Online Appendix to the Paper:
Media Competition and News Diets

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A Details on the Rollout of Television

The FCC was created by the Communications Act of 1934. This Act empowered the FCC to issue broadcasting licenses *"as public convenience, interest, and necessity requires."*[1] Starting in 1945, the FCC relied on comparative hearings when there were multiple applicants for a broadcast license (in practice, early applicants were often granted licenses without hearings). To determine which applicant was best qualified to hold the license, the FCC relied at the time (a number of changes were then introduced in 1965) on five criteria: (i) the local residency of the owners; (ii) the integration of ownership and management; (iii) the active participation by applicants in civic affairs; (iv) the broad diversification of background and interests; and (v) the past broadcast experience. The FCC also considered the diversification of control.

The development of television followed the growing use of radios in the 1930's; with television technology evolving directly from radio technology. As reported in Starr (1982), television experienced a failed start during the 1920s, when inventors in both Europe and America developed prototypes based on the 1884 work of Paul Nipkow. Television stalled during the late 1930s because of monopolies (Starr, 1982).

The FCC assigned television channels to specific markets. As detailed in Boddy (1993), *"in order to avoid interference, the commission in 1945 mandated geographical separations of eighty-five miles for stations on adjacent television channels and two hundred miles for stations on the same channel"*. Geographical separation were subsequently reduced to seventy-five miles and 150 miles in 1948.

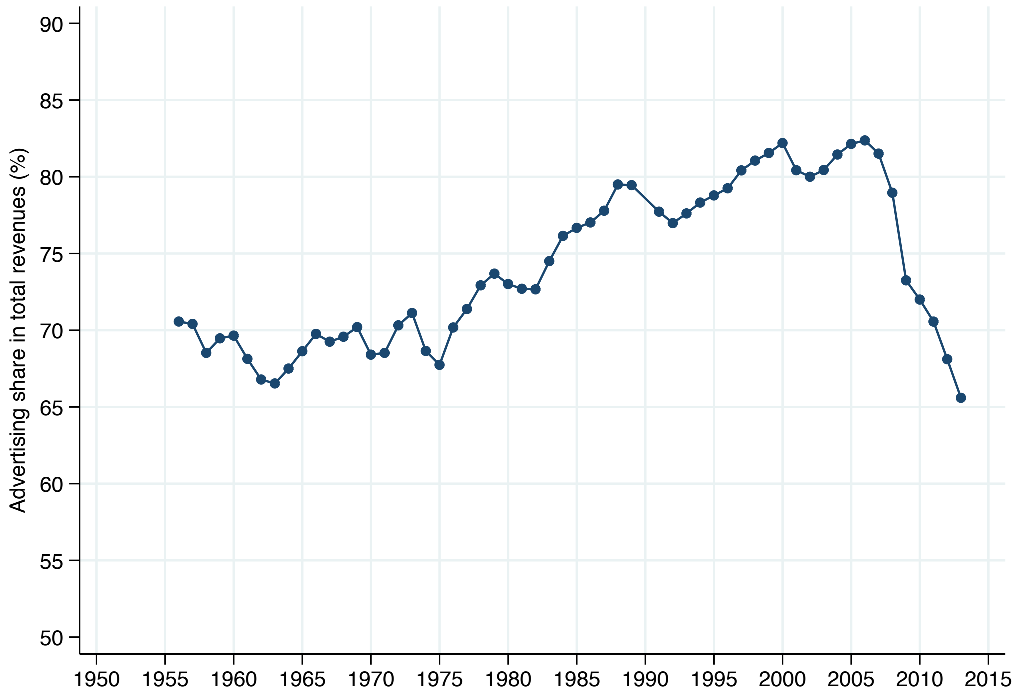
The critical issue of the television hearings was the role of UHF (ultra high frequency). As described in details in Boddy (1993), *"in its original allocations rulings for commercial television in the VHF band in 1941, the commission urged the industry to experiment with high definition and color television on the much large UHF band set aside for television experimentation."* The battle over UHF television reached center stage in the allocation hearings of 1943-44. On the one hand, CBS pressed a high-definition black and white system on the UHF band, offering the possibility of higher-definition monochrome and color broadcasting. On the other hand, RCA and others with significant interests in manufacturing and broadcasting, supported the immediate commercial expansion of VHF (very high frequency) service and opposed the proposed shift to the UHF band. In May 1945, the FCC approved a thirteen-channel VHF television system. At the same time, however, it encouraged continued experimentation in the UHF band with an eye toward the possibility of an eventual shift of the entire television service to the higher band. As highlighted by Boddy (1993), *"by approving VHF licenses in the short run while threatening an eventual move to UHF, the FCC's 1945 allocation decision led many prospective VHF broadcasters to hold off while awaiting the fate*

[1] The description of the broadcast license application process made in this paragraph relies on the "History of the Broadcast License Application Process" prepared for the FCC in 2000.

of color and UHF television". De facto, according to the 1946 FCC's *Annual Report*, 80 of the 1958 postwar applications for television stations were subsequently withdrawn by the end of that year. The FCC notes in the report that *"the reasons given [for the withdrawal] were either a desire to wait for color television or that television required a greater capital outlay than the applicants had anticipated."* In other words, because of this battle regarding the shift, the postwar development of television was slower than expected. More importantly, in a 1947 ruling, the FCC rejected the CBS UHF color proposal which led to an increasing number of applications.

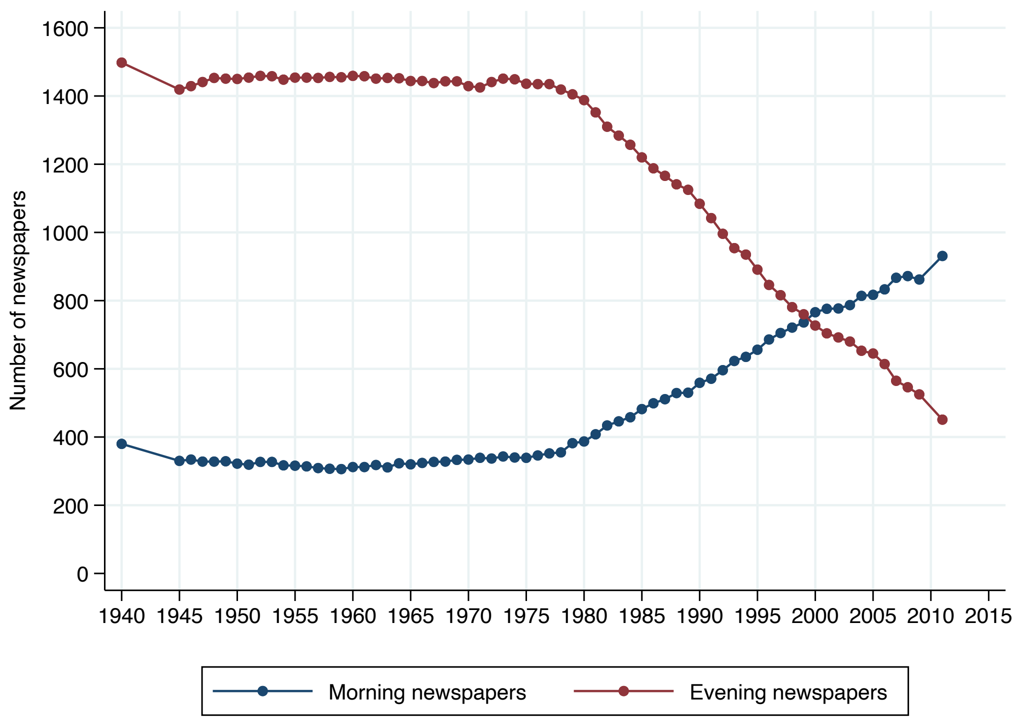
Content As noted in Noll et al. (1973), *"the fact remains that almost all of the programming broadcast over the local stations has a national focus."* Television stations produced little original journalism at the time *"since most local stations had been slow to get into the news business, providing little more than short summaries of wire-service headlines throughout the 1950s"* (de Leon, 2015). As highlighted in a FCC report reviewing FCC's historical decisions, "localism" did not produce the desired "local programming" during its first decades (Ismail, 2010).

B Additional figures



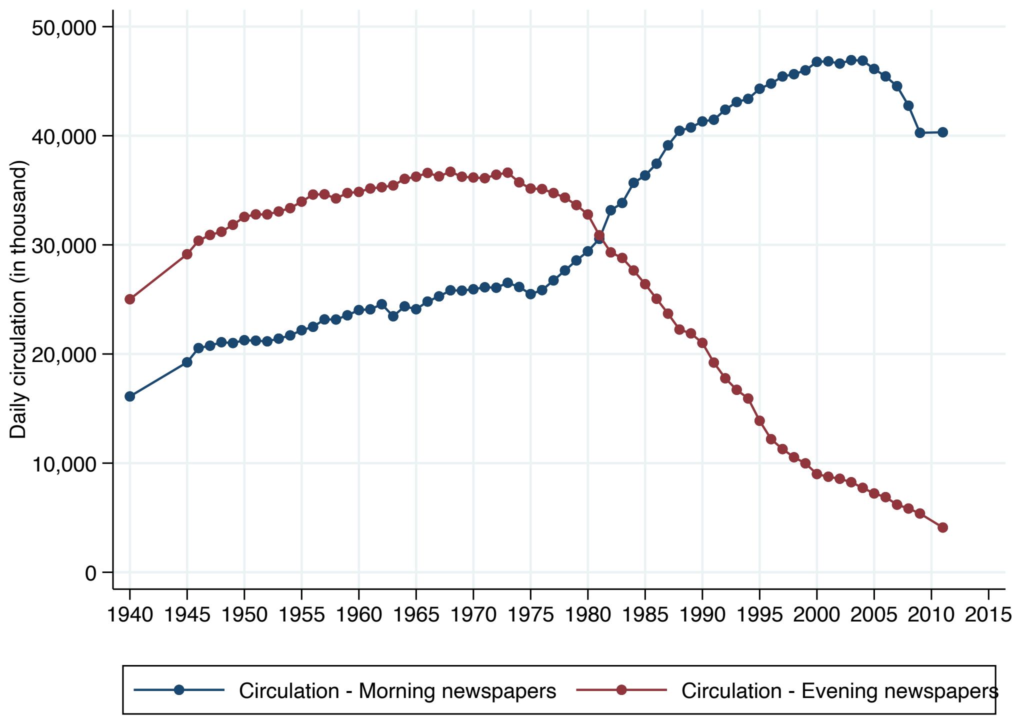
Notes: The Figure plots the evolution of the advertising share in newspaper total revenues in the United States between 1956 and 2013. Data on newspaper revenues are from the Newspaper Association of America (NAA).

