Before the
COPYRIGHT ROYALTY JUDGES
Washington, D.C.

In the Matter of	)	
	)	
Distribution of the 2004-2005	)	**Docket No.**
Cable Royalty Funds	)	**2007-3 CRB 2004-2005**
	)	
	)	

REBUTTAL STATEMENT OF THE DEVOTIONAL CLAIMANTS

Pursuant to Section 351.4 of the rules of the Copyright Royalty Judges (Judges"), 37 C.F. R. § 351.4 and the Order dated November 16, 2009, the Devotional Claimants ("Devotionals") submit this Rebuttal Statement and the attached written Rebuttal Testimony of Dr. Michael A. Salinger in connection with the above-referenced proceeding to distribute the 2004-2005 cable royalty funds ("2004-2005 Funds").

Dr. Michael Salinger is Professor of Economics at the Boston University School of Management and Managing Director of LECG, a company that provides economic analysis for legal and regulatory proceedings. From July 2005 through June 2007, he served as Director of the Bureau of Economics at the United States Federal Trade Commission ("FTC"). Dr. Salinger is an expert in economics and statistics, specializing in industrial economics, with experience in the empirical analysis of cable television and program markets.

Dr. Salinger's Rebuttal Testimony will respond to testimony and reports submitted by Professor Joel Waldfogel on behalf of Commercial Television/Settling

Parties, Dr. Arthur C. Gruen on behalf of Program Suppliers, Dr. George S. Ford, also on behalf of Program Suppliers, and by James M. Trautman on behalf of the Joint Sports Claimants/Settling Parties. His testimony addresses the usefulness the Bortz Survey and the Gruen Survey for the Judges determination of relative marketplace value of the various parties' categories of programming in connection with claims to the 2004-2005 Funds. Dr. Salinger also criticizes the utility of the Waldfogel Study and the Ford Study for this purpose.

Respectfully submitted,

DEVOTIONAL CLAIMANTS

Arnold P. Lutzker, DC Bar No. 101816
Carolyn Wimbly Martin, DC Bar No. 359051
Allison L. Rapp, Member Maryland Bar
Jeannette M. Carmadella, DC Bar No. 500586
Lutzker & Lutzker LLP
1233 20th Street, NW
Suite 703
Washington, DC 20036
Tel. 202-408-7600 Ext. 1
Fax 202-408-7677
arnie@lutzker.com

December 11, 2009

CERTIFICATE OF SERVICE

I, Arnold P. Lutzker, hereby certify that a copy of the foregoing "Rebuttal Statement of the Devotional Claimants" was emailed and hand delivered or sent via overnight delivery postage prepaid, as indicated, this 11th day of December, 2009 to the following:

NATIONAL ASSOCIATION OF BROADCASTERS John I. Stewart Jr. Ann Mace Jennifer H. Burdman Crowell & Moring, LLP 1001 Pennsylvania Ave, NW Washington, DC 20004-2595 **HAND DELIVERY**	**PROGRAM SUPPLIERS** Gregory O. Olaniran Dennis Lane Lucy Holmes Plovnick Stinson Morrison Hecker LLP 1150 18th Street, NW, Suite 800 Washington, DC 20036 **HAND DELIVERY**
JOINT SPORTS CLAIMANTS Robert Alan Garrett Stephen Marsh Brent S. LaBarge Arnold & Porter LLP 555 Twelfth Street, NW Washington, DC 20004-1206 **HAND DELIVERY** Philip R. Hochberg 11921 Rockville Pike Suite 300 Rockville, MD 20852 **OVERNIGHT DELIVERY** Richie T. Thomas Ian R. McPhie Squire, Sanders & Dempsey, LLP 1201 Pennsylvania Avenue, NW Washington, DC 20004 **OVERNIGHT DELIVERY** Thomas J. Ostertag Office of the Commissioner of Baseball 245 Park Avenue New York, NY 10167 **OVERNIGHT DELIVERY**	**MUSIC CLAIMANTS** Joan M. McGivern Samuel Mosenkis ASCAP One Lincoln Plaza New York, NY 10023 **OVERNIGHT DELIVERY** Jay Cohen Lynn B. Bayard Jayson L. Cohen PAUL, WEISS, RIFKIND, WHARTON & GARRISON, LLP 1285 Avenue of the Americas New York, NY 10019-6064 **OVERNIGHT DELIVERY** Marvin L. Berenson Joseph J. DiMona Broadcast Music, Inc. 320 West 57th Street New York, NY 10019 **OVERNIGHT DELIVERY** Michael J. Remington Jeffrey Lopez Drinker Biddle & Reath LLP

	1500 K Street, NW – Suite 1100 Washington, DC 20005-1209 **HAND DELIVERY** John C. Beiter Zumwalt, Almon & Hayes PLLC 1014 16th Avenue South Nashville, TN 37212 **OVERNIGHT DELIVERY**

CANADIAN CLAIMANTS GROUP L. Kendall Satterfield Richard M. Volin Finkelstein, Thompson, LLP 1050 30th Street, NW Washington, DC 20007 **HAND DELIVERY**	**PUBLIC TELEVISION CLAIMANTS** Ronald G. Dove, Jr. Lindsay L. Tonsager Covington & Burling 1201 Pennsylvania Ave, NW Washington, DC 20004-2401 **HAND DELIVERY**
NATIONAL PUBLIC RADIO Joyce D. Slocum Gregory A. Lewis National Public Radio, Inc. 635 Massachusetts Ave, NW Washington, DC 20001 **OVERNIGHT DELIVERY**	Gena Ashe Public Broadcasting Service 2100 Crystal Drive Arlington, VA 22202 **OVERNIGHT DELIVERY**

Arnold P. Lutzker

Before the
COPYRIGHT ROYALTY JUDGES
Washington, D.C.

In the Matter of	)	
	)	
Distribution of the 2004-2005	)	**Docket No.**
Cable Royalty Funds	)	**2007-3 CRB 2004-2005**
	)	
	)	

Rebuttal Testimony

Dr. Michael A. Salinger

December 11, 2009

TESTIMONY OF DR. MICHAEL A. SALINGER

I. Qualifications

1. My name is Michael A. Salinger. I am Professor of Economics at the Boston University School of Management and Managing Director of LECG, a company that provides economic analysis for legal and regulatory proceedings.

2. From July 2005 through June 2007, I took a leave of absence from Boston University to serve as Director of the Bureau of Economics at the United States Federal Trade Commission (FTC).

3. I joined the Boston University Faculty in 1990. Most of the courses I have taught have been in managerial economics or statistics. I have taught economics at the undergraduate, masters, doctoral, and executive level. I have taught statistics at the undergraduate and masters level. As Director of the Bureau of Economics, I designed a statistics course for antitrust attorneys. I have also taught business history, health care economics, and health care finance. I have been faculty director of the undergraduate business program, faculty director of the undergraduate honors program in the School of Management, and chairman of the Department of Finance and Economics. After returning to Boston University from the FTC, I was named an Everett W. Lord Distinguished Faculty Scholar. Prior to joining the Boston University faculty, I was an associate professor at the Graduate School of Business at Columbia University.

4. My area of specialization within economics is "industrial economics" (or "industrial organization"). I have published on a wide variety of economic topics[1] and have served on the editorial boards of both *The Journal of Industrial Economics* and *The Review of Industrial Organization*, two journals that specialize in publishing academic articles on industrial economics.

5. I have experience with respect to the cable television industry as a researcher, consultant, and government official. In 1989, shortly after the Time-Warner merger was announced, I testified before the Communications Subcommittee of the Senate Commerce Committee about my research on vertical integration between cable operators and pay cable services. I did various consulting assignments for Turner Broadcasting with respect to its cable operations, including an analysis of fees cable networks should pay ASCAP for the performance rights to music in the programming on its cable networks. While I was Director of the Bureau of Economics, the Commission reviewed the transaction in which Comcast and Time Warner acquired the assets of Adelphia Communications. I testified before the Senate Judiciary Committee about the Commission's decision not to challenge that acquisition.

6. My experience in the cable industry also includes my 1995 and 1996 testimony on behalf of Devotional Claimants before the Copyright Arbitration Royalty Panel (CARP) that determined the allocation of the compulsory license fees paid by cable systems from 1990 – 1992 for retransmitting distant broadcast signals.

---

[1] Statistical theory has played a central role in some of my publications. An example is Michael Salinger, "Standard Errors in Event Studies," *Journal of Financial and Quantitative Analysis*, Volume 27, March 1992, pp. 39-53. This article pointed out a common error in the computation of standard errors in a type of statistical analysis that is prevalent in the financial economics literature.

7. My affiliation with LECG started on August 1, 2007. Prior to working at the FTC, I was a special consultant to NERA and, before that, an academic adviser to the Princeton Economics Group. Over my career, I have worked on a variety of consulting assignments associated with legal and regulatory proceedings.

8. I received my BA, *magna cum laude* and with honors in economics, from Yale University in 1978. I received a Ph.D. in economics from the Massachusetts Institute of Technology in 1982.

9. For further details on my qualifications, see my curriculum vitae, which is attached as Appendix A to my statement.

II. Assignment and Main Conclusions

10. Counsel for Devotional Claimants has asked me to review the reports and analyses submitted by Professor Joel Waldfogel on behalf of Commercial Television/Settling Parties, Dr. Arthur C. Gruen on behalf of Program Suppliers, Dr. George S. Ford, also on behalf of Program Suppliers, and the Bortz Survey presented by James M. Trautman on behalf of the Joint Sports Claimants/Settling Parties and to assess their usefulness for determining the appropriate allocation of copyright royalties paid by cable systems for the retransmission of distant broadcast signals. More specifically, counsel has asked me to assess the extent to which the Professor Waldfogel, Dr. Gruen, and Dr. Ford studies and analyses confirm or contradict the results of the Bortz survey and whether any of them might even be superior to the Bortz survey as a foundation for allocating the copyright funds. Counsel has also asked me whether Professor Waldfogel's econometric study or the two Program Suppliers' surveys

have altered my expert opinion, which I have previously expressed, that the Bortz survey is the best available basis for allocating the compulsory copyright funds.

11. My major conclusions are as follows.

    a. For at least three reasons, the Waldfogel analysis has no probative value. First, whatever Professor Waldfogel's regression analysis measures, it is statistically too imprecise to be reliable. Second, Professor Waldfogel's use of his regression reflects a fundamental misinterpretation of what his results would mean (if they were measured precisely enough to mean anything). Professor Waldfogel measures a statistical relationship between royalties paid by cable systems and the minutes of different categories of retransmitted programming. In using the regression coefficients as measures of the value of different classes of programming, Professor Waldfogel implicitly assumes that the relationship he has measured between *royalties* and retransmitted programming reflects a relationship between *programming value* and retransmitted programming. It does not. Rather, it reflects the surprisingly complex statistical relationship between the amount of retransmitted programming and the number of distant signal equivalents (DSEs) used in the formula mandated by statute (rather than determined in a market) for computing royalty payments. As a result, Professor Waldfogel's regression reflects regulation, not market value. Third, even if Professor Waldfogel's results did reflect a statistical relationship between the value of programming carried by a cable system and

categories of retransmitted programming, one could not legitimately attribute the higher values *associated* with particular classes of retransmitted programming as being *caused* by the retransmitted programming without controlling for variation in the value of other programming cable systems carry, which he did not measure. Each of these three reasons is sufficient to dismiss the Waldfogel study as being a false measure of relative marketplace value and a fundamentally unreliable econometric tool in this proceeding.

b. Dr. Ford's survey, which measures the advertising value of different classes of programming, does not provide information about the value of different programming to cable operators, who do not sell advertising on the distant signals they import. Therefore, in my opinion, it is a useless tool for evaluating the relative marketplace value to cable operators of distantly retransmitted, non-network programming.

c. Dr. Gruen's survey of the value cable subscribers get from the different classes of programming provides indirect evidence about the value cable operators receive from programming. Dr. Gruen's survey, which was designed to parallel attributes of the Bortz survey, establishes that the relative value cable subscribers placed on religious programming closely resembles the value that Bortz's cable operators placed on key program categories, including religious programming. To the extent Dr. Gruen's survey is deemed reliable, it materially corroborates the survey answers

of cable operators about the value they place on programming, including religious programming.

d. By contrast, the 2004-2005 Bortz Survey faithfully updates the one I previously reviewed in my 1990-1992 Cable Royalty Distribution Proceeding testimony. In my professional opinion, the Bortz Survey is the best available approach to ascertaining the relevant marketplace value of the different classes of programming because it asks the right questions to the right parties.

III. The Waldfogel Study

12. The Waldfogel study is the most recent of a series of econometric studies put forward in proceedings to allocate the royalties paid by cable operators for the retransmission of distant broadcast signals.[2] In general, economists are skeptical of survey results because what people say about what they would do under various circumstances can differ substantially from what they would actually do. In contrast, market data reflects actual behavior. I share the concerns many economists have about survey evidence,[3] but it does not follow that all regression analysis based on

[2] Earlier attempts are the Besen study submitted in the CARP proceeding to allocate the 1990-1992 copyright royalty payments for cable system retransmission of distant broadcast signals and the Rosston study submitted in the 1998-1999 proceeding.

