

**Before the
COPYRIGHT ROYALTY JUDGES
Washington, D.C.**

_____)	
<i>In re</i>)	
)	
DISTRIBUTION OF CABLE)	NO. 14-CRB-0010-CD (2010-13)
ROYALTY FUNDS)	
_____)	

**WRITTEN DIRECT TESTIMONY OF
MICHELLE CONNOLLY, PH.D.**

December 22, 2016

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I. QUALIFICATIONS

1. I am a Professor of the Practice in the Economics Department at Duke University. I received a Ph.D. in economics from Yale University in 1996. After working at the Federal Reserve Bank of New York, I became an Assistant Professor of Economics at Duke University in the fall of 1997. I was promoted to Associate Professor of the Practice in 2006. While on leave from Duke University, I served as the Chief Economist of the Federal Communications Commission (FCC) from 2006 to 2007. I reported directly to the Chairman of the FCC and advised the Chairman and his staff on a variety of topics, including those involving the cable television industry. I returned to Duke University in 2007. In 2008, I was again asked to serve as Chief Economist of the FCC. After my second term at the FCC, I returned to Duke University. In 2012, I was made full Professor of the Practice at Duke.

2. I have taught courses on the Economics of Telecommunications Policy, Intermediate Macroeconomics, Graduate International Trade, and Graduate Advanced Macroeconomics, all at Duke University. I also have taught courses on research methods for undergraduate honors students. I have done research on topics involving theoretical and applied industrial economics. Much of my research considers industries in which there is monopolistic competition (as exists in the cable industry). I have published articles in peer-reviewed journals including the *American Economic Review*, the *American Economic Journal: Macroeconomics*, the *Review of Industrial Organization*, the *Review of Network Economics*, the *Journal of Economic Growth*, the *Journal of Economic History* and the *Journal of Development Economics*. I have been awarded a grant from The National Science Foundation, have been invited to speak at the White House, and have testified before Congress. I also have been an invited presenter or panelist on a variety of issues related to telecommunications policy.

3. My curriculum vitae is included as Appendix A.

II. INTRODUCTION AND SUMMARY

4. Section 111 of the Copyright Act grants cable system operators (CSOs) a statutory or “compulsory” license to retransmit copyrighted programming on broadcast stations, including out-of-market broadcast stations (distant signals). To qualify for the Section 111 license, CSOs must pay a statutorily-prescribed royalty which is collected by the Copyright Office and then distributed to copyright owners of the “non-network” programming on the distant signals. The purpose of this proceeding is to allocate, among different categories of distant signal non-network programming, the royalties that CSOs paid for their Section 111 licenses to retransmit broadcast signals during the years 2010-13. Those categories are set forth and defined in Appendix A to the Copyright Royalty Board’s (CRB) November 25, 2015 Order in this proceeding (Agreed Program Categories).¹

5. Historically, the CRB and its predecessors have allocated cable royalties among the Agreed Program Categories based upon a standard of “relative fair market value.” The Supreme Court has stated that “fair market value” is “...the price at which the property would change hands between a willing buyer and a willing seller, neither being under any compulsion to buy or sell and both having reasonable knowledge of relevant facts.”² Because Section 111 allows CSOs (the buyers) to retransmit distant signals without negotiating with copyright owners (the sellers), there is no empirical evidence which shows directly how much would be paid for the programming on those signals in free-market transactions; the sellers are under compulsion to sell for a legislatively mandated amount by virtue of the Section 111 compulsory license.

¹ *Notice of Participant Groups, Commencement of Voluntary Negotiation Period (Allocation), and Scheduling Order*, Docket No. 14-CRB-0010-CD (2010-13), Ex. A (Nov. 25, 2015) (“November 25 Order”).

² *U.S. v. Cartwright*, 411 U.S. 546, 551 (1973).

Thus, the CRB and its predecessors have considered a variety of different studies that seek to estimate the share of royalties each program category would have received in a hypothetical free market.

6. In the last litigated cable royalty allocation proceeding, which involved the 2004 and 2005 royalty funds, the CRB relied primarily upon the results of “constant sum” surveys of CSOs to determine the relative market value of each program category. The market research firm Bortz Media and Sports Group, Inc. (Bortz) designed and supervised the implementation of those surveys. The Bortz surveys asked a random sample of CSO program executives how they would have allocated their programming budgets among the different categories of distant signal programming they actually carried during 2004 and 2005. The CRB found the “Bortz study to be the most persuasive piece of evidence provided on relative value,” concluding that “[t]he Bortz intervals certainly mark the most strongly anchored range of relative programming values produced by the evidence in this proceeding.”³ While the CRB adjusted the 2004-05 Bortz survey results to account for other evidence, its final royalty allocations among the Agreed Program Categories tracked those results very closely.

7. The Joint Sports Claimants (JSC) have asked that I provide my opinion as to the appropriate economic analysis for allocating the 2010-13 cable royalties among the Agreed Program Categories. For the reasons discussed below, I believe that the CRB should follow the same approach that it adopted in the 2004-05 proceeding. It should rely primarily upon the results of the 2010-13 Bortz surveys to allocate the 2010-13 cable royalties. These results are set forth in a Bortz report entitled “Cable Operator Valuation of Distant Signal Non-Network Programming: 2010-13” (December 22, 2016) (Bortz Report).

³ *Distribution of the 2004 and 2005 Cable Royalty Funds*, 75 Fed. Reg. 57063 at 57066, 57068 (Sept. 17, 2010) (“2004-05 Distribution Order”).

8. In prior royalty proceedings the CRB also has suggested the use of, or has ascribed weight to, other types of studies to determine relative market values of distant signal programming. This includes a Shapley analysis and studies based upon certain subscriber viewing data and surveys of cable subscribers. As discussed below, I do not believe that a Shapley analysis offers an empirically feasible method of determining relative market value in this proceeding. Nor do I believe that cable *subscriber* viewing data and cable *subscriber* surveys reflect the relative amounts that cable *operators* would pay for the different categories of non-network distant signal programming.

