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Before the
COPYRIGHT ROYALTY JUDGES
Washington, D.C.

In re	)	
	)	
DISTRIBUTION OF CABLE ROYALTY FUNDS	)	**NO. 14-CRB-0010-CD (2010-13)**
	)	

Written Direct Testimony of Dr. Mark A. Israel

December 22, 2016

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I. QUALIFICATIONS

1. I am a Senior Managing Director of Compass Lexecon, an economic consulting firm where I have worked since 2006. From August 2000 to June 2006, I served as an Associate Professor at Northwestern University's Kellogg School of Management. I received my Ph.D. in economics from Stanford University in 2001.

2. I specialize in the economics of industrial organization—which is the study of competition in imperfectly competitive markets, including the study of antitrust and regulatory issues—as well as applied econometrics. At Northwestern and Stanford, I taught graduate-level courses covering topics including business strategy, industrial organization economics, and econometrics. My research on these topics has been published in leading economics journals including the *American Economic Review*, the *Rand Journal of Economics*, the *Review of Industrial Organization, Information Economics and Policy*, and *Antitrust Source.*

3. I have experience with applying economic analysis and econometric tools in a wide range of litigation, arbitration, regulatory, and antitrust matters. I have served as an expert for both the federal government and private parties in cases involving industries including cable television, broadcast television, wired and wireless telecommunications, broadband internet service, airlines, railroads, shipping, financial markets, credit cards, consumer retail, and others.

4. I have testified in federal court litigation and in many regulatory and arbitration proceedings in the U.S. and around the world. I also have submitted expert reports to government agencies and federal courts. Recently, I served as the testifying expert on

behalf of the U.S. Federal Trade Commission (FTC) in the proposed *Sysco/US Foods* merger, with the Judge relying on my report and testimony in deciding to grant an injunction.[1] I also have served as the lead expert in several other high profile recent mergers including: Comcast-NBCU, AT&T-Leap Wireless, T-Mobile-Metro PCS, and American Airlines-US Airways.

5. My full curriculum vitae is included as Appendix A.

II. INTRODUCTION AND SUMMARY

6. I have been asked by the Joint Sports Claimants (JSC):

- To review the Bortz Media and Sports Group report, entitled "Cable Operator Valuation of Distant Signal Non-Network Programming: 2010-13."[2] This report relies upon surveys (Bortz Survey) of cable system operators (CSOs)[3] to assess the relative fair market value of the different categories of programming shown on distant (out-of-market) broadcast signals retransmitted, for the years 2010-13.
- To determine whether the results of the Bortz Survey are consistent with actual marketplace behavior and thus provide a reliable estimate of the relative marketplace value of various categories of content.

7. I use two different methods (quite similar to those offered in prior cable royalty distribution proceedings) to determine whether actual marketplace behavior supports the results of the Bortz Survey: (1) a regression analysis that relies upon actual CSO 2010-12

[1] https://www.ftc.gov/enforcement/cases-proceedings/ftc-v-sysco-usf-holding-corp-us-foods-inc

[2] "Cable Operator Valuation of Distant Signal Non-Network Programming: 2010-13," Bortz Media & Sports Group, Inc., December 22, 2016.

[3] Throughout this report, I use the terms "CSO" and "cable system" interchangeably.

compulsory licensing royalty payments to estimate the relative values of the different distant signal programming categories, and (2) an analysis of the 2010-13 payments that various cable networks made to carry sports and other programming.

8. Observable marketplace behavior, as reflected in the analyses described above, corroborates the results of the Bortz Survey. The regression analysis produces relative valuations that closely match those in the Bortz Survey. Each of these analyses confirms that a minute of a sports program is worth significantly more than a minute of any other category of programming, consistent with the findings of the Bortz Survey. I conclude that the Bortz Survey is consistent with observed marketplace behavior and provides a reliable estimate of relative marketplace value of the different types of non-network programming on distant signals.

III. COMPULSORY LICENSING BACKGROUND

A. COMPUTATION OF CABLE COMPULSORY LICENSING ROYALTIES

9. In contrast to cable networks (*e.g.*, ESPN and TNT), distant broadcast signals are paid for by CSOs according to a statutory rate formula set by the U.S. Congress. The details of the royalty formula are complex, but, in general terms, the larger ("Form 3") CSOs (which accounted for the vast bulk of compulsory licensing royalty payments in 2010-13) pay a percentage of their "gross receipts" from subscribers to retransmit the copyrighted programming on broadcast signals.[4] The more distant signals a Form 3 CSO carries and the more it collects in receipts from subscribers, the more that CSO pays in royalties. Cable systems pay royalties for six month (accounting) periods. The U.S.

[4] "Gross receipts" are limited to those revenues that the CSO derives from subscribers "for the basic service of providing" TV and radio broadcast stations. Revenues derived from other services are not included in "gross receipts." See 17 U.S.C. § 111(d)(1)(B).

Copyright Office collects those royalties and then distributes them to copyright owners as directed by the Copyright Royalty Judges (Judges).

10. One of the key aspects of the royalty formula is the concept of Distant Signal Equivalents (DSEs). Each distant signal that a Form 3 CSO carries is assigned a DSE value, and the CSO pays for the sum of the DSEs that it carries (combined with how many subscribers receive those DSEs, and thus contribute to the CSO's gross receipts, as described below):[5]

- Independent stations (including FOX, Canadian and Mexican stations) receive a DSE value of 1.0.
- Network stations (ABC, CBS and NBC) receive a DSE value of 0.25.
- Noncommercial educational stations receive a DSE value of 0.25.

11. The royalty formula applies a graduated scale of royalty rates to distant signals, based on the number of distant signals carried. The royalty rate for the first DSE is 1.064 percent of gross receipts; this is sometimes referred to as the "minimum fee," as Form 3 CSOs carrying any DSE level from zero up to and including 1 must pay at least this amount. The rate for each of the second through fourth DSEs is 0.701 percent of gross receipts, and the rate for the fifth DSE and each additional DSE thereafter is 0.330 percent of gross receipts.[6] In addition to these graduated rates, a special royalty rate applies to certain distant signals that Form 3 CSOs would not have been permitted to carry under former FCC rules. The rate for those signals is 3.75 percent per DSE.

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5 See 17 U.S.C. § 111(f)(5).

6 See 17 U.S.C. § 111(d)(1)(B).

12. In calculating royalties, a Form 3 CSO may, in effect, divide itself into two or more "sub-systems" through the use of Subscriber Groups: groupings of subscribers from geographically distinct portions of the system, all of whom receive the same set of local and distant signals. These CSOs assign each Subscriber Group the portion of gross receipts it generates, as well as the DSE value representing the mix of distant signals that it receives. They then calculate the royalties due for each Subscriber Group, the total of which represents their royalty obligation so long as it exceeds the minimum fee (if it does not, the CSO pays the minimum fee).

13. Although Form 3 CSOs used Subscriber Groups prior to 2010, the Satellite Television Extension and Localism Act of 2010 (STELA) increased the incentive for them to do so: Before STELA, a Form 3 CSO that imported a fully-distant signal was required to pay for that signal based on the gross receipts from all of its subscribers, even those subscribers that did not receive the signal. Under STELA that CSO is required to pay royalties for such a signal based only on the gross receipts from the Subscriber Groups that actually receive the distant signal.

14. Empirical evidence shows that CSOs responded to the incentives under STELA by expanding the use of Subscriber Groups. According to data from CDC, the average number of Subscriber Groups increased from 0.95 Subscriber Groups per CSO in Accounting Period 2004-1 to 3.42 Subscriber Groups in Accounting Period 2013-2. However, the average number of Prorated DSEs was essentially static, at 1.11 in Accounting Period 2004-1, and at 1.14 in Accounting Period 2013-2.[7] Hence, relative to

[7] Prorated DSE is a measure of DSE that accounts for the fact that different Subscriber Groups within a CSO can carry different distant signals. I discuss the concept of Prorated DSE in more detail in paragraph 26, below.

the analysis in previous proceedings, it is particularly important to account for Subscriber Groups in this proceeding, and I do so, as explained below.

B. DISTANT SIGNAL PROGRAMMING CATEGORIES

15. Distant signal programming has historically been segmented into categories of programming types (and thus claimants) for purposes of the allocation determination in cable royalty proceedings. I understand that in this proceeding the parties agreed to, and the Judges have adopted, the following definitions of the categories of compensable TV programming[8]:

- **Program Suppliers** - Syndicated series, specials, and movies, except those included in the Devotional Claimants category. Syndicated series and specials are defined as including (1) programs licensed to and broadcast by at least one U.S. commercial television station during the calendar year in question, (2) programs produced by or for a broadcast station that are broadcast by two or more U.S. television stations during the calendar year in question, and (3) programs produced by or for a U.S. commercial television station that are comprised predominantly of syndicated elements, such as music videos, cartoons, "PM Magazine," and locally-hosted movies. [9]

- **Commercial Television (CTV)** - Programs produced by or for a U.S. commercial television station and broadcast only by that station during the calendar year in question, except those listed in subpart (3) of the Program Suppliers category.

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[8] The Judges' 11/25/2015 Order, Exhibit A. In addition to these categories, there is (1) a Music Claimants category, which covers the music works included within broadcast programming and (2) a National Public Radio category, which covers programming on non-commercial radio stations.

[9] The Program Suppliers category is comprised of both the 1) Movies and 2) Syndicated Shows / Series / Specials categories in the Bortz Survey.

- **Joint Sports Claimants (Sports)** - Live telecasts of professional and college team sports broadcast by U.S. and Canadian television stations, except programs in the Canadian Claimants category.

- **Public Television Claimants (PTV)** - All programs broadcast on U.S. noncommercial educational television stations.

- **Devotional Claimants (Devotional)** - Syndicated programs of a primarily religious theme, but not limited to programs produced by or for religious institutions.

- **Canadian Claimants (Canadian)** - All programs broadcast on Canadian television stations, except: (1) live telecasts of Major League Baseball, National Hockey League, and U.S. college team sports, and (2) programs owned by U.S. copyright owners.

I refer to the above as the Agreed Program Categories.

C. ALLOCATION OF CABLE ROYALTIES

16. I understand that the Judges and their predecessors have allocated the cable royalty funds among the Agreed Program Categories in accordance with their assessment of the relative marketplace value of each such category during the relevant years. Because CSOs pay for distant signals based on a statutory formula, there is no market price for distant signal programming to use in assessing relative marketplace value. Therefore, the Judges and their predecessors historically have based their allocation determination on evidence submitted by the parties regarding the relative marketplace value of the various categories of distant signal programming in a *hypothetical* free market. This assessment has focused on analyzing the relative value accorded to the different categories of distant signal programming by CSOs (the buyers of programming

in the hypothetical market), as a way of measuring the relative fair market value of distant signal programming.[10] One of the methods used to assess the relative fair market value is the Bortz Survey; another is an analysis of expenditures made on various categories of content. I discuss the relationship between these sources of evidence and my conclusions based on them in the remainder of this report.

IV. THE 2010-13 BORTZ SURVEY

A. THE BORTZ APPROACH

17. The Bortz Survey asked a random sample of cable operators how they would allocate a fixed budget among the different "non-network" programming categories on the distant signals they actually carried during each of the years 2010-13.[11] Bortz has designed and supervised similar annual surveys for more than 30 years.

18. In the last litigated "Phase I" proceeding (involving allocation of the 2004-05 royalty funds), the Judges relied "primarily" on the 2004-05 Bortz Survey to determine the relative fair market values of the Agreed Program Categories.[12] The precursor to the Copyright Royalty Judges, the Copyright Arbitration Royalty Panel (CARP), likewise determined that the Bortz Survey "best projected the value of broadcast programming in the hypothetical marketplace."[13] As the CARP concluded:

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10 Federal Register /Vol. 75, No. 180 / Friday, September 17, 2010. Page 57065. "[E]xplanations about what induces cable system operators (the buyers) in a hypothetical distant signal market to exhibit preferences for one type of programming relative to the other types of programming that form part of the bundle on a distant signal station are the focus in this proceeding.")

11 "Cable Operator Valuation of Distant Signal Non-Network Programming: 2010-13," Bortz Media & Sports Group, Inc., December 22, 2016.

12 Federal Register /Vol. 75, No. 180 / Friday, September 17, 2010. Page 57065.

13 Federal Register /Vol. 69, No. 16 /Monday, January 26, 2004. Page 3609.

> The critical significance of the Bortz Survey is the essential question it poses to cable system operators, that is: What is the relative value of the type of programming actually broadcast in terms of attracting and retaining subscribers? That is largely the question the Panel poses when it constructs a simulated market. Further, the question asks the cable system operator to consider the same categories we are presented here in the form of claimant groups - that is, sports, movies, and the others. That is also what the Panel must do.[14]

B. RESULTS OF THE 2010-13 BORTZ SURVEY

19. The Bortz Survey results for the period 2010-13 show, among other things, that cable operators value live professional and collegiate team sports programming (Sports programming) more highly than any other category of non-network programming on distant signals. See Table IV-1, below, which is derived from the 2010-13 Bortz report. Table IV-1 shows that, on average, cable operators would allocate Sports programming approximately 36 to 40 percent of their distant signal non-network programming budget.[15]

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[14] Report of the Copyright Arbitration Royalty Panel in Docket No. 94-3 CARP CD 90-92 at 65 (May 31, 1996); *National Association of Broadcasters v. Librarian of Congress*, 146 F.3d 907, 931 n. 21 (D.C. Cir. 1998).