[3] Notwithstanding this skepticism, survey evidence is sometimes the best evidence available. Particularly with respect to its consumer protection mission, the Federal Trade Commission sometimes relies on survey results. My duties as Director of the Bureau of Economics included assessing the relevance of survey results and advising the Chairman and other Commissioners based on those assessments. I have also used survey results in my published work. See Keith A. Anderson, Erik Durbin, and Michael A. Salinger, "Identity Theft," *Journal of Economic Perspectives*, Volume 22, 2008, pp. 171-192.

market data is useful. In fact, Professor Waldfogel's regression analysis is seriously flawed even as a tool for confirming the results of the Bortz survey.[4]

13. As described above in my "Main Conclusions," three of the problems with Professor Waldfogel's analysis are so fundamental that each by itself renders the study completely unreliable as a basis for allocating the royalties at issue in this proceeding.

14. First, even taken at face value, the results have such a large margin of error that they would not rule out any of the plausible allocations.[5] Subsection A below explains this point in more detail.

15. In addition, Professor Waldfogel misinterprets what his regression coefficients would mean if the estimates were precise enough to mean anything (which they are not). He estimates a statistical relationship between royalties paid by cable systems and the minutes of different categories of retransmitted programming, holding certain factors constant. The results indicate, for example, that an additional minute of sports programming is associated with a higher royalty of $2.77, whereas an additional minute of Program Supplier programming is associated with a higher royalty of only $0.075.[6] They also indicate that an additional minute of devotional programming is associated with a lower royalty payment, although the estimate is

[4] Since the Waldfogel results have no value even as a validation of the Bortz results, it should go without saying that they would not be a valid primary basis for allocating the copyright funds.

[5] This point would apply to what Professor Waldfogel reports about the precision of his results. As I explain below, the results are even less precise than he reports.

[6] The underlying programming category data reflect three weeks of observations. To get a more intuitive feel for the magnitudes involved, it might be helpful to consider what the coefficients imply about an additional hour per week of a particular type of programming. To do so, all that is necessary is to multiply the regression coefficients by 180 (because an extra hour per week would result in an additional 180 minutes over the three week period.) The coefficients imply that an additional hour of retransmitted Sports and Program Supplier programming per week would be associated with a higher royalty per six-month reporting period of $498.60 and $13.50, respectively.

not statistically significant (even under Professor Waldfogel's flawed calculation of statistical significance). Professor Waldfogel interprets these regression coefficients to mean that retransmitted Sports programming provides cable with 37.5 times (calculated as 2.77/0.075) more value per minute as does Program Supplier Programming and that Devotional Programming provides cable operators with no value.

16. To understand the flaws in this interpretation, an elaboration on why Professor Waldfogel got the results he did is necessary. Both as a legal and (as I will show) a statistical matter, the royalties a cable system pays depend primarily on system receipts and the number of DSEs. Ultimately, therefore, the statistical relationship between program category minutes and royalties must reflect some combination of the relationship between program category minutes and receipts and the relationship between program category minutes and DSEs.

17. Subsection B demonstrates that the coefficients Professor Waldfogel estimates on the programming category minutes variables largely reflect the relationship between programming category minutes and DSEs. They have virtually nothing to do with the relationship between programming category minutes and system receipts.

18. The results in Subsection B are at the heart for the first fundamental flaw in Professor Waldfogel's interpretation of his results. In analogizing his regressions to hedonic regression analysis, Professor Waldfogel assumes that the relative size of the estimated coefficients on program category minutes reflect the relative market value to cable operators of the different categories of programming. In fact, what they reflect is a regulatory formula.

19. There is an additional reason why Professor Waldfogel has misinterpreted what his results would mean (if they were precise enough to mean anything).[7] Suppose Professor Waldfogel had established that systems with relatively more sports programming had more valuable programming that resulted in higher receipts (which he has not established and could not possibly establish because it is not true). He could not logically attribute the higher value to the programming from the retransmitted distant broadcast signals without controlling for the programming on other channels carried by the cable system. As I explain in Subsection C, his interpretation is logically equivalent to comparing the average value of three-bathroom and four-bathroom houses and using the difference as an estimate of the value of an additional bathroom. Without controls for the other features of four-bathroom houses that are likely to make them more valuable than three-bathroom houses, such an interpretation is deeply flawed.

A. Extreme Imprecision of Waldfogel Results

20. Professor Waldfogel's regression results are based on regression analysis using data from four reporting periods spanning two years. Perhaps the simplest way to see that Professor Waldfogel's regression would be an unreliable basis for allocating royalties is to consider Tables 1 and 2.

21. Table 1 shows Professor Waldfogel's results using the entire sample period as well as the results from estimating the same regression separately for 2004 and 2005.[8]

[7] I reiterate that they are not.
[8] Here, the "same regression" means using the same variables.

Table 1
Instability of Professor Waldfogel's Regression Results

	Entire Sample	2004	2005	2004-2005 %
	(1)	(2)	(3)	(4)
Program Suppliers	0.075 **	0.111 **	0.032	-71%
	(0.037)	(0.047)	(0.055)	
	(2.04)	(2.35)	(0.58)	
Sports	2.770 ***	2.709 **	3.791 *	40%
	(0.989)	(1.127)	(2.185)	
	(2.80)	(2.40)	(1.74)	
Commercial TV	0.256 *	0.152	0.329	116%
	(0.141)	(0.176)	(0.216)	
	(1.82)	(0.87)	(1.52)	
Public Broadcasting	0.042	0.001	0.081	7247%
	(0.043)	(0.046)	(0.072)	
	(0.96)	(0.02)	(1.13)	
Devotional	-0.067	-0.058	-0.094	63%
	(0.123)	(0.153)	(0.191)	
	(-0.54)	(-0.38)	(-0.49)	
Canadian	0.282 **	0.355 *	0.221	-38%
	(0.124)	(0.207)	(0.140)	
	(2.28)	(1.72)	(1.58)	
Low Power	-0.115	-0.148	-0.099	-33%
	(0.334)	(0.446)	(0.496)	
	(-0.34)	(-0.33)	(-0.20)	
Mexican	0.886 **	1.470 ***	0.452	-69%
	(0.413)	(0.308)	(0.404)	
	(2.15)	(4.77)	(1.12)	
Lagged Subscribers	0.864 ***	0.830 ***	0.892 ***	7%
	(0.029)	(0.038)	(0.044)	
	(29.48)	(22.14)	(20.29)	
R-squared	0.75	0.75	0.75	
Standard Error	37,491	33,595	41,301	
Observations	4,954	2,604	2,350	

Notes: Columns (1) - (3) report regression results for the entire period, the 2004 sub-period, and the 2005 sub-period respectively. The dependent variable is royalty payments. The independent variables are same as those in Table 2 of Dr. Waldfogel's Report (with the exception that the two sub-period regressions leave out the accounting period indicator variables that are included in the whole period regression). (Column (1) is a reproduction of Dr. Waldfogel's results.) The Table reports only the results for the coefficients on the programming minutes variables and the lagged subscribers variable. See Table B1 in Appendix B for the full set of regression coefficients. Column 4 reports the percentage difference between the coefficients in column 3 and column 2. The values below each estimated coefficient are the coefficient standard error estimated with the same technique used by Dr. Waldfogel and the implied t-value, respectively. (See, however, the critique of Dr. Waldfogel's methodology for estimating standard errors in the text.) A single asterisk, double asterisks, and triple asterisks indicate significance at the 10%, 5%, and 1% significance levels respectively.

22. Crucially, the results are not stable across the sub-periods. In Table 1, the estimated coefficient on the Program Suppliers minutes variable is nearly three times as large with the 2004 data as with the 2005 data (0.111 versus 0.032). The estimated coefficient on the Commercial TV minutes variable is more than twice as large with the 2005 data as with the 2004 data (0.329 vs. 0.152). The coefficients on Public Broadcasting minutes differ by a factor of 80 between the two years (0.001 and 0.081). Even the coefficients on the Sports minutes variable differ substantially between the two years.

23. Table 2 shows the royalty allocation implied by the three regressions using Professor Waldfogel's methodology.

Table 2
Instability of Shares From Professor Waldfogel's Methodology

	Entire Sample	2004	2005	2004-2005 %
	(1)	(2)	(3)	(4)
Program Suppliers	24.7%	35.4%	10.2%	-71%
Sports	42.3%	47.4%	45.1%	-5%
Commercial TV	22.8%	12.9%	29.2%	127%
Public Broadcasting	6.8%	0.2%	12.9%	7303%
Devotional	0.0%	0.0%	0.0%	N/A
Canadian	3.3%	4.1%	2.5%	-38%
Low Power	0.0%	0.0%	0.0%	N/A
Mexican	0.1%	0.1%	0.0%	-66%

Notes: Column (1) reports results from reproduction of Professor Waldfogel's Table Y. Columns 2 and 3 report the results from the same methodology applied to the 2004 and 2005 sub-samples, respectively. Column 4 reports the percentage difference between the coefficients in column 3 and column 2.

24. Table 2 shows that the large differences in the estimated regression coefficients between 2004 and 2005 give rise to large differences in imputed shares. The Waldfogel methodology would give program suppliers a 35.4% share for 2004 data and only a 10.2% share for 2005. Much of the difference would go to Commercial

TV, which would receive a 29.2% share for 2005 using the Waldfogel methodology but only a 12.9% share for 2004. The Waldfogel methodology would give Public Broadcasting a paltry 0.2% for 2004 and a robust 12.9% for 2005. These results are totally inconsistent with a theme of the Settling Parties, namely that the marketplace value of the programming did not change substantially from 1998-99 to 2004-2005. Certainly, to my knowledge, no evidence was presented of dramatic marketplace factors supporting a dramatic difference in share between 2004 and 2005.

25. While Tables 1 and 2 provide an intuitive illustration of the instability of the allocations implied by Professor Waldfogel's methodologies, that instability is evident just from Professor Waldfogel's reported results. Because the data used to estimate regressions are subject to random variation, the parameters in a regression are themselves random. The regression coefficients should be understood as a "best available estimate." But "best" is not necessarily "very good." In evaluating a regression equation, one needs to consider not only the coefficients or "best estimate" but the entire range of plausible estimates. The appropriate approach for doing so is to construct "confidence regions" based on the estimated coefficients and their associated standard errors. The standard error associated with each coefficient is a measure of the imprecision of the coefficient estimate.

26. To construct a 95% symmetric confidence region for a coefficient, one multiplies the coefficient standard error by 1.96 and both adds and subtracts the resulting value to the estimated coefficient.[9] For example, using the entire sample, the coefficient on

[9] The width of a symmetric 95% confidence interval for a regression coefficient is always the product of the standard error of the parameter and a scaling factor that is typically about 2. The exact scaling factor (1.96

the Program Suppliers minutes variable is 0.075 with an estimated standard error of 0.037. Multiplying 0.037 by 1.96 gives 0.073. Both adding and subtracting this value from the estimated coefficient gives a 95% confidence interval 0.002 to 0.148. Note that the estimated coefficients for 2004 and 2005 of 0.111 and 0.032 both lie well within the confidence region estimated from the entire sample.[10] The same points apply to the coefficients on Commercial TV and Public Broadcasting. Using the results for the entire sample, the 95% confidence region for the coefficients on the Commercial Broadcaster minutes variable is from -0.020 to +0.532. The values estimated from the 2004 and 2005 data of 0.152 and 0.329, respectively, lie well within that range. For the coefficient on the Public Broadcasting minutes variable, the 95% confidence region is -0.043 to 0.126, a range that comfortably includes the 0.001 coefficient estimated for 2004 and the 0.081 coefficient estimated for 2005.

27. Because of the imprecision of the Waldfogel evidence as measured by the standard errors of the coefficients, any resemblance of the shares implied by the regression equation and the Bortz coefficients is at best merely a coincidence. Had purely random factors affecting the data turned out differently, the results could easily have implied shares dramatically different from the Bortz shares. If the Judges accept this methodology as being relevant for its allocations, they should anticipate that results in future years will imply shares much different from the Bortz survey (or any other

---

in this case) depends on the number of "degrees of freedom," which in turn depends on the number of observations and the number of variables included in the regression.

[10] The importance of this point is that it refutes any argument that the imprecision revealed by comparing the estimates from different years of data arises because of the smaller sample sizes that result from splitting the sample in half. The variation observed between the two years is well within the range of plausible parameter values that could be estimated using the entire sample period. (Moreover, as I discuss below, using two years data from the same systems does not make the estimates much more precise than the estimates based on one year of data.)

credible methodology that might be put forward) even in periods when there would be no other reason to suspect a market change significant enough to warrant a substantially different allocation.

28. While the instability of the results across periods is the main point to take from Table 1, several additional points about Professor Waldfogel's results and Table 1 are worth noting.

1. Additional Comments on Professor Waldfogel's Regression results

29. Various aspects of Professor Waldfogel's results might initially seem to create the appearance of statistical validity. In fact, however, any such appearance is an illusion.

