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Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
Library of Congress
Washington, D.C.

In the Matter of:	**DOCKET NO. 16–CRB–0003–PR (2018–2022)**
Determination of Rates and Terms for Making and Distributing Phonorecords (Phonorecords III)	

WRITTEN DIRECT REMAND TESTIMONY OF MICHAEL L. KATZ
(On behalf of Pandora Media, Inc.)

Submitted April 1, 2021

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I. QUALIFICATIONS, OVERVIEW OF ASSIGNMENT, AND SUMMARY OF CONCLUSIONS

1. My name is Michael L. Katz. I am the Sarin Professor Emeritus in Strategy and Leadership at the University of California at Berkeley's Haas School of Business Administration. I am also professor emeritus in Berkeley's Department of Economics. I previously served on the faculties of the Department of Economics at Princeton University and the Stern School of Business at New York University. I received my A.B. from Harvard University *summa cum laude* and my doctorate from Oxford University. Both degrees are in Economics. A more detailed description of my qualifications is provided in my written direct testimony in this proceeding and my curriculum vitae attached to that testimony.[1]

2. In my written direct testimony, at the request of counsel for Pandora Media, Inc. ("Pandora"), I interpreted the 801(b)(1) statutory objectives from the perspective of economics and conducted an assessment of their implications for the appropriate structure and levels of the statutory royalty rates for interactive music streaming services. I also examined several potential "benchmark" agreements and assessed whether these benchmarks are informative to the rate-setting task at hand, and, if so, whether adjustments to these benchmarks are necessary to arrive at "reasonable" royalty rates and terms that best achieve the four statutory objectives. In my rebuttal and supplemental written testimony,[2] I addressed several issues, arguments, and pieces of evidence raised

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[1] Written Direct Testimony of Michael L. Katz, November 1, 2016 (hereinafter *Katz WDT*).

[2] Written Rebuttal Testimony of Michael L. Katz, February 15, 2017 (hereinafter *Katz WRT*); Supplemental Written Rebuttal Testimony of Michael L. Katz, March 6, 2017.

in written direct testimony submitted by Copyright Owners' witnesses, particularly the written direct testimony of Copyright Owners' economic experts, Drs. Eisenach, Gans, and Rysman.[3]

3. Briefly, my opinions included the following:

- *Economics offers the following insights with respect to the interpretation and application of the 801(b)(1) objectives:*
  - **A. Maximize Availability:** In order to promote availability and consumer welfare, statutory royalties should allow *both* copyright owners and statutory licensees opportunities—not guarantees—to earn adequate financial returns if they are able to create offerings that are attractive relative to those of their competitors.
  - **B. Afford Both a Fair Return to Copyright Owners and a Fair Income to Copyright Users:** Although economics does not prescribe a specific notion of fairness, many economic policies are predicated on the idea that an outcome is fair if it corresponds to what would have happened in an effectively competitive market.
  - **C. Reflect Relative Roles:** To a large extent, the objective of reflecting copyright owners' and users' relative roles in making contributions and

[3] Expert Report of Jeffrey A. Eisenach, Ph.D., October 31, 2016; Expert Report of Joshua Gans, October 31, 2016; Expert Report of Marc Rysman, Ph.D., October 28, 2016.

incurring costs raises considerations similar to those raised by the first two statutory objectives: maximizing availability and fairness.

— **D. Minimize Disruptive Impact:** Absent a showing that the industry is in a financial condition such that business as usual—at least with respect to the licensed activities—is unsustainable, maintaining the status quo is the least disruptive path forward.

- *The 2012 Settlement is an excellent benchmark for rate-setting in the present proceeding.* This is so for several reasons:

— First, it involved similar (and, in some cases, the same) parties, and unlike some other potential benchmark agreements that cover other services and products (or were negotiated concurrently with agreements covering other services or products), the 2012 Settlement covered only the rights at issue in the present proceeding.

— Second, there do not appear to have been any asymmetries in market power, bargaining positions, or the ability to pursue litigation through a Copyright Royalty Board rate-setting proceeding (governed by the same 801(b)(1) factors) that would have distorted the outcome in favor of interactive streaming services.

— Third, an examination of how the industry has subsequently evolved demonstrates that this benchmark is not outdated and, indeed, supports a conclusion that the 2012 Settlement headline royalty rate should be lowered for the 2018-2022 period to best achieve the four statutory objectives. For example, interactive streaming services' relative contribution has increased but royalty rates have not been adjusted accordingly, which raises concerns regarding availability, fairness, and reflecting relative roles.

- *With one exception, the overall royalty structure of the 2012 Settlement remains economically sound and promotes achievement of the four statutory objectives.* The 2012 Settlement's royalty structure contains: (a) a revenue-based prong equal to a percentage of service revenue less the royalties paid for performance rights (*i.e.,* there is an "all-in" or *headline rate* for the sum of mechanical and public performance royalties); (b) a "TCC" prong based on a specified percentage of royalties paid by the service to record labels for sound recording rights; and, for some types of services, (c) a *per-subscriber minimum* that applies to the sum of mechanical and public performance royalties; and/or, (d) a *per-subscriber floor* on mechanical royalty payments (a "mechanical-only floor"). The percentages, per-subscriber minima, and floors (if applicable) vary by type of service. Based on my examination of changes in industry conditions since the 2012 Settlement was reached, I concluded that:

  — *Collecting total royalties for mechanical plus public performance rights on a percentage-of-revenue basis remains economically sound.* Indeed, imposing a new rate structure would run counter to the 801(b)(1) objective of minimizing disruption.

— *Having service-specific, per-subscriber minimums for combined mechanical and public performance royalties remains sound.* As the streaming industry continues to introduce innovative new types of services, allowing for minimums to address revenue-measurement issues while allowing flexibility for innovative, differentiated services remains appropriate.

— *As a result of past and potential future fragmentation of the licensing of musical compositions' public performance rights, per-subscriber floors applying only to mechanical royalties are no longer economically sound.* Well-accepted economic principles indicate that, due to the exercise of market power, this fragmentation can be expected to lead to higher total royalties for performance rights even in the absence of any increase in the underlying value of those rights. These higher performance rights royalties would interact with the mechanical-only royalty floor to boost the effective "all-in" royalty rate due to the exercise of market power.[4]

- *Drs. Gans's and Rysman's arguments against the use of a menu of royalty rates are unsound.* Contrary to Drs. Gans's and Rysman's assertions, it is beneficial to

[4] It is my understanding that the Services' joint proposal on remand includes the same per-subscriber floors as the 2012 Settlement, which makes it conservative in my view.

Copyright Owners, streaming services, and music consumers to have a range of different royalty rates depending upon the nature of the service and the underlying revenue model. This conclusion follows from the fact that different services give rise to different opportunity costs and face different demand conditions (*e.g.,* different services may have different price elasticities of demand).

- *Dr. Gans ignores important implications of his approach that reveal that his approach is internally inconsistent and yields implausible results.* Under the particular assumptions that he has made, Dr. Gans's Shapley Value analysis implies that music publishers and record companies should earn equal profits. Dr. Gans's approach also implies the equilibrium royalties should result in the streaming services' earning positive profits. Yet, interactive streaming services generally have yet to be profitable, and it is unclear that they will ever be profitable, even if the statutory rates are not increased in this proceeding. Dr. Gans ignores this fact, as well as that the logic of his own approach implies that his estimate of reasonable royalties is biased upward.

- *Drs. Eisenach's and Rysman's analyses of the 2012 Settlement and industry performance are unsound.* Drs. Eisenach and Rysman make two related arguments in an attempt to avoid confronting the implications of the success of the 2012 Settlement: (a) the assertion that the negotiated rates were always intended to be transitory; and (b) the assertion that the negotiated rates were not intended to be precedential. Regardless of the motivation for the 2012 Settlement, the levels and changes in various measures of industry structure and industry performance support the conclusion that the royalty rates and structure of the 2012 Settlement remain broadly reasonable. In fact, a variety of evidence shows that, due in large part to the rise of streaming, industry performance is improving. This improving performance has benefitted music publishers through increases in total royalty revenues for musical works.

4. Drawing on my training and experience as an economist, my examination of the public records of earlier proceedings, my analysis of the relevant industries, and my examination of the evidence produced in the present proceeding—including the written and oral testimony of Copyright Owners' economic experts—I continue to reach all of the conclusions summarized above, as well as others stated in greater depth in my written direct, rebuttal, and supplemental testimony.

5. In this written remand testimony, I address whether, from the perspective of economics, the Copyright Royalty Board's adoption of a rate structure that includes an uncapped total cost content ("TCC") prong combined with significantly increased rates comparable to those in the Final Determination ("Determination") vacated by the D.C. Circuit would promote the four 801(b)(1) statutory objectives. My central conclusion is that the vacated rate structure fails to satisfy any of the four statutory objectives.

6. More specifically, I reach the following conclusions:

- *The economic effects of the rate structure adopted by the Majority in the Determination can be understood only by considering the rate-setting scheme in its entirety.* In order to understand the extent to which the structure the Majority adopted—an uncapped TCC prong combined with significantly increased rates—it is essential to examine how the different components interact with one another, rather than attempt to analyze each one in isolation.

- *Professor Watt's rebuttal testimony, on which the Majority relied in key respects, is severely flawed and the results of his analysis are unreliable.* Most important:

  — Professor Watt's prediction regarding the magnitude of the see-saw effect is based on assumptions that are inconsistent with the facts as well as his own testimony. The results of his model are both unreliable and contrary to actual observed market outcomes.

  — Professor Watt's claims that the Shapley Value eliminates both the effects of hold-out and the "abuse of market power" have no grounding in economics. His claim that the Shapley Value eliminates the effects of "walk-away" power is demonstrably false, and his testimony does not—and cannot—demonstrate that his Shapley Value analysis corresponds to the outcome in an effectively competitive market or necessarily satisfies the 801(b)(1) factors.

7. Turning to the extent to which the Majority's chosen rate structure satisfies the statutory objectives, I conclude that:

- *Maximize Availability:* The vacated rate structure, if re-adopted on remand, would reduce the statutory licensees' economic incentives to promote their music streaming services and would create incentives to raise the prices of streaming services, thus reducing availability and harming consumers.
- *Afford Fair Return/Fair Income:* There is no reason to believe that the vacated rate structure corresponds to an equilibrium outcome in an effectively competitive market. Moreover, the Majority's vacated approach to accounting for the recording industry's market power inequitably placed the burden on the services and privileges the musical works copyright owners. Further, tying statutory rates to future negotiations between the services and sound recording rightsholders can result in rates changing for reasons having nothing to do with the relative roles of the musical works copyright owners and statutory licensees: it is difficult, if not impossible, to see how such changes could be considered to be fair.
- *Reflect Relative Roles:* To a large extent, the objective of reflecting copyright owners' and users' relative roles in making contributions and incurring costs raises considerations similar to those raised by the first two statutory objectives: maximizing availability and fairness. Those considerations—coupled with the fact that streaming plays an increasingly important role in the music industry—indicate that the vacated rate structure failed to reflect relative roles.
- *Minimize Disruptive Impact:* There are several respects in which the vacated rate structure fails to satisfy the statutory goal of avoiding disruption. Most

significantly, the structure dramatically increased the statutory royalty rates while removing the cap from the TCC prong. Phasing in the rate increases over time only reduces disruption if there are mitigating steps that the parties can enact during the phase-in period. Here, there is no evidence of potential mitigating steps. Streaming services can reduce their use of the statutory copyright only by raising prices and/or reducing promotion in order to suppress output. Such actions can only reduce—but not eliminate—the substantial adverse effects on the services. And the resulting reduction in industry output will harm consumers, whether or not there is a transition period. Moreover, tying statutory rates to future negotiations between the services and sound recording rightsholders creates uncertainty and threatens ongoing disruption. Other elements of the vacated rate structure, such as the change from a menu of rates to a unitary rate, could also be disruptive. Given that the principle function of a cap is to avoid disruption, it logically follows that removing the cap directly increases the risk of disruption.

8. I also find that the vacated rate structure—which relies on various unsound and mutually inconsistent theoretical models of bargaining—is especially inappropriate given that a rate structure (including the rate levels) based on the 2012 Settlement would promote the statutory objectives.

9. The remainder of my written rebuttal testimony explains these conclusions in greater depth and provides details of the facts and analyses that led me to reach them.[5]

II. THE ECONOMIC EFFECTS OF THE VACATED RATE STRUCTURE CAN BE UNDERSTOOD ONLY BY CONSIDERING THE SCHEME IN ITS ENTIRETY.

10. As the D.C. Circuit summarized:[6]

> There is no dispute that before and throughout the evidentiary hearing, no party had proposed or even hinted at the structure the Board ultimately adopted—an uncapped total cost content prong combined with significantly increased rates.

and:[7]

> Therefore, the Streaming Services were not only deprived of the opportunity to voice their objections to a completely uncapped total content cost prong, they were also given no opportunity to address the interplay between that rate structure and the increased revenue and total content cost rates.

11. In order to understand the effects of the structure the Majority adopted—an uncapped total cost content prong combined with significantly increased rates—it is essential to examine how the different components interact with one another, rather than attempt to analyze each one in isolation. As the D.C. Circuit stated, there is a significant interplay between the functional forms of the statutory royalties (*e.g.,* whether there is a royalty floor, whether royalties are equal to the minimum or maximum of different

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5 A list of materials on which I rely in my testimony is provided in Appendix B.

6 D.C. Circuit Opinion. No. 19-1028, August 7, 2020 (hereinafter *Slip Op.*), p. 34.

7 *Slip Op.*, p. 37.

prongs, or whether royalties are capped) and the rate levels themselves. For example, the Majority's call to dramatically raise the percent-of-TCC royalty rate and to remove the TCC cap interact with one another to increase the expected payments due under the TCC prong by more than would either action on its own. This fact has implications for the assessment of the vacated structure's effects with respect to all four of the 801(b)(1) statutory factors.

III. PROFESSOR WATT'S REBUTTAL TESTIMONY AS UTILIZED BY THE MAJORITY IS INTERNALLY INCONSISTENT, IS BASED ON INAPPROPRIATE ASSUMPTIONS, MAKES UNSUBSTANTIATED CLAIMS, AND IS CONTRADICTED BY ACTUAL MARKET OUTCOMES.

12. Professor Watt submitted several new models and analyses in his written rebuttal testimony and oral testimony.[8] These models and analyses are internally inconsistent, are based on inappropriate assumptions, make unsubstantiated claims, and are contradicted by actual market outcomes. In this section, I explain the fatal flaws in two areas of Professor Watt's testimony that appear to have played central roles in the Majority's findings with regard to whether the vacated rate structure would satisfy the 801(b)(1) statutory objectives: (a) his prediction of the extent to which negotiated sound recording royalties will fall in response to an increase in musical works royalties—the "see-saw

[8] Written Rebuttal Testimony of Richard Watt, February 15, 2017 (hereinafter *Watt WRT*); Oral Testimony of Richard Watt, March 27, 2017, Transcript, pp. 3026-3186 (hereinafter *Watt Oral Testimony*).

effect," and (b) his claims about the relationship between Shapley Value analyses, hold-out, and market power.

A. Professor Watt's prediction of the see-saw effect is unreliable and contradicted by experience.

13. Professor Watt offers what he asserts is "an appropriately modelled bargaining analysis" to explain the observed royalty rates realized through negotiations between sound recording copyright owners and the services.[9] Inter alia, he uses this model to predict the magnitude of the see-saw effect. Specifically, Professor Watt predicts that, if the royalties paid to musical works rightsholders increases by the amount Δ, then the labels and services will take this increase into account when bargaining with one another, and the royalties paid to sound recording rightsholders will fall by $0.954 \times \Delta$.[10]

14. Professor Watt's prediction plays an important role in the Determination:[11]

> … the Judges rely on Professor Watt's insight (demonstrated by his bargaining model) that sound recording royalty rates in the unregulated market will decline in response to an increase in the compulsory license rate for musical works… Professor Watt's bargaining model predicts that the total of musical works and sound recordings royalties would stay

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9 *Watt WRT,* ¶ 23.

