

FIGURE 1: LINEAR FIT BETWEEN PRICE AND TOTAL MVPD NFL NETWORK SUBSCRIBERS IN SAMPLE, 2008

Note: N = 8, Adjusted R-squared = 0.50

FIGURE 2: LINEAR-LOGARITHMIC FIT BETWEEN PRICE AND TOTAL MVPD NFL NETWORK SUBSCRIBERS IN SAMPLE, 2008

Note: N = 8, Adjusted R-squared = 0.78

For each univariate regression model—that is, a regression of net price per subscriber on total MVPD subscribers only—I report a statistic known as an “adjusted R-squared” that measures how well a particular model fits the data above and beyond what can be explained by knowledge of the average rate alone. A high adjusted R-squared (that is, a value close to one) indicates that the model explains the variation in the data well, whereas a low adjusted R-squared (that is, a

value close to zero) indicates that the model explains the variation in the data poorly. By virtue of its higher adjusted R-squared value (0.78 compared to 0.50), the linear-logarithmic specification fits NFL Network contract data better than the linear model.¹³⁸

118. The model indicates that several factors collectively determine the price MVPDs pay for carriage of NFL Network programming. Table 11 presents the parameter estimates and related measures of statistical significance yielded by this analysis.

TABLE 11: OLS REGRESSION RESULTS

Variable	Coefficient	Std. Error	T-Statistic	P-Value
Ln(Subscribers)				
Contract Year				
Package				
MFN				
High Penetration				
Duration				
Y2005				
Y2006				
Y2007				
Constant				

Note: N = 39, adjusted R-squared = 0.95.

As Table 11 indicates, *Contract Year*, *Package*, *MFN*, *High Penetration*, and *Y2005* variables are statistically significant factors that affect the price that other (non-Comcast) MVPDs pay for carriage of NFL Network programming.¹³⁹ Despite the lack of statistical significance of the subscriber variable, I include this factor in my model because Comcast would likely argue that it deserves a lower price due to its size.¹⁴⁰ The model does a nice job explaining the variation in

138. Note that my plots and R-squared statistics are based on univariate regressions where the Net Effective Rate is a function of either (1) total MVPD NFL Network subscribers (the linear model) or (2) the natural log of the total MVPD NFL Network subscribers (the linear-logarithmic model).

139. Note that I judge statistical significance at the 10 percent level. Only five variables have p-values less than 0.1 (and are thus statistically significant at the 10 percent level); furthermore, two variables have a p-value of less than 0.01, meaning that they are also statistically significant at the 1 percent level.

140. I have, for example, evaluated the effect of various specification changes such as adding discrete variables for each MVPD. These changes generally result in predictions that are either (1) consistent with the results in Tables 10 and 11 or (2) produce significantly higher estimates of the price Comcast should pay for carriage of the

prices above and beyond the mean (simple average) price, with an adjusted R-squared value of 0.95.

119. I can apply the model parameters to Comcast’s characteristics to determine the fair-market value that, absent the challenged conduct, Comcast would pay to carry NFL Network on its Expanded Basic tier. Table 12 presents the results for Comcast’s Expanded Basic tier of service.¹⁴¹

TABLE 12: PREDICTED COMCAST NET EFFECTIVE RATE ABSENT DISCRIMINATION FOR 2008

Tier	Net Effective Rate	95% Confidence Interval	
		Upper	Lower
Expanded Basic			

Because the predicted price is based on the rate that other MVPDs have voluntarily agreed to pay for carriage of NFL Network programming, this prediction represents a reasonable measure of the fair-market value that Comcast would have paid NFL Network absent Comcast’s challenged conduct. Thus, this model predicts that Comcast would pay a NER of _____ per subscriber per month to carry NFL Network on its Expanded Basic tier in 2008. In keeping with standard statistical approaches, the prediction model also provides a range of possible Comcast NER values. This “confidence interval” demonstrates that the appropriate NER that Comcast would pay for carriage of NFL Network programming on its Expanded Basic tier in 2008 is almost certainly between _____ and _____ per subscriber per month.¹⁴² The model predicts

NFL Network on its Expanded Basic tier. I have also evaluated a fixed effects model, which produces a confidence range that includes the prediction I present in Table 11. The fixed effects model considers only 32 observations from the sample (in part due to the nature of the sample) and thus does not provide the same predictive power that model [1] provides when estimated using OLS.