[15] The Program Suppliers category in these proceedings includes two of the categories in the Bortz Survey : 1) Movies and 2) Syndicated Shows / Series / Specials. I have aggregated the two together into Program Suppliers for the purposes of this table. CTV is the same as the Bortz Survey category "News and public affairs programs".

Table IV-1: Bortz Survey Results, 2010-2013

Programming Category	2010	2011	2012	2013	Bortz Survey Average 2010-2013
Sports	40.9%	36.4%	37.9%	37.7%	38.2%
Program Suppliers	31.9%	36.0%	28.8%	27.3%	31.0%
CTV	18.7%	18.3%	22.8%	22.7%	20.6%
PTV	4.4%	4.7%	5.1%	6.2%	5.1%
Devotional	4.0%	4.5%	4.8%	5.0%	4.6%
Canadian	0.1%	0.2%	0.6%	1.2%	0.5%

Source: Cable Operator Valuation of Distant Signal Non-Network Programming: 2010-13.

V. OBSERVABLE MARKETPLACE BEHAVIOR

20. My primary focus is on whether actual marketplace payments support the overall findings of the 2010-13 Bortz Survey. To this end, I undertake two different empirical analyses of actual marketplace behavior and compare the results of those analyses to the results of the 2010-13 Bortz Survey.

- First, I undertake a regression analysis similar to the analyses submitted on behalf of the Commercial Television Claimants by Professors Joel Waldfogel and Gregory Rosston, and found by the Judges and their predecessors to corroborate the Bortz Survey results in prior cable royalty distribution proceedings.[16]
- Second, I analyze the payments that cable networks made to copyright owners in the years 2010-13 for the rights to carry various categories of programming.

I find that both of these analyses corroborate the 2010-13 Bortz Survey results on relative marketplace valuations using observed marketplace behavior and outcomes.

[16] For the 1998-1999 proceeding, see Report of the Copyright Arbitration Royalty Panel to the Librarian of Congress, October 21, 2003, p. 21. For the 2004-2005 proceeding, see Federal Register /Vol. 75, No. 180 / Friday, September 17, 2010 (hereinafter 2004-05 Order), p. 57069.

A. REGRESSION ANALYSIS

1. Prior Regressions

21. In the 2004-05 cable royalty distribution proceeding, Dr. Joel Waldfogel performed a regression analysis to determine CSOs' relative valuation of different kinds of distant signal non-network programming, much like Professor Gregory Rosston did in the 1998-1999 proceeding.[17] The Waldfogel and Rosston written testimony on which I have relied are set forth in JSC Exhibits 18 and 15.

22. Dr. Waldfogel based his regression on how much CSOs paid for distant signal non-network programming under the statutory rate formula in 2004-2005, as a function of how much of each category of programming the CSOs retransmitted, together with various "control variables" used to hold other drivers of CSO payments constant. As Dr. Waldfogel explained, the purpose of his regression model was to:

> determine how the value of the distant signal bundles varies with additional minutes of each type of programming, holding everything else constant. To this end we regress observed royalty payments for the bundle on the numbers of minutes in each programming category, along with determinants of system revenue (the number of subscribers, local median income, etc.) and other determinants of the value of distant signals (the number of local channels, etc.)[18]

23. I agree with Dr. Waldfogel's overall approach. Although there is no marketplace price for the distant signal content, marketplace information can be gleaned from CSO carriage decisions and, in particular, what CSOs pay as a function of what they choose to

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17 Statement of Joel Waldfogel, *In the Matter of Distribution of the 2004 and 2005 Cable Royalty Funds Before the Copyright Royalty Judges*, Docket No. 2007-3 CRB CD 2004-2005, June 1, 2009 (hereinafter *Waldfogel Report*); Statement of Gregory Rosston, *In the Matter of Distribution of the 1998 and 1999 Cable Royalty Funds Before the Copyright Arbitration Royalty Panel*, Docket No. 2001-8 CARP CD 98-99, December 1, 2002 (hereinafter *Rosston Report*).

18 *Waldfogel Report*, p. 9.

carry. The regression enables me to determine the effective price the CSOs pay for each category of content by determining how much their payments go up with an additional minute of each category of content, holding other relevant factors constant.

24. In the 2004-2005 proceeding the Judges found the Waldfogel model helpful in corroborating the 2004-05 Bortz Survey results.[19] The predecessors to the Copyright Royalty Judges, the CARP, likewise found the Rosston regression analysis useful in corroborating the findings of the 1998-99 Bortz Survey, and therefore in determining the allocation of cable royalty funds in the 1998-1999 proceeding.[20] Thus, this type of regression study has proved to be an independent, informative analysis that helps assess the results of the Bortz Survey.

2. Model Specification

25. My regression analysis adopts the basic econometric framework of the Rosston and Waldfogel analyses.[21] In general, I have employed the same methodology used by Dr. Waldfogel in his 2004-05 study. However, as I describe in the following paragraphs, I have made certain modifications to that methodology, which I believe improve its reliability.[22]

26. **Subscriber Groups.** In order to account for the fact that any given distant signal may be received (and paid for) by only a portion of a cable system's subscribers and not others (that is by some Subscriber Groups but not necessarily all Subscriber Groups), I

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19 2004-05 Order at 57069.

20 Report of the Copyright Arbitration Royalty Panel to the Librarian of Congress, October 21, 2003, p 21.

21 They explained that framework in the written testimony found in JSC Exhibits 15 and 18.

22 I have consulted on my methodology with Professor Michelle P. Connolly, who I understand is also submitting testimony in this proceeding.

prorate each distant signal based on the fraction of the number of subscribers who receive it. For example, if only half of the subscribers receive a particular independent signal, then, in the regressions, the signal counts as only half of a distant signal equivalent (DSE). I implement this proration by using the variable in the CDC data called "Prorated DSE" as a measure of the prorated distant signal equivalents that each distant signal represents for each CSO – Accounting Period.

27. The use of Prorated DSE affects the explanatory variables in my model via its effect on the summation of programming minutes. In particular, in arriving at the number of minutes of each type of distant signal programming for each CSO – Accounting Period, I multiply the minutes by the Prorated DSE value for the particular distant signal, then sum the prorated minutes. Doing so scales the minutes on each distant signal (and thus the minutes of each type of programming) to account for the percentage of viewers who actually receive the signal.[23]

28. **Network Programming.** I include non-compensable Network Programming minutes in the estimation of the model, but only as a control variable, meaning that I exclude them from the calculation of shares of the royalty fund.[24] Network programming minutes are part of what a cable system obtains when it chooses to retransmit a distant signal that includes network programming, and therefore are part of the cost-benefit

[23] Because the use of Prorated DSE already (and more precisely) accounts for the fact that a signal may be distant only to a portion of a system's subscribers, my model omits the indicator variable for the carriage of partially distant signals used in the Waldfogel regression. Specifically, I exclude the Waldfogel variables "Indicator for Minimum Payment & DSE < 1", "Indicator for Minimum Payment & DSE <= 1" and "Indicator for Carriage of Partially Distant Signal". In their place, I do include a variable "Minimum Payment Indicator" which controls for those systems that pay only the statutory minimum payment.

[24] "Network Programming" – i.e., programming provided by ABC, CBS and NBC to their affiliates – is not part of the Agreed Program Categories, as it is non-compensable.

analysis that a cable system undertakes when deciding whether or not to carry such a distant signal. Hence, they should be included in a regression explaining total royalty payments. However, because they are not compensable minutes in this proceeding, I exclude Network Programming minutes from the share calculations. In other words, they effectively act like the other control variables in the regression – a factor that helps to explain royalty payments but does not directly enter the share calculations.[25]

29. **Mexican Stations.** I eliminate the separate category of "Mexican" programming used in the Waldfogel regression because the Judges' Order does not define a separate Mexican category.[26] And, because programs on distantly retransmitted Mexican stations can be included in the appropriate Agreed Program Category as defined by the Judges, I see no economic reason to separate out Mexican programming.[27]

30. **Sample Size.** I also employ a larger sample than Dr. Waldfogel did. In particular, Dr. Waldfogel's regression utilized a random sample of 21 days in each six-month accounting period over a two-year period (2004 – 2005).[28] In contrast, I have used data from a random sample of 28 days in each six-month accounting period over a three-year period (2010 – 2012). The use of 28 days of data per accounting period represents a 33

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25 Similarly, I include non-compensable programming minutes broadcast on WGN in the regression, but do not include such minutes in the share calculations. See Appendix B for further details.

26 Judges' 11/25/2015 Order, Exhibit A.

27 Most programming on Mexican distant signals is in the Program Suppliers category, with a smaller amount in the Devotional category. No programming on Mexican signals is in the Sports, CTV, PTV or Canadian categories because those categories are expressly limited to programing on U.S. and/or Canadian stations. Judges' 11/25/2015 Orders, Exhibit A.

28 *Waldfogel Report*, Appendix 2, p. 2.

percent increase in the number of days used by Dr. Waldfogel, while still ensuring that no day of the week is more represented in the data than another.

31. **Low-Power Stations.** Because programming on low-power signals has been categorized in the same fashion as programming on full-power signals in my regression datasets, I do not employ a separate "low-power" category.[29] In contrast, Dr. Waldfogel grouped all minutes on low-power stations—as well as all minutes on signals for which he lacked the data required to categorize the programming on the signal—into a residual category called "Low Power".[30] In my case, the available programming data for 2010-12 generally includes data on both low-power and full-power signals, and less than 2 percent of the distant signal minutes in the sample lacked the data required to categorize those minutes among the agreed programming categories.[31]

32. With these changes in place, I otherwise implement a regression model analogous to that used by Dr. Waldfogel. In particular, my model specification explains cable system distant signal royalty payments as a function of the minutes of the adopted programming categories, controlling for other relevant differences across cable systems and time. An observation in the data is a six-month period of time (accounting period) for each cable system. Therefore, a cable system that existed from 2010 through 2012 would appear in the data six times, twice for each year. For each observation, I sum the

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29 The minutes in my dataset that could not be categorized due to an absence of programming information are referred to as "Other" minutes and, like the non-compensable Network Programming minutes, are not included when calculating implied share allocations.

30 Statement of Joel Waldfogel, *In the Matter of Distribution of the 2004 and 2005 Cable Royalty Funds Before the Copyright Royalty Judges*, Docket No. 2007-3 CRB CD 2004-2005, June 1, 2009. Appendix 2, footnote 4.

31 This represents less than 1 percent of minutes, after prorating the minutes using the Prorated DSE variable.

programming minutes for each programming category, over a total of 28 randomly selected days in each six-month period.[32]

33. Similar to Professor Waldfogel (with the changes discussed above), I include the following control variables to the regression model:

- Number of CSO subscribers from the previous accounting period
- Number of activated channels for the CSO in the previous accounting period
- Count of broadcast channels for the CSO
- Indicator for whether a CSO pays the special 3.75 percent rate fee
- Indicator for whether or not the CSO pays the minimum statutory payment[33]
- Average household income for the Designated Market Area (DMA) of the CSO
- Indicators for the accounting period of each observation

34. Holding these factors constant, the regression allows me to answer the question: How much do CSO royalty payments increase with each additional minute[34] of each category of programming content, holding other relevant factors that determine royalty payments fixed? The answer provides an implicit average price for each minute of each category of programming, which provides marketplace evidence on relative valuations.

35. Further detail as to the methodology that I employed is set forth in Appendix B.

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[32] Days are chosen at random in such a way that each day of the week is represented four times, equally representing each.

[33] This variable replaces two variables in the Waldfogel specification: "Indicator for Minimum Payment & DSE < 1" and "Indicator for Minimum Payment & DSE <= 1".

[34] By which I mean "prorated minute", as I have described. I will shorten this simply to "minute" for the remainder of the paper for the sake of readability and brevity.

3. Regression Results

36. Table V-1, below, shows the regression results for my model.[35]

[35] Complete regression results for my regression model and all of the model sensitivities (including coefficient estimates for accounting period indicator variables and the constant term) are included as Appendix C.

Table V-1: Regression Model Results

VARIABLES	Regression Model All Categories (1)
Minutes of Sports Programming	4.836**
	(2.466)
Minutes of Program Suppliers Programming	0.469***
	(0.104)
Minutes of Commercial TV Programming	1.010***
	(0.355)
Minutes of Public Broadcasting Programming	0.660**
	(0.306)
Minutes of Canadian Programming	-0.973***
	(0.212)
Minutes of Devotional Programming	-0.701***
	(0.246)
Minutes of Network Programming	-0.985***
	(0.290)
Minutes of Other Programming	0.916**
	(0.462)
Number of Subscribers (Previous Accounting Period)	1.351***
	(0.0601)
Number of Activated Channels (Previous Accounting Period)	141.8***
	(18.73)
Median Household Income in Designated Marketing Area	1.339***
	(0.286)
Count of Broadcast Channels	-493.5
	(326.5)
Indicator for Special 3.75% Royalty Rate	41,918***
	(4,711)
Minimum Payment Indicator	-16,501***
	(3,689)
Observations	5,465
R-squared	0.692

Source: TMS/Gracenote; Cable Data Corporation; Kantar Media/SRDS

Note: Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

37. My model follows the same general method as Professors Waldfogel and Rosston, and measures each category's programming minutes' relative value as compared to each other category of compensable programming minutes individually. A regression coefficient on a programming category can be interpreted as the average value across all cable systems of an additional minute of that category of programming. This model confirms the finding from the 2010-13 Bortz Survey that Sports programming is worth substantially more than other programming, at $4.84 per minute.

