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An Economic Model of Sampling, Cover Versions, and Musical Collage

by

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An Economic Model of Sampling, Cover Versions, and Musical Collage

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Abstract

Copyright law has recently altered its restrictions on musicians who wish to engage in sampling, the use of other creators’ sound recordings to construct new musical works. These restrictions include recent judicial decisions like Bridgeport Music v. Dimension Films (6th Circuit, 2005), which found copyright infringement in the unauthorized use of a two-second sample used in the background of a song. More generally, expansions in copyright law, such as the 1976 Copyright Act’s expansion of the exclusive right “to prepare derivative works,” have made direct creative borrowing more expensive and occasionally impossible. In this paper I explore several legal and economic issues implicated by this policy problem, including copyright law’s discrimination between certain categories of creation, labor-economic choices presented to musicians who consider sampling, and various approaches to reform. Systematic data on sampling activity and sample-licensing fees are not currently available, making statistical analysis infeasible. Given that limitation, this paper outlines an economic model to highlight the fact that the creations of others are a key input into new creations. The model thus illustrates certain key tradeoffs, arguing that changes in copyright can affect musicians’ allocations of labor between recording, touring, and any outside options. Furthermore, legal changes will affect musicians’ decisions about whether to create recordings and whether to release those recordings commercially. I illustrate this tradeoffs using a simulation. I then use the model to frame a brief survey of proposals for reform to the sample-clearance system. Finally, I discuss approaches to future data-collection that would facilitate testing of the theoretical model.

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Introduction

Every musical work draws on prior musical works. Ideas first used in some prior work, perhaps long ago—for example, the diatonic scale, a seventh chord, or sonata form—have been the building blocks of countless pieces of music. Particular expressions of musical ideas, such as melodies, lyrics, or drum breaks, can also become part of later, different works. Musicians are influenced by the styles of other, prior musicians, whether they choose to pay homage to those styles, to modify them, or to reject them. Performance and recording techniques also pass from prior musicians to later ones. For these reasons, every musical work is a sort of collage, assembling, combining, mixing, and generally using music ideas and expression that other musicians discovered or created first. The overarching questions for copyright law are whether, when, how, and to what extent musicians should receive compensation for the subsequent use, by other musicians, of the ideas or expression they generate.

The dividing line between idea and expression has been an important boundary in copyright law between unprotected ideas and protected expression. To provide the examples in the opening paragraph, I had to think twice about how abstract a concept had to be for me to convincingly refer to it as an idea rather than expression. I wrote “a C7 chord” initially, but changed it to “a seventh chord,” since someone could argue that a C7 chord (rooted at C and containing a flat seventh) is a particular instantiation of a more general concept of chords rooted on any scale tone and containing sevenths, whether flat or major. On the other hand, because multiple inversions, placements, and embellishments of a C7 chord are possible, the mere specification of “C7” in a jazz or rock tune remains quite abstract. As it happens, copyright treats a single C7 chord as an idea; put that C7 chord in a sequence with another chord and another, and at various points as you build the sequence you’ll reach what different courts would deem protected expression.1

Copyright law contains other dividing lines, of course, like any other body of law. One can only copyright things that fall into eight categories of subject matter: architectural works are in, blank forms are out. Copyright draws a not-too-demanding line between original and non-original works. Among other elements of determining infringement, courts have distinguished quantitatively sufficient copying and “de minimis” copying. Moreover, copyright treats different types of subject matter differently. For the analysis in this paper, the distinction between musical composition copyrights and sound recording copyrights will be most important. What copyright protects can change depending on the subject matter, and so can the type of protection (and thus

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the amount of compensation). For instance, property rules apply to most categories, but liability rules apply to a few others.

Broadly speaking, my goal in this paper is to analyze how copyright law’s many categorizations affect, even shape, creativity. I seek to develop an economic framework to study the effects of changes in decisions about what musical works receive protections and about what kind of protection those musical works receive. Despite the pervasiveness of other works as an input to the creative process, and despite the blurriness of copyright’s many line-drawing exercises, stark differences in legal treatment can result from copyright’s modes of categorization.

More specifically, I have focused on the economic impact of copyright law’s treatment of music sampling, cover versions, and musical collage. “Sampling” in this context refers to the practice of using other creators’ sound recordings to construct new musical works. The practice, while common in genres like hip-hop and electronica, occurs in many other genres as well. Digital sampling technology, which allows musicians to easily reproduce and manipulate sounds, including sounds recorded by other musicians, arose in the mid-1980s. Soon after, copyright law had to respond, mainly in the form of courts deciding infringement lawsuits, starting with the landmark (of a sort) *Grand Upright Music v. Warner Brothers Records* in 1991. As it became clear that samples were in a protected category of copyright law, the music industry gradually developed a set of practices to handle what’s known as “sample clearance”—obtaining licenses to use samples in subsequent musical works. But case law continues to shape practices, and more immediately fears, in the music industry. *Bridgeport Music v. Dimension Films*, for which the Sixth Circuit’s final opinion came down in 2005, surprised many in the industry by holding that no “de minimis category”—i.e., a category of works or parts of works deemed too small to receive copyright protection—exists for sound recordings. As Justin Hughes has recently pointed out, copyright law does not define the central term “work,” which leaves open the possibility that sub-units of a work, such as short samples of a sound recording, can be treated as works themselves.

The surprising *Bridgeport* ruling shows that copyright law reflects specific choices about who receives a property right in what, and that such choices can have a distinctly categorical, on/off nature. Because copyright’s default mode of protection is a property rule, eliminating a de minimis category for sound recordings changed the legal environment—in the Sixth Circuit, anyway—from uncertainty, with a possibility of zero protection for a class of short parts of sound recordings, to a fair measure certainty, with maximal protection for any length of sound recording. Under the copyright code the court did not have much flexibility to craft an intermediate solution. But one can ask whether a different congressional policy would handle sampling better. Constitutionally, copyright law must strike a bargain between creators and the public, offering property rights in creative works for a limited time in return for more works and broader access to those works. How does choosing or shifting what categories of works receive

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3 410 F.3d 792 (6th Cir. 2005).
what kind of property rights affect both sides of this bargain? What are the consequences of stark categorization for creativity, for musicians, for the music industry, and for consumers?

In this paper I propose an economic framework for thinking about how copyright law treats different categories of musical creation. The law will discriminate based on whether a work uses protected aspects of musical composition, whether a work uses protected aspects of a sound recording, both, or neither. Within those four categories, other copyright doctrines will further categorize musical works. Many sampled works fall into the “both” category, but some don’t: for example, utilizing just a small portion of a musical composition can sometimes benefit from a de minimis exception to infringement of the composition. Consider another sub-classification, this time within the set of works using only a prior musical composition. Cover versions are re-recordings of previously recorded and distributed musical compositions that retain “the basic melody” and “fundamental character of the work.” They are subject to a compulsory license. I discuss other sub-categories below. In this paper I present a model of the economic consequences of these differences in treatment and to compare the results among categories.

My goals in presenting an economic model are to highlight certain important characteristics of the legal and economic environment, to capture a few key tradeoffs, and to generate some testable hypotheses about the effects of changes to the law of music copyrights. The central legal aspect of the music industry I hope to illustrate is the differential treatment among categories of music works based on how they are produced. The key economic aspects I focus on are, first, the ways that musical creation is a kind of production process with inputs that have particular prices, and second, the fact that musicians can allocate their time between different kinds of creative activities or to options outside the music industry. I present a model of musical production and of a musician’s allocation of labor time. The model posits that musicians face tradeoffs between inputs to production, between creative activities, and between strategies toward licensing. As a result, changes to copyright law that make a new category of works copyright-protected, depending on the details of economic conditions, result in benefits or harms for musicians and consumers in three ways: (1) more or fewer musical works being produced, especially in particular genres; (2) musicians shifting labor time from recording to performance or vice versa; and (3) more or fewer musicians choosing to license the prior works they use.

A model in the abstract can help to organize thinking or to illustrate tradeoffs, and even frame an evaluation of policy proposals. Several proposals for reforming copyright law’s treatment of prior musical works exist, as do several proposals for private-law solutions, and I begin a discussion of both in the context of the economic model described in broad strokes above (and in detail below). Ideally, however, the model can shape an empirical strategy. In this paper, I also mention my future plans for data collection, in anticipation of work that will test predictions from the model, measure conditions that appear important based on the model, or both.

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In short, this paper argues that copyright law promotes, discourages supports, shapes, and distorts creativity, and provides a model of how that might occur in the music industry, with a focus on the use of prior works in musical creation. The paper aims to set the table for an empirical investigation of whether copyright’s effect on the music industry, especially with regard to sampling, has been beneficial or harmful. Part I explains the relevant terrain of music copyright. Part II briefly describes the history and practice of sampling, and reviews the case law with an eye toward its economic content. Part III presents the economic model in two parts: first the model of production and second the model of musicians’ labor time allocation. Part IV considers various policy proposals, how to compare them, and how to begin to evaluate them in the context of the economic model. Part V explores the models’ implications for data collection and statistical analysis; a conclusion follows.

Part I: Relevant Provisions from Music Copyright

A. Musical compositions and sound recordings

A piece of recorded music potentially involves two separate types of copyrights: a musical composition copyright and a sound recording copyright.6 The two copyrights can have the same or different owners; alternatively, either one or both could rest outside of copyright protection in the public domain. Personally I find it easiest to think about recordings of popular standards to keep the two copyrights straight, and to distinguish what kind of entities typically own them. For example, Elvis Costello’s 1979 recording of “My Funny Valentine” gave him a sound recording copyright. He has (wisely) retained ownership of that copyright, as opposed to transferring it to a record label, which most major-label musicians do. But either way the musical composition copyright belongs to the estates of Richard Rodgers and Lorenz Hart and their publishing company, Chappell Music Ltd.7

Musical compositions became part of the subject matter of U.S. copyright law in 1831, relatively early in copyright’s history.8 The copyright code does not explicitly define the category.9 But one important note is that compositions do not have to be written formally as musical scores to receive protection. A composer, like any other would-be copyright holder, need only fix her work in a tangible medium of expression,10 for example by recording it to tape or to a computer hard disk, to copyright it.

