Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
The Library of Congress

In the Matter of

DETERMINATION OF RATES AND TERMS FOR MAKING AND DISTRIBUTING PHONORECORDS (PHONORECORDS III)

Docket No. 16-CRB-0003-PR (2018-2022)

EXPERT REPORT OF ANINDYA GHOSE (REPLACEMENT COPY)
NOVEMBER 1, 2016
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I. ASSIGNMENT

1. My name is Anindya Ghose. I have been asked by counsel for Apple Inc. (“Apple”) to provide an economic opinion relevant to the proceeding before the Copyright Royalty Board (“CRB”) to determine reasonable mechanical royalty rates and terms for making and distributing phonorecords for the period beginning January 1, 2018 and ending on December 31, 2022 (“Phonorecords III”). In particular, I have been asked to conduct an economic analysis of the digital music industry and mechanical royalty rates for permanent downloads, ringtones, interactive streams, and locker services, considering the following four objectives set forth in Section 801(b) of the Copyright Law:

   • To maximize the availability of creative works to the public.
   • To afford the copyright owner a fair return for his or her creative work and the copyright user a fair income under existing conditions.
   • To reflect the relative roles of the copyright owner and the copyright user in the product made available to the public with respect to 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.
   • To minimize any disruptive impact on the structure of the industries involved and on generally prevailing industry practices.

II. SUMMARY OF OPINIONS

2. Apple’s proposed royalty rates for permanent downloads and ringtones, which are the same as the current royalty rates for those products, are consistent with the Copyright Royalty Board’s finding in the prior Section 115 proceeding in 2008. The Copyright Royalty Board’s analysis from that proceeding applies even today and there is no compelling reason to change the royalty rates for permanent downloads and ringtones. Apple’s proposal for permanent downloads and ringtones is, therefore, reasonable.

3. A per-play rate structure, such as that proposed by Apple, is the appropriate structure for interactive streaming. It appropriately balances the rewards to songwriters and streaming services. As long as the per-play-rate is appropriately determined and streams are measured in a way that is indicative of demand, then the royalty payments to songwriters are likely to be
commensurate with the demand for their songs. In other words, under Apple’s proposal, if the demand for their songs increases (i.e., if their songs are streamed more), their income also will increase. Under a per-play rate structure, streaming services also would be rewarded appropriately for the risks they take, as the payment to songwriters would not be tied to the financial outcomes of the streaming services’ decisions about how to develop their platforms. If those decisions lead to greater revenues then the services would retain the additional financial rewards, thus incentivizing them to take such risks.

4. A per-play rate structure for interactive streaming is consistent with the rate structures for other prominent forms of music distribution (e.g., permanent downloads have a per-unit rate structure). As interactive streaming becomes a major means of music consumption and replaces other forms of music delivery, it is reasonable to bring the royalty rate structure in line with these other forms.

5. A per-play rate structure for interactive streaming is simple, transparent, and easy to administer. Under a per-play rate structure, the royalty payments to songwriters would correspond directly to the number of times a song is streamed (where a stream is appropriately measured). Songwriters would know exactly how royalty payments are calculated, and there would be no variability in the per-stream rates that songwriters receive from different services or from the same service over time.

6. Apple’s proposed royalty rate for interactive streaming also is reasonable in that it is consistent with benchmarks from the music industry and academic research.

7. Apple’s proposed royalty rates for paid locker services and purchased content locker services are similarly simple, transparent, and appropriate.

III. QUALIFICATIONS

8. I am a Professor of Information, Operations and Management Sciences (IOMS) and a Professor of Marketing, a Stern Faculty Scholar, and a NEC Faculty Fellow at New York University’s (“NYU”) Leonard Stern School of Business. At NYU, I have served in a number of capacities, including: Director of the Center for Business Analytics, Co-Director of the Center for Digital Economy Research, and Chair of the NYU-AIG Partnership on Innovation for Global Resilience. The principal focus of my research and teaching at NYU has been on analyzing the
economic consequences of the Internet on industries and markets transformed by its shared
technology infrastructure. Specifically, I have worked on economic issues arising in online
markets, Internet commerce, digital marketing, mobile advertising, and social media. I am the
author or co-author of over 80 peer-reviewed journal and conference articles on these and other
topics. I have also co-authored about 90 additional workshop articles.

9. I have served as a Senior Editor of *Information Systems Research* and an Associate Editor
of *Management Science*. I have received numerous awards for excellence in research in
Information Systems, Computer Science, and Marketing. In 2014, I was named by
BusinessWeek as one of the “Top 40 Professors Under 40 Worldwide.” I am a winner of the
CAREER award from the National Science Foundation (“NSF”) for my work on estimating the
economic value of user-generated content on social media platforms on the Internet. I have
received other NSF grants and grants from corporations recognizing my research.

10. I have consulted in various capacities with several leading Fortune 500 corporations on
realizing business value from Information Technology (“IT”) investments, internet marketing,
business analytics, mobile marketing, and digital marketing analytics. I have served in a senior
advisory role to Internet start-ups. I have been interviewed by and/or my research has been
profiled numerous times in the BBC, Bloomberg TV, CNBC, China Daily, The Economist, The
Economic Times, Financial Times, Forbes, NBC, Xinhua, Time, LA Times, Marketplace Radio,
Washington Post, The Wall Street Journal, Knowledge@Wharton, and elsewhere. I have taught
courses on the role of IT in business and society, Internet commerce, social media, digital
marketing, and business analytics at the undergraduate, MBA, Executive MBA, Master of
Science in Business Analytics, Executive Education and Ph.D. levels worldwide. I am a frequent
keynote speaker in executive gatherings and thought leader events globally.

11. I have previously provided expert testimony in the matter of *In re Facebook, Inc., IPO
Securities and Derivative Litigation*, on April 30, 2015.¹ A copy of my curriculum vitae is
attached as Appendix A. A list of materials I have relied upon in forming my opinions in this
expert report is attached as Appendix B.

¹ *In re Facebook, Inc., IPO Securities and Derivative Litigation*, on behalf of Facebook, Inc. and the individual
defendants, United States District Court, Southern District of New York, Case No. 1:12-md-02389.
12. I am being compensated at my standard billing rate of $800 per hour. I have been assisted in this matter by staff of Cornerstone Research, who worked under my direction. I may receive compensation from Cornerstone Research based on its collected staff billings for its support of me in this matter. Neither my compensation in this matter nor my compensation from Cornerstone Research is in any way contingent or based on the content of my opinion or the outcome of this or any other matter.

IV. BRIEF BACKGROUND ON PERMANENT DOWNLOADS, RINGTONES, INTERACTIVE STREAMING, AND LOCKER SERVICES, AND ON RELATED INDUSTRY TRENDS

13. In the past two decades, the music industry has expanded both in terms of breadth and accessibility. The digital era has largely moved music consumption from physical format sales, such as vinyl records and compact discs, to digital formats, which can be played on a greater variety of devices, both portable and non-portable. Primary among these digital formats are permanent downloads, ringtones, interactive streaming, and locker services.

A. Permanent Downloads and Ringtones

14. Permanent digital downloads are digitally transmitted sound recordings that are purchased and owned by a user (although the copyright still resides with the copyright owner). Apple’s iTunes software, a major innovation in digital downloads, was launched in January 2001. The iTunes Music Store opened shortly thereafter, in April 2003. Today, iTunes offers music, movie, and TV show downloads, as well as a radio service. In the last decade, other

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2 “Digital Definitions,” Harry Fox Agency, https://secure.harryfox.com/public/DigitalDefinitions.jsp#20, a true and correct copy of which is attached hereto as APL-081. In the Code of Federal Regulations, a “permanent digital download” is defined as a “digital phonorecord delivery that is distributed in the form of a download that may be retained and played on a permanent basis.” See 37 C.F.R. § 385.2.


competitors such as Amazon Music,6 Zune Marketplace (later renamed Xbox music, then Groove Music),7 Rhapsody (later renamed Napster),8 and Google Play Music have entered the market.9

15. The business models for most of these services are fairly similar: digital downloads are sold in single units or bundles, and each unit is associated with a price (typically within the $1 range for single digital tracks).10

16. Ringtones are excerpts of sound recordings that are used as alerts on mobile communications devices.11 Ringtones are provided by a variety of websites and applications ("apps"). Some of these allow users to download ringtones for free.12 Among these, Zedge and

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10 Amazon offers many digital downloads in a price range of $0.69–$1.29. See “Deals,” Amazon, https://www.amazon.com/MP3-Deals/b?node=678551011, a true and correct copy of which is attached hereto as APL-026; “Digital Music: $0.69–$1.29,” Amazon, https://www.amazon.com/s/ref=sr_s_n_r_b267856011%3A163856011%2Cp_36%3A69-129%2Cp_n_feature_browse-bin%3A625151011&qid=1477349398&bbn=163856011&sort=price-desc-rank, a true and correct copy of which is attached hereto as APL-026. iTunes offers digital downloads in a price range of $0.69–$1.29. See APL-027, “iTunes,” Apple, http://www.apple.com/itunes/music/. eMusic differs from competitors in that it offers several tiers of monthly plans in which users may purchase a certain number of MP3s. For example, a $15.99 monthly plan includes up to 34 downloads per month and a $1 bonus. Higher tiers offer more downloads per subscription dollar. Amie Street, though now defunct, offered a demand-based pricing system in which the price of a specific MP3 would vary with the number of times it was downloaded. See “Amplify Your Music Collection: Member Plans,” eMusic, http://www.emusic.com/info/plans-pricing/, a true and correct copy of which is attached hereto as APL-046; APL-148, Michael Arrington, “Amazon Acquires Amie Street, But Not in A Good Way,” TechCrunch, September 8, 2010, https://techcrunch.com/2010/09/08/amazon-acquires-amie-street-but-not-in-a-good-way/.
Mobile9 are the most popular. Other business models ask users to pay a fee for each ringtone downloaded; in these models, ringtone prices are similar to those for digital downloads.

B. Interactive Streaming

In contrast to digital download providers, streaming services (such as Apple Music, Google Play, and Spotify) enable users to access or “stream” music files from various devices (as opposed to allowing users to purchase and own the music files). These services do not provide users with permanent copies of the songs or albums, and they require an internet or mobile connection for access. Interactive streaming services (as opposed to non-interactive streaming services) provide “on-demand” access to music files and afford users a high degree of freedom with respect to music consumption. For example, not only can users play any song in the interactive streaming service provider’s catalog, they also can move forward or backward within a song and replay a song at any time. In addition, these services may add innovative features that enhance a user’s experience beyond pure streaming (e.g., ability to create playlists, ability to read lyrics of the songs being played, and customized recommendations). Many of these services also offer offline listening and limited downloads, which are digital deliveries of a sound recording that are available only for a pre-specified amount of time.
18. Interactive streaming services typically require users to have a subscription in order to access the service’s features. Some online services offer interactive streaming as a perk or incremental feature to a primary, subscription-based offering, but do not require users to pay the full monthly fee for the use of the streaming component (i.e., subscribers of the primary service pay a lower monthly fee for the streaming component than do non-subscribers). One example of such a service is Amazon Music Unlimited, which is an interactive streaming service provided for $7.99 per month to Amazon Prime subscribers, and $9.99 per month to all others. Amazon Prime subscribers also may access, at no additional charge, a streaming service called “Amazon Prime Music,” which offers ad-free access to a smaller library of music. Standalone subscription services are also offered, such as Apple Music and Spotify Premium. Lastly, some providers allow consumers to sign up and use interactive streaming services free of charge. These services are typically ad-supported, i.e., they generate revenues through the sale of advertising (e.g., Spotify Desktop).

C. Locker Services

19. Digital music locker services, which are a complement to streaming services, enable users to conveniently access their digital music files from a compatible device, such as a smartphone or desktop. Digital music files are uploaded to a locker either manually, by individual users, or via the locker service’s software, which scans each user’s music database and matches the files from this database to music files stored in a centralized repository (“the cloud”). In the latter method, the user’s original music file is not uploaded to the locker; rather,
the service affords the user access to a “matched” music file stored in the centralized repository. This “matched” file may be higher in sound quality than the user’s original music file.22

20. All three major digital music locker providers (Apple, Amazon and Google) employ match-based technology and provide two types of services: a purchased-content locker service and a paid locker service.23 A purchased-content locker service allows its users to access songs stored in the provider’s cloud, provided such songs were purchased through the same locker service provider or one of its affiliates.24 For example, when an Apple user purchases a song from Apple’s digital music store (iTunes), that user automatically gain access to the purchased song through Apple’s cloud, and can re-download that song at any time.25

21. A paid locker service, on the other hand, is subscription-based and provides users with access to songs that they store in the provider’s cloud without requiring the user to have purchased these songs from the provider.26 A user could, for example, manually rip or extract songs from a CD that was not purchased through the provider. The paid locker service would then “match” these ripped or extracted songs to songs in the service’s cloud. While this service is referred to as a “paid” locker service, some companies provide this service as a free benefit to their existing customers. For example, Amazon allows its customers to “match” up to 250 songs to its cloud.27 Users gain access to these songs through the Amazon Cloud Player.28 A paid locker service also may be bundled with another product. Apple Music, for example, provides its paid locker service (iTunes Match) to Apple Music users for free.29

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22 For example, songs are matched to a file with a format 256kbps AAC, 256kbps MP3, and 320kbps MP3 in Apple, Amazon, and Google’s digital music locker service, respectively. See Dan Graziano, “Comparing Music Storage Services from Apple, Amazon, Google,” CNET, March 10, 2015, https://www.cnet.com/how-to/itunes-match-vs-google-play-vs-amazon-music/, a true and correct copy of which is attached hereto as APL-070.