10 Specifically, Professor Watt predicts that the negotiated label fee is $0.716 \times R - 0.954 \times \theta \times R)$, where R is the revenue earned by the interactive streaming service if it obtains the necessary licenses and θ is the royalty rate for payments to the musical works rightsholders expressed as a percentage of revenue. (*Watt WRT*, App. 3, p. 12.) Hence, if $\theta \times R$ increases by amount Δ, then Professor Watt predicts the negotiated label royalties will fall by $0.954 \times \Delta$.

11 Copyright Royalty Board, Docket No. 16-CRB-0003-PR (2018-2022), Determination of Royalty Rates and Terms for Making and Distributing Phonorecords, (hereinafter *Determination*), pp. 73-74.

> "almost the same" in response to an increase in the statutory royalty. [Citation omitted.]

15. Given the use to which Professor Watt and the Majority put his model—to make quantitative predictions about real-world responses to policy changes—it is especially important to have a realistic and reliable model. However, Professor Watt's model is unrealistic in critical respects that generate misleading and unreliable predictions of the see-saw effect. In fact, there is no reason to expect that the total of musical works and sound recording royalties will stay "almost the same" in response to an increase in the statutory royalty for musical works. Instead, experience indicates that the total of musical works and sound recording royalties will rise by almost the full amount of the increase in the statutory royalty for musical works.

1. Professor Watt's bargaining model is based on assumptions that are inconsistent with both his own testimony and the facts.

16. Perhaps the biggest single problem with Professor Watt's analysis of the see-saw effect is that his Nash bargaining model relies on an extremely unrealistic assumption with respect to the payoff that a label would earn if it failed to reach an agreement with a streaming service. Indeed, his assumption in this regard is inconsistent with an assumption he makes in other parts of his testimony. His reliance on this unrealistic assumption is critical because disagreement payoffs play a central role in determining the outcome of a bargaining model of the type that Professor Watt considers.

17. The critical unrealistic assumption in Professor Watt's model of bargaining between a label and an interactive streaming service is that the streaming service is a

must-have partner. That is, he assumes that a sound recording rightsholder would have a payoff of zero if it failed to reach an agreement with the service being modeled in the bargaining. In making this assumption, Professor Watt overstates the contribution that an interactive streaming service makes to the economic surplus that a service and label can realize by reaching a licensing agreement.

18. The assumption that a label receives a zero payoff if it does not reach agreement with a streaming service is equivalent to assuming that, if a streaming service shut down, none of the consumers who would otherwise have used that streaming service will switch to alternative streaming services or other sources of licensed music. The two forms of the assumption are equivalent because, when the services are substitutes, failure to reach an agreement with one service will not drive a label's payoffs from interactive streaming to zero. It will not result in the loss of all of the benefits that could be enjoyed by reaching an agreement. Instead, many consumers would engage in substitution and choose other streaming services, which will allow the label to earn profits from the additional royalties that would be paid to it by those other services.

19. The assumption that there will be no substitution by consumers and the label will earn a payoff of zero is completely inconsistent with the claim Professor Watt makes elsewhere in his testimony that the services are close substitutes for one another. Professor Watt asserts that "…the different interactive streaming companies – Spotify, Apple Music, Rhapsody/Napster, Google Play Music, Amazon, etc. – do all compete (and rather fiercely) among themselves, offering very (perhaps perfectly) substitutable

services."[12] Indeed, Professor Watt criticizes Professor Marx for not modeling interactive streaming services as being substitutes for one another, and, *in his "benchmark" Shapley Value analysis, he explicitly assumes that 90 percent of the revenues would be diverted to other interactive streaming services*.[13]

20. Professor Watt's decision to ignore or assume away the substitution among services in his bargaining model is far from an innocuous simplifying assumption. Professor Watt has testified that "[t]he very essence of the Shapley methodology is to bring to the forefront what each player contributes to the total net surplus, and in that sense, it is important to capture correctly the different degrees of substitutability on each side of the market."[14] The same is true of the Nash bargaining model with respect to the net surplus the two bargaining parties would realize from reaching an agreement. However, Professor Watt's assumption badly fails to correctly capture the degree of substitutability and each player's contribution to the total net surplus.

21. As I demonstrate in Appendix A, Professor Watt's assumption that there is no substitution dramatically biases his model toward finding a large see-saw effect and

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[12] *Watt WRT*, ¶ 25.

[13] *Watt WRT*, ¶¶ 25, 32 n. 19.

Professor Watt states that his benchmark "is somewhat conservative, being as it is consistent with fully 10% of each interactive streaming company's customers being so loyal that they would rather abandon interactive streaming than to sign up with a different interactive streaming company." (*Watt WRT,* App. 3, p. 7.) The remaining 90 percent of customers are assumed to go to another streaming service. (*Id.*, pp. 6-7.)

[14] *Watt WRT,* ¶ 25.

renders his analysis unreliable. Indeed, even correcting just this one flaw in Professor Watt's analysis leads to a prediction that the share of an increase in musical works royalties that will fall on the streaming services is approximately *eight times* larger than Professor Watt's prediction. And, as discussed below, even this prediction is lower than what has actually been observed—the interactive services have borne 100 percent of the increase, not five percent as predicted by Professor Watt.

22. Moreover, Professor Watt's no-substitutability assumption is not the only problematical assumption in his model of bargaining between a label and streaming service. He also assumes that a label's non-content costs are proportional to licensing revenues.[15] This assumption appears to make no economic sense: under this assumption, a change in the licensing rate *holding the underlying sales constant* somehow leads to an increase in non-content costs that the sound recording rightsholders would pay. I also note that Professor Watt's cost assumption is inconsistent with the assumptions underlying his Shapley Value analysis—indeed, it is inconsistent with use of the Shapley Value. The Shapley Value applies to situations in which the overall payoff to a coalition is independent of how the aggregate payoff is divided among the coalition's members. By contrast, under Professor Watt's cost assumption, the aggregate payoff falls as sound recording rightsholders' share of the aggregate payoff rises because an increase in sound

[15] *Watt WDT*, App. 3, p. 5.

recording royalties triggers increased costs. As I show in Appendix A, this nonsensical assumption further inflates Professor Watt's estimate of the size of the see-saw effect.

23. Further, Professor Watt's overall approach is unreliable because his prediction of the size of the see-saw effect is very sensitive to the assumed values of various other parameters. As I show in Appendix A, changes in the assumed percentage of revenues paid by the streaming services to sound recording rightsholders could easily generate an estimated value of the see-saw effect equal to zero or even negative, neither of which is consistent with Professor Watt's Nash bargaining framework.

2. Professor Watt's prediction of the see-saw effect is contradicted by experience.

24. As other experts and I testified earlier in this proceeding, there are theoretical reasons to believe that a see-saw effect may occur, but there are complications and it is difficult to predict how big the effect will be.[16] Ultimately, the size of the see-saw effect is an empirical question. We now have market experience with which to answer the question: it is de minimis.

25. There have been several negotiations between sound recording copyright owners and streaming services since the Determination was issued. Contrary to Professor Watt's

16 See Oral Testimony of Michael Katz, April 5, 2017, Transcript, pp. 4944-4945; Oral Testimony of Leslie Marx, April 7, 2017, Transcript, pp. 5515-5516; Oral Testimony of Anindya Ghose, April 12, 2017, Transcript, pp. 5704-5705.

Professor Gans indicated that the "see-saw" effect might not occur, so that the full effect of any increase in musical works royalties would fall on the services. (Written Rebuttal Testimony of Joshua Gans, February 13, 2017, ¶ 32.)

prediction, the sound recording copyright owners have not lowered their royalties in response to increases in musical works mechanical royalties.

26. For example, Pandora recently negotiated license extensions with Warner Music Inc., Sony Music Entertainment, and Universal Music Group. It has also negotiated with the leading independent aggregators—the Merlin Network and Orchard Enterprises. George White, SVP of Music Licensing at Sirius XM and Pandora, has testified that for each of these record companies and aggregators, "[redacted]."[17]

27. Pandora's experience is not unique. Christopher Bonavia, Global Head of Label Business Affairs at Spotify, testified that: [redacted].[18] Waleed Diab, Global Head of Recorded Music Business Development at

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[17] Written Direct Remand Testimony of George White, Senior Vice President, Music Licensing, for Sirius XM and Pandora Media, LLC, April 1, 2021, ¶ 5.

[18] Written Direct Remand Testimony of Christopher Bonavia, Global Head of Label Business Affairs at Spotify USA Inc., April 1, 2021, ¶¶ 9, 13-21; Written Direct Remand

Google LLC, testified that [redacted].[19] Although the rates that Amazon has paid to major record labels for Amazon Music Unlimited ("Unlimited") [redacted], Rishi Mirchandani, Head of Content Licensing and Strategy for the digital-music business of Amazon.com Services LLC, testified that [redacted].[20]

B. PROFESSOR WATT'S CLAIMS THAT THE SHAPLEY VALUE ELIMINATES BOTH THE EFFECTS OF HOLD-OUT AND THE "ABUSE OF MARKET POWER" HAVE NO GROUNDING IN ECONOMICS.

28. Professor Watt's testimony regarding the relationship between the Shapley Value, hold-out, and market power is incorrect in several respects. His misstatements are important because, from the perspective of economics, whether an outcome corresponds to what one would expect to observe in an effectively competitive market is an important part of assessing whether that outcome satisfies the 801(b)(1) statutory objectives of maximizing availability, affording both a fair return for copyright owners and a fair income for copyright users, and reflecting relative roles. The fact that an outcome was

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Testimony of Benjamin Kung, Director in the Financial Planning & Analysis team at Spotify USA Inc., April 1, 2021, ¶ 8.

[19] Written Direct Remand Testimony of Waleed Diab, Global Head of Recorded Music Business Development at Google LLC, April 1, 2021, ¶¶ 9-11.

[20] Supplemental Testimony of Rishi Mirchandani, Head of Content Licensing and Strategy for the digital-music business of Amazon.com Services LLC, April 1, 2021, ¶¶ 13-25.

computed using a Shapley Value does *not* imply that the outcome corresponds to that of an effectively competitive market or that it satisfies statutory objectives.

29. For the reasons explained below, it was an error for Professor Watt to[21]

> find that the Shapley Analysis, taking the number of sellers in the market as a given, eliminates the "hold-out" problem that would otherwise cause a rate to be unreasonable, in that it would fail to reflect effective (or workable) competition.

1. Professor Watt's claim that the Shapley Value eliminates the effects of "walk-away" power is incorrect.

30. The Determination summarizes Professor Watt's testimony regarding the relationship between the Shapley Value and hold-out effects or walk-away power:[22]

> As Professor Watt explained in his separate criticism, there is no need to collapse the rights holders into a single bargaining entity to eliminate holdout power by the respective rights holders, because the "heart and soul" of the Shapley Model is exclusion of the holdout value that any input supplier could exploit in an actual bargain. 3/27/17 Tr. 3073 (Watt). He emphasized that, because the Shapley Model incorporates all possible "arrivals" of input suppliers, it eliminates from the valuation and allocation exercise the effect of an essential input supplier holding out every time or arriving simultaneously with another input supplier (or apparently creating Cournot Complement inefficiencies). Id. at 3069-70.

31. However, Professor Watt also appears to have testified that the Shapley Value does *not* eliminate holdout power:[23]

> The model … allows us to capture a player's *necessity [and] bargaining power, including* vetoes, *holdouts*, everything … that's actually in the market. It allows us to import all of that into a model that generates a fair

[21] *Determination*, p. 68.

[22] *Determination*, p. 66.

[23] *Watt Oral Testimony*, pp. 3058-3059.

> reflection upon each player of what they actually do without any abuse of … any power that they may have. [Emphasis added.]

32. Regardless of Professor Watt's testimony, any claim that the Shapley Value eliminates hold-out effects or walk-away power is mistaken: the Shapley Value reduces walk-away power but *does not eliminate it*.[24] This fact can be seen by considering a simple example. Suppose that there are two types of players, type A and type B. There is only one type-A player and N type-B players. The greatest payoff that can be earned by a coalition of players is 0 if it does not include the type-A player. If the coalition does include the type-A player, then the coalition can achieve a payoff of V if there is at least one type-B player in the coalition. The type-A player's marginal contribution is V except when he or she is the first agent to join the coalition, which happens only $\frac{1}{N+1}$ of the time. Hence, the type-A player's Shapley Value is $\frac{N}{N+1}V$, which converges to V as N gets large. For example, if $N = 99$, then the type-A player's Shapley Value gives him or her 99 percent of the total value, V.

33. Now, consider the interpretation of this result in terms of threats to walk away. Under a standard interpretation of the Shapley Value, each player receives the marginal contribution that his or her joining the existing coalition makes to the coalitions' total

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[24] It is a correct statement that it eliminates the effect of an essential input supplier's holding out *every time,* but that leaves considerable scope for hold-out effects, as the examples below demonstrate.

payoff, where players are equally likely to join the coalition in any order.[25] Except when he or she is the first player to join the collation, the type-*A* player can effectively threaten to walk away and refuse to join the coalition. As a result, the type-*A* player can hold out for the full value that the coalition can earn. Intuitively, it is precisely because the type-*A* player can hold out that he or she gets so much of the surplus.

34. This intuition can be developed further. There are two main sources of impatience in a multi-player bargaining game that drive a player to accept an offer.[26] One source is that a delay in making or accepting an offer is costly because agents discount the future and the delay postpones realizing the benefits of agreement.[27] The other source[28]

> is the desire to realize the gains from trade before others do. Hence, if a player rejects an offer (or makes an unacceptable one), he will give the other players a chance to meet and reach an agreement, so that by the time he gets another chance to bargain, there will be smaller gains from trade left to realize.

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25 See, *e.g.,* Lloyd S. Shapley and Martin Shubik (1954), "A method for evaluating the distribution of power in a committee system," *The American Political Science Review,* **48**:787-792.

Note that this intuitive interpretation does not describe the formal, non-cooperative bargaining game that has been identified in the academic literature as rationalizing the Shapley Value. For description of games identified in the research literature as rationalizing the Shapley Value in some settings, see Faruk Gul (1989), "Bargaining Foundations of Shapley Value, *Econometrica*, **57**(1): 81-95; Sergiu Hart and Andreu Mas-Colell (1996) "Bargaining and Value," *Econometrica*, **64**(2): 357-380.

26 For a discussion of these factors in the context of a specific bargaining game, see Gul (1989), *supra* note 25.

27 There can also be costs associated with participating in additional rounds of a bargaining process (*e.g.,* attorneys fees).

28 *Id.*, p. 89.

In the example above, the type-A player generally does not have the second concern because any agreement that does not involve that player cannot generate value. Hence, the type-A player can credibly threaten to walk away or hold out.

35. A slightly more complicated example shows that the effects of walk-away power persist even if there are multiple players of each type. Now, suppose that there are two type-A players and N type-B players. Also suppose that a coalition can earn V as long as it has at least one player of each type. In this example, when it is the k^{th} player to join the coalition, a type-A player's marginal contribution is V if it arrives before the other type-A player, which occurs with probability $\frac{N+2-k}{N+1}$, and 0 if it arrives after the other type-A player, which occurs with probability $\frac{k-1}{N+1}$. For each k greater than 1, a type-A player thus has an expected payoff of $\frac{N+2-k}{N+1}V$ conditional on being the k^{th} player to join the coalition. A type-A player's expected payoff is thus

$$\frac{1}{N+2}\sum_{k=2}^{N+1}\{V\frac{N+2-k}{N+1}\} = \frac{V}{(N+1)(N+2)}\left\{N(N+2) - (\frac{(N+2)(N+1)}{2} - 1)\right\}$$

$$= \frac{NV}{2(N+2)}.$$

36. As N gets large, each type-A player receives a payoff that is almost equal to $\frac{1}{2}V$. Thus, the two type-A players collectively would receive almost 100 percent of the benefits even though the two players are perfect substitutes for one another. Just as in the

previous example, in this example, a type-*A* player can be thought of as having a high Shapley payoff because it has the ability to hold out.

2. Professor Watt's testimony does not—and cannot—demonstrate that his Shapley Value analysis corresponds to the outcome in an effectively (or workably) competitive market.