III. ESTIMATING RELATIVE MARKET VALUE

9. I understand that all parties to this proceeding agree with the relative market value standard, which I also believe makes sound economic sense. There is no economic justification for allocating any distant signal program category more or less than it would have received in a free marketplace absent the Section 111 compulsory license. The more difficult question is how best to determine relative market value of each Agreed Program Category given the absence of marketplace negotiations over distant signal programming. In my opinion, the 2010-13 Bortz surveys provide a method for determining relative market value that is superior to other methods considered by the CRB in prior proceedings, *i.e.*, viewing studies, cable subscriber surveys and a Shapley valuation. My opinion finds support in the fact that observable marketplace behavior – as reflected in the studies (including the regression analysis) undertaken by Dr. Mark Israel of the economic consulting firm Compass Lexecon Inc. (Compass Lexecon) – corroborates the 2010-13 Bortz survey results.

A. The 2010-13 Bortz Cable Operator Surveys

10. For approximately thirty years, Bortz has conducted an annual survey of CSO program executives to identify how they value programming on the distant signals they carry pursuant to Section 111. Bortz has employed a well-established market research technique, known as a “constant sum” survey, in which each respondent is asked to divide a budget for distant signals among the different program categories. Bortz has employed the same methodology in its surveys for the years 2010, 2011, 2012 and 2013. However, it made certain refinements and improvements in that methodology in response to changes in the law and marketplace and issues raised by the Judges in the 2004-05 allocation proceeding.⁴

11. The 2010-13 Bortz surveys are well-designed and carefully constructed to reduce possible limitations of survey methodologies generally. The Bortz surveys collect information from the relevant decision makers, the CSOs themselves, who would have been the buyers in the hypothetical marketplace that the CRB seeks to replicate. The surveys allow for direct estimation of the perceived relative market value of different types of compensable programming carried on distant signals. They pose the same question that the CRB must answer in allocating the 2010-13 cable royalties among the Agreed Program Categories. That question has the additional advantage of asking the respondent about relative cost and value allocation independently of the current regulatory setting; hence, the survey responses are consistent with the relative valuations under a hypothetical market free of the compulsory license.

12. Moreover, the use and consistency of the Bortz surveys over the last thirty years provides for a great deal of continuity and confidence in the estimates generated from the current 2010-13 Bortz surveys. A significant advantage of the repetition of the same basic methodology

⁴ Bortz Report, pp. 24-40.

over such an extended period is its time consistency and established reputation and reliability. It affords the ability to update and to improve the survey methodology in response to issues raised in these proceedings and market developments, as was done with the 2010-13 Bortz surveys.

13. Dr. Robert Crandall testified on behalf of JSC in several prior cable royalty proceedings that “the best evidence of valuation of any specific programming type is the data provided by the Bortz survey.”⁵ His testimony supports the use of Bortz survey results to allocate the Section 111 royalties. Several expert witnesses from a variety of disciplines, representing various claimant groups, have provided comparable testimony in prior proceedings supporting reliance upon the Bortz survey results.⁶ The CRB and its predecessors, as well as the federal courts, have likewise found that those results are useful in determining the relative market value of the different categories of compensable programming carried as distant signals.⁷

⁵ Dr. Robert Crandall, Senior Fellow in Economic Studies, Brookings Institution (1998-99), ¶ 18 (JSC Ex. No. 6); see also Dr. Crandall (2004-05), ¶ 16 (JSC Ex. No. 4); Dr. Crandall (1989), pp. 6-7 (JSC Ex. No. 7).

⁶ Other witnesses testifying on behalf of JSC concerning Bortz surveys include Dr. Gregory Duncan, Professor of Economics, University of California - Berkeley (2004-05) (JSC Ex. No. 8); Dr. Joel Axelrod, President of BRX/Global, Inc., a market research firm (1990-92) (JSC Ex. No. 2); Dr. Leonard Reid, Professor of Advertising and Public Relations, University of Georgia (1989) (JSC Ex. No. 14); Dr. Samuel Book, President, Malarkey-Taylor Research (1989) (JSC Ex. No. 3).

Experts testifying on behalf of other claimant groups have also supported the Bortz survey, including: Dr. David Clark, President of KMC Media (1990-92; testifying for Devotionals); Dr. Richard Ducey, SVP of NAB’s Research and Information Group (1990-92; testifying for NAB); Dr. William Fairley, President of Analysis and Inference, Inc. (1990-92; testifying for PBS); John Fuller, Director of Research, PBS (1990-1992; testifying for PBS); Paul Much, Senior Managing Director of Houlihan, Lokey, Howard & Zukin, Inc. (1990-1992; testifying for NAB); Dr. Michael Salinger, Associate Professor of Economics, Boston University (1990-1992; testifying for Devotionals); Dr. David Scheffman, Professor of Economics, Vanderbilt University (1990-92; testifying for PBS); Dr. Steven Wildman, Associate Professor of Communications, Northwestern University (1990-92; testifying for NAB).

⁷ See 2004-05 Distribution Order; *Distribution of 1998 and 1999 Cable Royalty Funds*, 69 Fed. Reg. 3606, 3609-3616 (Jan. 26, 2004) (“1998-99 Phase I Distribution Order”) *aff’d Program Suppliers v. Librarian of Congress*, 409 F.3d 395, 402 (D.C. Cir. 2005); 1990-92 Report of the Copyright Arbitration Royalty Panel to the Librarian of Congress at 45-54 (May 31, 1996); *1989 Cable Royalty Distribution Proceeding*, 57 Fed. Reg. 15286, 15292-95 (Apr. 27, 1992).

I agree and believe that the CRB should rely primarily upon the 2010-13 Bortz survey results to allocate the 2010-13 cable royalties among the Agreed Program Categories.

B. Corroboration of the 2010-13 Bortz Survey Results

14. In evaluating any survey-based study that measures relative market value, it is important to consider whether the study results are consistent with observable marketplace behavior. To that end, I consulted with Dr. Israel and Compass Lexecon on their regression analyses which relate cable systems' 2010-12 royalty payments to the different categories of distant signal programming they retransmitted during those years. The regressions are comparable to those upon which the CRB and its predecessors relied in prior proceedings. Dr. Israel also analyzed the amounts that cable networks paid to carry sports and other programming analogous to that on distant signals during the years 2010-13. Both of these analyses are consistent with the results of the 2010-13 Bortz Surveys.

