q - \delta^2 a_2}{1 + \delta}, \delta a_2, \frac{\delta^2 q - \delta a_2}{1 + \delta}\right)$ .
- (c) Player 2 could reject while player 3 accepts. This launches a bilateral game between Player 1 and Player 2, with Player 2 offering first and a pie size of  $\delta^2 q \delta b_2$ . The resulting payoffs are:  $\left(\frac{\delta^3 q - \delta^2 b_2}{1 + \delta}, \frac{\delta^2 q - \delta b_2}{1 + \delta}, \delta b_2\right)$ .

- (d) Both Players 2 and 3 could reject. Now we play the original three-person game, with Players 2 and 3 offering first, for a pie of size  $\delta^2 q$ . The structure is thus recursive. Call the payoffs in the subgame  $(\delta^2(qab), \delta^2 a, \delta^2 b)$ , with no subscripts on the offers.

To solve this infinitely repeated game, I follow the solution method outlined in Gibbons.<sup>83</sup> Taking the second round of bargaining first, what would it take for both Player 2 and Player 3 to accept Player 1's offers? In other words, what are the incentive constraints for a subgame-perfect equilibrium?

The first four conditions determine the optimal offers by Player 1 in round two of bargaining,  $a_2^*$  and  $b_2^*$ , as a function of the continuation payoffs  $a$  and  $b$  in the event of the entire supergame being repeated (i.e., when both Player 2 and Player 3 reject Player 1's offers in the second round). These conditions can be understood as Player 1 avoiding creating a prisoners' dilemma among Player 2 and Player 3. The final three conditions consider what would it take, in the first round of bargaining, for Player 1 to accept both Player 2's and Player 3's offers.

1. Player 2's payoff  $\delta a_2$  must be greater than or equal to  $\delta^2 a$ , the continuation payoff if neither Player 2 nor Player 3 accepts.
2. Player 3's payoff  $\delta b_2$  must be greater than or equal to  $\delta^2 b$ , the continuation payoff if neither Player 2 nor Player 3 accepts.
3. Player 2's payoff  $\delta a_2$  must also be greater than or equal to  $\frac{\delta^2 q - \delta b_2}{1 + \delta}$ , which is Player 2's payoff if Player 3 accepts while Player 2 rejects.
4. Player 3's payoff  $\delta b_2$  must also be greater than or equal to  $\frac{\delta^2 q - \delta a_2}{1 + \delta}$ , which is Player 3's payoff if Player 2 accepts while Player 3 rejects.

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<sup>83</sup>ROBERT GIBBONS, GAME THEORY FOR APPLIED ECONOMISTS 68-71 (1992) (citing Rubinstein, *supra*, and Avner Shaked & John Sutton, *Involuntary Unemployment as a Perfect Equilibrium in a Bargaining Model*, 52 ECONOMETRICA 1351 (1984)).

5. It must be the case that  $qa_1b_1 \geq \delta(q - a_2^* - b_2^*)$ , so that it is worthwhile from Player 1's perspective not to reject both offers.
6. It must also be the case that  $qa_1b_1 \geq \frac{\delta qa_1}{1+\delta}$ , so that Player 1 does not have incentive to accept Player 2's offer but reject Player 3's offer.
7. Finally, and similarly, it must be true that  $qa_1b_1 \geq \frac{\delta qb_1}{1+\delta}$ , so that Player 1 does not have incentive to accept Player 3's offer but reject Player 2's offer.

This determines the optimal offers by Player 2 and Player 3 in round one, as a function of the second-round continuation payoffs  $a$  and  $b$ . In other words, to calculate the equilibrium, we will aim to set  $a_1^*(a) = a$  and  $b_1^*(b) = b$ . Conditions (3) and (4) imply (1) and (2), but not the reverse. So one must solve (3) and (4), the binding incentive constraints, for Player 1's optimal second-round offers. Then, based on that, we can get Player 1's best second-round payoff. Next, one can solve equation (5) based on that result. It turns out that condition (5) implies conditions (6) and (7), and the game is solved. The equilibrium payoffs (after some algebraic work based on the solution strategy just described), are:

$$\left( \delta - \frac{2\delta^2}{\delta + 2}, \frac{\delta^2 - \delta + 2}{2\delta + 4}, \frac{\delta^2 - \delta + 2}{2\delta + 4} \right)$$

which approaches  $(\frac{1}{3}, \frac{1}{3}, \frac{1}{3})$  as  $\delta$  approaches 1.