37. Professor Watt testified that the Shapley model is designed to remove "abuse of market power":[29]

> JUDGE STRICKLER: Well, let me ask you, then, just generally, does the Shapley valuation methodology as you have applied it in criticism to Dr. Marx -- does it lock in the existing market power of the players?
>
> [PROFESSOR WATT]: Yes. So absolutely, right? And if you -- if you look at the -- at the original Shapley paper and pretty much every single application of the Shapley model throughout, you know, economic history, what it's designed to do is to capture exactly that feature. It's not -- it's not designed to remove market power and necessity from players. It's designed to value the market power and their necessity. What it does -- what it is designed to do is to remove abuse of market power.

38. In his seminal article that defines the concept now bearing his name, Professor Shapley makes no mention of "market power" or its "abuse."[30] I am unaware of any article in the vast academic literature regarding the Shapley Value that asserts it was designed to "remove abuse of market power." Moreover, as far as I am aware, "abuse of market power" is not a precisely defined economic concept.[31] Notably. Professor Watt

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29 *Watt Oral Testimony,* pp. 3068-3069. See also *Watt Oral Testimony,* pp. 3058-3059.

30 Lloyd Shapley (1953), "A Value for n-Person Games," in Khun, H. and A. Tucker (eds.), *Contributions to the Theory of Games,* Vol. 2, Princeton: Princeton University Press.

31 European Community competition law does have an offense of "abuse of dominance." (Treaty on the Functioning of the European Union, Article 102.) Perhaps, Professor Watt

neither provides any citation to the academic literature to support his claim regarding the Shapley Value nor offers a definition of "abuse of market power."

39. Although it is not clear what Professor Watt means by abuse of market power, it is my understanding as an economist that the only meaning that would be relevant to the statutory 801(b)(1) standard would be one in which the absence of any abuse of market power implied that the outcome was consistent with what one would observe in an effectively competitive market. Whatever Professor Watt may have had in mind, the next two examples prove that the outcome of a Shapley analysis can starkly fail to correspond to the outcome of an effectively competitive market.

40. The first example can be interpreted as a situation in which there is a monopoly seller facing $N-1$ potential buyers. Under a competitive outcome, price would be near cost and almost all of the surplus would accrue to the buyers. However, as I will now demonstrate, the Shapley Value can allocate almost half of the total surplus to the monopolist.

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has this concept in mind. If so, it is not evident that it is relevant to the statutory standards in the present proceeding.

Perhaps Professor Watt is using the term more loosely to refer to practices that would violate U.S. antitrust laws. However, based on my experience as an antitrust economist, including my service as Deputy Assistant Attorney General for Economic Analysis in the Antitrust Division of the U.S. Department of Justice, it is my understanding that the exercise of monopoly power and monopoly pricing are generally legal under U.S. antitrust law absent the presence of other elements of conduct. In other words, the legal standard for assessing conduct under the antitrust laws is not whether that conduct conforms to the outcome of an effectively competitive market. The fact that legally acquired monopolies do not violate U.S. antitrust laws does *not* imply that, as a matter of economics, a monopolized market is effectively competitive.

41. Once again, suppose that there are two types of player, type A and type B. There is only one type-A player and $N-1$ type-B players. The greatest payoff that can be earned by a coalition is 0 if it does not include the type-A player. If the coalition does include the type-A player, then the coalition can achieve payoff nV, where n is the number of type-B players in the coalition. The type-A player can be thought of as the monopoly seller, and the type-B players as the buyers, each of which derives dollar benefits from consumption of the seller's good equal to V more than the seller's cost of production (i.e., V is surplus available to share among the parties). When the type-A player is the k^{th} player to join the coalition, its marginal contribution is $(k-1)V$. Summing over all N possible places in the arrival order, each of which has a $\frac{1}{N}$ chance of occurring, the type-A player's Shapley Value is

$$\frac{V}{N}\sum_{k=1}^{N}\{k-1\} = \frac{V}{N}\left\{\frac{N(N+1)}{2} - N\right\} = \frac{N-1}{2}V.$$

The total payoff of all players together is NV. Hence, the seller's share of the total payoff is $\frac{N-1}{2N}$, which is approximately equal to 50 percent when N is large. However, in a highly competitive market, the seller's share of the total surplus would be near 0. Thus, in this situation, the Shapley outcome is far from the competitive outcome. In other words, the Shapley Value does not eliminate the effects the type-A player's market power.

42. The next example can be interpreted as representing a market in which there are two firms offering perfectly substitutable products to $N-1$ buyers. Assuming that these

firms' constant, per-unit costs of production are equal to one another, the equilibrium in a standard model of price competition (*i.e.,* the undifferentiated Bertrand game) results in price equal to cost.[32] Intuitively, the firms are driven to price at cost because, if either supplier tries to hold out for a higher price, the other supplier will undercut it. As I now show, although the Shapley payoffs in this setting are closer to the competitive payoffs than are the Shapley payoffs in the monopoly example above, the Shapley outcome in this example still does not fully reflect the competitive outcome.

43. Suppose there are two type-A players (sellers who offer perfectly substitutable products) to $N-1$ type-B players (buyers). When it is the k^{th} player to join the coalition, a type-A's marginal contribution is $(k-1)V$ if it arrives before the other type-A player, which occurs with probability $\frac{N+1-k}{N}$, and 0 if it arrives after the other type-A player, which occurs with probability $\frac{k-1}{N}$. Summing over all $N+1$ possible places in the arrival order, each of which has a $\frac{1}{N+1}$ chance of occurring, each type-A player's Shapley Value is

$$\frac{V}{N+1}\sum_{k=1}^{N+1}\frac{(k-1)(N+1-k)}{N}$$

$$=\frac{V(N+2)}{N(N+1)}\sum_{k=1}^{N+1}k-\frac{V}{N(N+1)}\sum_{k=1}^{N+1}k^2-\frac{V(N+1)}{N}$$

[32] Jean Tirole, *The Theory of Industrial Organization*, MIT Press, 1988, p. 210.

$$= \frac{V(N+2)}{N(N+1)}\frac{(N+1)(N+2)}{2} - \frac{V}{N(N+1)}\frac{(N+1)(N+2)(2N+3)}{6} - \frac{V(N+1)}{N}$$

$$= \frac{V}{6N}\{(N+3)(N+2) - 6(N+1)\} = \frac{V(N-1)}{6}.$$

The total payoff of all players together is NV. Hence, each seller's share of the total payoff is $\frac{(N-1)}{6N}$. Their combined share thus is approximately equal to 33 percent when N is large. In other words, the sellers' combined Shapley Values when there are two sellers are substantially less than the monopoly seller's Shapley Value. This is, of course, only one example. But it is sufficient to demonstrate that any general claim that all Shapley outcomes represent the outcomes of effectively competitive markets is false.

IV. THE VACATED RATE STRUCTURE DID NOT MAXIMIZE THE AVAILABILITY OF CREATIVE WORKS TO THE PUBLIC

44. Factor A directs the Judges to set rates that "maximize the availability of creative works to the public."[33] The D.C. Circuit found that the Board cited sufficient evidence to support its conclusion that an increase in the royalty rates for mechanical licenses was necessary "to ensure the continued viability of songwriting as a profession."[34] However, even assuming that some increase in royalty rates for mechanical licenses would

[33] 17 U.S.C. §801(b)(1)(A).

[34] *Slip Op*., pp. 47-49.

stimulate more song-writing, the Majority's analysis of Factor A is incomplete because it fails to account for the streaming services' role in maximizing availability.[35]

45. Streaming services play an increasingly important role in making musical works available to the public. For example, according to data from the RIAA, paid subscription streaming accounted for 58 percent of U.S. Recorded Music Revenues in 2020, up from 17 percent in 2015.[36] Thus, the objective of maximizing the availability of creative works to the public will be achieved only if the statutory royalties give both writers/publishers *and* streaming services opportunities to earn adequate financial returns such that the services have the incentive and ability to price and promote offerings that consumers will find attractive.[37]

46. Focusing exclusively on the returns of songwriters will fail to promote availability to the greatest extent practicable—even if interactive streaming services remain in business. Availability will not be maximized because higher royalty rates and a unitary rate structure based on a one-sided analysis will induce the services to charge higher

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35 I also note that a Shapley Value analysis that omits consumers does not fully account for availability. There is no measure of consumer welfare in such a Shapley Value analysis: shares are based on contribution to profits, not consumer surplus.

36 RIAA, U.S. Sales Database, *available at* https://www.riaa.com/u-s-sales-database/, *site accessed* March 31, 2021. See Section VI.B below for additional evidence of the increasing importance of streaming for the distribution of music.

37 This is not to say that the Board should seek to set rates that guarantee success to any particular service. But to satisfy Factor A, the Board must account for effects that its rate scheme has on the prices services charge and the degree to which they inform consumers of—and encourage them to utilize—streaming services.

retail prices that discourage some consumers from subscribing to those services and/or induce the services to provide less attractive products (leading to less use of the services).

47. Economists recognize that it is meaningless to talk about the "availability" of a product without regard to price. For example, to say that a pharmaceutical product is equally "available" whether it is priced at $1 per dose or $1 million makes no economic sense.[38] The Majority also acknowledged the importance of the prices faced by consumers. For example, it stated:[39]

> Professor Marx's analysis of how a price discriminatory model maximizes availability is correct. Price discrimination not only serves low WTP listeners, but it also indirectly serves copyright owners, by incentivizing interactive streaming services to increase the total revenue that price discrimination enables. Any seller or licensor would prefer to maximize its revenue, and a rate structure that will effect such maximization thus would be the best structural inducement.

The Majority also found that "to equate 'availability' solely with a higher [statutory royalty] rate would produce, ultimately, a lower surplus."[40] However, although the Determination affirmed that that downstream prices matter, the Majority did not appropriately account for the effects that higher statutory royalty rates will have on those downstream prices.

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[38] One context in which this principle frequently arises in public policy discussions is antitrust policy toward refusals to deal. As economists widely recognize, a duty to deal that requires a firm to make an essential input "available" to other firms would be meaningless unless that duty also specifies a price. (See, *e.g.,* George A. Hay (2002) "A Monopolist's Duty to Deal: The Briar Patch Revisited," *Sedona Conference Journal*, **3**: 1-8.)

[39] *Determination*, pp. 84-85.

[40] *Determination*, p. 85.

48. Another way in which the Majority failed to take downstream pricing effects into account was in its adoption of a unitary rate structure, which the D.C. Circuit summarized as:[41]

> The Board, however, abandoned its prior use of different formulas and percentages to calculate the total content cost prong for different categories of offerings. Instead, it adopted a single, uncapped total content cost rate that applied to all categories of offerings.

The role of the different formulas and percentages previously used by the Board was to reflect different market conditions and (among other things) to support greater availability to consumers. While tying the statutory royalty to service revenues partially supports price-discrimination strategies aimed at increasing availability, it does not do so as fully as would having different formulas and percentages for different categories of offerings.

49. Finally, higher statutory royalty rates can also reduce availability in other ways. For example, it is my understanding that Pandora would reduce the promotion of its interactive streaming services in the event that the statutory royalty rates were set at the level adopted by the Majority in the vacated Determination.[42] Pandora would do so because such rate increases would reduce the economic returns from allocating a portion of the ad inventory on Pandora's free service to drive adoption of its subscription

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41 *Slip Op.,* p. 14.

42 Interview with Jason Ryan, Vice President of Financial Planning and Analysis at Pandora, March 31, 2021.

services.[43] When streaming services are promoted less, consumers are less aware of the options available to them and thus less likely to subscribe. In this sense, reduced promotion results in reduced availability.

V. THE VACATED RATE STRUCTURE DID NOT PROMOTE FAIRNESS.

50. Under factor B of the rate-setting standard, the statutory royalty scheme should afford the copyright owner a fair return for his creative work and the copyright user a fair income under existing economic conditions. The vacated royalty scheme did not do so. In large part, this is because the Majority relied on faulty analyses based on the Shapley Value.[44]

A. ECONOMIC INTERPRETATION OF FAIRNESS

51. Economic logic does not prescribe a single conception of fairness as the appropriate one for all purposes. Instead, economists study the implications of adopting principles that are intuitively appealing and/or appear to be utilized by people in making actual decisions. As I explained in my Written Direct Testimony, conceptions of fairness based on the idea that an outcome is fair if it is the result of a fair *process* are the most readily applicable to the present situation.[45] A bargaining process in which each party has equal knowledge, sophistication, and bargaining power is viewed by many economists to be a fair process. A fair return to a copyright owner and a fair income to a copyright user

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43 *Id.*

44 *Determination*, p. 86.

45 *Katz WDT,* § II.B.

are the return and income that would arise in a sufficiently competitive market in the absence of a mandatory licensing requirement.

52. The theoretical conditions of *perfect* competition often are not satisfied in actual markets. For example, in the case of intellectual property and software markets, marginal costs typically are near zero, so that perfectly competitive, marginal-cost pricing would not allow suppliers to cover their fixed costs.[46] It is thus necessary to consider markets that are competitive, but not perfectly so. Economists have long examined this concept, beginning with Professor J.M. Clark, who introduced the concept of "workable" competition.[47] Economists also refer to this concept as one of reasonably, or effectively, competitive markets.[48] A prominent economics textbook stated an implicit definition as follows:[49, 50]

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46 The long-run equilibrium price received by suppliers in a perfectly competitive market is equal to the suppliers' marginal cost. (See, *e.g.,* Andreu Mas-Colell, Michael D. Whinston, and Jerry R. Green (1995) *Microeconomic Theory*, Oxford University Press at 335-336.)

47 John M. Clark (1940), "Toward a Concept of Workable Competition," *American Economic Review,* **30**(2) Pt. 1: 241-56.

48 SoundExchange's economic expert in the SDARS I and SDARS II proceedings, Professor Ordover, defined effectively competitive markets as "markets not distorted by undue exercise of monopoly power on the part of sellers or monopsony power on the part of buyers." (*In the Matter of Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services*, Docket No. 14-CRB-0001-WR (2016-2020) Testimony of Janusz Ordover, November 28, 2011, ¶ 19; *see, also*, *In the Matter of Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services*, Docket No. 2006-1 CRB DSTRA, Testimony of Janusz Ordover, October 30, 2006, pp. 25-26.)

49 Dennis W. Carlton and Jeffrey M. Perloff (2005), *Modern Industrial Organization* (4th ed.), Boston: Pearson/Addison Wesley, at 85.

> Even though few industries fit the requirements of perfect competition, economists often speak of certain types of industries as being reasonably competitive if they have certain characteristics. Price-taking behavior, many firms, and free entry and exit are often used as criteria to judge the competitiveness of a market. Free entry and exit typically result in firms eventually earning zero [economic] profits.

In the presence of effective competition, no party has significant market power. Hence, a situation in which one or more parties have substantial market power does not constitute effective competition. And an outcome (*e.g.,* a royalty rate) that reflects the exercise of substantial market power does not reflect effective competition.

B. IMPLICATIONS OF SOUND RECORDING RIGHTSHOLDERS' MARKET POWER

53. As the Judges recognized, the major recording companies constitute a complementary oligopoly, which can lead to sound recording royalties well in excess of effectively competitive levels.[51] The high level of sound recording rightsholders' real-world market power has very significant implications for the Majority's vacated approach to rate setting.

54. First, and most obviously, the royalty rates paid by interactive services to sound recording rightsholders will be a poor benchmark for musical works royalty rates unless a downward adjustment is made to correct for the exercise of market power (in addition to any adjustments for factors such as differences in non-content costs). Hence, it is

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[50] A supplier earning zero *economic* profits will cover all of its costs, including the costs associated with financing its capital investments.

[51] *Determination,* pp. 71-72.

essential to make a downward adjustment when setting the royalty rates of the TCC prong; otherwise, the statutory rate will embody the exercise of market power rather than reflect the outcome of effective competition. In addition, to the extent that sound recording royalty rates are used as a benchmark in determining statutory royalty rates under the revenue prong, it is necessary to apply a market-power adjustment here, too.

55. The need to make a market-power adjustment raises the important question: how large an adjustment is necessary? One way in which one might answer this question is to compare the observed sound recording royalty rates with an estimate of what effectively competitive royalty rates would be using a Shapley model. However, such an approach is valid only if the outcome of the Shapley model is reflective of effective competition. As I discussed earlier and will explore further below, the results of the Shapley analyses on which the Majority relied do not reflect effective competition.