24 37 C.F.R. § 385.21.


26 37 C.F.R. § 385.21.


Ultimately, the main difference between a purchased-content locker service and a paid locker service is the type of files it allows its users to “match,” with paid locker service allowing more flexibility.30

D. Related Trends in the Digital Music Industry

The music industry has undergone changes at an accelerating pace since the first form of music recording was invented, as discussed in detail in Dr. Ramaprasad’s report.31 This change in pace has been characterized by several shifts in music consumption. In the past decade, since the advent of MP3 files and the iPod device, digital music delivery has been established as the main form of music delivery to consumers. The share of digital downloads as a fraction of the total music purchased (including physical distributions like CDs, vinyl, and digital downloads) has risen from less than 2% in 2004 to 54% in 2015,32 such that digital downloads now account for more than half of the revenues from music ownership. Meanwhile, revenues from streaming services have dramatically increased since 2010, and in 2015 were close to overtaking other forms of music consumption.33 As revenues from streaming services have increased, there has been a corresponding decrease in revenues from CD sales and permanent digital downloads.34 Given the trends in interactive streaming, CD sales, and digital downloads, it seems likely that future increases in streaming will continue to come at the expense of other forms of music distribution, such as digital permanent downloads and physical media (e.g., CDs).35

30 37 C.F.R. § 385.21.
32 Ramaprasad Report, ¶ 53.
33 Ramaprasad Report, Figure 1.
34 Ramaprasad Report, ¶ 55.
35 Prior academic research has found that music streaming also can stimulate sales of digital music (e.g., downloads). See, for example, Luis Aguiar and Bertin Martens, “Digital Music Consumption on the Internet: Evidence from Clickstream Data,” Information Economics and Policy 34, 2016, pp. 27–43, a true and correct copy of which is attached hereto as APL-137. With the rapid rise of Spotify, however, digital music sales have been decreasing, suggesting that there is a net substitution effect between streaming and digital music sales. See, for example, Luis Aguiar and Joel Waldfogel, “Streaming Reaches Flood Stage: Does Spotify Stimulate or Depress Music Sales?,” Institute for Prospective Technological Studies Digital Economy Working Paper 2015/05, 2015, pp. 1–37, a true and correct copy of which is attached hereto as APL-038.
V. CURRENT AND PROPOSED MECHANICAL ROYALTY RATES FOR PERMANENT DOWNLOADS, RINGTONES, INTERACTIVE STREAMING, AND LOCKER SERVICES

A. The Current Mechanical Royalty Rates

24. Title 37, Part 385 of the Electronic Code of Federal Regulations ("C.F.R"), titled “Rates and Terms for Use of Music Works Under Compulsory License for Making and Distributing of Physical and Digital Phonorecords,” is the subject of the current proceedings. It contains three subparts, each describing a different statutory category of music distribution: (i) Subpart A addresses physical phonorecord deliveries, permanent digital downloads, and ringtones; (ii) Subpart B addresses interactive streaming and limited downloads; and (iii) Subpart C addresses limited offerings, mixed service bundles, music bundles, paid locker services, and purchased content locker services. The royalty rates currently in effect for each of the three subparts were originally defined in 2008 and later extended to 2017 via negotiations in April 2012 among music industry participants, including the Recording Industry Association of America ("RIAA"), the National Music Publishers’ Association ("NMPA"), and the Digital Media Association ("DiMA").

1. The Current Mechanical Royalty Rates for Permanent Downloads and Ringtones

25. The current statutory mechanical royalty rates under Subpart A of Section 115 for physical phonorecord deliveries, permanent digital downloads, and ringtones are based on a per-unit structure that has been in effect since January 2006. $0.091 for each phonorecord delivery or permanent digital download (or $0.0175 per minute of playing time or fraction thereof, as of 2009, but this rate was based on the market rates that were in effect under various existing contracts. See “What Are Mechanical Royalty Rates?” Harry Fox Agency, https://www.harryfox.com/license_music/what_mechanical_royalty_rates.html, a true and correct copy of which is attached hereto as APL-009. See also "What Are Mechanical Royalty Rates?," Harry Fox Agency, https://www.harryfox.com/license_music/what_mechanical_royalty_rates.html, a true and correct copy of which is attached hereto as APL-071.}

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36 37 C.F.R. § 385. Limited offerings are subscription-based services that provided access only to specific music genres or playlists. Mixed service bundles combine various music and non-music services (such as locker service and ringtones plus a mobile phone), while music bundles offer various music products (such as CDs and ringtones).


38 Ringtones were not subject to compulsory licensing until 2006. The rate setting proceedings established a $0.24 mechanical royalty for ringtones as of 2009, but this rate was based on the market rates that were in effect under various existing contracts. See “What Are Mechanical Royalty Rates?,“ Harry Fox Agency, https://www.harryfox.com/license_music/what_mechanical_royalty_rates.html, a true and correct copy of which is attached hereto as APL-009; Final Determination of Rates and Terms, In the Matter of Mechanical and Digital Phonorecord Delivery Rate Determination Proceeding, November 24, 2008 (“Final Determination of Rates and Terms”), pp. 1–2, 7–8, 49, 53, 56–57, 60, 72, a true and correct copy of which is attached hereto as APL-071.
whichever is greater), and $0.24 for every ringtone.\textsuperscript{39} In 2008, these rates were re-established by the United States Copyright Royalty Judges.\textsuperscript{40}

2. The Current Mechanical Royalty Rate for Interactive Streaming

The current rate structure for interactive streaming and limited downloads was determined through a settlement between copyright owners, the Digital Media Association (“DiMA”), the Recording Industry Association of America (“RIAA”), and several others in 2008.\textsuperscript{41} The rate structure involves a complicated calculation in order to determine the mechanical royalty with respect to interactive streaming and limited downloads for any particular song. First, one must calculate the difference between (a) a percentage of service revenue, subject to a minimum as defined below, and (b) the royalty paid for the public performance of the musical work (as opposed to the public performance of the sound recording):\textsuperscript{42}

\begin{enumerate}
\item[26.] 10.5\% of service revenue, subject to a minimum of the lesser of:
\begin{enumerate}
\item a percentage of royalties for sound recordings (depending on the licensing record company’s status under U.S.C. 115), and
\item a per-subscriber rate of $0.80;\textsuperscript{43}
\end{enumerate}
\item[27.] Public performance royalties that have been or will be expensed on public performance licenses for performance of the musical composition.
\end{enumerate}

Second, one has to determine whether the royalty number that results from the calculation above is less than a per-subscriber rate of $0.50 per subscriber per month, in which case the per-subscriber rate applies instead.\textsuperscript{44} Finally, the royalty amount must be allocated, or divided,

\begin{footnotesize}
\footnotesuperscript{39} 37 C.F.R. §§ 385.3(a)–(b).
\footnotesuperscript{40} APL-071, Final Determination of Rates and Terms, pp. 1–2, 72.
\footnotesuperscript{41} APL-071, Final Determination of Rates and Terms, pp. 2, 17–20.
\footnotesuperscript{42} 37 C.F.R. § 385.12.
\footnotesuperscript{43} 37 C.F.R. § 385.13. Should the interactive streaming service be a free non-subscription or ad-supported service, the percentage of royalties minimum is a slightly higher percentage of expenses. See 37 C.F.R. § 385.13(c). The per-subscriber minimum also varies by type of service. For example, the per-subscriber minimum is $0.50 for standalone non-portable subscriptions, and $0.80 for standalone portable subscriptions. See 37 C.F.R. § 385.13(a).
\footnotesuperscript{44} The $0.50 per-subscriber royalty floor applies to standalone portable subscription services, the category into which Google Play, Spotify, and Apple Music fall. Standalone non-portable streaming only subscription services and standalone non-portable mixed subscription services are subject to a $0.15 and $0.30 per-subscriber per-month royalty floor, respectively. Bundled subscription services are subject to a floor of $0.25 per active subscriber (i.e., a subscriber who has played at least one licensed work in the month). There is no per-subscriber royalty floor for free non-subscription or ad-supported services. See 37 C.F.R. § 385.13(a).
\end{footnotesize}
among the songwriters and publishers who own the particular song, proportional to the number of plays of each licensed song during the reporting period.\footnote{37 C.F.R. § 385.12(b)(4); “How the Money Flows Back to Songwriters, Artists, Publishers, and Labels,” Future of Music Coalition, undated, http://futureofmusic.org/sites/default/files/moneyflow_streams.png, a true and correct copy of which is attached hereto as APL-110.}

28. Streaming services that offer promotional rates to subscribers, such as free trial periods, may not be required to pay royalties during these periods.\footnote{37 C.F.R. § 385.14.}

3. The Current Mechanical Royalty Rates for Locker Services

29. The current rate structure for locker services also involves a complicated calculation that is similar to the rate structure for interactive streaming. The royalties owed are calculated as the difference between (a) a percentage of service revenue,\footnote{The percentage of service revenue involved in the calculation ranges from 10.5% for limited offerings, to 11.35% for music bundles and mixed service bundles, to 12% for paid locker service, to 12% of incremental service revenue for purchased content locker service. See 37 C.F.R. § 385.23(a).} subject to a minimum of a percentage of royalties for sound recordings and, for paid locker services and limited offerings, a per-subscriber minimum;\footnote{The percentage-of-royalties minimum is the lower of a percentage of all-in royalties (mechanical rights and sound recording rights) owed for sound recordings and a (different and higher) percentage of royalties owed for sound recording rights only. This percentage varies by service as well. The per-subscriber minimum is $0.17 for paid locker services and $0.18 for limited offerings. See 37 C.F.R. § 385.23.} and (b) public performance royalties that have been or will be expensed on public performance licenses for performance of the musical composition.\footnote{37 C.F.R. § 385.22(b)(2).} Similar to the mechanical royalty for interactive streaming and limited downloads, the royalty amount that results from this calculation then is divided among songwriters and publishers in various ways, according to the service licensed.\footnote{37 C.F.R. § 385.22(b)(3).} Another complication is that the individual components of the calculation for paid locker services and purchased locker services are different.

30. The current “all-in” rate (inclusive of mechanical and performance rights) for paid locker service is the maximum of:\footnote{37 C.F.R. §§ 385.22(b)(1), 385.23(a)(4).}

\begin{enumerate}
\item 12% of service revenue;
\item 20.65\% of a service’s payments to record companies for sound recording rights only (if licenses are not pass-through), or 17.11\% of a service’s all-in payments to record companies for sound recording and mechanical rights together (if licenses are pass-through); and
\end{enumerate}
c) the aggregate amount of $0.17 per subscriber-month.

31. The all-in rate for purchased content locker service, on the other hand, is the greater of: 52

   a) 12% of incremental service revenue for purchased content locker service; and

   b) 22% of a service’s incremental payments to record companies (above the otherwise applicable payments for the permanent digital downloads) for sound recording rights only (if licenses are not pass-through), or 18% of a service’s all-in payments to record companies for sound recording and mechanical rights together (if licenses are pass-through).

