



## Vertical Integration in Multichannel Television Markets: Revisiting Regional Sports Networks Using Updated Data

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On November 20, 2017, the Antitrust Division of the U.S. Department of Justice (DOJ) sued in the U.S. District Court for the D.C. Circuit to enjoin the merger of AT&T and Time Warner.<sup>1</sup> On June 12, 2018, Judge Richard Leon denied the DOJ's request to enjoin the AT&T-Time Warner merger.<sup>2</sup> On appeal, a three-judge panel of the U.S. Court of Appeals for the D.C. Circuit unanimously affirmed Judge Leon's decision.<sup>3</sup> The DOJ reportedly shortly thereafter represented to the merging parties that it would not appeal.<sup>4</sup>

The DOJ built its case on a theoretical bargaining model that implied that a vertically integrated (with distributors) content owner would charge higher prices to rival distributors than would a non-vertically integrated content owner.<sup>5</sup> Relatively little academic empirical work has been done on the subject. One of the few articles on the topic—*Vertical Integration in Multichannel Television Networks: A Study of Regional Sports Networks* by Kevin Caves, Chris Holt, and Hal Singer (to which we will refer in this article as “the 2013 study”)—was cited by one of the government's expert economic

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<sup>1</sup> Complaint, *United States v. AT&T, Inc.*, No. 1:17-cv-02511 (D.D.C. Nov. 28, 2017), <https://www.justice.gov/atr/case-document/file/1012916/download>.

<sup>2</sup> *United States v. AT&T, Inc.*, 310 F. Supp. 3d 161 (D.D.C. 2018).

<sup>3</sup> *United States v. AT&T, Inc.*, No. 18-5214, 2019 WL 921544 (D.C. Cir. Feb. 26, 2019).

<sup>4</sup> See Brent Kendall, *U.S. Appeals Court Rejects Justice Department Antitrust Challenge to AT&T-Time Warner Deal*, WALL ST. J., Feb. 26, 2019, <https://www.wsj.com/articles/u-s-appeals-court-rejects-justice-department-antitrust-challenge-to-at-t-time-warner-deal-11551194524>.

<sup>5</sup> See Expert Report of Carl Shapiro, *United States v. AT&T, Inc.*, No. 1:17-cv-02511 (D.D.C. Feb. 2, 2018), <https://www.justice.gov/atr/case-document/file/1081336/download>.

witnesses, Professor Carl Shapiro, as supporting his claim that “vertical integration had a significant and positive impact on the fees negotiated by networks.”<sup>6</sup>

However, the data source used by the 2013 study—SNL Kagan—periodically revises its historical data to reflect new information. There are also an additional seven years of data available today relative to those used in the 2013 study. Using the data set as of mid-2018, we analyze (1) the time period analyzed by the 2013 study: 1998 to 2010, (2) the more recent time period: 2011 to 2017, and (3) the combined period: 1998 to 2017. As detailed in the remainder of this article, we find that the 2013 study’s results are reversed with the updated data. Contrary to the conclusion in the 2013 study, vertical integration is not associated with higher content prices.

### I. DATA

We have obtained the same SNL Kagan licensing fee data set used in the 2013 study, but we have updated those data through mid-2018, including current data and revisions to the data used in the 2013 study.<sup>7</sup>

As noted above, SNL Kagan periodically revises its historical data based on new information. Once it makes a revision, SNL Kagan does not maintain archived versions of its pre-revision data. We do, however, have a version of the SNL Kagan data as of 2014.<sup>8</sup> Using that data set, we obtain results quite similar to those presented in the 2013 study, which indicates that the change in results reported here is due to subsequent revisions of the data and not due to any differences in methodology.

Summary statistics matching those reported in the 2013 study are presented below, along with the equivalent statistics from the current data set for the same time period (1998 to 2010) and for the complete time period (1998 to 2017).

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<sup>6</sup> See Rebuttal Report of Carl Shapiro at 41, *United States v. AT&T, Inc.*, No. 1:17-cv-02511 (D.D.C. Feb. 26, 2018) (citing Kevin W. Caves, Chris C. Holt & Hal J. Singer, *Vertical Integration in Multichannel Television Networks: A Study of Regional Sports Networks*, 12 *REV. NETWORK ECON.* 61 (2013)), <https://www.justice.gov/atr/case-document/file/1081321/download>.