38. Because each of the programming categories is estimated individually, this model can be used, together with data on the number of minutes of each category of programming, to determine the relative valuations of each type of programming. Table V-2, below, calculates these implied royalty allocations. In particular, to determine the total value of the different categories of programming for each CSO - Accounting Period, I multiply the corresponding regression coefficient (which gives the average value of an additional minute of that type of programming) by the actual number of compensable minutes aired. I then calculate the implied percentage value that each programming category contributes as the ratio of the total value for that category divided by the sum of the total values across all the categories.

Table V-2: Royalty Share Allocation

Claimant Group	Value of an Additional Minute[1]	System and Prorated DSE Weighted Compensable Minutes	Value of Minutes	Implied Share of Royalties
[A]	[B]	[C]	[D] = [B] * [C]	[E] = [D] /(89,701,903)
Sports	4.836**	6,962,722	33,674,484	37.54%
Program Suppliers	0.469***	51,261,616	24,058,506	26.82%
Commercial TV	1.01***	19,677,607	19,873,956	22.16%
Public Broadcasting	0.66**	18,322,702	12,094,957	13.48%
Devotional	-0.701***	4,384,240	0	0.00%
Canadian	-0.973***	4,839,825	0	0.00%
Total		**105,448,713**	**89,701,903**	**100.00%**

Source: TMS/Gracenote; Cable Data Corporation; Kantar Media/SRDS

Notes: *, **, and *** indicate results are significant at the 90, 95, and 99 percent confidence levels, respectively.

[1] Minutes prorated.

39. Table V-3, below, compares the royalty allocation implied by my regression results to those of Drs. Waldfogel and Rosston, from 2004-2005 and 1998-1999, respectively. My regression results imply the same rank order among the top four programming categories as Dr. Waldfogel's regression results do, and the magnitude of the royalty allocations is generally similar among the top three categories, as well. My results also agree with those of Dr. Rosston on the set of the top four programming categories, as well as on the Canadian and Devotional categories.

Table V-3: Comparison of Regression Results

Programming Category	Israel Regression Model 2010-2012	Waldfogel Regression Model 2004-2005	Rosston Regression Model 1998-1999
Sports	37.5%	42.4%	32.7%
Program Suppliers	26.8%	24.7%	48.9%
CTV	22.2%	22.9%	10.9%
PTV	13.5%	6.8%	7.5%
Devotional	0.0%	0.0%	0.0%
Canadian	0.0%	3.3%	0.0%

Source: Israel base regression model; Waldfogel Report; Rosston Report.

40. Table V-4 and Figure V-1 compare the 2010-13 Bortz Survey results to my 2010-2012 regression model results. For the four highest valued categories of programming (Sports, Program Suppliers, Commercial Television and Public Television), the 2010-12 regression results are in accord with the results of the 2010-13 Bortz Survey on the rank order of the relative market value of these programming categories to cable operators.[36] In addition, for Sports, the regression estimate of 37.5 percent falls within the minimum and maximum estimates of 36.4 percent and 40.9 percent from the Bortz Survey across the years. For Program Suppliers, the regression estimate of 26.8 percent falls very near the bottom end of the range of results of the Bortz Survey, at 27.3 percent. For Commercial Television, the regression estimate of 22.2 percent falls within the minimum and maximum estimates of 18.3 percent to 22.8 percent from the Bortz Survey.

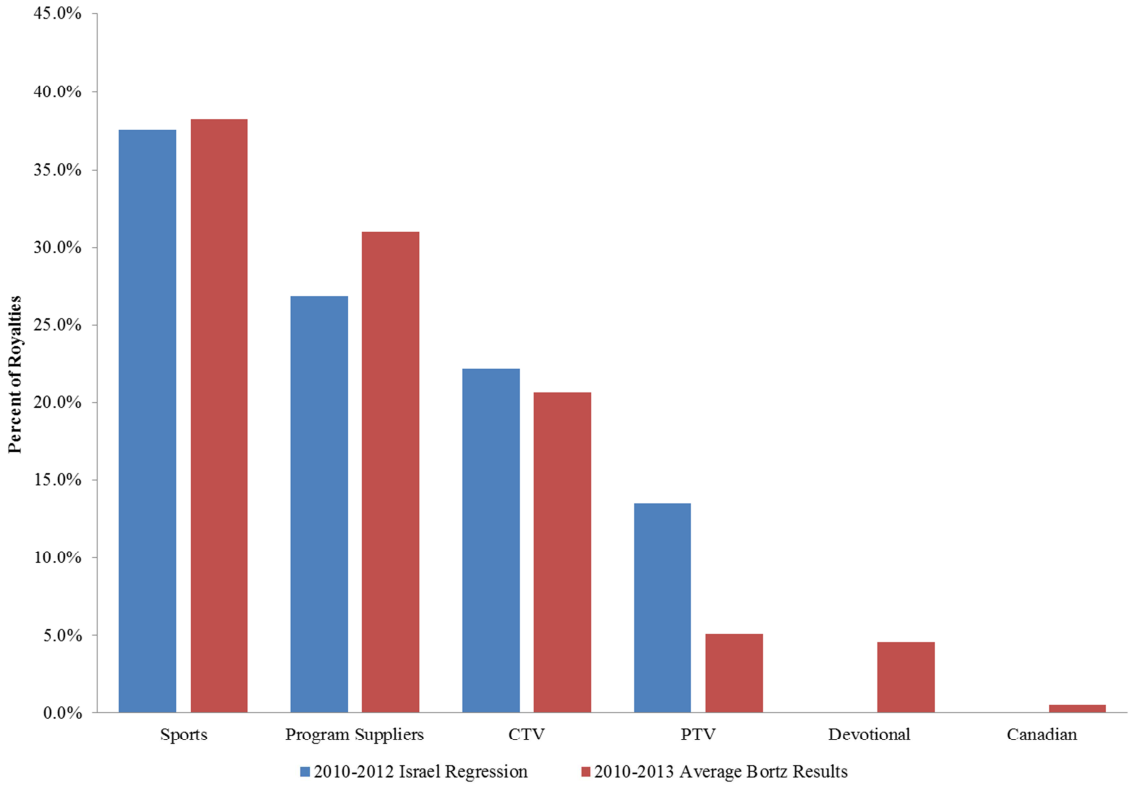
[36] The Bortz Survey reports survey responses to two separate categories that comprise the Program Suppliers Agreed Program Category: 1) Movies and 2) Syndicated Shows / Series / Specials. I have aggregated the Bortz Survey results for these two categories into the single category of Program Suppliers.

Table V-4: Comparison of Bortz Survey Results to Regression

Programming Category	2010	2011	2012	2013	Bortz Survey Average 2010-2013	Israel Regression 2010-2012
Sports	40.9%	36.4%	37.9%	37.7%	38.2%	37.5%
Program Suppliers	31.9%	36.0%	28.8%	27.3%	31.0%	26.8%
CTV	18.7%	18.3%	22.8%	22.7%	20.6%	22.2%
PTV	4.4%	4.7%	5.1%	6.2%	5.1%	13.5%
Devotional	4.0%	4.5%	4.8%	5.0%	4.6%	0.0%
Canadian	0.1%	0.2%	0.6%	1.2%	0.5%	0.0%

Source: Cable Operator Valuation of Distant Signal Non-Network Programming: 2010-13, Israel regression model.

Figure V-1: Comparison of Bortz Survey Results to Regression



Sources: Cable Operator Valuation of Distant Signal Non-Network Programming: 2010-13; Israel regression model.

41. For the three lower ranked programming categories (Public Television, Devotional, and Canadian), my regression model agrees with the Bortz Survey on the relative share of the sum of Public Broadcasting + Devotional + Canadian categories, a

total of roughly 9 to 13 percent. However, the regression attributes all of that value to the Public Broadcasting category, while the Bortz Survey finds that CSOs also would allocate a small portion of their budgets to the Devotional and Canadian categories (on average <5% and <1% respectively). In sum, then, while different methods may reach different conclusions about allocation of dollars within the lowest valued categories of programming, there is striking agreement on the allocation across the most important programming categories and the overall value of the remaining categories.

42. The fact that two entirely different methods yield extremely similar numbers for Sports programming in particular—one method based on the views of the buyers of the programming and another based on their observed marketplace decisions—provides compelling economic evidence in support of the Bortz Survey findings on the proper allocation to Sports programming in particular. The similarity of results also provides compelling economic evidence on the proper allocation to the top three categories more generally, as well as the proper split between those top categories and the bottom three categories.

43. In Appendix C to this report, I report the results of a number of "sensitivity analyses" on my regression model—alternative specifications that show my conclusions are not sensitive to minor changes in the way my model is implemented. All of the sensitivity analyses confirm the relative ranking of the various categories, particularly of the top three categories relative to the bottom three. They also confirm that Sports programming minutes are substantially more valuable than other categories of programming: Three different sets of regression results, testing three different variations

on my regression model, all show that Sports programming is consistently the most valuable type of programming for CSOs.

44. Most importantly, all of the sensitivity analyses are consistent with the distribution of royalties implied by the Bortz Survey. Each of these sensitivity analyses confirms my result for my regression model, which in turn supports the conclusions reached by the Bortz Survey.

B. ANALYSIS OF CABLE NETWORK EXPENDITURES

45. I also have undertaken an analysis that focuses upon the amounts that cable networks paid to carry sports and other programming during the years 2010-13 (Cable Content Analysis). This analysis is similar to one that JSC provided the Judges in the 2004-05 proceeding, which is found at JSC Exhibit 16.[37] For 2010-13, I compare the amounts that cable networks spent per hour of programming televised and total household viewing hours (HHVH).[38]

46. The Bortz Survey found that CSOs would allocate a substantial portion of their distant signal programming budgets to live sports programming, although such programming comprises only a relatively small share of the programing hours shown and viewed on those signals. This implies that CSOs accord a high value per hour to live sports programming. My Cable Content Analysis reaches a result consistent with this and thus further corroborates the results of the Bortz Survey. In particular, the Cable Content Analysis illustrates that for each year from 2010 to 2013, cable networks paid

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[37] Rebuttal Testimony of James Trautman, *In RE: Distribution of the 2004 and 2005 Cable Royalty Funds*, December 11, 2009 (JSC 2004-2005 Rebuttal).

[38] I employ the same HHVH metric used in the JSC 2004-2005 Rebuttal, which responded to time- and viewing-based methodologies presented by the Program Suppliers' experts in those proceedings.

much more per hour (televised or viewed) for JSC programming than for all other types of cable programming. Said differently, JSC programming's share of cable network expenditures is larger than JSC programming's share of cable network broadcast minutes or HHVH.

47. Table V-5, below, compares total hours, total household viewing hours (HHVH), and total cable network expenditures for JSC programming to all other kinds of programming on the top 25 cable networks.[39] For the top 25 cable networks, JSC programming represents roughly 1 percent (1.06%) of all programming in terms of total hours transmitted, and less than 3 percent (2.96%) of total HHVH. However, the top 25 cable networks devoted more than 20% (22.68%) of their programming budgets to JSC programming. Expenditures per hour of programming can be calculated by dividing total expenditures by total hours of programming for each category, which shows that expenditures per hour of JSC programming is worth almost 30 times (27.41) more than all other kinds of programming on the top 25 cable networks. Expenditures per hour of viewing can be calculated by dividing total expenditures by HHVH. On a dollar per household viewing hour basis JSC programming is worth roughly 10 times (9.60) more than all other programming on the top 25 cable networks.

[39] My underlying documents contain statistics on programming hours, viewership, and expenditures for each individual cable network.

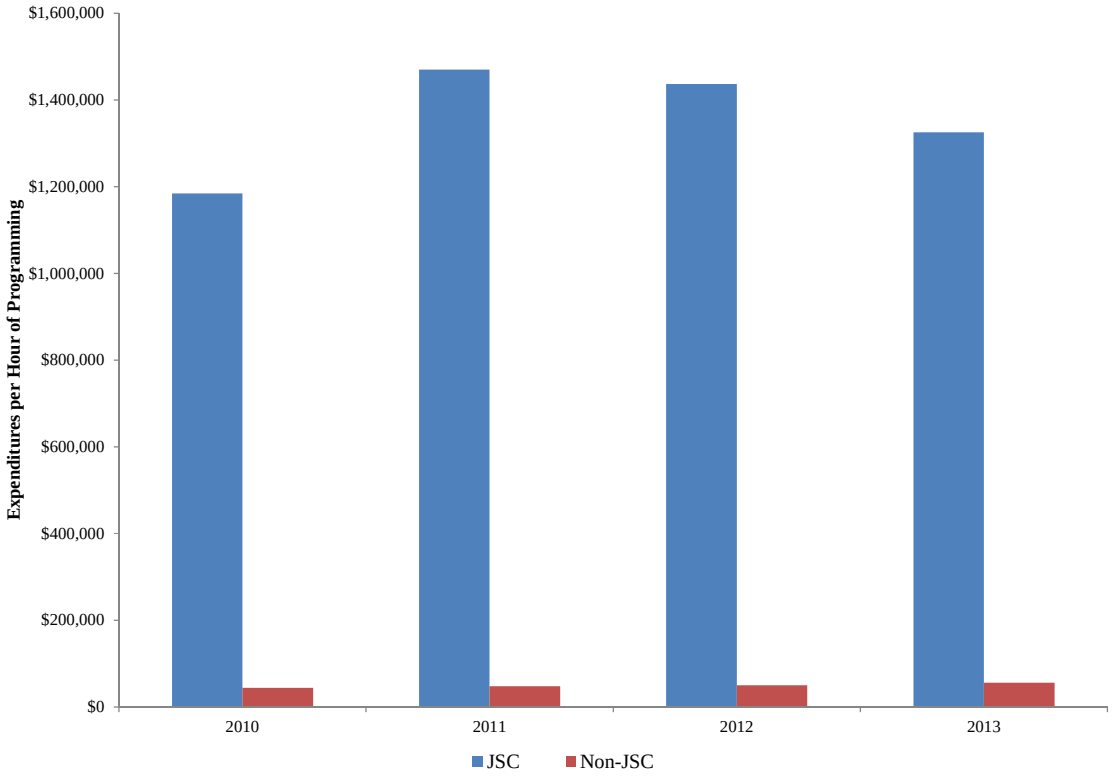
Table V-5: Cable Content Analysis 2010-2013, Summary of Top 25 Networks

Category	Total Programming Hours	Total HHVH (000)	Expeditures ($M)	Expenditures per Hour of Programming	Expenditures per Hour of Viewing
	[A]	[B]	[C]	[D] = [C] / [A]	[E] = [C] / [B]
JSC	9,274.0	15,164,368.9	$12,524.7	$1,350,513.0	$0.826
Non-JSC	866,726.0	496,492,970.2	$42,702.0	$49,268.2	$0.086
JSC / Non-JSC	0.01	0.03	0.29	27.41	9.60
JSC % of Total	1.06%	2.96%	22.68%		

Sources: Economics of Basic Cable 2015; various articles from Sports Media Watch, Sports Business Daily, ESPN Media Zone, TV By the Numbers, Soccer America, NY Times, USA Today, WSJ, Morgan Wick, and other various sources. See my underlying documents for a full list of sources.