56. Moreover, in practice, we know that sound recording rightsholders earn greater payoffs than indicated by the Shapley Value analyses on which the Majority relied.[52] As a matter of arithmetic, if sound recording rightsholders receive more than their Shapley payoffs, then the streaming services and/or musical works rightsholders must necessarily receive *less* than their respective Shapley payoffs.

57. This fact raises a further important question: how will the burden of the excessive royalties collected by sound recording rightsholders be fairly apportioned between the

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[52] *Determination,* pp. 71-72.

streaming services and the musical works rightsholders given that they cannot both receive the full payoffs predicted by the analyses on which the Majority's relied?

58. I address these implications and questions in the following sections.

C. The Shapley Value eliminates neither hold-out power nor market power, and it need not correspond to the outcome of an effectively competitive market.

59. The relationship between Shapley payoffs and those of an effectively competitive market is important in this proceeding for at least two reasons. First, as discussed above, if properly done, a Shapley analysis could in theory serve as a basis for estimating the size of the market-power adjustment necessary (along with other adjustments) in order to use the interactive-streaming, sound recording royalty rates as a benchmark. Second, to the extent the payoffs identified through a Shapley analysis are interpreted as evidence regarding the appropriate royalty rates under the 801(b)(1) standard, those payoffs should be reflective of effective competition.

60. However, as I now discuss, the results of a Shapley analysis need not reflect effective competition in general, and they do not reflect effective competition in the particular models on which the Majority relied.

61. Like the concept of effective competition, the Shapley Value can be interpreted as a process-based conception of fairness. However, the Shapley Value is an incomplete tool for assessing fairness. Specifically, the Shapley Value takes the structure of the underlying situation or "game" as given and then characterizes the division of surplus

among the players in a way that has been interpreted as "fair" conditional on the structure of the game. If the underlying structure is not effectively competitive, however, then the payoffs identified by the Shapley Value are very unlikely to correspond to the payoffs associated with an effectively competitive outcome and may not correspond to typical conceptions of fairness. For example, in some situations, two parties can raise their share of the total rewards by "merging," so that they are treated as if they are a single entity when calculating Shapley payoffs.[53] Many people would consider it unfair to allow all of the sellers of substitute products to merge with one another in order to charge higher prices, and the outcome would not be reflective of effective competition. In such a situation, however, the Shapley Value would calculate increased payoffs for the parties that merge. That is, the Shapley approach would not prevent prices from rising above the effectively competitive level as a result of the merger.

62. Professor Watt's testimony offers a misleading picture of the relationship between the Shapley Value and effective competition.[54] Because it adopted Professor Watt's claims, the Majority's analysis of this issue was also unsound:[55]

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53 Richard Watt (2010), "Fair Copyright Remuneration: The Case of Music Radio," *Review of Economic Research on Copyright Issues,* **7**(2): 21-37, pp. 33-34, discusses a hypothetical numerical example illustrating this fact. For a general analysis of the effects of such mergers or "collusion," see Ilya Segal (2003), "Collusion, Exclusion, and Inclusion in Random-Order Bargaining," *Review of Economic Studies*, **70**(2): 439-460.

54 See Section III.B above.

55 *Determination*, p. 68. The Determination similarly asserts that "The Shapley analyses conducted by Professors Marx and Watt also eliminate this 'walk away' power by valuing all possible orderings of the players' arrivals." (*Determination*, n. 69.)

> The Judges agree with Professor Watt and find that the Shapley Analysis, taking the number of sellers in the market as a given, eliminates the "hold-out" problem that would otherwise cause a rate to be unreasonable, in that it would fail to reflect effective (or workable) competition. However, Professor Marx's Shapley Model also attempts to eliminate a separate factor—market power…").

Both the claim that use of the Shapley Value eliminates the effects of hold out and that market power is a separate factor are incorrect. As shown in Section III.B.1 above, the Shapley Value reduces the walk-away power but *does not eliminate it*.[56] And, as shown in Section III.B.1 above, the ability to hold out is precisely what gives rise to market power in bargaining under the Shapley Value approach.

63. The first error is particularly consequential in the light of the Determination's statement "that a purpose of the compulsory license is to prevent the licensor from utilizing or monetizing the ability to 'walk away' as a cudgel to obtain a better bargain."[57]

64. Although the Shapley Value does not always correspond to an effectively competitive outcome, the Shapley Value can represent an effectively competitive outcome when applied to an underlying game with an appropriate structure.[58] However, in practice, it may be impossible to compute the Shapley Value in situations where the

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56 It is a correct statement that it eliminates the effect of an essential input supplier's holding out *every time,* but that leaves considerable scope for hold-out effects, as the examples show.

57 *Determination*, p. 33.

58 The notions of the Shapley Value and the competitive outcome converge *if* there are sufficiently many players who are substitutes for each other. (See, *e.g.,* Robert J. Aumann (1975), "Values of Markets with a Continuum of Traders," *Econometrica,* **43**(4): 611- 646.)

underlying game has a structure that would give rise to effective competition. In commenting on Professor Marx's analysis, the Majority recognized this fact:[59]

> Although at first blush it would seem more appropriate for Professor Marx to have *directly* adjusted the copyright holders' market power by breaking them up into several entities each with less bargaining power, such an approach would make Shapley modeling less tractable (by increasing the number of arrival alternatives in the algorithm), … [Emphasis in original.]

65. One strategy that has been proposed to address this issue is to examine situations in which multiple parties possess substantial market power, in the hope that each party's market power will offset that of the other parties and that the outcome will reflect that of an effectively competitive market.[60] This approach imposes less of a computational burden than does analyzing an effectively competitive market structure.[61] However, the resulting Shapley payoffs generally do not correspond to those that would be realized under effective competition.[62]

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59 *Determination*, n. 119.

60 For example, as the Determination observes, Professor Watt, in a published academic paper, modified the Shapley analysis in a way that "equalized market power between rights holders and licenses (radio stations)." (*Determination,* p. 67 (citing Richard Watt (2010), "Fair Copyright Remuneration: The Case of Music Radio," *Review of Economic Research on Copyright Issues,* **7**(2): 21-37.))

61 The Determination characterizes this property as "the practicality of equalizing market power by inflating the power of the streaming services (by reducing them to a single representative agent)." (*Determination*, n. 119.)

62 As a witness in the *Web IV* proceeding, I made the similar point that outcome of bilateral monopoly where the seller charges a uniform price and the buyer chooses the quantity may not be close to the competitive outcome. Specifically, I showed that, even when there is only a single buyer and that buyer has equal bargaining power with the seller, the resulting price is not closer to the competitive price than to the monopoly price, and such a price is not effectively competitive as that term would be understood by competition economics. (*In re Determination of Royalty Rates and Terms for Ephemeral Recording*

66. A simple example illustrates this general principle. Consider a firm selling its output to consumers. As noted above, under a competitive outcome, the price would be near cost and almost all of the surplus would accrue to the buyers. Now, consider the Shapley value when the buyers are treated as a single player. Because there is no surplus unless both the seller and the agglomerated buyer are in the coalition, whichever one joins the collation second will receive all of the surplus. Given that the two players have equal chances of being second, the Shapley payoff for each player is one half of the total surplus. Thus, even with this structure, the seller gets a far greater percentage of the surplus than it would in a competitive market.

67. In summary, the Shapley Value is ill-suited to representing effective competition in copyright licensing to streaming services.

D. THERE IS NO REASON TO BELIEVE THAT THE VACATED RATE STRUCTURE WOULD GENERATE A FAIR INCOME FOR SERVICES.

68. The Majority's approach tied the statutory royalty rate to several non-statutory factors and thus there is no basis to believe the resulting rate would generate a fair income for services. This critique is valid even if one believes that the Majority correctly estimated what the ratio of sound recording and musical works royalties would be under a fair outcome.

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and Webcasting Digital Performance of Sound Recordings (Web IV), CRB Docket No. 14-CRB-0001-WR (2016-2020), Written Direct Testimony of Michael L. Katz, October 7, 2014, Technical Appendix, §A.)

69. According to the Majority:[63]

> … an uncapped TCC prong effectively imports into the rate structure the protections that record companies have negotiated with services to avoid the undue diminution of revenue through the practice of revenue deferral. [Note omitted.]

70. However, as Judge Strickler stated in his Dissent:[64]

> … Copyright Owners rightly note that they obtain no legal protection under such a TCC prong. In making this argument regarding displacement and deferral of revenue, Copyright Owners lay out comprehensively *all the problems* inherent in an uncapped TC prong set in a greater of rate structure, such as adopted in the majority opinion:
>
>> The notion that Google's TCC prong will provide protection from revenue gaming, deferral and displacement, and other revenue prong problems is unsupported and speculative. Relying on just the TCC to solve those admitted problems leaves the Copyright Owners' protection from such problems entirely outside the statute …. the per-user rates in the label deals are what protects the Copyright Owners from price-slashing by the services. What is left unanswered …is … how can it be reasonable to ask the Judges to set a rate that does not itself provide for a fair return … but simply puts the Copyright Owners' fair return in the hands of the labels to negotiate terms that will adequately protect the publishers and songwriters as well? The labels do not have a mandate to ensure that the Services provide a fair return to the Copyright Owners, and cannot be directed to ensure such. Indeed, labels may not have the same incentives as songwriters and publishers to negotiate such protections in their deals. To wit, a label could make an agreement with a service that includes only a revenue prong in exchange for equity or some other consideration that it may never include in the applicable revenue subject to the TCC. … [W]hat if Google

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63 *Determination*, p. 36.

64 Dissenting Opinion of Copyright Royalty Judge David R. Strickler, Docket No. 16-CRB-0003-PR (2018-2022) (hereinafter *Dissenting Opinion*)*,* pp. 5-6, citing CORPFF-Google, pp. 39-41 (emphasis in original).

> purchased one or more record labels and did not have to pay ***any*** label royalties? Or what if Spotify chose to avail itself of the compulsory license to create its own master recordings embodying musical works -- which it is already doing [COPFF ¶ 396] -- and chose to compensate itself for its use of the master recordings on a sweetheart basis (or not at all)? Or what if one or more labels decided to enter the interactive streaming market and did not have to pay themselves royalties? In each case, the Copyright Owners' protection – the protection that the Services admit the Copyright Owners need and is provided by the TCC -- would be gone.

71. The Copyright Owners' argument similarly applies to the services. One could make the argument above replacing "Copyright Owners" with "Services," and "return" with "income":

> What is left unanswered …is … how can it be reasonable to ask the Judges to set a rate that does not itself provide for a fair income … but simply puts the Services' fair income in the hands of the labels to negotiate terms that will adequately protect the Services as well? The labels do not have a mandate to ensure that the Copyright Owners provide a fair income to the Services, and cannot be directed to ensure such.

72. As the D.C. Circuit observed:[65]

> Uncapping the total content cost prong across all categories leaves the Streaming Services exposed to potentially large hikes in the mechanical license royalties they must pay. … By eliminating any cap on the total content cost prongs, the Final Determination yokes the mechanical license royalties to the sound recording rightsholders' unchecked market power.

73. Under the vacated rate structure, a change in sound recording rightsholders' market power due to firm restructuring (*e.g.,* a merger or spinoff) could lead to a change in the negotiated royalty rates paid to sound recording rightsholders. The rates under the

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65 *Slip Op*., p. 36.

TCC prong of the vacated rate structure for musical works royalties would then change as well. Suppose, for example, that the change in market power led to an increase in sound recording royalties. Consideration of 801(b)(1) Factors B and C would indicate that there should be *no change* in the musical works royalty rate, while consideration of Factors A and D would suggest that the musical works royalty rate should *fall*. However, under the vacated rate structure, the musical works royalty rate would *rise*. In short, the uncapped TCC prong adopted by the Majority would not promote *any* of the four 801(b)(1) factors and, indeed, would be directly contrary to two of them.

E. THE MAJORITY'S APPROACH INEQUITABLY BURDENED THE SERVICES AND PRIVILEGED THE MUSICAL WORKS COPYRIGHT OWNERS.

74. The Majority's approach to accounting for recording industry market power was to set the ratio of musical works copyright owners' statutory royalties to sound recording copyright owners' royalties equal to what the Majority believed the ratio would be if the sound recording copyright owners did not have market power.[66]

75. The Majority calculated what it considered to be the percent-of-revenue rate implied by Shapley—and Shapley-inspired—analyses.[67] That is, the Majority sought to

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66 *Determination*, p. 73 ("The Judges find that the problem of, in essence, importing complementary oligopoly profits into the musical works rate through a TCC percentage can be avoided by reducing the TCC percentage. Specifically, the TCC percentage should be reduced to a level that produces the same (non-complementary-oligopoly) percentage revenue rate when applied to the existing [[redacted]]% combined royalty as the Shapley-produced TCC percentage yields when applied to the theoretical combined royalties in the model.")

67 *Determination*, p. 72.

ensure that the musical works rightsholders would receive what the Majority calculated to be the payoff implied by Shapley and Shapley-inspired analyses.

76. The following hypothetical situation illustrates the implications of this approach. Suppose that industry's total surplus is 6, and the Shapley Value is 2 each for the sound recording rightsholders, musical works rightsholders, and streaming services. Also, for expositional simplicity, assume that no firm incurs non-content costs. Moreover, suppose that, due to the exercise of market power, the sound recording rightsholders currently receive an actual payoff of 4, while under the existing statutory royalties the musical works rightsholders receive 1. Under the Majority's percent-of-revenue approach to updating the statutory royalty, the first step was to calculate a musical works royalty rate implied by Shapely and Shapley-inspired analyses.[68] This rate is equal to the combined royalty rate that the Majority concluded was predicted by Shapley analyses multiplied by the musical works rightsholders' share of combined revenues, which was based on the Majority's consideration of Shapley and Shapley-inspired analyses. In this example, the combined royalty rate is $\frac{2+2}{6} = \frac{2}{3}$ and the musical works rightsholders' share of combined royalties is $\frac{2}{2+2} = \frac{1}{2}$. Hence, the Majority's approach would lead to a new statutory royalty rate (R_{mw}) equal to $\frac{2}{3} \times \frac{1}{2} = \frac{1}{3}$, so that the payoffs to sound recording rightsholders, musical works rightsholders, and streaming services would be 4, 2, and 0,

68 *Determination,* p. 73.

respectively. In other words, the services would bear all of the burden of the sound recording rightsholders' exercise of market power.

77. A similar pattern would arise under the Majority's adjusted-TCC approach. Under that approach, the musical works royalty rate would be equal to the $TCC\ percentage$ times the royalty rate paid by interactive services to sound recording rightsholders. The Majority calculated what it concluded the $TCC\ percentage$ would be if the industry participants received their Shapley payoffs. The Majority acknowledged that the TCC actually paid to sound recording rightsholders in the marketplace, TCC_t, is greater than the TCC that was indicated by the Shapley analyses it considered. The Majority thus implemented an adjustment to the TCC factor. The target, or adjusted, TCC is equivalent to

$$adjusted\ TCC = \frac{R_{mw}}{R_t - R_{mw}}, \qquad (1)$$

where R_{mw} is the musical works royalty rate (expressed as a percentage of service revenues) the Majority believed was implied by Shapley and Shapley-inspired analyses, and R_t is the combined royalty rate (as a percentage of service revenues) observed in the marketplace.[69]

78. When the statutory royalty rate is set equal to R_{mw}, the combined royalty rate is $R_t = TCC_t + R_{mw}$. This last equation is equivalent to

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69 *Determination*, n. 135 ("$TCC = 1 \div \left((R_t/R_{mw}) - 1\right)$").

$$TCC_t = R_t - R_{mw}. \tag{2}$$

Hence, by Equations (1) and (2) the royalty rate as a percentage of service revenues implied by the TCC prong is

$$adjusted\ TCC \times TCC_t = \frac{R_{mw}}{R_t - R_{mw}} \times (R_t - R_{mw}) = R_{mw}.$$

In words, as did its implied-percentage-of-revenue approach, the Majority's adjusted-TCC approach sought to ensure that the musical works rightsholders receive their Shapley payoff. The issue is even more extreme if the statutory royalty rate in place when the calculations are done is less than that implied by the Shapley analysis: the Majority's adjusted-TCC approach would lead to the musical works rightsholders receiving *more* than their Shapley payoff.[70]

79. Consider the example above once more. Under the Majority's adjusted-TCC approach, the first step was to calculate the target TCC, which is equals to $\frac{R_{mw}}{R_t - R_{mw}}$. Suppose that the musical works rightsholders currently receive 1, which is less than their Shapley Value of 2. Then $\frac{R_{mw}}{R_t - R_{mw}} = \frac{\frac{1}{3}}{\frac{5}{6} - \frac{1}{3}} = \frac{2}{3}$. The second step was to multiply the target

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70 Suppose the current musical works royalty rate is $R_{mw} - \tau$, where τ is a positive constant. Then $TCC_t = R_t - R_{mw} + \tau$, and the royalty rate as a percentage of service revenues implied by the TCC prong is

$$adjusted\ TCC \times TCC_t = \frac{R_{mw}}{R_t - R_{mw}} \times (R_t - R_{mw} + \tau)$$

$$= R_{mw} + \tau \frac{R_{mw}}{R_t - R_{mw}} > R_{mw}.$$

TCC times the TCC, or $\frac{2}{3} \times 4 = \frac{8}{3}$. Hence, the Majority's approach leads to a payoff for the musical works rightsholders that is larger than the musical works rightsholders' Shapley payoff, while the services actually suffer losses equal to $6 - 4 - 2\frac{2}{3} = -\frac{2}{3}$. In other words, the services bear more than 100 percent of the burden of the sound recording rightsholders' exercise of market power.