Figure B.1: Advertising share in newspaper total revenues, United States, 1956-2013



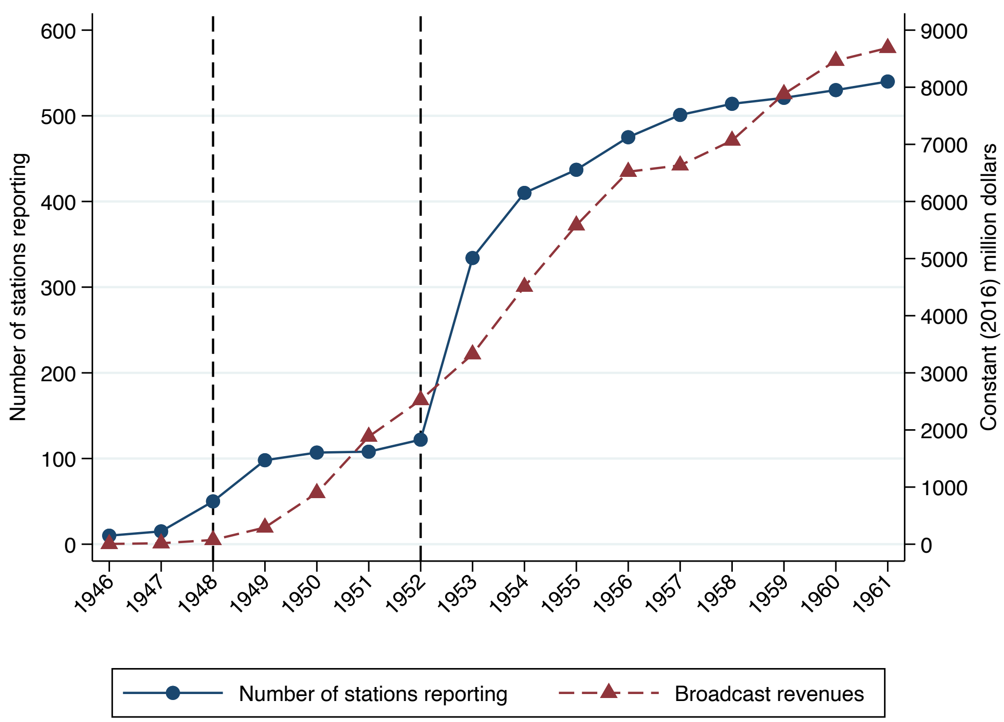
Notes: The Figure plots the evolution of the total number of morning newspapers and of evening newspapers in the United States between 1940 and 2011. Data on the number of newspapers are from the Newspaper Association of America (NAA).

Figure B.2



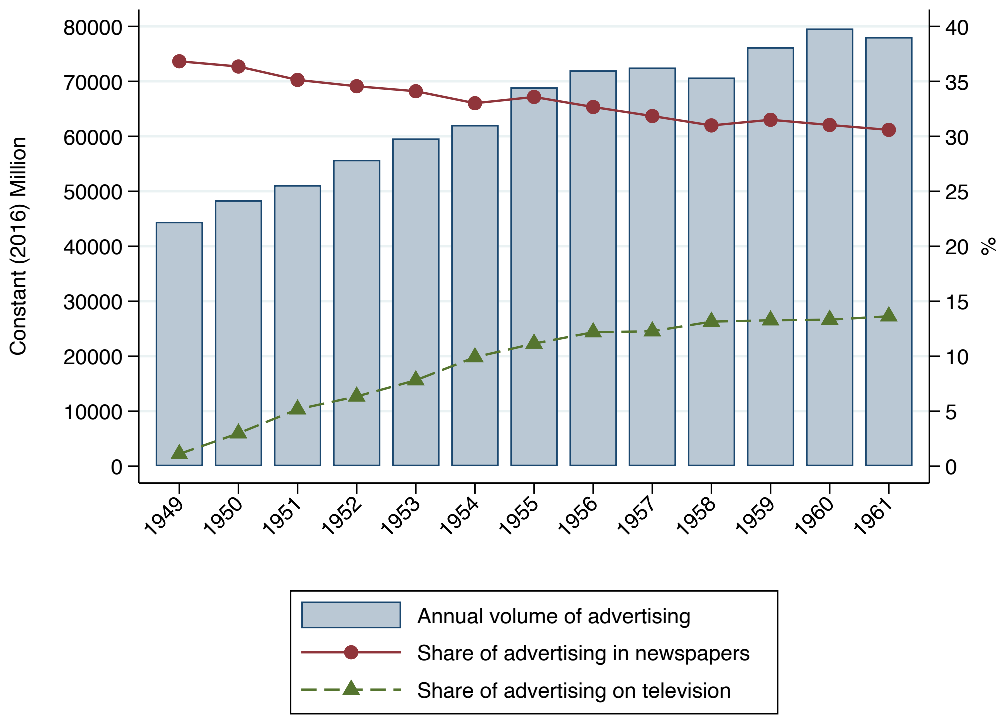
Notes: The Figure plots the evolution of the total circulation (aggregated over all newspapers) of morning newspapers and of evening newspapers in the United States between 1940 and 2011. Data on newspapers' circulation are from the Newspaper Association of America (NAA).

Figure B.3



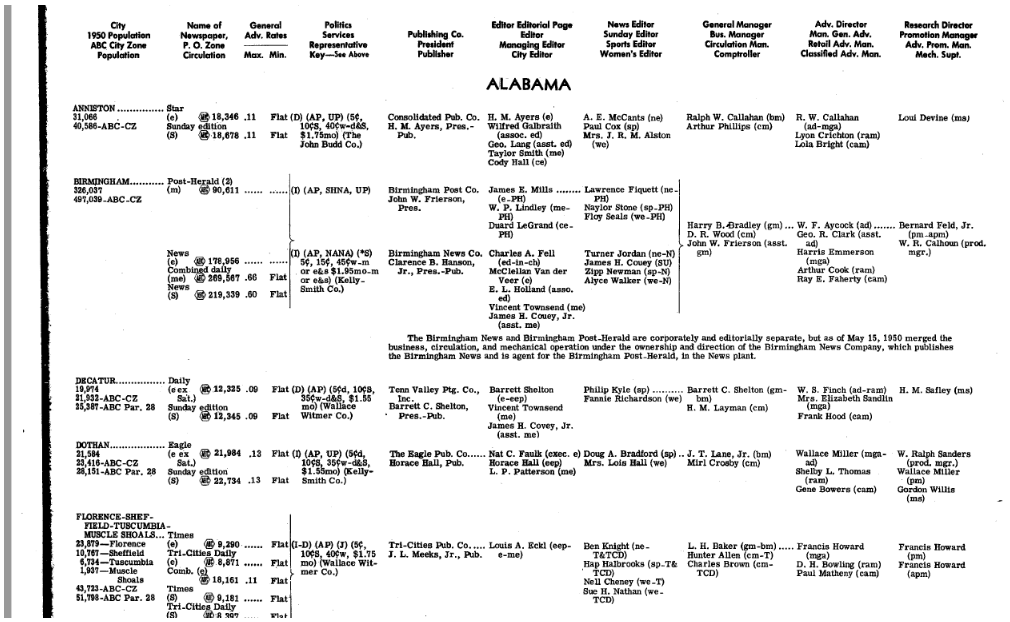
Notes: The Figure plots the evolution of the number of stations reporting (blue line with dots, left y-axis), and of the total broadcast revenues (dashed red line with triangles, right y-axis), from 1946 to 1961. The data come from the Television Factbooks.

Figure B.4: Expansion of the television industry in the United States: Number of broadcasting stations and Broadcast revenues, 1946-1961



Notes: The Figure plots the evolution of the annual volume of advertising in the United Sates between 1949 and 1961. The blue bars (left y-axis) report the values of the total volume in constant (2016) millions dollars. Total advertising includes advertising on radio and television, advertising in newspapers and magazines, farm publications, direct mail, business papers, outdoor advertising, as well as some miscellaneous advertising. The red line with dots and the dashed green line with triangle represent respectively the share of newspapers and the share of television in total advertising (in percentage, right y-axis). The data come from the Television Factbooks.

Figure B.5: Annual volume of advertising in the United States, 1949-1961



City 1950 Population ABC City Zone Population	Name of Newspaper, P. O. Zone Circulation	General Adv. Rates Max.	Min.	Politics Services Representative Key—See Above	Publishing Co. President Publisher	Editor Editorial Page Editor Managing Editor City Editor	News Editor Sunday Editor Sports Editor Women's Editor	General Manager Bus. Manager Circulation Man. Comptroller	Adv. Director Man. Gen. Adv. Retail Adv. Man. Classified Adv. Man.	Research Director Promotion Manager Adv. Prom. Man. Mech. Supt.
ALABAMA										
ANNISTON 31,066 40,586-ABC-CZ	Star (e) 18,346 Sunday edition (S) 18,678	.11 .11	Flat Flat	(D) (AP, UP) (5¢, 10¢S, 40¢w-d&S, $1.75mo) (The John Budd Co.)	Consolidated Pub. Co. H. M. Ayers, Pres.-Pub.	H. M. Ayers (e) Wilfred Galbraith (assoc. ed) Geo. Lang (asst. ed) Taylor Smith (me) Cody Hall (ce)	A. E. McCants (ne) Paul Cox (sp) Mrs. J. R. M. Alston (we)	Ralph W. Callahan (bm) Arthur Phillips (cm)	R. W. Callahan (ad-mga) Lyon Crichton (ram) Lola Bright (cam)	Loui Devine (ms)
BIRMINGHAM 326,037 497,039-ABC-CZ	Post-Herald (2) (m) 90,611	......	......	(I) (AP, SHNA, UP)	Birmingham Post Co. John W. Frierson, Pres.	James E. Mills (e-PH) W. P. Lindley (me-PH) Duard LeGrand (ce-PH)	Lawrence Fiquett (ne-PH) Naylor Stone (sp-PH) Floy Seals (we-PH)	Harry B. Bradley (gm) D. R. Wood (cm) John W. Frierson (asst. gm)	W. F. Aycock (ad) Geo. R. Clark (asst. ad) Harris Emmerson (mga) Arthur Cook (ram) Ray E. Faherty (cam)	Bernard Feld, Jr. (pm-apm) W. R. Calhoun (prod. mgr.)
	News (e) 178,956 Combined daily (me) 269,567 News (S) 219,339	...... .66 .60	...... Flat Flat	(I) (AP, NANA) (*S) 5¢, 15¢, 45¢w-m or e&s $1.95mo-m or e&s) (Kelly-Smith Co.)	Birmingham News Co. Clarence B. Hanson, Jr., Pres.-Pub.	Charles A. Fell (ed-in-ch) McClellan Van der Veer (e) E. L. Holland (asso. ed) Vincent Townsend (me) James H. Couey, Jr. (asst. me)	Turner Jordan (ne-N) James H. Couey (SU) Zipp Newman (sp-N) Alyce Walker (we-N)			
					The Birmingham News and Birmingham Post-Herald are corporately and editorially separate, but as of May 15, 1950 merged the business, circulation, and mechanical operation under the ownership and direction of the Birmingham News Company, which publishes the Birmingham News and is agent for the Birmingham Post-Herald, in the News plant.					
DECATUR 19,974 21,932-ABC-CZ 25,387-ABC Par. 28	Daily (e ex Sat.) 12,325 Sunday edition (S) 12,345	.09 .09	Flat Flat	(D) (AP) (5¢d, 10¢S, 35¢w-d&S, $1.55 mo) (Wallace Witmer Co.)	Tenn Valley Ptg. Co., Inc. Barrett C. Shelton, Pres.-Pub.	Barrett Shelton (e-eep) Vincent Townsend (me) James H. Covey, Jr. (asst. me)	Philip Kyle (sp) Fannie Richardson (we)	Barrett C. Shelton (gm-bm) H. M. Layman (cm)	W. S. Finch (ad-ram) Mrs. Elizabeth Sandlin (mga) Frank Hood (cam)	H. M. Safley (ms)
DOTHAN 21,584 23,416-ABC-CZ 28,151-ABC Par. 28	Eagle (e ex Sat.) 21,984 Sunday edition (S) 22,734	.13 .13	Flat Flat	(I) (AP, UP) (5¢d, 10¢S, 35¢w-d&S, $1.55mo) (Kelly-Smith Co.)	The Eagle Pub. Co. Horace Hall, Pub.	Nat C. Faulk (exec. e) Horace Hall (eep) L. P. Patterson (me)	Doug A. Bradford (sp) Mrs. Lois Hall (we)	J. T. Lane, Jr. (bm) Mirl Crosby (cm)	Wallace Miller (mga-ad) Shelby L. Thomas (ram) Gene Bowers (cam)	W. Ralph Sanders (prod. mgr.) Wallace Miller (pm) Gordon Willis (ms)
FLORENCE-SHEFFIELD-TUSCUMBIA-MUSCLE SHOALS 23,879—Florence 10,767—Sheffield 6,734—Tuscumbia 1,937—Muscle Shoals 43,723-ABC-CZ 51,798-ABC Par. 28	Times (e) 9,290 Tri-Cities Daily (e) 8,871 Comb. (e) 18,161 Times (S) 9,181 Tri-Cities Daily (S) 8,397	.... .11	Flat Flat Flat Flat Flat	(I-D) (AP) (J) (5¢, 10¢S, 40¢w, $1.75 mo) (Wallace Witmer Co.)	Tri-Cities Pub. Co. J. L. Meeks, Jr., Pub.	Louis A. Eckl (eep-e-me)	Ben Knight (ne-T&TCD) Hap Halbrooks (sp-T&TCD) Nell Cheney (we-T) Sue H. Nathan (we-TCD)	L. H. Baker (gm-bm) Hunter Allen (cm-T) Charles Brown (cm-TCD)	Francis Howard (mga) D. H. Bowling (ram) Paul Matheny (cam)	Francis Howard (pm) Francis Howard (apm)

Notes: The figure reproduces a page of the *Editor & Publisher International Yearbook*. To illustrate, for the *Decatur Daily*, we see a weekday circulation of 12,325 and an advertising price of \$0.09 per line. An "agate line" is a standard unit of measurement for print advertising. It is defined as one column of a paper wide, by one agate, or 1/14 of an inch. So, to place an ad in the *Decatur Daily* that spanned three columns and was 5 inches tall would cost an advertiser $(3 * 5 * 14 * 0.09) =$ \$18.90 in 1955. The weekday price was \$0.05 and the Sunday price was \$0.10 (\$0.05 would be approximately \$0.42 in 2016 dollars), and the newspaper subscribed to the Associated Press (AP). The figure was reprinted with permission from *Editor & Publisher*.