48. Figure V-2, below, compares top 25 cable network expenditures on JSC content per hour of programming to expenditures on Non-JSC content per hour of programming in each year from 2010 to 2013. As reflected above, the top 25 cable networks spend much more per hour of JSC programming than they do per hour of Non-JSC programming.

Figure V-2: Cable Network Expenditures Per Hour of Programming 2010-2013, Top 25 Networks



Sources: Economics of Basic Cable 2015; various articles from Sports Media Watch, Sports Business Daily, ESPN Media Zone, TV By the Numbers, Soccer America, NY Times, USA Today, WSJ, Morgan Wick, and other various sources. See my underlying documents for a full list of sources.

49. The cable networks TBS and TNT, which both carry a mix of JSC and other categories of programming, show similar patterns in JSC programming value as the analysis of cable networks overall. Table V-6 shows results similar to Table V-5, but broken out separately for TBS and TNT. On the basis of total programing hours, JSC programming accounted for roughly 2 percent (0.02) of the total programming hours transmitted by TBS, and roughly 3 percent (0.03) of the total programming hours transmitted by TNT, during the years 2010-13. In terms of viewership, JSC generated roughly 5.5 percent of the total household viewing hours on TBS during that period, and roughly 7.9 percent on TNT. However, TBS spent 44.4 percent of its 2010-13 programming budget on JSC programming, while the comparable number for TNT was 45.5 percent. Expenditures per hour of JSC programming were more than 40 times

(40.11) greater than expenditures per hour of all other programming on TBS, and expenditures per hour of JSC programming were nearly 30 times (29.06) greater than expenditures per hour of all other kinds of programming on TNT. In terms of expenditures per household viewing hour, JSC is roughly 13 times (13.66) more valuable that all other types of programming on TBS, and 10 times (9.67) more valuable than all other types of programming on TNT.

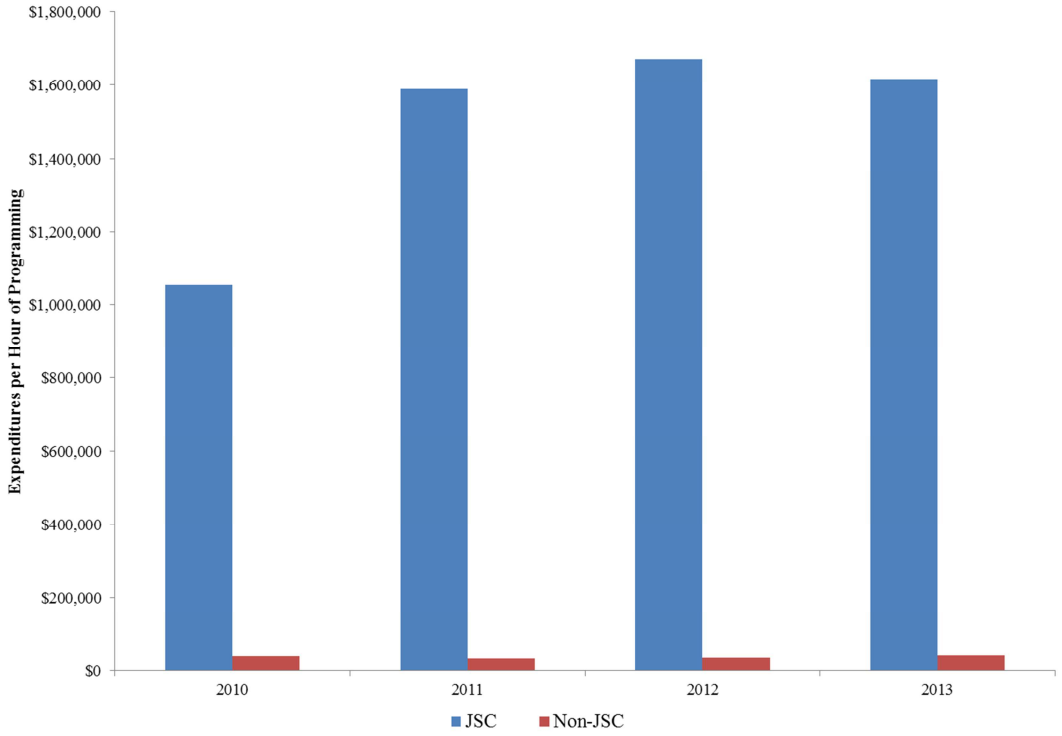
Table V-6: Cable Content Analysis 2010-2013, TBS & TNT

Network	Category	Total Programming Hours	Total HHVH (000)	Expeditures ($M)	Expenditures per Hour of Programming	Expenditures per Hour of Viewing
		[A]	[B]	[C]	[D] = [C] / [A]	[E] = [C] / [B]
TBS	JSC	684.0	1,220,722.6	$1,031.0	$1,507,370.6	$0.845
	Non-JSC	34,356.0	20,880,757.4	$1,291.2	$37,581.7	$0.062
	JSC / Non-JSC	0.02	0.06	0.80	40.11	13.66
	JSC % of Total	1.95%	5.52%	44.40%		
TNT	JSC	977.0	2,513,281.9	$2,042.0	$2,090,056.2	$0.812
	Non-JSC	34,063.0	29,162,878.1	$2,450.2	$71,931.9	$0.084
	JSC / Non-JSC	0.03	0.09	0.83	29.06	9.67
	JSC % of Total	2.79%	7.93%	45.46%		

Sources: Economics of Basic Cable 2015; various articles from Sports Media Watch, Sports Business Daily, ESPN Media Zone, TV By the Numbers, Soccer America, NY Times, USA Today, WSJ, Morgan Wick, and other various sources. See my underlying documents for a full list of sources.

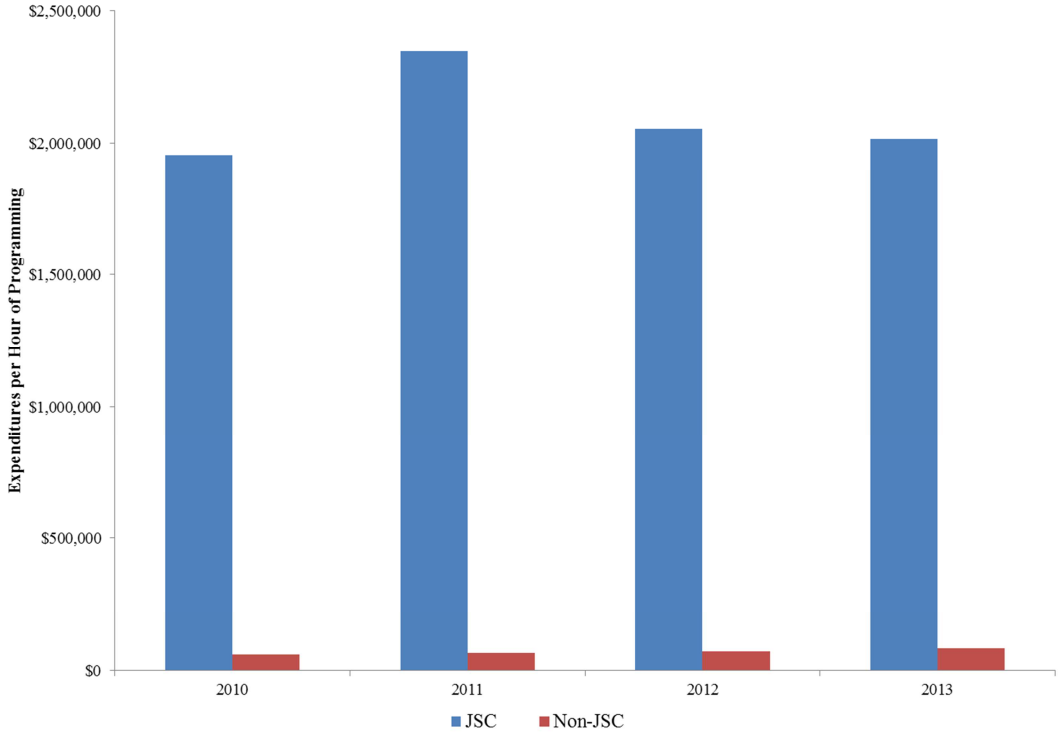
50. Figure V-3 and Figure V-4, below, show that TBS and TNT spent much more per hour of JSC programming than they did per hour of Non-JSC programming, respectively.

Figure V-3: TBS Expenditures Per Hour of Programming 2010-2013



Sources: Economics of Basic Cable 2015; various articles from Sports Media Watch, Sports Business Daily, ESPN Media Zone, TV By the Numbers, Soccer America, NY Times, USA Today, WSJ, Morgan Wick, and other various sources. See my underlying documents for a full list of sources.

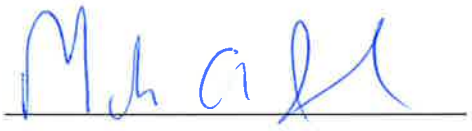
Figure V-4: TNT Expenditures Per Hour of Programming 2010-2013



Sources: Economics of Basic Cable 2015; various articles from Sports Media Watch, Sports Business Daily, ESPN Media Zone, TV By the Numbers, Soccer America, NY Times, USA Today, WSJ, Morgan Wick, and other various sources. See my underlying documents for a full list of sources.

51. The significant fees that cable networks pay for the rights to televise JSC programs are mirrored by the significantly higher license fees that cable systems and other MVPDs pay to carry these networks. During the years 2010-13, there were 97 nationally- and regionally-distributed cable networks with a minimum of 50 million subscribers in 2013. Of this number, 14 offered telecasts of JSC events (JSC Networks) and 83 did not do so (Non-JSC Networks).[40] The average 2010-13 license fee for JSC Networks was $0.753 per subscriber per month, while the average 2010-13 license fee for the non-JSC Networks was $0.174 per subscriber per month.

I declare under penalty of perjury that the foregoing is true and correct. Executed on December 21, 2016.



Mark A. Israel

[40] See my underlying documents for the details to these calculations. Regional sports networks (RSNs) are not included in this analysis. However, the average monthly affiliate license fee per subscriber for all RSNs, if I assume the largest possible count of subscribers for all RSNs, is $3.305 during 2010-13. The average monthly affiliate license fee/subscriber for the RSN in Chicago (Comcast SportsNet Chicago) is $2.648 during 2010-13.

Appendix A

APPENDIX A – CURRICULUM VITAE

Mark A. Israel **November 2016**
Senior Managing Director
Compass Lexecon

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Washington, DC 20005
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misrael@compasslexecon.com

SUMMARY OF PROFESSIONAL EXPERIENCE

- Served as an expert for both the Federal Government and private parties in cases involving industries including fixed and mobile telecommunications, cable television, broadband internet service, other high technology industries, airlines, railroads, shipping, financial markets, credit cards, beverages, consumer retail, and many others.
- Testified in Federal Court and appeared in front of government agencies including DOJ, FTC, and FCC, and state agencies on behalf of numerous clients.
- Submitted expert reports in Federal Court, as well affidavits, declarations, and white papers to agencies including DOJ, FTC, FCC, DOT, and state agencies.
- Written numerous academic articles on topics including competition economics, merger policy, telecommunications, airlines, insurance markets, and labor markets. Research published in leading scholarly and applied journals including The American Economic Review, The Rand Journal of Economics, The Review of Industrial Organization, Antitrust Source, and the Global Competition Review, and presented to business, government, and academic audiences around the world.

AREAS OF EXPERTISE

- Antitrust and competition economics; industrial organization economics
- Applied econometrics
- Economic and econometric analysis of horizontal and vertical mergers
- Economic and econometric analysis of antitrust litigation topics, including: Class certification, damages, and liability issues in cases involving price fixing, exclusive dealing, monopolization, bundling, price discrimination, and exclusionary practices

EDUCATION

- Ph.D., Economics, STANFORD UNIVERSITY, June 2001.
- M.S., Economics, UNIVERSITY OF WISCONSIN-MADISON, August 1992.
- B.A., Economics, ILLINOIS WESLEYAN UNIVERSITY, Summa Cum Laude, May 1991.