B. Apple’s Proposal

32. Apple proposes no change to the rates under Subpart A for phonorecords or permanent digital downloads. 53

33. Apple proposes simplifying the rate structure for the second statutory category under Subpart B (interactive streaming and limited downloads) in a way that matches the rate structure for phonorecord deliveries, permanent digital downloads, and ringtones under Subpart A. For interactive streams and limited downloads, Apple proposes an all-in per-play rate of $0.00091 for all non-fraudulent interactive streams greater than or equal to 30 seconds. The mechanical royalty would be equal to this all-in rate minus performance royalties paid for performance of the musical composition. Fraudulent interactive streams and interactive streams less than 30 seconds would have a royalty rate of zero. 54

34. The third statutory category, under Subpart C, currently contains five types of services: limited offerings, mixed service bundles, music bundles, paid locker services, and purchased content locker services. Apple proposes eliminating these separate categories and simplifying the existing complex rate structures to a single monthly per-subscriber all-in rate (inclusive of mechanical and performance rights) of $0.17 for paid locker services. The royalty rate for purchased content locker services proposed by Apple is zero. 55

52 37 C.F.R. §§ 385.22(b)(1), 385.23(a)(5).
54 Apple Inc. Proposed Rates and Terms, p. 2.
55 Apple Inc. Proposed Rates and Terms, p. 3.
C. The Various Participants’ Proposals

1. The Various Participants’ Proposals for Permanent Downloads and Ringtones

In addition to Apple, Further, the National Music Publishers’ Association (“NMPA”), National Songwriters’ Association International (“NSAI”), Universal Music Group, Warner Music Group, the Church Music Publishers Association, the Songwriters of North America, and the Harry Fox Agency reached a settlement in June 2016 to extend the current rate structure for these formats through the next rate setting period (2018-2022). Should the settlement fail to consummate, however, NMPA and NSAI propose higher rates for phonorecords, digital downloads, and ringtones. On October 28, 2016, the NMPA, NSAI, and Sony Music Entertainment also agreed to the settlement and urged the Judges to adopt the settlement industry-wide for the statutory rates and terms under Subpart A.

2. The Various Participants’ Proposals for Interactive Streaming

In summary, the structures of the eight rate proposals of the various participants, including Apple, with respect to Subpart B rates for interactive streaming are of the following three types: (i) per-play rate structures; (ii) per-stream rate structures; and (iii) per-consumption rate structures.

57 Further, the National Music Publishers’ Association (“NMPA”), National Songwriters’ Association International (“NSAI”), Universal Music Group, Warner Music Group, the Church Music Publishers Association, the Songwriters of North America, and the Harry Fox Agency reached a settlement in June 2016 to extend the current rate structure for these formats through the next rate setting period (2018-2022). Should the settlement fail to consummate, however, NMPA and NSAI propose higher rates for phonorecords, digital downloads, and ringtones. On October 28, 2016, the NMPA, NSAI, and Sony Music Entertainment also agreed to the settlement and urged the Judges to adopt the settlement industry-wide for the statutory rates and terms under Subpart A.

56 Further, the National Music Publishers’ Association (“NMPA”), National Songwriters’ Association International (“NSAI”), Universal Music Group, Warner Music Group, the Church Music Publishers Association, the Songwriters of North America, and the Harry Fox Agency reached a settlement in June 2016 to extend the current rate structure for these formats through the next rate setting period (2018-2022). Should the settlement fail to consummate, however, NMPA and NSAI propose higher rates for phonorecords, digital downloads, and ringtones. On October 28, 2016, the NMPA, NSAI, and Sony Music Entertainment also agreed to the settlement and urged the Judges to adopt the settlement industry-wide for the statutory rates and terms under Subpart A.
George Johnson proposes a per-play rate for interactive streaming, and a one-time fee plus a per-play rate for locker services. 61

38. In addition to Apple, 60 in this proceeding submitted rate proposals for locker services under Subpart C.

61 George Johnson’s (GEO) Preliminary Disclosures, pp. 3–4.
62 As discussed in Dr. Ramaprasad’s report, these are minima based on the number of subscribers. See Ramaprasad Report, § IV.B.2.
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3. The Various Participants’ Proposals for Locker Services

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41. In the subsequent sections, I discuss why Apple’s proposal makes the most sense from an economic perspective and why the other proposals are not appropriate.

VI. APPLE’S PROPOSED RATES FOR PERMANENT DOWNLOADS AND RINGTONES ARE CONSISTENT WITH THE COPYRIGHT ROYALTY BOARD’S FINDING IN THE PRIOR SECTION 115 PROCEEDING

42. In the Mechanical and Digital Phonorecord Delivery Rate Determination Proceeding that took place between 2006 and 2008, the Copyright Royalty Board determined that statutory mechanical royalty rates under Section 115 for physical phonorecord deliveries, permanent digital downloads, and ringtones are to be based on a per-unit structure (also known as a “usage fee” or “usage-based” structure).67 In their 2008 determination, the Copyright Royalty Judges held that “several factors tip the scales in favor of a usage fee structure,” as opposed to the alternative “revenue-based” proposals.68 In light of the difficulties associated with revenue-based proposals, the Judges concluded that “it is more reasonable to adopt a usage-based fee structure.”69

43. In their analysis, the Copyright Royalty Board Judges highlighted various advantages associated with a usage-based (per-download or per-reproduction) royalty structure. First, the Judges determined that measuring usage for downloads and ringtones is “straightforward” and does not involve any intractable problems.70 The Judges observed that “each reproduction of the musical work on a physical CD (or some other older physical format such as cassette tapes or

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65 APL-071, Final Determination of Rates and Terms, p. 22.
66 APL-071, Final Determination of Rates and Terms, p. 2.
67 APL-071, Final Determination of Rates and Terms, p. 23.
68 APL-071, Final Determination of Rates and Terms, p. 23.
69 APL-071, Final Determination of Rates and Terms, p. 23.
70 APL-071, Final Determination of Rates and Terms, p. 23.
vinyl LPs), a permanent digital download or a digital ringtone counts as a use of the musical work, [n]o proxies need be formulated to establish the number of such reproductions. They are readily calculable as the number of units in transactions between the parties.\textsuperscript{71} In contrast, the Judges identified numerous difficulties with using a “percentage of revenue” approach, such as “differences and disagreements related to the definition of revenues” in the proposals of different parties.\textsuperscript{72} The Judges also noted that “auditing and enforcement costs are likely to be lower” in a usage-based rate structure as “fewer data elements are required to be collected and reviewed…compared to a revenue-based metric.”\textsuperscript{73} Ultimately, the Judges concluded that the “ease of application [of the usage-based structure] offers an efficiency in valuing the rights at issue not available under the percentage of revenue alternatives.”\textsuperscript{74}

44. The Judges also addressed arguments raised by proponents of a revenue-based structure. For example, some participants in that proceeding claimed that a usage-based rate structure would have a negative impact on service providers’ business, and that a revenue-based structure would allow more flexibility to lower the prices of music delivered to consumers.\textsuperscript{75} In response, the Judges stated that the royalties in question constitute “just one component of industry expenses (as distinguished from several other major cost components),” that these other costs can serve as a source for price reductions and that there is no persuasive evidence that the application of a per-unit structure would have an adverse impact on business.\textsuperscript{76} Moreover, the Judges indicated that the flexibility that would be provided to businesses by virtue of using revenue-based structures raises “serious questions of fairness precisely because the percentage of revenue metric may be a less than fully satisfactory proxy for measuring more usage or the actual intensity of the usage of the rights in question.”\textsuperscript{77}

45. I concur with the Copyright Royalty Board’s assessments from the prior Section 115 proceeding. Based on my review and analysis, its assessment continues to apply to today’s music industry, and there is no compelling reason to introduce changes to either the structure or the magnitude of these royalty rates. The fact that

\textsuperscript{71} APL-071, Final Determination of Rates and Terms, p. 23.
\textsuperscript{72} APL-071, Final Determination of Rates and Terms, pp. 24–25.
\textsuperscript{73} APL-071, Final Determination of Rates and Terms, p. 25, footnote 18.
\textsuperscript{74} APL-071, Final Determination of Rates and Terms, p. 24.
\textsuperscript{75} APL-071, Final Determination of Rates and Terms, pp. 25–26.
\textsuperscript{76} APL-071, Final Determination of Rates and Terms, pp. 26–27.
\textsuperscript{77} APL-071, Final Determination of Rates and Terms, p. 27.
the notion that the findings set forth by the Copyright Royalty Board Judges in 2008 pertaining to statutory Subpart A mechanical royalty rates under Section 115 for physical phonorecord deliveries, permanent digital downloads, and ringtones continue to apply today. Apple’s proposal, consequently, is consistent with and supportive of the policy objectives laid out in Section 801(b). The further supports my conclusions.

VII. APPLE’S PROPOSED RATE FOR INTERACTIVE STREAMING IS APPROPRIATE

A. On Balance, A Per-Play Rate Structure Is the Appropriate Structure For Interactive Streaming

Interactive streaming is a fundamental departure from the norm of music consumption because it shifts the model for how we consume music from music ownership (buying an album or a song to listen to it) to music access (wherein it is no longer necessary to buy a particular album or song to listen to it). Below, I discuss why this alters how “value” is created by the various stakeholders involved and why the royalty rate structure for interactive streaming needs to be realigned to ensure that music creators and music distributors each are appropriately rewarded for their relative contributions. In my opinion, Apple’s proposed per-play rate structure for interactive streaming royalties is more likely to achieve that goal of realignment than are the proposals submitted by the other participants in this proceeding.

1. The Economics of an Appropriate Rate Structure

A piece of music passes through many stages before it reaches the final consumer. Each entity in this chain of music creation and distribution creates value. On the copyright creator/owner side, songwriters are the first link. They expend their creative talent and effort to compose the songs that a performing artist records in a recording studio. Many songwriters work with publishers who take care of the many administrative tasks, such as registering the creative work with the correct organizations, collecting and distributing

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the royalties received, and creating commercial opportunities for songwriters.79 These
songwriters and publishers own the copyrights in their musical compositions.80

49. Once a song is written, it may be recorded. The record labels are the copyright holders of
the final sound recording and are responsible for marketing the song, collecting and distributing
the royalties, and at times also nurturing and developing the artist.81 The final link in this chain,
which directly connects consumers to the piece of music, is the distributor. A distributor could
be a retail store (e.g. Virgin Megastores, Best Buy, Walmart, etc.), a digital download store (e.g.
iTunes), or a streaming service provider (e.g. Apple Music, Spotify).82

50. On the copyright user side, interactive streaming services provide consumers access to a
large catalog of songs that they can listen to “on-demand” without owning the songs (and paying
for that ownership).83 The value provided by these services has increased their popularity.84 In
addition to the convenience of offering music on-demand, these services also create value for
consumers by offering a variety of features, such as curated playlists,85 song lyrics, and ways to
discover new music, which enhances the listening experience.86 Academic research has found
that because streaming services encourage discovery of new music, consumers of such services

http://www.digitalmusicnews.com/2014/02/28/understandpublishing/, a true and correct copy of which is attached
hereto as APL-154.
80 APL-025, United States Copyright Office, “Copyright and the Music Marketplace,” Register of Copyrights
Report, February 2015, NMPA0001047–1291 at 1116.
81 Helienne Lindvall, “Behind the Music: What Do Record Labels Actually Do? You’d Be Surprised,” The
labels, a true and correct copy of which is attached hereto as APL-107; APL-154, Paul Resnikoff, “Now You Know
82 Of course, artists could directly connect with consumers through live shows or, as has been the case more
recently, through channels such as YouTube and Facebook without going through a record label. See, for example,
Kristen Philipkoski, “Why Not Winning America’s Got Talent and Avoiding a Major Record Label Was Awesome
not-winning-americas-got-talent-and-avoiding-a-major-record-label-was-awesome-for-lindsey-stirling/print/, a true
and correct copy of which is attached hereto as APL-134.
guide.html, a true and correct copy of which is attached hereto as APL-140.
84 Ramaprasad Report, ¶ 64; Joshua Cornell Jenkins, “Going With the Flow: How the Convenience of Streaming
Has Changed the Way We Consume Media,” The Odyssey Online, July 14, 2015,
https://www.theodysseyonline.com/media-streaming, a true and correct copy of which is attached hereto as APL-
128; Testimony of David Dorn, §§ IV.A.–B.
85 A curated playlist is a collection of songs personalized for music listeners based on the information the streaming
services have. See Testimony of David Dorn, ¶¶ 55–57.
86 Testimony of David Dorn, §§ IV.B.
listen to a wider variety of music.87 From the artists’ perspective, this could increase the likelihood that they will find an audience if they create high quality songs.88

51. Because songs are a critical input for a streaming service, and because songwriters hold copyright over their musical compositions, streaming services compensate songwriters through royalty payments.

52. People spend a lot of time and money listening to music.89 Consumers listen to music for various reasons, including to relieve stress or boredom, or to express feelings and emotions.90 Listening to music is regarded as an important leisure activity for a variety of people.91 If a consumer actively listens to a song instead of spending the time doing something else, it suggests that the song has some value to the consumer. Even if a consumer is listening to music while engaging in some other activity, for instance while working, exercising, or cooking, he actively made the decision to turn on the music, which again suggests that listening to music is an activity that the consumer enjoys doing. Furthermore, the fact that consumers buy songs in the form of CDs and permanent downloads and pay for subscriptions to stream songs demonstrates that songs have value for consumers.

53. Songwriters expect to be compensated appropriately for the value their creations provide to consumers. They also expect their compensation to be commensurate with the demand for their songs. If the demand for their creations increases, they expect their compensation to increase. Although artists may create art for art’s sake, economic incentives matter to many artists.92 Accordingly, from a commercial perspective, if artists were not sufficiently compensated for the demand for their songs, their incentives to create songs would decrease.