Figure B.6: Newspaper Raw Data: Illustration

1954 ADVERTISING LINAGE REPORTED BY 1,509 NEWSPAPERS

Total, National, Local, Classified and Legal Volume in
1,085 Cities as Reported to Editor & Publisher

ALABAMA

City	Paper	Published	Total Linage	Display National	Display Local	Classified	Legal
Birmingham	Post-Herald	(m)	13,886,413	3,033,457	6,962,937	3,602,676	287,343
	News	(e)	20,476,868	3,029,536	13,821,703	3,605,868	19,761
	News	(S)	9,144,098	1,495,614	6,124,694	1,521,730	2,060
	Total	(meS)	43,507,379	7,558,607	26,909,334	8,730,274	309,164
Decatur	Daily	(eS)	5,014,828	537,012	3,660,328	758,156	59,332
Dothan	Eagle	(e)	6,938,705	707,579	5,257,059	942,642	31,425
Gadsden	Times	(e)	6,389,950	993,762	4,342,366	978,152	75,670
Huntsville	Times	(eS)	7,167,846	904,862	5,526,934	677,712	58,338
Montgomery	Advertiser	(m)	11,594,058	1,899,646	7,810,824	1,861,034	22,554
	Journal	(e)	11,646,810	1,898,134	7,801,262	1,843,198	104,216
	Advertiser	(S)	4,148,060	435,764	3,072,090	637,042	3,164
	Total	(meS)	27,388,928	4,233,544	18,684,176	4,341,274	129,934
	Examiner	(e)	705,494	41,987	515,565	122,334	25,608
			(First daily issue Aug. 30, 1954. Figures for 4 months only)				
Opelika	News	(e)	2,634,226	414,820	1,961,092	187,376	70,938
Selma	Times-Journal	(eS)	5,814,298	715,456	4,513,712	549,906	35,224
Troy	Messenger & Herald	(eS)	2,470,590	395,416	2,006,140	37,898	31,136
Tuscaloosa	News	(eS)	7,485,030	787,276	5,818,274	797,622	81,858

ALASKA

City	Paper	Published	Total Linage	Display National	Display Local	Classified	Legal
Anchorage	News	(e)	3,665,676	302,736	2,495,934	756,378	110,628
	Times	(e)	6,951,021	711,095	5,242,825	997,101	—
				(Legal included in Classified)			
Fairbanks	News-Miner	(e)	5,099,666	650,607	3,802,946	621,516	24,597
Ketchikan	News	(e)	2,031,149	295,625	1,649,564	85,960	—
				(Legal included in Classified)			

ARIZONA

City	Paper	Published	Total Linage	Display National	Display Local	Classified	Legal
Bisbee	Review	(m)	2,080,405	112,796	1,259,314	708,295	—
				(Legal included in Classified)			
Douglas	Dispatch	(e)	2,324,630	302,358	1,787,114	172,382	62,776
Mesa	Tribune	(e)	3,577,500	409,664	2,331,504	796,334	39,998
Phoenix	Republic	(m)	18,963,672	2,363,494	12,070,100	4,499,824	30,254
	Gazette	(e)	18,966,360	2,376,122	12,068,392	4,501,616	20,230
	Republic	(S)	6,258,098	1,428,000	3,367,378	1,460,578	2,142
	Total	(meS)	44,188,130	6,167,616	27,505,870	10,462,018	52,626
Tucson	Star	(m)	12,387,672	1,498,924	7,899,041	2,769,511	220,195
	Citizen	(e)	14,272,100	1,664,033	9,709,784	2,769,511	128,772
	Star	(S)	3,401,944	312,935	2,309,083	760,879	19,047
	Total	(meS)	30,061,717	3,475,892	19,917,908	6,299,902	368,014
Yuma	Sun & Sentinel	(e)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

ARKANSAS—Continued

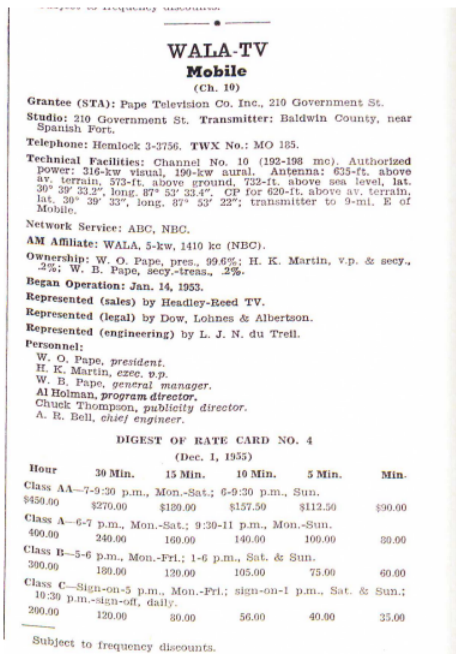
City	Paper	Published	Total Linage	Display National	Display Local	Classified	Legal
Hot Springs	Sentinel-Record	(mS)	8,235,654	951,636	7,284,018	1,873,242	36,120
	New Era	(e)	6,338,080	935,200	5,369,882	1,572,074	27,062
	Total	(meS)	14,573,734	1,886,836	12,653,900	3,445,316	63,182
Little Rock	Arkansas Democrat	(e)	10,992,058	2,053,758	7,178,052	1,634,710	125,538
	Sunday edition	(S)	3,157,868	408,086	2,234,484	514,038	1,260
	Total	(eS)	14,149,926	2,461,844	9,412,536	2,148,748	126,798
Magnolia	Banner-News	(e)	2,703,743	417,368	2,046,723	182,672	56,980
Mena	Star	(e)	1,792,000	600,000	1,084,000	108,000	—
				(Legal included in Classified)			
Paragould	Press-Soliphone	(e)	2,381,704	376,264	1,817,298	154,976	33,166
Pine Bluff	Commercial	(e)	1,534,714	244,516	1,007,888	240,366	41,944
	Sunday edition	(S)	401,738	23,464	346,850	31,284	140
	Total	(eS)	1,936.452	267,980	1,354,738	271,650	42,084
				(Figures from October 1 to December 31, 1954)			
Rogers	News	(e)	1,871,285	282,199	1,533,600	13,022	23,464
Russellville	Courier-Democrat	(e)	1,415,534	270,788	1,220,240	44,982	12,138
Springdale	News	(e)	2,019,969	218,365	1,563,828	190,410	46,795
Stuttgart	Leader	(e)	2,255,708	473,970	1,467,270	242,912	31,556
Texarkana	Gazette	(m)	8,365,140	1,099,910	5,687,584	1,339,996	21,014
	News	(e)	8,242,234	1,106,098	5,547,710	1,316,686	35,742
	Gazette	(S)	2,886,156	145,306	2,411,878	266,378	9,534
	Total	(meS)	19,493,530	2,351,314	13,647,172	2,923,060	66,290

CALIFORNIA

City	Paper	Published	Total Linage	Display National	Display Local	Classified	Legal
Alameda	Times-Star	(e)	3,434,326	509,040	2,142,014	646,170	137,102
Alhambra	Post-Advocate	(e)	7,481,852	556,354	4,644,248	2,216,074	71,176
Anaheim	Bulletin	(e)	4,840,738	527,618	3,101,616	1,065,722	145,782
Antioch	Ledger	(e)	2,688,466	197,426	2,069,860	342,076	79,114
Bakersfield	Californian	(e)	15,937,124	1,965,922	11,058,138	2,586,948	326,116
Berkeley	Gazette	(e)	7,947,318	806,160	4,535,906	2,466,918	138,334
Brawley	News	(e)	2,748,816	440,076	1,812,300	432,824	63,616
Burbank	Review	(e)	3,412,054	393,568	2,503,900	426,396	88,200
Burlingame	Advance-Star	(e)	4,506,138*	481,390	2,810,304	761,754	224,280
			(* Includes 228,410 lines in Peninsula Living-Saturday Tabloid Section)				
Chico	Enterprise-Record	(e)	6,154,729	780,619	3,906,329	1,262,331	205,394
Corona	Independent	(e)	3,006,038	266,671	2,033,431	613,536	92,400
Culver City	Star-News	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Notes: The figure reproduces a page of Editor & Publisher's *Annual Lineage Supplement*. To illustrate, we see that the *Decatur Daily* sold 5,014,828 lines of advertising in 1955, with the majority going to local advertisers (3,660,628), and the balance to national advertisers (537,012), classifieds (758,156), and legal (59,332). The figure was reprinted with permission from *Editor & Publisher*.

Figure B.7: Advertising Raw Data: Illustration



WALA-TV

Mobile

(Ch. 10)

Grantee (STA): Pape Television Co. Inc., 210 Government St.

Studio: 210 Government St. **Transmitter:** Baldwin County, near Spanish Fort.

Telephone: Hemlock 3-3756. **TWX No.:** MO 185.

Technical Facilities: Channel No. 10 (192-198 mc). Authorized power: 316-kw visual, 190-kw aural. Antenna: 635-ft. above av. terrain, 573-ft. above ground, 732-ft. above sea level, lat. 30° 39′ 33.2″, long. 87° 53′ 33.4″. CP for 620-ft. above av. terrain, lat. 30° 39′ 33″, long. 87° 53′ 22″; transmitter to 9-mi. E of Mobile.

Network Service: ABC, NBC.

AM Affiliate: WALA, 5-kw, 1410 kc (NBC).

Ownership: W. O. Pape, pres., 99.6%; H. K. Martin, v.p. & secy., .2%; W. B. Pape, secy.-treas., .2%.

Began Operation: Jan. 14, 1953.

Represented (sales) by Headley-Reed TV.

Represented (legal) by Dow, Lohnes & Albertson.

Represented (engineering) by L. J. N. du Treil.