30. The first aspect of the results that might seem to suggest some statistical validity to Professor Waldfogel's regressions is that the over-all statistical fit of the regression appears reasonably good. The R-squared value of 0.75 means that the model "explains" 75% of the variation in royalties paid by cable systems. As Professor Waldfogel pointed out in his oral testimony, one must be careful about drawing inferences from the level of R-squared. But even if one could use the fit of the model to inform one's assessment of its statistical validity, the over-all fit of the model says nothing about the statistical properties of the individual coefficients that Professor Waldfogel takes as estimates of programming value.[11]

[11] An analogy illustrates the point. Suppose one had data on the number of wins for each Major League Baseball team in a season, the number of runs it scored, the number of runs it allowed, and the average height of ushers working at the team's stadium. Suppose one then used those data to run a regression in with the number of wins as the dependent variable, and runs scored, runs allowed, and average usher height

31. The vast majority of the explanatory power in the regression comes from the subscriber variable. The cable systems in the data set vary substantially in size. Bigger systems pay higher royalties. While intuitive, the point is evident in the formal statistics. In addition to the program category minutes variables, Table 1 reports the coefficients on the number of subscribers ("Lagged Subscribers").[12] The t-statistics on the subscriber variable are approximately 10 times the t-statistic even on the Sports minutes variable (the most significant of the program category minutes variables). (The t-statistic on a coefficient can be interpreted as reflecting the additional explanatory power added by the associated variable). All the other variables combined (including such obvious measures as the indicator variable for paying 3.75% royalties), add relatively little explanatory power. [13]

32. The second aspect of the Professor Waldfogel's results that might create the illusion of statistical validity is that he reports that the coefficient he estimates on the Sports

---

as independent variables. Because runs scored and runs allowed likely have substantial statistical power in explaining the number of wins, the R-squared statistic in the regression might be reasonably high. That would not in any way provide evidence that usher height has anything to do with the number of wins.

[12] Professor Waldfogel uses lagged subscribers rather than subscribers in his regression. The apparent reason for doing so is to take lagged subscribers as an exogenous measure of system size and then to allow for the possibility that attractive programming could create value by increasing the number of subscribers. The use of lagged subscribers rather than subscribers does not have a material effect on Dr. Waldfogel's results. As a technical matter of econometrics, the lagged subscribers variable is not exogenous because the errors in the model are correlated across cable systems over time.

[13] The estimated coefficient of 0.864 in the full sample means that in comparing systems that have the same value for the other variables included in the regression, systems with more subscribers pay higher royalties on average than do systems with fewer subscribers. More precisely, the estimate indicates that the additional royalties paid by larger systems (for a six-month period) are, on average, higher by $0.864 per additional subscriber. It should come as no surprise that systems with more subscribers pay higher royalties and the magnitude of the coefficient also conforms with common sense. One might expect the coefficient on the number of subscribers to equal the average royalty per subscriber. The average royalties per system are $43,533 and the average number of subscribers is 36,673, which implies an average royalty of $1.19, which is greater than the estimated coefficient of 0.864. The main explanation for the difference is that royalties per subscriber are lower for larger systems in large part because, on average, larger systems have fewer DSEs than do small systems. Note that in distinct contrast to the coefficients on the programming category minutes variables, the parameter estimated on the subscriber variable is stable over time and very precisely measured. The estimated coefficient on the subscriber variable provides an example of the sort of regression result that lends itself to a meaningful and valid interpretation.

minutes variable is significant at the 1% level and that the coefficients he estimates on the Program Supplier, Canadian, and Mexican minutes variables are significant at the 5% level.

33. First of all, in all likelihood, none of the coefficients on the program category minutes variables is statistically significant. Professor Waldfogel's assessment of statistical significance is based on his estimated t-statistics. With a sample as large as Professor Waldfogel's, a t-statistic with an absolute value greater than 1.96 means that the associated coefficient is significant at the 5%, and a t-statistic with an absolute value greater than 2.58 means that the associated coefficient is significant at the 1% level. The t-statistic is computed as the coefficient divided by the associated standard error. As large as the reported standard errors are, however, Professor Waldfogel has underestimated them probably by a factor of nearly 2. In estimating standard errors, Professor Waldfogel has assumed that his sample consists of 4,954 observations *that are independent of each other*. Such an assumption might be tenable if he had observations on 4,954 *different* cable systems. He does not, however. Rather the sample consists of approximately 1,250 different systems with four observations for most of the systems. Because the observations for a single system over time are highly correlated with each other, his effective sample size is much closer to 1,250 than to 4,954.[14] Since the standard errors are inversely proportional to the square root of the number of observations *when all observations*

[14] I have computed the correlations across cable systems of the residuals from Professor Waldfogel's regression for all six pairs of sample periods. The possible values of the absolute value of the correlation range from 0 to 1, with 1 indicating perfect correlation (meaning a perfect linear relationship) and 0 indicating that the variables are perfectly uncorrelated. The range of the correlations was from 0.815 (between the 2004-1 and 2005-1 accounting periods) and 0.941 (between the 2004-2 and 2005-2 accounting periods).

are independent, the true standard errors are likely nearly twice as large as reported and the t-statistics are roughly half what Professor Waldfogel estimates. *Proper calculation of the standard errors would likely lead to the conclusion that none of the coefficients on the program minutes variables is significant at conventional levels.*

34. Even if the coefficients on some of the programming minutes variables were statistically significant, the importance of the conclusion would be extremely limited. The term "statistical significance" can be as different from the common English meaning of "significance" as the term "shoe tree" is from the word "tree." If Professor Waldfogel were correct that some of the coefficients he has estimated on the program category minutes variables were statistically significant, all that would mean is that we could be confident that they are not 0 (or negative). No party to this proceeding has suggested, however, that the value of sports programming or program supplier programming is 0, so statistically ruling out 0 does nothing to resolve the points of dispute. Moreover, demonstrating that the results are statistically significant would not validate Professor Waldfogel's interpretation of the results as reflecting program value.

35. The criticisms of Professor Waldfogel's claims about the statistical significance of the coefficients on the programming variables apply equally to his assertion that he can statistically reject the share Bortz respondents gave to Devotional Programming. With a proper estimate of the standard errors, he could not reject a coefficient on the Devotional minutes variable that, using his methodology, would imply that Devotional claimants should get their Bortz share. Even if he could statistically

reject such a value (which he cannot), his insinuation that the result would imply that the Judges should reject the Bortz share for Devotional Claimants would still rest on the validity of his interpretation of the regression coefficients as reflecting the value of different types of programming on retransmitted broadcast signals (which they do not).[15]

36. I now turn to an elaboration of why such an interpretation is invalid.

B. Professor Waldfogel's Regression Coefficients are Not Hedonic Measures of Program Value

37. In his written report as well has his oral testimony, Professor Waldfogel suggests that his regression is or is at least closely related to what economists refer to as a "hedonic" regression. To understand why this interpretation is not valid, it is useful to understand why Professor Waldfogel got the results he got. The analysis will proceed in three steps. The first is to estimate a statistical model of the royalty formula. It will confirm as a matter of statistics what we should expect as a matter of law. Most of the variation in royalties can be attributed to three factors: the number of DSEs, system receipts, and an indicator variable for whether the system pays 3.75% fees. This model provides the foundation for estimating statistical models with system receipts and the number of "Effective DSEs" as dependent variables. The second step is to run the regression of system receipts on Professor Waldfogel's explanatory variables. The results demonstrate that the key features of the relationship Professor Waldfogel estimates between royalties and program category

[15] I further note that not even if Professor Waldfogel's estimated standard errors were correct (which they are not) and his methodology were conceptually sound (which it is not), he could not rule out a share for Devotional Claimants that would exceed substantially the percentage allocation they received in earlier proceedings.

minutes do not reflect the relationship between program category minutes and receipts cable systems receive in the market. The final step is to estimate a regression of DSEs on Professor Waldfogel's explanatory variables. The results indicate that the key features of the relationship Professor Waldfogel estimates between royalties and program category minutes does reflect the relationship between program category minutes and DSEs as computed by a regulatory formula.

1. Statistical Estimate of Royalty Formula

38. Under the compulsory license for retransmitted broadcast signals, the royalties a cable operator pays depend on the number of DSEs and system receipts. The exact relationship is more complicated than a single percentage of system receipts. A Form 3 system must pay for at least one DSE even if it retransmits less than one. The percentage paid for the first DSE is different from the percentages paid for subsequent "allowed DSEs." A cable operator has to pay 3.75% of receipts for signals beyond the "allowed DSEs," and the number of "allowed DSEs" varies across systems. Still, an equation that one might expect to provide a reasonable approximation of the royalty formula is:

$$(1) \qquad R = b_0 S^{b_1} D^{b_2} b_3^{I_{3.75}} .$$

where R is royalties, S is system receipts, D is the number of "Effective DSEs," and $I_{3.75}$ is an indicator variable that equals 1 for a system that pays 3.75 fees and 0 for systems that do not.

39. In equation (1), the explanatory variables are multiplied by each other. In a linear specification, the variables are added to each other. While the linear specification is

more familiar, it makes little sense in this application because adding the effects of the various explanatory variables imposes the implicit assumption that the effect of each explanatory variable on royalties is independent of the other variables. For example, it would mean that the additional royalties a cable operator would have to pay when it increases the number of DSEs would be the same regardless of system size, or that the additional payments due to adding a subscriber or raising the price of basic service would be independent of the number of DSEs.[16]

40. The standard approach to estimating an equation like (1) is to do so in logarithmic form:

$$(1') \qquad \ln R = \ln b_0 + b_1 \ln S + b_2 \ln D + \ln b_3 I_{3.75}$$

While arguably somewhat more complex mathematically than a linear specification, the use of this "functional form" is a completely standard technique in econometrics and virtually all econometricians would consider this logarithmic (or multiplicative) specification to be superior to a linear specification for this application. Not only does it make more sense, but it also has better technical econometric properties.[17]

41. Table 3 reports the estimates both for the full sample and for each year separately.

[16] The problems with a linear specification for equation (1) apply equally to Professor Waldfogel's regression. His model assumes that the relationship between an increase in program minutes and royalties is independent of system size, which makes no sense. This is yet another problem with the Waldfogel study, albeit one that is less fundamental than the three highlighted in this report.

[17] Specifically, with data that range over such a large scale, a common problem is "heteroskedascticity." (The problem arises because the "residuals" tend to be larger for the larger systems.) Professor Waldfogel testified that he worried about and attempted to correct for heteroskesticity in his estimate of standard errors. In many cases, likely including this one, heteroskedasticity is a less prominent feature of the data after a logarithmic transformation and therefore may eliminate the need for an inherently imperfect heteroskedasticity correction.

Table 3
Statistical Estimate of Royalty Formula

	Entire Sample (1)	2004 (2)	2005 (3)	2004-2005 % (4)
Receipts (ln)	0.979 ***	0.980 ***	0.977 ***	0%
	(0.004)	(0.005)	(0.005)	
	(276.53)	(197.91)	(192.58)	
"Effective" DSE's (ln)	0.776 ***	0.784 ***	0.767 ***	-2%
	(0.015)	(0.020)	(0.022)	
	(52.09)	(39.18)	(34.50)	
3.75% Indicator	0.485 ***	0.507 ***	0.461 ***	-9%
	(0.014)	(0.020)	(0.020)	
	(34.08)	(25.08)	(23.05)	
Intercept	-4.348 ***	-4.371 ***	-4.308 ***	-1%
	(0.051)	(0.071)	(0.074)	
	(-84.86)	(-61.61)	(-58.02)	
R-squared	0.95	0.95	0.95	
Standard Error	0.24	0.24	0.24	
R-squared (untransformed data)	0.83	0.80	0.85	
Observations	5,142	2,729	2,413	

Notes: Columns (1) - (3) report regression results for the entire period, the 2004 sub-period, and the 2005 sub-period respectively. The dependent variable is the natural logarithm of royalty payments. The independent variables are the natural logarithm of receipts, the natural logarithm of "Effective DSEs," and a dummy variable that equals 1 for systems that paid a 3.75% royalty in the accounting period and 0 for those that did not. "Effective DSEs" are actual DSEs or 1, whichever is higher. To provide a valid basis of comparison with Table 1, the second to last row reports R-squared based on Royalties (rather than the logarithm of Royalties). The untransformed regression uses the same observations as the regression in logarithms (i.e., those observations where all transformed variables are positive). A single asterisk, double asterisks, and triple asterisks indicate significance at the 10%, 5%, and 1% significance levels respectively.

42. The results in Table 3 provide a stark contrast with the results in Table 1. The results for the two years are virtually identical to each other and to the results for the full sample. The likely explanation for the stability of the results is that the equation reported in Table 3 captures a real and stable relationship among the variables in the data.

43. Another major difference between the results of Tables 1 and 3 is the significance of the variables.[18] All the coefficients are estimated very precisely. In the full sample, the coefficient on the natural logarithm of subscribers is 0.979 with a standard error of only 0.004, implying a 95% confidence interval of 0.971 to 0.987. While the estimates of the other coefficients are not quite as precise as the estimate of the coefficient on the number of subscribers, they are substantially more precise than the coefficients on the category minutes variables in Professor Waldfogel's regression.