<sup>7</sup> SNL KAGAN, TV NETWORK SUMMARY (2018) [hereinafter SNL KAGAN, 2018 TV NETWORK SUMMARY]. These data are proprietary but available to the public for purchase.

<sup>8</sup> SNL KAGAN, TV NETWORK SUMMARY (2014) [hereinafter SNL KAGAN, 2014 TV NETWORK SUMMARY]. These data are proprietary but available to the public for purchase.

Table 1. Summary Statistics from the 2013 Study (1998 to 2010)

	Variable	Obs.	Mean	Std. Dev.	Min.	Max.
All RSNs	License Fee per Sub per Month (2010 USD)	410	\$1.57	\$0.62	\$0.18	\$3.18
	= 1 if MVPD-Affiliated	410	0.751	0.433	0	1
	Prog. Costs per Sub per Month (2010 USD)	410	\$1.42	\$0.58	\$0.22	\$4.93
	Ad. Revenue per Sub per Month (2010 USD)	410	\$0.42	\$0.21	\$0.10	\$1.38
	Age of Network	410	12	8	0	41
	Year	410	2004	4	1998	2010
Independent RSNs	License Fee per Sub per Month (2010 USD)	102	\$1.81	\$0.69	\$0.19	\$2.94
	Prog. Costs per Sub per Month (2010 USD)	102	\$1.65	\$0.68	\$0.22	\$3.99
	Ad. Revenue per Sub per Month (2010 USD)	102	\$0.37	\$0.17	\$0.10	\$1.20
	Age of Network	102	11	8	0	27
	Year	102	2007	3	1998	2010
Affiliated RSNs	License Fee per Sub per Month (2010 USD)	308	\$1.49	\$0.58	\$0.18	\$3.18
	Prog. Costs per Sub per Month (2010 USD)	308	\$1.34	\$0.53	\$0.27	\$4.93
	Ad. Revenue per Sub per Month (2010 USD)	308	\$0.44	\$0.22	\$0.10	\$1.38
	Age of Network	308	12	8	0	41
	Year	308	2004	3	1998	2010

Source: Caves, Holt & Singer, *supra* note 6, at 80.

Table 2. Summary Statistics Based on SNL  
Kagan Data as of 2018 (1998 to 2010)

	Variable	Obs.	Mean	Std. Dev.	Min.	Max.
All RSNs	License Fee per Sub per Month (2010 USD)	410	\$1.33	\$0.64	\$0.18	\$3.44
	= 1 if MVPD-Affiliated	410	0.751	0.433	0	1
	Prog. Costs per Sub per Month (2010 USD)	410	\$1.23	\$1.04	\$0.22	\$18.09
	Ad Revenue per Sub per Month (2010 USD)	410	\$0.39	\$0.21	\$0.04	\$1.60
	Age of Network	410	12	8	0	41
	Year	410	2004	4	1998	2010
Independent RSNs	License Fee per Sub per Month (2010 USD)	102	\$1.57	\$0.81	\$0.19	\$3.44
	Prog. Costs per Sub per Month (2010 USD)	102	\$1.54	\$1.81	\$0.22	\$18.09
	Ad Revenue per Sub per Month (2010 USD)	102	\$0.34	\$0.15	\$0.04	\$0.66
	Age of Network	102	11	8	0	27
	Year	102	2007	3	1998	2010
	Affiliated RSNs	License Fee per Sub per Month (2010 USD)	308	\$1.26	\$0.55	\$0.18
Prog. Costs per Sub per Month (2010 USD)		308	\$1.12	\$0.56	\$0.27	\$5.66
Ad Revenue per Sub per Month (2010 USD)		308	\$0.41	\$0.22	\$0.05	\$1.60
Age of Network		308	12	8	0	41
Year		308	2004	3	1998	2010

Source: SNL KAGAN, 2018 TV NETWORK SUMMARY, *supra* note 7.