80. A central source of the problem is that the Majority illogically attempted to set the benefits earned by musical works copyright owners relative to the benefits enjoyed by a non-party rather than those enjoyed by the other party, the streaming services. That is, the Majority concerned itself solely with the ratio of sound recording royalties to musical works royalties:[71]

> First, the use of an uncapped TCC metric is the most direct means of implementing a key finding of the Shapley analyses conducted by experts for participants on both sides in this proceeding: the ratio of sound recording royalties to musical works royalties should be lower than it is under the current rate structure. [Note omitted.]

However, the Shapley analyses credited by the Majority also found that the ratio of sound recording royalties to the net benefits received by the services should be lower than it is under the current rate structure. Yet the Majority made no attempt to correct this ratio. Of course, one could argue that there is no reason to attempt to "repair" this ratio because it involves the economic welfare of entities (sound recording copyright holders) that are

71 *Determination*, p. 35.

not parties to the statutory license. But *exactly the same criticism* applies to the vacated approach.

81. Given that the two parties to the statutory license are the musical works copyright owners and the interactive-streaming services, it would be much more logical to focus on the ratio of the benefits received by musical works copyright owners and the services. In other words, this factor strongly indicates that, if one is going to apply the Shapley Value approach, one would set the ratio of the musical works rightsholders and services equal to the appropriate value, rather than doing so with the ratio of payoffs for musical works rightsholders and sound recording rightsholders.[72]

82. Such an approach more closely comports with intuitive notions of fairness. If sound recording copyright holders are appropriating an excessive share of the benefits being generated by streaming, then the musical works copyright holders and services should share in bearing the consequences of the exercise of sound recording rightsholders' market power. I am unaware of any principle of fairness that says the burden should fall entirely on the services.[73]

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72 I have not attempted to calculate the resulting payoffs under this approach because doing so would require developing a complex Shapley model that accurately reflected effective competition, and a more reliable approach is to utilize the 2012 Settlement as a benchmark.

73 The problem with the vacated approach is confounded by the incorrect assertion that sound recording copyright owners and musical works copyright owners necessarily would earn the same profits under Shapley Value analysis. As the summarized in the Determination (*Determination,* p. 63):

83. The Majority acknowledged that:

(a) All of the models based on Shapley principles indicated that the ratio of sound recording to musical works royalties should be lower than the one that existed at the time of the testimony;[74] and

(b) "Professors Marx's and Watt's Shapley analyses also pointed to a lower overall percentage of service revenue being directed to copyright royalties than exists under the current rate structure.[75]

84. The Majority's approach increased the overall percentage of service revenue being directed to copyright royalties, thus moving the services total costs further away from that suggested by the Shapley Value analyses on which the Majority relied.[76] The Majority attempted to justify this approach by assuming that any increase in the statutory royalty for musical works will be almost entirely offset by a hypothesized decrease in the negotiated sound recording royalty rates—the see-saw effect.[77]

85. The Majority relied on Professor Watt's prediction that the see-saw effect would be substantial:[78]

> Since Professor Gans identifies musical works and sound recordings as perfect complements, he assumes that the musical works licensors would receive the same profit as the record companies (but not the same royalty rate, given their different costs).

But even with perfect complements, the number of each party matters. For example, with three must-have labels and one musical works owner, the labels companies would collectively earn four times as much as the musical works owner.

74 *Determination,* pp. 86-87.

75 *Determination,* p. 87.

76 *Determination,* n. 132.

77 *Determination,* pp. 73-74.

78 *Determination*, pp. 73-74.

> … the Judges rely on Professor Watt's insight (demonstrated by his bargaining model) that sound recording royalty rates in the unregulated market will decline in response to an increase in the compulsory license rate for musical works… Professor Watt's bargaining model predicts that the total of musical works and sound recordings royalties would stay "almost the same" in response to an increase in the statutory royalty. [Citation omitted.]

86. As summarized by the D.C. Circuit:[79]

> Judge Strickler further reasoned that uncapping the total content cost prong could imperil the existence of the interactive streaming services. Specifically, the sound recording copyright owners "may decide to keep their rates high despite the increase in mechanical rates," or they may simply create their own "in-house" streaming services and refuse to contract with the existing interactive streaming services at all. J.A. 837.

87. As Judge Strickler observed in his dissent:[80]

> the record companies may decide to keep their rates high despite the increase in mechanical rates, or decide it is in their interest to avoid a reduction in royalty revenue by creating a completely different paradigm for streaming, by which the record companies move the streaming service in-house and effectively destroy the existing services. Is this speculative? Of course it is, but *that is precisely the problem*. As Copyright Owners' counsel stated in closing argument, and as Google intimated in its post-hearing filing, the potential impact of the record companies' responses to such a rate structure, given their market power, needed to be tested at the hearing, which, of course, it was not.

88. Experience has proven Judge Strickler's concern to be prescient. As summarized in Section III.A.2 above, since the Determination was issued there have been several negotiations between sound recording copyright owners and streaming services.

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[79] *Slip Op.,* p. 18.

[80] *Dissenting Opinion*, p. 4.

Contrary to Professor Watt's prediction, the sound recording copyrights owners did not lower their royalties in response to increases in musical works' mechanical royalties.

89. In short, there is no reason to think that sound recording copyright owners will negotiate rates that yield streaming services the profits indicated by the Shapley Value analyses. A central implication of this fact is that the vacated rates and rate structure did not follow the Majority's stated approach to fairness.

VI. THE VACATED RATE STRUCTURE DID NOT REFLECT RELATIVE ROLES.

90. The vacated rate structure failed to reflect the relative roles or contributions of musical works copyright owners and interactive streaming services in making music available to the public.

A. ECONOMIC INTERPRETATION

91. To a large extent, the objective of reflecting copyright owners' and users' relative "creative contribution, technological contribution, capital investment, cost, risk, and contribution to the opening of new markets for creative expression and media for their communication"[81] raises considerations similar to those raised by the first two statutory objectives.

92. Reflecting relative roles is similar to maximizing availability in that failure to reflect copyright owners' capital investments, costs, and risks can diminish the incentives

[81] 17 U.S.C. §801(b)(1)(C).

to create and publish new works, while failure to reflect copyright users' capital investments, costs, and risks can lead to a curtailment of investments in streaming services. Moreover, the relative creative and technological contributions and contributions to opening up new markets capture the extent to which investments and other activities contribute to maximizing availability.

93. The objective of reflecting relative roles also raises issues similar to those raised by the fair income/fair return objective. In particular, failure to reflect the relative contributions parties make to the creation of benefits and the relative costs—including investment costs—that they incur to make those contributions is unfair in the sense that effective competition or bargaining by parties with comparable bargaining power would reflect relative contributions and costs.[82]

94. From the perspective of economics, stating a separate objective of reflecting relative capital investment and risk also highlights the desirability of taking return on investments (including those that might be considered to be sunk costs) into account in determining statutory royalties. Stated differently, this factor counsels in favor of

[82] The long-run equilibrium price received by suppliers in a perfectly competitive market is equal to the suppliers' marginal cost, regardless of the suppliers' relative contribution to the creation of benefits. (See, *e.g.,* Andreu Mas-Colell, Michael D. Whinston, and Jerry R. Green (1995), *Microeconomic Theory*, Oxford University Press, p. 335-336.) Hence, were one to use *perfect* competition as the fairness notion, any return above cost would be unfair. However, consideration of effective competition or balanced bargaining leads to fair outcomes in which copyright owners share in the benefits created.

considering price setting in the context of a forward-looking process (*i.e.,* considering the effects on future investments).[83]

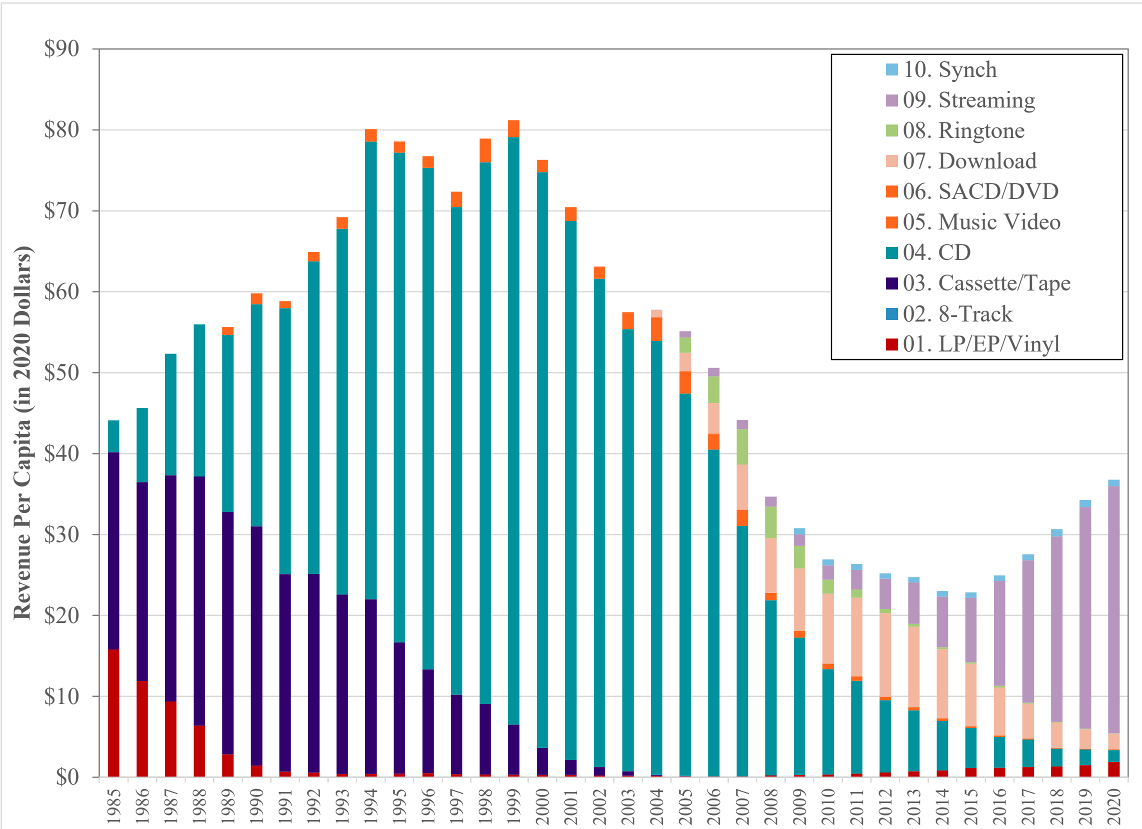
B. STREAMING IS MAKING AN INCREASINGLY LARGE CONTRIBUTION TO THE MUSIC INDUSTRY

95. Examination of industry data indicates that the relative importance of streaming has been increasing, which suggests that the musical works royalty rate should be falling, not rising.

96. Figure 1 below illustrates the contributions of various sources toward total U.S. music revenues and how the sources' relative importance has changed over time.

[83] One implication of taking the contrary position would be that the (now sunk) costs incurred to write existing songs should be ignored so that the writers of those songs would not be entitled to compensation.

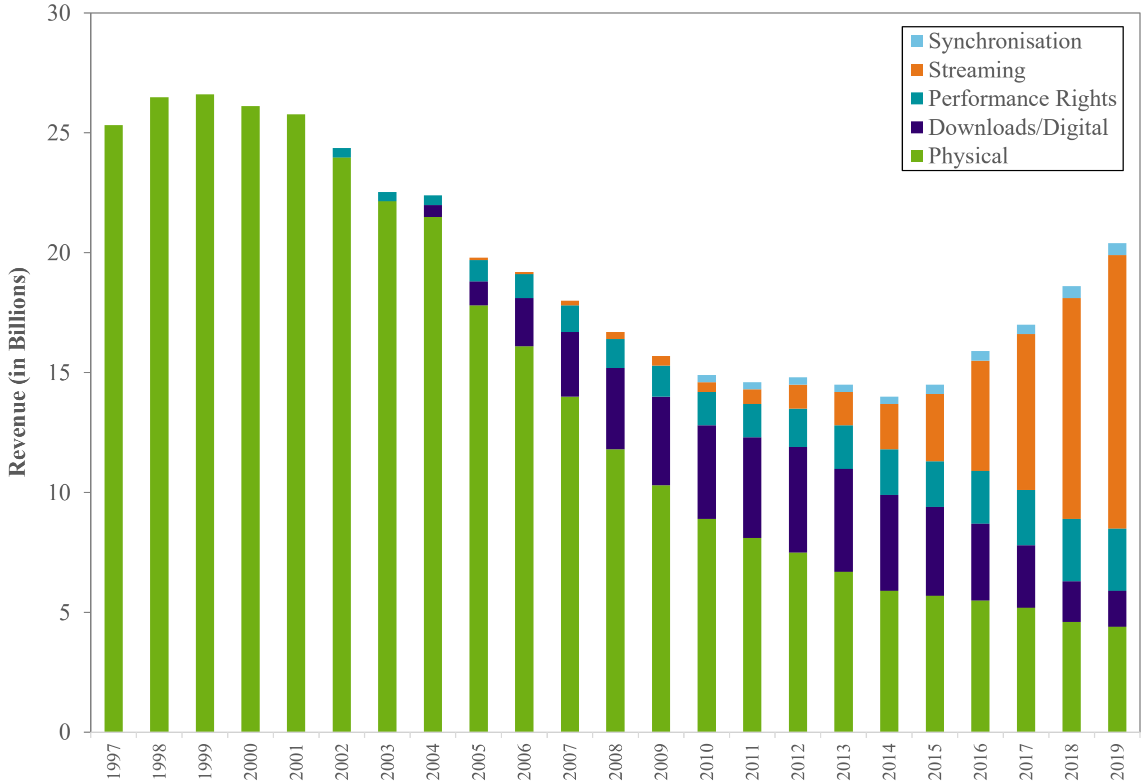
Figure 1: U.S. Music Revenue (per capita), 1985-2020



Sources: RIAA U.S. Sales Database, *available at* https://www.riaa.com/u-s-sales-database/, *site accessed* March 31, 2021 (inflation-adjusted U.S. recorded music revenues by format); U.S. Census Bureau Population Data (U.S. census population estimates).

97. Figure 2 shows similar information at the global level.

Figure 2: Global Music Revenue, 1997-2019



Sources: IFPI Recording Industry in Numbers 2014 (SPOTCRB0003415); IFPI Global Music Report 2019, *available at* https://www.ifpi.org/wp-content/uploads/2020/07/Global_Music_Report-the_Industry_in_2019-en.pdf, *site accessed* March 31, 2021.