44. Because the standard errors of the coefficients are so small relative to the coefficients themselves, the reported t-values substantially exceed those on the program category variables in Professor Waldfogel's regression. As explained above, the mere fact that some coefficients are statistically significant (based on conventional standards of significance, such as 5% and 1%) in a regression is not sufficient to demonstrate that the regression is reliable. Table 3 illustrates the sort of significance levels that can arise when one estimates a convincing relationship with a sample as large as the one underlying Professor Waldfogel's regression.

45. There can be little doubt about the proper logical interpretation of the regressions reported in Table 3. They reflect the formula for computing royalties. The basis for this conclusion is not just that (1) the variables are the ones that we know enter the formula and (2) the functional form reflects the actual formula as well. In addition, the estimated coefficients are about what one would expect based on the formula.

[18] I have not corrected the standard errors for the correlation in the residuals across systems over time. However, even if the standard errors are twice as large as I have estimated and the t-values are only half the reported values, the variables are highly significant by any standard.

The estimated coefficient on the logarithm of subscribers is very close to 1.[19] The estimated coefficient on the logarithm of the number of "Effective DSEs" is positive but less than 1, as one would expect. An estimated coefficient of 1 would mean that for a system of a given number of subscribers (and setting aside, for the moment, 3.75% fees), royalty payments would be directly proportional to the number of DSEs. However, because the royalty rate for the first DSE is greater than the royalty rate for subsequent allowed DSEs, royalties increase less than proportionately with the number of DSEs. To be sure, the statistical model does not match the regulatory formula perfectly. The constant term of -4.35 implies that the royalty rate for systems with 1 DSE would be 1.3%, which is slightly above the actual rate. The coefficient on the indicator variable for systems paying 3.75% royalties indicates that systems that do pay such royalties pay approximately 65% more than they would if all their DSEs were allowed. That estimate is probably somewhat lower than the reality. However, these differences are quite plausibly attributable to the fact that the multiplicative specification, while far superior to a linear specification, is a simplification of the actual formula (as is appropriate in constructing a model).

46. The results reported in Table 3 have the two key features that make the results reliable. First, the parameter estimates are highly precise. Second, there is no doubt about the proper logical interpretation of the statistical facts. Professor Waldfogel's regression has neither of these features.

[19] The precision of the estimates is so great that the estimates are actually statistically significantly different from 1. As noted above, however, the term "statistical significance" has a very precise technical meaning that can be quite different from the common English meaning of the term. The small difference between the estimated coefficients and 1 is not economically significant.

2. Statistical Model of System Receipts

47. Given the results in Table 3 showing that one can explain virtually all the variation in royalties with variation in system receipts and DSEs, a natural question to ask about Professor Waldfogel's results is the extent to which the explanatory power of the variables he uses lies in their power in explaining receipts or DSEs.[20]

48. Table 4 reports the results of the regression of system receipts in which system receipts is the dependent variable and the independent variables are those Professor Waldfogel used in his regression analysis. Like the Tables 1-3, Table 4 reports results for the full sample and separately for each year.

[20] While the regression in Table 3 also includes an indicator variable for whether a system pays 3.75% fees, that variable enters Professor Waldfogel's regression as well. Thus, there is no reason to assess the extent to which Professor Waldfogel's variables "explain" variation in the 3.75% fees. What is of interest is the extent to which the other variables in Professor Waldfogel's regressions explain the other variables that enter the regression in Table 3.

Table 4
Statistical Relationship between System Receipts and Category Minutes

	Entire Sample	2004	2005
	(1)	(2)	(3)
Program Suppliers	-1.268	2.363	-4.327
	(2.184)	(1.774)	(3.565)
	(-0.58)	(1.33)	(-1.21)
Sports	-49.350	-58.436	-45.198
	(43.877)	(38.934)	(130.894)
	(-1.12)	(-1.50)	(-0.35)
Commercial TV	20.388 ***	8.959	28.394 **
	(7.577)	(5.958)	(12.983)
	(2.69)	(1.50)	(2.19)
Public Broadcasting	1.912	-2.933 **	6.769
	(3.170)	(1.494)	(6.002)
	(0.60)	(-1.96)	(1.13)
Devotional	-4.475	-5.729	-3.929
	(7.840)	(6.859)	(13.586)
	(-0.57)	(-0.84)	(-0.29)
Canadian	-12.058 **	-4.884	-18.179 **
	(5.846)	(8.027)	(8.723)
	(-2.06)	(-0.61)	(-2.08)
Low Power	-67.207 **	-104.022 ***	-44.406
	(27.132)	(39.960)	(34.344)
	(-2.48)	(-2.60)	(-1.29)
Mexican	116.491 ***	147.216 ***	80.678 **
	(28.247)	(12.220)	(37.335)
	(4.12)	(12.05)	(2.16)
Lagged Subscribers	80.576 ***	77.109 ***	83.418 ***
	(1.904)	(1.890)	(3.124)
	(42.33)	(40.80)	(26.7)
R-squared	0.88	0.91	0.86
Standard Error	2,208,747	1,687,348	2,648,520
Observations	4,954	2,604	2,350

Notes: Columns (1) - (3) report regression results for the entire period, the 2004 sub-period, and the 2005 sub-period respectively. The dependent variable is system receipts (that form the basis for royalty payments). The independent variables are same as in Table 1 (with the exception that the two sub-period regressions leave out the accounting period indicator variables that are included in the whole period regression). The Table reports only the results for the coefficients on the programming minutes variables and the lagged subscribers variable. See Table B4 in Appendix B for the full set of regression coefficients. The values below each estimated coefficient are the coefficient standard error estimated with the same technique used by Dr. Waldfogel and the implied t-value, respectively. (See, however, the critique of Dr. Waldfogel's methodology for estimating standard errors in the text.) A single asterisk, double asterisks, and triple asterisks indicate significance at the 10%, 5%, and 1% significance levels respectively.

49. In Table 4, the one coefficient that is both precisely measured and stable over the two years is the coefficient on lagged subscribers. This finding is not at all surprising since systems with more subscribers naturally have higher receipts.

50. For the purposes of assessing Professor Waldfogel's interpretation of his results, the most important set of coefficients are those on the Sports programming minutes variable. The coefficients are *negative,* albeit measured so imprecisely that they are statistically insignificant.

51. A positive and statistically significant coefficient on Sports minutes in Table 4 would indicate that systems with a relatively large amount of retransmitted Sports programming have higher system revenues than do systems with less retransmitted Sports programming. To be most supportive of Professor Waldfogel's interpretation of his regression, the coefficient on Sports minutes in Table 4 should not merely be positive and significant. It should exceed the coefficients on other types of programming by approximately the same amount as in Table 1. (As I will discuss in Subsection C, such a result would not prove Professor Waldfogel's interpretation, but it would at least be consistent with it.)

52. The negative coefficient on Sports minutes in Table 4 means that within Professor Waldfogel's sample,[21] the value of programming is on average lower on systems that retransmit additional Sports minutes (holding the other Waldfogel variables constant).

[21] Because the estimated coefficient on Sports minutes is not statistically significant, there is a reasonable probability that the coefficient estimated from a different sample would be positive.

53. Before turning to the next section, I should note that I agree with the point that Dr. Crandall made in his direct testimony that efforts to estimate the value of cable programming with regression models of system receipts (either total or per subscriber) on the programming carried by cable systems have generally yielded disappointing results.[22] That does not preclude the possibility that better data might yield convincing results, but I also agree with Dr. Crandall that minutes of programming in different categories is likely too crude a measure of program value to be useful for a hedonic regression analysis. In other words, twice as many minutes of a particular category of programming does not necessarily imply twice as much value. The long history of these failed efforts and the obvious shortcomings of the measures used in them provide additional reasons to doubt that the coefficients Professor Waldfogel estimates on the program category minutes variables reflect the relationship between programming and system revenue.

3. Statistical Model of DSEs

54. If the relationship between programming minutes variables and royalty payments does not reflect a relationship between those variable and system receipts, then the next obvious hypothesis to test is whether programming minutes variables are systematically related to "Effective DSEs." Table 5 reports the regression of the number of "Effective DSEs" on the variables included in Professor Waldfogel's regression both for the full sample and separately for each year. Also, as in Tables 1

[22] See Tr. 254-255 (Crandall).

and 4, Table 5 only reports the coefficients on the programming category minutes variables and the number of subscribers.

Table 5
Statistical Relationship between "Effective" DSE's and Category Minutes

	Entire Sample (1)	2004 (2)	2005 (3)
Program Suppliers	0.701 ***	0.849 ***	0.579 ***
	(0.082)	(0.124)	(0.113)
	(8.52)	(6.85)	(5.13)
Sports	10.006 ***	10.138 ***	9.892 **
	(2.324)	(2.771)	(4.825)
	(4.31)	(3.66)	(2.05)
Commercial TV	0.619 **	0.678 *	0.568
	(0.263)	(0.364)	(0.370)
	(2.35)	(1.86)	(1.53)
Public Broadcasting	0.044	0.164 *	-0.053
	(0.072)	(0.096)	(0.098)
	(0.61)	(1.70)	(-0.54)
Devotional	-0.301	-0.507	-0.175
	(0.290)	(0.476)	(0.338)
	(-1.04)	(-1.07)	(-0.52)
Canadian	2.187 ***	2.226 ***	2.174 ***
	(0.278)	(0.386)	(0.400)
	(7.88)	(5.76)	(5.44)
Low Power	-0.556	0.747	-1.370
	(1.421)	(2.299)	(1.700)
	(-0.39)	(0.33)	(-0.81)
Mexican	-2.162 ***	-1.551 **	-2.788 ***
	(0.552)	(0.709)	(0.835)
	(-3.92)	(-2.19)	(-3.34)
Lagged Subscribers	-0.001 ***	-0.001 ***	-0.001 ***
	(0.000)	(0.000)	(0.000)
	(-6.07)	(-3.55)	(-4.96)
R-squared	0.49	0.51	0.47
Standard Error	0.53	0.53	0.53
Observations	4,954	2,604	2,350

Notes: Columns (1) - (3) report regression results for the entire period, the 2004 sub-period, and the 2005 sub-period respectively. The dependent variable is "Effective DSE's", (i.e., actual DSE's or 1, whichever is greater.) The independent variables are same as in Tables 1 and 4, except that the minutes variables are divided by 100,000 and lagged subscribers are divided by 1,000. (Dividing variables by a constant makes the results easier to read, but has no effect on their substantive meaning.) The Table reports only the results for the coefficients on the programming minutes variables and the lagged subscribers variable. See Table B5 in Appendix B for the full set of regression coefficients. The values below each estimated coefficient are the coefficient standard error estimated with the same technique used by Dr. Waldfogel and the implied t-value, respectively. (See, however, the critique of Dr. Waldfogel's methodology for estimating standard errors in the text.) A single asterisk, double asterisks, and triple asterisks indicate significance at the 10%, 5%, and 1% significance levels respectively.

55. The programming category minutes variables have much more explanatory power in Table 5 than in Table 4. The t-statistic on the Program Suppliers minutes variable is 8.52 in Table 5, but only -0.58 in Table 4. For Sports minutes, the t-statistic is 4.31 in Table 5 and only -1.12 in Table 4. Also, while the coefficient on Lagged Subscribers is statistically significant in Table 4, it does not have anywhere near the level of significance that it has in Table 5. Thus, in contrast to Table 4, where the vast majority of the power in explaining system receipts is from the subscribers variables, the programming category minutes variables have substantial power to explain "Effective DSEs."

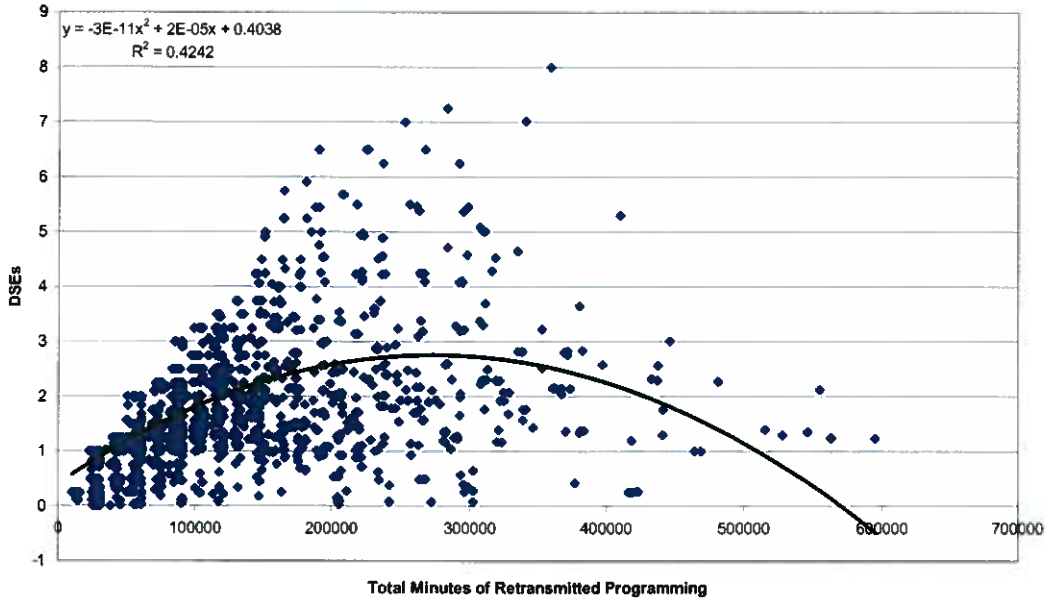
56. The results in Table 5 largely resolve the puzzle behind why the coefficient on the sports programming minutes variable estimated by Professor Waldfogel exceeded the coefficients on the other programming minutes variables by so much. The coefficient on the sports programming minutes variable in Table 5 is 10.01, whereas the coefficients on the Program Suppliers minutes variable and the Broadcaster minutes variables are only 0.70 and 0.62, respectively. Also, the ratio of the coefficient on the sports programming minutes variable to the coefficient on the Program Suppliers minutes variables in Table 5 is substantially larger for 2005 than for 2004, which also resembles the results in Table 1.