6 17 U.S.C. § 102(a)(2), (a)(7) (2000). The copyright code uses more general terminology than I have here, specifying that copyright protects “musical works, including any accompanying words.” 17 U.S.C. § 102(a)(2). In this paper I will refer to the (older) terminology of “musical compositions” to make a clearer distinction with sound recordings.
7 ELVIS COSTELLO, My Funny Valentine, on THE VERY BEST OF ELVIS COSTELLO (Rhino Entertainment 2001).
8 JULIE E. COHEN ET AL., COPYRIGHT IN A GLOBAL INFORMATION ECONOMY 31 (2002).
9 The copyright code does, however, often refine or clarify the category by referring to “nondramatic musical works.” See, e.g., 17 U.S.C. § 101. This draws a distinction with the category of “dramatic works, including any accompanying music.” 17 U.S.C. § 102(a)(3).
Songwriters and composers often sign contracts selling a fraction of the revenue from their copyright to a publisher, in return for promotional, administrative, and other services. Originally the musical composition copyright generated revenue mainly through music publishers’ sales of sheet music.\textsuperscript{11} Sheet music is a tangible manifestation of an abstract piece of music, much as books are with respect to literary works. And for a long time the business reality was that music publishers produced and controlled the main avenue for making their musical compositions tangible and salable. But by the early twentieth century, with the advent of piano rolls and phonograph records that contained both an underlying musical composition and a recording of a particular rendition of that composition, music publishers found themselves without control over the popular new technology for disseminating their copyrighted works.\textsuperscript{12} After much legal and political wrangling,\textsuperscript{13} however, publishers did begin to collect royalties from licenses to the nascent recording business—after all, most commercial sound recordings still used a musical composition.\textsuperscript{14} This arrangement, with publishers of copyrighted musical compositions collecting royalties from the record companies’ sales of uncopyrighted sound recordings, lasted several decades.

Eventually, however, because pirate record companies could copy recordings with increasing fidelity as reproduction technology advanced, the record companies eventually sought copyright protection for sound recordings.\textsuperscript{15} In 1972, Congress added sound recordings as eligible subject matter for copyright. The copyright code defines sound recordings as “works that result from the fixation of a series of musical, spoken, or other sounds . . . regardless of the nature of the material objects, such as disks, tapes, or other phonorecords, in which they are embodied.”\textsuperscript{16} (The copyright code refers to the physical medium that contains a copy of a sound recording of a musical composition as a “phonorecord.”\textsuperscript{17}) Thus copyright law now recognizes separate rights for musicians who compose and musicians who perform for the purpose of recording.

B. Differing Exclusive Rights

The scope of copyright owners’ rights varies by subject matter. In particular, some stark differences exist between the rights associated with musical compositions and those associated with sound recordings. The basic bundle of rights that comes with a copyright includes the exclusive rights to reproduce, to distribute, to perform publicly, to display publicly, and to

\textsuperscript{11} RUSSELL SANJEK & DAVID SANJEK, PENNIES FROM HEAVEN: THE AMERICAN POPULAR MUSIC BUSINESS IN THE TWENTIETH CENTURY 16 (1996).
\textsuperscript{12} Id. at 22-23.
\textsuperscript{13} See Timothy Wu, Copyright’s Communications Policy, 103 Mich. L. Rev. 278, 297-304 (2004).
\textsuperscript{14} An exception would be “found sounds,” e.g. recordings of crickets or construction sites.
\textsuperscript{15} DONALD S. PASSMAN, ALL YOU NEED TO KNOW ABOUT THE MUSIC BUSINESS 309-10 (2000).
\textsuperscript{17} Id. (“‘Phonorecords’ are material objects in which sounds . . . are fixed by any method now known or later developed, and from which the sounds can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device.”).
prepare derivative works based on the copyrighted work.\textsuperscript{18} Each term has a special meaning within copyright, of course, but I will only provide extra detail on the derivative-works right here because of its importance for sampling and cover versions.

Section 101 of the copyright code defines a derivative work as “a work based upon one or more preexisting works, such as a . . . musical arrangement . . . sound recording . . . abridgment, condensation, or any other form in which a work may be recast, transformed, or adapted.”\textsuperscript{19} Thus a sound recording can be considered a derivative work when and if a musical composition underlies it. More importantly, the exclusive right to prepare derivative works grants copyright holders monopoly control on arrangements, abridgments, condensed versions, recastings, transformations, and adaptations. As a consequence, at least one judge has criticized the exclusive right to prepare derivative works as “hopelessly overbroad.”\textsuperscript{20} Regardless, the right to prepare derivative works puts musical collage using prior works—including sampling—within the scope of the exclusive rights of copyright owners. As I will describe below, other provisions may exempt some instances of using prior works. But it is important to recognize as a starting point that copyright’s broad grant of rights puts sampling, cover versions, and musical collage under the control of the prior artists whose work is being used.

Many provisions in the copyright code restrict, alter, or augment the aforementioned exclusive rights for various categories of works.\textsuperscript{21} Two key examples appear in the very section that defines the basic bundle. Section 106 does not grant sound recording copyright holders an exclusive right to display their work, perhaps simply because it is difficult to conceive of “displaying” a sound without performing it or playing a recording of someone else’s performance of it.\textsuperscript{22} The same section also limits the performance right for sound recordings to certain “digital audio transmissions,” which include some webcasts.\textsuperscript{23} So the copyright code’s description of exclusive rights specifies that owners of musical composition copyrights receive payment from (traditional) radio stations for over-the-air performances of their songs, whether live or in the form of a recording, while owners of sound recordings do not. Another important provision limits the distribution right. The “first sale” doctrine allows owners of particular

\begin{itemize}
  \item Id. § 106.
  \item Id. § 101.
  \item Micro Star v. FormGen Inc., 154 F.3d 1107, 1110 (9th Cir. 1998) (Kozinski, J.) (“The statutory language is hopelessly overbroad, however, for ‘every book in literature, science and art, borrows and must necessarily borrow, and use much which was well known and used before.’ ”) (citing Melville B. Nimmer & David Nimmer, 1 Nimmer on Copyright, § 3.01, at 3-2 (1997) (quoting Emerson v. Davies, 8 F. Cas. 615, 619 (C.C.D. Mass. 1845) (No. 4436)).
  \item 17 U.S.C. § 106.
  \item Id.; see id. § 114(d) for the gory details of webcasting classification. The digital performance right in sound recordings (or DPRSR) is subject to a compulsory license, for which “non-interactive” webcasters can qualify if their playlists meet certain requirements. Id. § 114(d)(2), (j)(13).
\end{itemize}
copies of a copyrighted work to sell or otherwise dispose those copies.\textsuperscript{24} Some exceptions to the first-sale exception exist, including a prohibition on renting phonorecords, disallowing the possibility of CD rental along the lines of movie rental.\textsuperscript{25}

The copyright code also circumscribes both the reproduction and derivative-works rights for sound recordings. Section 114(b) limits the reproduction right to “the right to duplicate the sound recording in the form of phonorecords or copies that directly or indirectly recapture the actual sounds fixed in the recording.”\textsuperscript{26} Furthermore, that same section limits sound recording copyright holders to the right to make derivative works “in which the actual sounds fixed in the sound recording are rearranged, remixed, or otherwise altered in sequence or quality.”\textsuperscript{27} As a result of these provisions, sound-alike recordings do not infringe the sound recording copyright, though they might infringe a musical composition copyright.\textsuperscript{28} The statute states that a “sound recording that consists entirely of independent fixation of other sounds,” even if it attempts to imitate another recording, does not infringe the reproduction or derivative-works right.\textsuperscript{29} This leaves the realm of style and recording technique outside of copyright’s protection. Subsequent musicians can mimic styles and recording techniques as long as they record their work independently. But music employing samples can infringe both the reproduction and derivative-works rights in sound recordings.

Another very important limitation on the reproduction and distribution right applies only to musical compositions. Since 1909, musical compositions have been subject to a compulsory license for the manufacture of phonorecords.\textsuperscript{30} This resulted from the government’s antitrust concerns and the aforementioned political and legal squabbles between the publishers and the early-twentieth-century recording industry.\textsuperscript{31} The royalties from this license are known as “mechanical royalties” or just “mechanicals.” To be subject to the compulsory license, a composition must have been previously recorded (giving the copyright holder “first use”), the previous recording must have been distributed publicly, and the licensee can only use the composition in phonorecords, not movies.\textsuperscript{32} Though it sounds like a strong limitation on owners of musical composition copyrights, the compulsory license does not actually give much creative latitude musicians using prior compositions in their works. While a beneficiary of the compulsory license can arrange and interpret the composition to some extent, “the arrangement shall not change the basic melody or fundamental character of the work.”\textsuperscript{33} Thus, beneficiaries of the compulsory license can only produce a certain kind of cover version without the composition copyright owner’s permission. They are not free to remix, to reconstruct, or to slice and dice.

\textsuperscript{24} Id. § 109(a).
\textsuperscript{25} Id. § 109(b)(1)(A).
\textsuperscript{26} Id. § 114(b).
\textsuperscript{27} Id.
\textsuperscript{28} COHEN ET AL., supra note 8, at 432.
\textsuperscript{29} Id.
\textsuperscript{30} 17 U.S.C. § 115.
\textsuperscript{31} See text accompanying notes 11-14.
\textsuperscript{32} See PASSMAN, supra note 15, at 212, 214.
The statutory rate for the mechanical license is now 9.1 cents per phonorecord, or 1.75 cents per minute of playing time, whichever is greater. But as Donald Passman explains, the compulsory license carries a heavy administrative burden and is almost never used. Instead, the compulsory rate functions as a ceiling, because if a publisher demanded a higher price, the record company could always opt for the compulsory license. Nevertheless, the requirement that the cover version remain faithful to the “fundamental character” of the original composition retains its force. If a would-be licensee wished to alter that fundamental character, then under the copyright code she would be seeking to create a derivative work. That exclusive right is, of course, protected by a property rule. The musical composition copyright holder is free to deny permission or to charge as high a price as they can get.

I have tried to describe the most important and most relevant differences between music composition copyrights and sound recording copyrights, as well as some limitations on the Section 106 exclusive rights that accompany them. Other music-related limitations exist, such as the compulsory license for jukeboxes, or the exemption to the public performance right for establishments of less than 2,000 square feet from liability for playing music from the radio. The overarching point is that some provisions carve out exceptions to the broad exclusive rights of copyrights in musical compositions or sound recordings, but not in a way that facilitates wide and flexible use of prior works without the copyright owner’s permission.

C. Some Important Music Industry Institutions

Most musicians enter into contractual agreements with publishing companies and record companies. Publishers deal with musical composition copyrights; record labels deal with sound recording copyrights. Both types of entities, especially the larger firms, generally require musicians to assign the musicians’ copyrights to them, which is why I tend to refer to “copyright owners” and “copyright holders” rather than just writing “musicians.” Ownership in both industries is fairly consolidated, but many small publishers and record labels exist (and a few thrive). I will not recite the details of publishing and recording agreements, which can be found elsewhere. It is useful background information, however, that publishing deals generally split the royalty revenue 50-50 between composer and publisher, while net recording royalty rates usually sit below 10 percent of retail for compact discs. Record-label contracts typically provide musicians with an advance, which the label deducts from the musician’s royalties, along with recording, promotional, and other costs.