98. Examination of Figures 1 and 2 suggests three points:

- First, from 2000 through 2014, the music industry suffered substantial revenue losses each year relative to the previous year. The popular press, industry observers, and academic researchers widely attribute much, but not all, of this decline to the digitization of music and rise of unlicensed music file-sharing sites, most notably starting with Napster in 1999.[84]

- Second, the decline in music industry revenues was not triggered by licensed streaming services. The decline in total music revenues began well before licensed streaming became significant.
- Third, the data indicate that the rise of streaming (including interactive streaming) has reversed the long-term trend of decreasing industry revenues. Figure 1 shows that streaming accounted for an increasing share of U.S. music revenue starting around 2011, when Spotify debuted in the United States.[85] Since 2015, music

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84 See, *e.g.,* David Goldman, "Music's lost decade: Sales cut in half," *CNN Money*, February 3, 2010, *available at* http://money.cnn.com/2010/02/02/news/companies/napster_music_industry/, *site accessed* March 31, 2021; Luis Aguiar, Nestor Duch-Brown, and Joel Waldfogel (2015), "Revenue, New Products, and the Evolution of Music Quality since Napster," Institute for Prospective Technological Studies Digital Economy Working Paper 2015/03, European Commission JRC Technical Reports; ABC News, "RIAA: New Data Show Napster Hurt Sales," February 26, 2002, *available at* http://abcnews.go.com/Technology/story?id=98801, *site accessed* March 31, 2021. These sources are described further in *Katz WDT*, n. 78.

85 Other data also show that on-demand music streaming is increasing rapidly. For example, according to Nielsen data, there were 317 billion on-demand music streams in 2015, up 93 percent from the prior year. And the first half of 2016 has continued to see growth with 209 billion on-demand streams, up 59 percent from the same period in 2015. (See Nielsen, "2015 Nielsen Music U.S. Report," p. 8; Nielsen, "2016 Nielsen Music U.S. Mid-Year Report," p. 2.)

By 2020, according to Nielsen data, there were 2.2 trillion global on-demand audio song streams, up 22.6 percent from the prior year, and 872.6 billion U.S. on-demand audio song streams, up 17 percent from the prior year. (See MRC Billboard, "Year-End Report U.S. 2020," *available at* https://www.musicbusinessworldwide.com/files/2021/01/MRC_Billboard_YEAR_END_2020_US-Final.pdf, *site accessed* March 31, 2021, p. 8.)

industry revenues have grown as revenues attributable to streaming have grown. RIAA data indicate that streaming accounted for approximately 83 percent of music revenue in the United States in 2020.[86]

VII. THE VACATED RATE STRUCTURE DID NOT MINIMIZE DISRUPTIVE IMPACT.

99. The final statutory objective—minimizing any disruptive impact on the structure of the industries involved and on generally prevailing industry practices—calls for an analysis of the impact that changes in the form and/or levels of the royalty rates paid by interactive streaming services would have on the music publishing and streaming industries.

100. As discussed in Section VI.B above, examination of industry data reveals an industry that has been recovering from its earlier economic challenges (*e.g.,* piracy) and is likely to remain sustainable over the coming years—primarily due to the increasing popularity of licensed streaming. Therefore, the objective of minimizing disruption implies that it is desirable to avoid making major changes to the current statutory royalty scheme. However, the vacated structure would have imposed very substantial changes and failed to satisfy the statutory goal of avoiding disruption.

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86 RIAA U.S. Sales Database, *available at* https://www.riaa.com/u-s-sales-database/, *site accessed* March 31, 2021.

101. Perhaps most significantly, the structure would have dramatically increased the royalty rates in both the revenue and TCC prongs. It increased the headline rate by approximately 44 percent.[87] Such large rate increases would have been disruptive.

102. The Majority acknowledged that "a rate increase of the magnitude sought by Copyright Owners would run the very real risk of preventing the services from surviving the 'short-run,' threatening the type of disruption Factor D is intended to prevent."[88] The Majority purported to address this issue in two ways: (a) by proposing a transition period over which the rate increases would be phased in, and (b) by asserting that that see-saw effect would largely insulate the interactive streaming services from large increases in the total royalties paid to sound recording and musical works copyright owners.

103. The Majority asserted that phasing in the increased rates would give the services an opportunity to adapt:[89]

> While the reasonable rate determined by the Judges does not present the same risk of disruption as the rates sought by the Copyright Owners, it does represent a not insubstantial increase of approximately 44% over the current headline rate. In order to mitigate the risk of short-term market disruption, and to afford the services sufficient opportunity "to adequately adapt to the changed circumstance produced by the rate change," the Judges will phase in the new rate in equal annual increments over the rate period.

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87 *Determination*, p. 85.

88 *Determination*, p. 88.

89 *Determination*, p. 88.

104. However, phasing the rate increases in over time only reduces disruption if there are mitigating steps that the parties can enact during the phase-in period. Here, there is no meaningful evidence that potential mitigating steps exist. The only ways for streaming services to reduce their use of the statutory copyright is to raise prices and/or reduce promotion in order to suppress output—which would then reduce the demand for licensed musical works as an input. Such actions can only reduce—but not eliminate—the substantial adverse effects on the services. And the resulting reduction in industry output will harm consumers, whether or not there is a transition period.

105. The Majority's also relied on Professor Watt's prediction that the see-saw effect would be very substantial, so that sound recording royalties would fall over time as a result of the increase in musical works royalties.[90] But, as already demonstrated, Professor Watt's analysis is unreliable. As discussed in Section III.A.1 above, his bargaining model is based on unrealistic assumptions that bias its findings, and his prediction regarding the see-saw effect has been refuted by subsequent experience as described in Section III.A.2 above.

106. There are other elements of the Majority's chosen rate structure that could be disruptive. For example, it would have ended the practice of having distinct rates for different categories of service such as student plans and family plans.[91] The role of the different formulas and percentages is to reflect different market conditions and to support

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90 *Determination*, pp. 73-74.

91 *Determination*, p. 90.

greater availability to consumers. Thus, the move to a unitary rate structure could disrupt some or all of the business models underlying these different offerings.

107. Removing the cap from the TCC prong also would have been disruptive. As the D.C. Circuit observed:[92]

> The Copyright Royalty Board's Final Determination adopted a rate structure for computing the mechanical license that uncapped the total content cost prong for every category of streaming service offered, while simultaneously increasing both the total content cost and revenue rates. With no cap in place, the Board's decision removed the only structural limitation on how high the total content cost (which is pegged to unregulated sound recordings royalties) can climb.

108. Given that the principle function of a cap is to avoid disruption, it logically follows that removing the cap would have increased the risk of disruption. Moreover, the TCC prong ties statutory rates to future negotiations between the services and sound recording rightsholders, which creates uncertainty and threatens ongoing disruption that might otherwise be mitigated when a cap is in effect.

VIII. THE VACATED RATE STRUCTURE IS ESPECIALLY INAPPROPRIATE GIVEN THAT A RATE STRUCTURE BASED ON THE 2012 SETTLEMENT WOULD PROMOTE THE STATUTORY OBJECTIVES.

109. There is no reason to try to rescue the vacated structure because, as I discussed in my written direct testimony, the 2012 Settlement provides an excellent benchmark. In my present testimony, I discuss the evidence that consideration of each of the four

92 *Slip Op*., p. 32.

801(b)(1) statutory objectives indicates that there have been no recent changes in industry conditions that would change this conclusion.

A. The 2012 Settlement Continues to Promote the Four Statutory Factors.

110. It is useful to consider each of the four objectives in turn:

- *Maximize Availability.* The availability of creative works to the public depends on both content creators (*i.e.,* songwriters and publishers) and content distributors (*e.g.,* streaming services) having sufficient financial incentives. As described in my written direct testimony, at that time the music publishing industry had stabilized and leading publishers were earning considerable profits, while interactive streaming services remained unprofitable.[93] These trends have continued. For example, in 2019, U.S. music publishing revenues increased by 11.6 percent relative to the prior year, marking the fifth consecutive year of growth.[94] Meanwhile, services continue to lose money or barely break-even. For example, Spotify earned negative operating income in 2020 and projects to have negative operating income again in 2021.[95] Hence, neither the current state

[93] *Katz WDT,* § III.D.

[94] "NMPA reveals US publishing revenues grew by 11.6% in 2019," *music:)ally,* June 11, 2020, *available at* https://musically.com/2020/06/11/nmpa-reveals-us-publishing-revenues-grew-by-11-6-in-2019/, *site accessed* March 31, 2021.

[95] Spotify released forward-looking guidance for full year 2021 projecting gross margins of 23.7 – 25.7 percent and operating losses of €200-300 million. ("Spotify Technology S.A. Announces Financial Results for Fourth Quarter 2020," *Businesswire,* February 3, 2020,

of the industry, nor changes in industry conditions since the 2012 Settlement indicates that availability would be improved by increasing royalty rates. If anything, this factor counsels in favor of reducing rates to induce interactive streaming services to invest, innovate, and enter to an even greater extent.

- *Afford Both Fair Return to Copyright Owners and Fair Income to Services.* The facts that the music industry has stabilized and publishers are currently more profitable than are interactive streaming services certainly does not suggest that royalty rates should be raised to promote fairness. Arguably, they suggest that rates should be lowered.

- *Reflect Relative Roles.* As described in my written direct testimony, at that time interactive streaming had become an increasingly important form of music distribution, and there had been significant innovation by interactive music streaming services that was valuable to consumers and put a halt to the precipitous decline in music recording revenues that began in 2000.[96] That innovation continues. For example, Spotify spent approximately $954 million (€837 million) on research and development and approximately $1,173 million (€1,029 million) on sales and marketing in 2020 (up from Spotify's spending $159 million (€143 million) on research and development and $273.5 million

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available at https://www.businesswire.com/news/home/20210203005304/en/, *site accessed* March 31, 2021.)

96 *Katz WDT,* §§ III.A and III.D.

(€247 million) on sales and marketing in 2015.[97] Music publishers spend relatively little on investment in the creation, marketing, and distribution of musical works,[98] while songwriters invest their time in the creation of musical works. All things considered, industry trends and conditions do not indicate that the statutory objective would be better achieved by raising rates.

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97 "Spotify Technology S.A. Announces Financial Results for Fourth Quarter 2020," *Businesswire,* February 3, 2020, *available at* https://www.businesswire.com/news/home/20210203005304/en/, *site accessed* March 31, 2021. (Annual figures provided in Euros were converted to U.S. dollars using the corresponding annual exchange rate reported by the Federal Reserve (series AEXUSEU); Tim Ingham, "Spotify Revenues Topped $2BN Last Year as Losses Hit $194M," musicbusinessworldwide.com, May 23, 2016, *available at* http://www.musicbusinessworldwide.com/spotify-revenues-topped-2bn-last-year-as-losses-hit-194m/, *site accessed* March 31, 2021.

98 See *Katz WDT*, n. 139, citing:

In the Matter of Digital Performance Right in Sound Recordings and Ephemeral Recordings, Docket No. 2005-1 CRB DTRA, Rebuttal Testimony of Charles Ciongoli, September 2006, p. 54 ("Universal Publishing spends little or nothing to create, market, promote, manufacture and distribute copyrighted musical works."). [redacted] Travel and entertainment expenses are considered to be marketing-related by Universal's chief financial officer. (*In the Matter of* Digital Performance Right in Sound Recordings and Ephemeral Recordings, Docket No. 2005-1 CRB DTRA, Rebuttal Testimony of Charles Ciongoli, September 2006, pp. 7-8.)

Similarly, Warner-Chappell [redacted]

Publishers do not invest in traditional R&D. If one includes artists and repertoire (A&R) as a form of research and development, UMPG and Warner-Chappell [redacted]

- *Minimize Disruptive Impact.* This objective suggests that the status quo should be maintained. Although all parties in the music value chain face challenging economic conditions, under the current statutory rates there has been a strong supply of new, high-quality musical works and ongoing investment in the creation of innovative streaming services. Maintaining the current statutory rates would minimize any disruptive impact on the structure of the industries involved, as well as industry practices. Moreover, minimizing disruption can be expected to promote future investment. Rate stability facilitates the services' investment planning and promotes investment, all else equal. Hence, investment incentives are promoted by avoiding rate changes in the absence of strong reasons based on application of the other three factors.

B. DIRECT DEALS BETWEEN MUSIC PUBLISHERS AND RECORD COMPANIES FOR MECHANICAL RIGHTS FOR PERMANENT DIGITAL DOWNLOADS SUPPORT THE CONCLUSION THAT THE 2012 SETTLEMENTS REMAINS A GOOD BENCHMARK.

111. The National Music Publishers' Association, Inc. ("NMPA") and the Nashville Songwriters Association International ("NSAI") recently announced a settlement in principle with Sony Music Entertainment ("SME"), UMG Recordings, Inc. ("UMG"), and Warner Music Group Corp. ("WMG") regarding royalty rates and terms under Section 115 of the Copyright Act for physical phonorecords (*e.g.,* CDs, cassettes, and records), permanent digital downloads, ringtones, and music bundles at present addressed

in 37 C.F.R. Part 385 Subpart B.[99] Under the terms of the proposed settlement, the mechanical royalties for permanent digital downloads would remain unchanged from the current rate of either $0.091 per song or $0.0175 cents per minute of playing time or fraction thereof, whichever amount is larger.[100]

112. Expressed as a share of an average retail price of approximately one dollar per track for a digital download, the $0.091 figure corresponds to a percentage royalty rate of just 9.2 percent, which is less than 10.5 percent.[101] As presented in Table 1 below, there

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[99] *In re Determination of Royalty Rates and Terms for Making and Distributing Phonorecords (Phonorecords IV)*, CRB Docket No. 21–CRB–0001–PR (2023–2027), Notice of Settlement in Principle, March 2, 2021.

[100] According to the Notice, "the Participants expect to propose to the CRJs that the royalty rates and terms presently set forth in 37 C.F.R. Part 385 Subpart B, and the related definitions and late fees for Subpart B Configurations presently addressed in Subpart A, should be continued for the rate period at issue in the Proceeding." (*Id*., p. 2.) See also 37 C.F.R. § 385.11(a). ("For every physical phonorecord and Permanent Download the Licensee makes and distributes or authorizes to be made and distributed, the royalty rate payable for each work embodied in the phonorecord or Permanent Download shall be either 9.1 cents or 1.75 cents per minute of playing time or fraction thereof, whichever amount is larger.").

[101] If a song is longer than 5.2 minutes (that is, $0.091/$0.0175), a royalty over $0.091 is applicable. (*Id.*) The vast majority of songs are less than 5.2 minutes long. One report suggests that the average length of songs in 2008 was 3.91 minutes with a standard deviation of 0.76 minutes. (Rhett Allain, "Why are Songs on the Radio About the Same Length?" *Wired*, July 11, 2014, *available at* https://www.wired.com/2014/07/why-are-songs-on-the-radio-about-the-same-length/, site accessed March 31, 2021.) Assuming song length is approximately normally distributed, then approximately 97.5 percent of songs are less than 5.4 minutes long (close to the break-even value length of 5.2 minutes). Thus, the value $0.091 that I use in the calculations presented in this section is very close to the actual average royalty payment per song.

Data regarding the length of the top 200 streamed songs on Spotify in the U.S. during the week of October 20, 2016, also confirms that my use of $0.091 is reasonable. In particular, 190 out of the 200 songs (or 95 percent) were less than 5.2 minutes long, with a mean song length of 3.68 minutes and standard deviation of 0.72 minutes. (Spotify Top 200, *available at* https://spotifycharts.com/regional/us/weekly/latest, site accessed has been an increase in the average price of single digital downloads, from $0.99 in 2006 to $1.22 in 2016, and a corresponding decline in the current statutory mechanical rate as a share of the price, from 9.2 percent to 7.5 percent.[102] As a result, this benchmark suggests that, if anything, the current headline rate in the 2012 Settlement is too high.

October 27, 2016.) Weighted by the share of streams that each song accounted for during the period shows that 97.4 percent of the streamed songs were less than 5.2 minutes in length. And the stream-weighted average royalty payment, accounting for the length of song, is $0.0912, virtually equal to the $0.091 per-track royalty that I use in my analysis.