Personnel:

W. O. Pape, *president.*
H. K. Martin, *exec. v.p.*
W. B. Pape, *general manager.*
Al Holman, *program director.*
Chuck Thompson, *publicity director.*
A. R. Bell, *chief engineer.*

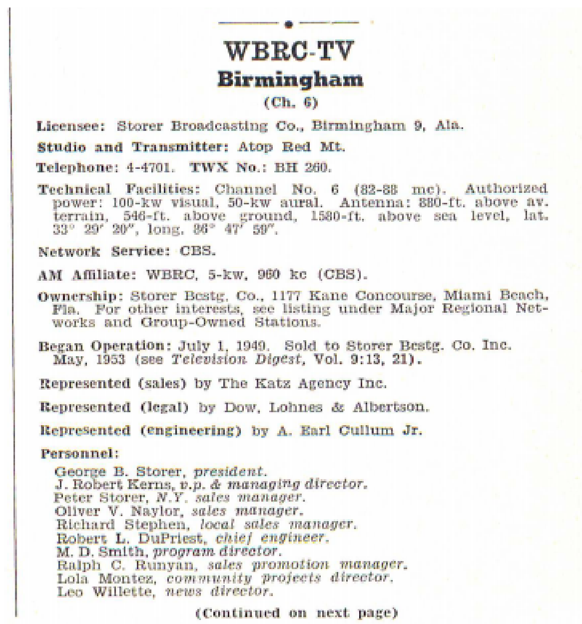
DIGEST OF RATE CARD NO. 4

(Dec. 1, 1955)

Hour	30 Min.	15 Min.	10 Min.	5 Min.	Min.
Class AA—7-9:30 p.m., Mon.-Sat.; 6-9:30 p.m., Sun.					
$450.00	$270.00	$180.00	$157.50	$112.50	$90.00
Class A—6-7 p.m., Mon.-Sat.; 9:30-11 p.m., Mon.-Sun.					
400.00	240.00	160.00	140.00	100.00	80.00
Class B—5-6 p.m., Mon.-Fri.; 1-6 p.m., Sat. & Sun.					
300.00	180.00	120.00	105.00	75.00	60.00
Class C—Sign-on-5 p.m., Mon.-Fri.; sign-on-1 p.m., Sat. & Sun.; 10:30 p.m.-sign-off, daily.					
200.00	120.00	80.00	56.00	40.00	35.00

Subject to frequency discounts.

(a) WALA (Mobile, AL)



WBRC-TV

Birmingham

(Ch. 6)

Licensee: Storer Broadcasting Co., Birmingham 9, Ala.

Studio and Transmitter: Atop Red Mt.

Telephone: 4-4701. **TWX No.:** BH 260.

Technical Facilities: Channel No. 6 (82-88 mc). Authorized power: 100-kw visual, 50-kw aural. Antenna: 880-ft. above av. terrain, 546-ft. above ground, 1580-ft. above sea level, lat. 33° 29′ 20″, long. 86° 47′ 59″.

Network Service: CBS.

AM Affiliate: WBRC, 5-kw, 960 kc (CBS).

Ownership: Storer Bcstg. Co., 1177 Kane Concourse, Miami Beach, Fla. For other interests, see listing under Major Regional Networks and Group-Owned Stations.

Began Operation: July 1, 1949. Sold to Storer Bcstg. Co. Inc. May, 1953 (see *Television Digest*, Vol. 9:13, 21).

Represented (sales) by The Katz Agency Inc.

Represented (legal) by Dow, Lohnes & Albertson.

Represented (engineering) by A. Earl Cullum Jr.

Personnel:

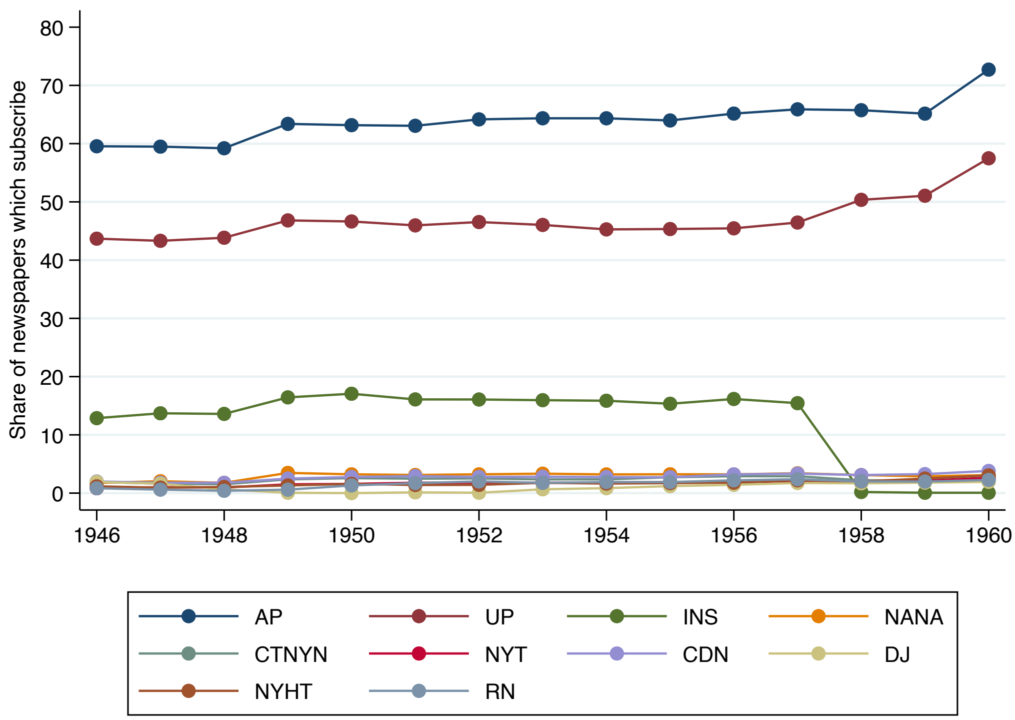
George B. Storer, *president.*
J. Robert Kerns, *v.p. & managing director.*
Peter Storer, *N.Y. sales manager.*
Oliver V. Naylor, *sales manager.*
Richard Stephen, *local sales manager.*
Robert L. DuPriest, *chief engineer.*
M. D. Smith, *program director.*
Ralph C. Runyan, *sales promotion manager.*
Lola Montez, *community projects director.*
Leo Willette, *news director.*

(Continued on next page)

(b) WBRC (Birmingham, AL)

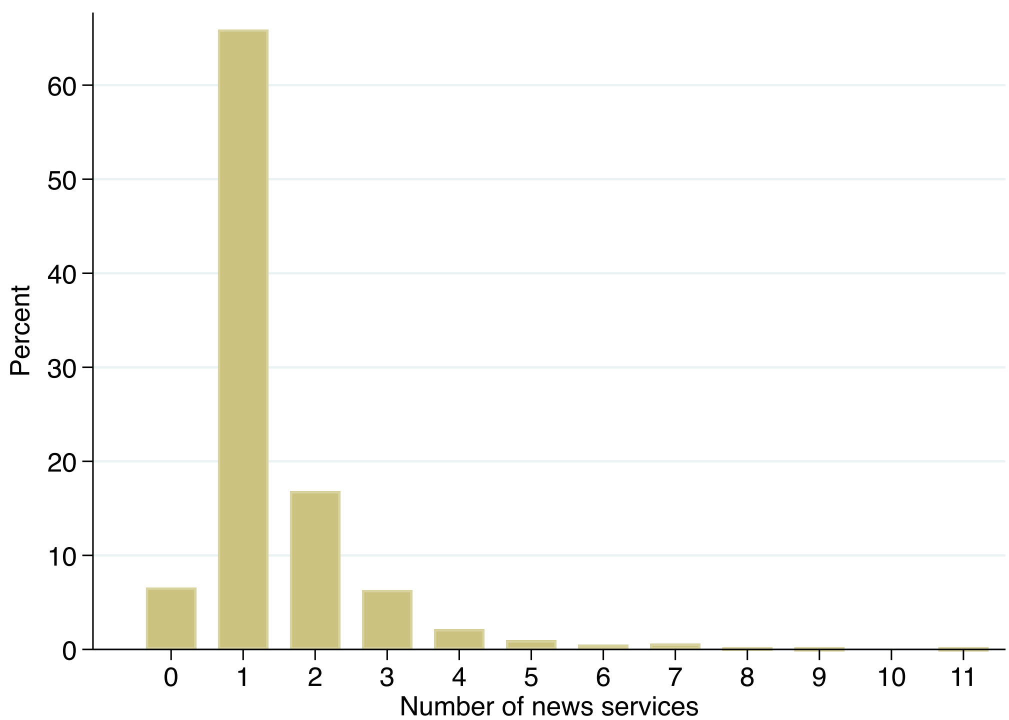
Notes: The figures reproduce two pages of the 1955 edition of the *Advanced Television Factbook* (published by *Warner Communications*) with information about WBRC (Birmingham, AL) and WALA (Mobile, AL). We see that the dates of first broadcasts were July 1, 1949 for WBRC and Jan 14, 1953 for WALA. Reprinted with permission of Warren Communications News (www.warren-news.com; 202-872-9200; sales@warren-news.com). Do not further redistribute without permission of Warren.

Figure B.8: Television Raw Data: Illustration



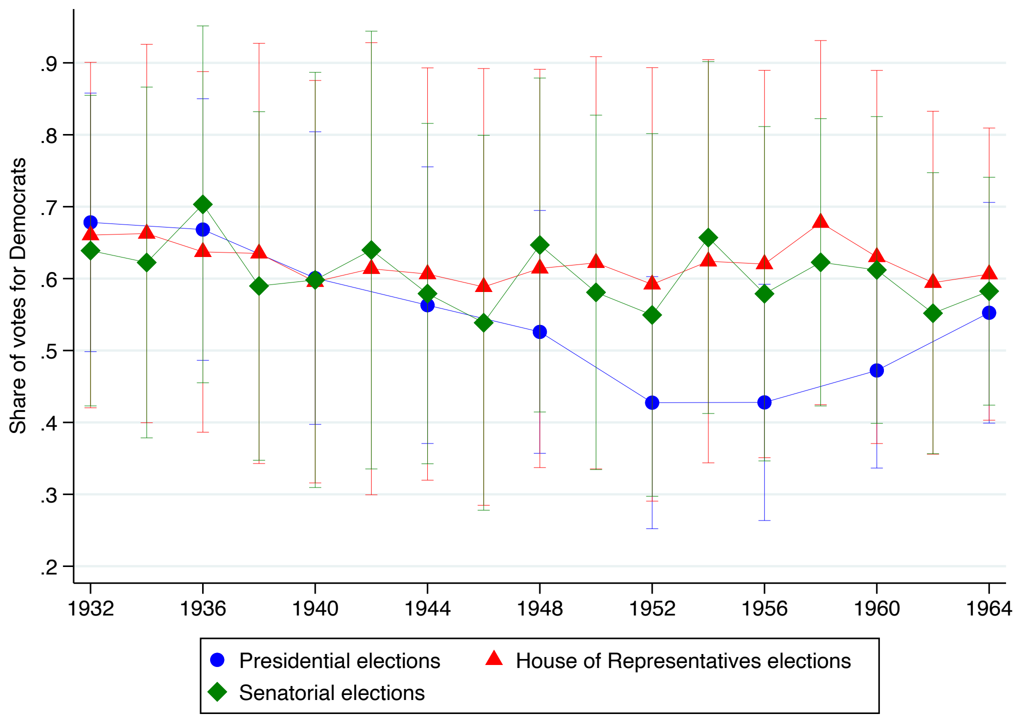
Notes: The Figure plots for each year the share of the newspapers which subscribe to the main news services (i.e. AP, UP, INS, etc.). The data come from *Editor & Publisher International Yearbook*. The collapse of the INS comes from the fact that it was absorbed by UP in 1958.

Figure B.9: Share of newspapers subscribing to the main news services



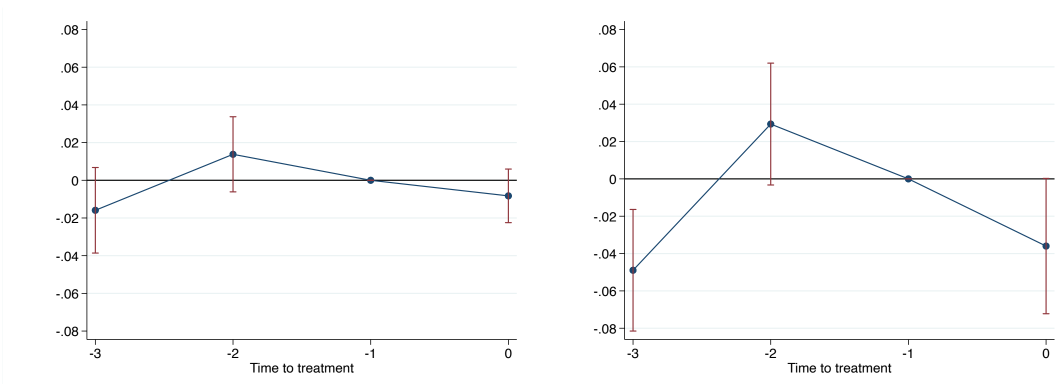
Notes: The Figure plots the distribution of the number of news services (i.e. AP, UP, INS, etc.) to which the newspapers subscribe. An observation is a newspaper-year. The data come from *Editor & Publisher International Yearbook*.