Table 3. Summary Statistics Based on SNL Kagan Data as of 2018 (1998 to 2017)

	Variable	Obs.	Mean	Std. Dev.	Min.	Max.
All RSNs	License Fee per Sub per Month (2010 USD)	654	\$1.60	\$0.85	\$0.18	\$5.47
	= 1 if MVPD-Affiliated	654	0.609	0.488	0	1
	Prog. Costs per Sub per Month (2010 USD)	654	\$1.31	\$0.93	\$0.22	\$18.09
	Ad Revenue per Sub per Month (2010 USD)	654	\$0.41	\$0.21	\$0.04	\$1.60
	Age of Network	654	15	9	0	48
	Year	654	2008	6	1998	2017
Independent RSNs	License Fee per Sub per Month (2010 USD)	256	\$1.94	\$0.93	\$0.19	\$5.47
	Prog. Costs per Sub per Month (2010 USD)	256	\$1.52	\$1.25	\$0.22	\$18.09
	Ad Revenue per Sub per Month (2010 USD)	256	\$0.39	\$0.17	\$0.04	\$0.88
	Age of Network	256	16	10	0	48
	Year	256	2011	4	1998	2017
	Affiliated RSNs	License Fee per Sub per Month (2010 USD)	398	\$1.39	\$0.71	\$0.18
Prog. Costs per Sub per Month (2010 USD)		398	\$1.17	\$0.60	\$0.23	\$5.66
Ad Revenue per Sub per Month (2010 USD)		398	\$0.43	\$0.22	\$0.05	\$1.60
Age of Network		398	14	8	0	41
Year		398	2006	5	1998	2017

Source: SNL KAGAN, 2018 TV NETWORK SUMMARY, *supra* note 7.

For the time period used in the 2013 study, the average license fees, programming costs, and ad revenue are somewhat lower in the 2018 version of the data. However, the relevant patterns in the data are generally the same. For example, the license fees for the vertically integrated regional sports networks (RSNs) are, on average, lower than for the independent RSNs, regardless of the data set or time period used.

When extending the time period to years beyond 2010, not every RSN used in the 2013 study remains in the data (see Table 4 below). In particular, the RSNs that are not present throughout the 1998-to-2017 time period are Action Sports Cable Network, Carolinas Sports Entertainment Television,

Cox Suns Arizona, Empire Sports Network, FOX Sports Net Chicago, and Royals Sports Television Network. These networks are included in our analysis from 1998 to 2010. The affiliation status of the RSNs included in the updated data is reported in Table 4 below.

Table 4. Regional Sports Network  
Affiliation Summary

Network	Formerly Known As	Launched	Years Present in Data	MVPD Affiliation (1998–2017)
Action Sports Cable Network	Blazervision	1996	1998–2002	None
Altitude Sports & Entertainment	–	2004	2004–2017	None
Carolinas Sports Entertainment Television	–	2004	2004–2005	None
Channel 4 San Diego	–	1997	1998–2016	Cox Commc'ns (1998–2017)
Comcast SportsNet Bay Area	Sports Channel Pacific/Bay Area; FOX Sports Bay Area	1990	1998–2017	Cablevision (1998–2006); Comcast (2008–2017); TCI (1998); AT&T (1999); DIRECTV (2003–2007)
Comcast SportsNet California	Comcast SportsNet West	2004	2004–2017	Comcast (2004–2017)
Comcast SportsNet Chicago	–	2004	2004–2017	Comcast (2004–2017)
Comcast SportsNet New England	SportsChannel New England; FOX Sports Net New England	1988	1998–2017	Cablevision (1998–2006); MediaOne (1998–1999); TCI (1998); AT&T (1999–2001); Comcast (2002–2017); DIRECTV (2003–2004)
Comcast SportsNet Northwest	–	2007	2008–2017	Comcast (2004–2017)
Comcast SportsNet Philadelphia	Comcast SportsNet	1997	1998–2017	Comcast (2004–2017)
Comcast SportsNet Washington	Home Team Sports	1984	1998–2017	TCI (1998); AT&T (1999–2001); Comcast (2001–2017)
Cox Sports Television	–	2002	1998–2017	Cox Commc'ns (2002–2017)
Cox Suns Arizona	ASPN	1999	1998–2006	Cox Commc'ns (1999–2002)