34 U.S. Copyright Office, Copyright Royalty Rates: Section 115, the Mechanical License, at http://www.copyright.gov/carp/m200a.html (last visited Jan. 28, 2006).
37 Id. § 110(5)(B).
38 See generally PASSMAN, supra note 15.
39 Id. at
40 Id. at 172-75.
Performing Rights Organizations (PROs) administer the performance rights for musical compositions. Their members are publishing companies and musicians who compose. The two major PROs are the American Society of Composers, Artists, and Publishers (ASCAP) and Broadcast Music, Inc. (BMI), but the Society of European Stage Authors and Composers (SESAC) also administers some performance rights in the U.S. The PROs offer “blanket licenses”—licenses that set an annual fee, rather than tallying up the uses of individual compositions—to radio stations, concert venues, restaurants, and other public places in which proprietors play music. Each PRO uses its own formula to compensate its member publishers and composers. Among scholars of intellectual property law and economics, the PROs have been celebrated as private-sector mechanisms that reduce the transaction costs between thousands of radio stations and concert venues and thousands of musical composition copyright holders. The PROs’ blanket licenses for concert venues will become important in the economic model of Part III, as it underlies musician’s ability to profit from public performances without negotiating licenses for any compositions they may use in their performance, because the licenses exist between the PROs and the venues.

Other music-industry institutions exist to collect royalties and to negotiate licenses. The Harry Fox Agency administers the mechanical license discussed above, and will also handle “synchronization rights,” which are licenses to use musical compositions in films. A single institution thus generally handles the licensing fees for cover versions. A relatively new organization called SoundExchange administers the compulsory license for digital performances in sound recordings, that is, they collect and distribute webcasting royalties, among other related services. Many other institutions peculiar to the music industry exist, including sample clearance houses, which I will address in Part II. The PROs, Harry Fox, and SoundExchange will become important in the economic model in Part III and in the policy discussion of Part IV. While some licensing fees for the use of prior works are relatively low because of a compulsory license, other types of licensing fees are relatively low because a small number of institutions serve as clearinghouses or otherwise facilitate negotiations. Licensing situations not falling into either of those categories—like sampling—face higher fees and more complex licensing negotiations.

D. Copyright Infringement Among Musicians

The methodology with which courts determine liability in infringement lawsuits also shapes musicians’ ability to use prior works. To prove infringement in any area of copyright

41 See Robert P. Merges, Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations, 84 CAL. L. REV. 1293 (1996). While the PROs do serve this important function in the music industry, one reason they came to do so is that the Department of Justice investigated ASCAP for many years and led the PROs to enter consent decrees that require fair terms for their licensees. See Wu, supra note 13, at 310-11, 335-37.
42 See COHEN, supra note 8, at 429.
law, the plaintiff must prove (1) valid ownership of a copyright and (2) unauthorized exercise of an exclusive right from Section 106, meaning that the defendant engaged in (a) copying in fact and (b) substantial similarity between the copyrighted work and the allegedly infringing work. Plaintiffs can demonstrate copying in fact by direct evidence of copying, direct evidence of access to the work, or by circumstantial evidence of access. Many approaches to substantial similarity have emerged from commentary and case law.

A pair of prominent cases illustrates the importance of the “copying in fact” element of infringement to copyright’s effect on creativity. The owner to the copyright of the musical composition “He’s So Fine,” a tune popularized by the Chiffons’ recording, successfully sued George Harrison for his song “My Sweet Lord.” Harrison’s song utilized two similar musical themes in a similar pattern. The court noted that Harrison had access to the work because the Chiffons’ song had been a hit in England, where Harrison lived at the time. Moreover, the court found copying in fact even though the court conceded that Harrison had copied the song subconsciously. In Selle v. Gibb, by contrast, the plaintiff songwriter unsuccessfully sued the Bee Gees for infringing his unpublished song. Selle did not “establish a reasonable possibility that the complaining work was available to the alleged infringer.” Thus, musicians’ works will be subject to the results of a substantial similarity analysis unless the plaintiff fails to show that the defendant ever heard the prior work.

Substantial similarity determinations often depend on whether an ordinary, non-expert observer would deem the works in question similar. This approach has several defects. It makes no effort to distinguish protected expression from unprotected elements, such as ideas. Another problem is courts have applied the ordinary observer approach in a way that discriminates between “high art” and “low art.” For example, in a lawsuit against Cole Porter, the Second Circuit remarked that “plaintiff’s and defendant’s compositions are not caviar,” while asserting that expert opinions on popular music must be confined to observations about how an ordinary observer would react. This implies that classical composers can receive the benefit of expert testimony on subtle musical differences, while rock and jazz composers cannot. Judicial classifications by genre and distinctions based on notions of quality or sophistication violate the nondiscrimination principle Justice Holmes articulated in Bleistein v. Donaldson Lithographing Co., Inc.

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45 See COHEN, supra note 8, at 319.
46 Id. at 354.
48 Id. at 179.
49 Id. at 180 (“It is apparent . . . that neither Harrison nor Preston [an organist in Harrison’s band] were conscious of the fact that they were utilizing the He's So Fine theme. However, they in fact were, for it is perfectly obvious to the listener that in musical terms, the two songs are virtually identical except for one phrase.” (footnotes omitted)).
50 741 F.2d 896 (7th Cir. 1984).
51 Id. at 901.
52 Arnstein v. Porter, 154 F.2d 464, 473 (2d Cir. 1946).
Nonetheless, musicians using prior works may have more or less latitude because of the genre in which their music falls.

Particularly important in the context of sampling, leading treatise for copyright has articulated the concept of “fragmented literal similarity” as a way to conceive of substantial similarity. When a musician uses a small portion of a prior sound recording in a new work, the distinction between expression and ideas is not relevant, since prior expression has been used directly. The question becomes, “At what point does such fragmented similarity become substantial so as to constitute the borrowing an infringement?” Courts answer this question with respect to the plaintiff’s work, not the defendant’s. Infringement can occur when the portion used is large enough quantitatively or important enough qualitatively in the plaintiff’s work. Some courts recognize an amount of similarity that they consider to be de minimis, such as a single note or chord. Beyond that there are no hard and fast rules along the quantitative dimension, because the qualitative dimension can always trump.

Fair use is a frequent, and complicated, affirmative defense to copyright infringement, though of course other defenses are available. Fair use is a four-factor, case-by-case test. The most recent Supreme Court decision on fair use involved sampling. Rap group 2 Live Crew had a viable fair use defense to infringement of Roy Orbison’s composition “Pretty Woman,” because the Court deemed 2 Live Crew’s subsequent work a parody. Whether non-parodic samples can articulate a fair-use defense on the basis of being “transformative,” something courts could take into account under fair use’s first factor remains unresolved. An expanded “transformative use” doctrine, however, may not benefit musicians using prior works

53 188 U.S. 239 (1903) (Holmes, J.) (“It would be a dangerous undertaking for persons trained only to the law to constitute themselves final judges of the worth of pictorial illustrations, outside of the narrowest and most obvious limits. . . . [T]he taste of any public is not to be treated with contempt.”).
55 Id. at 13-53.
56 Id. at 13-55.
57 Other defenses include, but are not limited to: misuse; abandonment; receipt of permission from the copyright owner; invalidity, for example due to a lack of originality or non-ownership (that is, the plaintiff does not own the copyright); and merger (that is, the merging of idea and expression such that the expression is unprotected).
60 Acuff-Rose Music, Inc. v. Campbell, 972 F.2d 1429, 1438 (6th Cir. 1992) (“Acuff-Rose's musicologist stated that the riff was probably sampled from the original, that is, simply recorded verbatim and then mixed with 2 Live Crew's additions.”).
61 Campbell, 510 U.S. at 594.
62 See id. at 578-79 (citing Pierre N. Leval, Toward a Fair Use Standard, 103 HARV. L. REV. 1105 (1990)).
in a practical sense. Fair use’s case-by-case nature makes it unpredictable and defending any lawsuit requires great expense.63

II. Sampling in Practice and in Court

A. Creative Practice

Digital sampling technology, which arose in the 1980s, made the use of prior sound recordings much more easy, inexpensive, and powerful. The following definition explains:

Digital sampling is a type of computer synthesis in which sound is rendered into data, data that in turn comprise instructions for reconstructing that sound. Sampling is typically regarded as a type of musical quotation, usually of one pop song by another, but it encompasses the digital incorporation of any prerecorded sound into a new recorded work.64

Incorporating a prior work into a new one, however, can involve considerable alteration:

[S]ound, once rendered into data, can be manipulated in a variety of ways down to the smallest details. Tempo and pitch can be increased or decreased in any increment, and the two can be manipulated independently. . . . Sounds can be reversed, cut, looped, and layered; reverberation can be added; certain frequencies within a sound can be boosted or deemphasized. . . . All of these manipulations can be visited upon any sound, musical or otherwise, and on any length of sound that can be recorded. A sample can be a fraction of a waveform, a single note from an instrument or voice, a rhythm, a melody, a harmony, or an entire work or album.65

With digital sampling, musicians have a full range of sound-manipulation possibilities. But even analog technologies, such as phonograph records or magnetic tape, allowed musicians to use prior sound recordings in new works.

Sampling with analog technologies dates back to at least 1930, when composers Paul Hindemith and Ernst Toch each performed works in which they sampled themselves playing various instruments or singing vocal parts.66 (Today musicians call this practice overdubbing or multitracking.) As musicologist Mark Katz explains, recording technology alters the roles of composers, performers, and listeners. One such “phonograph effect” (in Katz’s terminology) is that composers could control performances, sidestepping the traditional role of performers in interpreting musical compositions.67 Over time, musicians have had other creative motivations

65 Id. at 139.
66 Id. at 99-113.
67 Id. at 24-25, 110-113.
for sampling, including the desire to recombine elements from disparate sources. Sampling shares this motivation with many longstanding practices of composition, from Brahms, who quoted melodic themes from Beethoven, to Bob Dylan, who has used chord progressions from spirituals and lyrics from other writers. As in the 2 Live Crew case, sampling can facilitate parody, mockery, or criticism—not to mention homage, allusion, or other, types of discourse that are not necessarily hostile to the sampled work.

Jamaican DJs became involved in recording as early as the late 1960s; new music continues to use both samples such DJs used and samples of their recordings. Starting sometime in the mid-1970s, turntablism and rap music developed in New York, forging the most direct roots of modern hip-hop. For a time, digital sampling occurred in “a sort of Wild West,” in which few (if any) musicians negotiated licenses for the samples they used. Sampling practices in rap music varied from using the entire bass line or melody from a prior work to creating complex collages of dozens, if not hundreds, of sampled sounds. Musicians in classical, rock, electronica, jazz, and other genres also use samples in their music. But the eventual legal controversy over sampling centered on hip-hop.