15. Dr. Gregory Rosston and Dr. Joel Waldfogel completed regression studies in the 1998-1999 and the 2004-2005 proceedings, respectively, on behalf of the National Association of Broadcasters (NAB)/Commercial Television Claimants. The CRB (in 2004-05) and the CARP (in 1998-99) concluded that these studies had certain limitations but nonetheless provided useful information concerning the relative market values of the programming categories on distant signals. In particular, both the CRB and CARP found the regression analyses useful as corroborating the Bortz Survey results.⁸

⁸ Report of the Copyright Arbitration Royalty Panel to the Librarian of Congress, at p. 21 (October 21, 2003). In the 2004-2005 Final Distribution Order, the CRB found that "...as a result of the manner in which he has conceptualized his model, Dr. Waldfogel's regression coefficients do provide some additional useful, independent information about how cable operators may view the value of adding distant signals based on the programming mix on such signals." 2004-05 Distribution Order at 57069.

16. One of the primary constraints with such empirical studies is that they are by definition relying on observed outcomes in the current market which is subject to regulatory constraints, rather than a hypothetical market free of such regulation. Nevertheless, these studies allow for estimation of the relative values of distant signal programming categories based on the offerings of particular programming types. They are helpful in determining the relative market value placed on such compensable programming subject to regulatory constraints. To the extent that these constraints do not unduly impact one programming type over another, it appears reasonable that the relative values estimated in such regressions would also be consistent, *i.e.*, have a similar rank ordering and a similar magnitude of differences in relative market values, as those present without current regulations.⁹ The Bortz surveys ask for relative valuations of compensable programming independently of regulatory structure. To the extent that both approaches lead to similar relative value estimates, that fact would support my view of the appropriateness of using the 2010-13 Bortz survey in estimating the relative marketplace value of different types of programming carried on distant signals.

17. The primary consideration underlying specifications in the current and previous regression studies is that while royalty payments are regulated, the choice of whether or not to carry a distant signal is not. Given both the opportunity and direct costs of carrying a distant signal, the decision by a CSO to carry a particular distant signal is an economic choice which reveals the *relative* valuation of programming content to that CSO within its current mix of programming offerings. The key benefit of a regression is that it can parse out the separate

⁹ Given that the royalty fees for the carriage of distant signals are independent of the programming offered on these distant signals, this seems a reasonable assumption. One might argue that if CSOs could insert advertising on the distant signals that they carry, then certain types of programming might marginally benefit more from the removal of these regulatory constraints. Nevertheless, even with such a possibility, revenue from advertising would remain very small relative to revenue from subscription fees for CSOs and hence the *relative* valuation of programming to CSOs would be unlikely to be greatly impacted.

impact of different types of programming on a CSO's final royalty payments, while controlling for additional independent factors – which are affected by the number and type of distant signals chosen by the CSO as well as the CSO's revenues (“gross receipts”).¹⁰

18. Dr. Gregory Rosston undertook a basic pooled Ordinary Least Squares regression of minutes of program type carried via distant signals by a cable system in an accounting period on the total royalties paid by that cable system in that same accounting period. Controls include the number of subscribers to a cable system in the previous accounting period, the number of channels carried on the system also in the previous period, the total number of local channels, average household income in the television market in which the cable system operated, a dummy variable for whether or not the cable system pays any royalties at the higher 3.75 percent royalty rate, whether the cable system carries any partially distant signals, and time dummies. For the allocation of the 2004 and 2005 cable royalty funds, Waldfoegel follows the same general specification used by Rosston but simultaneously considers cable systems with three different fee levels.¹¹

19. Dr. Israel uses a similar specification to Waldfoegel but attempts to improve upon the reliability of the regressions primarily by 1) adjusting the minutes on each distant signal to reflect the fraction of subscribers who actually receive that signal on a distant basis, 2) including non-compensable Network Programming minutes as a control variable, 3) assigning

¹⁰ Waldfoegel explains that “For Form 3 systems, the royalty payment for a bundle of distant signals is the product of the percentage rate (which is determined by the number of DSEs carried and other factors) and the system gross receipts for program service tiers that include broadcast stations. Hence, variation across CSO distant signal royalty payments is directly affected by two basic factors, the number and type of distant signals chosen and the system gross receipts.” Dr. Joel Waldfoegel (2004-05) at p. 7 (JSC Ex. No. 18).

¹¹ Waldfoegel addresses the previous criticism of the Rosston results of parameter instability across study years by allowing the estimated coefficients on minutes to differ in 2004 and 2005. He finds that it is not possible to reject the hypothesis “... that the minutes parameters are equal across years. While the parameter estimates vary across years, the variation is not statistically significant.” Dr. Joel Waldfoegel (2004-05), Appendix 3, p. 3 (JSC Ex. No. 18).

programming previously categorized as “Mexican” programming into their respective Agreed Program Categories defined by the Judges,¹² 4) assigning programming on low-power signals to their respective programming categories,¹³ and 5) using a larger sample both in terms of days sampled in each accounting period, as well as an increase in total observations.¹⁴

20. The results from Dr. Israel’s regression produce estimates for the implied royalty shares by programming type that are highly consistent with both previous regression studies and the 2010-13 Bortz survey results. All four estimate that the four highest value categories of programming are Sports, Program Suppliers, Commercial Television and Public Television.¹⁵ Most importantly, in addition to finding the exact same rank ordering for the top four programming categories as the 2010-2013 Bortz survey, Dr. Israel’s study yields estimates that are either squarely within or just slightly outside the range estimated over the three years by Bortz for the top three highest value programming categories.¹⁶ It is quite remarkable that such different empirical approaches are yielding results that are this similar, at least for the higher valuation programming types.¹⁷ Combined, the top three programming types are estimated to be valued at 86.5 percent of the total value of distant signal compensable programming in

¹² November 25 Order, Ex. A.

¹³ This is particularly relevant since Waldfoegel had grouped all low-power minutes, as well as all minutes on signals lacking sufficient data to categorize the programming, into a separate “Low Power” category.

¹⁴ The programming data used by Compass Lexecon cover a total of six accounting periods, *i.e.*, each six-month accounting period for 2010-2012. Programming data are sampled 28 days in each six-month accounting period for a total of 168 days. This is an increase in both the number of accounting periods (6 vs. 4) and an increase in the number of days sampled (28 vs. 21) relative to Waldfoegel. Hence the total number of days sampled is 168 compared to 84 for Waldfoegel. Still, due to the fall in the overall number of CSOs in the market over time, Compass Lexecon ends up with 5,465 observations, or slightly more than a ten percent increase relative to the Waldfoegel regressions.