92 Richard E. Caves, “Organizing to Collect Rents: Music Copyrights” in Creative Industries: Contracts between Art and Commerce (Cambridge, MA: Harvard University Press, 2002), p. 297 (“If the song is free for the taking, the songwriter reaps no reward for her creative labors. Valuing art for art’s sake, she may still bestow her lyrical
54. Notably, the mere initiation of a stream is not necessarily indicative of demand for the song. Music is an “experience good” that generates value to a consumer once it is consumed.\(^9\) As a result, interactive streaming services provide consumers with convenient means to “sample” and discover new music—consumers may only play a snippet of a song and skip the rest if they decide that they do not like the song. Therefore, the demand for a song on an interactive streaming service can be captured by the number of times the song is streamed where the duration of each stream is sufficiently long to indicate demand from consumers for that song.\(^9\)

Put simply, instances where a consumer sampled a small snippet of short duration and “moved on” would not be considered a reflection of true consumer demand for the sampled song.

55. Streaming services, like any business, expect to be rewarded appropriately for the risks they take and the investments they make. In a competitive marketplace, firms try to differentiate themselves by innovating and adding/improving features.\(^9\) This innovation enables firms to attract customers and succeed in the marketplace.\(^9\) Streaming services must also innovate to differentiate themselves from competitors, and that requires taking risks. Developing a new, innovative feature may require a substantial amount of investment in idea generation, development, planning, and execution. The success of a new product or a feature is not known until it is made available to the target market, however, which is why there is risk involved in developing new products and features.\(^9\) For example, Spotify developed the ‘Discover page’

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\(^9\) *APL-161*, Philip Kotler and Kevin Lane Keller, *Marketing Management*, 15th edition (New York: Pearson, 2016), p. 432; see also Robert Atkinson and Stephen J. Ezell, “What is Innovation Policy?” in *Innovation Economics: The Race For Global Advantage* (New Haven, CT: Yale University Press, 2012), p. 131 (“[R]esearch . . . suggests that firms not replacing at least 10 percent of their revenue streams annually with new products or services are likely to be out of business within five years. . . . In fact, [disruptive innovation] has contributed to a dramatic widening since the mid-1990s in the disparity in profits between the leading firms in industries that use technology intensively.”), a true and correct copy of which is attached hereto as APL-056.

feature to help users identify new music they might like but did not know about. Though the feature was not used by many consumers initially, Spotify incorporated the feedback from the lack of success of this feature and continued to develop it. Today, the current incarnation of the ‘Discover weekly’ page is very popular.98 As another example, Apple Music developed many features that benefit consumers and musicians. These include recommender systems that increase music discovery; tools that enable subscribers to easily share songs, albums, and personally curated playlists; and communities that connect musicians, music experts, and fans to enhance the music experience.99

56. There also are many examples of products and services that failed to take off. Sony developed Music Unlimited, a music streaming service, and launched it in the U.S. in 2011.100 Sony believed that its “global reach and wide range of devices would help make the service a success. Sony is leapfrogging into this space [cloud based music]. That is a very visionary and bold thing to do.”101 Sony was not able to attract a large subscriber base, however, and four years after launch it decided to shut down its streaming service.102 Similarly, Microsoft launched a portable music player named Zune in 2006 to compete with the Apple iPod.103 Because the “Zune was too little, too late,” “Microsoft never gave consumers a real clear reason to buy [a Zune] instead of the market leading iPod,” and because “the initial marketing for the Zune was

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99 Testimony of David Dorn, ¶¶ 49–62.


57. Given the risks associated with developing new products and features, streaming services expect returns commensurate with the risks they take. If they do not earn sufficient returns when their innovations create value for consumers, their incentives to take risks and to innovate decrease.\footnote{Devin Coldewey, “Microsoft Puts The Zune Down The Memory Hole,” \textit{TechCrunch}, October 4, 2011, \url{https://techcrunch.com/2011/10/04/microsoft-puts-the-zune-down-the-memory-hoe/}, a true and correct copy of which is attached hereto as \textit{APL-079}.} In general, firms would be expected to embark on new, risky, projects only if the expected return is positive.\footnote{Industrial Organization economics is aware of the necessity to create noncompetitive situations (by granting patents) in order to encourage innovation and absent such guarantees, “no one firm is willing to pay the sums of money (often huge) necessary to (innovate) without compensation.” \textit{See} Jean Tirole, \textit{The Theory of Industrial Organization} (Cambridge, MA: The MIT Press, 1988), p. 390, a true and correct copy of which is attached hereto as \textit{APL-057}.}

58. In summary, the “value” that music creates for music consumers is passed on to the streaming services in the form of subscription revenues or ad-generated revenues. As discussed above, both the songwriters and the streaming services need to be appropriately rewarded for their creative talent, effort, and risk-taking. Thus, the value extracted from consumers must be shared appropriately between songwriters and streaming services.

59. If the payment to songwriters is too high at the expense of the streaming services, the latter’s incentive to innovate, and perhaps the ability to provide a sustainable service, would decrease. If the payment to streaming services is too high at the expense of the songwriters, the latter’s incentive to create songs would decrease. An appropriate rate structure must balance the interests of these two important components of the music ecosystem.

2. A Per-Play Rate Structure Appropriately Balances the Rewards to Songwriters and Streaming Services

60. A per-play rate structure appropriately balances the rewards to songwriters and streaming services. Under a per-play rate structure, songwriters are paid each time their songs are

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\footnote{Erik Brynjolfsson and Xiaoquan (Michael) Zhang, “Innovation Incentives for Information Goods,” \textit{Innovation Policy and the Economy} 7, 2006, pp. 99–123 at p. 99, a true and correct copy of which is attached hereto as \textit{APL-091}.}
streamed. As long as the per-play rate is appropriately determined and streams are measured in a way that is indicative of demand (e.g., by considering the streams that are longer than 30 seconds to eliminate accidental streams or streams of snippets of songs where users are merely sampling a song), payments to songwriters are likely to be commensurate with the demand for their songs. If the demand for their songs were to increase (i.e., if their songs are streamed more), their income also would increase.

61. Under a per-play rate structure, streaming services also would be rewarded for the risks they take, as the payments to songwriters would not be tied to the financial outcomes of the streaming services’ decisions as to how to develop their services. If a streaming service makes certain decisions (e.g., to invest in developing a new feature that benefits consumers), and its revenues increase because of that decision, the streaming service alone should receive the additional revenue attributable to that innovation because it is not connected to any particular songwriter. Accordingly, increased revenue due to any innovation specific to the service should not have to be shared with songwriters. This properly apportioned and incentivized structure makes it more likely that the streaming service will innovate and create additional value for consumers.

62. In contrast, a percent-of-revenue structure does not always appropriately balance the rewards to songwriters and streaming services. As an initial matter, the compensation to songwriters from the streaming services is inherently “risky,” whether under a percent-of-revenue or a per-play rate structure, because it depends on whether and to what extent the songwriters’ songs are streamed. Put simply, there is always a risk that the songwriter will earn $0 because there is no demand for his or her songs.

63. A percent-of-revenue structure exposes songwriters’ compensation to two additional types of risk, however. First, there also is risk arising from uncertainty related to the financial performance of the streaming service. Revenues for ad-supported streaming services (e.g., Spotify Free) depend on the revenues such services are able to obtain from advertisers.

Likewise, the revenues for subscription streaming services (e.g., Apple Music) depend on the
number of subscribers such services are able to attract. The revenues in both cases are, by their
nature, uncertain, and depend on the actions taken by the streaming services. Consequently, they
increase the variability in the payments received by songwriters. If the streaming service were to
suffer low revenues, songwriters’ compensation would be adversely affected. Indeed, the
streaming business model, under the current royalty structure, has been blamed for making it
tougher for songwriters to finance their creative efforts, and for the “collapse of Nashville’s
musical middle class.”

Second, the percent-of-revenue rate structure also gives rise to risk if the songwriters’
compensation is decoupled from the demand for their songs. It is possible that songwriters’
compensation may not increase even when the demand for their songs increases. For example,
consider the revenues of a paid subscription service. If the streaming of every song were to
double, but the number of subscribers did not change (so that the revenue does not change), the
songwriters’ royalties might not change even though the demand for their songs increased.
Because songwriters’ royalties could remain the same even as the number of streams doubles,
the value of each stream would necessarily fall. Such an outcome would not occur under a per-
play rate structure, where each stream has the same value, regardless of the number of streams.

Another feature of the percent-of-revenue structure is that it may expose songwriters to
variable compensation across different streaming services even if the demand for their songs
does not vary. Because different streaming services may have different business models (e.g.,
ad-supported, subscription-based), and may make different business decisions such as how to
price their services (for subscription-based services) or how to place and what to charge for ads
(for ad-supported services), their revenues may vary. It is plausible that different streaming
services might pay different royalties to the same songwriter for the same number of streams
under the percent-of-revenue structure. For example, if two ad-supported streaming services had
exactly 1 million streams of the same songs in a month, but one streaming service had revenues
of $1 million while the other had revenues of $1.5 million, the royalty payments made by the two

\[109\] APL-025, United States Copyright Office, “Copyright and the Music Marketplace,” Register of Copyrights
Report, February 2015, NMPA00001047–1291 at 1133; Nate Rau, “Nashville’s Musical Middle Class Collapses,”
The Tennessean, January 28, 2015, http://www.tennessean.com/story/entertainment/music/2015/01/04/nashville-
musical-middle-class-collapses-new-dylans/21236245/, a true and correct copy of which is attached hereto as APL-
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streaming services under a percent-of-revenue structure could be different. The streaming service with greater revenues would likely make greater royalty payments. This would imply that the same songs are more “valuable” when played on one service than on the other, despite identical levels of demand (i.e., number of streams).

66. To understand the incentives at play in the current context, the academic literature that has examined revenue-sharing arrangements between upstream firms (e.g., manufacturers) and downstream firms (e.g., retailers) is instructive. That literature has found that revenue sharing can help align the incentives of the two entities when the downstream firm faces uncertain demand. For example, a revenue sharing arrangement can incentivize the downstream firm to increase inventory in a way that is beneficial to both entities of the vertical channel. However, a revenue sharing arrangement can also create a perverse incentive for the downstream firm (which may have other, complementary business lines that do not rely on the upstream firm) to employ a “loss leader” strategy that hurts the upstream firm in an effort to drive demand for the complementary products. A loss leader strategy is one in which a multiproduct firm sells one or more products below cost to attract customers that would then buy other more profitable products.

67. Translating this to the current proceeding, the upstream entity is the songwriter and the downstream entity is the streaming service. Because streaming services do not have to pay per stream under a percent-of-revenue structure, they could be incentivized to use a loss leader strategy. A streaming service might offer a low price to attract customers to its regular service with the hope that these customers would later convert to the premium service and pay a higher

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111 For example, Cachon and Lariviere state that “[i]n the case of complements (say, personal computers and printers), the retailer may discount the product offered under revenue sharing to spur sales of the other product. Here, revenue sharing may result in a product being used as a loss leader.” See Gérard Cachon and Martin Lariviere, “Supply Chain Coordination with Revenue Sharing Contracts: Strengths and Limitations,” Management Science 51, no. 1, 2005, pp. 30–44, a true and correct copy of which is attached hereto as APL-097.

price. For example, Spotify employs a loss-leader strategy in its “freemium” offering.\footnote{Will Oremus, “Spotify’s New Features Aren’t Just About You. They’re About Money.,” \textit{Slate}, May 20, 2015, \url{http://www.slate.com/blogs/moneybox/2015/05/20/spotify_now_streaming_music_leader_adds_video_podcasts_running_features.html}, a true and correct copy of which is attached hereto as \textit{APL-170}.} Although less than one-third of Spotify’s user base consists of paid subscribers, 89.9\% of its revenues came from subscription fees in 2015.\footnote{Tim Ingham, “Spotify Revenues Topped $2BN Last Year as Losses Hit $194M,” \textit{Music Business Worldwide}, May 23, 2016, \url{http://musicbusinessworldwide.com/spotify-revenues-topped-2bn-last-year-as-losses-hit-194m/}, a true and correct copy of which is attached hereto as \textit{APL-035}.} Spotify, on its website, explains that once it attracts listeners to its freemium product, it works on drawing these users into the premium subscription tier.\footnote{“Spotify Explained,” \textit{Spotify Artists}, \url{https://www.spotifyartists.com/spotify-explained/}, a true and correct copy of which is attached hereto as \textit{APL-176}.} Because such a loss leader, or free service, will have lower revenues (by definition) relative to a subscription-based service, the compensation to songwriters for the use of their songs on that service is also lower, although such use may ultimately be highly beneficial to the service.