B. Sampling Case Law

In 1991, Grand Upright Music v. Warner Brothers Records effectively ended the “Wild West” period for sampling. Rapper Biz Markie admitted to sampling the song “Alone Again (Naturally)” by Gilbert O’Sullivan. Judge Kevin Duffy’s opinion famously opened with “Thou shalt not steal,” and, given the admission of copying in fact, focused heavily on the copyright’s validity. The court did not analyze substantial similarity. But Judge Duffy did provide some

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68 McLeod, supra note 63, at 75-77.
69 See Katz, supra note 64, at 153-156 (analyzing Public Enemy’s music as an example).
71 See Katz, supra note 64, at 116-17; McLeod, supra note 63, at 69-72.
72 McLeod, supra note 63, at 67.
74 It should not surprise anyone, given the ugly history of race in the music industry, that a genre associated closely with African-Americans and African-American culture (though by no means limited to African-Americans) has received the most vigorous scrutiny. Cf. Sanjek & Sanjek, supra note 11, at 64, 326, 650 (documenting the segregation of white and black music); Candace R. Hines, Note, Black Musical Traditions and Copyright Law: Historical Tensions, 10 Mich. J. Race & L. 463, 489-491 (2005) (discussing digital sampling).
76 McLeod, supra note 63, at 78 (“Record companies became stricter [after Grand Upright].”); Passman, supra note 15, at 307 (“[The record industry’s] ‘catch me if you can attitude came to an abrupt halt.’”).
77 Grand Upright, 780 F. Supp. at 182.
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.”

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.”

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 did, of course, ensue. *Jarvis v. A&M Records* involved a song by C&C Music Factory that sampled a composition by Boyd Jarvis. The court considered the case as one of fragmented literal similarity, and conducted an element-by-element analysis, rather than asking whether an ordinary observer 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 from the work as well as an original arrangement of certain lyrical phrases.

In *Fantasy v. La Face Records*, the plaintiff accused TLC of infringing the song “Mr. Big Stuff,” a sound recording made in 1971. 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.

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

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78 *Id.* at 184-85.
81 *Id.* at 291-92.
83 *Id.* at *4-*5, *7-*8.
84 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. *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.
86 *Id.* at *15.
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.”\(^{87}\) The Beastie Boys had licensed the sound recording from Newton’s record label, but not the underlying composition. 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.\(^{88}\) 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 that 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.’”\(^{89}\) 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.\(^{90}\)

Two years later, Bridgeport Music v. Dimension Films held that no de minimis exception applied to sound recordings.\(^{91}\) “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 sample consisted 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.\(^{92}\) 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,\(^{93}\) to imply that any work not entirely independently created infringes.\(^{94}\) From this the court concluded: “Get a license or do not sample.”\(^{95}\) The court did not consider, nor explicitly cast aspersions on, the possibility of fair use.\(^{96}\)

The Sixth Circuit supported its reasoning in Bridgeport with several policy arguments, many of them economic in character.\(^{97}\) First, the court reasoned, musicians can produce their own recordings of portions of songs they wish to sample. This touches on the notion that

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\(^{87}\) Newton v. Diamond, 388 F.3d 1189, 1191 (9th Cir. 2003).
\(^{88}\) 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.”).
\(^{89}\) Id. at 1196 (quoting testimony defendants’ expert Dr. Lawrence Ferrara).
\(^{90}\) 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 later composition with three identical words and three identical notes to a prior composition did not infringe.
\(^{91}\) 410 F.3d 792 (6th Cir. 2005).
\(^{92}\) The musical composition had received a synchronization license. Id. at 796.
\(^{93}\) 17 U.S.C. § 114(b); see supra text accompanying notes 26-29.
\(^{94}\) Bridgeport, 410 F.3d at 800.
\(^{95}\) Id. at 801.
\(^{96}\) Id. at 805.
\(^{97}\) Id.
sampling saves recording costs by obviating the need to pay musicians to re-record musical phrases.\footnote{For a discussion of this issue, 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.”).} Second, the court asserted that substitutes in the market for sample licenses would constrain prices. Third, the court noted that sampling (unlike, say, George Harrison’s subconscious copying) 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 court’s view, because they are “physical,” not “intellectual.”\footnote{Bridgeport, 410 F.3d at 802.} The court reasoned that nothing valuable can be used for free, and any sound used must be valuable—thus, no sound recording sample can be free.\footnote{This prong of the court’s reasoning echoed the court’s arguably circular logic regarding the market-harm factor of fair use in Princeton University Press v. Michigan Document Services, 99 F.3d 1381, 1387 & n.4 (6th Cir. 1996) (en banc). The two opinions had different authors, however, and Judge Guy, who authored Bridgeport, was not on the Sixth Circuit in 1996.} 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.”\footnote{Bridgeport, 410 F.3d at 804.}

C. Industry Practice

In the wake of \textit{Grand Upright}, sample clearance became a much more urgent and frequent activity on the part of musicians and record labels. Sample clearinghouses sprang up, which are “similar to publisher clearinghouses in that they are authorized by member copyright owners to clear samples for use on albums according to an agreed upon fee structure.”\footnote{A. Dean Johnson, Comment, Music Copyrights: The Need for an Appropriate Fair Use Analysis in Digital Sampling Infringement Suits, 21 Fla. St. L. Rev. 135, 163 (1993).} Licensing arrangements for samples include flat fees and royalty arrangements that involve a percentage of mechanical royalties (and possibly performance royalties, too).\footnote{See Johnson, supra note 102, at 163-64.} Flat fees range “from $5,000 to $15,000” for both the composition and the sound recording “if the usage is minor, and it’s a little-known song.”\footnote{PASSMAN, supra note 15, at 307.} For more significant uses or for more famous songs, fees increase to “$50,000 and more” for the sound recording and to 50 percent of publishing revenue for the composition.\footnote{Id. at 307-08.} Licensing fees are higher the later in the sampling work’s creative process the negotiations begin.\footnote{Interview by Rick Karr with George Clinton & Hank Shocklee at the Future of Music Coalition Policy Summit (Sept. 12, 2005) (notes on file with author).} To sum up, as expert music lawyer Donald Passman puts it:
“Since there’s no compulsory license for samples, you have to make whatever deal the rights owners decide to bless you with.”

Though they do exist, sample clearinghouses are not centralized like the PROs, the Harry Fox Agency, and SoundExchange. As a result, transaction costs may remain relatively high, as they include legal fees and efforts to identify any relevant copyright owners who do not participate in a clearinghouse. Furthermore, sample clearinghouses do not address the problem of pricing for multiple samples. Passman describes a situation in which three publishers demand 40, 40, and 30 percent of publishing revenue in return for sample licenses, for a total of 110 percent. If one copyright holder demands a 100 percent royalty rate on the publishing revenue, as Prince does, that forecloses both a musician’s ability to collect mechanical royalties and a musician’s flexibility to sample more than one song in a new work. Prince is certainly within his rights to charge 100 percent, and it may be the case that such property-rule protection is socially beneficial. Here I just want to describe the legal and institutional environment that musicians face.

Sample clearinghouses could—but do not currently—provide a clear, accessible menu of prices that adjusted for particular kinds of uses. As the Sixth Circuit asserted, “[T]he record industry, including the recording artists, has the ability and know-how to work out guidelines, including a fixed schedule of license fees, if they so choose.” Producer Hank Shocklee of Public Enemy has similarly suggested a menu of sample-licensing prices, available up front and varying based on the amount used and the instrument sampled (that is, a snare drum sample might cost more or less than sampling a voice). Some commentators have advocated the creation of a single, non-profit clearinghouse to serve such a function. I will consider these solutions and others in Part IV. But to frame and facilitate that analysis, I will first present a formal economic model of musicians’ use of prior works.

III. A Labor-Time-Allocation Model of Sampling and Licensing

A. Relevant Prior Literature

By way of introduction, I would like to discuss three sets of ideas from scholarship on the economics of intellectual property which I have drawn from, combined, and added to in order to construct a model of musicians’ use of prior works. First, from William Landes and Richard Posner, I use the insight that increased copyright protection does not unambiguously benefit

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108 Id. at 308.
109 See McLEOD, supra note 63, at 94.
110 Bridgeport, 410 F.3d at 804.
111 Interview by Rick Karr with George Clinton & Hank Shocklee at the Future of Music Coalition Policy Summit (Sept. 12, 2005) (notes on file with author).
musicians. Because prior works are an input into musicians’ production processes, a tradeoff exists between increased return on a musician’s own copyrights and increasing “author’s cost of expression.” Landes and Posner’s model subsumes all aspects of copyright protection—subject matter, scope, duration, and so on—into a single index. My model will differ in that it focuses specifically on the music industry and attempts to capture the categorizations described in Part I between musical compositions and sound recordings, and their accompanying rights. Furthermore, my model makes explicit the exchange between subsequent musicians and copyright owners of prior works. A final and important difference is that my model will not focus on copyright enforcement or the ease of making unauthorized copies. Landes and Posner describe the competitive balance between original creators and copyists who make copies that substitute for the original. Though the competitive environment among musicians would be an interesting extension to pursue in future work, for reasons of simplicity the model I describe will abstract away from competition among musical works, treating musicians as monopolists constrained by scarcity in inputs to production, market demand, and time.

The model describes musicians as choosing between three activities: composing and recording (“recording”), touring and performing (“touring”), and an outside option that pays a fixed wage. A recent paper by the cultural economists Ruth Towse and Richard Watt outlines a formal model of musician’s allocation between recording (“royalty-generating activities”), performances, and leisure. The authors focus on developing a life-cycle model, in which musicians develop a portfolio of royalty-generating works early in life, and then shift their allocation towards performance later in life. (Think of the Rolling Stones.) Their model does not differentiate among types of musicians. The complexity of their model forces them to assume away the leisure choice in the full, multiple-time-period version. The model I present here only involves a single time period, again for the sake of simplicity. But I take a broadly similar approach to Towse and Watt’s by conceiving of musicians as having decisions about how to allocate their time. I also go a step further by allowing musicians who choose to spend time recording to decide between two different business models.

From the economic literature on patents and innovation, I have borrowed the idea of “making a clean separation between an exogenous process that generates ideas for innovations, and the decisions whether to invest in them.” A notion of scarcity of ideas is implicit in such an approach; in the model I present below, each musician has an endowment of a single idea for a new musical work. Whereas the patent literature often discusses businesses’ or grant makers’

114 Id. at 73.
115 Id. at 71-72.
117 Id. at 25.
118 Id. at 3, 7 (modeling musicians’ non-royalty-generating time as a composite of performing, other work, and leisure).
decisions to invest in inventions from science or engineering.\textsuperscript{120} I will discuss musicians’
decisions about whether to record their musical ideas and whether to release them commercially,
thus requiring payment of licensing fees.

B. Production and Licensing Costs

In keeping with the above, I model a musician’s idea for a musical work as a production
function, in other words, a technology for musical creation. I intend for this to capture how
different musicians choose different quantities of the inputs available to them. The production
function takes labor and prior works as inputs, and produces a single musical work as an output.
Any musician’s production function can be described in terms of the same set of inputs, but will
vary in the specific parameters. In this setup, musicians’ ideas can be thought of as having
naturally bestowed parameters or parameters chosen by the musicians themselves outside of, or
prior to, the system.