EMPLOYMENT HISTORY

Compass Lexecon: *Senior Managing Director*, January 2016 – Present.

(Previously: *Executive Vice President*, April 2013 – January 2016; *Senior Vice President*, January 2009 – March 2013; *Vice President*, January 2008 – December 2008; *Economist*, January 2006 – December 2007.)

Kellogg School of Management, Northwestern University: *Assistant Professor of Management and Strategy*, 2000 – 2006; *Associate Professor of Management and Strategy*, 2007 – 2008.

State Farm Insurance: *Research Administrator*, 1992 – 1995.

RECENT PROFESSIONAL RECOGNITIONS

American Antitrust Institute 2015 Antitrust Enforcement Awards, *Outstanding Antitrust Litigation Achievement in Economics* Finalist.

Global Competition Review Who's Who Legal: Competition 2016, leading Economist.

Global Arbitration Review's 2016 International Who's Who of Commercial Arbitration, leading Expert Witness.

LIVE TESTIMONIAL EXPERIENCE

Testimony as Economic Expert on behalf of Anthem Inc., *United States of America, et al. v. Anthem Inc. and Cigna Corp.*, In the District Court of the District of Columbia, No. 16-cv-01493 (ABJ), Deposition: November 9, 2016.

Testimony as Economic Expert on behalf of Defendants, *Darren Ewert v. Nippon Yusen Kabushiki Kaisha et al.*, Supreme Court of British Columbia, No. S-134895. Deposition: September 14, 2016.

Testimony in Commercial Arbitration on Issues Related to Mobile Wireless Competition; New York, NY; April 12, 2016.

Testimony as Economic Expert on behalf of Regal Entertainment Group, In the Matter of iPic – Gold Class Entertainment, LLC, et al., v. Regal Entertainment Group, AMC Entertainment Holdings, Inc., et al., In the District Court of Harris County, Texas, 234th Judicial District, No. 2015-68745. Deposition: January 12, 2016. Live Trial Testimony: January 21, 2016.

Testimony as Economic Expert on behalf of Federal Trade Commission in Re: Federal Trade Commission et al. v. Sysco Corporation and USF Holding Corp., Civil Action No. 15-cv-00256 (APM). Deposition: April 28, 2015. Live Trial Testimony: May 7, May 8, May 14, 2015.

Appearances in Federal Communications Commission, Economists Panels:

- Comcast/Time Warner, January 2015
- AT&T/T-Mobile, July 2011
- Comcast/NBCUniversal, August 2010

Appearance before California Public Utility Commission, Public Hearings on Comcast/Time Warner Merger, Los Angeles, April 2015.

Appearance as Economic Testifying Expert in front of Department of Justice, Federal Trade Commission, Federal Communications Commission, and State Regulatory Agencies in many additional transactions, including: Danaher/NetScout, AT&T/Leap Wireless, T-Mobile/MetroPCS, American Airlines/US Airways, SpectrumCo/Cox/Verizon Wireless, oneworld antitrust immunity application, PepsiCo/bottlers, Houghton Mifflin/Harcourt, Chicago Mercantile Exchange/Chicago Board of Trade.

EXPERT REPORTS, AFFIDAVITS, AND DECLARATIONS

Expert Report of Mark A. Israel, In the Matter between Darren Ewert and DENSO Corporation et al., In the Supreme Court of British Columbia, Vancouver Registry, No. S-135610, November 15, 2016.

Supplemental and Rebuttal Expert Report of Mark A. Israel, In the Matter of United States of America, et al. v. Anthem Inc. and Cigna Corp., In the United States District Court, District of Columbia, No. 16-cv-01493 (ABJ), October 28, 2016.

Expert Report of Mark A. Israel, In the Matter of United States of America, et al. v. Anthem Inc. and Cigna Corp., In the United States District Court, District of Columbia, No. 16-cv-01493 (ABJ), October 7, 2016.

Reply Verified Statement of Mark Israel and Jonathan Orszag, "Review of Commodity, Boxcar, and TOFC/COFC Exemptions," Surface Transportation Board, Docket No. EP 704 (Sub-No. 1), August 26, 2016.

Third Declaration of Mark Israel, Daniel Rubinfeld, and Glenn Woroch, "Analysis of the Regressions and Other Data Relied Upon in the Business Data Services FNPRM And a Proposed Competitive Market Test," Federal Communications Commission, WC Docket Nos. 16-143, 15-247, 05-25, RM-10593, August 9, 2016.

Verified Statement of Mark Israel and Jonathan Orszag, "Review of Commodity, Boxcar, and TOFC/COFC Exemptions," Surface Transportation Board, Docket No. EP 704 (Sub-No. 1), July 26, 2016.

Second Declaration of Mark Israel, Daniel Rubinfeld, and Glenn Woroch, "Analysis of the Regressions and Other Data Relied Upon in the Business Data Services FNPRM And a Proposed Competitive Market Test," Federal Communications Commission, WC Docket Nos. 16-143, 05-25, RM-10593, June 28, 2016.

Expert Declaration of Mark A. Israel, In the Matter of Liberman Broadcasting, Inc. and LBI Media, Inc. vs. Comcast Corporation and Comcast Cable Communications, LLC, Federal Communications Commission, MB Docket No. 16-121, June 7, 2016.

Expert Report of Mark Israel, In the Matter of La Crosse County, individually, and on behalf of all others similarly situated, v. Trinity Industries, INC. and Trinity Highway Products, LLC, In the United States District Court, Western District of Wisconsin, No. 3:15-cv-00117-scl, May 27, 2016.

Expert Report of Mark A. Israel, In the Matter between Darren Ewert and Nippon Yusen Kabushiki Kaisha, et al., In the Supreme Court of British Columbia, Vancouver Registry, No. S-134895, May 20, 2016.

Second Supplemental Declaration of Mark Israel, Daniel Rubinfeld, and Glenn Woroch, In the Matter of Special Access for Price Cap Local Exchange Carriers, Federal Communications Commission, WC Docket No. 05-25, April 20, 2016.

Supplemental Declaration of Mark Israel, Daniel Rubinfeld, and Glenn Woroch, In the Matter of Special Access Rates for Price Cap Local Exchange Carriers, Federal Communications Commission, WC Docket No. 05-25, March 24, 2016.

Declaration of Mark Israel, Daniel Rubinfeld, and Glenn Woroch, In the Matter of Special Access Rates for Price Cap Local Exchange Carriers, Federal Communications Commission, WC Docket No. 05-25, February 19, 2016.

Declaration of Mark Israel, Daniel Rubinfeld, and Glenn Woroch, "Competitive Analysis of the FCC's Special Access Data Collection," Federal Communications Commission, WC Docket No. 05-25, January 26, 2016.

Declaration of Dr. Mark Israel, In the Matter of iPic – Gold Class Entertainment, LLC, et al., v. Regal Entertainment Group, AMC Entertainment Holdings, Inc., et al., In the District Court of Harris County, Texas, 234th Judicial District, No. 2015-68745, January 18, 2016.

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Declaration of Mark A. Israel, Attached to "Response of AT&T Mobility LLC to Notice of Apparent Liability for Forfeiture," Federal Communications Commission, File No. EB-IHD-14-00017504, July 17, 2015.

Reports in Re: Federal Trade Commission et al. v. Sysco Corporation and USF Holding Corp., Civil Action No. 15-cv-00256 (APM). Declaration: February 18, 2015. Report: April 14, 2015. Rebuttal Report: April 21, 2015.

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Expert Report of Mark A. Israel, "Economic Analysis of the Effect of the Comcast-TWC Transaction on Broadband: Reply to Commenters," Federal Communications Commission, MB Docket No. 14-57, September 22, 2014.

Supplemental Declaration of Mark Israel and Allan Shampine, In the Matter of Amendment of the Commission's Rules Related to Retransmission Consent, Appendix A to "Reply Comments of the National Association of Broadcasters," Federal Communications Commission, MB Docket No. 10-71, July 24, 2014.

Declaration of Mark Israel and Allan Shampine, In the Matter of Amendment of the Commission's Rules Related to Retransmission Consent, Appendix B to "Comments of the National Association of Broadcasters," Federal Communications Commission, MB Docket No. 10-71, June 26, 2014.

Expert Report of Mark A. Israel, "Implications of the Comcast/Time Warner Cable Transaction for Broadband Competition," Federal Communications Commission, MB Docket No. 14-57, April 8, 2014.

Declaration of Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, "Sprint's Proposed Weighted Spectrum Screen Defies Economic Logic and Is Inconsistent with Established Facts," Federal Communications Commission, WT Docket No. 12-269, March 14, 2014.

Reply Declaration of Mark A. Israel, "Competitive Effects and Consumer Benefits from the Proposed Acquisition of Leap Wireless by AT&T: A Reply Declaration," Federal Communications Commission, WT Docket No. 13-193, October 23, 2013.

Declaration of Mark A. Israel, "An Economic Analysis of Competitive Effects and Consumer Benefits from the Proposed Acquisition of Leap Wireless by AT&T," Federal Communications Commission, WT Docket No. 13-193, August 1, 2013.

Supplemental Reply Declaration of Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, "Comments on Appropriate Spectrum Aggregation Policy with Application to the Upcoming 600 MHz Auction," Federal Communications Commission, WT Docket No. 12-269, June 13, 2013.

Reply Declaration of Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, "Comment on the Submission of the U.S. Department of Justice Regarding Auction Participation Restrictions," Federal Communications Commission, WT Docket No. 12-269, June 13, 2013.

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Declaration of Mark A. Israel and Michael L. Katz, "Economic Analysis of Public Policy Regarding Mobile Spectrum Holdings," Federal Communications Commission, WT Docket No. 12-269, November 28, 2012.

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Expert Report of Robert Willig, Mark Israel, Bryan Keating, and Jonathan Orszag, "Response to Supplementary Comments of Hubert Horan," Docket DOT-OST-2009-1055, October 22, 2010.

Expert Report of Robert Willig, Mark Israel, Bryan Keating, and Jonathan Orszag, "Measuring Consumer Benefits from Antitrust Immunity for Delta Air Lines and Virgin Blue Carriers," Docket DOT-OST-2009-1055, October 13, 2010.

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Expert Report of Mark Israel and Michael L. Katz, "The Comcast/NBCU Transaction and Online Video Distribution," Federal Communications Commission, MB Docket No. 10-56, May 4, 2010.

Expert Report of Mark Israel and Michael L. Katz, "Application of the Commission Staff Model of Vertical Foreclosure to the Proposed Comcast-NBCU Transaction," Federal Communications Commission, MB Docket No. 10-56, February 26, 2010.

Expert Report of Robert Willig, Mark Israel, and Bryan Keating, "Competitive Effects of Airline Antitrust Immunity: Response of Robert Willig, Mark Israel, and Bryan Keating" in Docket DOT-OST-2008-0252, January 11, 2010.

Affidavit of Dr. Mark A. Israel on Class Certification in Re: Puerto Rican Cabotage Antitrust Litigation, in the United States District Court for the District of Puerto Rico, MDL Docket No. 3:08-md-1960 (DRD), December 10, 2009.

Expert Report of Robert Willig, Mark Israel, and Bryan Keating, "Competitive Effects of Airline Antitrust Immunity" in Docket DOT-OST-2008-0252, September 8, 2009.

Expert Report and Supplemental Expert Report of Dennis W. Carlton and Mark Israel in Re: Toys "R" Us-Delaware, Inc., and Geoffrey Inc. v. Chase Bank USA N.A. in American Arbitration Association New York, New York, Commercial Arbitrations No. 13-148-02432-08, February 27, 2009 (Expert Report), March 20, 2009 (Supplemental Expert Report).

Expert Reports of James Levinsohn and Mark Israel in Re: 2006 NPM Adjustment Proceeding pursuant to Master Settlement Agreement, October 6, 2008 (Expert Report), January 16, 2009 (Expert Report), March 10, 2009 (Expert Report).

EXPERT WORK IN REVIEW OF MERGERS/TRANSACTIONS

Successful Acquisition of Starwood Hotels & Resorts by Marriott International. 2016. Led team that performed detailed analysis of competitive conditions, extensive econometric analysis of pricing, and full review of Marriott's internal pricing models to demonstrate that Starwood and Marriott were not close competitors, combined ownership of the brands would not lead to upward pricing pressure, and competition would remain robust post-merger.

Successful Acquisition of PR Newswire by GTCR. 2016. Lead economic expert for GTCR. Made presentations to DOJ showing lack of competitive harm from the transaction, based on detailed analysis of win/loss data, including calculations showing no possible upward pricing pressure (UPP) concerns regardless of the level of margins.

Successful Acquisition of Schurz Communications' Broadcast Stations by Gray Television. 2015. Lead economic expert for Gray. Made presentations to DOJ demonstrating output expanding effects of proposed transaction in light of the scale economies in television production and advertising and the small size of the DMAs affected by the transaction.

Successful Acquisition of the Communications Business of Danaher Corporation by NetScout Systems. 2015. Lead economic expert for NetScout. Made presentations to DOJ describing proper economic framework for analysis of competition and potential merger harms, and demonstrated that the presence of multiple viable competitors and numerous other credible threats to be used by powerful buyers in a dynamic industry made theories of anti-competitive harm from the merger implausible.