68. For the streaming services, the percent-of-revenue structure decreases the upside rewards of innovation because songwriters share those rewards. Streaming services create value for consumers beyond the pure distribution of music. For example, streaming services offer a variety of innovative features such as curated suggestions, social media integration, and the “playlist of the week.”\footnote{Stuart Dredge, “Which is the Best Music Streaming Service?,” \textit{The Guardian}, February 16, 2016, \url{https://www.theguardian.com/technology/2016/feb/16/which-is-the-best-music-streaming-service-spotify-apple-music}, a true and correct copy of which is attached hereto as \textit{APL-120}; Testimony of David Dorn, § IV.} As discussed earlier in this report, such innovations enhance the user experience, increase user exposure to different artists, and enable users to discover music.\footnote{\textit{See also}, Ramaprasad Report, § VII.B.1.} This facilitation of music discovery and exploration increases consumer welfare.\footnote{\textit{See Ramaprasad Report, § VII.B.}} Streaming services would expect to obtain all incremental revenues associated with the value created through these features which are not connected to any particular songwriter. Under the percent-of-revenue structure, however, a portion of this value is shared with songwriters.

69. A hybrid structure (i.e., a maximum of multiple structures) also does not appropriately balance rewards to songwriters and streaming services. Because one of the prongs of a hybrid structure is a percent-of-revenue structure, it has the undesirable feature of decreasing the upside rewards of innovation. At the same time, other prongs may effectively protect songwriters from
the downside, as is the case with the current rate structure. Specifically, one of the prongs in the current structure is based on the number of subscribers. If the streaming service has low revenues but a large number of subscribers, the songwriters would likely not suffer, because their royalty payment would be based on the number of subscribers rather than on revenues. This structure may tilt the balance of rewards towards songwriters at the expense of streaming services.

Therefore, a per-play rate structure is a more appropriate rate structure for streaming services, and is more likely to balance the rewards to songwriters and streaming services.

3. **A Per-Play Rate Structure is Consistent with Accepted Royalty Rate Structures for Other Prominent Forms of Music Distribution**

Music distribution has evolved from physical media to digital downloads to streaming. In the past, for every prominent form of music distribution, royalties were paid for each incremental unit consumed (i.e., there was a royalty payment associated with every song/album sold). As the number of music units sold increased, the royalty payments increased commensurately.

As discussed earlier (in Section VI), in 2008 the Copyright Royalty Board weighed the appropriate size and structure of the mechanical royalty rate for physical phonorecord deliveries, permanent digital downloads, and ringtones. It concluded that a per-unit structure was properly suited for the industry and was consistent with the four Section 801(b) factors. At the time of the 2008 decision, the per-unit structure covered virtually all forms of music delivery prevalent at the time (i.e., physical phonorecords and digital downloads).

The current royalty rates based on the per-unit structure for physical formats and permanent digital downloads have been in effect since January 2006 (before that, they were

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119 See Ramaprasad Report, ¶¶ 46–47.
slightly lower in magnitude). As discussed in Section V.C., in the current proceeding many key players in the industry, including NMPA, NSAI, other copyright owners, Warner Music Group, Universal Music Group, and Sony Music Entertainment entered into a settlement to keep the existing royalty rates for physical phonorecords, permanent digital downloads, and ringtones for the rate period 2018-2022. This suggests that the music industry continues to be comfortable with the magnitude and structure of the statutory rates in place today, and, with a single exception, has requested to extend them for another rate period.

Because other prominent forms of music distribution are based on a per-unit royalty structure, as the music units sold increase, the royalty payments increase commensurately. In contrast, if royalty payments to publishers and songwriters are calculated as a share of revenues, there is no guarantee that the royalty payments would increase commensurately with music consumption. For example, if the growth of streaming music consumption, as measured by number of streams, outpaces associated revenues (and any royalties calculated as a percentage of those revenues), there will be a divergence between the growth in music consumption on the one hand, and royalty payments to publishers and songwriters on the other. This was indeed the case in the ad-supported streaming industry in recent years, as shown in Figure 1 below. Although the number of streams via ad-supported services increased 63% between 2013 and 2014, and 101% between 2014 and 2015, revenues over the same time period only increased by 34% and 31%, respectively.

123 For example, Spotify calculates royalty payments to publishers and songwriters based, among other things, on Spotify’s revenue (through advertising and subscriptions) and the share of the songwriters’ songs relative to the overall streams on Spotify. With an increase in the number of streams for a song, all else equal, the total royalty payment for that song would increase. However, if the revenue does not increase as the streaming of a song increases, the royalty payment per stream would decrease. See “Spotify Explained,” Spotify Artists, https://www.spotifyartists.com/spotify-explained/, a true and correct copy of which is attached hereto as APL-176.
Figure 1

Growth of Ad-Supported Interactive Music Streaming in the U.S.
Revenues and Number of Streams
2014 – 2015

Source: "Music streaming is getting bigger and bigger, but artist revenue isn’t keeping up," March 22, 2016, Mashable, a true and correct copies of which is attached hereto as API-177; "News and Notes on 2015 RIAA Shipment and Revenue Statistics," RIAA, a true and correct copies of which is attached hereto as API-093.

Note: "Annual Growth" refers to the change from the previous year.

75. Moreover, interactive streaming is growing as other forms of music delivery (e.g., physical, permanent downloads) are declining.\(^{124}\) As interactive streaming becomes a major means of music consumption, it is reasonable to bring the streaming rate structure in line with that of other key methods of music delivery. Since copyright owners continue to lose guaranteed per-unit income for reproduction of their works in these other forms, bringing the structure of interactive streaming royalties in line with those methods would provide copyright owners with protection against those losses. Indeed, the finding by the Copyright Royalty Board in its 2008 opinion that a per-unit rate (or a per-play rate, in this case) is appropriate for permanent downloads because it appropriately balances the rewards to songwriters and publishers with the

costs to distributors also applies to streaming services. As with the previous forms of music
distribution, a per-play rate structure is needed to appropriately compensate copyright owners.

4. A Per-Play Rate Structure is Simple and Transparent

76. The calculation of royalty payments for interactive streaming under a percent-of-revenue rate structure or a hybrid rate structure is complex. As an initial matter, it requires the determination of the relevant revenue of the streaming service or the “service revenue,” as it is called under the current statutory rates. Service revenue under the current statutory rates is not simply the total revenue of the streaming service, but rather the total revenue minus exclusions such as:

- “Revenue derived from non-music voice, content and text services;”
- “Revenue derived from other non-music products and services (including search services, sponsored searches and click-through commissions); and”
- “Revenue derived from music or music-related products and services that are not or do not include licensed activity.”

77. Further, for ad-supported streaming services, the current statutory rates provide that “advertising or sponsorship revenue shall be reduced by the actual cost of obtaining such revenue, not to exceed 15%.”

78. The determination of service revenue for streaming could be particularly challenging when the service provider offers a streaming service as part of a larger bundle of services for which it charges a single price. For example, Amazon Prime subscribers are offered multiple bundled services such as expedited shipping on eligible goods (e.g., free two-day shipping), music streaming and access to personalized and curated playlists (e.g., Prime Music, not to be confused with Amazon Music Unlimited, which is not bundled with Amazon Prime), e-book rentals (e.g., Kindle Owner’s Lending Library), and select movies and TV shows (e.g., Prime

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125 37 C.F.R. §§ 385.11–12.
126 37 C.F.R. § 385.11.
127 37 C.F.R. § 385.11.
Video) for a price of $10.99/month.\footnote{“Amazon Prime One Year Membership,” Amazon, https://www.amazon.com/Amazon-Prime-One-Year-Membership/dp/B00DBYBNEE, a true and correct copy of which is attached hereto as APL-026.} Under the current statutory rates, the service revenue for such bundles is subjective and can be interpreted differently by different service providers.\footnote{37 C.F.R. § 385.11.}

“Where the licensed activity is provided to end users as part of the same transaction with one or more other products or services that are not a music service engaged in licensed activity, then the revenue deemed to be recognized from end users for the service for the purpose of the definition in paragraph (1) of the definition of ‘Service revenue’ shall be the revenue recognized from end users for the bundle less the standalone published price for end users for each of the other component(s) of the bundle; provided that, if there is no such standalone published price for a component of the bundle, then the average standalone published price for end users for the most closely comparable product or service in the U.S. shall be used or, if more than one such comparable exists, the average of such standalone prices for such comparables shall be used.”

79. A hybrid rate structure, which may have percent-of-revenue as one of its prongs, also has other implications for calculating royalty payments. For example, under the current statutory rates, the number of subscribers and the royalty payments made for sound recordings also need to be considered in the calculation of royalty payments to songwriters.\footnote{37 C.F.R. § 385.13.}

80. The number and variety of factors to consider under the percent-of-revenue structure or the hybrid structure make the calculation of royalty rates complicated. The particular business model of the service provider (e.g., ad-supported or subscription-based) and the strategic decisions made by the service provider could affect service revenue and may lead to widely varying effective per-stream rates: a songwriter could receive different per-stream rates for the same song streamed on different services, and could even receive different per-stream rates from the same service for different time periods, depending on the actual magnitude of the revenue and how the service revenue is determined.

81. Accordingly, because the magnitude of service revenue is inherently idiosyncratic, the calculation of the royalty payment based on service revenue is opaque to songwriters. For example, consider Service A and Service B, two interactive streaming services, each with 1
million users. Suppose 700,000 of Service A’s users are paid subscribers, whereas only 400,000 of Service B’s users are paid subscribers, and the rest are free trial users. If both services charge the same subscription price per month, their service revenues would be different. As a result, even if the total number of streams on both Service A and Service B for a particular song are identical, the royalty payments made by the two services for that same song would be different. In such a system, songwriters may not be able to understand why they are being paid differently by the two services.

82. The complexity and the resulting potential confusion surrounding the calculation of royalty payments has been recognized by the Copyright Royalty Board Judges in a different setting (Web IV proceeding):

   “Moreover, other parties raised numerous, valid objections to the use of a greater-of-structure with a percent-of-revenue prong, See, e.g., NAB Ex. 4011 (Weil WRT) (a percent-of-revenue would create uncertainty and controversy regarding the definition and allocation of revenue).”132

83. A per-play rate structure, on the other hand, is simple to understand and administer. The royalty payment made to the songwriters would correspond directly to the number of times a song is streamed multiplied by the per-play rate. It also is transparent. The songwriters would know precisely how their payment was calculated given a certain number of streams of their songs. There would be no variability in the per-stream rates that songwriters would receive from different services or from the same service over time.

84. In summary, Apple’s proposal for interactive streaming supports the CRB’s Section 115 rate objectives133:

   a) Objective: To maximize the availability of creative works to the public.

   • Per-play rate structures have been used successfully in other methods of music distribution and are likely to be successful for interactive streaming, as well. Moreover, these rate structures provide incentives for songwriters and publishers to continue creating new musical works, and for interactive

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132 Copyright Royalty Board, “Determination of Royalty Rates and Terms for Ephemeral Recording and Webcasting Digital Performance of Sound Recordings (Web IV),” Federal Register 81, no. 84, May 2, 2016, 26316–26410 at 26326, a true and correct copies of which is attached hereto as APL-036.

streaming services to continue innovating and developing their music distribution platforms.

b) Objective: To afford the copyright owner a fair return for his or her creative work and the copyright user a fair income under existing conditions.

- Under Apple’s proposal, the copyright owners would be protected because the intrinsic value of their work is recognized by the per-play rate. The copyright user, too, would have the opportunity to earn a fair income, particularly in light of the current growth and popularity of the interactive streaming industry.

c) Objective: To reflect the relative roles of the copyright owner and the copyright user in the product made available to the public with respect to 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.

- Apple’s proposal appropriately balances the rewards to songwriters and streaming services. Songwriters are paid each time their songs are streamed and receive a payment commensurate with the demand for their songs that is not tied to the financial outcomes of the streaming services’ decisions. On the other hand, streaming services enjoy the benefits of their innovations and relative contributions that generate increased revenue.

d) Objective: To minimize any disruptive impact on the structure of the industries involved and on generally prevailing industry practices.

- Per-unit rates are well established for various different forms of music distribution, and are very familiar to the music industry. Because a per-play rate only requires two metrics for calculation (the rate, and the number of streams), administering this system would retain the intuitive simplicity of other prevailing per-play rate structures.