Network	Formerly Known As	Launched	Years Present in Data	MVPD Affiliation (1998–2017)
Empire Sports Network	–	1990	1998–2017	Adelphia (1998–2005); TCI (1998); DIRECTV (2003–2007)
FOX Sports Arizona	–	1996	1998–2017	Cablevision (1998–2004); TCI (1998); DIRECTV (2003–2007)
FOX Sports Carolinas	–	2008	1998–2017	None
FOX Sports Detroit	–	1997	1998–2017	Cablevision (1998–2004); TCI (1998); DIRECTV (2003–2007)
FOX Sports Florida	SportsChannel Florida	1989	2008–2017	Cablevision (1998–2004); TCI (1998); AT&T (1999); DIRECTV (2003–2007)
FOX Sports Midwest	–	1997	1998–2017	Cablevision (1998–2004); TCI (1998); DIRECTV (2003–2007)
FOX Sports Net Chicago	SportsChannel	1984	1998–2017	Cablevision (1998–2004); TCI (1998); DIRECTV (2003–2006)
FOX Sports North	Midwest Sport Channel	1989	1998–2017	Cablevision (2000–2004); DIRECTV (2003–2007)
FOX Sports Ohio	SportsChannel Ohio	1989	2005–2017	Cablevision (1998–2004); TCI (1998); DIRECTV (2003–2007)
FOX Sports South	–	1990	1998–2017	Cablevision (1998–2004); TCI (1998); DIRECTV (2003–2007)
FOX Sports Southwest	–	1983	1998–2017	Cablevision (1998–2004); TCI (1998); DIRECTV (2003–2007)
FOX Sports Tennessee	–	2007	1998–2017	DIRECTV (2007)
FOX Sports West	–	1985	1998–2017	Cablevision (1998–2004); TCI (1998); DIRECTV (2003–2007)
FOX Sports Wisconsin	Midwest Sports Channel Wisconsin	1995	1998–2017	Cablevision (2000–2004); DIRECTV (2003–2007)
Madison Square Garden Network	–	1969	1998–2017	Cablevision (1998–2010); TCI (1998); DIRECTV (2003–2004)
Mid-Atlantic Sports Network	–	2005	2005–2017	None

Network	Formerly Known As	Launched	Years Present in Data	MVPD Affiliation (1998–2017)
MSG Plus	SportsChannel New York; FOX Sports New York	1989	1998–2017	Cablevision (1998–2010); TCI (1998); DIRECTV (2003–2004)
New England Sports Network	–	1984	1998–2017	None
Prime Ticket	FOX Sports Net West 2	1997	1998–2017	Cablevision (1998–2004); TCI (1998); DIRECTV (2003–2007)
Root Sports Northwest	FOX Sports Northwest	1988	1998–2017	Cablevision (1998–2004); TCI (1998); DIRECTV (2003–2017)
Root Sports Pittsburgh	FOX Sports Pittsburgh	1986	1998–2017	Cablevision (1998–2004); TCI (1998); DIRECTV (2003–2017)
Root Sports Rocky Mountain	FOX Sports Rocky Mountain	1988	1998–2017	Cablevision (1998–2004); TCI (1998); DIRECTV (2003–2017)
Royal Sports Television Network	–	2003	2003–2008	None
SportsNet New York	Sterling Entertainment	2006	2006–2017	Time Warner Cable (2006–2016); Charter (2016–2017); Comcast (2006–2017)
SportSouth	Turner South	1999	1999–2017	Time Warner Cable (1999–2005); DIRECTV (2006–2007)
SportsTime Ohio	–	2006	2006–2017	None
Sun Sports	Sunshine Network	1988	1998–2017	Comcast (1998–2001); Cox (1998–2004); MediaOne (1998–1999); TCI (1998); AT&T (1998–2000); Cablevision (2003–2004); DIRECTV (2003–2007)
YES Network	–	2002	2002–2017	None

Sources: Caves, Holt & Singer, *supra* note 6, at 77–78; *supra* Table 1.



## II. THE MODEL

We estimate the same regression models used in the 2013 study.<sup>9</sup> That analysis includes six models written as follows (indexed by  $k$ ):

$$Fee_{it} = \alpha + \alpha_i + \beta_k Affil_{it-k} + \delta_1 Cost_{it} + \delta_2 Ad_{it} + \sum_{j=1}^J \theta_j X_{ijt} + \varepsilon_{it}$$

$$k = 0, 1, 2, 3, 4, 5 \tag{1}$$

where  $Fee_{it}$  is the real license fee per subscriber per month for network  $i$  in year  $t$ ;  $\alpha_i$  denotes a fixed effect for network  $i$ ;  $Affil_{it-k}$  is equal to 1 if the RSN was affiliated in year  $t - k$ , and 0 if the RSN was independent;  $Cost_{it}$  is the real RSN programming expenses per subscriber per month in year  $t$ ;  $Ad_{it}$  is the real RSN advertising revenue per subscriber per month in year  $t$ ;  $X_{ijt}$  is a set of additional controls (yearly dummies); and  $\varepsilon_{it}$  is a random error term.