The overarching structure and timing of the model are as follows:

1. nature (or prior choice by the musician) determines the parameters of the
production function for one new musical work;
2. based on the implied choice of inputs and prospectively sunk cost of recording
that work, the musician chooses whether to record;
3. simultaneously, given the parameters of consumer demand for recording and
for touring, the musician chooses whether to release the recording
commercially, incurring licensing fees, or to avoid them through non-
commercial release;
4. the musician allocates their remaining time between touring and their outside
option.

The optimization implicit in steps (2) and (3) occurs at the same time, with the musician
essentially choosing between three business-model options: commercial release of recordings
plus touring, non-commercial release of recordings plus touring, and touring only.\textsuperscript{121} Step (4)
might also be considered simultaneous to steps (2) and (3), but the all-or-nothing nature of the
decision to record, as I have modeled it, suggests a temporal characterization. The model occurs
within a single time period, say, one year.

Specifically, I model a musician’s production function as:

\[ Y = f(D, M, S, L^R) = D^\alpha M^\beta S^\gamma (L^R)^{1-\alpha-\beta-\gamma} = 1 \]  \hspace{1cm} (i)

where \( D \) denotes public-domain ideas, works, and uses; \( M \) denotes copyrighted uses of musical
compositions; \( S \) denotes copyrighted uses of sound recordings; and \( L^R \) denotes the fraction of

\textsuperscript{120} See, e.g., id. at 46-53.

\textsuperscript{121} The musician’s outside option could be considered a fourth option, but choosing a fixed
outside wage is not really a well-described “business model.”
labor time spent on composition and recording, with $0 \leq L^R \leq 1$. Here we see the separate categories of copyright law embodied in different economic inputs available to musicians. Note that M and S denote copyrighted “uses,” not copyrighted works, since, as Part I described, the exclusive rights in copyrighted works have many limits. The production function has Cobb-Douglas form, so that the exponents represent the cost shares of the variables to which they are attached. These cost shares can vary from musician to musician, representing the relative weight, so to speak, that their creative process puts on the four inputs.

One benefit of formally modeling musical production in this way is that each input can have a separate price. Public-domain uses carry a (relatively low) search cost $z_d$; the input prices $z_m$ and $z_s$ are the effective licensing fees for musical compositions and sound recordings, respectively; and the input price of musicians’ labor is $w$, the wage available in their outside option, that is, their non-recording, non-touring labor. The licensing fees can be thought to have a licensor-fee component and a transaction cost component, but I will not decompose them at this point in the analysis. The Cobb-Douglas production function allows a degree of substitution between inputs. Thus, when the price of one input increases, musicians’ use of that input will decrease and musicians’ use of all other inputs with non-zero shares will increase. That said, the shares are important, too—a musician who uses a non-zero share of copyrighted sound recordings, for instance, will use at least some amount of sound recordings in their new musical work under any conditions.

I will treat musicians as self-employed profit-maximizers who may contract with institutions such as record labels, publishers, or retailers. This abstracts away from any notion of a utility function beyond “more profits, more utility” and implies that I will forgo formal modeling of uncertainty and risk aversion, at least in this instantiation of the model. Profit maximization implies cost minimization, which dictates the musician’s choice of input levels should they choose to record. The explicit statement of the musician’s problem is:

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122 I recognize that in this model, the notation can dismay a reader, because of the large number of variables and parameters. I have tried to use first-letter signals or familiar letters where possible, such as L for labor and c for cost. Beyond that I can only ask for your patience.


124 I have modeled D, M, and S as continuous variables, rather than integers, despite the fact that they represent “uses” of either public-domain or copyrighted material, a discrete concept. Because I treat these variables as having a fixed, exogenous price, however, one can interpret portions of uses as representing instances where the licensor tailored the licensing fees to a particular use or where the musician could negotiate lower fees for whatever reason.

Min_{LR, D, M, S} \{wL^R + z_dD + z_mM + z_sS\} \quad \text{subject to} \quad f(D, M, S, L^R) = 1 \quad (ii)

where \(w, z_d, z_m, \text{ and } z_s\) are exogenous but vary between the commercial business model and the non-commercial business model (in the non-commercial case I will mark them as \(u\)’s, for unlicensed). I will not report the specific solutions here, but the input levels are entirely determined by the shares, the input prices, and the assumption that output is fixed at one.

C. Labor Allocation and Business-Model Choice

When I refer to musicians choosing between “business models,” I mean that musicians can choose from three different profit functions: commercial, non-commercial, and no-recording. The commercial business model includes selling copies recordings as well as tickets to performances on tour. The non-commercial business model involves making recordings, distributing them at cost (partly to promote performances), and touring. To call a business model “non-commercial” may seem a bit strange, but in the music industry, especially for musicians early in their careers, free or low-priced “demo tapes” have been common for decades, even as the musician engages in public performances. The no-recording business model consists solely of touring. The three associated profit functions are (I write the three functions in rapid succession only to facilitate comparison later; an explanation of the motivation will follow):

\[\Pi^{\text{COM}} = \left[g(\eta, Q) - c\right]Q - wL^R - z_dD - z_mM - z_sS + Z^R + [h(\eta, Q, L^T) - w]L^T \quad (iii)\]
\[\Pi^{\text{NON-COM}} = -wL^R - u_dD - u_mM - u_sS + [h(\eta, Q, L^T) - w]L^T \quad (iv)\]
\[\Pi^{\text{NO-RECORD}} = [h^{\text{NO-RECORD}}(\eta, Q, L^T) - w]L^T \quad (v)\]

where \(g(\cdot)\) is inverse consumer demand for recordings, \(\eta\) is an important parameter measuring commercial appeal, \(h(\cdot)\) is inverse consumer demand for touring, \(L^T\) is the fraction of labor time spent on tour, with \(0 \leq L^T \leq 1\), and \(c\) is the constant marginal cost of manufacturing and distributing copies of a recording. At this point it is important to mention the time-budget constraint, \(L^R + L^T - 1 = 0\). In other words, musicians spend their entire allocation of time, whether on recording, touring, or their outside option.

The intuition behind the commercial profit function is straightforward: musicians record, then earn profits by participating in the (monopolistic) markets for their recordings and tours. The first term in brackets, \([g(\eta, L^R, Q) - c]\), simply represents price minus marginal cost, which is then multiplied by quantity to get sales revenue for recordings. The four ensuing \(w\) and \(z\) terms together represent the sunk costs of recording, both labor and licensing.\(^{126}\) \(Z^R\) represents the musicians’ proceeds from licensing their own musical compositions and sound recordings to

\(^{126}\) See supra section III.B. The sunk costs are also fixed, once the musician is given a set of input prices and the input shares of a musician’s production function, but I avoid calling them fixed to emphasize that different input prices and different input-share parameters in the musician’s production function will produce different levels of sunk costs, which largely drives the choice of profit function.
others. The second bracketed term, \( h(\eta, Q, L^T) - w \), represents touring revenue per unit time minus the opportunity cost (again, the outside wage) of that time. Again price minus marginal cost is multiplied by quantity, although here the fraction of labor time spent on tour is also the “quantity of touring,” which I hope will make some intuitive sense. I have left any fixed costs of touring out of the model.

The non-commercial profit function may still involve a positive fraction of labor time spent recording, but several terms from the commercial profit function are absent. I assume that musicians distributing their music non-commercially provide copies to their listeners at cost. With no promotional costs or retail markup, that cost can be quite low. Recordings continue to generate consumer surplus, according to the inverse demand function \( g(\cdot) \), but \( g(\cdot) \) may have different parameters to reflect the smaller reach of non-commercial distribution. Another difference is that the search cost for public-domain uses may decrease as compared to the commercial case, because musicians have less concern about making a mistake about whether a given work they wish to use is in the public domain or not. More important, in terms of magnitude, are the lower input costs for uses of musical compositions and sound recordings. I assume—in an admitted oversimplification, considering the complexity of fair-use law127—for purposes of the model that the musicians’ uses of copyrighted works are identifiably and obviously “fair,” largely because of the non-commercial nature of the musician’s recording activity, such that the musician does not fear lawsuit.128 Finally, the non-commercial profit function omits any revenue from licensing. If a musician opts out of the commercial system, they opt out of both sides of the licensing transaction. The tradeoff along this dimension between the commercial and non-commercial profit functions represents a specific instance of the general fact that copyright protection has both benefits and costs for creators.

The no-recording profit function is much simpler. It includes no labor time spent recording, no input costs, and no licensing fees or revenue. The parameters of inverse consumer demand for touring may differ, which I have noted with a “no-record” superscript on the \( h(\cdot) \) function in equation (v); the basic functional form stays the same across business models. The basic idea of the no-recording profit function is that, if the sunk costs of recording become too great, a musician has the option of earning money from performances—with the tradeoff that the musician has no recordings to distribute to promote their tours.

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128 See 17 U.S.C. § 107(1) (listing “the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes” as one of the four factors for a court to weigh in a fair use analysis). One problem with this assumption is that the musician, in the business model using non-commercial distribution of recordings, will continue to earn money from touring. While I can assume somewhat plausibly that the musician’s public performances of copyrighted works will be covered by blanket licenses from the PROs, see supra section II.C, it is not at all clear that earning revenue from an activity related to the purportedly non-commercial recording would not tip the first fair use factor, and perhaps the whole fair use analysis, against the musician in this instance. Instead of the simple setup here, one could build into the model some risk of an infringement lawsuit for musicians who choose the non-commercial profit function (and thus do not license the prior works they use).
With the three profit functions described, one can describe the musician’s choice of business model as:

$$\text{Max } \{\Pi^{\text{COM}}, \Pi^{\text{NON-COM}}, \Pi^{\text{NO-RECORD}}\} \quad (vi)$$

as well as the optimal choices of $L^R$, $L^T$, and $Q$:

$$(L^{R*}, L^{T*}, Q^*) = \text{Argmax}_{L^R, L^T, Q} \{ \text{Max } \{\Pi^{\text{COM}}, \Pi^{\text{NON-COM}}, \Pi^{\text{NO-RECORD}}\} \} \quad (vii)$$

subject to three constraints: $L^R + L^T \leq 1$; $0 \leq L^R \leq 1$; and $0 \leq L^T \leq 1$. To solve this model, one must proceed case by case, because of the nested profit functions and the inequality constraints. Rather than reporting the model’s solution in the abstract and recounting the details of the first order conditions, in the next section I will describe a simple, illustrative simulation using the model’s framework.

D. Simulated Results

To use the model as a simulation, I choose particular functional forms for $g(\cdot)$ and $h(\cdot)$ and the values of the model’s many parameters. Later in this section, I will vary certain parameters to simulate the implications of various changes in copyright law for musicians’ labor-allocation decisions, business model choice, and total compensation within the time period, which can be thought of one year. By choosing particular functional forms, I can also discuss consumer surplus in both the market for copies of one musician’s recordings and the market for performances on tour. I should emphasize from the outset, of course, that while I have tried to choose realistic parameters, the analysis is entirely hypothetical and illustrative. While I have calibrated values in a direction I think points toward the realm of plausibility, any consideration of magnitudes is a function of the parameters I chose to illustrate certain tradeoffs. In short, the simulation may not reflect the relative importance of various factors in the real world.