B. Apple’s Proposed Per-Play Rate for Interactive Streaming is Consistent with Relevant Benchmarks

85. Dr. Ramaprasad has compared Apple’s proposed per-play rate for interactive streaming with benchmarks from the music industry and academic research.\(^\text{134}\) Based on my review of her analysis, I understand that both music industry professionals and academics agree that the streams-to-downloads ratio is, or has recently been, close to 100:1.\(^\text{135}\) Applying this ratio to the royalty rate for downloads ($0.091) results in a per-play rate of $0.00091 for interactive streaming, which is the rate proposed by Apple. Dr. Ramaprasad’s finding is sound and I

\(^{134}\) See Ramaprasad Report, § VIII.
\(^{135}\) See Ramaprasad Report, § VIII.
therefore conclude that Apple’s proposal is also reasonable in that it is consistent with accepted benchmarks.

VIII. APPLE’S PROPOSED RATES FOR LOCKER SERVICES ARE APPROPRIATE

86. Apple’s proposal for locker services under Subpart C also simplifies the royalty structure currently governing the mechanical royalties for locker services. It also balances the rewards to the songwriters and to the streaming services, and is, therefore, appropriate.

A. A Per-Subscriber Rate Structure for Paid Locker Services is Simple, And Balances the Rewards to Songwriters and Locker Services

87. A per-subscriber rate structure, rather than a percent-of-revenue rate structure or a hybrid rate structure, is appropriate for paid locker services. The per-subscriber rate structure proposed by Apple is simpler and easier to understand than the current rate structure. It further balances the rewards to the songwriters and to the streaming services. Some of the disadvantages of percent-of-revenue and hybrid rate structures discussed earlier in the context of interactive streaming are also relevant for locker services. However, a per-play rate structure, such as that proposed by Apple for interactive streaming, would not be appropriate for locker services.

88. First, as was the case with a per-play rate structure in interactive streaming, a per-subscriber rate structure for locker services would be transparent and simpler to understand. The calculation of royalties based on a percent-of-revenue rate structure or a hybrid rate structure, on the other hand, is a complex exercise and is likely to confuse songwriters. Furthermore, many paid locker services are bundled with other services. Apportioning the revenue attributable to the paid locker service part of the bundle is challenging and subject to interpretation. Under a per-subscriber rate, copyright owners would know precisely how their royalty payments were calculated.

89. Second, paid locker services cater to consumers who previously purchased a song or album, either as a digital download (from any service) or a physical medium (e.g., CD or Vinyl). These consumers typically “upload” a previously purchased CD album after extracting its songs (this process is also known as “ripping” the files from the CD).\textsuperscript{136} Thus, one can think of a paid

\textsuperscript{136} Mark Harris, “CD Ripping: Is it Legal to Rip Your Own CDs?,” \textit{About.com}, September 23, 2016, \url{http://mp3.about.com/od/digitalmusicfaq/f/CDripping_legal.htm}, a true and correct copies of which is attached hereto as APL-141.
locker service as a service that enhances the value of a previously purchased album or song by allowing users to stream their purchased music from any device that connects to the locker service. More simply, a locker service gives users access to all of their music without the inconvenience of physically carrying a collection of CDs.137

90. It is for this ease of access that paid locker services may charge a subscription fee, a portion of which is paid (as royalty payments) to copyright owners. A per-subscriber rate best reflects the value a consumer derives from the paid locker service. Moreover, it ensures that copyright owners are paid even when consumers use the paid locker service to upload songs but choose not to exercise the option to stream that music. A per-play rate structure, in that scenario, would pay copyright owners nothing. More importantly, applying a per-play rate for songs streamed through a paid locker service would not be justifiable because consumers own those songs and royalties have already been paid for those songs.

91. Third, a percent-of-revenue rate structure would penalize copyright owners when a service provider chooses to discount its service as a loss-leader. A service provider may have complementary products and offer the service at a discount or for free in order to attract users to the complementary products. For example, Google Play offers locker services for free to its users. In a percent-of-revenue rate structure, copyright owners would be forced to share the burden of this subsidy.

92. Fourth, under a per-subscriber rate, service providers would be better rewarded for the risks they take in creating value for consumers. Locker service providers may add an innovative feature, such as an easy-to-use interface. The providers also may invest in technologies that lead to higher quality service, such as increased upload/download speeds. If a service provider is able to add more innovative features and charge a higher price, a per-subscriber rate structure, as opposed to a percent-of-revenue rate structure, would allow them to reap the rewards of such innovation.

137 Maura Johnston, a music journalist, recalled her experience of bringing 24 CDs while commuting and having to decide which to bring. However, she notes, the advent of the MP3 in 2009 eliminated the decision-making process. See Jacob Ganz, “The Decade in Music: The Way We Listen Now,” National Public Radio, December 2, 2009, http://www.npr.org/2009/12/02/121023882/the-decade-in-music-the-way-we-listen-now, a true and correct copies of which is attached hereto as APL-117.

B. **Songwriters May Not Need to be Paid for Purchased Content Locker Services**

93. Purchased content locker services provide users the ability to access music that they have already purchased through the same locker service provider for free.\(^{139}\) For example, a consumer that purchases a song from iTunes has access to his or her copy of the song from the iTunes locker and can re-download the song at any time without any charge.\(^{140}\) In other words, iTunes locker service is an additional service that comes bundled with the purchase of a digitally downloaded song. It is important to note that songwriters are paid royalties when consumers purchase songs. Because the only purpose of the service is to allow users to continue to access the music they have already purchased from that service,\(^ {141}\) an additional royalty for purchased content locker service is not justifiable.

IX. **CONCLUSION**

94. Apple’s proposed royalty rates for permanent downloads and ringtones under Subpart A, which are the same as the current royalty rates for those products, are consistent with the Copyright Royalty Board’s finding in the prior Section 115 proceeding in 2008.\(^ {142}\) The Copyright Royalty Board’s analysis and findings from that proceeding apply to the current proceeding and there is no compelling reason to change the royalty rates for permanent downloads and ringtones. Apple’s proposal for permanent downloads and ringtones is, therefore, reasonable.

95. A per-play rate structure, such as that proposed by Apple, is the appropriate structure for interactive streaming under Subpart B because it balances the rewards to songwriters and streaming services. As long as the per-play rate is appropriately determined and streams are measured in a way that is indicative of demand, royalty payments to songwriters are likely to be commensurate with the demand for their songs. If the demand for their songs increases (i.e., if their songs are streamed more), their income also will increase. Under a per-play rate structure,

\(^{139}\) 37 C.F.R. § 385.21.
streaming services also would be rewarded for the risks they take, as the payment to songwriters would not be tied to the financial outcomes of the streaming services’ decisions.

96. A per-play rate structure for interactive streaming is consistent with the rate structures for other prominent forms of music distribution (e.g., permanent downloads have a per-unit rate structure). As interactive streaming becomes a major means of music consumption and replaces other forms of music delivery, it is reasonable to bring the royalty rate structure in line with these other forms.

97. A per-play rate structure for interactive streaming is simple, transparent, and easy to administer. Under a per-play rate structure, the royalty payments to songwriters would correspond directly to the number of times a song is streamed (where a stream is appropriately measured). Songwriters would know exactly how royalty payments are calculated, and there would not be variability in per-stream rates that songwriters receive from different services or from the same service over time.

98. Apple’s proposed royalty rate for interactive streaming is also reasonable in that it is consistent with benchmarks from the music industry and academic research.

99. Apple’s proposed royalty rates for paid lockers services and purchased content locker services under Subpart C are similarly simple, transparent, and appropriate.
I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge, information and belief.

Anindya Ghose

November 1, 2016

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ACADEMIC EXPERIENCE

5/2013 – Present
NYU Stern School of Business
Professor of Information, Operations and Management Sciences
Robert L. & Dale Atkins Rosen Faculty Fellow

9/2013 – 12/2014
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Co-Chair, NYU-AIG Partnership on Innovation for Global Resilience

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NYU Stern School of Business
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Associate Professor (with tenure)
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8/2011 – 7/2012
Wharton School of Business, University of Pennsylvania
Visiting Associate Professor

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NYU Stern School of Business
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EDUCATION

2004 Tepper School of Business, Carnegie Mellon University.
Ph.D. Information Systems

2002 Tepper School of Business, Carnegie Mellon University.
M.S. Information Systems

M.B.A. Finance, Marketing, & Information Systems

1996 Regional Engineering College, (REC), Jalandhar, India.
B.Tech. Instrumentation & Control Engineering

CONSULTING

Berkeley Corporation, Dataxu, Facebook, IBM, Intel, Jet, NBC Universal, OneVest, Samsung, CBS (Showtime), 3TI China, Bank of Khartoum

SELECTED ACADEMIC HONORS AND AWARDS

• 2015 Distinguished Fellow Award from INFORMS IS Society.
• 2015 Nominated for Best Paper in INFORMS-CIST
• 2015 Best Paper Award in MIS Quarterly for 2015
• 2015 Nominated for Best AIS Paper Award.
• 2015 NET Institute Grant
• 2015 Marketing Science Institute Award
• 2015 Adobe Faculty Research Award
• 2014 Best Paper Award in Management Science IS department from the last 3 years (2011-2013)
• 2014 Best Paper Award in Information Systems Research for 2014
• 2014 Best Overall Conference Paper Award at American Marketing Association Conference.
• 2014 Best Digital Marketing Track Paper Award at American Marketing Association Conference.
• 2014 Kauffman Foundation Grant
• 2014 Selected For “Top 40 under 40 Business School Professors Worldwide” by Business Week.
• 2014 Selected For “Top 200 Thought Leaders for Big Data and Business Analytics” by Analytics Week.
• 2013 Google Faculty Research Award
• 2012 Best Theme Paper Award, International Conference on Information Systems (ICIS)
• 2012 Marketing Science Institute Award
• 2012 SEI-Wharton Future of Advertising Grant
• 2012 Institute on Asian Consumer Insights Award
• 2012 Google Faculty Research Award
• 2012 NET Institute Grant
• 2012 NYU Abu Dhabi Institute Seed Grant
• 2011 Best Paper Award, 2nd Annual Workshop on Health IT and Economics (WHITE)
• 2011 Daniel P. Paduano Fellowship at NYU Stern
• 2011 Delphi Big Think Fellowship
• 2011 Best Paper Award, 20th International World Wide Web Conference (WWW)
• 2011 Marketing Science Institute Young Scholar
• 2011 NYU Abu Dhabi Institute Seed Grant
• 2010 Google-WPP Marketing Research Award
• 2010 NSF IGERT Award
• 2010 MSI-Wharton Interactive Media Initiative (WIMI) Award
• 2009 Meritorious Service Award (Associate Editor) for Management Science.
• 2009 MSI-Wharton Interactive Media Initiative (WIMI) Award
- 2009 NYU-Poly Research Award
- 2009 NSF SFS Award
- 2009 NYU Stern Center for Japan-US Business and Economics Studies Grant
- 2008 Best Paper Award Nominee Workshop on Information Technology and Systems
- 2008 NET Institute Grant
- 2007 Best Track Paper Award (WISA) International Conference on Information Systems
- 2007 Best Paper Award Nominee International Conference on Information Systems
- 2007 Best Published Paper Runner Up Award in *Information Systems Research*
- 2007 Marketing Science Institute Award
- 2007 Microsoft Virtual Earth Award
- 2007 NSF CAREER Award
- 2006 Microsoft Live Labs Award
- 2006 NET Institute Grant
- 2005 ACM SIGMIS Doctoral Dissertation Award. (1st Runner-Up)
- 2005 Best Paper Award Nominee Hawaiian International Conference on System Sciences (HICSS)
- 2004 Best Paper Award Nominee, International Conference on Information Systems (ICIS)
- 2003 Doctoral Consortium Fellow, International Conference on Information Systems

**REFEREED JOURNAL PUBLICATIONS**

   - **Best Overall Conference Paper Award at 2014 American Marketing Association Conference.**
   - **Best Track Paper Award in Digital Marketing at 2014 American Marketing Association Conference.**
Management Science, 60(6), 1470-1488.

   - Best Paper Award at the 2011 Workshop on Health IT and Economics
   - Best Paper Award in MIS Quarterly
   - Nominated for Best Paper Award in AIS


   - 2013 ISR Best Published Paper Award


   - Best Paper Award at the 2011 International World Wide Web Conference


   - Best Paper Award from 2011-2013


- 2006 ISR Best Published Paper Runner-up Award & Lead Article


**WORKING PAPERS**


- Best Theme Paper Award at 2012 International Conference on Information Systems.


**PATENTS**


BOOK CHAPTERS


PAPERS IN REFEREED CONFERENCE AND WORKSHOP PROCEEDINGS

on the Outbreaks of STDs Workshop on Health IT & Economics (WHITE), University of Maryland at College Park. **Best Paper Award.**


January. Best Paper Award Nominee


**PAPERS IN CONFERENCE AND WORKSHOP PROGRAMS**


Engagement: Evidence from a Randomized Experiment on a Crowdfunding Platform.  
**INFORMS Annual Meeting, Minneapolis, MN.**


Economics (WISE), St. Louis, December.
39. Combining Text mining with Econometrics: Monetization of User-Generated Content and Online Advertising. *CITI Conference on User-Generated Content 3.0, Columbia University, April.*


International Conference on Electronic Commerce (ICEC 2003), Pittsburgh, October.