Following the 2013 study, we control for network age using a spline with knot points<sup>10</sup> at the quintiles of the age variable. Standard errors are clustered by network owner. All prices are deflated to 2010 dollars using the Consumer Price Index (CPI).<sup>11</sup>

## III. EMPIRICAL RESULTS FROM RE-ESTIMATING THE 2013 MODEL USING UPDATED DATA

Caves, Holt, and Singer appear to have estimated their model in levels without weights. We replicate this approach, but we also estimate log regressions, and estimate the level and log regressions both with and without weights (using affiliate revenues as weights).<sup>12</sup> Following the model presented in Table 4 of the 2013 study, we use a contemporaneous affiliation indicator and up to five possible lags of the affiliation indicator, for 1998 to 2010 (Table 5a and Table 5b below), 2011 to 2017 (Table 6a and Table 6b below), and 1998 to 2017 (Table 7a and Table 7b below). That methodology yields 72 different permutations of the regression specification.

<sup>9</sup> Caves, Holt & Singer, *supra* note 6, at 81–82 & tbl.4.

<sup>10</sup> See WILLIAM H. GREENE, *ECONOMETRIC ANALYSIS* 158–60 (Prentice Hall 7th ed. 2012) (describing how one can fit a curve using spline functions, a type of piecewise polynomial function); *id.* at 159 (showing that “knots” are points at which a piecewise polynomial function is partitioned into subintervals).

<sup>11</sup> We use annual CPI, not seasonally adjusted, obtained from the Federal Reserve Bank of St. Louis. *Consumer Price Index: Total All Items for the United States (CPALTT01USA661S)*, FEDERAL RESERVE BANK OF ST. LOUIS, <https://fred.stlouisfed.org/series/CPALTT01USA661S>.

<sup>12</sup> Because economic theory does not specify the functional form of the dependent variable, we specify it in levels and, as a robustness check, in logs. As another check, we run weighted versions of regressions (using total affiliate fee revenues for each network in each year as weights) to test whether the effect of vertical integration on prices varies with network size.

We find that the 2013 study's conclusion that vertically integrated content owners charge higher fees does not hold up in the updated data. This inference can be seen in several ways: (1) overall, 54 of the 72 regression specifications have negative coefficients on the vertical integration variable, of which 22 are statistically significant at the 10-percent level; (2) only one of the 72 vertical integration coefficients is positive and statistically significant; (3) the average effect of vertical integration on affiliate fees among the models estimated in levels is  $-\$0.08$ ; and (4) the average effect of vertical integration on affiliate fees among the models estimated in logs is  $-3.9$  percent.

Table 5a. Regression Results Using Lagged Multichannel Video Programming Distributor (MVPD) Affiliation (1998 to 2010) (Variables in Levels)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Weighted:	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Affil.	-0.278**	-	-	-	-	-	-0.148	-	-	-	-	-
Affil. Lag 1	-	-0.087	-	-	-	-	-	-0.017	-	-	-	-
Affil. Lag 2	-	-	-0.039	-	-	-	-	-	0.066	-	-	-
Affil. Lag 3	-	-	-	-0.074**	-	-	-	-	-	-0.087	-	-
Affil. Lag 4	-	-	-	-	-0.054**	-	-	-	-	-	-0.053*	-
Affil. Lag 5	-	-	-	-	-	-0.021	-	-	-	-	-	-0.020
Prog. Costs per Sub per Month (2010 USD)	0.057	0.690**	0.800**	0.844**	0.902**	0.965**	0.264	0.663**	0.806**	0.862**	0.903**	0.963**
Ad. Revenue per Sub per Month (2010 USD)	0.411*	-0.179	-0.267*	-0.326*	-0.454*	-0.765*	0.605*	0.070	-0.090	-0.183	-0.443	-1.009*
Age of Network Spline 1	0.085**	0.072**	0.057*	0.045	0.001	-0.021	0.099**	0.109**	0.046**	0.025	0.004	0.010
Age of Network Spline 2	-0.082	-0.118	-0.073	-0.003	0.085	0.126	-0.169**	-0.137**	-0.053	0.045	0.107	0.070
Age of Network Spline 3	0.131	0.248	0.142	-0.022	-0.218	-0.307	0.365**	0.297**	0.104	-0.122	-0.260	-0.175
Constant	0.347**	0.036	0.153	-0.145	0.500**	0.773**	-0.445	-1.272**	-0.202*	-0.136	0.011	0.451
F Statistic	983	845	853	361	89	29	563	2446	831	570	6196	257
F P-Value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	410	369	328	288	250	214	410	369	328	288	250	214
R-squared	0.866	0.934	0.953	0.962	0.971	0.979	0.919	0.950	0.963	0.967	0.972	0.977
Number of Networks	41	41	40	38	36	33	41	41	40	38	36	33

Notes: Standard errors are clustered by owner. \* =  $p < 0.1$ ; \*\* =  $p < 0.05$ .