141. The predicted prices are based on the following parameter values for Comcast in 2008: :

142. A confidence interval is a statistically derived range that provides a measure of the reliability of a particular point estimate. In applied economics, a 95 percent confidence interval is considered to have a very high degree of reliability.

that the parties would not likely agree to any value above or below this range in an arms-length transaction absent the challenged conduct.

120. To project the fair-market value of carriage of NFL Network on Comcast's Expanded Basic tier for the years 2009-12, I apply the subscriber-weighted year-over-year (YoY) growth rate of the NERs for the MVPDs in my sample that have contractual rates for any year between 2009 and 2012 and that, like Comcast, carry the eight-game package.¹⁴³ Table 13 shows the average annual NERs used to calculate the projected Comcast rate for the period 2009-2012.

TABLE 13: SELECT MVPD ANNUAL NERs 2009-2012

2008	
2009	
2010	
2011	
2012	

Source: NFL Network contracts; Empiris calculations.

Note that the MVPDs listed in Table 13 have substantially different numbers of NFL Network subscribers. To account for this variation when I calculate the annual YoY NER growth rate, I weight each MVPD's NERs by its 2008 NFL Network subscribership. I calculate the average subscriber-weighted year-over-year change by selecting the appropriate sample for each year. Thus, for example, the 2009 year-over-year NER growth rate is calculated as the subscriber-weighted change in NERs for each MVPD in Table 13 because each MVPD has a carriage contract for both 2008 and 2009. In contrast, the YoY NER growth rate for 2011 is calculated as the subscriber-weighted average increase from 2010 to 2011. This value can only be calculated

143. .

using data for the MVPDs that have an established NER for carrying eight-game package programming in both years. Table 14 presents my estimated year-over-year NER growth rates and projects the appropriate Comcast rate for each year from 2009-2012.

TABLE 14: PROJECTED COMCAST NERS, 2008-2012

Year-over-Year (YoY) Growth Rate	Projected Comcast NER
2008	
2009	
2010	
2011	
2012	

Note: 2008 is the base year; thus the first computed growth rate is that from 2008 to 2009.

Table 14 can be used to extend the predicted rate out to 2012.

C. The Reliability of the Fair-Market Value Range Derived from Analysis of the Fair-Market Rates Paid by Other MVPDs Is Confirmed by Comcast’s Actual Contract Rate and by Internal Comcast Valuations

121. Comcast valuations support the reliability of my estimate of the fair-market value of NFL Network programming carried on Comcast’s Expanded Basic tier. First, my estimate is supported by the price Comcast actually agreed to pay pursuant to the affiliation agreement.

. I examine each valuation below.

1. The Price Estimate Is Confirmed by Comcast’s Actual Agreement for Carriage of NFL Network Programming

122. As noted above, the results of the analysis above are corroborated by the contract that currently governs Comcast’s carriage of NFL Network programming.

123. The existing contract informs the per subscriber per month rates that Comcast committed to paying NFL Network for all of NFL Network's programming, including the regular-season NFL games. As noted above,

rate; . Table 15 summarizes the
to pay }that Comcast committed

144.

145.

146.

147.

TABLE 15: 2008 COMCAST AFFILIATE RATES AS STIPULATED BY THE NFL-COMCAST AGREEMENT

Sources:

Notes: *

** Information on Comcast's subscriber counts is not publicly available. Comcast's 2008 Expanded Basic subscribers are derived from Internal NFL Network documents (so-called "remittance reports") for 2007. Because such 2008 data were unavailable, I assume that Comcast's Expanded Basic subscribership grew at the same annual rate between June 2007 and 2008 as it did between September 2006 and June 2007. Comcast's 2008 D2 subscribers are based on an estimate provided by Frank Hawkins. See Declaration of Frank Hawkins, May 2, 2008, ¶ 4 ("My understanding is that the "D2" tier is available to approximately 8.6 million Comcast subscribers who receive digital television service.").

*** The "Base" Fee is equal to the adjusted base payment per month divided by the total in-tier subscribers.

†

As Table 15 demonstrates, Comcast committed to pay

124. As noted in Section IV.B, the NER is the most comprehensive measure of the carriage fee paid by an MVPD to NFL Network. The Affiliation Agreement also informs the NER that Comcast would have paid for carriage of NFL Network programming on its Expanded Basic or D2 tiers.