Figure B.10: Distribution of the number of news services to which the newspapers subscribe



Notes: The Figure plots the average share of votes received by the Democrats at elections for all the Presidential, House of Representatives, and Senatorial elections that took place between 1932 and 1964.

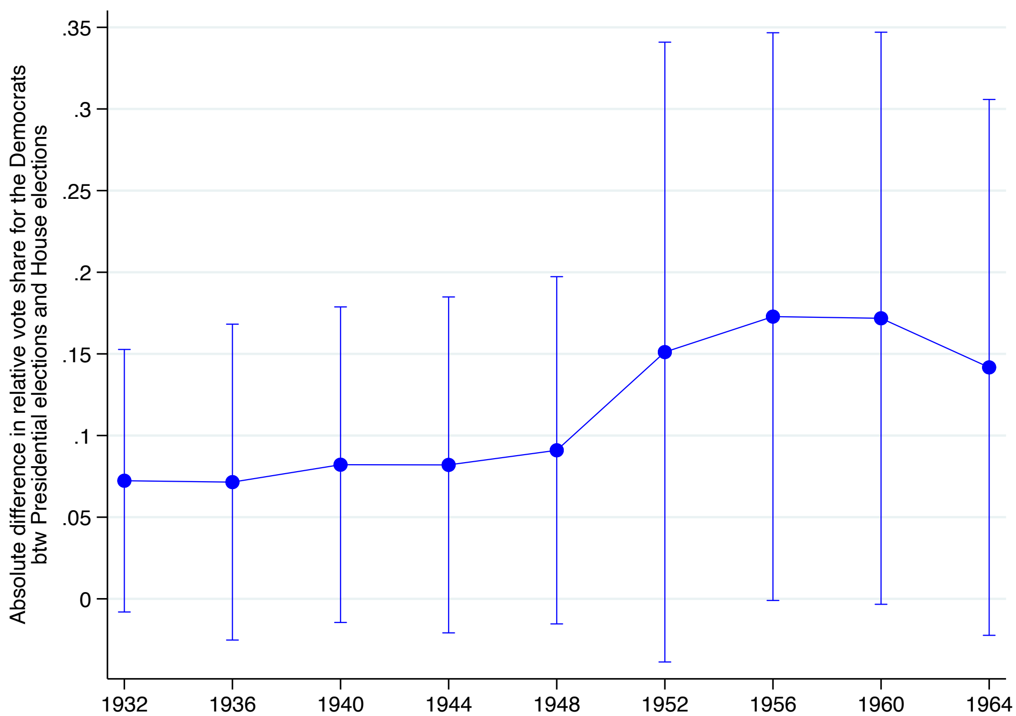
Figure B.11: Share of votes for the Democrats



(a) Congruence House (b) Congruence Senate

Notes: The figures plot the estimates and 95% confidence intervals, using the de Chaisemartin and D'Haultfœuille (2020) method, based on the Stata command did_multipleGT, available from the SSC repository. Standard errors are clustered at the television station level. We use the inverse hyperbolic sine transformation of the dependent variables, the 60% threshold to define county-level penetration, and the Grade B signal. All specifications include year and county fixed effects.

Figure B.12: Assessing the plausibility of the common trends assumption: Long-difference placebos



Notes: The Figure plots the absolute value of the difference between the vote share for the Democratic Party in the Presidential elections and in the House elections during the 1932-1964 period.

Figure B.13: Absolute value of difference between the vote share for the Democratic Party in the Presidential elections and in the House elections

C Additional tables

Table C.1: Summary statistics: Newspapers' Characteristics, only Newspapers included in the content analysis

	Mean	St.Dev	P25	Median	P75	Obs
Subscription price	0.43	0.10	0.36	0.42	0.47	2,057
Daily Circulation	15,802	21,875	5,123	8,816	20,083	2,057
Advertising Rate	0.8	0.6	0.4	0.6	0.9	1,984
National Lineage	0.7	0.8	0.3	0.5	0.8	1,420
Local Lineage	4.6	3.2	2.4	3.7	6.1	1,419
Classified Lineage	1.0	1.1	0.3	0.6	1.3	1,411

Notes: The Table provides summary statistics. An observation is a newspaper/year. The time period is 1944-1964. Only the 102 newspapers that are used in the content analysis are included. Subscription price and advertising rate are in constant (2016) dollars.

Table C.2: Broadcast Launches Around the 1948 Licensing Freeze

Licensed Prior to Freeze		Licensed After Freeze	
Market	First Commercial Broadcast	Market	First Commercial Broadcast
Nashville, TN	Sept 30, 1950	Portland, OR	Sep 20,1952
Lansing, MI	May 1, 1950	Denver, Co	Oct 12, 1952
Norfolk, VA	Apr 2, 1950	Lubbock, TX	Nov 13, 1952
Des Moines, IA	Feb 21, 1950	Austin, TX	Nov 27, 1952
San Antonio, TX	Dec 11, 1949	Honolulu, HI	Dec 1, 1952
Phoenix, AZ	Dec 4, 1949	Colorado Springs, CO	Dec 7, 1952
Utica, NY	Dec 1, 1949	Roanoke, VA	Dec 11, 1952
Binghamton, NY	Dec 1, 1949	El Paso, TX	Dec 14, 1952
Davenport, IA	Oct 31, 1949	Spokane, WA	Dec 20, 1952
Tulsa, OK	Oct 22, 1949	South Bend, IN	Dec 21, 1952
Kansas City, MO	Oct 16, 1949	Wilkes-Barre, PA	Jan 1, 1953
Charleston, WV	Oct 22, 1949	Youngstown, OH	Jan 11, 1953
Greensboro, NC	Sep 22, 1949	Tucson, AZ	Jan 13, 1953
Johnstown, PA	Sep 15, 1949	Mobile, AL	Jan 14, 1953
Jacksonville, FL	Sep 15, 1949	Rocherster, MN	Jan 16, 1953
Omaha, NE	Aug 29, 1949	Bangor, ME	Jan 25, 1953
Grand Rapids, MI	Aug 15, 1949	Peoria, IL	Feb 05, 1953
Charlotte, NC	Jul 15, 1949	Lincoln, NE	Feb 18, 1953
Providence, RI	Jul 10, 1949	Seattle, WA	Mar 1, 1953

Notes: Source data are from *Advanced TV Factbook*. Non-commercial broadcasts are excluded. The left set are ordered by descending date, the right by ascending.

Table C.3: Summary Statistics: Newspapers' Characteristics, only Freeze Cities, using a 20-month window around the "freeze"

	Mean	St.Dev	P25	Median	P75	Obs
Subscription price	0.43	0.11	0.36	0.40	0.47	19,202
Daily Circulation	34,882	72,649	4,843	9,028	26,240	19,202
Advertising Rate	1.1	1.2	0.4	0.6	1.1	18,412
National Lineage	0.7	0.8	0.3	0.4	0.7	10,532
Local Lineage	4.4	3.6	2.2	3.4	5.5	10,534
Classified Lineage	1.0	1.3	0.3	0.6	1.3	10,455

Notes: The Table presents summary statistics. An observation is a newspaper/year. The time period is 1944-1964. Only newspapers located in "freeze cities" are included. We use a 20-month window to define the freeze sample. Subscription price and advertising rate are in constant (2016) dollars.

D Robustness checks

Table D.1: Newspaper content: OLS Estimation

	(1) Total text	(2) National wire	(3) Local original	(4) Photos	(5) Editorials
TV	-0.045**	-0.063*	-0.083***	-0.028	-0.031
	(0.020)	(0.037)	(0.024)	(0.057)	(0.046)
Year & Newspaper FEs	✓	✓	✓	✓	✓
R-sq	0.81	0.57	0.75	0.56	0.66
Observations	3173.00	3173.00	3173.00	3173.00	3173.00
Clusters (TVStation)	61	61	61	61	61
Nb of newspapers	102	102	102	102	102

Notes: * p<0.10, ** p<0.05, *** p<0.01. The time period is 1946-1955. Models are estimated using OLS. Standard errors are clustered at the television station level. Dependent variables are in natural logs. All specifications include city population as a control, an indicator for city population missing, categorical variables for the number of newspapers in the market, and date and newspaper fixed effects.

Table D.2: Newspaper content: Negative Binomial Estimation

	(1) Total text	(2) National wire	(3) Local original	(4) Local wire	(5) Photos	(6) Editorials
main						
TV	-0.047**	-0.055	-0.083***	-0.014	-0.041	-0.037
	(0.020)	(0.038)	(0.025)	(0.061)	(0.057)	(0.051)
Date & Newspaper FEs	✓	✓	✓	✓	✓	✓
Observations	3,196	3,196	3,196	3,196	3,196	3,196
Clusters (TVStation)	61	61	61	61	61	61
Nb of newspapers	102	102	102	102	102	102
Marginal Effect	-5.66	-1.56	-5.06	-0.14	-0.52	-0.29

Notes: * $p<0.10$, ** $p<0.05$, *** $p<0.01$. The time period is 1946-1955. Models are estimated using a negative binomial estimation. An observation is a newspaper-date. Standard errors are clustered at the television station level. All specifications include city population as a control, an indicator for city population missing, categorical variables for the number of newspapers in the market, and date and newspaper fixed effects.

Table D.3: Readership Market Regressions: Including all newspapers

	Subscription price			Circulation		
	(1)	(2)	(3)	(4)	(5)	(6)
TV	-0.052***	-0.050***	-0.051***	-0.023**	0.014	-0.028**
	(0.014)	(0.017)	(0.014)	(0.010)	(0.016)	(0.011)
Year & Newspaper FEs	✓	✓	✓	✓	✓	✓
Sample	All	Morning	Evening	All	Morning	Evening
R-sq	0.55	0.61	0.54	0.99	0.99	0.98
R-sq (within)	0.17	0.19	0.16	0.45	0.40	0.47
Observations	27,543	5,386	22,147	27,543	5,386	22,147
Clusters (TVStation)	327	178	299	327	178	299
Nb of newspapers	1,933	475	1,507	1,933	475	1,507

Notes: * p<0.10, ** p<0.05, *** p<0.01. The time period is 1944-1964. Models are estimated using OLS estimations. Standard errors are clustered at the television station level. Dependent variables are in natural logs. All specifications include city population as a control, an indicator for city population missing, categorical variables for the number of newspapers in the market, and year and newspaper fixed effects. The total number of newspapers is slightly lower than the sum of morning and evening newspapers because of frequency changes (i.e., morning newspapers becoming evening newspapers, or the opposite).