Successful Acquisition of Windmill Distribution Co. by Manhattan Beer Distributors. 2015. Lead economic expert for Manhattan Beer Distributors. Submitted White Paper to DOJ demonstrating, based on margin data, that the merger would be highly unlikely to lead to anti-competitive effects. Transaction was granted early termination from the Hart Scott Rodino process by the DOJ.

Proposed Acquisition of Time Warner Cable by Comcast Corporation. 2014-2015. Served as lead economic expert on broadband issues on behalf of Comcast Corporation. Submitted multiple Declarations and made multiple presentations to DOJ and FCC, explaining lack of horizontal, bargaining, or vertical/foreclosure concerns with regard to broadband competition as a result of the transaction.

Successful acquisition of Leap Wireless by AT&T. 2014. Lead economic expert for AT&T. Submitted multiple Declarations to FCC and made presentation to DOJ, demonstrating the transaction would generate substantial consumer benefits, while generating at most minimal upward pricing pressure in a properly defined mobile wireless services market and no issues related to spectrum concentration or other competitive concerns.

Successful merger of American Airline and US Airways. 2013. Lead consulting expert, managing Compass Lexecon team of over 25 economists supporting multiple experts. Made multiple presentations to DOJ, worked on expert reports in litigation, and assisted counsel with the analysis leading to settlement of litigation, permitting transaction to close.

Successful merger of T-Mobile USA and MetroPCS. 2013. Lead economic expert for T-Mobile USA. Conducted economic analyses of competitive effects of the transaction, as well as consumer benefits from reduced costs and increased network quality. Presented analyses to both DOJ and FCC.

FTC Investigation of Acquisition of Dollar Thrifty Automotive Group by Hertz, 2012. Served as a lead economic expert for FTC and prepared to serve as FTC's testifying expert against the merger, prior to case settlement. Conducted empirical analyses based on previous rental car mergers demonstrating likely price increases from the transaction.

Decision by Federal Communications Commission not to extend the ban on exclusive contracts for satellite-delivered, cable-affiliated networks. 2012. Lead economic expert for National Cable and Telecommunications Association. Submitted economic analysis demonstrating that the ban on exclusive distribution of satellite-delivered, cable affiliated networks is no longer warranted given increased marketplace competition. FCC made decision to allow the ban to sunset.

Successful sale of wireless spectrum by SpectrumCo and Cox ("Cable Companies") to Verizon Wireless and successful completion of related commercial agreements. 2012. On behalf of the Cable Companies, performed economic analyses demonstrating lack of competitive harm from the transaction on markets for backhaul and Wi-Fi services. Presented analyses to FCC.

Successful acquisition by LIN Media of broadcast television stations from NVTV. 2012. Lead economic expert for LIN Media. Prepared economic analysis demonstrating lack of competitive concern over potential issues related to Shared Service and Joint Sale Arrangements.

Proposed acquisition of T-Mobile USA by AT&T. 2011. Served as one of the lead economists, initially for T-Mobile (along with Michael Katz) and ultimately for both parties (along with Michael Katz and Dennis Carlton). Made multiple presentations to DOJ and FCC. Appeared in FCC Workshop, ex parte meeting.

S*uccessful application for antitrust immunity by Delta and Virgin Blue*. 2010. Together with Robert Willig, Bryan Keating, and Jon Orszag, prepared economic analyses demonstrating substantial net consumer benefits from antitrust immunity. Submitted results in expert reports to Department of Transportation.

Successful joint venture between Comcast and NBC Universal (and ultimate full acquisition of NBC Universal by Comcast). 2010. Served as one of the lead economists (along with Michael Katz) on behalf of the merging parties. Wrote multiple reports submitted to FCC (with Michael Katz) demonstrating lack of significant competitive concerns from the transaction. Made multiple presentations to DOJ and FCC. Appeared in FCC Workshop of economists, ex parte meeting.

Successful application for antitrust immunity for oneworld alliance and associated joint venture of American Airlines, British Airways, and Iberia Airlines. 2009-2010. Together with Robert Willig and Bryan Keating, prepared economic analyses demonstrating substantial net consumer benefits associated with antitrust immunity for the joint venture. Submitted results in expert reports to Department of Transportation.

Successful acquisition by PepsiCo of bottlers, PBG and PAS. 2009. Performed econometric and simulation analyses demonstrating pro-competitive effect of merger on PepsiCo's own brands, other brands distributed by PBG and PAS, and overall marketplace. Presented results to FTC (together with Dennis Carlton).

Successful merger of Delta Airlines and Northwest Airlines. 2008. In support of Dennis Carlton, developed empirical and theoretical analyses to demonstrate merger's pro-competitive nature. Work focused on (ultimately settled) private litigation opposing the merger.

Successful acquisition of Harcourt Education by Houghton Mifflin. 2007. Along with Daniel Rubinfeld and Frederick Flyer, developed econometric analyses demonstrating lack of competitive harm from proposed merger. Presented results to DOJ.

Successful acquisition of Chicago Board of Trade by Chicago Mercantile Exchange. 2007. Along with Robert Willig and Hal Sider, developed and presented multiple empirical analyses demonstrating lack of competitive harm from merger. Submitted multiple white papers and made multiple presentations to DOJ.

SELECTED OTHER EXPERT/CONSULTING WORK

Led team supporting Dennis Carlton's testimony in Toshiba/Hannstar TFT-LCD Antitrust litigation vs. Plaintiff Best Buy, 2013.

Led team supporting Dennis Carlton's testimony in Toshiba's TFT-LCD Class Action Antitrust litigation. Named Litigation Matter of the Year for 2012 by *Global Competition Review*, 2012.

As economic expert for US Airways, developed econometric analysis of air traffic at major US airports, presented to Philadelphia Airport management team, 2011.

Prepared analysis of the competitive impact of low-cost-carrier competition in Washington, DC and New York airports. Filed with DOT, 2011.

On behalf of major pharmaceutical firm, developed econometric model to forecast pharmaceutical expenditures, 2009.

Developed econometric model to measure of the importance of network effects in credit cards in the context of measuring damages incurred by a major credit card issuer, 2007-2008.

PUBLICATIONS

"Complementarity without Superadditivity," (with Steven Berry, Philip Haile, and Michael Katz), forthcoming in *Economics Letters*, 2016.

"Antitrust in a Mobile World," (with Yonatan Even, Jonathan M. Jacobson, Scott Martin, and Dr. Helen Weeds), Chapter 17 of *International Antitrust Law & Policy: Fordham Competition Law 2015*, Edited by James Keyte, Juris Publishing, Inc., 2016.

"Buyer Power in Merger Review," (with Dennis W. Carlton and Mary Coleman), Chapter 22 of *The Oxford Handbook of International Antitrust Economics*, Volume 1, Roger D. Blair and D. Daniel Sokol, eds, Oxford University Press, 2015.

"The Evolution of Internet Interconnection from Hierarchy to 'Mesh': Implications for Government Regulation," (with Stanley M. Besen), *Information Economics and Policy*, December 2013.

"Airline Network Effects and Consumer Welfare," (with Bryan Keating, Dan Rubinfeld, and Robert Willig), *Review of Network Economics*, November 2013.

"The Delta-Northwest Merger: Consumer Benefits from Airline Network Effects (2008)," (with Bryan Keating, Daniel L. Rubinfeld, and Robert D. Willig), *The Antitrust Revolution*, Sixth Edition, Edited by John E. Kwoka, Jr. and Lawrence J. White, Oxford University Press, New York, July 2013.

"Proper Treatment of Buyer Power in Merger Review," (with Dennis W. Carlton), *Review of Industrial Organization*, July 2011.

"Response to Gopal Das Varma's Market Definition, Upward Pricing Pressure, and the Role of the Courts: A Response to Carlton and Israel," (with Dennis W. Carlton), *The Antitrust Source*, December 2010.

"Will the New Guidelines Clarify or Obscure Antitrust Policy?" (with Dennis W. Carlton), *The Antitrust Source*, October 2010.

"Should Competition Policy Prohibit Price Discrimination?" (with Dennis W. Carlton), *Global Competition Review*, 2009.

"The Empirical Effects of Collegiate Athletics: An Update Based on 2004-2007 Data," (with Jonathan Orszag), Paper commissioned by National Collegiate Athletic Association, available *at* *http://www.epi.soe.vt.edu/perspectives/policy_news/pdf/NCAASpending.pdf*, February 2009.

"Services as Experience Goods: An Empirical Examination of Consumer Learning in Automobile Insurance," *The American Economic Review*, December 2005.

"Tenure Dependence in Consumer-Firm Relationships: An Empirical Analysis of Consumer Departures from Automobile Insurance Firms," *The Rand Journal of Economics*, Spring 2005.

"The Impact of Youth Characteristics and Experiences on Transitions Out of Poverty," (with Michael Seeborg), *The Journal of Socio-Economics*, 1998.

"Racial Differences in Adult Labor Force Transition Trends," (with Michael Seeborg), *The Journal of Economics*, 1994.

SELECTED RECENT PRESENTATIONS

American Bar Association Section of Antitrust Law, "Economic Issues Raised In The Comcast – Time Warner Cable Merger," Panelist, February 2016.

Fordham Competition Law Institute, 42nd Annual Conference on International Antitrust Law and Policy, Panel: Antitrust in a Mobile World, Panelist, October 2015.

American Bar Association Section of Antitrust Law, "Merger Practice Workshop," Faculty Member, October 2015.

Searle Center Conference on Antitrust Economics and Competition Policy, Panel on Recent Transactions in the Telecom Industry, Panelist, September 2015.

National Bureau of Economic Research, Summer Institute 2015, Industrial Organization Meetings, "Panel Discussion of the Comcast-Time Warner Merger," Panelist, July 2015.

Federal Communications Bar Association, "How the Antitrust Agencies and the FCC are Likely to Analyze Vertical Mergers," Panelist, November 2014.

The Coca Cola Company Global Antitrust Forum, "Round Table Discussion on Use of Economics and Economists," Panel Chair, November 2014.

Compass Lexecon Competition Policy Forum, Lake Como Italy, "Consolidation of the Telecoms Industry in the EU and the US," Panelist, October 2014.

The IATA Legal Symposium 2014, Aviation Law: Upfront and Center, "Merger Analysis – A sudden shift in approach by DOJ in the American Airlines and US Airways merger," Panelist, February 2014.

Georgetown Law 7th Annual Global Antitrust Enforcement Symposium, "Merger Enforcement and Policy," Panelist, September 2013.

American Bar Association Section of Antitrust Law, "Airline Mergers: First Class Results or Middle-Seat Misery?" Panelist, May 2013.

American Bar Association Section of Antitrust Law, "Go Low or Go Home! Monopsony a Problem?" Panelist, March 2012.

Federal Communications Bar Association Transactional Committee CLE Seminar, "The FCC's Approach to Analyzing Vertical Mergers," Panelist, October 2011.

The Technology Policy Institute Aspen Forum, "Watching the Future: The Economic Implications of Online Video," Panelist, August 2011.

American Bar Association Forum on Air & Space Law, 2011 Update Conference, "Antitrust Issues: What's on the Horizon for the Industry," Panelist, February 2011.

American Bar Association Section of Antitrust Law, "Antitrust in the Airline Industry," Panelist, September 2010.

GRANTS AND HONORS

Searle Fund for Policy Research Grant, 2004-2006, for "An Empirical Examination of Asymmetric Information in Insurance Markets."

Kellogg School of Management Chairs' Core Course Teaching Award, 2003 & 2005.

Bradley Dissertation Fellowship, Stanford University, 1999-2000.

Stanford University, Outstanding Second Year Paper Prize, 1997.

SELECTED ACADEMIC SEMINARS

Yale University
University of Arizona
Washington University, St. Louis
University of Pennsylvania
University of Toronto
UCLA
University of Wisconsin-Madison
Massachusetts Institute of Technology
Harvard University
University of Chicago
Columbia University
University of Texas
Carnegie Mellon University
University of California, Irvine
University of California, San Diego

REFEREE FOR ACADEMIC JOURNALS

American Economic Review
The Journal of Industrial Economics
The Rand Journal of Economics
Journal of the European Economic Association
The Review of Economic Studies
The Review of Economics and Statistics
Journal of Risk and Insurance

Appendix B

APPENDIX B – DATA BUILD

I. DATA SOURCES

A. CABLE DATA CORPORATION[1] (CDC)

1. Cable Data Corporation (CDC) collects data from Form 3 statements of account that cable system operators (CSOs) file with the Copyright Office[2]. These data detail, by accounting period, how many subscribers each CSO has, what distant signals each CSO carries, how many activated channels the CSO transmits, and how many of the activated channels are broadcast television channels. The CDC data also report the prorated DSE value for each signal. CDC prorates each signal's reported DSE value, on a CSO-by-CSO basis, to reflect the percentage of CSO subscribers that receive the signal on a distant basis. Table B I-1, below, summarizes the data from CDC.

[1] http://www.cabledatacorp.com/data.htm

[2] See, for example, Statement of Account SA3 (LONG FORM) 2010, http://www.copyright.gov/forms/SOA-old/SA3c-2010.pdf

Table B I-1: CDC Data Summary

Variable	Total	Mean	Min	Median	Max	Standard Deviation
Royalties	$550,601,192	$100,750	$5,631	$30,744	$3,133,513	$228,016
Subscribers	325,130,451	59,493	185	16,201	1,586,416	134,139
Receipts (100s)	420,664,856	76,974	5,280	21,415	2,352,200	176,528
Active Channels	1,796,390	329	8	338	905	162
Broadcast Channels	118,383	22	1	18	272	14
Prorated DSE	6,368	1.17	0.00	1.00	5.76	0.65
Reported DSE	11,738	2.15	0.25	1.25	34.25	2.57
Total Call Signs-System-Periods	19,538	3.58	1.00	2.00	59.00	4.53
Total System-Periods	5,465					

Source: Cable Data Corporation.
Note: Limited to regression sample.