Workshop on Information Systems and Economics (WISE 2002), Barcelona, Spain, December.


RESEARCH GRANTS AND AWARDS

2015 Adobe Faculty Research Award for “Combining Machine Learning with Randomized Field Experiments to Improve Mobile Advertising,” (with B. Li) $ 50,000.

2015 NET Institute Grant for “Towards Digital Attribution,” (with V. Todri), $3000.

2014 Wharton Customer Analytics Institute Award (with V. Todri, P. Adamapolous and P.V. Singh)


2013 Google Faculty Research Award for “Mobile Analytics in the New Mobile Economy,” $66,500.

2012 Marketing Science Institute Grant for “Apps and Advertising in the Mobile Economy,” $15,000.


2012 Institute on Asian Consumer Insights (ACI) Grant for “Mobile Ad Effectiveness and App Adoption in Asian Markets,” $30,000.

2012 Google Faculty Research Award for “Designing Ranking Systems for Product Search Engines,” (With P. Ipeirotis), $60,000.

2012 NET Institute Grant for “Impact of Internet Intermediaries on Spread of STDs,” (with J. Chan), $7000.


2010 MSI-Wharton Interactive Media Initiative (WIMI) Grant for “Modeling Consumer Behavior in Social Media: Analyzing the Role of Geographical Location and Multichannel Usage in Microblogging Platforms,” (with S. Han), $ 10,000.

2010 Wharton Interactive Media Initiative (WIMI) Grant for “Modeling and Examining the Interdependence between Search and Display Advertising,” (with A. Goldfarb and S. Bae), $5000.

2010 Google-WPP Marketing Research Award for “Modeling The Dynamics Of Consumer Behavior In Mobile Advertising And Mobile Social Networks,” $ 75,000.


2009 NET Institute Summer Grant for “A Structural Model of User Learning and Dynamics in Mobile Media Content,” (with S. Han).

2009 MSI-Wharton Interactive Media Initiative (WIMI) Grant for “The Economic Impact of User-Generated Content: Combining Text mining with Demand Estimation in the Hotel Industry,” (with P. Ipeirotis), $ 6,500.

2009 MSI-Wharton Interactive Media Initiative Grant for “User Content Generation and Usage in Digital Media,” (with S. Han), $ 6,500.
2009 NYU-Poly Research Grant for “The Economics of User-Generated Content in Online Social Media,” (with V. Dhar and K. Ross), $ 73,500.

2008 NET Institute Summer Grant for “Impact of Product Attributes and Geography in Search Engine Advertising”


2007 NET Institute Summer Grant for “An Empirical Analysis of Sponsored Search in Online Advertising,” (with S. Yang).


2007 Microsoft Virtual Earth Award for “Local Search for Hotels and Restaurants using Econometrics, Spatial Data, and Image Classification,” (with P. Ipeirotis), $ 35,000.


2006 Microsoft Live Labs Award for “Combining Econometric and Text Mining Approaches for Measuring the Effect of Online Information Exchanges,” (with P. Ipeirotis) $ 37,500.

2006 NET Institute Summer Grant for “Electronic commerce and Local Competition,” (with C. Forman and A. Goldfarb).


2005 NET Institute Summer Grant for “Pricing and Product Line Strategies for Consumer Software,” (with A. Sundararajan).

2003 Finalist, Third Annual e-BRC Doctoral Support Award Competition, 2003

INVITED PRESENTATIONS, PLENARY TALKS, AND KEYNOTES


9. April 2015. Invited Speaker. Rotman School (Marketing), University of Toronto. Title: “Randomized Field Experiments in Mobile Marketing.”
10. April 2015. Invited Speaker. KAIST University, Seoul. Title: “Randomized Field and Natural Experiments in Mobile Marketing.”


15. November 2014. Invited Speaker, David Eccles School of Business (Marketing), University of Utah, Title: “Randomized Field Experiments in Mobile Marketing”.


19. May 2014. Invited Speaker. Foster School of Business (Marketing), University of Washington, Seattle. Title: “Analyzing the Interdependence between Web and Mobile Advertising: A Randomized Field Experiment”.

20. April 2014. Invited Speaker. KAIST University, Seoul. Title: “Randomized Field Experiments in Mobile Marketing.”

21. March 2014: Keynote Speech. Workshop on Social & Business Analytics, University of Texas, Austin. Title: “Big Data, Randomized Field Experiments and Mobile Marketing Analytics”.


Commerce in the New Mobile Economy.”
37. March 2013. Invited Speaker. Fudan University, (Marketing). Shanghai. Title: “Ranking Products on Search Engines.”
40. February 2013. Invited Speaker. Lerner School of Business, University of Delaware, Newark. Title: “Ranking Products on Search Engines.”
44. January 2013. Invited Speaker. Boston University, Boston. Title: “Ranking Products on Search Engines.”
51. October 2012. Invited Speaker. TED lecture series. TEDxNYU. Title: “Mobile Marketing Trends.”
57. April 2012. Invited Speaker. University of Texas at Austin, Austin. Title: “Interplay Between Search and Social Media: Designing Ranking Systems for Search Engines.”


Search, Organic Search, and User-Generated Content in Electronic Markets.”

CONFERENCE PRESENTATIONS

1. October 2014. Invited Speaker, INFORMS Annual Conference, Thought Leader Series. Title: “Randomized Field Experiments in Mobile Marketing.”


June 2011. Conference Presentation. ZEW Conference, Mannheim. Title: “Designing Ranking Systems for Hotels on Travel Search Engines By Mining User-Generated and Crowd-Sourced Content.”


of Internet Referral Services on the Supply Chain.”


74. February 2004. Invited Speaker. Tulane University. Title: “Impact of Internet Referral Services on The Supply Chain.”


79. May 2011. Invited Speaker. Rising Star Speaker Series, Case Western University. Cleveland. Title: “Designing Ranking Systems for Hotels on Travel Search Engines By Mining User-Generated and Crowd-Sourced Content.”

80. May 2011. Invited Speaker. MIT (Sloan Marketing), Boston. Title: “Designing Ranking Systems for Hotels on Travel Search Engines By Mining User-Generated and Crowd-Sourced Content.”


82. April 2011. Invited Speaker. Seoul National University, Seoul. Title: “Designing Ranking Systems For Hotels on Travel Search Engines By Mining User-Generated and Crowd-Sourced Content.”


85. October 2010. Invited Speaker. University of Maryland, College Park. Title: “Designing Ranking Systems for Hotels on Travel Search Engines By Mining User-Generated and Crowd-Sourced Content.”

86. October 2010. Invited Speaker. Distinguished Speaker Series, Georgia Tech, Atlanta, October. Title: Designing Ranking Systems for Hotels on Travel Search Engines By Mining User-Generated and Crowd-Sourced Content.

88. September 2010. Invited Speaker. Harvard University (Economics), Boston. Title: “Designing Ranking Systems for Hotels on Travel Search Engines By Mining User-Generated and Crowd-Sourced Content.”

89. September 2010. Invited Speaker. George Mason University, Washington DC. Title: “Designing Ranking Systems for Hotels on Travel Search Engines By Mining User-Generated and Crowd-Sourced Content.”


91. July 2010. Invited Speaker. Stanford Institute of Theoretical Economics (SITE), Stanford University. Title: “A Dynamic Structural Model of User Learning in Mobile Media Content.”


125. February 2004. Invited Speaker. Tulane University. Title: “Impact of Internet Referral Services on the Supply Chain.”

TEACHING

- EMBA: Social Media and Digital Marketing Analytics, NYU Spring 2015. (Instructor Rating: 6.4/7)
- C20:0038: Social Media and Digital Marketing Analytics, NYU Fall 2014. (Instructor Rating: 6.8/7)
- TRIUM Global MBA course: Social Media and Digital Marketing Analytics, NYU Fall 2014. (Instructor Rating: 4.5/5)
- MSBA course: Social Media and Digital Marketing Analytics, NYU Summer 2014. (Instructor Rating: 6.9/7)
- MBA course B20:3310: Social Media and Digital Marketing Analytics, NYU Summer 2014. (Instructor Rating: 6.3/7)
- Executive Education: Leveraging Social Media and Digital Marketing, Spring 2014. (Instructor Rating: 6.9/7)
- Executive Education: Leveraging Social Media and Digital Marketing, Fall 2013. (Instructor Rating: 6.9/7)
6.7/7)

- EMBA: Social Media and Digital Marketing Analytics, NYU Spring 2014. (Instructor Rating: 6.85/7)
- C20:0038: Social Media and Digital Marketing Analytics, NYU Fall 2013. (Instructor Rating: 6.7/7)
- MSBA course: Social Media and Digital Marketing Analytics, NYU Fall 2013. (Instructor Rating: 6.8/7)
- TRIUM Global MBA course: Social Media and Digital Marketing Analytics, NYU Fall 2013. (Instructor Rating: 3.9/5)
- MBA course B20:3310: Social Media and Digital Marketing Analytics, NYU Summer 2013. (Instructor Rating: 6.5/7)
- Executive Education: Leveraging Social Media and Digital Marketing, Spring 2013. (Instructor Rating: 6.0/7)
- MBA course B20:3310: Social Media and Digital Marketing Analytics, NYU Fall 2012. (Instructor Rating: 6.0/7)
- C20:0038: Social Media and Digital Marketing Analytics, NYU Fall 2012. (Instructor Rating: 6.2/7)
- C20:0001: IT in Business & Society: UG Core, NYU Fall 2010. (Instructor Ratings: 6.5/7, 6.6/7)
- C20:0038: Electronic Commerce and Social Media: UG Elective, NYU Fall 2009. (Instructor Rating: 6.0/7)
- C20:0001: IT in Business & Society: UG Core, NYU Fall 2008. (Instructor Ratings: 6.6/7, 6.7/7)
- C20:0001: IT in Business & Society: UG Core, NYU Fall 2007. (Instructor Ratings: 6.6/7, 6.7/7)
- C20:0001: IT in Business & Society: UG Core, NYU Fall 2006. (Instructor Ratings: 6.8/7, 7/7)
- C20:0001: IT in Business & Society: UG Core, NYU Fall 2005. (Instructor Ratings: 6.6/7, 6.8/7, 6.6/7)
- C20:0001: IT in Business & Society: UG Core, NYU, Fall 2004. (Instructor Ratings: 6.2/7, 6.3/7)

**PROFESSIONAL SERVICE (JOURNALS)**

- **Senior Editor** – *Information Systems Research* (September 2012 – )
- **Associate Editor** – *Management Science* (Jan 2009 – Present)
- **Associate Editor** – *Management Science* Special Issue on Business Analytics (August 2012 – Present)
- **Associate Editor (Ad Hoc) – Management Science** (2008 – 2009)
- **Associate Editor** – *Information Systems Research* (Jan 2009 – December 2012)
- **Associate Editor (Ad Hoc) – MIS Quarterly** (2010 – Present)
- **Associate Editor** – *MIS Quarterly*, Special Issue on “Perspectives on Trust in Information Systems,” 2009.
- **Panel Member** – Hong Kong Research Grants Council. (2014 – )
PROFESSIONAL SERVICE (CONFERENCES & WORKSHOPS)

- **Conference Co-Chair** – Workshop on Information Systems and Economics (WISE), 2014, Auckland, December.
- **Track co-Chair** – Economics of Information Systems, International Conference on Information Systems (ICIS) 2012, Orlando.
- **Senior Program Committee** – ACM Electronic Commerce Conference 2012, Spain, June.
- **Senior Program Committee** – ACM Electronic Commerce Conference 2011, San Jose, June.
- **Program Committee** – INFORMS Conference on Information Systems and Technology (CIST) 2012, October.
- **Program Committee** – INFORMS Conference on Information Systems and Technology (CIST) 2010, Austin, November.
- **Program Committee** - The First International Workshop on Opinion Mining for Business Intelligence (OMBI 2010), Toronto, August.
- **Program Committee** - Workshop on Social Media Analytics (SOMA 2010), Washington DC, July
- **Program Committee** – ACM Electronic Commerce Conference 2010, Boston, June
- **Conference Co-Chair** – INFORMS Conference on Information Systems and Technology (CIST), 2009, San Diego, October.
- **Steering Committee Member** - Second New York Computer Science and Economics Day (NYCE Day), 2009, November.
- **Conference Co-Chair** – Fourth Symposium on Statistical Challenges in Ecommerce Research (SCECR) 2008, NY, May.
- **Track Chair** – Pacific Asia Conference on Information Systems (PACIS) 2009, India, July (Ecommerce Track).
- **Track Chair** – Pacific Asia Conference on Information Systems (PACIS) 2008, China, July (Economics of Information Systems Track).
- **Associate Editor** – International Conference on Information Systems (ICIS) 2009, Phoenix, December (Economics of Information Systems Track).
- **Associate Editor** – International Conference on Information Systems (ICIS) 2007, Montreal, December (Web-Based Information Systems Track).
- **Program Committee** – ACM Electronic Commerce Conference 2009, Stanford, June.
- **Program Committee** – World Wide Web Conference 2009 (WWW), Spain, May.
- **Program Committee** – World Wide Web Conference 2008 (WWW), Beijing, May (Social Networks and Web 2.0 Track and Internet Monetization Track)
- **Program Committee** – International Conference on Web Search and Data Mining (WSDM) 2008, Stanford University, February.
- **Program Committee**– Workshop on Interdisciplinary Studies in Security and Privacy, 2008 (WISSP), NYU-Polytechnic, September.
- **Program Committee**–International Conference on Electronic Commerce 2007 (ICEC), Minnesota, August.
- **Program Committee**– Workshop on Economics of Information Security 2007 (WEIS), Pittsburgh, June.
• Program Committee – INFORMS Conference on Information Systems and Technology (CIST) 2007, Seattle, November.
• Program Committee – ACM Electronic Commerce Conference 2007, San Diego, June.
• Program Committee – International Conference on Decision Support Systems 2007, Kolkata, January
• Program Committee – International Symposium of Information Systems 2006, Hyderabad, December
• Associate Editor – International Conference on Information Systems 2006 (ICIS), Milwaukee, December (Economics of Information Systems Track).
• Associate Editor – International Conference on Information Systems 2006 (ICIS), Milwaukee, December (General Track).
• Program Committee – INFORMS Conference on Information Systems and Technology 2006 (CIST), Pittsburgh, November 2006.