Table D.4: Advertising Market Regressions: Including all newspapers

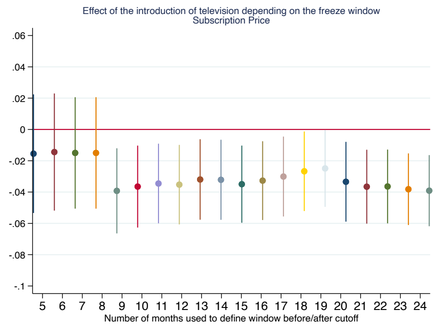
	Ad Prices			Local Advertising			National Advertising			Classified Advertising		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
TV	-0.012	0.013	-0.016**	0.024*	0.060*	0.018	-0.022	0.053	-0.039**	-0.002	0.041	-0.007
	(0.008)	(0.018)	(0.008)	(0.013)	(0.032)	(0.014)	(0.017)	(0.045)	(0.017)	(0.019)	(0.042)	(0.020)
Year & Newspaper FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sample	All	Morning	Evening	All	Morning	Evening	All	Morning	Evening	All	Morning	Evening
R-sq	0.97	0.96	0.96	0.77	0.83	0.73	0.85	0.87	0.79	0.84	0.86	0.82
R-sq (within)	0.34	0.24	0.38	0.21	0.27	0.20	0.32	0.29	0.33	0.21	0.24	0.21
Observations	25,961	5,017	20,934	14,747	1,985	12,752	14,729	1,979	12,740	14,656	1,975	12,671
Clusters (TVStation)	326	178	298	308	127	281	308	126	281	308	126	281
Nb of newspapers	1,911	459	1,500	1,493	279	1,237	1,487	275	1,235	1,486	277	1,232

Notes: * $p<0.10$, ** $p<0.05$, *** $p<0.01$. The time period is 1944-1964. Models are estimated using OLS estimations. Standard errors are clustered at the television station level. Dependent variables are in natural logs. All specifications include city population as a control, an indicator for city population missing, categorical variables for the number of newspapers in the market, and year and newspaper fixed effects. The total number of newspapers is slightly lower than the sum of morning and evening newspapers because of frequency changes (i.e., morning newspapers becoming evening newspapers, or the opposite).

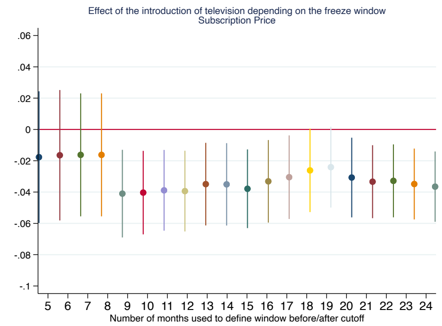
Table D.5: Newspaper content: Poisson Regression: Including all newspapers

	(1) Total text	(2) National wire	(3) Local original	(4) Local wire	(5) Photos	(6) Editorials	(7) Nb pages	(8) Matlab total	(9) Matlab mean
main									
TV	-0.041**	-0.020	-0.067**	-0.003	-0.078*	-0.058	-0.005	-0.033	-0.036
	(0.020)	(0.034)	(0.026)	(0.045)	(0.042)	(0.039)	(0.022)	(0.049)	(0.038)
Date FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓
Newspaper FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	4,495	4,495	4,495	4,495	4,495	4,495	10,073	10,073	10,073
Clusters (TVStation)	89	89	89	89	89	89	72	72	72
Nb of newspapers	141	141	141	141	141	141	104	104	104
Marginal Effect	-5.17	-0.61	-4.25	-0.03	-1.05	-0.47	-0.09	-4.27	-0.28

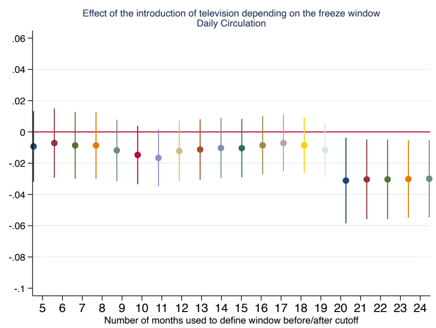
Notes: * $p<0.10$, ** $p<0.05$, *** $p<0.01$. The time period is 1946-1955. Models are estimated using a Poisson regression. An observation is a newspaper-date. Standard errors are clustered at the television station level. All specifications include city population as a control, an indicator for city population missing, categorical variables for the number of newspapers in the market, and date and newspaper fixed effects.



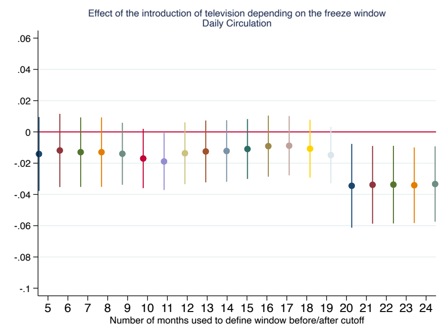
(a) Subscription price – All newspapers



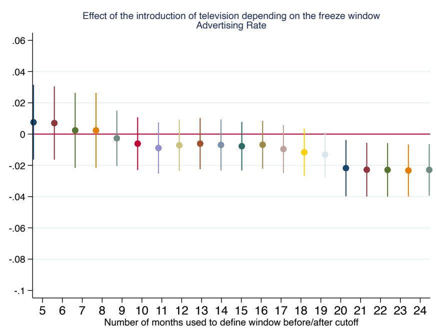
(b) Subscription price – Evening newspapers



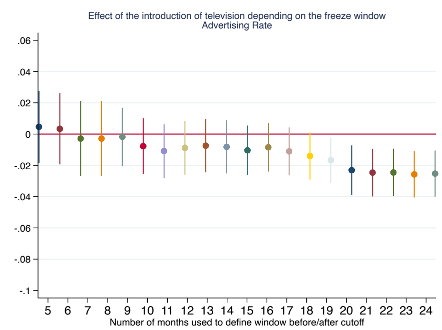
(c) Circulation – All



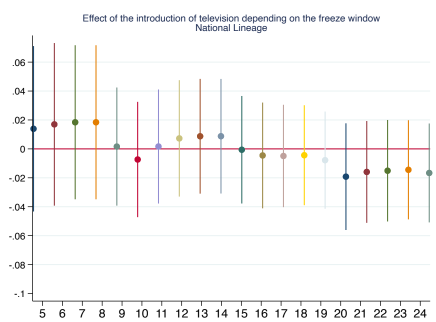
(d) Circulation – Evening newspapers



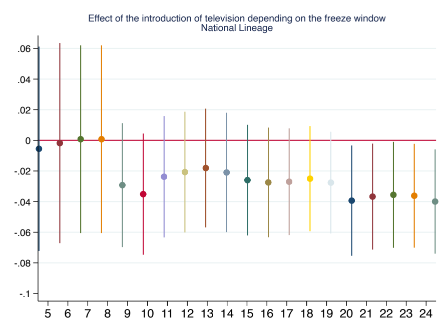
(e) Advertising rate – All



(f) Advertising rate – Evening newspapers



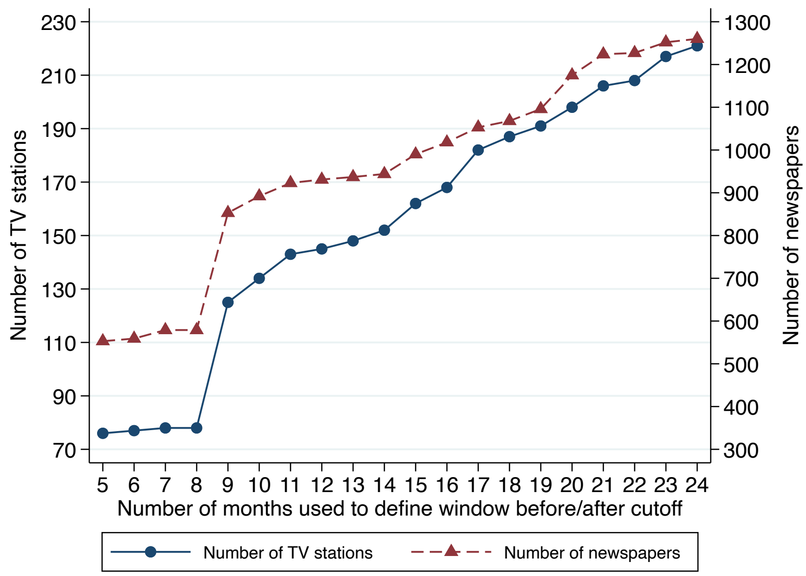
(g) National advertising – All



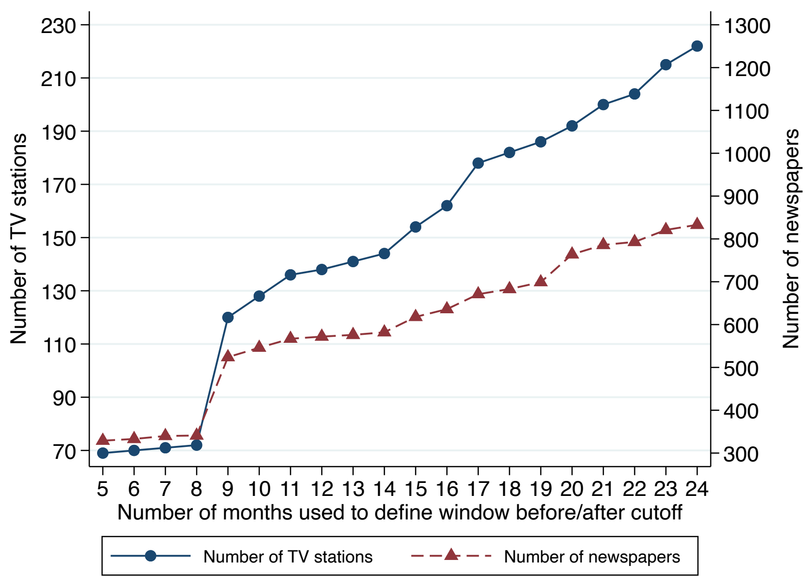
(h) National advertising – Evening newspapers

Notes: The figures plot the coefficient associated to TV in equation (1) depending on the size of the window (in number of months) used to define the "freeze". See Section 7 (including Footnote 49) in the main text for extra details.

Figure D.1: Effect of the introduction of television, using different windows around the "freeze"



(a) Grade B



(b) Grade A

Notes: The Figure plots the number of television markets and newspapers included in the empirical analysis depending on the number of months used to define the window around the "freeze". Upper Figure D.2a reports this number when we use the Grade B signal contours, and bottom Figure D.2b when we use Grade A signal. The spike observed in the number of observations when moving from a 8-month to a 9-month window around the "freeze" is due to the fact that a very large number of television stations started operating in March 1953.

Figure D.2: Sample size depending on the number of months used to define the window around the "freeze"

Table D.6: Robustness check: Consider “all day” newspapers as evening newspapers

	Subscription price	Circulation	Ad Prices	Local Advertising	National Advertising	Classified Advertising
	(1)	(2)	(3)	(4)	(5)	(6)
TV	-0.036**	-0.034**	-0.024**	0.003	-0.023	0.003
	(0.015)	(0.016)	(0.010)	(0.019)	(0.021)	(0.027)
Year & Newspaper FEs	✓	✓	✓	✓	✓	✓
Sample	Evening (incl. all day)	Evening (incl. all day)	Evening	Evening (incl. all day)	Evening (incl. all day)	Evening (incl. all day)
R-sq	0.52	0.99	0.97	0.76	0.85	0.84
R-sq (within)	0.16	0.46	0.35	0.20	0.32	0.20
Observations	17,752	17,752	17,088	10,069	10,069	9,998
Clusters (TVStation)	196	196	195	182	182	182
Nb of newspapers	1,043	1,043	1,037	835	833	832

Notes: * $p<0.10$, ** $p<0.05$, *** $p<0.01$. The time period is 1944-1964. Models are estimated using OLS estimations. Standard errors are clustered at the television station level. Dependent variables are in natural logs. All specifications include city population as a control, an indicator for city population missing, categorical variables for the number of newspapers in the market, and year and newspaper fixed effects.