I generate a simulation with two types of musicians: those with relatively high commercial appeal and those with relatively low commercial appeal. Each type chooses between the three business models. I specify the specific functional forms and list them in Appendix 1. The parameters I have chosen for this particular simulation are based on calibrations to give the model a roughly realistic feel. To mention a pair of examples, I have set the musician’s outside wage to $20,000 and calibrated the price of recordings to the neighborhood of $10 to $18. The maximum consumer willingness for a copy of a recording to $30 for higher-appeal musicians and $18 for lower-appeal musicians, which generates what I think are reasonable values for consumer surplus under an assumption of linear demand curves.

Because the model features a production side as well as two consumer markets, it contains a multitude of parameters. To conduct scenario analysis, I restrict myself to changing only two kinds of parameters, which depend on the legal regime for musicians’ use of prior works to create new works. The two “policy levers” I adjust to create different scenarios are, first, the input shares of public domain uses, copyrighted musical compositions, and copyrighted
sound recordings; and, second, the costs of licensing musical compositions and sound recordings for use in new works.

Specifying inputs to a production function is an act of categorization. For instance, economists typically classify some things as “capital,” some as “labor,” and some as “intermediate goods” in macroeconomic modeling. Economists make such classifications based on economic theory. My argument is that the production function for new musical works also reflects a categorization—a classification not based on economic theory, in this case, but on the legal regime. Since the different categories may each be associated with different input costs, the categorization matters a great deal to musicians’ sunk costs of recording. Cases like *Grand Upright* and *Bridgeport*, which each ruled in a context of previous legal uncertainty, changed the classification scheme. Where musicians had previously treated certain uses of copyrighted works as if they were public-domain uses, the post-*Grand Upright* or post-*Bridgeport* legal regime now classified those uses as requiring a license. The change in categorization will increase the required sunk costs to produce a recording, at least in terms of my model and its assumption about the functional form of production. In turn, this increase in sunk costs will alter musicians’ profit maximization decisions, in terms of (1) how to allocate their labor time, (2) whether to record or not, and (3) whether to release their recordings commercially.

Licensing costs are a more straightforward economic lever. If the legal environment changes such that copyright holders demand higher fees, then the sunk costs of recording will increase under the assumptions I have made about production. (While musicians can substitute away from relatively expensive inputs to some extent, they continue to use some non-zero amount of them.) If transaction costs increase, whether because music lawyers charge more money or because the complexity of the legal environment increases, then the sunk costs will increase in the same fashion. The model treats input costs for musical compositions and sound recordings as the effective cost of licensing, which can contain both licensing fees and transaction costs.

The results of three different scenarios are included in Appendix 2. Scenario A presents the base case, in which both higher-appeal and lower-appeal musicians choose to record and choose to release their recordings commercially. Notice that the musicians pay licensing fees and also receive licensing revenue (which is lower, and can be thought of as being net of transaction costs). The musician’s choice of profit function coincides with the socially optimal choice. More specifically, the result in Scenario A maximizes social surplus in the context of a second-best equilibrium in which music, as a public good, requires intellectual property protection.

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130 See supra section III.B.
131 With Cobb-Douglas production, an exogenous change in the input share of a relatively expensive input will increase total production costs.
protection to allow musicians to cover their fixed costs by earning monopoly profits in the markets for recordings and tour performances.  

Scenario B describes the post-Grand Upright or post-Bridgeport situation, in which legal categorizations have been established and have changed the economic situation of musical production. This second scenario illustrates two qualitative implications of the model. First, the lower-appeal types have switched decisions under the new conditions, in which musical compositions and sound recordings have higher shares in input. They now choose the no-recording, tour-only option. Second, notice that while both the commercial and the non-commercial business model are suboptimal for the lower-appeal type (in fact, they produce negative economic profits), the preference ordering has shifted between the two of them. This suggests that, under different parameters, there will be scenarios in which musicians of some type will choose the non-commercial business model.

Finally, Scenario C illustrates the effect of a decrease in licensing fees, subsequent to the changes in input shares of Scenario B, whether because of a voluntary reduction in fees, the institution of a new compulsory license for samples, or a reduction in transaction costs, perhaps through a more PRO-like sample clearinghouse. Note that, in this simulation, despite a 90% reduction in fees for both musical compositions and sound recordings, neither type’s optimal choice of business model changes. Perhaps all this shows is that, under these particular parameters or assumptions about specific functional forms, input shares are a more sensitive policy lever to change musicians’ sunk costs of production than licensing fees are. But it also illustrates that once the legal regime classifies most samples as copyright-protected rather than public-domain, an increase in sample-licensing efficiency or a compulsory license may not be enough to coax some musicians to record again. In the simulation, the inability to provide incentives to the lower-appeal types costs society a considerable surplus, with the lower-appeal musician choosing an option with 98 percent less social surplus ($368 compared to $24,717). Drawing a particular line between the public domain and the subjects of copyright may have profound and even persistent effects on creativity.

While the magnitudes in the simulation may be misleading or unrealistic, I think that the model shows the importance of considering all the different margins along which the legal regime can misalign incentives. Society can lose the benefits of creativity when musicians choose not to record, when musicians choose not to release recordings commercially, or when musicians shift labor time among their various options. The model shows that the categorization schemes of copyright law have complicated consequences. If policymakers and judges want to successfully regulate the relationship between the samplers and the sampled, they should take these complications into account.

E. Possible Extensions

132 For a discussion of intellectual property protection as a second-best solution, see SCOTCHMER, supra note 119, at 34-39.
133 While I have verified that such results exist for certain parameters, I will not report such a result here for the sake of brevity.
Another way that the model presented here could be used is to consider different “types” of musicians along a different dimension. Rather than varying the “commercial appeal” parameter $\eta$, we could conceive of musicians as varying in the input shares associated with public-domain uses, musical compositions, sound recordings, and labor time spent recording. In such a setup, one would conceive of the input shares as having two components: one component determined by the legal regime’s categorization of uses of prior works (which is how I have used the input shares in Section III.D), and one component determined by musicians’ characteristics or predilections. Such a simulation would provide another view of the effects of policy changes like an increase in copyright protection for samples or a decrease in licensing costs.

Other, more fundamental extensions, changes, adjustments, or refinements may be possible, while retaining the basic structure of the problem as I have modeled it. In this model, so far, there are no intertemporal considerations, and thus no recording for the sake of a future royalty stream from copyrighted assets, or any building up of an audience, or any potential for investments in human capital. The model could account for uncertainty, especially in the intertemporal case. The institution of record labels, which function to insure musicians against the risk of low commercial appeal and cross-subsidize among musicians, might enter such a model more explicitly.

In the model presented here, musicians are constrained by laws, by institutions and by market demand, but are only implicit constrained (through the parameters of market demand) by other musicians offering recordings or performances that substitute, to some degree, for their own. With no explicit model of competition among musicians, there is no opportunity to examine the issue of incumbent musicians as compared to new entrants, or musicians with large stockpiles of frequently sampled songs—think of James Brown—as compared to downstream samplers.

Finally, competition in the market for samples is not modeled explicitly. I have modeled the amount of sampling activity, but not the choice of samples. If particular samples have great market power, it might be interesting to model whether those licensors have the power to price discriminate among potential licensees, and the consequences of that market power. Such price discrimination has been observed in the market for licensing video for use in documentary films, where markets are small and prices are not typically disclosed. The market for music samples may have a similar character, although the existence of some clearinghouse institutions in the sample clearance system may reduce licensors’ ability to price-discriminate.

IV. Considerations for Evaluating Copyright Reform Proposals

Concerns about the effect of the sampling case law on creativity have sparked various proposals for reform. Often, these proposals mention sampling in the context of a larger concern about copyright law. In this paper, I have done the reverse, focusing on the “business-to-

134 See Towsé & Watt, supra note 116; text accompany notes 116-118.
business” issue of licensing among musicians while leaving aside the business-to-consumer issues of file-sharing and the like. But the labor-time-allocation model can frame some of the recent policy proposals, perhaps in a way that can lead to empirical tests of the theory’s hypotheses about which policies will maximize social welfare.

A. Expanding Fair Use

One policy option easily handled by the model’s framework would be to cover most sampling as a transformative, and thus fair, use. Under such an option, “most” sampling could mean a variety of things, about which other authors have speculated. Regardless of the specific contours, the fundamental idea would be that some currently copyrighted, or thought-to-be-copyrighted, uses would move into the public domain. The model would reflect this as an increase in the input share of public-domain uses. In terms of the simulation I have presented in section III.D, this change would be like a progression from Scenario B to Scenario A, and under the assumptions of the model would result in more musical works being recorded and higher social surplus. Thus, in terms of the model, the fair use option is attractive. For other reasons—namely fair use’s uncertainty and case-by-case nature—the option may be less desirable than I have described in this paragraph, and may be unworkable. But a model with uncertainty might be able to capture some of the down sides of relying on fair use, and examine the tradeoff against the benefits of lower sunk costs from licensing.

B. Full Propertization

Something of the obverse of expanding fair use would be to eliminate it, opting for the propertization of as many musical ideas as possible, hoping that well-defined property rights would promote investment, the development of private institutions to decrease transaction costs, or both. Terry Fisher has analyzed in great detail such a scenario for the music and film industries. This approach might expand protection beyond the boundaries currently drawn in copyright law, so that musicians could, for example, sue other musicians for appropriating certain styles or recording techniques. This would also involve eliminating current limitations like the compulsory license for cover versions and the de minimis exception to substantial similarity. In terms of the model, this would achieve something like the reverse of the scenario above. The input share of public-domain uses in musical production would decline to zero, or almost zero, depending on how tightly policymakers and judges closed the lid on prior musical works. The welfare consequences, under the assumptions of the model and the calibrated parameters of the simulation, would be quite negative. But, if transaction-cost-

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136 This welfare improvement would come from reducing musicians’ sunk costs. A portion of the sunk costs leaks outside of the system of musicians and consumers in the form of search costs and transaction costs. Because intellectual-property protection works to help musicians cover the sunk costs of producing creative works, reducing sunk costs allows intellectual-property incentives to operate more strongly.


138 See text accompanying notes 30-35.

139 See text accompanying notes 54-56.
reducing institutions would truly emerge as a result of fuller propertization, then the cost of licensing would decrease, mitigating the increase in the sunk costs of recording somewhat. The results of Scenario C, however, suggest that the effect of the change in the input share of public-domain uses might dominate.

Something left out of the model might compensate for these likely negative consequences of full propertization. If intellectual property protection became less leaky in the business-to-consumer market, then perhaps the cost-benefit analysis of full propertization could, in theory, tilt the other way. It is unclear, however, whether expanding protection could enhance musicians’ revenue enough to compensate for their having to license every use on the production side of the market.