2. From CDC, I extracted information on each Form 3 CSO including any channels carried as distant signals by these CSOs and the royalty payments made by these CSOs for the accounting periods of 2009 Period 2 through 2012 Period 2, for a total of seven semi-annual periods of data. The raw data contain observations at the CSO / Channel Call-Sign / accounting period level. The regression uses six periods of data (2010 through 2012) for the concurrent variables of the regression:

- The royalty fee paid by the CSO for the accounting period
- The count of broadcast channels the system carried
- Indicator for whether the CSO paid the 3.75% royalty rate
- Indicator for whether the CSO made the minimum royalty payment
- Indicators for accounting periods

- The number of subscribers in the previous period[3]
- The count of activated channels the system carried in the previous period[4]

B. TMS / GRACENOTE[5]

3. Tribune Media Services (TMS) / Gracenote provides archived data on programming that appeared on each of the broadcast stations that CSOs carried as a distant signal in 2010-12. These data reflect the title, date, time and duration of various programs, and on which distant signals they were transmitted.[6] Their data are much like what some cable subscribers see on their electronic programming guides (and in fact, their data are used to create such guides in real time). See Figure B I-1, below, for an example.

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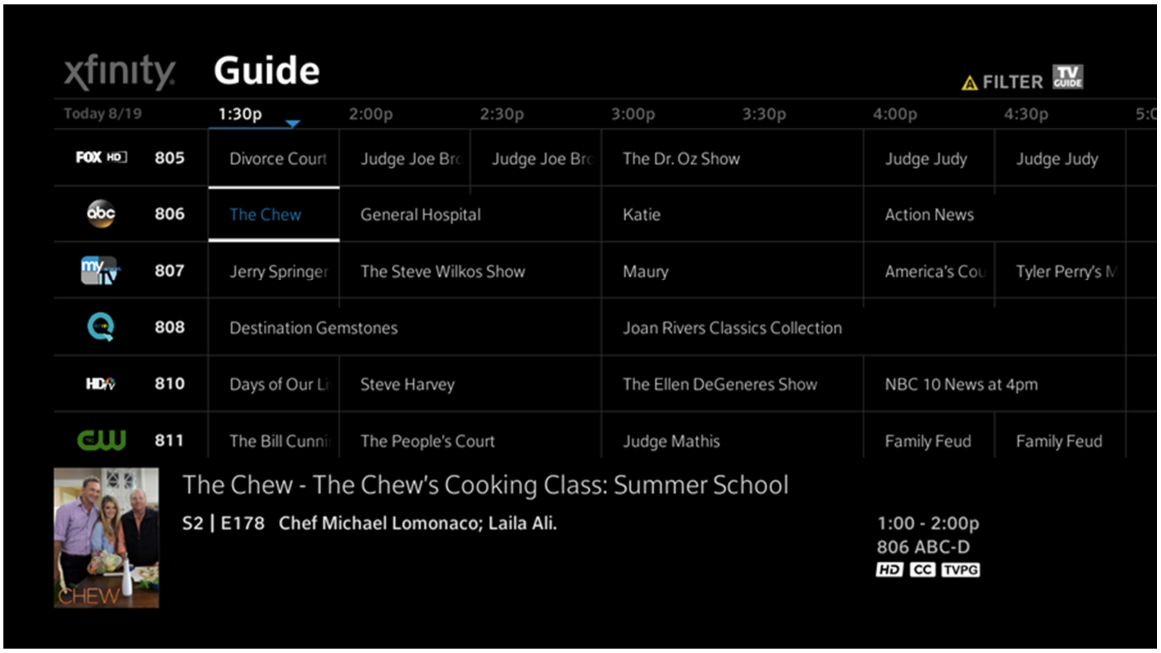
[3] Thus, for example, for 2010 Period 1, the regression uses the number of subscribers from 2009 Period 2. This variable from the regression uses data from 2009 Period 2 through 2012 Period 1.

[4] Thus, for example, for 2010 Period 1, the regression uses the count of activated channels from 2009 Period 2. This variable from the regression uses data from 2009 Period 2 through 2012 Period 1.

[5] http://www.gracenote.com/video/tv-listings-and-data/

[6] Please see "Data Specification: TV Listings Format Standard Flat File", Version 1.0 September 23, 2005, included among my underlying documents.

Figure B I-1: Sample Cable System Programming Guide



4. Although the TMS/Gracenote data include entries on a program's "Category" and "Program Type," those entries were not made based on the Agreed Program Categories adopted in this proceeding. Therefore, the programs had to be sorted among the Agreed Program Categories. Categories were assigned to individual programs by Gregory Klein of GK Consulting and James Trautman of Bortz Media and Sports Group, Inc. (Bortz Media), at the request of counsel.[7] I understand that Messrs. Klein and Trautman determined the appropriate categorization based on (i) the TMS/Gracenote data (including consideration of the program's title, its TMS Category and Program Type, and the type of station broadcasting it), (ii) the spreadsheets categorizing claimed

[7] Mr. Klein was an executive for over twenty-seven years at the cable industry's principal trade association (now known as NCTA - The Internet & Television Association) – where he served as Vice President, Research; Senior Director, Economic and Policy Analysis; and Director, Economic and Policy Analysis. As set forth more fully in his Written Direct Testimony, Mr. Trautman is Managing Director of Bortz Media, and he has over thirty years of experience in advising CSOs, cable programming networks, owners of programming and content rights and other entities with interests in the cable television and satellite industries.

programming served in discovery by parties to these proceedings, and (iii) their industry knowledge and experience.

5. I have used a sample of 28 24-hour periods for each six-month accounting period to identify representative programming on the distant signals carried by all Form 3 CSOs from 2010-2012. This generated a very large dataset. See Table B I-2, below. My analysis incorporates information from TMS/Gracenote on 4,987,476 individual television program transmissions on 1,153 different distant signals, totaling almost 230 million minutes of distant signal programming.[8]

Table B I-2: TMS / Gracenote Data Summary

Programming category	Observations	Call sign count	Average duration in minutes	Total minutes	Share of total minutes
Total	*4,987,476*	*1,153*	*46*	*227,309,872*	
Canadian	85,599	25	39	3,328,197	1.5%
Commercial TV	585,234	1,012	49	28,429,360	12.5%
Devotional	385,856	938	39	15,219,260	6.7%
Network	847,567	704	63	53,450,020	23.5%
Program Suppliers	3,072,467	1,147	41	125,116,567	55.0%
Sports	10,753	625	164	1,766,468	0.8%

Source: TMS data / Gracenote.

Note: "Average duration in minutes", "Total minutes", and "Share of total minutes" reflect modifications to account for redundant observations and programs that extend past midnight.

[8] "Share of total minutes" column does not reflect the extent to which the programming category was available to subscribers. For example, programming on the superstation WGN was available to approximately 250 million subscribers (4,127 system-periods) during the years 2010-12 while programming on WIAT was available to only about 169 thousand subscribers (10 system-periods). Therefore, programming from WGN appropriately gets much more weight in the regression than does programming from WIAT, reflecting its far greater availability. In this table, however, for purposes of determining share of total minutes, one minute of programming on WGN is given the same weight as one minute of programming on WIAT.

6. From a TMS/Gracenote dataset with over 900 stations per semi-annual period, I selected a data sample of 28 randomly selected dates[9] per accounting period, with detailed programming data for non-public / non-educational call-signs. As discussed above, with help from my staff at Compass Lexecon, specialists at GK Consulting and Bortz Media categorized programming minutes into the following categories:

- Network Programming
- Program Suppliers
- Sports Programming
- Commercial TV Programming
- Public Broadcasting[10]
- Devotional Programming
- Canadian Programming
- "Other" Programming[11]

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[9] Dates were randomly selected such that equal numbers of each of the days of the week would be represented in the sample. With 28 total dates, each day of the week is represented 4 times in each 6 month accounting period.

[10] All call-signs identified as public broadcasting stations are assumed to carry "Public Broadcasting" programming 24 hours per day. I understand that for purposes of these proceedings the Public Television Claimants programming category is defined to include all programs broadcast on U.S. noncommercial educational television stations. Accordingly, no program-by-program categorization was required for programming on PBS and other noncommercial educational stations.

[11] A small number of call-signs that were present in the CDC data, suggesting that they were carried on a distant basis by at least one Form 3 system, were not present in the TMS/Gracenote data and therefore there was insufficient information to categorize the programming on those call-signs. Such channel/dates are treated as "Other" programming minutes.

7. Programming that appeared on WGNA but did not also appear simultaneously on the WGN broadcast station is non-compensable in the royalty scheme. Both compensable and non-compensable WGNA programming minutes were categorized and included in the regression for purpose of computing the coefficients. However, non-compensable WGNA programming was designated as such so that it would be segregable for purposes of applying the regression coefficients to compensable minutes when computing royalty shares, since the parties to these proceedings are only entitled to compensation for programing that was broadcast simultaneously on both WGNA and the local WGN Chicago over-the-air station.

8. In all, nearly five million programs were categorized across 168 days. Summary statistics regarding the final categorized minutes appear at the end of this appendix.

C. KANTAR MEDIA SRDS LOCAL MARKET AUDIENCE ANALYST[12]

9. The last source of data is used for only one of the control variables: Average Income by Designated Market Area (DMA). DMA is a geographic definition created by the Nielsen Company.[13] Kantar/SRDS provide income statistics by DMA, which I match to the CDC variable on the DMA of each CSO. A summary of the income data by DMA is provided in Table B I-3, below.

[12] http://www.kantarmedia.com/us/our-solutions/media-planning-tools/srds-media-planning-platform/srds-online-databases/local-market-audience-analyst

[13] http://www.nielsen.com/intl-campaigns/us/dma-maps.html

Table B I-3: Kantar / SRDS Income Data Summary

Count of DMAs	Average	Standard Deviation	Min*	Median	Max**
210	$45,132	$7,889	$26,176	$44,023	$81,897

Source: 2013 Kantar/SRDS DMA data

*The minimum income DMA is Greenwood-Greenville, MS

**The maximum income DMA is Washington et al, DC-MD

10. I received median income data by designated market area for the year 2013[14], which maps directly to the DMA designation in the CDC data, from Kantar Media. These data allow me to include the median income of the subscribers of the CSO in the regression model.

II. DATA BUILD METHODOLOGY

A. TMS/GRACENOTE AGGREGATION

11. After categorizing the programming minutes from TMS/Gracenote, it is necessary to aggregate the programming minutes from the level of individual program on a given date for a given call-sign to the level of Call-Sign / Semi-Annual Period in order to merge the TMS/Gracenote programming data to the CDC data on CSOs. At this step in the data build, it is only necessary to sum the programming minutes from the TMS/Gracenote data by their assigned categories over each 28 day sample per accounting period.

B. TMS/GRACENOTE MERGE TO CDC

12. The second stage of the data build creates a dataset with observations at the CSO / Call-Sign / Semi-Annual Period level, with the addition of programming category minutes for each call-sign in the CDC dataset. I merge the TMS/Gracenote data

[14] No previous data were available, therefore 2013 was the best approximation for 2010-2012.

described above with the CDC data setting forth which Form 3 systems carried which call-signs in which accounting periods. However, not all of the programming minutes come from TMS/Gracenote. I do not use programming data for Public Broadcasting Stations (PBS) or educational stations from TMS/Gracenote, but instead simply assign 24 hours per day for PBS and educational call-signs in the CDC data to the Public Broadcasting category.[15] In addition, some of the call-signs in the CDC data do not have a match in the TMS/Gracenote data. In these cases, I assign 24 hours per day as "Other" programming[16], as the data required to assign those minutes to program category were not available. In both the cases of PBS and educational programming, as well as the "Other" programming, I assign 40,320 minutes (24 hours * 60 minutes * 28 days = 40,320 minutes) to each Call-Sign / Semi Annual Period. At this point, all of the CSOs / Call-Sign / Semi-Annual Periods in the CDC data have been assigned programming minutes by category.

C. PRORATION OF MINUTES

13. As I describe in my report, simply summing the programming minutes of all call-signs for each CSO in each accounting period does not accurately reflect the programming that was available to all subscribers of a CSO, because often different Subscriber Groups within the same system receive different distant signals from one another. Therefore, to approximate the programming minutes in a way that mimics the

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15 In some cases, CDC did not identify all of the call-signs of PBS stations, and Gregory Klein and Jim Trautman assigned additional call-signs to PBS. See my underlying documents for details.

16 In his June 1, 2009 report, Joel Waldfogel categorized such minutes as "Low Power" but the effect on the regression and the known programming categories is identical. I have not labelled these minutes as "Low Power" because I have no basis to assume that they are all attributable to low power stations.

way that a CSO has to pay royalties for the programming minutes, I prorate the programming minutes using the Prorated DSE variable in the CDC data.[17] In order to arrive at the prorated minutes used in the regression analysis, I multiply the number of programming minutes for a particular CSO / Call-Sign / Semi-Annual Period by the Prorated DSE value in the CDC data.