Similar analysis using data on the length of the top 100 streamed songs on Spotify in the U.S. on March 30, 2021, further confirms that my use of $0.091 is reasonable. In particular, 99 out of the 100 songs (or 99 percent) were less than 5.2 minutes long, with a mean song length of 3.19 minutes and standard deviation of 0.72 minutes. (Spotify Top 200, *available at* https://spotifycharts.com/regional/us/weekly/latest, *site accessed* March 31, 2021.) Weighted by the share of streams that each song accounted for during the period shows that 99.2 percent of the streamed songs were less than 5.2 minutes in length. And the stream-weighted average royalty payment, accounting for the length of song, is $0.0912, virtually equal to the $0.091 per-track royalty that I use in my analysis.

Use of a more comprehensive data source might generate slightly different results, but would be highly unlikely to alter the finding that the permanent digital download royalty rates are lower than the corresponding statutory royalty rates currently in effect for interactive streaming. For instance, even if only 80 percent of streamed songs were less than 5.2 minutes long, and the remaining 20 percent had lengths uniformly distributed between 5.20 and 8 minutes, the share-weighted average royalty payment per song would be $0.096. Using this amount, instead of $0.091, would not change the substantive conclusions discussed in the text.

102 Price per track is calculated as the average revenue per track for single digital downloads.

Table 1: The Current Statutory Rate As a Share of Price Per Digital Track

Year	Revenue (in millions)	Tracks (in millions)	Price Per Track	Royalty Per Track	Royalty as a Share of Price
2006	$581	586	$0.99	$0.091	9.2%
2007	$811	819	$0.99	$0.091	9.2%
2008	$1,032	1,043	$0.99	$0.091	9.2%
2009	$1,172	1,124	$1.04	$0.091	8.7%
2010	$1,336	1,177	$1.14	$0.091	8.0%
2011	$1,522	1,332	$1.14	$0.091	8.0%
2012	$1,645	1,403	$1.17	$0.091	7.8%
2013	$1,573	1,333	$1.18	$0.091	7.7%
2014	$1,355	1,154	$1.17	$0.091	7.8%
2015	$1,185	986	$1.20	$0.091	7.6%
2016	$900	743	$1.21	$0.091	7.5%
2017	$668	545	$1.23	$0.091	7.4%
2018	$490	399	$1.23	$0.091	7.4%
2019	$408	330	$1.24	$0.091	7.3%
2020	$313	257	$1.22	$0.091	7.5%

Source: RIAA U.S. Sales Database, *available at* https://www.riaa.com/u-s-sales-database/, *site accessed* March 31, 2021.

113. The proposed settlement between music publishers and UMG, WMG, and SME further confirms the validity of either maintaining the statutory royalty rates currently in effect or lowering them. In particular, the fact that the publishers agreed to maintain the status quo rates indicates that neither new information nor changes in marketplace conditions warranted a change to the status quo. Indeed, after accounting for inflation, the publishers actually agreed to the equivalent of a lower percentage royalty rate than they had been receiving at the time of the 2012 settlement.

114. The announced settlement in principle is of interest for another reason. As Professor Watt observes, "when there are only two players in a Shapley model…, the outcome is identical to that which is given by the Nash Bargaining Solution with equal bargaining powers."[103] Hence, the settlement can be interpreted as showing that the ratio of sound recording royalties to musical works royalties from a Shapley analysis would be $\frac{0.70-0.075}{0.075} = 8.33$.

115. This ratio is very different than the one that Professors Watt derived in his analysis of hypothetical bargaining between sound recording copyright holders and musical works copyright holders. Professor Watt testified that, based on his Shapley Value analysis, a ratio of $\frac{0.565}{0.435} = 1.30$ is "what we would expect to find in an unrestricted market negotiation between the two groups."[104]

116. The difference between Professor Watt's predicted ratio and what we observe in the settlement in principle further calls into question the reliability of the Shapley Value approach.

IX. CONCLUSION

117. Drawing on my training and experience as an economist, my examination of the public records of earlier proceedings, my analysis of the relevant industries, and my examination of the evidence produced in the present proceeding, I conclude that, from the

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[103] *Watt WRT,* App. 3, p. 9.

[104] *Id*.

perspective of economics, the re-adoption of a rate structure that includes an uncapped TCC prong combined with significantly increased rates would fail to satisfy any of the four statutory objectives. I also continue to find that the royalty structure (both the form and the rate levels) of the 2012 Settlement provides an economically sound basis on which to set the statutory rates for the 2018-2022 period.

APPENDIX A: PROFESSOR WATT'S A CALIBRATED BARGAINING MODEL

118. Professor Watt uses a calibrated bargaining model to predict the rate at which an increase in the royalties paid to musical works copyright owners would induce sound recording copyright owners to accept lower royalties from the services (*i.e.,* the see-saw effect). As the analysis of this appendix demonstrates, Professor Watt's prediction is based on a modeling approach that is highly unrealistic and generates results that are completely unreliable.

119. The infirmities of Professor Watt's analysis can be seen by considering the following slightly generalized version of his model of the bargaining between a label and an interactive streaming service. The Nash Bargaining Solution is the license fee, L^*, that maximizes the so-called Nash product:[105]

$$N(L) = (R - L - M - C_S)^{1-\mu}(L - C_L - A)^{\mu}, \quad \text{(A.1)}$$

where

- R is the revenue earned by the streaming service if it obtains the necessary licenses;
- L is the royalty payment that the service agrees to pay the label;

[105] I generally adopt Professor Watt's notation. However, because there are inconsistencies in his notation, I make a few changes to maintain consistency in my notation. For example, Professor Watt uses s as a subscript to denote the sound recording industry (*Watt WRT,* ¶ 29), and he also uses S to denote a streaming service in parts of his appendix (*Watt WRT,* App. 3, p. 1) but a record label in other parts of his appendix (*Watt WRT,* App. 3, p. 8.). Elsewhere he uses L to denote record labels (*Watt WRT,* App. 3, p. 10).

- M is the statutory royalty payment paid by the streaming service to musical works rightsholders;
- C_S is the streaming service's total non-content costs;
- μ is the Nash bargaining-power coefficient (only values between 0 and 1 are consistent with the Nash bargaining framework);[106]
- C_L is the label's non-content costs; and
- A is the payoff that the label would receive if it did not reach an agreement with the streaming service.

120. Suppose that we can express the following three quantities in terms of other quantities in the model:

- $M = \theta R$, where θ is the royalty rate for payments to the musical works rightsholders expressed as a percentage of revenue;
- $C_L = f_L + r_L L$, where f_L and r_L are constants; and
- $A = \sigma R \delta^0 (1 - r_L)$, where σ is the share of revenues that would be diverted to other streaming services and δ^0 is the royalty rate that the label receives from the other interactive streaming services.[107]

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106 Professor Watt incorrectly suggests that μ could take the values 0 or 1. (*Watt WRT,* App. 3, p. 10.) However, if μ took one of these values, then the predicted license fee would be equal to either negative infinity or infinity.

107 In addition, one should account for non-streaming alternatives if one is going to use the model to predict the see-saw rate. I do not further consider this complication because introducing it would not change the fact that this approach—especially Professor Watt's application of it—is unreliable. Moreover, there is no reason to rely on theoretical

121. Expressed in terms of the more detailed notation, the Nash product (A.1) is

$$N(L) = (R - L - \theta R - C_S)^{1-\mu}(L - f_L - r_L L - \omega R)^{\mu}. \qquad \text{(A.2)}$$

where the notation has been simplified by defining $\omega \equiv \sigma\delta^0(1 - r_L)$.

122. The first derivative of $N(L)$ is

$$N'(L) = -(1-\mu)(R - L - \theta R - C_S)^{-\mu}(L - f_L - r_L L - \omega R)^{\mu}$$
$$+ \mu(1 - r_L)(R - L - \theta R - C_S)^{1-\mu}(L - \alpha_L - r_L L - \omega R)^{\mu-1} \qquad \text{(A.3)}$$

L^*, the value of the license fee that maximizes the Nash product, must satisfy the first-order condition $N'(L^*) = 0$. It follows from Equation (A.3) that $N'(L^*) = 0$ if and only if

$$0 = -(1-\mu)(L - f_L - r_L L - \omega R) + \mu(1 - r_L)(R - L - \theta R - C_S),$$

which is equivalent to

$$(1 - r_L)L = \mu(1 - r_L)(R - \theta R - C_S) + (1-\mu)(f_L + \omega R).$$

Hence,

$$L^* = \mu(R - \theta R - C_S) + (1-\mu)\frac{f_L + \omega R}{1 - r_L}. \qquad \text{(A.4)}$$

123. Observe that this equation implies that, if the musical works royalties, $M = \theta R$, changes by the total amount Δ, then the resulting sound recording royalties, L^*, changes by $\mu\Delta$. Hence, in addition to being the bargaining-power parameter, μ is also the rate at which the see-saw effect occurs.

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predictions given that we have now accumulated market experience on which we can rely.

124. Equation (A.4) can be rewritten to express the value of μ as a function of the other parameters:

$$L^* = \mu(R - \theta R - C_S) + (1 - \mu)\frac{f_L + \omega R}{1 - r_L},$$

which is equivalent to

$$\mu = \frac{(1 - r_L)L^* - f_L - \omega R}{(1 - r_L)(R - \theta R - C_S) - f_L - \omega R}.$$

125. The royalties received by the label can be expressed as $L^* = \delta R$, where δ is the royalty rate expressed as a fraction of streaming revenues. Using this notation,

$$\mu = \frac{(1 - r_L)\delta R - f_L - \omega R}{(1 - r_L)(R - \theta R - C_S) - f_L - \omega R}.$$

If we know the values of the parameters on the right-hand side of the this equation, we can derive an estimate of the value of μ.

126. Professor Watt makes two highly problematical assumptions. First, Professor Watt assumes that $C_L = 0.45 \times \delta R$.[108] That is, he assumes that $f_L = 0$ and $r_L = 0.45$. In other words, he assumes that a change in the licensing rate, δ, *holding the underlying sales constant*, somehow causes the sound recording rightsholders non-content costs to rise.

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[108] *Watt WRT,* App. 3, pp. 11-12.

127. Professor Watt also assumes that the sound recording copyright owners have no outside option (*i.e.,* $A = 0$). Using the formula $A = \omega R = \sigma R \delta^0 (1 - r_L)$ and noting that Professor Watt assumes that $\delta^0 = 0.60$ and $r_L = 0.45$,[109] we see that Professor Watt's assumption that $A = 0$ is equivalent to assuming that $\sigma = 0$. In words, Professor Watt assumes that there would be no diversion to other interactive streaming services if the label failed to reach an agreement with a particular service. As noted in the text, elsewhere in his report, Professor Watt asserts that it is reasonable to assume that $\sigma = 0.90$.[110]

128. Under Professor Watt's assumptions,

$$\mu = \frac{\delta R}{R - \theta R - C_S}.$$

The fact that Professor Watt's assumptions are problematical can be seen by the property that, given observed sound recording royalties, his estimate of μ is independent of the label's non-content costs. Intuitively, one would expect that, holding the observed license fee constant, seeing higher non-content costs would lead the analyst to attribute less bargaining power to the licensor.

129. Professor Watt assumes that $\delta = 0.6$, $\theta = 0.12$, and $C_S = 0.25 \times R$.[111] Under these assumptions,

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109 *Watt WRT*, App. 3, p. 11.

110 *Watt WRT,* App. 3, pp. 6-7.

111 *Watt WRT,* App. 3, pp. 11-12.

$$\mu = \frac{0.6}{0.63} = 0.95.$$

130. Professor Watt does not follow his own methodology (specifically, he does not account for this claim that the label's costs will vary with the royalty rate it receives) and thus calculates a value of $\mu = 0.92$.[112] However, he does not take his estimate of μ to be an estimate of the rate of the see-saw effect. Instead, he calculates the see-saw rate as[113]

$$\frac{\mu}{1-(1-\mu)r_L} = \frac{0.92}{1-0.08\times 0.45} = 0.95.$$

Thus, although Professor Watt's estimate of the bargaining power parameter is incorrect even accepting his other assumptions, his estimate of the see-saw rate is consistent with his other assumptions.

131. If one were to maintain all of Professor Watt's assumptions except to allow for $\omega > 0$, then

$$\mu = \frac{0.55\times 0.60\times R - \omega R}{0.55\times R\times(1-0.12-0.25)-\omega R}.$$

$$\mu = \frac{0.33-\omega}{0.35-\omega}.$$

The estimated see-saw rate quickly approaches 0 as ω approaches 0.33 from below. Moreover, $\omega > 0.33$ would imply that the model is misspecified because negative values of μ are inconsistent with the modeling approach.

112 *Watt WRT,* App. 3, p. 11.

113 *Watt WRT,* App. 3, p. 12.

132. Recall that Professor Watt assumes that $\delta^0 = 0.60$, $r_L = 0.45$, and—elsewhere in his testimony—$\sigma = 0.90$. Using the definition $\omega = \sigma\delta^0(1 - r_L)$, Professor Watt's assumptions imply that $\omega = 0.30$, which yields an estimated value of $\mu = 0.67$. This predicted see-saw rate is far below Professor Watt's prediction of 0.954.

133. Now, return to the (unrealistic) assumption that $\omega = 0$, and consider the effects of Professor Watt's assumption that an increase in the royalty rate paid to sound recording rightsholders will trigger an increase in the sound recording rightsholders non-content costs. To see the effect of this assumption, consider what would happen if one instead makes the much more plausible assumption that the royalty rate does not directly affect the sound recording copyright owners' non-content costs (*i.e.,* $C_L = f_L$). Then setting $f_L = 0.27 \times R$[114] and maintaining all of Professor Watt's other assumptions,

$$\mu = \frac{0.60 \times R - 0.27 \times R}{R - 0.12 \times R - 0.25 \times R - 0.27 \times R}.$$

$$\mu = \frac{0.60 - 0.27}{1 - 0.12 - 0.25 - 0.27} = \frac{0.33}{0.36} = 0.92.$$

This predicted see-saw rate is lower than Professor Watt's estimate of 0.95.

134. If we abandon both of the unrealistic assumptions above, but—for the sake of argument—adopt Professor Watt's other assumptions,

$$\mu = \frac{0.60 - 0.27 - \omega}{1 - 0.12 - 0.25 - 0.27 - \omega} = \frac{0.33 - \omega}{0.36 - \omega}.$$

[114] $0.27 = 0.45 \times 0.60$.

Now, a value of $\omega = 0.30$ yields an estimated value of $\mu = 0.50$. This value corresponds to a situation in which the label and the streaming service have equal bargaining power and would bear equal shares of the burden of any increase in musical works royalties.[115]

135. It is important to recognize that the calculations in this appendix demonstrate that Professor Watt's approach—not just the specific prediction he makes—is unreliable; the corrections above do not rehabilitate his model. That is, although the predictions derived above based on more realistic assumptions are superior to Professor Watt's prediction, they have flaws as well.

136. One issue is that Professor Watt asserts that "It is also true that [there] exist other close substitutes to interactive streaming – including non-interactive services, which give further weight to the claim that, even as a whole, the interactive streaming firms do not supply an essential input."[116] Accounting for consumer substitution to non-interactive services would further raise the value of A used in the model calibration, and thus lead to even lower estimates of μ.

137. Another reason that the overall approach is unreliable is that the predicted value of μ is very sensitive to the assumed values of various other parameters. For example, if

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115 The parties would have equal bargaining power as captured by μ. The label and service still would not have equal bargaining positions because their disagreement payoffs would be dramatically different from one another. This imbalance is due to the complementary oligopoly nature of the labels and the substitution among the services.

116 *Watt WRT*, n. 14.

the interactive services were assumed to pay 55 percent of their revenues to sound recording rightsholders (*i.e.,* $\delta = 0.55$), then

$$\mu = \frac{0.55 - 0.27 - \omega}{1 - 0.12 - 0.25 - 0.27 - \omega} = \frac{0.28 - \omega}{0.36 - \omega}.$$

In this case, a value of $\omega = 0.30$ yields an estimated value of μ that is negative, which is inconsistent with the Nash bargaining model.

138. It should also be noted that, even if one incorrectly believed that Professor Watt's unrealistic assumptions that $C_L = 0.45 \times R$ and $\omega = 0$ were appropriate, his results depend on at least one other unjustified assumption. Recall that, under these two assumptions,

$$\mu = \frac{\delta R}{R - \theta R - C_S}.$$

Professor Watt generally relies on Professor Marx's estimates of various parameter values, and he acknowledges that her estimates imply that $C_S = 0.424 \times R$.[117] However, Professor Watt assumes, without offering any quantitative evidence, that $C_S = 0.25 \times R$.[118] Had he used Professor Marx's empirical estimate C_S, he would have estimated that

$$\mu = \frac{0.60}{1 - 0.12 - .424} > 1,$$

117 *Watt WRT,* App. 3, p. 5.