C. Creative Commons Licenses

Creative Commons licenses offer musicians several options to voluntarily renounce certain layers of intellectual-property protection. The organization offers three licenses specifically designed for sampling.\footnote{Creative Commons, Choose Your Sampling License Options, at http://creativecommons.org/license/sampling?lang=en-us (last visited Jan. 28, 2006).} Two of licenses allow subsequent musicians to sample a portion of a work, but not the whole, for any non-advertising purposes; one adds a license to copy and distribute the entire work non-commercially, for example, to engage in file-sharing. The third license restricts sampling to non-commercial uses, adding the file-sharing license as well. The voluntary nature of Creative Commons licenses makes them seem welfare-enhancing almost by default. The questions are how many musicians will use them and how well the structures in place to spread the word about Creative-Commons-licensed works will function.

The distinction Creative Commons makes between commercial and non-commercial uses maps onto a key distinction I have emphasized in the model. The relative frequency with which the no-sampling-for-advertising licenses are used compared to the no-commercial-sampling license would determine the relative reductions in sunk costs between the commercial business model and the non-commercial one. The more popular the no-commercial-sampling license, the greater the increase in the non-commercial business model’s relative attractiveness to musicians.

D. Transaction-Facilitating Institutions

The idea of a pre-specified menu of licensing costs, with adjustments for different types of uses and sliding scales for different lengths of musical material sampled,\footnote{See text accompanying notes 110-112.} is highly appealing from an efficiency standpoint. One could model the adoption of such a system as a reduction in effective licensing costs, whether because of reduced transaction costs or reduced prices because more widely dispersed information about sample prices promotes competition in the market for samples. The model suggests that, regardless of the source, such a change would be salutary for creativity. But perhaps one lesson from the simulations presented above is that reducing licensing costs without also relaxing the categorization between public-domain uses
and infringing uses may not have the desired effect. Some of the reform proposals seem complementary, not mutually exclusive.

E. Alternative Compensation Systems

Alternative compensation systems (ACS) for copyright involve the government collecting tax revenue, whether through the general income tax or through use taxes on services like internet access, distributed to musicians according to some measure of consumer preference. In return, the public would receive the elimination of most of copyright law’s prohibitions on infringing the exclusive rights of creators, gaining the right to copy and distribute music at will.\textsuperscript{142} Terry Fisher’s favored proposal for copyright reform falls into this category,\textsuperscript{143} and it is one aspect of his proposal I will discuss briefly here. In Fisher’s proposal, musicians must register to participate in the ACS. 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?”\textsuperscript{144} 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%.”\textsuperscript{145} The musician would then provide the registration numbers of the works sampled.

To relate this to the economic model of this paper, one could, as with the other proposals, consider it as potentially reducing the transaction costs of licensing. Perhaps this type of government-administered sample clearinghouse would be the most efficient policy option in this regard, with the concomitant benefits to social welfare I have described (and qualified) above. Furthermore, as Fisher points out, licensing fees would decrease because they would be tailored to duration, regardless of the prominence of the creator of sampled work,\textsuperscript{146} a stark contrast with the current sample clearance system.\textsuperscript{147}

The ACS shares some drawbacks with traditional compulsory-licensing systems. Setting the compensation levels appropriately presents administrative difficulties. In addition, the compulsory licensing regime reduces licensors’ compensation levels, which (depending on the amount of transaction cost savings from an ACS or compulsory license) may harm musicians who are net licensors of samples. The restrictions on contract behavior bother many who come from a baseline assumption that samples from creative works should be property. And from the licensor’s perspective, the compulsory licensing regime eviscerates the derivative-works right. This loss of control over the use of musical creations matters a great deal, particularly to adherents of the moral-rights perspective of copyright law. The model I present here involves licensing revenue changing hands but does not include an explicit model of the market for samples. Nor does it include, for musicians, a potential psychic cost of being sampled in an

\textsuperscript{142} See supra section I.B.
\textsuperscript{143} FISHER, supra note 137, at 199-258.
\textsuperscript{144} Id. at 206.
\textsuperscript{145} Id.
\textsuperscript{146} Id. at 234-35.
\textsuperscript{147} See supra section II.C.
annoying, repugnant, or otherwise distressing way. A full appraisal of the ACS would call for such extensions of the basic model presented here.

On the positive side, the ACS would change the basic economics of producing recordings, such that musicians adjust their production decisions significantly. Using prior works still has an implicit licensing cost under the ACS, which would depend on the particular formula for compensation. But shifting to a check-box system of sample-license approval changes the sunk costs of licensing into a back-end cost, taken out of the government-administered revenue from selling copies of the recording in question. This might reduce the psychological salience of the categories of public domain uses, copyrighted musical compositions, and copyrighted sound recordings, leading to less of a distortion of creative choices.¹⁴⁸ Musicians would still face a tradeoff between using the prior works they want to and the revenue they will forgo in the ACS (to the benefit of the prior musicians sampled). But with the elimination of licensing costs from sunk costs, leaving only search costs and labor time in the parlance of the labor-time-allocation model, musicians’ choices about whether to spend labor time on recording would be less distorted. In other words, a lower level of compensation would be necessary to provide sufficient incentive to record. Alternatively, considering the distribution of “types” of musicians, musicians with lower expected commercial appeal who do not create recordings under the current system would produce recordings under the ACS. The source of this enhancement to social welfare is the elimination of transaction and negotiation costs, and eliminating the need to pay the (implicit) licensing fees up front. In the context of the economic model presented here, at least, this provides much to recommend Fisher’s ACS proposal.

V. Implications for Future Data Collection

In future work I plan to go beyond modeling, simulation, and calibration and collect some actual data of three main types. First, in conjunction with an interdisciplinary research project on sampling, I will participate in collecting qualitative information about the sample clearance system. This will involve interviewing musicians, producers, music lawyers, and other relevant people from music industry. In addition, the project involves developing a quantitative sense of the transaction costs involved in sample clearance from both sides of the transaction, the sampler and the sampled. Finally, the project team will estimate what it would have cost to license certain pre-Grand Upright works, created during the aforementioned “Wild West” period of sampling, under today’s sample clearance system. All this information should provide valuable insights about how to extend or alter the model, as well as how to simulate and calibrate it.

Second, to test the labor-allocation implications of the model—the notion that musicians may substitute between recording, touring, and an outside option in response to legal changes—I am considering whether to field a survey of musicians about their creative practices, focusing particularly on their time allocations. This might provide a way to collect information that sheds light on policies that affect creativity without requiring questions about copyright law that may provoke strong (and perhaps less informative) responses. One model for such a survey might be

¹⁴⁸ FISHER, supra note 137, at 238. This parallels the freedom that Fisher argues consumers would enjoy if the ACS proposal were implemented. See id. at 18-31, 236-38.
the Information on Artists series of surveys, which asked a random sample of artists about their workspaces and work habits. One limitation of this empirical strategy is the absence of a long time series that might elucidate musicians’ responses to legal changes. A cross-sectional approach, perhaps differentiating musicians by whether they use and whether they license prior works, may provide some useful information.

Third, and finally, it would clearly be valuable to collect basic information about the licensing practices, taking musical works as the unit of analysis. This would include data about the number of works licensed in musical works over time, and data on the number of works containing samples (licensed or not). Industry data from All Music Guide are available but expensive, and may not contain detailed information about licensed samples. Some websites provide historical information on who has sampled whom. This information might need to be augmented with industry data. More importantly, the data-collection methods, which determine whether a sampled or sampling album shows up in the data or not, would have to be well understood. Sample-licensing data might also come directly from the liner notes of CDs and cassettes. Most albums involving cleared samples make a note of having done so, providing a copyright notice identifying the licensor and the original work. This approach would facilitate a historical analysis, since most albums released before *Grand Upright* are still available, perhaps facilitating a pre/post analysis of musicians’ and record labels’ licensing behavior.

**Conclusion**

The difficulty of identifying and measuring copyright law’s effect on creativity calls for analysis of specific economic, legal, and institutional contexts. Copyright’s differential treatment of sampling—as opposed to its treatment of cover versions, musical collage, parody, and works dependent on prior works in ways that fall outside of copyright—provides such a context. I have presented a model featuring a musician’s production function, a decision about how to allocate their labor time, and a choice of business model. A simulation based on that model illustrates how changes to the legal regime for sampling could affect musicians’ choices about whether to create recordings, how much time to spend on them, and whether to release them commercially. The model suggests that decisions like *Bridgeport* might have increased some musicians’ sunk costs of recording enough to deter them from recording, potentially to the detriment of social welfare. If that is the case, policy makers should consider reform proposals like ACS, in order to better foster creativity and to avoid the kind of discrimination between musical genres or modes of creation that Justice Holmes warned against in *Bleistein* over a century ago.

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151 See supra text accompanying note 53.
Appendix 1: Specific Functional Forms Used in Simulation

What follows are the specific functional forms I have used to simulate results from the model. Demand for copies of recordings is given by:

\[ g(\eta, Q) = k\eta - gQ \]  \hspace{1cm} (A-i)

where \( k \) is a parameter that varies between the commercial and non-commercial business models, \( \eta \) is a parameter capturing the musician’s commercial appeal (here in the form of the maximum consumer willingness to pay for a copy of the musician’s recording), and \( gQ \) gives the slope of the demand curve, which is linear. Demand for touring is given by:

\[ h(\eta, Q, L^T) = A\eta + BQ - hLL^T \]  \hspace{1cm} (A-ii)

where \( A \) is a parameter adjusting \( \eta \) so that the entire term \( A\eta \) contributes to the maximum (collective) consumer willingness to pay for a unit of the musician’s performance time, \( B \) is a parameter that augments willingness to pay for performances based on the quantity of recordings sold, and \( hL \) provides the slope of demand for touring, which is also linear. Finally, licensing revenue is given by:

\[ Z^R = t \eta \left[ z_dD^* + z_sS^* \right] / \left( \frac{1}{2} (\eta^{\text{HIGH}} + \eta^{\text{LOW}}) \right) \]

where the \( t \) coefficient discounts licensing revenue for transaction costs and the rest expression is based on an assumption of that the two types of musicians are distributed equally in the population (hence the one-half) and that each musician’s share of the total pool of licensing revenue is a function of their commercial appeal so that those musicians with high \( \eta \) get a higher fraction than those with low \( \eta \).
Appendix 2: Scenario Analysis

Scenario A: Base Case

Input Shares:
- D, public domain uses: 33.3%
- M, musical compositions: 8.3%
- S, sound recordings: 8.3%
- L^R, labor time recording: 50%

Input Costs:
- z_d, cost of D: $50 com/$10 non-com
- z_m, cost of M: $5,000 com/$25 non-com
- z_s, cost of S: $10,000 com/$25 non-com
- w, outside wage: $20,000

“Higher-Appeal Types” (\(\eta = 30\))