148. Orszag is wrong to suggest that I do not take into account factors such as the value of ad avails and marketing support. See Orszag Report at ¶ 25 ("As noted above, price is an important element of the value proposition offered by a network such as the NFL Network. But there are other important components of an MVPD's assessment of any cable network. These factors include the protection against future price increases; presence of other programming alternatives; whether competing MVPDs are carrying the network; the opportunity costs of carriage (e.g., any bandwidth constraints); the presence of a most favored nation (MFN) clause; advertising availabilities offered by the programmer; required levels of advertising by the MVPD; the term of the contract; the video-on-demand provisions; the Internet streaming provisions; the price escalators in the contract; exclusivity of

Table 16

presents the NER that Comcast would pay for carriage of NFL Network programming under the existing Affiliation Agreement.

TABLE 16: 2008 COMCAST NERS AS STIPULATED BY THE AFFILIATION AGREEMENT

Source: Internal NFL Network Documents; Empiris Calculations.
Note: Numbers may not sum due to rounding.

125. Comcast and NFL Network had thus agreed to a contract, with NERs as set out in Table 16, *before* Comcast initiated the challenged conduct of placing NFL Network on a tier less-penetrated than the tier on which Comcast placed its affiliated sports networks (Versus/OLN, and the Golf Channel). (As noted earlier, Comcast carries both Versus and the Golf Channel on its Expanded Basic tier.).

content; and the flexibility offered to the MVPD in terms of the MVPD's tiering decisions. Neither the NFL's Carriage Complaint nor Dr. Singer has addressed these important factors in their claims of discrimination."). Clearly, many of these factors are actually built into my NER calculations.

2. The Price Estimate Is Consistent With Valuations Reflected in Comcast's Internal Documents

126. Internal Comcast analyses also corroborate the predicted price that Comcast should pay for carriage of the NFL Network programming according to my regression model.

D. Response to Comcast's Criticisms Relating to Fair Market Value

127. In this section, I respond to Comcast's critique of my econometric model for estimating the fair market value of programming on the NFL Network. It bears emphasis that Comcast's experts failed to offer an alternative valuation to my estimate. Moreover, they failed to rebut my reliance on the NFL-Comcast contract to corroborate my estimated rate.

1. Orszag Incorrectly Asserts That the Valuation of MVPDs That Do Not Carry NFL Network Should Be Considered When Determining Fair Market Value in Phase Two

128. My fair-market-value analysis considered the question of whether, accepting that Comcast has a duty to carry NFL Network on the same tier that it carries its affiliated national sports networks, what is the appropriate price for carriage. To answer that question, one may look to contracts between NFL Network and other MVPDs only; "contracts" that are not yet entered into cannot inform the valuation exercise. Yet Orszag faults my analysis for precisely this reason:

149.

See also Table 16, *supra*.

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Among other problems with his econometric analysis, he ignores all of the MVPDs that have decided that the price of the NFL Network exceeds the value of the channel (*e.g.*, Time Warner, Charter, Cablevision, Bright House, Suddenlink, Mediacom, etc.).¹⁵⁰

There is no fair value to attach to MVPDs that have not entered into contracts with NFL Network, nor has Comcast attempted to identify such a value. To borrow an analogy to housing markets, consider a sale of a home for \$1 million. Although five individuals may have bid on the home, only the bid of the successful purchaser informs the market value. It would be nonsensical to assume that the four other bidders valued the house at \$0.

2. Orszag Incorrectly Asserts That My Estimated Rate Is Not Reliable Due to Serial Correlation of the Error Terms

129. Mr. Orszag states that the regression analysis in my expert report was subject to serial correlation.¹⁵¹ It bears noting that Mr. Orszag simply *asserts* the existence of serial correlation in the data without providing the econometric results from an appropriate test for serial correlation, as is consistent with best-practices in the field of econometrics. This point aside, a quick review of the data in this matter and econometric analysis in general refutes this criticism.

130. *First*, even if serial correlation is present in the data, least-squares still results in unbiased and consistent estimates.¹⁵² Although alternative methods can result in more efficient estimates (meaning simply that the estimates have a narrower confidence interval), those alternative estimates (assuming they are also unbiased and consistent) will converge to the same estimates as least-squares in large samples. Therefore, Mr. Orszag's criticism of the effect of serial correlation (to the extent that any exists) is misplaced.