Table 5b. Regression Results Using Lagged Multichannel Video Programming Distributor (MVPD) Affiliation (1998 to 2010) (Variables in Logs)

	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Weighted:	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Affil.	-0.176**	-	-	-	-	-	-0.082	-	-	-	-	-
Affil. Lag 1	-	-0.094*	-	-	-	-	-	-0.039	-	-	-	-
Affil. Lag 2	-	-	-0.054*	-	-	-	-	-	-0.001	-	-	-
Affil. Lag 3	-	-	-	-0.047**	-	-	-	-	-	-0.040	-	-
Affil. Lag 4	-	-	-	-	-0.034	-	-	-	-	-	-0.025	-
Affil. Lag 5	-	-	-	-	-	-0.014	-	-	-	-	-	-0.011
Log Prog. Costs per Sub per Month (2010 USD)	0.343**	0.644**	0.721**	0.743**	0.783**	0.817**	0.528**	0.654**	0.707**	0.724**	0.739**	0.760**
Log Ad. Revenue per Sub per Month (2010 USD)	-0.083	-0.232**	-0.252**	-0.262**	-0.292**	-0.308**	-0.066	-0.148**	-0.166**	-0.193**	-0.232**	-0.293**
Age of Network Spline 1	0.085**	0.065**	0.054**	0.048**	0.015	-0.004	0.077**	0.070**	0.032*	0.036	0.018	-0.010
Age of Network Spline 2	-0.118**	-0.097	-0.056	-0.017	0.038	0.063	-0.090**	-0.049	-0.005	0.051	0.098	0.095
Age of Network Spline 3	0.228***	0.187	0.091	-0.000	-0.118	-0.168	0.180**	0.085	-0.020	-0.145	-0.245	-0.232
Constant	-0.526**	-0.420**	-0.415**	-0.670**	-0.185	0.071	-0.903**	-1.109**	-0.389**	-1.001**	-0.970**	-0.147
F Statistic	1694	1573	545	479	167	101	1935	859	1781	4266	2405	299
F P-Value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	410	369	328	288	250	214	410	369	328	288	250	214
R-squared	0.920	0.948	0.964	0.968	0.973	0.978	0.937	0.952	0.960	0.964	0.969	0.974
Number of Networks	41	41	40	38	36	33	41	41	40	38	36	33

Notes: Standard errors are clustered by owner. \* =  $p < 0.1$ ; \*\* =  $p < 0.05$ .

Table 6a. Regression Results Using Lagged MVPD  
Affiliation (2011 to 2017) (Variables in Levels)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Weighted:	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Affil.	-0.733**	-	-	-	-	-	-0.608**	-	-	-	-	-
Affil. Lag 1	-	-0.256**	-	-	-	-	-	-0.246**	-	-	-	-
Affil. Lag 2	-	-	-0.153**	-	-	-	-	-	-0.128**	-	-	-
Affil. Lag 3	-	-	-	-0.037	-	-	-	-	-	0.022	-	-
Affil. Lag 4	-	-	-	-	-0.010	-	-	-	-	-	0.092	-
Affil. Lag 5	-	-	-	-	-	-0.028	-	-	-	-	-	0.022
Prog. Costs per Sub per Month (2010 USD)	1.383**	1.390**	1.385**	1.381**	1.388**	1.415**	1.402**	1.406**	1.400**	1.404**	1.396**	1.398**
Ad. Revenue per Sub per Month (2010 USD)	-1.145**	-1.196**	-1.154**	-1.131**	-1.166**	-1.245**	-1.292**	-1.400**	-1.315**	-1.312**	-1.377**	-1.314**
Age of Network Spline 1	0.046**	0.050**	0.049**	0.047**	0.050**	0.053**	0.066**	0.085**	0.083**	0.077**	0.073**	0.078**
Age of Network Spline 2	0.017	0.016	0.017	0.018	0.007	0.004	-0.026	-0.031	-0.028	-0.026	-0.019	-0.026
Age of Network Spline 3	-0.070	-0.075	-0.078	-0.074	-0.046	-0.038	0.028	0.031	0.025	0.031	0.016	0.029
Constant	0.059	0.065	0.051	0.053	-0.102	-0.020	-0.012	-0.531*	-0.517	-0.548*	-0.483	-0.700*
F Statistic	467	310	399	264	350	849	27,774	208	221	257	1183	29,369
FP-Value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	244	244	244	244	242	239	244	244	244	244	242	239
R-squared	0.983	0.983	0.983	0.983	0.983	0.984	0.977	0.978	0.977	0.977	0.977	0.977
Number of Networks	35	35	35	35	35	35	35	35	35	35	35	35