57. As to the coefficients on the minutes of Devotional programming minutes variable in Table 5, they are negative (albeit nowhere near statistically significant). The result helps explain why the coefficients on the Devotional programming minutes variables in Table 1 are negative. Systems with more Devotional programming minutes pay

lower royalties on average because, holding other factors constant, they have fewer DSEs. That result might seem surprising. Because distant signals consist of minutes of programming, one might expect more minutes of any type to be associated with more DSEs. Consider, however, Figure 1, which shows a scatter plot with the sum across all program categories in Professor Waldfogel's regressions of minutes on the horizontal axis and the number of DSEs on the vertical axis.[23] The observations in the lower right corner indicate that a substantial fraction of systems retransmit a relatively large number of minutes but have a relatively low number of DSEs. A plausible explanation is that these systems retransmit partially distant signals. Whatever the explanation, the relationship between minutes of programming and DSEs reflects a regulatory formula for computing DSEs, not relative market value.

[23] The curve in Figure 1 is represents a regression equation. The dependent variable is DSEs. The independent variables are "Total Minutes" and "Total Minutes Squared." "Total Minutes" is the sum of the eight (non-network) programming minutes categories that enter Professor Waldfogel's regressions. "Total Minutes Squared" is "Total Minutes" multiplied by itself. The inclusion of a squared term is a standard technique for using linear regression analysis to estimate non-linear relationships. Table B6 in Appendix B reports the regression complete regression results underlying the curve in Figure 1.

Figure 1
Minutes of Retransmitted Programming and DSEs



58. The results in this subsection demonstrate that the relationship between copyright royalties and program category minutes variables does not reflect a statistical relationship (much less a causal one) between the relative market value of programming carried by systems and the type of programming they retransmit. Instead, it reflects a relationship between program category minutes and the regulatory formula for determining DSEs.

C. Professor Waldfogel's Failure to Control for other Types of Programming Cable Systems Carry

59. The preceding two subsections have shown that Professor Waldfogel's regression is statistically too imprecise to be of any value and that, in any event, what it measures (albeit imprecisely) about the relationship between program minute categories and royalties reflects the regulatory formula for computing DSEs and nothing about

relative market value of the different classes of programming. Even if his study were sufficiently precise to be reliable and even it did reflect a relationship between the value of programming carried by cable systems and the amount of different categories of programming on distant broadcast signals, the study would still suffer from an additional fatal flaw.

60. Professor Waldfogel interprets his regression as being what economists refer to as a hedonic regression. Hedonic regression is a widely used statistical technique to explain variation in the market prices of different goods as a function of their characteristics. A common example is housing prices. A hedonic model of housing prices is a regression model in which the dependent variable is the price of houses and the independent variables are features expected to affect the price of a house such as the number of bedrooms, the number of bathrooms, the number of other rooms, the size of land, the location, the age of the house, and so on.

61. The third fatal flaw of Professor Waldfogel's study is that his regression includes some characteristics that affect the value of programming carried by a cable system but omits others (and the omitted programming is likely far more important than the programming he has included).

62. To see how fundamental this problem is, consider running a regression to explain housing prices in which the only explanatory variable is the number of bathrooms. Hypothetically, suppose the equation one estimated was:

$$P = 200{,}000 + 75{,}000\ B,$$

where P is the price of a house and B is the number of bathrooms. One can always interpret a regression equation as giving the average value of the dependent variable for any given value of the independent variables. In this example, the equation implies that the average price of houses with three bathrooms is

$$P = 200{,}000 + 75{,}000 \times 3 = 425{,}000,$$

and the average price of houses with four bathrooms is

$$P = 200{,}000 + 75{,}000 \times 4 = 500{,}000.$$

63. It is important to be clear on what the regression does not necessarily mean. The fact that the average price of 3-bathroom houses $425,000 whereas the average price of 4-bathroom houses is $500,000 does not imply that, on average, adding a bathroom to a house increases its value by $75,000. Indeed, there is good reason to believe that such is not the case because, on average, 4-bathroom houses are likely to be systematically different from three-bathroom houses in ways other than the number of bathrooms, and these other features are likely to affect the value of a house. On average, 4-bathroom houses are likely to have more other rooms, more total square footage, be on larger plots of land, have better kitchen appliances, and so on. As a logical matter, to use a comparison of housing prices to ascertain the market value of an additional bathroom, one would need to compare the prices of houses with different numbers of bathrooms but which otherwise have similar features. Multiple regression analysis is a statistical tool that allows a research to hold these other features constant. To do so, however, one needs to include the other relevant product features as explanatory variables in the regression. In the housing example, if one ran the regression of the housing prices on the number of bathrooms, the number of

bedrooms, the square footage of other rooms, and the size of the plot, one would likely get a much smaller coefficient on the number of bathrooms.

64. The term "hedonic" regression refers not just to a regression of market prices on product characteristics but also to the interpretation of the estimated coefficients as implicit prices of product features. This interpretation adds the assumption that the statistical relationship reflects a causal relationship. The interpretation is an assumption, not a result. Such an assumption is untenable when the regression excludes features that likely affect the price of the item and that are likely correlated with the features included in the regression.

65. With respect to Professor Waldfogel's regressions, suppose that the coefficient on retransmitted Sports minutes were positive and significant in the regression with system receipts as the dependent variable. Such a result would mean that, on average, systems with more retransmitted Sports minutes have higher receipts; and one might plausibly infer that the higher receipts were due to a more attractive package of programming. Such a finding would be analogous to the regression of housing prices on the number of bathrooms. The higher value of the package would not necessarily be attributable to the retransmitted Sports minutes. The statistical fact of higher average program value for systems with more Sports minutes could be attributable to other programming that subscribers value and that are more likely to be present on systems that have a relatively large number of Sports minutes.

66. Professor Waldfogel's so-called sensitivity analysis does not address this issue at all. In a regression of prices on product features, the only way to assess whether the estimated coefficients reflect the value of other features is to measure those features

and include them in the regression. That is the opposite of what he did. His sensitivity analysis entailed removing variables, not adding them. That was a completely useless exercise. One learns nothing from the fact that the coefficients on which Professor Waldfogel relies did not change when he removed variables. Moreover, if the variables were ones that he should have controlled for, then a change in the regression coefficients when those variables are eliminated would not have invalidated an otherwise valid interpretation of the regression. (Of course, Professor Waldfogel's interpretation is not valid, so there was nothing to invalidate.)

67. To summarize this discussion of Professor Waldfogel's results, the study suffers from three fundamental flaws each of which would be sufficient grounds for dismissing it altogether. First, the results are too imprecise statistically to be reliable. Second, the statistical relationship between programming category minutes and royalties within Professor Waldfogel's sample primarily reflects the regulatory formula for determining DSEs, not the marketplace value of programming. Third, even if the statistical relationship between programming category minutes and royalties did reflect variation in programming value across systems, one could not logically attribute the statistical relationship as reflecting just the value of programming on retransmitted distant broadcast signals.

IV. The Ford Study

68. Dr. George S. Ford's study submitted in this proceeding presents estimates of the relative value of different categories of retransmitted programming *to advertisers*.

69. As I understand the rationale for this proceeding, cable operators owe royalties to copyright owners of programming on retransmitted distant broadcast signals because the cable operators get value from the programming they retransmit. Absent a compulsory license, cable operators would have to negotiate with owners of the copyrights on the distant signals they wish to retransmit. The royalty set by statute substitutes for the fee that cable operators and copyright owners would negotiate in a free market. In such a free market, one would expect as a matter of economics that owners of programs that create more value for cable operators could negotiate higher copyright fees.

70. Also as I understand it, the rationale for basing the allocation of the copyright funds on "relative marketplace value" is to reproduce as best as one can the fees that different copyright owners would negotiate if the copyright fees were negotiated in a free market.

71. Cable operators do not sell advertising on retransmitted broadcast signals. Thus, the value of programming to advertisers does not determine the value cable operators receive from the programming on distant signals they retransmit. In turn, the royalties one would expect copyright owners to be able to negotiate with cable operators in a hypothetical free market would not depend on the value to advertisers.

72. Dr. Ford's assertion that his study is relevant for this proceeding rests on the implicit assumption that the term "relative marketplace value" can have a general meaning

that does not depend on the institutional details of the market. That is simply wrong as a matter of economics.

73. A "market price" is necessarily a transaction price. Every transaction necessarily has a particular buyer and a particular seller.

74. There are a wide variety of circumstances under which one tries to estimate what an unobserved transaction price should or would be by using observed prices of "comparable" transactions. Indeed, this general approach underlies the hedonic approach that Professor Waldfogel purported to use. For the observed price to be a reasonable proxy for the unobserved price, however, the buyer and seller in the transaction that yields an observed price have to be sufficiently comparable to the buyer and seller in the transaction for which a price is not observed. Because the value advertisers get from programming is so different from the value cable operators get, transactions between copyright owners and advertisers are not comparable to transactions between copyright owners and cable operators. This lack of comparability is the fundamental flaw in using Dr. Ford's analysis as a foundation for allocating copyright royalties.

V. The Gruen Study

75. Dr. Arthur C. Gruen's testimony concerned the results of a survey of cable subscribers about the relative value they place on different classes of programming. The survey questions resemble those in the Bortz questionnaire. While Dr. Gruen made various arguments about the superiority of his questions and associated script relative to the Bortz survey, the main methodological difference between Dr.

Gruen's survey and the Bortz survey is the nature of the respondents: individual subscribers in the Gruen survey and managers of cable systems in the Bortz survey.

76. In many respects, the results in the Gruen Survey bear substantial similarity to those in the Bortz survey. Taking averages over the two years, the Bortz respondents gave movies and series a relative value of 37.1% whereas Dr. Gruen's respondents gave them 40.6%. The Bortz respondents gave News and Public Affairs an average weight of 16.6% compared with 17.5% in the Gruen survey.

77. Despite these similarities, there are some important differences as well. In Dr.Gruen's survey, live team sports get an average weight of only 17.5%, compared with 35.2% in the Bortz survey. A substantial fraction of this difference according to Dr. Gruen is that his survey explicitly separated out team and non-team sports, with the latter getting an average weight of 7.1%. PBS gets a substantially greater weight in the Gruen survey than in the Bortz survey.[24] Devotional programming does somewhat better in the Gruen survey than in the Bortz survey.

78. Dr. Gruen argues that a survey of subscribers is inherently better than a survey of cable operators because subscribers are the ultimate consumers of the product. As he put it:

> The measure of value in these proceedings has been the ability to attract and retain subscribers. Given that premise, subscriber preferences should carry great weight in determining relative program values. Basic cable subscribers ultimately pay the copyright royalty fees as well as the other programming costs. Although cable operators write the royalty checks, the revenue used to pay those fees is generated from subscribers. In economic terms, demand by cable operators for distant signals is derived from consumer demand for programming. [Gruen Written Testimony at 28]

[24] The Bortz Survey acknowledges that PBS (and Canadian) content may be undervalued. Some methodologically sound adjustment for PBS and Canadian content in Bortz results would be appropriate.

79. I agree with the points Dr. Gruen makes in this paragraph; I disagree with the conclusion he draws from them.

80. My disagreement stems from my understanding of the objective of this proceeding. As I understand it, the objective in determining the "relative marketplace value" of different classes of programming is to reproduce as best as possible the values that would result if the copyright fees were determined in a free market, i.e., if cable operators and copyright owners negotiated them at arms length. In this hypothetical market, the buyer would be the cable operator, not the individual subscriber. As a result, the fee one would expect would depend directly on the value of the programming to the cable operator.

81. While the approach of the Bortz survey is superior to the approach of the Gruen survey as a basis for allocating the copyright funds, the Gruen survey does provide information that is relevant for this proceeding. Even though the objective of this proceeding is to determine the relative market place values that cable operators would pay different copyright owners, the value that cable operators get from programming ultimately derives from whether consumers value the programming and are willing to pay cable subscription fees to gain access to it.