150. *Orszag Report* at 6. Orszag offers no evidence for the proposition that the cited MVPDs regard NFL Network as too expensive. Contracts may not have been entered into for any number of reasons.

151. *Orszag Report* at 56-57.

152. RAMU RAMANATHAN, *INTRODUCTORY ECONOMETRICS* 367 (Harcourt Brace 2d. ed. 1992).

131. *Second*, had Mr. Orszag correctly controlled for serial correlation using generalized least squares (GLS),¹⁵³ he would have found that the GLS estimator yields results very similar to the least-squares predictions found in my original expert report.¹⁵⁴ Table 17 below presents the GLS estimates applied to data identical to that used to derive the least-squares estimates presented in my original expert report.

TABLE 17: GLS REGRESSION RESULTS

Variable	Coefficient	Std. Error	Z-Statistic	P-Value
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Note: N = 33; Wald test finds statistical significance of entire regression at 1 percent.

132. Using the GLS results in the table above, the predicted arm’s length rate for Comcast is , and the confidence interval surrounding that prediction is , which contains my original prediction of . Therefore, the GLS estimates cannot reject the hypothesis that the correct predicted rate for Comcast is . For this reason, correcting for the presence of autocorrelation, to the extent that it exists, cannot lead to a change in the assessed rate that Comcast would have paid for the NFL Network had it negotiated in good faith.

153. See, e.g., JAMES D. HAMILTON, TIME SERIES ANALYSIS 220-22 (Princeton University Press 1994).

154. I do note that counsel for Comcast provided certain computer code, presumably generated by Mr. Orszag or persons working under Mr. Orszag, containing two different regressions that adjust for serial correlation. (This code was provided in a file entitled “Orszag_00011.do”). It is my understanding that these regressions were produced, at least in part, to test for serial correlation. The two regressions performed in this file, neither of which Mr. Orszag discusses in his expert report, employ random effects regression techniques that control for serial correlation. This technique is similar, but not identical to, the GLS technique that I discussed above. That said, if one uses Mr. Orszag’s random effects regressions that adjust for serial correlation to predict a fair market rate for the NFL Network, one finds predicted Comcast rates of between and . Consequently, Mr. Orszag’s own regressions that correct for serial correlation result in predicted Comcast rates that are in line with those produced in my expert report.

133. *Third*, if one adopts Mr. Orszag’s methodology, which is to look at only a single year and disregard relevant data, one still finds predicted rates for Comcast similar to those I discussed in my expert report.¹⁵⁵ Specifically, given Mr. Orszag’s description of his analysis, it would appear that he simply estimated my regression after restricting the sample to 2008 only and then further excluded WOW and DirecTV. Although Mr. Orszag is correct in saying that such a regression as a whole is statistically insignificant,¹⁵⁶ he neglects to check the statistical significance of the *prediction, which is the entire point of the exercise in this proceeding*. Specifically, after running Mr. Orszag’s regression, which I do not endorse as correct econometric methodology, I find that Mr. Orszag’s own regression predicts a rate of _____ with a 90 percent confidence interval of _____. *Therefore, Mr. Orszag’s own flawed regression finds that the predicted rate for Comcast is _____ and that this prediction is statistically significant at 10 percent.*

134. Finally, I note that Mr. Orszag’s results regarding the statistical significance of the model as a whole rest entirely on his disposal of relevant data. In particular, if one includes the observation for DirecTV, one finds that (1) the regression for 2008 only is significant as a whole at 5 percent, and (2) the 95 percent confidence interval surrounding the predicted rate is _____, which contains my predicted Comcast rate of _____. Therefore, one cannot reject the

155. *Orszag Report*: at fn 108. It bears note that Mr. Orszag simply stated that he performed a regression for a single year and found that the estimated parameters of this regression were jointly statistically insignificant. Again, best-practices in the industry dictate that one should present one’s regression results and the results of any hypothesis tests performed on the basis of those results. It is improper to assert that one has performed an analysis and then fail to present the results of this analysis.