D. FINAL AGGREGATION AND OTHER VARIABLES

14. I then sum the prorated minutes from the dataset above to aggregate the data to a CSO / Semi-Annual Period level, which is the final level of aggregation for the regression. To that dataset I merge on:

- Previous period activated channels from CDC
- 2013 Median Income by CSO DMA

15. In addition, at this point I add the indicator variables to the dataset. I add an indicator for CSOs that paid the minimum royalty fee. The applicable minimum royalty fee is 1.064% of a CSO's total gross receipts.[18] The CDC data contain variables for total royalty fee paid as well as total receipts for each CSO in each semi-annual period. I divide the total royalty fee paid by each CSO by the total receipts for that CSO in that

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[17] I understand that CDC determines the Prorated DSE for each distant signal a CSO carries by computing the prorated DSE for each signal for each Subscriber Group, and then totaling the Subscriber Group results to determine the prorated DSE value of the signal on the system. For each Subscriber Group, the formula is: Prorated DSE = DSE * (Subscriber Group gross receipts / system gross receipts). See http://copyright.gov/forms/sa3.pdf for details on the calculation of DSE.

[18] The rate of 1.064% was established by the Satellite Television Extension and Localism Act, which provided that this rate "shall take effect commencing with the first accounting period occurring in 2010." See Public Law 111–175, Sections 104(c)(1) and 104(d).

semi-annual period; CSOs that paid a royalty fee equal to 1.064% of their total gross receipts are assigned the minimum fee indicator variable

16. The CDC data also indicate whether a system paid fees at the special 3.75% rate which is assessed for the transmission of certain distant signals that the system would have been prohibited from carrying under the FCC's rules as they existed before June 24, 1981. From these data, I create an indicator variable for whether a CSO paid the special 3.75% rate in the given semi-annual period.

17. In this way, I use these three data sources to create a dataset for the regression analysis which evaluates CSOs at the CSO / Account Period level, summing all of the prorated programming minutes on all of the distant signals at each CSO in each 28 day period. The final dataset includes 5,465 CSO / Account Periods, over the three year period from 2010-2012. Table B II-1, below, shows the range of values in the regression dataset.

Table B II-1: Regression Dataset Summary Statistics

Variable	Mean	Standard Deviation
Royalty paid	$100,750	$228,016
Prorated Canadian minutes	886	5,347
Prorated Commercial TV minutes	3,601	3,335
Prorated Devotional minutes	2,486	2,991
Prorated Program Supplier minutes	32,680	19,005
Prorated Public Broadcasting Minutes	3,353	5,680
Prorated Sports minutes	1,274	782
Prorated "Other" minutes	331	3,051
Prorated Network minutes	1,940	3,760
Subscribers (previous period)	57,498	129,589
Active channels (previous period)	314	157
Median income	$47,628	$9,681
Broadcast Channels	22	14
Indicator for 3.75% royalty rate	0.28	0.45
Indicator for minimum payment	0.44	0.50
Number of observations	5,465	

Source: TMS / Gracenote, CDC, Kantar / SRDS.

E. REGRESSION SPECIFICATION

18. With the above data, I estimate the following regression using ordinary least squares: [19]

[19] Indicator for the first half of 2010 is omitted.

- Total royalty fee paid by the CSO = βO + βl *(Program Supplier prorated minutes) + β2*(Sports prorated minutes) + β3*(Commercial TV prorated minutes) + β4*(Public Broadcasting prorated minutes) + β5*(Devotional prorated minutes) + β6*(Canadian prorated minutes) + β7*("Other" prorated minutes) + β8*(Network prorated minutes) + β9*(number of subscribers from previous accounting period) + β10*(number of activated channels from previous accounting period) + β11*(median household income in DMA(s)) + β12*(count of broadcast channels) + β13*(indicator for 3.75% royalty rate) + β14*(indicator for second half of 2010 accounting period) + β15*(indicator for first half of 2011 accounting period) + β16*(indicator for second half of 2011 accounting period) + β17*(indicator for first half of 2012 accounting period) + β18*(indicator for second half of 2012 accounting period) + β19*(indicator for minimum payment) + ε.

Appendix C

APPENDIX C – REGRESSION MODEL SENSITIVITIES

I. REGRESSION MODEL SENSITIVITIES

A. CONCLUSIONS FROM THE REGRESSION MODEL ARE NOT AFFECTED BY REASONABLE CHANGES IN MODEL SPECIFICATION

1. Below, I perform a number of sensitivity analyses on my econometric model (2010-2012 Regression Model), changing the model specification in several ways to confirm that my conclusions are not driven by specific, technical modeling assumptions but rather are driven by true patterns in the underlying data.[1] As discussed below, my conclusions are not affected by these reasonable changes in model specifications.

- Model #2 isolates Sports minutes and compares those minutes to all other programming categories combined. This model sensitivity is intended to test whether the value for Sports minutes is sensitive to splitting out the individual programming categories. This change has no effect on any of my conclusions.

- Model #3 adds what is called a "fixed effect" for the DMA in which a CSO operates to my 2010-2012 Regression Model. The DMA fixed effect should control for any market-specific traits of the CSO that are not already being controlled for in the base model (and thus base conclusions only on variation across CSOs in a given DMA or changes in a DMA over time). This change has no effect on any of my conclusions.

- Model #4 adds a variable to the 2010-2012 Regression Model that is the interaction between the special 3.75% fee and the number of subscribers who receive distant signals that pay the 3.75% fee. By adding this variable to the

[1] In addition to these model sensitivities, I run statistical tests called F-tests to examine whether my regression results change depending on the time period evaluated. These tests show that my results are stable over time (meaning I cannot reject the hypothesis of no changes in the coefficient on any programming category over time). These F-test computations and other materials supporting the regression will be produced to all parties as "underlying documents" to my testimony.

regression, I allow the model to control for the royalties that are the result of the 3.75% fee separately from the base rate fee royalties, as they are in the royalty formula. This change has no effect on any of my conclusions.

2. Table C I-1 shows the results of Model #2 which includes only two categories of compensable programming: Sports programming and Non-Sports programming.[2] On average, an additional minute of Sports programming is worth approximately $5.36 (5.357***) to the cable systems, whereas an additional minute of all other categories of Non-Sports programming are worth approximately $0.36 (0.364***). Hence, each additional minute of Sports programming is worth more than ten-times as much as each additional minute of all other types of programming, on average. This model provides clear corroboration for the Bortz Survey results that minutes of Sports programming are worth substantially more than minutes of other programming.

[2] One exception to this is that non-compensable minutes on WGN are also included in the "Non-Sports programming" category. See Appendix B for more details.

Table C I-1: Model Sensitivity Results, Model #2

VARIABLES	Simple Model Sports v. Non-Sports (2)
Minutes of Sports Programming	5.357***
	(2.070)
Minutes of Non-Sports Programming	0.364***
	(0.0703)
Minutes of Network Programming	-0.740***
	(0.260)
Minutes of Other Programming	0.972**
	(0.467)
Number of Subscribers (Previous Accounting Period)	1.349***
	(0.0596)
Number of Activated Channels (Previous Accounting Period)	139.2***
	(18.66)
Median Household Income in Designated Marketing Area	1.344***
	(0.286)
Count of Broadcast Channels	-488.3
	(324.9)
Indicator for Special 3.75% Royalty Rate	41,408***
	(4,688)
Minimum Payment Indicator	-17,654***
	(3,601)
Observations	5,465
R-squared	0.691

Source: TMS/Gracenote; Cable Data Corporation; Kantar Media/SRDS

Note: Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

3. Table C I-2, below, shows the results of sensitivity analyses #3 and #4, which use alternative model specifications. Both models show Sports programming with consistently higher values than all other categories of programming, with an additional minute of Sports programming being worth between $4.52 (4.524) and $4.88 (4.878**),

on average; more than four times greater than a minute of the next most valuable programming category.

Table C I-2: Model Sensitivity Results, Alternate Specifications

VARIABLES	DMA FE All Categories (3)	3.75*Sub All Categories (4)
Minutes of Sports Programming	4.524	4.878**
	(3.163)	(2.435)
Minutes of Program Suppliers Programming	0.792***	0.478***
	(0.120)	(0.104)
Minutes of Commercial TV Programming	-0.0416	0.991***
	(0.543)	(0.353)
Minutes of Public Broadcasting Programming	0.943**	0.636**
	(0.388)	(0.296)
Minutes of Canadian Programming	-1.274***	-0.950***
	(0.333)	(0.200)
Minutes of Devotional Programming	-0.980***	-0.616**
	(0.296)	(0.258)
Minutes of Network Programming	-1.484***	-0.954***
	(0.436)	(0.293)
Minutes of Other Programming	0.437	0.946**
	(0.469)	(0.470)
Number of Subscribers (Previous Accounting Period)	1.310***	1.285***
	(0.0603)	(0.0473)
Number of Activated Channels (Previous Accounting Period)	197.2***	145.3***
	(22.45)	(18.83)
Median Household Income in Designated Marketing Area		1.380***
		(0.297)
Count of Broadcast Channels	-540.6*	-532.9
	(320.9)	(339.5)
Indicator for Special 3.75% Royalty Rate	40,296***	35,968***
	(4,981)	(5,004)
3.75% Fee * Previous Period Subscribers		0.102
		(0.0963)
Minimum Payment Indicator	-19,594***	-16,258***
	(4,029)	(3,756)
Observations	5,465	5,465
R-squared	0.756	0.693

Source: TMS/Gracenote; Cable Data Corporation; Kantar Media/SRDS
Note: Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

B. DETAILED REGRESSION RESULTS

4. Table C I-3, below, shows the full regression output for each of the models, my main model as well as the above sensitivities, including the constant term and account period indicator variables.

Table C I-3: Detailed Regression Results for All Models

VARIABLES	Regression Model All Categories (1)	Simple Model Sports v. Non-Sports (2)	DMA FE All Categories (3)	3.75*Sub All Categories (4)
Minutes of Sports Programming	4.836**	5.357***	4.524	4.878**
	(2.466)	(2.070)	(3.163)	(2.435)
Minutes of Non-Sports Programming		0.364***		
		(0.0703)		
Minutes of Program Suppliers Programming	0.469***		0.792***	0.478***
	(0.104)		(0.120)	(0.104)
Minutes of Commercial TV Programming	1.010***		-0.0416	0.991***
	(0.355)		(0.543)	(0.353)
Minutes of Public Broadcasting Programming	0.660**		0.943**	0.636**
	(0.306)		(0.388)	(0.296)
Minutes of Canadian Programming	-0.973***		-1.274***	-0.950***
	(0.212)		(0.333)	(0.200)
Minutes of Devotional Programming	-0.701***		-0.980***	-0.616**
	(0.246)		(0.296)	(0.258)
Minutes of Network Programming	-0.985***	-0.740***	-1.484***	-0.954***
	(0.290)	(0.260)	(0.436)	(0.293)
Minutes of Other Programming	0.916**	0.972**	0.437	0.946**
	(0.462)	(0.467)	(0.469)	(0.470)
Number of Subscribers (Previous Accounting Period)	1.351***	1.349***	1.310***	1.285***
	(0.0601)	(0.0596)	(0.0603)	(0.0473)
Number of Activated Channels (Previous Accounting Period)	141.8***	139.2***	197.2***	145.3***
	(18.73)	(18.66)	(22.45)	(18.83)
Median Household Income in Designated Marketing Area	1.339***	1.344***		1.380***
	(0.286)	(0.286)		(0.297)
Count of Broadcast Channels	-493.5	-488.3	-540.6*	-532.9
	(326.5)	(324.9)	(320.9)	(339.5)
Indicator for Special 3.75% Royalty Rate	41,918***	41,408***	40,296***	35,968***
	(4,711)	(4,688)	(4,981)	(5,004)
3.75% Fee * Previous Period Subscribers				0.102
				(0.0963)
Minimum Payment Indicator	-16,501***	-17,654***	-19,594***	-16,258***
	(3,689)	(3,601)	(4,029)	(3,756)
Accounting Period				
2010-2	-4,230	-4,243	-3,672	-4,354
	(4,838)	(4,727)	(4,656)	(4,820)
2011-1	-1,580	-1,122	415.0	-1,887
	(5,020)	(4,992)	(4,723)	(5,000)
2011-2	-1,066	22.41	-1,145	-1,396
	(5,364)	(5,356)	(4,880)	(5,333)
2012-1	7,468	9,038	5,941	6,773
	(6,098)	(6,084)	(5,716)	(6,089)
2012-2	5,585	6,368	4,248	4,784
	(6,438)	(6,428)	(6,156)	(6,335)
Constant	-102,875***	-100,441***	-56,539***	-102,651***
	(14,640)	(14,419)	(7,537)	(14,427)
Observations	5,465	5,465	5,465	5,465
R-squared	0.692	0.691	0.756	0.693

Source: TMS/Gracenote; Cable Data Corporation; Kantar Media/SRDS

Note: Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Certificate of Service

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

Multigroup Claimants, represented by Brian D Boydston served via Electronic Service at brianb@ix.netcom.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 Lawrence K Satterfield served via Electronic Service at lksatterfield@satterfield-pllc.com

Devotional Claimants, represented by Arnold P Lutzker served via Electronic Service at arnie@lutzker.com

Public Broadcasting Service (PBS), represented by Ronald G. Dove Jr. served via Electronic Service at rdove@cov.com

National Association of Broadcasters (NAB), represented by David J Ervin served via Electronic Service at dervin@crowell.com

MPAA-represented Program Suppliers, represented by Lucy H Plovnick served via Electronic Service at lhp@msk.com

Broadcast Music, Inc. (BMI), represented by Janet Fries served via Electronic Service at janet.fries@dbr.com

SESAC, Inc., represented by John C. Beiter served via Electronic Service at jbeiter@lsglegal.com

Signed: /s/ Michael E Kientzle