82. The allocations implied by the Bortz and Gruen surveys are generally not far apart. In other words, the relative values that, according to the Bortz survey, cable operators place on different classes of programming make sense because they largely mirror the value their subscribers say they place on the programming. As a result, the Gruen results largely reinforce and confirm the Bortz results.

83. As a matter of economics, one would expect the value cable operators to place on different classes of programming to depend on the value consumers place on the programming, but one would not necessarily expect the value cable operators get from different types of programming to be directly proportional to the value consumers get. Differences can arise because cable operators sell basic cable service as a bundle. When selling a bundle, the value the seller gets from a particular component can differ from the average value consumers place on the good.

84. To understand this point, consider the following extreme but illustrative hypothetical example. Assume:

    a. Each channel carries either all movies or all sports;

    b. 60% of households are willing to pay $1/movie channel and $0.50 per sports channel;

    c. 40% of households are willing to pay $1 per sports channel and $0.50 per movie channel;

    d. a system offers 20 channels in its basic service;

    e. it initially devotes 12 to movie channels and 8 to sports channels; and

    f. the marginal cost of a channel is 0.

    Given these assumptions, the households that prefer movies are willing to pay $16 for cable service (calculated as 12 x $1 + 8 x $0.50). The other 40% are willing to pay only $14 (calculate as 8 x $1 + 12 x $0.50). The profit-maximizing price for the cable operator is $14, which induces all households to subscribe. (Charging $16 and getting only 60% of households yields less.) Now, suppose that the cable

operator drops two movie channels and replaces them with 2 sports channels. On average, consumers would disapprove of this switch. However, the cable operator would make more money because both types of households would value the offering at $15 (calculated as 10 x $1 + 10 x $0.50). The cable operator can then raise the price to $15 and still get all households to subscribe.

85. The key point of this example is that the relative value of sports and movie channels to the cable operator differs somewhat from the relative value subscribers place on the two types of channels. The cable operator values the two sports channels more than the two movie channels that it drops to make room for them. On average, subscribers value the movie dropped movie channels more than the extra sports channels.

86. In this example, which is based on a model of bundling that is often used to understand the effects of the bundling of basic cable service, the cable operator's demand for cable channels is derived from the demand by consumers, just as Dr. Gruen suggests. Moreover, the preferences of consumers have "great weight." Nonetheless, the relative value a cable operator places on different signals might be somewhat different from the relative value subscribers place on the signals.

87. To summarize, the Gruen study provides information that is relevant for the allocation of copyright royalties between program classes because it corroborates the

Bortz study. However, where the results differ, the Bortz results are conceptually more appropriate than the Gruen results.[25]

VI. The Bortz Survey

88. I now turn to the question of whether one or more of the Waldfogel, Ford, or Gruen methodologies provide approaches that are superior to the approach of the Bortz survey for allocating the copyright funds on a "relative marketplace value" basis.

89. One can only meaningfully analyze "relative marketplace value" within the context of a specific market setting. In my opinion, the relevant marketplace is a hypothetical market in which the copyright owners would sell retransmission rights directly to cable systems. There is, however, another constraint. If cable systems and copyright owners negotiated retransmission rights on an unbundled basis, there is no guarantee that the same programs would be transmitted. The copyright owners of programs that might otherwise have been transmitted but were not have no claim on the funds. Rather, the Judges must allocate the funds to the copyright owners of the programs that were retransmitted (and from which cable operators presumably received value).

90. Because of this constraint, one must hypothesize a set of relative marketplace values in which cable operators would have selected the programs that they actually ended up carrying. As a matter of economic theory, the proper notion of relative market

[25] This conceptual point does not apply to the survey design issue of whether the administration of the Bortz survey made an adequate distinction between team and non-team sports and handled PBS and Canadian content properly.

value is what relative prices on the different types of programming would have induced cable operators to select the programming that they did.

91. There is likely no way to get a perfectly accurate answer to that question. However, among the approaches that have been put forward in this proceeding, the Bortz Survey comes closest to being conceptually correct. The constraint that the market outcome must entail the programs actually transmitted eliminates supply-side considerations, so relative marketplace value has to refer to the relative valuation by the buyers. Moreover, what matters is the value placed on the programming by the entities that would be the actual purchasers in the relevant hypothetical market place. Since the buyers would be the cable operators, a survey of the cable operators is more appropriate than a survey of cable subscribers.

VII. Conclusion

92. Of the competing methodologies, the Waldfogel and Ford approaches are so deeply flawed that they cannot be considered even remotely serious competitors to the Bortz study. The approach of the Gruen study does yield relevant information. However, the Bortz study is conceptually superior because it focuses on the value placed on different categories of programming by the cable operators, who would be the actual purchasers in the hypothetical marketplace, rather than the subscribers, who would not be directly involved in the hypothetical transactions.

Appendix A

Curriculum Vitae of Dr. Michael A. Salinger

Michael A. Salinger, Managing Director, LECG

350 Massachusetts Avenue, Suite 300
Cambridge, MA 02139
USA

Phone: 617.252.9994
Fax: 617.621.8018
Email: msalinger@lecg.com

Summary

Michael A. Salinger is a managing director in LECG's Cambridge office and a professor of economics at the Boston University School of Management, where he has served as chairman of the department of finance and economics. Prior to joining LECG, Dr. Salinger served two years as director of the Bureau of Economics with the FTC, overseeing approximately 70 PhD economists and additional professional staff. Prior to his tenure at Boston University, he was an associate professor at Columbia University Business School and a staff economist in the Bureau of Economics, as well as serving on the editorial boards of the *Review of Industrial Organization* and the *Journal of Industrial Economics*. Dr. Salinger has consulted for private organizations and a variety of worldwide government agencies including the EPA, the Federal Trade Commission, the Board of Governors of the Federal Reserve, and the Australian Competition and Consumer Commission. He has published articles on such issues as the structural determinants of market power, the statistical properties of firm growth, and the competitive effects of tying and vertical mergers. Dr. Salinger holds a PhD in economics from the Massachusetts Institute of Technology and an undergraduate degree from Yale University.

Current Positions

LECG (2007) Managing Director

Boston University School of Management (1990) Professor of Economics (Associate Professor 1990-2001), W. Everett Lord Distinguished Faculty Scholar (2007-), Chairman of Finance and Economics Department (2000-2004), Faculty Director of Undergraduate Program (1999-2000)

Previous Positions

United States Federal Trade Commission, Director, Bureau of Economics, (while on leave from Boston University), 2005–2007

Sloan School of Management, MIT, Visiting Associate Professor of Applied Economics, (while on leave from Boston University) 1997-1998

Columbia University Graduate School of Business, Associate Professor of Economics and Finance (Assistant Professor 1982-1987)

United States Federal Trade Commission, Economist, Bureau of Economics, Antitrust Division (while on leave from Columbia), 1985-1986

Academic Publications

Salinger, Michael A., "Business Justification Defenses in Tying Cases," in Wayne Dale Collins (ed.), *ABA Section of Antitrust Law, Issues in Competition Law and Policy* (United States: ABA Section of Antitrust Law), Volume 3, 2008, pp. 1911-1928.

Keith A. Anderson, Erik Durbin, and Michael A. Salinger, "Identity Theft," *Journal of Economic Perspectives*, Volume 22, 2008, pp. 171-192.

David S. Evans and Michael A. Salinger, "The Role of Cost in Determining When Firms Offer Bundles and Ties," *Journal of Industrial Economics*, Volume 56, 2008, pp. 143-168.

"The Legacy of Matsushita," *Loyola University Chicago Law Journal*, Volume 38, 2007, pp. 475-490.

Michael A. Salinger, Pauline M. Ippolito, and Joel L. Schrag, "Economics at the FTC: Pharmaceutical Patent Dispute Settlements and Behavioral Economics," *Review of Industrial Organization*, Volume 31, 2007, pp. 85-105.

David S. Evans and Michael Salinger, "Curing Sinus Headaches and Tying Law: An Empirical Analysis of Bundling Decongestants and Pain Relievers," in Jay Pil Choi, ed., *Recent Developments in Antitrust: Theory and Evidence* (Cambridge: MIT Press), 2007, pp. 91-124.

Keith A. Anderson, Christopher J. Garmon, Michael A. Salinger, David R. Schmidt, and John M. Yun, "Economics at the FTC: Data Intensive Mergers and Policy R&D," *Review of Industrial Organization*, Volume 29, 2006, pp. 327-348.

Dongfeng Fu, Sergey V. Buldyrev, Michael A. Salinger, and H. Eugene Stanley, "Percolation Model for Growth Rates of Aggregates and Its Application for Business Firm Growth," *Physical Review E*, Volume 74, 036118, September 2006.

Alden Abbott, and Michael A. Salinger, "Learning from the Past: The Lessons of Vietnam, IBM, and Tying," *Competition Policy International*, Volume 2, 2006, pp. 3-19.

D. S. Evans, A. J. Padilla, & M. Salinger, "A Pragmatic Approach to Identifying and Analyzing Legitimate Tying Cases," *European Competition Law Annual 2003: What is an Abuse of a Dominant Position?* (Oxford: Hart Publishing).

David S. Evans and Michael Salinger, "Why Do Firms Bundle and Tie? Evidence from Competitive Markets and Implications for Tying Law," *Yale Journal on Regulation*, Volume 22, 2005, pp. 37-89.

"Shareholder Class Actions After the Crash: Statistical and Case Evidence on the Effect of the Private Securities Litigation Reform Act," *The Financier*, Volume 10, 2003, pp. 8-24.

D. S. Evans and M. Salinger, "Competition Thinking at the European Commission: Lessons from the Aborted GE-Honeywell Merger," *George Mason Law Review*, Volume 10, 2002, pp. 489-527.

K. N. Hylton and M. Salinger, "Reply to Grimes: Illusory Distinctions and Schisms in Tying Law," *Antitrust Law Journal*, Volume 70, 2002, pp. 231-246.

K. N. Hylton and M. Salinger, "Tying Law and Policy: a Decision Theoretic Approach," *Antitrust Law Journal*, Volume 69, 2001, pp. 469-526.

"Lowering Prices with Tougher Regulation: Forward-Looking Costs, Depreciation, and the Telecommunications Act of 1996," in Michael Crew (ed.), *Regulation Under Increasing Competition* (Boston: Kluwer Academic Publishers) 1998, pp. 45-61

"Regulating Prices to Equal Forward-Looking Costs: Cost-Based Prices or Price-Based Costs?" *Journal of Regulatory Economics*, September 1998, Volume 14, pp. 149-63.

L. A. N. Amaral, S. V. Buldyrev, S. Havlin, M. A. Salinger, and H. E. Stanley, "Power Law Scaling for a System of Interacting Units with Complex Internal Structure," *Physical Review Letters*, Volume 80, 1998, pp. 1385-1388.

L. A. N. Amaral, S. V. Buldyrev, S. Havlin, H. Leschhorn, P. Maass , M. A. Salinger, H. E. Stanley, and M. H. R. Stanley, "Scaling Behavior in Economics: I. Empirical Results for Company Growth," *Journal Physique I France*, April 1997, Volume 7, pp. 621-633.

S. V. Buldyrev, L. A. N. Amaral, S. Havlin, H. Leschhorn, P. Maass, M. A. Salinger, H. E. Stanley, and M. H. R. Stanley, "Scaling Behavior in Economics: II. Modeling of Company Growth," *Journal Physique I France*, April 1997, Volume 7, pp. 635-650.

"Buying and Banking on Prospective Returns in Telecommunications," in E. M. Noam and A. J. Wolfson, eds., *Globalism and Localism in Telecommunications* (Amsterdam: Elsevier Science) 1997, pp. 289-296.

M. H. R. Stanley, L. A. N. Amaral, S. V. Buldyrev, S. Havlin, H. Leschhorn, P. Maass, M. A. Salinger, and H. E. Stanley, "Scaling Behaviour in the Growth of Companies," *Nature*, Volume 379, February 29, 1996, pp. 804-806.

M. Klass and M. A. Salinger, "Do New Theories of Vertical Foreclosure Provide Sound Guidance for Consent Agreements in Vertical Merger Cases," *Antitrust Bulletin*, Volume 40, Fall 1995, pp. 667-698.

M. H. R. Stanley, S. V. Buldyrev, S. Havlin, R. Mantegna, M. A. Salinger, and H. E. Stanley, "Zipf Plots and the Size Distribution of Firms," *Economics Letters*, September 1995, pp. 453-457.

"A Graphical Analysis of Bundling," *The Journal of Business*, Volume 68, January 1995, pp. 85-98.

"Value Event Studies," *Review of Economics and Statistics*, Volume 74, November 1992, pp. 671-677.

"Standard Errors in Event Studies," *Journal of Financial and Quantitative Analysis*, Volume 27, March 1992, pp. 39-53.

"Vertical Mergers in Multi-Product Industries and Edgeworth's Paradox of Taxation," *Journal of Industrial Economics*, Volume 40, September 1991, pp. 545-556; Reprinted in Louis Philips (ed.), *Applied Industrial Economics* (Cambridge: Cambridge University Press) 1998.