156. The p-value of the F-test for the significance of all regression parameters is 0.297. Therefore, the regression would be significant, as a whole, only with a level of significance of 30 percent or greater. As I stated above, however, this regression excludes relevant data and should not be relied upon as accurately reflecting the statistical significance of the regression estimates I have produced in this proceeding.

hypothesis on the basis of these results that the fair rate from Comcast for the NFL Network is

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3. Orszag Incorrectly Asserts My Estimated Rate Is Not Reliable Due to Alleged Simultaneity Bias

135. Mr. Orszag asserts that my regression methodology suffers from an endogeneity problem.¹⁵⁸ It bears note, however, that Mr. Orszag simply asserts that opinion rather than performing any formal analysis that would determine whether endogeneity bias exists. A common test for the detection of such bias is a Hausman test, which Mr. Orszag did not perform. Had he performed such a test, he would have determined that no such endogeneity bias exists in my regression analysis.

136. To determine whether Mr. Orszag's assertion is at all accurate, I conducted a Hausman test. Because of data limitations I exclude the variable duration from my normal least-squares regression model and use it as an instrument to predict penetration¹⁵⁹ the variable that Mr. Orszag asserts to be endogenous. The Hausman test does *not* reject the hypothesis that least-squares is relatively efficient to the instrumental variables—that is, *there is no endogeneity bias in the model*.¹⁶⁰ Therefore, Mr. Orszag's speculation that my regression methodology suffers

157. Furthermore, it bears note that in performing his regression that excluded all data but 2008 in an apparent effort to correct for serial correlation, Mr. Orszag ignored *his own regression analysis*, which I discussed in footnote 150 *supra*, that employed regression methodology specifically tailored to correct for serial correlation. If Mr. Orszag wanted to correct for serial correlation, he should have looked no further than his own regression analysis that tested for its presence rather than dispose of dozens of relevant observations. Moreover, these regressions, which Mr. Orszag used to test for and correct for autocorrelation, predict Comcast rates of between _____ and _____. Consequently, Mr. Orszag's own analysis provided to counsel for NFL Network affirms my own predictions of the fair market rate paid by Comcast for the NFL Network.

158. Orszag Report at 57-58.

159. This does not substantially affect the prediction of the resulting least-squares estimator. The predicted rate is still about _____ : and the 95 percent confidence interval around the prediction contains my estimate of _____. I also note that I use duration because it does a good job of predicting penetration. That is, in the regression of penetration on duration, tier, and total MVPD subscribers, duration is significant at the 1 percent level and 57 percent of the variation in share is explained by the model.

160. The Chi-Squared statistic for the Hausman test is 3.92, which has a p-value of 0.8646.

from endogeneity bias proves incorrect when subjected to an appropriate econometric test for such bias—a test that Mr. Orszag should have performed himself.

CONCLUSION

137. Comcast discriminated against NFL Network on the basis of affiliation by placing it on a less-penetrated tier than Comcast’s affiliated national sports networks, the Golf Channel and Versus. Comcast did so even though ratings data show that NFL Network is more widely watched—and thus more popular—than Comcast’s affiliated networks. This analysis demonstrates that, whether for “total day,” “prime time,” or for particular programs, NFL Network is more popular than either of the Comcast-affiliated national sports networks. NFL programming also enjoys substantial “out-of-market” popularity in cities other than those of the competing teams. These facts refute any suggestion that Comcast’s refusal to carry NFL Network on Comcast’s Expanded Basic tier was justified based on relative popularity.

138. An analysis of what comparable MVPDs pay for carriage of NFL Network programming indicates that the fair-market value of carriage of NFL Network programming on Comcast’s Expanded Basic tier in 2008 is approximately [REDACTED] and almost certainly between [REDACTED] and [REDACTED]. This prediction is corroborated by what Comcast actually agreed to pay NFL Network if Comcast carried the network on [REDACTED] (approximately [REDACTED], although Comcast’s threatened and actual actions may have depressed

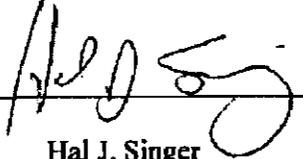
[REDACTED]. These findings further refute any suggestion that Comcast’s decision to carry NFL Network on its premium sports tier was justified by cost

concerns; the prices also indicate the appropriate price for carriage that should be ordered by the FCC.

139. Using the year-over-year average growth rate of the NERs of all MVPDs in my sample that carry equivalent programming, I project Comcast's rate for the period 2009-12. I estimate that Comcast should pay an NER ranging from _____ per subscriber per month in 2008 to _____ per subscriber per month in 2012 for carriage of NFL Network on Comcast's Expanded Basic tier.