¹⁵ Dr. Mark Israel (2010-13), p. 21.

¹⁶ Dr. Mark Israel (2010-13), pp. 21-22.

¹⁷ Dr. Israel finds a similar total estimated valuation for the lowest three programming categories of 13.5 percent relative to Bortz’s estimated range of around 9 to 13 percent. However, the regression results appear to be placing all of this value onto Public Broadcasting. Dr. Mark Israel (2010-13) pp. 22-23.

Dr. Israel's study. The 2010-2013 Bortz survey estimates that these top three categories were valued within the range of 87.7 percent to 91.5 percent over this same time period.

21. I agree with those economists who have testified that regression studies can provide some additional information about the relative CSO valuation of programming categories offered on distant signals that they choose to carry.¹⁸ Regressions allow the simultaneous consideration of many variables that are deemed theoretically relevant to the outcome being considered. This diminishes the risk of omitted variable bias in which a simple correlation between two factors could appear artificially magnified because a relevant factor of influence was not being considered, causing its impact to be artificially and inappropriately captured by the primary variable of interest. Regressions also allow the analysis of actions taken. In other words, given the actual decisions made by CSOs we see their revealed preferences. This yields information on the relative valuation of the addition of programming types to existing CSO offerings *under current regulations*.

22. Nevertheless, I have not seen evidence, nor am I aware of any reason to believe, that current regulations would inherently favor one type of programming over another. Hence, the relative valuation of compensable programming types carried on distant signals in regressions using realized data should still be predictive of the relative valuation of compensable programming types carried on distant signals in a hypothetical market free of regulation. I therefore agree with other economists who conclude that such regression studies are relevant to corroborating Bortz survey results to the extent that they find similar rank orderings of estimated relative valuations and to the extent that the regression study estimates appear to be of generally similar magnitudes as those estimated using the 2010-13 Bortz surveys.

¹⁸ See Dr. Gregory Rosston (1998-99) (JSC Ex. No. 15), Dr. Joel Waldfogel (2004-05) (JSC Ex. No. 18), and Dr. Mark Israel (2010-13).

23. In addition to the regression just discussed, Dr. Israel also calculated the average amount spent by cable networks per hour of programming televised and per total household viewing hour for JSC programming versus non-JSC programming during the years 2010-13. While cable networks are not the focus of the current proceedings, and advertising plays a greater role in the cable network market, this measure speaks to the relative marketplace valuation of JSC programming in the general marketplace. From 2010 to 2013, Dr. Israel calculates that those expenditures by the top 25 cable networks were on average around 27 times greater per hour for JSC programming than for all other types of programming. Thus, those networks allocated over 20 percent of their programming expenditures to JSC programming, despite the fact that such programming amounted to only about one percent of total hours of programming transmitted and just under three percent of total household viewing hours.¹⁹

C. Other Methodologies

1. Shapley Analysis

24. The CRB suggested in the context of recent “Phase II” proceedings that a Shapley valuation would be an optimal economic approach to determining relative market value.²⁰ From a theoretical perspective this approach has great merit. However, in the context of this proceeding, a Shapley valuation is not feasible because the relevant data do not exist. Moreover, even if the data existed, the immense number of potential permutations would pose an obstacle to such an analysis. As the CRB noted in quoting the observations of Professor Richard Watt, “[t]he Shapley model provides a reasonable working solution for regulators.... However, it

¹⁹ Dr. Mark Israel (2010-2013), p. 25.

²⁰ *Distribution of 1998 and 1999 Cable Royalty Funds*, 80 Fed. Reg. 13423, 13429-13430 (Mar. 13, 2015) (“1998-99 Phase II Distribution Order”).

does suffer from a particularly pressing problem – that of data availability.”²¹ Other scholars have similarly concluded that the absence of appropriate data is an obstacle to applying Shapley valuation to industries with bundled products.²²

25. This data problem stems from the fact that a Shapley valuation shares the revenues attributable to a bundle of products based on the expected marginal revenue of each product *averaging over all of its possible arrival orders in a bundle*. Thus, in order to calculate the Shapley value, one would need to know the revenue possible for every potential bundle ordering combination. Additionally, for any bundle with a significant number of products, the calculation of the exact Shapely value is computationally challenging. For N products there are N factorial (N!) possible orderings of the products. While a bundle of three products would have just six possible orderings, with each addition to the bundle the number of permutations escalates and quickly becomes unmanageable. A bundle of 30 products would have 30!, or approximately 2.65×10^{32} (two hundred and sixty-five nonillion), potential orderings. In view of the vastly larger number of potential components to the bundles of programming assembled by CSOs, the number of possible permutations would be overwhelming, even if measures of the revenue possible for each ordering combination were available. Given that a Shapley valuation is not empirically feasible, alternative approaches are necessary to accurately determine the economically appropriate distribution of cable royalty funds to different claimants.

²¹ 1998-99 Phase II Distribution Order at 13432, n.33. The CRB further noted the testimony in that proceeding from Dr. Erkan Erdem that “...there was no evidence in the record (or apparently otherwise available) by which one could calculate the Shapley values in this proceeding.” *Id.* at 13432.

²² See Shiller, Benjamin and Joel Waldfogel, “The Challenge of Revenue Sharing with Bundled Pricing: An Application to Digital Music” (2009), addressing this issue in the context of songs offered within a bundle to individual consumers.

2. Viewing

26. In previous proceedings some parties have introduced studies based in whole or in part on the viewing and/or volume of carriage of programs as a potential basis for determining the relative value of programming carried on distant signals. In the 2004-2005 Phase I proceedings, the CRB determined that the Bortz survey provides a better measure of the relative value of programming categories than studies based on Nielsen viewing data:

Having carefully reviewed and considered all of the evidence in the record, the Judges find that the values of the program categories at issue among these contending claimants are most reasonably delineated by a range bounded by certain results indicated primarily by the Bortz constant sum survey, to a lesser extent by the Waldfogel regression analysis and, to a slight extent, by the Gruen constant sum survey.²³

Similarly, the CARP in the 1998-1999 Phase I proceeding, in an order adopted by the Librarian of Congress, found “[a]fter considering both the Bortz survey and the Nielsen study” that “the Bortz survey best measured the value of programming.”²⁴

27. However, in the context of “Phase II” proceedings (which distribute funds to the various claimants within a single programming category, as opposed to the “Phase I” task of allocating royalties among the Agreed Program Categories), the CRB has stated that viewing-based studies are a useful – albeit “second-best” – measure of value.²⁵ The CRB “found viewership-based methodologies to be an acceptable approach to help determine relative market value of television programs *within a single, homogeneous program category*.”²⁶

²³ 2004-05 Distribution Order at 57065.