Table D.7: Robustness check: Readership, Using a different set of controls

	Subscription price			Circulation		
	(1)	(2)	(3)	(4)	(5)	(6)
TV	-0.035**	-0.045**	-0.031**	-0.030*	0.007	-0.034**
	(0.015)	(0.019)	(0.015)	(0.016)	(0.017)	(0.016)
Year & Newspaper FEs	✓	✓	✓	✓	✓	✓
Sample	All	Morning	Evening	All	Morning	Evening
R-sq	0.53	0.55	0.53	0.99	0.99	0.98
R-sq (within)	0.15	0.15	0.16	0.43	0.38	0.45
Observations	19,159	3,884	15,267	19,159	3,884	15,267
Clusters (TVStation)	197	130	181	197	130	181
Nb of newspapers	1,156	282	910	1,156	282	910

Notes: * p<0.10, ** p<0.05, *** p<0.01. The time period is 1944-1964. Models are estimated using OLS. Standard errors are clustered at the television station level. Dependent variables are in natural logs. All specifications include city population as a control, an indicator for city population missing, and year and newspaper fixed effects. The total number of newspapers is slightly lower than the sum of morning and evening newspapers because of frequency changes (i.e., morning newspapers becoming evening newspapers, or the opposite).

Table D.8: Robustness check: Advertising, Using a different set of controls

	Ad Prices			Local Advertising			National Advertising			Classified Advertising		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
TV	-0.016*	-0.002	-0.016*	0.008	0.044	0.006	-0.024	0.049	-0.042**	0.014	0.033	0.019
	(0.009)	(0.019)	(0.009)	(0.017)	(0.042)	(0.018)	(0.019)	(0.058)	(0.019)	(0.024)	(0.058)	(0.026)
Year & Newspaper FEs	X	X	X	X	X	X	X	X	X	X	X	X
Sample	All	Morning	Evening	All	Morning	Evening	All	Morning	Evening	All	Morning	Evening
R-sq	0.97	0.96	0.96	0.77	0.81	0.72	0.85	0.86	0.79	0.84	0.85	0.81
R-sq (within)	0.34	0.23	0.39	0.20	0.26	0.19	0.32	0.30	0.33	0.21	0.20	0.21
Observations	20,086	4,193	15,885	11,443	1,649	9,786	11,443	1,646	9,789	11,371	1,637	9,726
Clusters (TVStation)	233	150	212	220	102	200	221	102	201	221	102	201

Notes: * $p<0.10$, ** $p<0.05$, *** $p<0.01$. The time period is 1944-1964. Models are estimated using OLS. Standard errors are clustered at the television station level. Dependent variables are in natural logs. All specifications include city population as a control, an indicator for city population missing, and year and newspaper fixed effects. The total number of newspapers is slightly lower than the sum of morning and evening newspapers because of frequency changes (i.e., morning newspapers becoming evening newspapers, or the opposite).

Table D.9: Readership: Monopoly markets

	Subscription price			Circulation		
	(1)	(2)	(3)	(4)	(5)	(6)
TV	-0.045***	-0.077***	-0.037**	-0.030**	0.005	-0.034**
	(0.017)	(0.026)	(0.016)	(0.014)	(0.020)	(0.013)
Year & Newspaper FEs	✓	✓	✓	✓	✓	✓
Sample	All	Morning	Evening	All	Morning	Evening
R-sq	0.52	0.54	0.52	0.99	0.99	0.98
R-sq (within)	0.17	0.20	0.17	0.48	0.52	0.47
Observations	15,564	2,705	12,852	15,564	2,705	12,852
Clusters (TVStation)	190	106	168	190	106	168
Nb of newspapers	901	185	739	901	185	739

Notes: * p<0.10, ** p<0.05, *** p<0.01. The time period is 1944-1964. Models are estimated using OLS. Standard errors are clustered at the television station level. Dependent variables are in natural logs. All specifications include city population as a control, an indicator for city population missing, and year and newspaper fixed effects. Only markets with a single newspaper are included. The total number of newspapers is slightly lower than the sum of morning and evening newspapers because of frequency changes (i.e., morning newspapers becoming evening newspapers, or the opposite).

Table D.10: Advertising: Monopoly markets

	Ad Prices			Local Advertising			National Advertising			Classified Advertising		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
TV	-0.033***	-0.022	-0.033***	0.004	0.089*	-0.005	-0.021	0.109	-0.045**	0.004	0.040	-0.000
	(0.011)	(0.030)	(0.010)	(0.020)	(0.049)	(0.021)	(0.021)	(0.066)	(0.021)	(0.027)	(0.072)	(0.028)
Year & Newspaper FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sample	All	Morning	Evening	All	Morning	Evening	All	Morning	Evening	All	Morning	Evening
R-sq	0.96	0.94	0.94	0.76	0.82	0.71	0.85	0.85	0.78	0.84	0.85	0.81
R-sq (within)	0.34	0.20	0.39	0.19	0.29	0.18	0.32	0.30	0.33	0.19	0.21	0.19
Observations	15,012	2,652	12,353	9,488	1,199	8,283	9,498	1,198	8,294	9,417	1,191	8,220
Clusters (TVStation)	190	105	167	178	75	160	178	75	160	178	74	160
Nb of newspapers	901	185	739	768	130	647	768	130	647	765	129	645

Notes: * p<0.10, ** p<0.05, *** p<0.01. The time period is 1944-1964. Models are estimated using OLS. Standard errors are clustered at the television station level. Dependent variables are in natural logs. All specifications include city population as a control, an indicator for city population missing, and year and newspaper fixed effects. Only markets with a single newspaper are included. The total number of newspapers is slightly lower than the sum of morning and evening newspapers because of frequency changes (i.e., morning newspapers becoming evening newspapers, or the opposite).

Table D.11: Newspaper content: Poisson Regression – Monopoly markets

	(1) Total text	(2) National wire	(3) Local original	(4) Local wire	(5) Photos	(6) Editorials	(7) Nb pages	(8) Matlab total	(9) Matlab mean
main									
TV	-0.071**	-0.079	-0.103***	-0.052	-0.041	-0.042	-0.015	-0.132**	-0.081*
	(0.030)	(0.049)	(0.031)	(0.069)	(0.060)	(0.058)	(0.027)	(0.064)	(0.045)
Date FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓
Newspaper FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	2,991	2,991	2,991	2,991	2,991	2,991	6,388	6,388	6,388
Clusters (TVStation)	60	60	60	60	60	60	47	47	47
Nb of newspapers	97	97	97	97	97	97	68	68	68
Marginal Effect	-8.40	-2.22	-6.14	-0.54	-0.48	-0.32	-0.24	-14.77	-0.62

Notes: * $p<0.10$, ** $p<0.05$, *** $p<0.01$. The time period is 1946-1955. Models are estimated using a Poisson regression. An observation is a newspaper-date. Standard errors are clustered at the television station level. All specifications include city population as a control, an indicator for city population missing, and date and newspaper fixed effects. Only markets with a single newspaper are included.

Table D.12: Readership: At most "one newspaper per frequency" (morning or evening) markets

	Subscription price			Circulation		
	(1)	(2)	(3)	(4)	(5)	(6)
TV	-0.039**	-0.045**	-0.035**	-0.029**	0.003	-0.031**
	(0.016)	(0.021)	(0.016)	(0.013)	(0.018)	(0.013)
Year & Newspaper FEs	✓	✓	✓	✓	✓	✓
Sample	All	Morning	Evening	All	Morning	Evening
R-sq	0.52	0.54	0.52	0.99	0.99	0.98
R-sq (within)	0.17	0.19	0.17	0.45	0.43	0.46
Observations	17,164	3,524	13,633	17,164	3,524	13,633
Clusters (TVStation)	196	128	180	196	128	180
Nb of newspapers	1,029	261	801	1,029	261	801

Notes: * p<0.10, ** p<0.05, *** p<0.01. The time period is 1944-1964. Models are estimated using OLS. Standard errors are clustered at the television station level. Dependent variables are in natural logs. All specifications include city population as a control, an indicator for city population missing, and year and newspaper fixed effects. Only markets with at most "one newspaper per frequency" (morning or evening) are included. The total number of newspapers is slightly lower than the sum of morning and evening newspapers because of frequency changes (i.e., morning newspapers becoming evening newspapers, or the opposite).

Table D.13: Advertising: At most "one newspaper per frequency" (morning or evening) markets

	Ad Prices			Local Advertising			National Advertising			Classified Advertising		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
TV	-0.025**	-0.005	-0.027***	0.002	0.075*	-0.007	-0.020	0.090	-0.043**	0.002	0.047	-0.001
	(0.011)	(0.026)	(0.010)	(0.019)	(0.045)	(0.020)	(0.021)	(0.061)	(0.020)	(0.027)	(0.063)	(0.028)
Year & Newspaper FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sample	All	Morning	Evening	All	Morning	Evening	All	Morning	Evening	All	Morning	Evening
R-sq	0.97	0.95	0.95	0.76	0.82	0.71	0.85	0.86	0.79	0.84	0.85	0.81
R-sq (within)	0.34	0.23	0.39	0.19	0.25	0.18	0.32	0.29	0.33	0.19	0.19	0.19
Observations	16,474	3,397	13,070	9,794	1,330	8,457	9,798	1,327	8,464	9,722	1,321	8,394
Clusters (TVStation)	194	126	177	179	83	164	179	83	164	179	82	164
Nb of newspapers	1,024	257	799	819	160	671	817	159	670	815	158	669

Notes: * p<0.10, ** p<0.05, *** p<0.01. The time period is 1944-1964. Models are estimated using OLS. Standard errors are clustered at the television station level. Dependent variables are in natural logs. All specifications include city population as a control, an indicator for city population missing, and year and newspaper fixed effects. Only markets with at most "one newspaper per frequency" (morning or evening) are included. The total number of newspapers is slightly lower than the sum of morning and evening newspapers because of frequency changes (i.e., morning newspapers becoming evening newspapers, or the opposite).

Table D.14: Robustness check: Readership: Controlling for State-year FEs

	Subscription price			Circulation		
	(1)	(2)	(3)	(4)	(5)	(6)
TV	0.003	0.002	0.005	-0.023**	0.021	-0.032***
	(0.008)	(0.016)	(0.009)	(0.009)	(0.017)	(0.010)
Newspaper FEs	✓	✓	✓	✓	✓	✓
State-Year FEs	✓	✓	✓	✓	✓	✓
Sample	All	Morning	Evening	All	Morning	Evening
R-sq	0.68	0.76	0.68	0.99	1.00	0.99
R-sq (within)	0.01	0.01	0.00	0.06	0.05	0.06
Observations	19,088	3,728	15,191	19,088	3,728	15,191
Clusters (TVStation)	197	125	180	197	125	180
Nb of newspapers	1,110	248	882	1,110	248	882

Notes: * p<0.10, ** p<0.05, *** p<0.01. The time period is 1944-1964. Models are estimated using OLS. Standard errors are clustered at the television station level. Dependent variables are in natural logs. All specifications include city population as a control, an indicator for city population missing, categorical variables for the number of newspapers in the market, and state-year and newspaper fixed effects. The total number of newspapers is slightly lower than the sum of morning and evening newspapers because of frequency changes (i.e., morning newspapers becoming evening newspapers, or the opposite).

Table D.15: Robustness check: Advertising: Controlling for State-year FEs

	Ad Prices			Local Advertising			National Advertising			Classified Advertising		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
TV	-0.017**	0.020	-0.022***	-0.019	0.063	-0.026	-0.027	-0.029	-0.045***	0.007	0.100	0.003
	(0.007)	(0.022)	(0.008)	(0.026)	(0.057)	(0.024)	(0.017)	(0.064)	(0.016)	(0.026)	(0.062)	(0.026)
Newspaper FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
State-Year FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sample	All	Morning	Evening	All	Morning	Evening	All	Morning	Evening	All	Morning	Evening
R-sq	0.97	0.97	0.97	0.78	0.87	0.75	0.87	0.91	0.82	0.86	0.88	0.84
R-sq (within)	0.01	0.01	0.02	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01
Observations	18,296	3,562	14,561	10,337	1,077	8,975	10,337	1,073	8,977	10,255	1,064	8,912
Clusters (TVStation)	196	124	179	183	64	167	183	64	167	183	64	167
Nb of newspapers	1,098	242	875	812	107	687	811	107	686	808	106	686

Notes: * p<0.10, ** p<0.05, *** p<0.01. The time period is 1944-1964. Models are estimated using OLS. Standard errors are clustered at the television station level. Dependent variables are in natural logs. All specifications include city population as a control, an indicator for city population missing, categorical variables for the number of newspapers in the market, and state-year and newspaper fixed effects. The total number of newspapers is slightly lower than the sum of morning and evening newspapers because of frequency changes (i.e., morning newspapers becoming evening newspapers, or the opposite).