* * *

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.



Hal J. Singer
April 6, 2009

APPENDIX 1: CURRICULUM VITAE

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EDUCATION

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TULANE UNIVERSITY, B.S. *magna cum laude* (Economics), 1994. Dean's Honor Scholar (full academic scholarship). Senior Scholar Prize in Economics, 1994.

CURRENT EMPLOYMENT

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EMPLOYMENT HISTORY

CRITERION ECONOMICS, L.L.C., Washington, D.C.: President, 2004-2008. Senior Vice President, 1999-2004.

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THE JOHNS HOPKINS UNIVERSITY, ECONOMICS DEPARTMENT, BALTIMORE: Teaching Assistant, 1996-98.

AUTHORED BOOKS AND BOOK CHAPTERS

Valuing Life Settlements as a Real Option, co-authored with Joseph R. Mason, in *LONGEVITY TRADING AND LIFE SETTLEMENTS* (Vishaal Bhuyan ed., John Wiley & Sons 2009).

An Antitrust Analysis of the World Trade Organization's Decision in the U.S.-Mexico Arbitration on Telecommunications Services, co-authored with J. Gregory Sidak, in *HANDBOOK OF TRANS-ATLANTIC ANTITRUST* (Philip Marsden, ed. Edward Elgar 2006).

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11. Ralph O. Stalsberg, et al. v. New York Life Insurance Company, New York Life Insurance and Annuity Corporation, Case No. 2:07-Cv-29-Bj (D. Utah).
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2. The Effect of Brokered Deposits and Asset Growth on the Likelihood of Failure (prepared for Morgan Stanley, Citigroup, and UBS), co-authored with Joseph Mason and Jeffrey West (Dec. 17, 2008).
3. Estimating the Benefits and Costs of M2Z's Proposal: Reply to Wilkie's *Spectrum Auctions Are Not A Panacea* (prepared for CTIA), co-authored with Robert W. Hahn, Allan T. Ingraham and J. Gregory Sidak (July 23, 2008).
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1. *Markets and Regulation: How Do We Best Serve Customers?*, Wireless U. Communications Policy Seminar, UNIVERSITY OF FLORIDA PUBLIC UTILITY RESEARCH CENTER, Tampa, FL., Nov. 13, 2008.
2. *The Price Of Medical Technology: Are We Getting What We Pay For?* HEALTH AFFAIRS BRIEFING, Washington, D.C., Nov. 10, 2008.
3. *Standard Setting and Patent Pools*, LAW SEMINARS INTERNATIONAL, Arlington, VA., Oct. 3, 2008.
4. *The Changing Structure of the Telecommunications Industry and the New Role of Regulation*, INTERNATIONAL TELECOMMUNICATIONS SOCIETY BIENNIAL CONFERENCE, Montreal, Canada, June 26, 2008.
5. *The Debate Over Network Management: An Economic Perspective*, AMERICAN ENTERPRISE INSTITUTE CENTER FOR REGULATORY AND MARKET STUDIES, Washington, D.C., Apr. 2, 2008.
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7. *Telecommunications Symposium*, U.S. DEPARTMENT OF JUSTICE ANTITRUST DIVISION, Washington, D.C., Nov. 29, 2007.
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9. *Association for Computing Machinery's Net Neutrality Symposium*, GEORGE WASHINGTON UNIVERSITY, Washington, D.C., Nov. 12, 2007.
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12. *William Pitt Debating Union*, UNIVERSITY OF PITTSBURGH, SCHOOL OF ARTS & SCIENCES, Pittsburgh, PA., Feb. 23, 2007.

13. *Annual Conference*, WIRELESS COMMUNICATIONS ASSOCIATION INTERNATIONAL, Washington, D.C., June 27, 2006.
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American Economics Association

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JOURNAL OF RISK MANAGEMENT AND INSURANCE REVIEW

JOURNAL OF REGULATORY ECONOMICS

MANAGERIAL AND DECISION ECONOMICS

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PERSONAL INFORMATION

American citizen, born March 31, 1972. Married to Ingrid Arraut Singer. Two daughters: Alexis and Kayla. Resident of Oakton, Virginia.

February 11, 2009

APPENDIX 2: MATERIALS RELIED UPON

Academic Literature

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