²⁴ 1998-99 Phase I Distribution Order at 3609. In affirming that award, the D.C. Circuit ruled that the CARP did not “act unreasonably in declining to rely on Nielsen for direct evidence of viewing, as Bortz adequately measured the key criterion of relative market value. Moreover, as the CARP put it, Bortz ‘subsumes inter alia all viewing data that a CSO might consider when assessing relative value of programming groups.’” *Program Suppliers v. Librarian of Congress*, 409 F.3d at 402.

²⁵ 1998-99 Phase II Distribution Order at 13432-33.

²⁶ *Order Reopening Record and Scheduling Further Proceedings*, Docket Nos. 2012-6 CRB CD 2004-09 (Phase II), 2012-7 CRB SD 1999-2009 (Phase II) (May 4, 2016) (emphasis added).

28. As several distinguished economists have testified in prior proceedings, viewership-based methodologies are not a good measure of the relative value of the various categories of distant signal programming.²⁷ There is also a significant and long established academic literature which underscores the economic fallacy of using viewership data to estimate the relative value of programming carried on distant signals.²⁸ I agree with the prior testimony of Drs. Wildman, Crandall, and Crawford that viewership alone does not allow for an appropriate estimation of the relative value of programming carried on distant signals.²⁹ Rather, the Bortz survey provides a far more economically relevant method of estimating the relative value of the Agreed Program Categories carried on distant signals.

29. CSOs choose which (if any) distant signals to carry based on maximizing profits from household subscriptions. This means that CSOs will consider both the incremental cost of carrying a distant signal and the incremental revenue from attracting new subscribers to a bundle, retaining existing subscribers, or being able to charge a higher price to existing subscribers. In this context, viewership does not necessarily reflect the willingness to pay on the part of subscribers; intensity of preferences is more relevant. For example, sports fans may be willing to pay much more to watch the games of their favorite team, even if these games are only televised at specific and limited times in a year, than for 100 hours of old sitcoms that they watch while trying to go to sleep. Simple viewing does not represent value for a CSO when choosing to carry a distant signal.

²⁷ Dr. Steven Wildman (1990-92); Dr. Gregory Crawford Rebuttal Testimony (2004-05); Dr. Robert Crandall Direct Testimony (1998-99) (JSC Ex. No. Ex. 6); Dr. Robert Crandall Rebuttal Testimony (1998-99) (JSC Ex. No. 5); Dr. Robert Crandall (2004-05) (JSC Ex. No. 4).

²⁸ For example, Owen, B. and S. Wildman. (1992). *Video Economics*. Harvard University Press: Cambridge, Mass.

²⁹ Dr. Steven Wildman (1990-92); Dr. Gregory Crawford Rebuttal Testimony (2004-05); Dr. Robert Crandall Direct Testimony (1998-99) (JSC Ex. No. Ex. 6); Dr. Robert Crandall Rebuttal Testimony (1998-99) (JSC Ex. No. 5); Dr. Robert Crandall, (2004-05) (JSC Ex. No. 4).

30. While viewership is relevant (although still not the only relevant factor) to *broadcast* stations in selecting content – because advertising revenues generally increase with the size of the audience watching a program – the calculus is different for CSOs. CSOs receive no advertising revenue from distant broadcast signals, and even if CSOs could insert advertisements into distant signals, the revenues from such advertisements would still be dwarfed by the revenue coming from subscription revenues.³⁰ As such, the perceived intensity of subscriber preferences would continue to hold far greater influence on a CSO’s decision to carry a distant signal than would the opportunity for small revenues through advertising.³¹

31. Moreover, the economics of bundling suggests that the most profitable addition to a cable system’s programming is for content that is *negatively correlated* with content already offered by the cable system.³² The negative correlation across subscriber preferences for programming type is important in this context because it means that when choosing to carry distant signals, CSOs will not only be concerned with average demand for a channel, but also

³⁰ Napoli found that 85% of CSO revenues from basic channel offerings come from subscriptions rather than advertising fees. Napoli, P. (2003). *Audience Economics: Media Institutions and the Audience Marketplace*. Columbia University Press: New York. More recently, SNL Kagan reported that in 2010-13 less than 4 percent of total cable television revenue came from net local advertising revenue. *Broadband Cable Financial Databook*, SNL Kagan (2015 ed.). There is no reason to believe that advertising sales on distant signals would be greater than that for cable channels currently earning advertising revenues for CSOs. Hence, the presence of such advertising revenue would have at most a very marginal impact on a CSO’s desire to carry a distant signal.

³¹ See Dr. Gregory Crawford Rebuttal Testimony (2004-05) p. 6; Spence, A. and B. Owen, (1977). “Television Programming, Monopolistic Competition, and Welfare.” *Quarterly Journal of Economics*. Vol. 91, 103-126; Owen, B. and S. Wildman. (1992). *Video Economics*. Harvard University Press: Cambridge, Mass. (research in media economics on the difference between program content choices under systems which maximize advertising revenue verses systems that are driven by pay-support in TV markets).