"The Concentration-Margins Relationship Reconsidered," *Micro-Brookings Papers on Economic Activity*, 1990, pp. 287-321.

"Stock Market Margin Requirements and Volatility: Implications for Regulation of Stock Index Futures," *Journal of Financial Services Research*, Volume 3, December 1989, pp. 121-138.

"The Meaning of 'Upstream' and 'Downstream' and the Implications for Modeling Vertical Mergers," *Journal of Industrial Economics*, Volume 37, June 1989, pp. 373-387.

"Vertical Mergers and Market Foreclosure," *Quarterly Journal of Economics*, Volume 103, May 1988, pp. 345-356.

"Tobin's q, Unionization, and the Concentration-Profits Relationship," *Rand Journal of Economics*, Volume 15, Summer 1984, pp. 159-170.

M. A. Salinger and L. H. Summers, "Tax Reform and Corporate Investment: A Microeconometric Stimulation Study," in M. Feldstein, ed., *Behavioral Stimulation Methods in Tax Policy Analysis*, University of Chicago Press, 1984, pp. 247-281.

Other Publications/Interviews/Published Transcripts

"Introduction to Chapters VII and IX of Augustin Cournot, *Researches into the Mathematical Principles of the Theory of Wealth*," *Competition Policy International*, vol. 4, 2008, pp. 275-82.

"Economic Analysis of Competition Practices in the EU and US: A View from Chief Economists," *Competition Policy International*, vol. 3, 2007, pp. 81-98.

"Four Essential Points About Antitrust Enforcement," *The Wall Street Journal* (letter), October 6, 2007.

"Interview with FTC Director of the Bureau of Economics Michael Salinger," *The Antitrust Source*, December 2006, available at http://www.abanet.org/antitrust/at-source/06/12/Dec06-Salinger12=19f.pdf .

"The Current State of Economics Underlying Section 2: Comments of Michael Katz and Michael Salinger," *The Antitrust Source*, December 2006, available at http://www.abanet.org/antitrust/at-source/06/12/Dec06-BrownBag.pdf .

"Give Your Cabdriver a Big Fat Tip," *The Wall Street Journal*, June 24/25, 2006, pg. A10.

Michael Salinger and Paul Pautler, "The Bureau of Economics at the US Federal Trade Commission," *Global Competition Review*, April 2006, pp. 3-5.

"Interview: Michael Salinger," *Global Competition Review*, 9 November 2005.

"Commentary," *The Review of Futures Markets*, Volume 10, 1991, pp. 398-402.

"Comment," in J. Coffee, L. Lowenstein, and S. Rose-Ackerman, eds., *Knights, Raiders, and Targets: The Impact of Hostile Takeovers*, Oxford University Press, 1988, pp. 71-73.

Speeches as Director of the Bureau of Economics

"Economics Supporting the Twin Missions of the FTC," American Bar Association 55th Antitrust Spring Meeting, Breakfast with the Bureau Directors, JW Marriott Hotel, Washington, DC, April 20, 2007.

"Concluding Remarks for Energy Markets in the 21st Century: Competition Policy in Perspective," Washington, DC, April 12, 2007.

"Prepared Remarks on the Relationship between Antitrust and Regulation and on the Effects-Based Analysis," Presented before the Jevons Society, University College of London, United Kingdom, February 21, 2007.

"The Legacy of Matsushita: Has this Thing Called Economics Gotten Way Out of Hand?" Presented at Matsushita at 20, Loyola University School of Law, Institute for Consumer Antitrust Studies, Chicago, September 29, 2006.

"Looking for the Keys Under the Lampost: Insights from Economics into Standards for Unilateral," Conduct ABA Section of Antitrust Law, Economics and Section 2 Committees Brown Bag, Washington, DC, FTC Conference Center, July 24, 2006.

"Consumer Protection Economics at the FTC," Prepared remarks for the Chief Economist Roundtable at the International Industrial Organization Conference, Boston, MA, April 8, 2006.

"Assessing Whether What We Know Is So," Presentation before the American Bar Association, 54th Antitrust Law Spring Meeting, Breakfast with the Bureau Directors, JW Marriott Hotel, Washington, DC, March 31, 2006.

"Moneyball and Price Gouging," Boston Bar Association Antitrust Committee, Boston, MA, February 27, 2006.

"Can Economics Bridge the Atlantic? Monopolization Under Section 2, Dominance Under Article 82, and Fouls in Football," George Mason University Fall 2005 Antitrust Symposium, Washington, DC, September 20, 2005.

"Four Questions About Horizontal Merger Enforcement," American Bar Association Antitrust Section Economics Committee Brown Bag Presentation, Washington, DC., September 14, 2005.

"Is It Live Or Is It Memorex? Models of Vertical Mergers and Antitrust Enforcement Association of Competition Economics (ACE) Seminar on Non-Horizontal Mergers," Competition Commission, London, UK, September 7, 2005, and Fondation Universitaire, Brussels, Belgium September 8, 2005.

"Challenges in Identifying Anticompetitive Dominant Firm Behavior," National Economic Research Associates (NERA) 2005 Antitrust and Trade Regulation Seminar, Santa Fe, New Mexico, July 7, 2005.

Congressional and Commission Testimony

"Petroleum Industry Consolidation," Joint Economic Committee of Congress, May 23, 2007.

"Sports Programming and Cable Distribution: The Comcast/Time Warner/Adelphia Transaction," US Senate, Judiciary Committee, December 7, 2006.

"Prepared Remarks of Dr. Michael A. Salinger" (on efficiencies in the treatment of horizontal mergers), Antitrust Modernization Commission, November 17, 2005.

"Testimony of Michael A. Salinger before the Senate Commerce, Science, and Transportation Committee, Subcommittee on Communications," Media Ownership: Diversity and Concentration, US Senate Hearings 101-357, 1989, pp. 97-107.

Litigation and Regulatory Testimony, Affidavits, and Reports

Report on behalf of the Australian Competition and Consumer Commission in ACCC v. PRK Corp Ltd & Ors, regarding antitrust consequences of joint venture between automobile stevedores, No NSD 1703 OF 2007, Federal Court of Australia, New South Wales District Registry (2009).

Report and trial deposition testimony on behalf of defendants in Artie's Auto Body, Inc., et. al. v. The Hartford Fire Insurance Company regarding allegations of unfair trade practices, Docket No. X08-CV-03-0196141S (CLD) (Superior Court of Connecticut) (2009).

Report and deposition on behalf of defendants in Universal Delaware, Inc., et. al. v. Comdata Corporation regarding class certification, Civil Action No. 07-1078-JKG (United States District Court, Eastern District of Pennsylvania) (2009).

Report on behalf of plaintiffs in Rapaport, et. al. v. IDEX Online et. al. regarding unfair trade practices, Index No. 04 CV 06626 (RJH) (United States District Court, Southern District of New York) (2008).

Testimony on behalf of Gillette in Schick Manufacturing, Inc., et al. v. The Gillette Company regarding statistical analysis of shaving studies, Civil Action No. 3-05-cv-174 (JCH) (United States District Court, District of Connecticut) (2005).

Affidavit on behalf of Gillette regarding statistical analysis of shaving study in Gillette Australia Pty. Ltd. v. Energizer Australia Pty. Ltd. (Federal Court of Australia, New South Wales District) (2004).

Affidavit on behalf of Gillette regarding statistical analysis of shaving study in Wilkinson Sword GmbH v. Gillette Deutschland GmbH & Co. (Hamburg District Court) (2004).

Peer Review for United States Environmental Protection Agency of BEN model of economic benefit from avoidance of environmental regulations (2003).

Report and deposition testimony on behalf of Turner Broadcasting in US v. ASCAP in the Matter of the Application of Turner Broadcasting Systems, Inc., et al. for the Determination of Reasonable License Fees regarding appropriate ASCAP fees for cable networks (2000).

Report and deposition testimony on damages on behalf of defendants in Heineken Technical Services v. Charles Darby, Decotec International, Ltd. and Wolfgang Fiwek regarding damage estimates for theft of trade secrets (United States District Court, District of Massachusetts, Civil Action No. 98-CV-11952 JLT) (1999).

Reports on damages on behalf of Governor Pedro Rosselló and other officials of the Commonwealth of Puerto Rico in El Dia, Inc., et al. v. Pedro Rosselló (United States District Court for the District of Puerto Rico, Civil Action No. 97-2841 JAF) regarding damage estimates (1999).

Report entitled "Pricing Flexibility in Exchange Access Reform" submitted by GTE, reply comments. Federal Communications Commission (CC Docket No. 96-262 et al.) (1997).

Direct and Rebuttal Testimony on behalf of Devotional Broadcasters in proceeding before Copyright Arbitration Royalty Panel to determine the allocation of the royalties paid by cable operators for the retransmission of distant broadcast signals from 1990 to 1992. Direct testimony concerned conceptual approaches to allocate the funds. Rebuttal testimony critiqued an econometric study submitted by the Motion Picture Association of America (1996).

Reports for Turner Broadcasting on the treatment of affiliate transactions in cable television price regulations (1994).

Written testimony on behalf of Devotional Broadcasters before the Copyright Royalty Tribunal. Testimony concerned appropriate procedures for allocating royalties paid by cable operators among different classes of programs on retransmitted broadcast signals (1993).

Deposition testimony for Long Lake Energy Corp. in monopolization suit against Niagara Mohawk Corporation. Testimony concerned appropriate market definition (1991).

Affidavit concerning class certification in a class action suit against bottlers of Coke and Pepsi. Affidavit argued that a conspiracy to raise the price of colas sold on promotion to grocery stores affected soft drink prices in general (1989).

Testified as to damages on behalf of Record Club of America in a breach of contract suit against United Artists. Testimony concerned distinction between marginal and average cost and econometric projection of sales (1988).

Other Professional Activities/Distinctions

Panelist, "Horizontal Merger Guideline Review Project," joint Department of Justice and Federal Trade Commission Workshop, New York, NY, December 8, 2009.

Panelist, "Section 5 of the FTC Act as a Competition Statute," Federal Trade Commission Workshop, Washington, D.C., October 17, 2008.

Panelist, "FTC at 100: Into our Second Century," Federal Trade Commission Roundtable, Washington, DC, July 29, 2008

Participant, Academic Consultants Meeting on Non-Traditional Financial Services, Federal Reserve Board, April 16, 2008.

Presenter, Fundamentals of Antitrust Economics, American Bar Association Antitrust Section Spring Meeting, 2007, 2008.

Editorial Board, *Journal of Industrial Economics*, 2002-2006, (Associate Editor, 1996-2002).

Editorial Board, *Review of Industrial Organization*, 2002-2005.

Special Consultant, National Economic Research Associates, 1994-2005.

Member, Science Advisory Board/Illegal Competitive Advantage, United States Environmental Protection Agency, 2004.

Broderick Prize for Service to Undergraduate Community, Boston University, 2004.

Who's Who in America (first listing in 2003).

Principal Investigator: "A Statistical Mechanics Approach to Coase's Theory of the Firm," National Science Foundation Grant SES-0113103, 8/1/01-7/31/02.

Courses Taught

Boston University
Undergraduate: Modeling Business Decisions and Market Outcomes (course designer and director), Probability and Statistics, Business History
Masters: Quantitative Methods, Managerial Economics, Health Care Economics, Health Care Finance, Economics of Strategic Planning
Executive: Microeconomics (Korean Executive MBA), Macroeconomics
Doctoral: Cross-disciplinary Theory and Research

MIT
MBA: Microeconomics, Economics of Strategic Planning

Columbia:
MBA: Business Economics, Economics of Strategic Planning, Econometrics, Industrial Organization
Doctoral: Microeconomics, Industrial Organization

Appendix B

Supplemental Statistical Tables

B1. Tables 1, 4, and 5 in the text report only a subset of the regression coefficients. Tables B1, B4, and B5 report the all the regression coefficients for those regressions.

B2. Table B6 reports the regression underlying the curve shown in Figure 1.