UNIVERSITY SERVICE
• External Review Committee, OPIM Department, Wharton School, 2015.
• IOMS Executive Committee, 2013 – Present
• Stern Dean’s Faculty Advisory Committee, 2012 – Present
• Stern MBA Launch Committee, 2011 – Present
• NYU Stern-Poly Collaboration Taskforce Committee, 2011
• Stern Doctoral Program Review Committee, 2010
• Stern Research Resources Committee, New York University, 2010 –
• Track Director for Interactive Marketing, CeDER, NYU Stern, 2009–2010.
• Panel Judge in India Leadership Exchange Program Competition, 2009.
• AACSB Review Junior Faculty Team, Stern School, 2009.
• IS faculty member, Stern Undergraduate Honors Program, 2006 – Present.
• Ph.D. Committee, IOMS Department, Stern School, 2005 – 2006, 2009–.
• Stern School Team India Committee under Dean Kim Corfman, 2008 –2009.
• Promotion & Tenure Review Committee, IOMS Department, Stern School, 2006.
• Strategic Planning Meeting, Stern School, 2006.
• Faculty Recruitment Committee, IOMS Department, Stern School, 2005 – 2006.
• Panelist on “Effective Teaching Strategies”, New Faculty Orientation at NYU Stern, 2005.
POST-DOCTORAL STUDENT SUPERVISION

1. Dr. Sang-Pil Han (Post Doctoral Advisor, NYU, 2008–2011 (Now Assistant Professor at City University of Hong Kong)
2. Dr. Sung-Hyuk Park (Post Doctoral Advisor, NYU, 2012– )

DOCTORAL STUDENT SUPERVISION

1. Jason Chan – Stern School, IOMS Department (Chair), (Assistant Professor at Carlson School, University of Minnesota from Fall 2014)
2. Beibei Li – Stern School, IOMS Department (co-Chair), (Assistant Professor at Carnegie Mellon University since Fall 2012)
3. Gordon Burtch – Fox School of Business, Temple University (co-Advisor), (Assistant Professor at Carlson School, University of Minnesota from Fall 2013)
4. Yan Huang – Heinz College, Carnegie Mellon University (Thesis Committee member), (Assistant Professor at Ross School, University of Michigan from Fall 2013)
5. Ke-Wei Huang – Stern School, IOMS Department (Thesis Committee member), Graduated 2007 (now Assistant Professor at National University of Singapore)
6. Zheyin (Jane) Gu – Stern School, Marketing Department (Thesis Committee member), Graduated 2008 (now Assistant Professor at SUNY Albany)
7. Rong Zheng – Stern School, IOMS Department (Thesis Committee member), Graduated 2009 (now Assistant Professor at Hong Kong University of Science and Technology)
8. Manuel Arriaga – Stern School, IOMS Department (Thesis Committee member), Graduated 2011 (now Assistant Professor at Cambridge University)
9. Nikolay Archak – Stern School, IOMS Department (Thesis Committee member), Graduated 2012 (Six Sigma)
10. Sanghee Bae – 6th year Student, Stern School, Marketing Department (Thesis Committee member)
11. Mingdi Xin – Stern School, IOMS Department (Proposal Committee member), Graduated 2009 (now Assistant Professor at University of California at Irvine)
12. Akhmed Umyarov – Stern School, IOMS Department (Proposal Committee member), Graduated 2010 (now Assistant Professor at University of Minnesota)
13. Vilma Todri – 4th year Student, Stern School, IOMS Department (Chair)
14. Xuan Ye – 4th year Student, Stern School, IOMS Department (Thesis Committee Member)
15. Zubin Jelveh – 4th year Student, NYU Poly
16. Wally Wang – 2nd year Student, Stern School, IOMS Department

UNDERGRADUATE STUDENT SUPERVISION

1. Prita Kumar – Stern School (Undergraduate Honors Thesis Advisor)
2. Rohan Deshpande – Stern School (Undergraduate Project Advisor)
3. Pratik Mehta – Stern School (Undergraduate Honors Thesis Advisor)
4. Aileen Chua – Stern School (Undergraduate Honors Thesis Advisor)
5. Eliott Finch – Stern School (Undergraduate Honors Thesis Advisor)

PROFESSIONAL MEMBERSHIPS

- **Expert Affiliate**: Cornerstone Research (2015 – Present)
- **Advisory Board Member**: Big Data and Mobile Analytics Center, Fox School of Business, Temple University.
• Faculty Affiliate: Marketing Science Institute (2008 – Present)

INDUSTRY POSITIONS

2013 - Present Chief Data Scientist, 3TI China
2014 - Present Scientific Advisor, OneVest
1999-2000 Senior Consultant, E-Business Division, IBM.
1997 Management Trainee, Glaxo SmithKline Beecham.

SELECTED PRESS COVERAGE & OPINION PIECES

• Economist Group, May 2015
• BBC World News, March 2015
• The Financial Times, March 2015
• USA Today, February 2015
• Washington Post, February 2015
• The Economist, January 2015.
• National Public Radio, January 2015.
• Newsweek, January 2015.
• The Guardian January 2015.
• The Toronto Sun, January 2015.
• Bloomberg Media, January 2015.
• The Economic Times January 2015.
• The Business Standard, January 2015.
• The Economic Times December 2014.
• USA Today, December 2014.
• OZ, December 2014.
• Bloomberg Media, October 2014.
• LA Times, October 2014.
• Business Week, September 2014.
• The Wall Street Journal, September 2014.
• “Marketing in the Facebook Age: B-Schools Tackle Social Media with Innovative New Courses”, MBAPrograms, June 2014
• “Professor Big Data”, The Programmatic Mind, June 2014.
• “Hulu Lets You Order Pizza Without Leaving The Website,” USA Today, May 2014.
• “Kickstarter Backlash Over Oculus” Market Makers, Bloomberg TV, March 2014.
• “The Lessons of Oculus, or Why We Need a Capitalism for the Masses”, National Review Online, March 2014.
• “Best 40-Under-40 Professor Anindya Ghose”, Business Week Poets and Quants, February 2014.
• “Push Ads Across Devices to Drive Click-throughs, Conversions: NYU professor,” Mobile Marketer, November 2013.
• “Topsy Buy Gives Apple Mountains of Twitter Data,” Ecommerce Times, November 2013
• “Investors Give Yahoo Benefit of Doubt,” Ecommerce Times, October 2013
• “The Crowdfunding Economy is About to Pop”, Time, September 2013
• “B-Schools Are Putting Consumers Under the Social Media Microscope”, BusinessWeek, July 2013.
• “Business Grad to Wall Street: Drop Dead”, Wired, June 2013.
• “Three Professors Share Crowdfunding Research - Tune In To Learn How To Make Your Campaign A Success.”, Forbes, June 2013.
• “Facebook Gets Too Much in Your Face”, LA Times, April 2013.
• “Revising an Outdated Business Model? Try Predictive Analytics.” CNBC, October 2012.
• “Microsoft Take a Stab at News Gathering.” Ecommerce Times, October 2012.
• “What Guided Google to Frommer’s?” Knowledge @ Wharton, September 2012.
• “Digital is for Real.” SmartMoney, August 2012.
• “Craigslist Linked to Rise in STDs.” NBC, May 2012.
• “Facebook’s Dream IPO is Starting to Look Like a Nightmare.” MSNBC, May 2012.
• “Facebook an Overvalued Bust.” Ignites, Financial Times, May 2012.
• “RIM to Post Loss, Plans ‘Significant’ Job Cuts.” MSNBC, May 2012.
• “The Travel Search Engine That Thinks the Way You Do?” Knowledge @ Wharton, May 2012.
• “Facebook closes at 38.37 dollars in market debut.” Xinhua, China Daily, May 2012.
• “As Headphones Invade The Office, Are We Lonelier?” National Public Radio, May 2012.
• “Google's New Privacy Policy: When Consumers' Worlds Collide, the Company Stands to Profit.” Forbes, February 2012.
• “Africa Calling: Listen Up”. NYU Stern Op-Ed, February 2012
• “Drinking from a Fire Hose: Has Consumer Data Mining Gone Too Far?” Knowledge @ Wharton, November 2011.
• “Walmart’s Use of Social Media.” BBC News, November 2011.
• “Crowd-Funding (Finally) Goes to Washington.” NYU Stern Op-Ed, October 2011.
• “Something For the Weekend.” Financial Times, October 2011.
• “Awsum Shoes: Is it Ethical to Fix Grammatical and Spelling Errors in Internet Reviews.” Slate, May 2011.
• “Does Reviewer Quality Matter.” Steven D. Levitt, Freakonomics, April 2011.
• “Personal Blogging at Work Increases Productivity.” Forbes, March 2011
Documents Relied Upon

**Motions and Legal Pleadings**

Amazon Digital Services LLC’s Initial Disclosures and Initial Proposed Rates and Terms, *In re RESTRICTED — Subject to Protective Order in Docket No. 16-CRB-0001-PR (2018-2022)* (Phonorecords III)  
July 15, 2016

Apple Inc. Proposed Rates and Terms, *In the Matter of Determination of Rates and Terms for Making and Distributing Phonorecords (Phonorecords III)*  
RESTRICTED — Subject to Protective Order in Docket No. 16-CRB-0001-PR (2018-2022) (Phonorecords III)  
July 15, 2016

**Final Determination of Rates and Terms, In the Matter of Mechanical and Digital Phonorecord Delivery Rate Determination Proceeding**  
November 24, 2008

**George Johnson’s (GEO) Preliminary Disclosures, In the Matter of Determination of Royalty Rates for Making and Distributing Phonorecords (Phonorecords III)**  
RESTRICTED — Subject to Protective Order in Docket No. 16-CRB-0001-PR (2018-2022) (Phonorecords III)  
July 15, 2016

**Motion to Adopt Settlement Industry-Wide, In re Determination of Rates and Terms for Making and Distributing Phonorecords (Phonorecords III).**  
RESTRICTED — Subject to Protective Order in Docket No. 16-CRB-0001-PR (2018-2022) (Phonorecords III)  
October 28, 2016

**Testimony of David Dorn, In re Determination of Royalty Rates and Terms for Making and Distributing Phonorecords (Phonorecords III)**  
RESTRICTED — Subject to Protective Order in Docket No. 16-CRB-0001-PR (2018-2022) (Phonorecords III)  
November 1, 2016

**Expert Report**

Expert Report of Jui Ramaprasad  
November 1, 2016

**Academic Articles**

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<td>“Amazon Prime One Year Membership,” <em>Amazon</em>, <a href="https://www.amazon.com/Amazon-Prime-One-Year-Membership/dp/B00DBYBNEE">https://www.amazon.com/Amazon-Prime-One-Year-Membership/dp/B00DBYBNEE</a></td>
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<td>“Browsing Featured Ringtones,” <em>Zedge</em>, <a href="http://www.zedge.net/ringtones/">http://www.zedge.net/ringtones/</a></td>
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**All other sources and exhibits mentioned within the Report**