³² Crawford, Gregory S. and Ali Yurukoglu. (2012). “The Welfare Effects of Bundling in Multichannel Television Markets.” *American Economic Review*, Vol. 102, No. 2, (April), 643-685; Crawford, Gregory S. and Joseph Cullen (2007). “Bundling, Product Choice, and Efficiency: Should Cable Television Networks Be Offered a La Carte?” *Information Economics and Policy*. Vol. 19, 379-404; Dr. Gregory Crawford (2004-05); Carlton, Dennis W. and Jeffrey M. Perloff. (2005) *Modern Industrial Organization*. Fourth Ed. Pearson Addison Wesley, New York; Dr. Steven Wildman (1990-92).

with carrying channels that are different from one another so as to increase the profitability of the subscription bundle.³³ This also suggests that more niche programming will be chosen.³⁴

32. Thus, in the context of the economic value of individual programming within a bundle to a CSO, neither simple viewership data nor volume of programming is an appropriate metric for the relative market value of programming on distant signals. As Dr. Steven Wildman has testified, “If anything, ... we would expect that the types of programs accounting for the largest fraction of the viewing audience on distant signals to have the least value to cable systems at the margin. Thus, a viewing measure based on gross percentage shares of household viewing hours would tend to provide results that are *inversely correlated* with the appropriate measures of the relative values of distant signal programs.”³⁵ He underscores this by showing that what “cable systems pay in per-subscriber fees for basic cable networks is not closely correlated with audience size for those networks.”³⁶

33. The economic reality that viewership is not a good metric for the relative value of various categories of programming is further illustrated by Dr. Israel’s finding that the top 25

³³ Even within homogeneous programming, viewership is not necessarily a valid measure for relative value to a CSO. For example, consider an individual who likes news and public affairs programming. This individual might prefer MSNBC programming to CNN programming. Yet, for a CSO, if it already provides one of these channels in a given bundle, the addition of the second will have less marginal value to it than if the CSO currently carries neither. This is true even if a particular individual likes one more than the other (or if viewership is generally higher for one than the other) since it is the *marginal* increase in CSO profits that is relevant to its decision to offer the additional programming. Moreover, since it is the intensity of preferences for programs that influence a CSO’s ability to attract, retain, and charge higher subscription prices, viewership without true knowledge of preferences is potentially misleading.

³⁴ See Dr. Gregory Crawford Rebuttal Testimony (2004-05) p. 10; Dr. Gregory Crawford (2008) “The Discriminatory Incentives to Bundle: The Case of Cable Television,” *Quantitative Marketing and Economics*, Vol. 33, no. 3, 41-78; Dr. Steven Wildman (1990-92).

³⁵ Dr. Steven Wildman (1990-92), p. 9 (emphasis added).

³⁶ Wildman explains that “the 1990, 1991, and 1992 average license fees per subscriber for ESPN and CNN were substantially higher than USA Network’s license fee even though USA Network had higher average prime time ratings and, except for CNN’s higher number in the Gulf War year of 1991, higher average 24 hour ratings than either ESPN or CNN.” Dr. Steven Wildman (1990-92), p. 14.

cable networks devote almost 23 percent of their programming expenditures to JSC sports programming, although that programming accounts for about 1 percent of those networks' total programming hours and less than 3 percent of their total household viewing hours.³⁷ These results, and Dr. Israel's similar results for his analyses of the TBS and TNT cable networks, demonstrate (in an analogous market) that viewership and volume of programming are not valid measures of the relative value of programming categories, even in a market in which CSOs are able to insert advertising.

3. Cable Subscriber Surveys

34. The CRB's 2004-2005 Phase I determination also considered the results of a constant sum survey of cable *subscribers* and concluded that, although it was "much less useful" than the other evidence of relative value presented to the Judges, it "cannot be totally disregarded."³⁸ However, it appears that those subscriber survey results did not alter the CRB's awards to any significant degree.

35. The CRB was correct to accord little weight to this cable subscriber survey. A study of cable *subscribers* misses the relevant economic market because even in the hypothetical market for distant signal programming the buyers would be cable system *operators*. As the CRB has found, it is the Bortz survey that "focuses on the appropriate buyer in the hypothetical market – *i.e.*, the cable operator."³⁹ Moreover, given that the respondents of the Bortz survey are internalizing their beliefs about subscriber preferences when responding to questions about the relative value of categories of programming, this aspect of the market is reflected in the Bortz survey.

³⁷ Dr. Mark Israel (2010-13), p. 25.

³⁸ 2004-2005 Distribution Order, p. 23.

³⁹ *Ibid.*

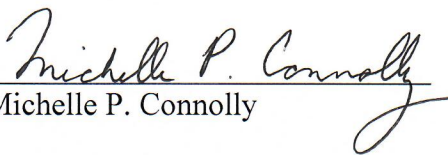
36. Conversely, when considering the preferences of only cable subscribers, all of the other market forces affecting the valuation of programming categories by a CSO are inappropriately ignored. As Dr. Wildman has correctly testified:

While it is the case that CSO and cable subscriber surveys presented to the Copyright Royalty Tribunal in the past showed somewhat similar overall rank-order value assignments by CSOs and subscribers, the two types of surveys do produce different allocations of value among different types of programs. Therefore, in comparing the two types of surveys it is important to remember that from an analytical perspective, the two approaches are not close substitutes for each other. Because CSOs are the purchasers in the relevant marketplace and subscriber demands are filtered through them, the CSO survey results must be considered more primary and as more directly relevant to the determination of appropriate compensation than the subscriber surveys.⁴⁰

⁴⁰ Dr. Steven Wildman (1990-92), pp. 7-8.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on December 20, 2016.


Michelle P. Connolly

APPENDIX A

CURRICULUM VITAE

December 2016

DUKE UNIVERSITY **Department of Economics**

MICHELLE P. CONNOLLY

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Department of Economics
Duke University
Durham, NC 27708
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EDUCATION

Ph. D., Economics, Yale University, 1996
M. Phil., Economics, Yale University, 1993
M. A., Economics, Yale University, 1992
B. A., Economics, Phi Beta Kappa, Summa Cum Laude, Distinction in the Major, Yale University, 1990

APPOINTMENTS

Professor of the Practice, Duke University, August 2012
Associate Professor of the Practice, Duke University, Sept. 2006- July 2012.
Chief Economist, Federal Communications Commission, Aug. 2008 – 2009.
Economics Director of Duke in New York: Financial Markets and Institutions Program, Jan. 2007 - June 2009.
Director of EcoTeach, Duke University, Sept. 2007 – July 2008.
Chief Economist, Federal Communications Commission, Aug. 2006 – 2007.
Director of EcoTeach and Assistant Professor of the Practice, Duke University, Sept. 2005 – Dec. 2006.
Assistant Professor, Duke University, Sept. 1997 – Aug. 2005.
Economist, International Research Function, Federal Reserve Bank of New York, Aug. 1996 – 1997.