Notes: Standard errors are clustered by owner. \* =  $p < 0.1$ ; \*\* =  $p < 0.05$ .

Table 6b. Regression Results Using Lagged MVPD Affiliation (2011 to 2017) (Variables in Logs)

	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Weighted:	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Affil.	0.104	-	-	-	-	-	-0.234**	-	-	-	-	-
Affil. Lag 1	-	-0.054*	-	-	-	-	-	-0.040	-	-	-	-
Affil. Lag 2	-	-	-0.002	-	-	-	-	-	0.017	-	-	-
Affil. Lag 3	-	-	-	0.040	-	-	-	-	-	0.093**	-	-
Affil. Lag 4	-	-	-	-	0.017	-	-	-	-	-	0.068	-
Affil. Lag 5	-	-	-	-	-	-0.015	-	-	-	-	-	0.019
Log Prog. Costs per Sub per Month (2010 USD)	0.981**	0.981**	0.981**	0.989**	0.988**	1.040**	0.918**	0.916**	0.921**	0.949**	0.921**	0.919**
Log Ad. Revenue per Sub per Month (2010 USD)	-0.233**	-0.233**	-0.233**	-0.245**	-0.235**	-0.291**	-0.284**	-0.282**	-0.289**	-0.361**	-0.308**	-0.282**
Age of Network Spline 1	0.019	0.020	0.019	0.018	0.042**	0.024**	0.021*	0.024**	0.023**	0.022**	0.018*	0.020**
Age of Network Spline 2	-0.119	-0.120	-0.119	-0.016	-0.114	-0.130	-0.118*	-0.118*	-0.117*	-0.113*	-0.136*	-0.131*
Age of Network Spline 3	0.228***	0.187	0.091	-0.000	-0.118	-0.168	0.180*	0.085	-0.020	-0.145	-0.245	-0.232
Constant	-0.108	-0.108	-0.108	-0.115	-1.255**	-0.344**	-0.206	-0.324**	-0.334*	-0.418**	-0.309**	-0.297
F Statistic	204	841	175	199	640	484	42,363	164	156	298	318	523
F P-Value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	244	244	244	244	242	239	244	244	244	244	242	239
R-squared	0.985	0.985	0.985	0.985	0.985	0.989	0.980	0.980	0.980	0.981	0.981	0.981
Number of Networks	35	35	35	35	35	35	35	35	35	35	35	35

Notes: Standard errors are clustered by owner. \* =  $p < 0.1$ ; \*\* =  $p < 0.05$ .

Table 7a. Regression Results Using Lagged MVPD  
Affiliation (1998 to 2017) (Variables in Levels)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Weighted:	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Affil.	-0.293**	-	-	-	-	-	-0.098	-	-	-	-	-
Affil. Lag 1	-	-0.107	-	-	-	-	-	-0.027	-	-	-	-
Affil. Lag 2	-	-	-0.063	-	-	-	-	-	0.034	-	-	-
Affil. Lag 3	-	-	-	-0.028	-	-	-	-	-	0.099	-	-
Affil. Lag 4	-	-	-	-	-0.003	-	-	-	-	-	0.145	-
Affil. Lag 5	-	-	-	-	-	-0.006	-	-	-	-	-	0.123
Prog. Costs per Sub per Month (2010 USD)	0.135	0.926**	1.045**	1.117**	1.186**	1.243**	0.667**	1.034**	1.152**	1.214**	1.249**	1.274**
Ad. Revenue per Sub per Month (2010 USD)	0.568	-0.336	-0.479**	-0.579**	-0.695**	-0.857**	-0.098	-0.637**	-0.816**	-0.977**	-1.092**	-1.162**
Age of Network Spline 1	0.081**	0.114**	0.056**	0.044**	0.034	0.036	0.130**	0.138**	0.069**	0.053**	0.053**	0.069**
Age of Network Spline 2	-0.101**	-0.105	-0.074	-0.045	-0.020	-0.024	-0.171**	-0.139**	-0.100**	-0.057	-0.041	-0.077
Age of Network Spline 3	0.221	0.276	0.204	0.134	0.078	0.091	0.401**	0.345**	0.256*	0.153	0.118	0.205
Constant	0.601	-2.304**	-0.315**	-0.149	-0.211	-0.214	-1.101**	-1.952**	-0.243**	-0.176	-0.370	-0.467
F Statistic	16.0	32.5	39.4	35.0	30.1	30.4	23.7	32.8	69.0	63.6	32.6	36.5
FP-Value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	654	613	572	532	492	453	654	613	572	532	492	453
R-squared	0.873	0.947	0.957	0.961	0.965	0.967	0.931	0.952	0.959	0.962	0.963	0.964
Number of Networks	41	41	40	40	39	38	41	41	40	40	39	38