<table>
<thead>
<tr>
<th>Business Model Options</th>
<th>Commercial</th>
<th>Non-Com</th>
<th>Tour Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licensing costs</td>
<td>$1,174</td>
<td>$268</td>
<td>$0</td>
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<tr>
<td>Expected licensing revenue</td>
<td>$734</td>
<td>n/a</td>
<td>n/a</td>
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<tr>
<td>Fraction of time spent recording, L-R</td>
<td>17.6%</td>
<td>4.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Fraction of time spent touring, L-T</td>
<td>80.8%</td>
<td>35.0%</td>
<td>25.0%</td>
</tr>
<tr>
<td>Fraction of time spent on outside option</td>
<td>1.6%</td>
<td>61.0%</td>
<td>75.0%</td>
</tr>
<tr>
<td>Touring revenue</td>
<td>$48,782</td>
<td>$13,118</td>
<td>$8,125</td>
</tr>
<tr>
<td>Recording Profit (Net of fixed costs)</td>
<td>$15,030</td>
<td>-$1,608</td>
<td>n/a</td>
</tr>
<tr>
<td>Outside wages</td>
<td>$322</td>
<td>$12,199</td>
<td>$15,000</td>
</tr>
<tr>
<td>Total compensation</td>
<td>$70,738</td>
<td>$25,049</td>
<td>$23,125</td>
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<tr>
<td>Total consumer surplus</td>
<td>$53,147</td>
<td>$6,225</td>
<td>$1,563</td>
</tr>
<tr>
<td>Total social surplus (musicians &amp; consumers)</td>
<td>$101,537</td>
<td>$10,738</td>
<td>$4,688</td>
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</table>

“Lower-Appeal Types” (\(\eta = 18\))

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<th>Business Model Options</th>
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<th>Non-Com</th>
<th>Tour Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licensing costs</td>
<td>$1,174</td>
<td>$268</td>
<td>$0</td>
</tr>
<tr>
<td>Expected licensing revenue</td>
<td>$440</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Fraction of time spent recording, L-R</td>
<td>17.6%</td>
<td>4.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Fraction of time spent touring, L-T</td>
<td>28.8%</td>
<td>11.5%</td>
<td>7.0%</td>
</tr>
<tr>
<td>Fraction of time spent on outside option</td>
<td>53.6%</td>
<td>84.5%</td>
<td>93.0%</td>
</tr>
<tr>
<td>Touring revenue</td>
<td>$9,900</td>
<td>$2,953</td>
<td>$1,645</td>
</tr>
<tr>
<td>Recording Profit (Net of fixed costs)</td>
<td>-$1,455</td>
<td>-$1,608</td>
<td>n/a</td>
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<tr>
<td>Outside wages</td>
<td>$10,721</td>
<td>$16,901</td>
<td>$18,600</td>
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<tr>
<td>Total compensation</td>
<td>$25,477</td>
<td>$19,586</td>
<td>$20,245</td>
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<tr>
<td>Total consumer surplus</td>
<td>$8,559</td>
<td>$1,185</td>
<td>$123</td>
</tr>
<tr>
<td>Total social surplus (musicians &amp; consumers)</td>
<td>$11,687</td>
<td>$235</td>
<td>$368</td>
</tr>
</tbody>
</table>

Note: Musician’s profit-maximizing choices in bold.
**Scenario B: Post Grand Upright or Bridgeport, Requiring Licensing for More Samples**

In this scenario, the legal categorization of certain uses of prior musical compositions and sound recordings shifts from the public domain to copyright protection, changing the input shares.

**Input Shares:**
- D, public domain uses: 16.7%
- M, musical compositions: 16.7%
- S, sound recordings: 16.7%
- L, labor time recording: 50%

**Input Costs:**
- $d$, cost of D: $50 com/$10 non-com
- $m$, cost of M: $5,000 com/$25 non-com
- $s$, cost of S: $10,000 com/$25 non-com
- $w$, outside wage: $20,000

**“Higher-Appeal Types” (η = 30)**

<table>
<thead>
<tr>
<th>Business Model Choices</th>
<th>Commercial</th>
<th>Non-Com</th>
<th>Tour Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licensing costs</td>
<td>$6,016</td>
<td>$701</td>
<td>$0</td>
</tr>
<tr>
<td>Expected licensing revenue</td>
<td>$3,760</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Fraction of time spent recording, L-R</td>
<td>45.1%</td>
<td>5.3%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Fraction of time spent touring, L-T</td>
<td>54.9%</td>
<td>35.0%</td>
<td>25.0%</td>
</tr>
<tr>
<td>Fraction of time spent on outside option</td>
<td>0.0%</td>
<td>59.8%</td>
<td>75.0%</td>
</tr>
<tr>
<td>Touring revenue</td>
<td>$36,200</td>
<td>$13,118</td>
<td>$8,125</td>
</tr>
<tr>
<td>Recording Profit (Net of fixed costs)</td>
<td>$12,056</td>
<td>-$2,103</td>
<td>n/a</td>
</tr>
<tr>
<td>Outside wages</td>
<td>$0</td>
<td>$11,951</td>
<td>$15,000</td>
</tr>
<tr>
<td>Total compensation</td>
<td>$64,048</td>
<td>$24,368</td>
<td>$23,125</td>
</tr>
<tr>
<td>Total consumer surplus</td>
<td>$36,453</td>
<td>$6,225</td>
<td>$1,563</td>
</tr>
<tr>
<td>Total social surplus (musicians &amp; consumers)</td>
<td>$77,493</td>
<td>$10,243</td>
<td>$4,688</td>
</tr>
</tbody>
</table>

**“Lower-Appeal Types” (η = 18)**

<table>
<thead>
<tr>
<th>Business Model Choices</th>
<th>Commercial</th>
<th>Non-Com</th>
<th>Tour Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licensing costs</td>
<td>$6,016</td>
<td>$701</td>
<td>$0</td>
</tr>
<tr>
<td>Expected licensing revenue</td>
<td>$2,256</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Fraction of time spent recording, L-R</td>
<td>45.1%</td>
<td>5.3%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Fraction of time spent touring, L-T</td>
<td>28.8%</td>
<td>11.5%</td>
<td>7.0%</td>
</tr>
<tr>
<td>Fraction of time spent on outside option</td>
<td>26.1%</td>
<td>83.3%</td>
<td>93.0%</td>
</tr>
<tr>
<td>Touring revenue</td>
<td>$9,900</td>
<td>$2,953</td>
<td>$1,645</td>
</tr>
<tr>
<td>Recording Profit (Net of fixed costs)</td>
<td>-$10,643</td>
<td>-$2,103</td>
<td>n/a</td>
</tr>
<tr>
<td>Outside wages</td>
<td>$5,219</td>
<td>$16,654</td>
<td>$18,600</td>
</tr>
<tr>
<td>Total compensation</td>
<td>$18,764</td>
<td>$18,906</td>
<td>$20,245</td>
</tr>
<tr>
<td>Total consumer surplus</td>
<td>$8,559</td>
<td>$1,185</td>
<td>$123</td>
</tr>
<tr>
<td>Total social surplus (musicians &amp; consumers)</td>
<td>$4,315</td>
<td>-$260</td>
<td>$368</td>
</tr>
</tbody>
</table>
Scenario C: Decreasing Licensing Costs

This could involve voluntarily reduced fees, a compulsory license, or reduced transaction costs.

Input Shares:
D, public domain uses: 16.7%
M, musical compositions: 16.7%
S, sound recordings: 16.7%
L\textsuperscript{R}, labor time recording: 50%

Input Costs:
z_{d}, cost of D: $50 \text{ com}/$10 \text{ non-com}
z_{m}, cost of M: $500 \text{ com}/$25 \text{ non-com}
z_{s}, cost of S: $1,000 \text{ com}/$25 \text{ non-com}
w, outside wage: $20,000

“Higher-Appeal Types” (\(\eta = 30\))

<table>
<thead>
<tr>
<th>Business Model Choices</th>
<th>Commercial</th>
<th>Non-Com</th>
<th>Tour Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licensing costs</td>
<td>$2,792</td>
<td>$701</td>
<td>$0</td>
</tr>
<tr>
<td>Expected licensing revenue</td>
<td>$1,745</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Fraction of time spent recording, L-R</td>
<td>20.9%</td>
<td>5.3%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Fraction of time spent touring, L-T</td>
<td>79.1%</td>
<td>35.0%</td>
<td>25.0%</td>
</tr>
<tr>
<td>Fraction of time spent on outside option</td>
<td>0.0%</td>
<td>59.8%</td>
<td>75.0%</td>
</tr>
<tr>
<td>Touring revenue</td>
<td>$48,035</td>
<td>$13,118</td>
<td>$8,125</td>
</tr>
<tr>
<td>Recording Profit (Net of fixed costs)</td>
<td>$15,101</td>
<td>-$2,103</td>
<td>n/a</td>
</tr>
<tr>
<td>Outside wages</td>
<td>$0</td>
<td>$11,951</td>
<td>$15,000</td>
</tr>
<tr>
<td>Total compensation</td>
<td>$70,466</td>
<td>$24,368</td>
<td>$23,125</td>
</tr>
<tr>
<td>Total consumer surplus</td>
<td>$51,904</td>
<td>$6,225</td>
<td>$1,563</td>
</tr>
<tr>
<td>Total social surplus (musicians &amp; consumers)</td>
<td>$100,973</td>
<td>$10,243</td>
<td>$4,688</td>
</tr>
</tbody>
</table>

“Lower-Appeal Types” (\(\eta = 18\))

<table>
<thead>
<tr>
<th>Business Model Choices</th>
<th>Commercial</th>
<th>Non-Com</th>
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<td>$701</td>
<td>$0</td>
</tr>
<tr>
<td>Expected licensing revenue</td>
<td>$1,047</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Fraction of time spent recording, L-R</td>
<td>20.9%</td>
<td>5.3%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Fraction of time spent touring, L-T</td>
<td>79.1%</td>
<td>11.5%</td>
<td>7.0%</td>
</tr>
<tr>
<td>Fraction of time spent on outside option</td>
<td>0.0%</td>
<td>83.3%</td>
<td>93.0%</td>
</tr>
<tr>
<td>Touring revenue</td>
<td>$18,638</td>
<td>$2,953</td>
<td>$1,645</td>
</tr>
<tr>
<td>Recording Profit (Net of fixed costs)</td>
<td>-$9,901</td>
<td>-$2,103</td>
<td>n/a</td>
</tr>
<tr>
<td>Outside wages</td>
<td>$0</td>
<td>$16,654</td>
<td>$18,600</td>
</tr>
<tr>
<td>Total compensation</td>
<td>$15,368</td>
<td>$18,906</td>
<td>$20,245</td>
</tr>
<tr>
<td>Total consumer surplus</td>
<td>$30,745</td>
<td>$1,185</td>
<td>$123</td>
</tr>
<tr>
<td>Total social surplus (musicians &amp; consumers)</td>
<td>$24,717</td>
<td>-$260</td>
<td>$368</td>
</tr>
</tbody>
</table>