FIELDS

Macroeconomics, Int'l Trade, Development, Growth, Telecommunications, Media

GRANTS

National Science Foundation, Secure and Trustworthy Cyberspace Medium Grant, “Dollars for Hertz: Making Trustworthy Spectrum Sharing Technically and Economically Viable,” 2013-2017

Teagle Grant, Duke University, 2008

Spencer Grant, Duke University, 2006

Arts and Sciences Research Council Grant, Duke University, 1998

Arts and Sciences Research Council Grant, Duke University, 1997

John F. Enders Research Grant, 1995

HONORS AND AWARDS

Howard D. Johnson Trinity College Teaching Prize, 2011

Top 5% of Duke University Undergraduate Instructors, Fall 2009, Fall 2010, Fall 2011.

Honorary Faculty Speaker, Duke University Economics Majors Graduation, Spring 2010.

Raymond Powell Teaching Prize, Yale University, 1994

Yale University Dissertation Fellowship, 1995

Ryoichi Sasakawa Young Leaders Fellowship, 1993

Yale University Fellowship, Full Support, 1990-1994

William Masee Prize for Excellence in Economics, (Best Academic Grade Record in Economics), Yale University, 1990

Phi Beta Kappa, Yale University, 1990

Summa Cum Laude, Yale University, 1990

National Merit Scholar, 1987

PUBLICATIONS

“The Digital Divide and other Economic Considerations for Network Neutrality” with Clement Lee and Renhao Tan, *Review of Industrial Organization*. December 2016: 1-18. DOI 10.1007/s11151-016-9554-8

“How Much of South Korea's Growth Miracle Can be Explained by Trade Policy,” with Kei-Mu Yi, *American Economic Journal: Macroeconomics*. Vol 7, Issue 4, October 2015: 188-221.

“Improved Reasoning in Undergraduate Writing through Structured Workshops,” with Jason Dowd, Robert Thompson and Julie Reynolds, *The Journal of Economic Education*. Vol. 46, Issue 1, 2015: 14-27.

“A Basic Analysis of Entry and Exit in the US Broadband Market, 2005-2008,” with James Prieger, *Review of Network Economics*. Vol. 12, No. 3, September 2013: 229-279.

“Proposed FCC Incentive Spectrum Auctions: The Importance of Re-optimizing Spectrum Use,”

Chapter in *Communications Law and Policy in the Digital Age: The Next Five Years*. Randolph May 2012.

“Economics at the Federal Communications Commission, 2008-2009: Broadband and Merger Review,” with James Prieger, *Review of Industrial Organization*, Nov. 2009, Vol. 35: 387-417.

“Sustaining the Goose that Lays the Golden Egg: A Continuous Treatment of Technological Transfer,” with Nelson Sa and Pietro Peretto, *Scottish Journal of Political Economics*, Sept. 2009, Vol. 56: 492-507.

“The Manhattan Metaphor,” with Pietro Peretto, *Journal of Economic Growth*, Dec. 2007, Vol. 12, 4: 329-350.

“Economics at the Federal Communications Commission: 2006-2007,” with Evan Kwerel, *Review of Industrial Organization*, Nov. 2007, Vol. 31: 107-120.

“Implications of Intellectual Property Rights for Dynamic Gains from Trade,” with Diego Valderrama, *American Economic Review*, May 2005.

“Human Capital in the Post-Bellum South: a Separate but Unequal Story,” *Journal of Economic History*, June 2004, Vol. 64, 2: 363-399.

“The Dual Nature of Trade: Measuring its Impact on Imitation and Growth,” *Journal of Development Economics*, Oct. 2003, Vol 72, 1: 31-55.

“Industry and the Family: Two Engines of Growth,” with Pietro Peretto, *Journal of Economic Growth*, March 2003, Vol. 8, 1: 115-148.

“Mercosur: Implications for Growth in Member Countries.” with Jenessa Gunther, *Current Issues in Economics and Finance*. May 1999, Vol. 5, no. 7. Federal Reserve Bank of New York.

WORKING PAPERS

“The Evolution of U.S. Spectrum Values Over Time,” Michelle Connolly, Nelson Sa, Chris Roark, Azeem Zaman, and Akshaya Trivedi, 2016.

“FCC Spectrum Auction Rules,” Michelle Connolly, Repton Salisbury, Akshaya Trivedi and Azeem Zaman, 2016.

“What’s on TV? An Analysis of Programming Offered by U.S. Cable and Broadcasting,” with Gregory Crawford, 2010.

“Openness to Ideas,” with Kei-Mu Yi, 2009.

“North-South Technological Diffusion: A New Case for Dynamic Gains from Trade,” with Diego Valderrama, 2006.

OTHER WORK

Op-Ed. Many Reasons to Renew Obama Fast-Track Authority on Trade. *Raleigh News and Observer*, June 10, 2015.

Guest editor. “The 80th Anniversary of the 1934 Communications Act and the Inception of the Federal Communications Commission” *Review of Industrial Organization*: Volume 45, Issue 3 (2014).

“An Analysis of Entry and Exit in the US Broadband Market in Recent Years,” with James Prieger, Report to the Broadband Task Force, FCC, 2011.

Book Review on *The Race between Education and Technology* by Claudia Goldin and Lawrence Katz. *Economic History Review*, Vol. 63.3, Aug 2010.

Book Review on *Intellectual Property and Development*, edited by Carsten Fink and Keith E. Maskus. *Journal of Economic Literature*, June 2006, Vol. XLIV, pp. 475-458.

“The Impact of Removing Licenses and Restrictions to Import Technology on Technological Change.” Background Report for the World Development Report 2000/2001, July 1999.

TEACHING

Economics of Telecommunications Policy, Duke University, 2012.

Honors Research Seminar, Duke University, 2007 – 2016.

Intermediate Undergraduate Macroeconomics, Duke University, 1998 - 2000, 2002, 2003, 2005, 2006, 2010, 2012, 2014, 2016.

Graduate International Trade, Duke University, 2002, 2003, 2005.

Advanced Graduate Macroeconomics, Duke University, 1997 - 1999.

UNIVERSITY SERVICE

Run Spectrum Lab at Duke University with seven undergraduate and two masters lab members. Interviewer for Duke Nominations for Rhodes, Marshall, Mitchell, and Schwarzman Scholarships, Fall 2016.