118 *Watt WRT,* App. 3, p. 7.

which is inconsistent with his Nash bargaining model. Although Professor Watt might argue that this shows that costs cannot be that high, an equally—if not more—plausible—explanation is that his model is misspecified.

APPENDIX B: MATERIALS RELIED UPON

Produced Documents

	Date	Bates Number(s)
IFPI Recording Industry in Numbers 2014.	--	SPOTCRB0003415
Universal Music Publishing Group US P&L, 2012-2016.	--	UMPG0002118
Warner-Chappell Comparative US P&L Analysis, 2011-2016.	--	WC000000829

Filings

	Date	Bates Number(s)
CRB DTRA, Rebuttal Testimony of Charles Ciongoli.	09/2006	--
D.C. Circuit opinion. No. 19-1028, August 7, 2020.	08/2020	--
Phonorecords III, Dissenting Opinion of Copyright Royalty Judge David R. Strickler, Docket No. 16-CRB-0003-PR (2018-2022).	02/2019	--
Phonorecords III, Expert Report of Jeffrey A. Eisenach, Ph.D.	10/2016	--
Phonorecords III, Expert Report of Joshua Gans.	10/2016	--
Phonorecords III, Expert Report of Marc Rysman, Ph.D.	10/2016	--
Phonorecords III, *In re Determination of Royalty Rates and Terms for Making and Distributing Phonorecords*, Docket No. 16-CRB-0003-PR (2018-2022).	02/2019	--
Phonorecords III, Oral Testimony of Anindya Ghose.	04/2017	--
Phonorecords III, Oral Testimony of Leslie Marx.	04/2017	--
Phonorecords III, Oral Testimony of Richard Watt, Ph.D.	03/2017	--
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Phonorecords III, Written Rebuttal Testimony of Richard Watt, Ph.D.	02/2017	--
Phonorecords IV, *In re Determination of Royalty Rates and Terms for Making and Distributing Phonorecords*, Notice of Settlement in Principle, Docket No. 21–CRB–0001–PR (2023–2027).	03/2021	--
SDARS I, Written Testimony of Janusz Ordover.	10/2006	--
SDARS II, Written Testimony of Janusz Ordover.	11/2011	--
Web IV, Written Direct Testimony of Michael L. Katz.	10/2014	--

Data

AEXUSEU: U.S. / Euro Foreign Exchange Rate, U.S. Dollars to One Euro, Annual, Not Seasonally Adjusted, Federal Reserve Economic Data, Economic Research Division, Federal Reserve Bank of St. Louis.	--	--
RIAA U.S. Sales Database, *available at* https://www.riaa.com/u-s-sales-database/, *site accessed* March 31, 2021.	--	--
U.S. Census Bureau Population Data (U.S. census population estimates).	--	--

Reports

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Other

17 U.S. Code § 801 - Copyright Royalty Judges; Appointment and Functions.	--	--
37 C.F.R. § 385 - Rates and Terms for Use of Nondramatic Musical Works in The Making and Distributing of Physical and Digital Phonorecords.	--	--
Interview with Jason Ryan, Vice President of Financial Planning and Analysis at Pandora, March 31, 2021.	03/2021	--
Treaty on the Functioning of the European Union, Article 102.	--	--

PUBLIC VERSION

Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
The Library of Congress
Washington, D.C.

In re **DETERMINATION OF RATES AND TERMS FOR MAKING AND DISTRIBUTING PHONORECORDS (Phonorecords III)**	**Docket No. 16-CRB-0003-PR (2018-2022) (Remand)**

DECLARATION OF MICHAEL KATZ

I, Michael Katz, declare under penalty of perjury that the statements contained in my Written Direct Remand Testimony in the above-captioned proceeding are true and correct to the best of my knowledge, information, and belief.

Executed this 1st day of April, 2021 in San Francisco, CA.

Michael L Katz

Michael Katz

PUBLIC VERSION

Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
The Library of Congress
Washington, D.C.

In re **DETERMINATION OF RATES AND TERMS FOR MAKING AND DISTRIBUTING PHONORECORDS (Phonorecords III)**	**Docket No. 16-CRB-0003-PR (2018-2022) (Remand)**

WRITTEN DIRECT REMAND TESTIMONY OF GEORGE WHITE
(On behalf of Pandora Media, LLC)

INTRODUCTION

1. My name is George White. I am the Senior Vice President, Music Licensing, for Sirius XM and Pandora Media, LLC (together, the "Company"). I have served in that role since I joined the Company in September 2013, first with Sirius XM and then, after Sirius XM acquired Pandora in 2018, for Pandora as well.

2. My work prior to joining the Company includes executive posts at *Billboard*, as General Manager of *Billboard* Digital, and Warner Music Group, where I served as Senior Vice President, Strategy and Product Development, working for over a decade to lead the development of new mobile and online distribution and promotion channels for music. I have a Bachelor of Arts in Economics from Davidson College.

3. My chief responsibility at the Company is negotiating licenses with rights owners—music publishers, performance rights organizations, and record companies—for the rights necessary to operate our services. As relevant to this proceeding, those services include Pandora Plus (a "limited offering" in the parlance of Section 115), and the fully interactive Pandora Premium service. Historically, Pandora relied primarily (though not exclusively) on statutory licenses under Sections 112 and 114 to operate its noninteractive offerings. In 2016,

Pandora decided to expand its offerings to upgrade our prior Pandora One subscription webcasting service to Pandora Plus and to add Pandora Premium. To accomplish that expansion, Pandora began entering into direct license agreements with individual record companies, which set the royalty rates Pandora would pay for sound recording rights.

4. I present this testimony to address how Pandora's rates paid for sound recordings [redacted]—in the wake of the Judges' 2018 Final Determination, which uncapped the so-called "TCC" prong and increased mechanical rate levels for musical works. In short, [redacted].

5. As described in the following sections, Pandora continues to pay the major record companies (Warner Music Inc., Sony Music Entertainment, and Universal Music Group) and the leading independent aggregators (the Merlin Network and Orchard Enterprises) the same basic royalty rates that Pandora paid for its Pandora Premium and Pandora Plus services before the Final Determination here. Moreover, in its recent renewal negotiations with each of these record companies and aggregators, [redacted].

A. Warner Music Inc.

6. On September 15, 2016, Pandora entered into an agreement with Warner setting sound recording royalty rates for a two-year term. For the Pandora Premium service, Pandora

agreed to pay Warner a headline royalty rate [redacted].

7. For Pandora Plus, Pandora agreed to pay Warner a headline royalty rate [redacted].

8. [redacted]

[redacted], at which point I became more directly involved in the negotiations along with my colleague, Angela Abbott. At that point in time, we sought to reengage with Warner on [redacted].

9. The Pandora and Warner teams spoke during the week of April 6, 2020 to kick-start the renewal discussions. I specifically requested rate relief in light of the *Phonorecords III* determination. On April 16, 2020, Ms. Abbott followed up on those discussions by sending an email to the Warner team (copying me and other members of the Pandora team) with a set of slides and a proposed term sheet for the renewal, which outlined [redacted][1] [redacted].

10. On April 28, 2020, Warner's Jessica Goldenberg sent an email [redacted]

[1] *See* [redacted] (PAN Dir. Rem. Ex. 001) at 2-3.

[redacted][2]

11. On May 1, 2020, Ms. Abbott emailed the Warner team again (copying me and other members of the Pandora team) explaining that [redacted][3]

12. The Warner negotiators [redacted].

13. [redacted].

B. Sony Music Entertainment

14. On September 12, 2016, Pandora entered into an agreement with Sony setting sound recording royalty rates for a two-year term. For the Pandora Premium service, Pandora agreed to pay Sony a royalty rate [redacted]

[2] *Id.* at 1-2.
[3] *Id.* at 1.

[redacted].

15. For the Pandora Plus service, Pandora agreed to pay Sony [redacted]. Those basic royalty rates remain in effect today.

16. In 2020, Pandora redoubled its efforts to negotiate a new licensing agreement with Sony, who, as with Warner, [redacted]. On September 3, 2020, we held a kickoff meeting with the Sony team to discuss the renewal. We walked through our list of requests, and I made clear [redacted].

17. After the meeting, on September 8, 2020, my colleague, Craig McFadden, followed up on the discussions by sending an email to the Sony team (copying me and other members of the Pandora team) with a proposed term sheet for the renewal, which outlined [redacted]

[redacted].[4]

18. On September 18, 2020, Sony's Dan Blumberg sent us a markup of the draft term sheet, which [redacted][5] [redacted] The parties also agreed that [redacted].

19. After several months of further negotiations, [redacted].

C. Universal Music Group

20. On September 14, 2016, Pandora entered into an agreement with Universal setting sound recording royalty rates. For the Pandora Premium service, Pandora agreed to pay Universal a royalty rate [redacted]

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[4] *See* [redacted] (PAN Dir. Rem. Ex. 002).
[5] *See* [redacted] (PAN Dir. Rem. Ex. 003).

[redacted]. The initial term of the agreement was two years.

21. During the fourth quarter of 2017, Pandora and Universal began negotiations to amend their license agreement. Although nearly a year remained in the term of the original agreement, [redacted].[6] Although the amendment ("UMG Amendment No. 4") was not formally executed until February 6, 2018—thus post-dating the Initial Determination in this matter by roughly ten days—[redacted], and was not in any way related to or driven by, the initial determination. The royalty rates established in UMG Amendment No. 4 [redacted].

22. On July 9, 2020, a team from Pandora met with representatives from Universal to kick-start negotiations on a long-term renewal of our sound recording license agreement. The Pandora team was led by Mr. McFadden and included Chris Norton, David Ring, Jonathan Barnes, and myself. The Universal team included Aaron Harrison, Mike Janus, and Bryan

[6] *See* [redacted] (PAN Dir. Rem. Ex. 004).

Stone. During that meeting, the Pandora team walked Universal through its list of "asks," and I explicitly stated that Pandora [redacted]. Shortly after that meeting, Pandora sent Universal a written term sheet, including the rate relief I requested.[7]

23. [redacted]. As such, [redacted].

[redacted]

D. Merlin Network

24. On September 12, 2016, Pandora entered into an agreement with Merlin setting sound recording royalty rates for a two-year term. For the Pandora Premium service, Pandora agreed to pay Merlin [redacted] but that occurred only during the first few months after Pandora Premium was first launched.

25. For the Pandora Plus service, Pandora agreed to pay Merlin [redacted].

[7] *See* [redacted] (PAN Dir. Rem. Ex. 005).

26. [redacted]. After a series of short-term renewals, Pandora's conversations [redacted], similar to the record companies discussed above. During those conversations, I specifically mentioned [redacted]. When we resumed negotiations a couple months later, Merlin [redacted].

27. After additional negotiations, [redacted].

E. Orchard Enterprises

28. On September 12, 2016, Pandora entered into an agreement with Orchard setting sound recording royalty rates for a two-year term. For the Pandora Premium service, Pandora agreed to pay Orchard [redacted], but that occurred only during the first few months after Pandora Premium was first launched.

29. For the Pandora Plus service, Pandora agreed to pay Orchard [redacted].

30. Those basic royalty rates [redacted]

[redacted] (as noted above in ¶ [redacted]).

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DECLARATION OF GEORGE WHITE

I, George White, declare under penalty of perjury that the statements contained in my Written Direct Remand Testimony in the above-captioned proceeding are true and correct to the best of my knowledge, information, and belief.

Executed this 1st day of April, 2021 in Woodbine, NJ.

George White

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INDEX OF WRITTEN DIRECT REMAND EXHIBITS SUBMITTED ON BEHALF OF PANDORA MEDIA, LLC

Exhibit No.	Sponsoring Witness	Description
PAN Dir. Rem. Ex. 001	George White	WMG Email (Restricted)
PAN Dir. Rem. Ex. 002	George White	SME Email (Sept. 8, 2020) & PAN-SME Term Sheet (Restricted)
PAN Dir. Rem. Ex. 003	George White	PAN-SME Term Sheet (Restricted)
PAN Dir. Rem. Ex. 004	George White	UMG Email (Oct. 27, 2017) (Restricted)
PAN Dir. Rem. Ex. 005	George White	UMG Email (July 20, 2020) & PAN-UMG Term Sheet (Restricted)

Pan. Dir. Rem. Exs. 1 - 5

(Phonorecords III)

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DECLARATION AND CERTIFICATION OF BENJAMIN E. MARKS REGARDING RESTRICTED PROTECTED MATERIAL

(On behalf of Pandora Media, LLC)

1. I am counsel for Pandora Media, LLC ("Pandora") in the above-captioned case. I respectfully submit this declaration and certification pursuant to the terms of the Protective Order issued July 27, 2016 (the "Protective Order"). I am authorized by Pandora to submit this Declaration on Pandora's behalf.

2. I have reviewed the Services' Joint Opening Brief (the "Opening Brief"), the Written Direct Remand Testimony of Pandora's expert witness Michael L. Katz (the "Katz WDRT") (including the document produced in connection therewith), and the Written Direct Remand Testimony of Pandora's fact witness George White (the "White WDRT") (including the exhibits attached to the White WDRT and the documents produced in connection therewith). I have also reviewed the definitions and terms provided in the Protective Order. After consultation with my client, I have determined to the best of my knowledge, information and belief that portions of the Opening Brief, the Katz WDRT (including the associated document), and the White WDRT (including the associated exhibits and documents) contain information that Pandora has designated as "confidential information" as defined by the Protective Order (the "Protected Material"). The Protected Material is shaded in grey highlight in the restricted e-

filings of the Opening Brief, the Katz WDRT, and the White WDRT, and is fully redacted in the public e-filings of the same.

3. The Protected Material includes, but is not limited to, testimony and exhibits involving (a) contracts and contractual terms (including the negotiation thereof), that are not available to the public, highly competitively sensitive and, at times, subject to express confidentiality provisions with third parties; and (b) highly confidential internal business information, financial data, negotiation correspondence, and competitive strategy that are proprietary, not available to the public, and commercially sensitive.

4. If this contractual, strategic, and financial information were to become public, it would place Pandora at a commercial and competitive disadvantage, unfairly advantage other parties to the detriment of Pandora, and jeopardize its business interests. Information related to confidential contracts or relationships with third-party content providers could be used by Pandora's competitors, or by other content providers, to formulate rival bids, bid up Pandora payments, or otherwise unfairly jeopardize Pandora's commercial and competitive interests.

5. The contractual, commercial and financial information described in the paragraphs above must be treated as Restricted Protected Material in order to prevent business and competitive harm that would result from the disclosure of such information while, at the same time, enabling Pandora to provide the Copyright Royalty Judges with the most complete record possible on which to base their determination in this proceeding.

Pursuant to 28 U.S.C. § 1746, I hereby declare under the penalty of perjury that, to the best of my knowledge, information and belief, the foregoing is true and correct.

Dated: April 1, 2021
New York, NY

/s/ *Benjamin E. Marks*

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Counsel for Pandora Media, LLC

Proof of Delivery

I hereby certify that on Monday, April 05, 2021, I provided a true and correct copy of the Pandora's Written Direct Remand Submission (Public Version) to the following:

Apple Inc., represented by Dale M Cendali, served via ESERVICE at dale.cendali@kirkland.com

Johnson, George, represented by George D Johnson, served via ESERVICE at george@georgejohnson.com

Spotify USA Inc., represented by A. John P. Mancini, served via ESERVICE at jmancini@mayerbrown.com

Nashville Songwriters Association International, represented by Benjamin K Semel, served via ESERVICE at Bsemel@pryorcashman.com

Google LLC, represented by David P Mattern, served via ESERVICE at dmattern@kslaw.com

Amazon.com Services LLC, represented by Scott Angstreich, served via ESERVICE at sangstreich@kellogghansen.com

National Music Publishers Association (NMPA) et al, represented by Benjamin Semel, served via ESERVICE at Bsemel@pryorcashman.com

Signed: /s/ Todd Larson