Notes: Standard errors are clustered by owner. \* =  $p < 0.1$ ; \*\* =  $p < 0.05$ .

Table 7b. Regression Results Using Lagged MVPD Affiliation (1998 to 2017) (Variables in Logs)

	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Weighted:	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Affil.	-0.204**	-	-	-	-	-	-0.107*	-	-	-	-	-
Affil. Lag 1	-	-0.135**	-	-	-	-	-	-0.075	-	-	-	-
Affil. Lag 2	-	-	-0.095**	-	-	-	-	-	-0.041	-	-	-
Affil. Lag 3	-	-	-	-0.068*	-	-	-	-	-	-0.008	-	-
Affil. Lag 4	-	-	-	-	-0.048	-	-	-	-	-	0.016	-
Affil. Lag 5	-	-	-	-	-	-0.044	-	-	-	-	-	0.003
Log Prog. Costs per Sub per Month (2010 USD)	0.482**	0.777**	0.866**	0.921**	0.975**	1.017**	0.655**	0.753**	0.818**	0.862**	0.894**	0.914**
Log Ad. Revenue per Sub per Month (2010 USD)	0.025	-0.153**	-0.188**	-0.214**	-0.242**	-0.261**	-0.132**	-0.201**	-0.232**	-0.260**	-0.273**	-0.287**
Age of Network Spline 1	0.075**	0.073**	0.051**	0.040**	0.010	0.003	0.066**	0.063**	0.046**	0.034**	0.006	0.007
Age of Network Spline 2	-0.101**	-0.062	-0.032	-0.007	0.021	0.038	-0.048	-0.025	-0.003	0.023	0.042	0.039
Age of Network Spline 3	0.238**	0.148	0.074	0.013	-0.054	-0.092	0.105	0.049	-0.002	-0.063	-0.106	-0.098
Constant	-0.843**	-1.637**	-0.877**	-0.819**	-0.209	-0.157	-1.063**	-1.291**	-1.002**	-0.949**	-0.249	-0.269
F Statistic	103.8	82.4	204.7	151.2	64.2	38.1	68.4	61.0	268.8	239.4	40.0	63.6
F P-Value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	654	613	572	532	492	453	654	613	572	532	492	453
R-squared	0.923	0.949	0.960	0.963	0.967	0.971	0.948	0.956	0.959	0.960	0.962	0.964
Number of Networks	41	41	40	40	39	38	41	41	40	40	39	38

Notes: Standard errors are clustered by owner. \* =  $p < 0.1$ ; \*\* =  $p < 0.05$ .

## CONCLUSION

In an article published in 2013, Caves, Holt, and Singer used SNL Kagan data to estimate a set of regression models that they claimed showed that vertically integrated content providers charged higher prices than did non-integrated providers. As a result, they claimed that “any potential efficiencies arising from vertical integration in the industry should be weighed against the prospect of increased content costs and the potential for reduced output and economic welfare.”<sup>13</sup> In this article, we have shown that those results do not hold up to updates in the underlying data—either on the original time period (given revisions to the data) or on a more recent time period, or on a combination of the two. Indeed, overall, the results are more consistent with *lower* prices due to vertical integration than with higher prices. Consequently, the 2013 study’s policy conclusions are not, in fact, supported by the updated data.

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<sup>13</sup> Caves, Holt & Singer, *supra* note 6, at 89.