Vice-President, Phi Beta Kappa, Duke University Chapter, 2014 – present.

Director of Honors Program, Department of Economics, 2007– 2008, 2009 – present.

Committee on Members in Course, Phi Beta Kappa, Duke University Chapter, 2009 – present.

Duke Alumni Association Board Member, Sept. 2012 – May 2016.

Faculty Advisor to Duke Fed Challenge Team, 2015.

Duke Library Council, 2012 – 2015.

Duke Faculty-Student Connections Work Group, 2012.

Director of Duke in NY: Financial Markets and Institutions Program, 2007 – 2009.
Co-creator of Duke in NY: Financial Markets and Institutions Program, 2007.
Director of EcoTeach, Department of Economics, 2005 – 2008.
Duke University Academic Council, 2007 – 2008, 2009 – 2010.
Committee on the Undergraduate Experience, Duke University, Fall 2005.
Forum for Excellence in Undergraduate Education, Fall 2005 – Fall 2009.

PRESENTATIONS IN LAST TEN YEARS

Discussant for “The Future of the Internet Ecosystem in a Post-Open Internet Order World”
Technology Policy Institute and the University of Pennsylvania Law School’s Center for
Technology, Innovation and Competition, National Press Club, Washington, DC, January 8,
2016.

Panelist for “Does Platform Competition Render Common Carriage Irrelevant in an IP World?”
Progressive Policy Institute, Washington, DC, November 20, 2013.

Panelist for “A Workshop On How To Meet The Information Needs Of Communities.” UNC
Center for Media Law and Policy, Jan. 20, 2012.

Chautauqua Lecture for Duke University Freshman, 2011 and 2012.

Panelist for Congressional Hispanic Caucus Institute Public Policy Conference, September, 2011

Witness for the Congressional Hearing on “Promoting Broadband, Jobs and Economic Growth
Through Commercial Spectrum Auctions.” For the Communications and Technology
Subcommittee of the House Energy and Commerce Committee. June 1, 2011.

Panelist with Paul Milgrom, Michael Riordan, and Hal Varian for the Presentation of the FCC
Spectrum Auction Authority Letter to President Obama. White House. April 6, 2011.

Panelist at the Broadband Breakfast, "Setting the Table for the National Broadband Plan:
Collecting and Using Broadband Data," Washington, DC, February 2010.

AAC&U Annual Meeting, “Systematic Improvement of Teaching and Learning Through
Experimentation and Assessment,” Washington, DC January, 2010.

NBER's Summer Institute 2009, Economic Fluctuations and Growth, Small Working Group,
Cambridge, July, 2009.

Systematic Improvement of Undergraduate Education in Research Universities, Duke
University, June 12, 2009.

Panelist and Moderator, ACLP Advanced Communications 2009 Summit, Advanced
Communications Law and Policy Institute, New York Law School, April 2009.

Keynote Panelist, Wireless Technologies: Enabling Innovation and Economic Growth Conference, Georgetown Center for Business and Public Policy, Washington, DC, April 2009.

Martin H. Crego Lecture in Economics, All College Lecture, “Economics and Public Policy at the FCC,” Vassar College, March, 2009.

Forum for Excellence in Undergraduate Education, Kennedy School, March 2009, Nov. 2007, Nov. 2006, Nov. 2005.

“Universal Service Fund Reform,” Phoenix Center 2008 Annual U.S. Telecoms Symposium: Telecoms Priorities for the New Administration, Washington, DC, Nov. 2008.

“Intellectual Property Rights and International Trade,” Conference on Regional Determinants of Productivity Growth, University of Washington, Oct. 2007.

“Economic Drivers in Policy Formulation,” Spectrum Management Conference, Law Seminars International, Washington, DC, Sept. 2007.

Keynote Speaker, “Antitrust Developments in the United States,” CRA Int’l Antitrust Conference, Brussels, June 2007.

Keynote Speaker, “Economic Analysis in FCC Decision Making,” FCBA and Stanford Institute on Economic Policy Research, April 2007.

PROFESSIONAL ACTIVITIES

Yale Alumni School Committee Volunteer, October 2012 – present.

Board of Academic Advisors, Free State Foundation, July 2011 – present.

Steering Committee Member for NSF funded “Enhancing Access to the Radio Spectrum (EARS) Initiative, Spring 2010.

Consultant to the National Broadband Task Force, 2009 – 2010.

2009 TPRC Program Committee Member: The 37th Research Conference on Communication, Information and Internet Policy, September 2009.

Consultant to the Federal Communications Commission, 2007.

2008 TPRC Program Committee Member: The 36th Research Conference on Communication, Information and Internet Policy, September 2008

LANGUAGES

Fluent in English and French

Working Knowledge of Spanish

Certificate of Service

I hereby certify that on Monday, February 12, 2018 I provided a true and correct copy of the Dr. Michelle Connolly Written Direct Testimony to the following:

Public Broadcasting Service (PBS), represented by Dustin Cho served via Electronic Service at dcho@cov.com

Multigroup Claimants, represented by Brian D Boydston served via Electronic Service at brianb@ix.netcom.com

SESAC, Inc., represented by Christos P Badavas served via Electronic Service at cbadavas@sesac.com

National Public Radio, Inc. (NPR), represented by Gregory A Lewis served via Electronic Service at glewis@npr.org

Spanish Language Producers, represented by Brian D Boydston served via Electronic Service at brianb@ix.netcom.com

American Society of Composers, Authors and Publishers (ASCAP), represented by Sam Mosenkis served via Electronic Service at smosenkis@ascap.com

Canadian Claimants Group, represented by Victor J Cosentino served via Electronic Service at victor.cosentino@larsongaston.com

Devotional Claimants, represented by Jeannette M. Carmadella served via Electronic Service at jeannette@lutzker.com

National Association of Broadcasters (NAB), represented by John Stewart served via Electronic Service at jstewart@crowell.com

Broadcast Music, Inc. (BMI), represented by Joseph DiMona served via Electronic Service at jdmona@bmi.com

MPAA-represented Program Suppliers, represented by Alesha M Dominique served via Electronic Service at amd@msk.com

Signed: /s/ Michael E Kientzle