Table B1
Instability of Professor Waldfogel's Regression Results

	Entire Sample (1)	2004 (2)	2005 (3)	2004-2005 % (4)
Program Suppliers	0.075 **	0.111 **	0.032	-71%
	(0.037)	(0.047)	(0.055)	
	(2.01)	(2.35)	(0.58)	
Sports	2.770 ***	2.709 **	3.791 *	40%
	(0.969)	(1.127)	(2.185)	
	(2.86)	(2.40)	(1.74)	
Commercial TV	0.256 *	0.152	0.329	116%
	(0.148)	(0.176)	(0.216)	
	(1.72)	(0.87)	(1.52)	
Public Broadcasting	0.042	0.001	0.081	7247%
	(0.048)	(0.046)	(0.072)	
	(0.96)	(0.02)	(1.13)	
Devotional	-0.067	-0.058	-0.094	63%
	(0.124)	(0.153)	(0.191)	
	(-0.54)	(-0.38)	(-0.49)	
Canadian	0.282 **	0.355 *	0.221	-38%
	(0.126)	(0.207)	(0.140)	
	(2.23)	(1.72)	(1.58)	
Low Power	-0.115	-0.148	-0.099	-33%
	(0.334)	(0.446)	(0.496)	
	(-0.34)	(-0.33)	(-0.20)	
Mexican	0.886 **	1.470 ***	0.452	-69%
	(0.413)	(0.308)	(0.404)	
	(2.15)	(4.77)	(1.12)	
Lagged Subscribers	0.864 ***	0.830 ***	0.892 ***	7%
	(0.029)	(0.038)	(0.044)	
	(29.48)	(22.14)	(20.29)	
Indicator for Minimum Payment & DSE < 1	3736.915 *	6418.862 ***	1416.255	
	(1941.457)	(2402.106)	(3198.437)	
	(1.92)	(2.67)	(0.44)	
Indicator for Minimum Payment & DSE <= 1	-14741.289 ***	-13856.398 ***	-15739.339 ***	
	(2068.158)	(2671.594)	(3196.059)	
	(-7.13)	(-5.19)	(-4.93)	
Activated Channels	2.970	-1.324	9.241	
	(5.958)	(7.169)	(9.734)	
	(0.50)	(-0.18)	(0.95)	
Median Household Income	-0.174 **	-0.141 *	-0.206 *	
	(0.071)	(0.076)	(0.120)	
	(-2.46)	(-1.87)	(-1.72)	
Local Channels	447.708 ***	410.949 **	446.254 *	
	(164.668)	(173.624)	(256.106)	
	(2.72)	(2.37)	(1.74)	
Indicator for Special 3.75% Royalty Rate	21068.244 ***	21089.176 ***	20949.578 ***	
	(2553.249)	(3321.749)	(3928.844)	
	(8.25)	(6.35)	(5.33)	
Indicator for Carriage of Partially Distant Signal	-9269.108 ***	-9372.057 ***	-9388.264 ***	
	(1874.028)	(2322.511)	(2988.562)	
	(-4.95)	(-4.04)	(-3.14)	
Constant	7556.516 **	7005.234 **	10310.659 **	
	(3145.674)	(3441.430)	(4580.637)	
	(2.40)	(2.04)	(2.25)	
Indicator for 07/2004 -12/2004 Accounting Period	-956.977			
	(1323.431)			
	(-0.72)			
Indicator for 01/2005 - 06/2005 Accounting Period	2191.965			
	(1526.339)			
	(1.44)			
Indicator for 07/2005 - 12/2005 Accounting Period	4021.082 **			
	(1656.435)			
	(2.43)			
R-squared	0.75	0.75	0.75	
Standard Error	37,491	33,595	41,301	
Observations	4,954	2,604	2,350	

Notes: Columns (1) - (3) report regression results for the entire period, the 2004 sub-period, and the 2005 sub-period respectively. The dependent variable is royalty payments. The independent variables are same as those in Table 2 of Dr. Waldfogel's Report (with the exception that the two sub-period regressions leave out the accounting period indicator variables that are included in the whole period regression). (Column (1) is a reproduction of Dr. Waldfogel's results.) Column 4 reports the percentage difference between the coefficients in column 3 and column 2. The values below each estimated coefficient are the coefficient standard error estimated with the same technique used by Dr. Waldfogel and the implied t-value, respectively. (See, however, the critique of Dr. Waldfogel's methodology for estimating standard errors in the text.) A single asterisk, double asterisks, and triple asterisks indicate significance at the 10%, 5%, and 1% significance levels respectively.

Table B4
Statistical Relationship between System Receipts and Category Minutes

	Entire Sample	2004	2005
	(1)	(2)	(3)
Program Suppliers	-1.266	2.363	-4.327
	(2.184)	(1.774)	(3.565)
	(-0.58)	(1.33)	(-1.21)
Sports	-49.350	-58.436	-45.198
	(43.877)	(38.934)	(130.894)
	(-1.12)	(-1.50)	(-0.35)
Commercial TV	20.388 ***	8.959	28.394 **
	(7.577)	(5.958)	(12.983)
	(2.69)	(1.50)	(2.19)
Public Broadcasting	1.912	-2.933 **	6.769
	(3.170)	(1.494)	(6.002)
	(0.60)	(-1.96)	(1.13)
Devotional	-4.475	-5.729	-3.929
	(7.840)	(6.859)	(13.586)
	(-0.57)	(-0.84)	(-0.29)
Canadian	-12.058 **	-4.884	-18.179 **
	(5.846)	(8.027)	(8.723)
	(-2.06)	(-0.61)	(-2.08)
Low Power	-67.207 **	-104.022 ***	-44.406
	(27.132)	(39.960)	(34.344)
	(-2.48)	(-2.60)	(-1.29)
Mexican	116.491 ***	147.216 ***	80.678 **
	(28.247)	(12.220)	(37.335)
	(4.12)	(12.05)	(2.16)
Lagged Subscribers	80.576 ***	77.109 ***	83.418 ***
	(1.901)	(1.890)	(3.124)
	(42.33)	(40.80)	(26.7)
Indicator for Minimum Payment & DSE < 1	-280833.082 ***	-124911.868	-467836.200 **
	(107099.313)	(101181.576)	(201873.880)
	(-2.62)	(-1.23)	(-2.32)
Indicator for Minimum Payment & DSE <= 1	-119508.946	-152676.526	-71452.087
	(86202.701)	(100617.344)	(130847.360)
	(-1.39)	(-1.52)	(-0.55)
Activated Channels	-631.466	-353.143	-815.348
	(401.127)	(360.695)	(723.916)
	(-1.57)	(-0.98)	(-1.13)
Median Household Income	-4.653	1.456	-10.211
	(5.170)	(4.048)	(9.283)
	(-0.90)	(0.36)	(-1.10)
Local Channels	37435.391 ***	33643.029 ***	35750.471 *
	(12699.032)	(9923.939)	(20255.193)
	(2.95)	(3.39)	(1.77)
Indicator for Special 3.75% Royalty Rate	-97133.042	-185317.071 **	540.617
	(103025.786)	(85707.134)	(194764.882)
	(-0.94)	(-2.16)	(0.00)
Indicator for Carriage of Partially Distant Signal	125737.669	83696.362	147088.479
	(87204.586)	(89616.684)	(147651.747)
	(1.44)	(0.93)	(1.00)
Constant	283853.285	139154.029	500853.279
	(189437.836)	(184787.813)	(321208.718)
	(1.5)	(0.75)	(1.56)
Indicator for 07/2004 -12/2004 Accounting Period	-67981.340		
	(67500.270)		
	(-1.01)		
Indicator for 01/2005 - 06/2005 Accounting Period	108058.352		
	(87215.245)		
	(1.24)		
Indicator for 07/2005 - 12/2005 Accounting Period	22823.751		
	(90464.35)		
	(0.25)		
R-squared	0.88	0.91	0.86
Standard Error	2,208,747	1,687,348	2,618,520
Observations	4,954	2,604	2,350

Notes: Columns (1) - (3) report regression results for the entire period, the 2004 sub-period, and the 2005 sub-period respectively. The dependent variable is system receipts (that form the basis for royalty payments). The independent variables are same as in Table 1 (with the exception that the two sub-period regressions leave out the accounting period indicator variables that are included in the whole period regression). The values below each estimated coefficient are the coefficient standard error estimated with the same technique used by Dr. Waldfogel and the implied t-value, respectively. (See, however, the critique of Dr. Waldfogel's methodology for estimating standard errors in the text.) A single asterisk, double asterisks, and triple asterisks indicate significance at the 10%, 5%, and

Table B5
Statistical Relationship between "Effective" DSE's and Category Minutes

	Entire Sample (1)	2004 (2)	2005 (3)
Program Suppliers	0.701 ***	0.849 ***	0.579 ***
	(0.082)	(0.124)	(0.113)
	(8.52)	(6.85)	(5.13)
Sports	10.006 ***	10.138 ***	9.892 **
	(2.324)	(2.771)	(4.825)
	(4.31)	(3.66)	(2.05)
Commercial TV	0.619 **	0.678 *	0.568
	(0.263)	(0.364)	(0.370)
	(2.35)	(1.86)	(1.53)
Public Broadcasting	0.044	0.164 *	-0.053
	(0.072)	(0.096)	(0.098)
	(0.61)	(1.70)	(-0.54)
Devotional	-0.301	-0.807	-0.175
	(0.249)	(0.476)	(0.338)
	(-1.04)	(-1.67)	(-0.52)
Canadian	2.187 ***	2.226 ***	2.174 ***
	(0.278)	(0.386)	(0.400)
	(7.88)	(5.76)	(5.44)
Low Power	-0.556	0.747	-1.370
	(1.421)	(2.299)	(1.700)
	(-0.39)	(0.33)	(-0.81)
Mexican	-2.162 ***	-1.551 **	-2.788 ***
	(0.552)	(0.709)	(0.835)
	(-3.92)	(-2.19)	(-3.34)
Lagged Subscribers	-0.001 ***	-0.001 ***	-0.001 ***
	(0.000)	(0.000)	(0.000)
	(-6.07)	(-3.55)	(-4.96)
Indicator for Minimum Payment & DSE < 1	0.247 ***	0.287 ***	0.209 ***
	(0.032)	(0.046)	(0.045)
	(7.83)	(6.26)	(4.67)
Indicator for Minimum Payment & DSE <= 1	-0.591 ***	-0.564 ***	-0.611 ***
	(0.024)	(0.033)	(0.034)
	(-24.49)	(-17.09)	(-17.90)
Activated Channels	0.000	0.000 **	0.000
	(0.000)	(0.000)	(0.000)
	(-1.61)	(-2.18)	(-0.36)
Median Household Income	0.000 ***	0.000 ***	0.000 **
	(0.000)	(0.000)	(0.000)
	(-3.40)	(-2.74)	(-2.15)
Local Channels	0.001	0.005 *	-0.002
	(0.002)	(0.003)	(0.003)
	(0.63)	(1.88)	(-0.76)
Indicator for Special 3.75% Royalty Rate	-0.073 **	-0.093 **	-0.057
	(0.033)	(0.042)	(0.042)
	(-2.44)	(-2.21)	(-1.37)
Indicator for Carriage of Partially Distant Signal	-0.317 ***	-0.349 ***	-0.290 ***
	(0.029)	(0.040)	(0.042)
	(-10.91)	(-8.65)	(-6.97)
Constant	1.464 ***	1.376 ***	1.574 ***
	(0.060)	(0.079)	(0.073)
	(24.29)	(17.40)	(21.52)
Indicator for 07/2004 - 12/2004 Accounting Period	0.002		
	(0.021)		
	(0.09)		
Indicator for 01/2005 - 06/2005 Accounting Period	0.050 *		
	(0.026)		
	(1.92)		
Indicator for 07/2005 - 12/2005 Accounting Period	0.014		
	(0.027)		
	(0.52)		
R-squared	0.49	0.51	0.47
Standard Error	0.53	0.53	0.53
Observations	4,954	2,604	2,350

Notes: Columns (1) - (3) report regression results for the entire period, the 2004 sub-period, and the 2005 sub-period respectively. The dependent variable is "Effective DSE's", (i.e., actual DSE's or 1, whichever is greater.) The independent variables are same as in Tables 1 and 4, except that the minutes variables are divided by 100,000 and lagged subscribers are divided by 1,000. (Dividing variables by a constant makes the results easier to read, but has no effect on their substantive meaning.) The values below each estimated coefficient are the coefficient standard error estimated with the same technique used by Dr. Waldfogel and the implied t-value, respectively. (See, however, the critique of Dr. Waldfogel's methodology for estimating standard errors in the text.) A single asterisk, double asterisks, and triple asterisks indicate significance at the 10%, 5%, and 1% significance levels respectively.

Table B6
DSEs and Minutes of Retransmitted Programming

	Entire Sample
Minutes of Retransmitted Programming	1.716E-05 ***
	(0.000)
	(30.76)
Squared Minutes of Retransmitted Programming	-3.135E-11 ***
	(0.000)
	(-18.2)
Intercept	0.404 ***
	(0.021)
	(18.88)
R-squared	0.42
Standard Error	0.66
Observations	5,143

Notes: The dependent variable is the total DSEs. The independent variables are the total minutes of retransmitted programming, and squared total minutes of retransmitted programming. Total minutes of retransmitted programming are calculated by summing programming minutes from each of the following programming categories: Program Suppliers, Sports, Commercial TV, Public Broadcasting, Devotional, Canadian, Low Power, and Mexican. A single asterisk, double asterisks, and triple asterisks indicate significance at the 10%, 5%, and 1% significance levels respectively.

Before the
COPYRIGHT ROYALTY JUDGES
Washington, D.C.

In the Matter of	)	
	)	
Distribution of the 2004-2005	)	**Docket No.**
Cable Royalty Funds	)	**2007-3 CRB 2004-2005**
	)	
	)	

Declaration

I, Michael A. Salinger, declare under penalty of perjury that the Rebuttal Testimony of Michael A. Salinger presented in the 2004-2005 Cable Copyright Royalty Distribution Proceeding is true and correct.

Michael A. Salinger

DATED: 12-11-2009