Table D.16: Robustness check: Readership, Using Grade A signal contours

	Subscription price			Circulation		
	(1)	(2)	(3)	(4)	(5)	(6)
TV	-0.032**	-0.048**	-0.024*	-0.048***	-0.003	-0.056***
	(0.015)	(0.022)	(0.014)	(0.018)	(0.019)	(0.018)
Year & Newspaper FEs	✓	✓	✓	✓	✓	✓
Sample	All	Morning	Evening	All	Morning	Evening
R-sq	0.53	0.56	0.53	0.99	0.99	0.98
R-sq (within)	0.16	0.17	0.16	0.45	0.42	0.48
Observations	12,225	3,128	9,088	12,225	3,128	9,088
Clusters (TVStation)	190	123	169	190	123	169
Nb of newspapers	749	220	556	749	220	556

Notes: * p<0.10, ** p<0.05, *** p<0.01. The time period is 1944-1964. Models are estimated using OLS. Standard errors are clustered at the television station level. Dependent variables are in natural logs. All specifications include city population as a control, an indicator for city population missing, categorical variables for the number of newspapers in the market, and year and newspaper fixed effects. The total number of newspapers is slightly lower than the sum of morning and evening newspapers because of frequency changes (i.e., morning newspapers becoming evening newspapers, or the opposite).

Table D.17: Robustness check: Advertising, Using Grade A signal contours

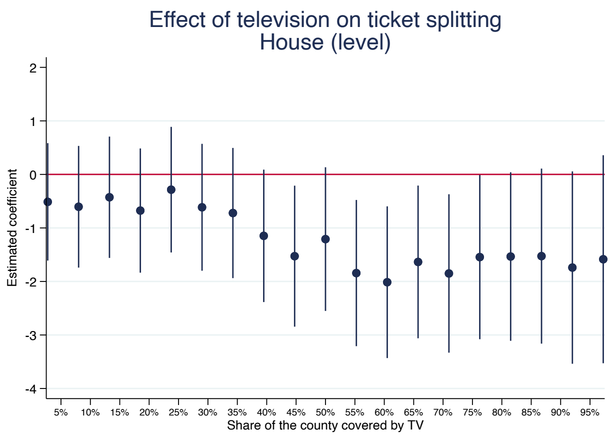
	Ad Prices			Local Advertising			National Advertising			Classified Advertising		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
TV	-0.024*	-0.019	-0.020*	0.010	0.049	0.006	-0.028	0.061	-0.054*	-0.032	-0.084	-0.018
	(0.012)	(0.025)	(0.011)	(0.024)	(0.089)	(0.025)	(0.029)	(0.094)	(0.028)	(0.031)	(0.099)	(0.033)
Year & Newspaper FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sample	All	Morning	Evening	All	Morning	Evening	All	Morning	Evening	All	Morning	Evening
R-sq	0.97	0.95	0.96	0.79	0.80	0.75	0.86	0.85	0.80	0.86	0.82	0.85
R-sq (within)	0.35	0.24	0.40	0.23	0.23	0.23	0.31	0.27	0.32	0.22	0.17	0.23
Observations	11,603	2,991	8,603	6,116	986	5,123	6,111	984	5,120	6,085	977	5,101
Clusters (TVStation)	189	121	168	172	72	150	173	72	151	173	72	151
Nb of newspapers	742	216	552	546	119	435	544	118	434	543	117	434

Notes: * $p<0.10$, ** $p<0.05$, *** $p<0.01$. The time period is 1944-1964. Models are estimated using OLS. Standard errors are clustered at the television station level. Dependent variables are in natural logs. All specifications include city population as a control, an indicator for city population missing, categorical variables for the number of newspapers in the market, and year and newspaper fixed effects. The total number of newspapers is slightly lower than the sum of morning and evening newspapers because of frequency changes (i.e., morning newspapers becoming evening newspapers, or the opposite).

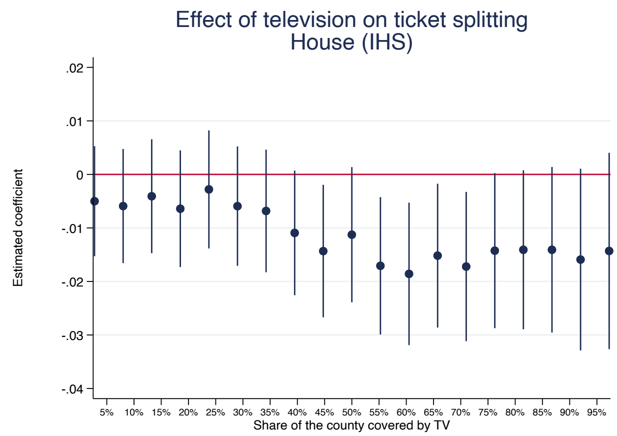
Table D.18: Robustness check: Newspaper content: Poisson Regression, Using Grade A signal contours

	(1) Total text	(2) National wire	(3) Local original	(4) Local wire	(5) Photos	(6) Editorials	(7) Nb pages	(8) Matlab total	(9) Matlab mean
main									
TV	-0.102**	-0.099	-0.110**	-0.203***	-0.090	-0.025	0.002	-0.162**	-0.094*
	(0.045)	(0.064)	(0.054)	(0.075)	(0.085)	(0.086)	(0.037)	(0.073)	(0.057)
Date FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓
Newspaper FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	1,615	1,615	1,615	1,615	1,615	1,615	3,436	3,436	3,436
Clusters (TVStation)	38	38	38	38	38	38	30	30	30
Nb of newspapers	49	49	49	49	49	49	36	36	36
Marginal Effect	-13.83	-3.03	-7.65	-2.34	-1.36	-0.22	0.03	-24.13	-0.70

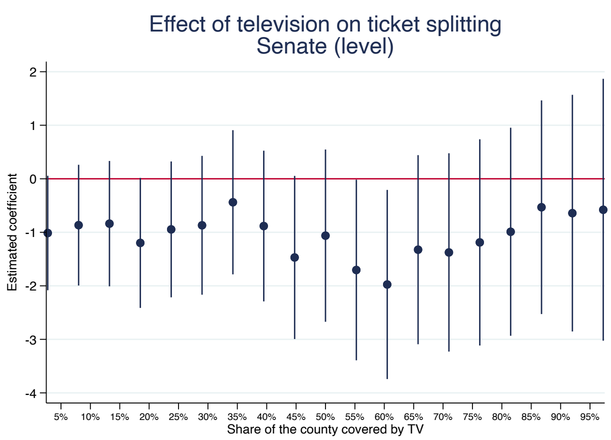
Notes: * $p<0.10$, ** $p<0.05$, *** $p<0.01$. The time period is 1946-1955. Models are estimated using a Poisson regression. An observation is a newspaper-date. Standard errors are clustered at the television station level. All specifications include city population as a control, an indicator for city population missing, categorical variables for the number of newspapers in the market, and date and newspaper fixed effects.



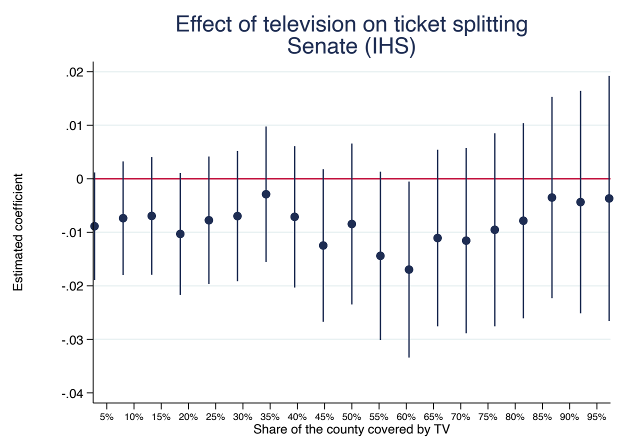
(a) House – level



(b) House – IHS



(c) Senate – level



(d) Senate – IHS

Notes: The figures plot the coefficient associated to TV when estimating the impact of television penetration on ticket splitting, depending on the share of the county covered by television.

Figure D.3: Absolute difference in the vote share for the Democrats between "Local" and Presidential Elections, Depending on the share of the county covered by television

E Theory

E.1 Main Analysis

Virtually all newspapers in our dataset bundle local and national news. Because we are interested in changes in news diets, in what follows we treat local and national news as distinct products and, inspired by the literatures on two-sided markets and bundling,[2,3] we write a simple model of newspaper content choice and pricing which centers on this idea of the newspaper as a bundle. We show that the entry of a pure national news media outlet decreases an incumbent's incentives to provide *both* local and national news. We also show that the incumbent's decrease in content is especially pronounced if bundling is used as a price-discrimination device (as suggested by its widespread use in our data). Although our model is special in several ways, it offers a cautionary tale regarding the production of local news in a more competitive national news market. We analyze and discuss several extensions below.

E.1.1 Setting

There are 2 media outlets – an incumbent ($z = I$) and an entrant ($z = E$) – and 2 products – local news ($k = L$) and national news ($k = N$). I produces $q_{I,L} \in \{\underline{q}, \overline{q}\}$ local news and $q_{I,N} \in \{\underline{q}, \overline{q}\}$ national news, where $\Delta q \equiv \overline{q} - \underline{q} > 0$, and it incurs a fixed cost $F(q_{I,k})$ per product k (where $F(\underline{q}) = 0 \leq F(\overline{q}) = F$). E specializes in national news by supplying an exogenous amount $q_{E,N}$. We refer to consumers of content as 'readers,' although I and E may well rely on distinct media technologies (e.g., television and newspaper). Both outlets sell their content to readers at zero marginal cost. In addition, they sell readers' attention to advertisers (also at zero marginal cost). We denote by p^R_z and p^A_z the prices media outlet z charges readers and advertisers.

Readers There exists a mass 1 of readers, each of whom has taste for news determined by $u_i \sim \mathrm{U}[0,1]$. For simplicity, we assume that reader preferences are independent of advertising.

[2] Bundling allows companies to exploit complementarities in consumption and cost savings in production. Bundling also allows monopolists to extract higher consumer surplus (e.g., Stigler, 1968; Adams and Yellen, 1976; Schmalensee, 1982; McAfee et al., 1984; Bakos and Brynjolfsson, 1999; Chen and Riordan, 2013) and deter entry (e.g., Whinston, 1990; Nalebuff, 2004). For recent empirical work on bundling in media markets see Chu et al. (2011), Crawford and Yurukoglu (2012), and Ho et al. (2012). For more recent theoretical work see also Hurkens et al. (2019).

[3] The model we build incorporates advertising and is thus related to the theoretical literature on two-sided markets (e.g., Caillaud and Jullien, 2001, 2003; Rochet and Tirole, 2003, 2006; Armstrong, 2006; Weyl, 2010). A strand of this literature has modeled media markets specifically (e.g., Gabszewicz et al., 2001, 2004; Gal-Or and Dukes, 2003; Strömberg, 2004; Anderson and Coate, 2005; Armstrong and Wright, 2007; Peitz and Valletti, 2008; Crampes et al., 2009; Esther Gal-Or et al., 2012). Our analysis is also related to empirical studies of two-sided markets (e.g., Rysman, 2004; Jin and Rysman, 2015; Kaiser and Wright, 2006; Kaiser and Song, 2009; Song, 2015).

Readers' tastes for local and national news are perfectly negatively correlated. Reader i enjoys gross payoffs $q_{z,L} + \frac{1}{2}(1 - u_i)$ and $q_{z,N} + \frac{1}{2}u_i$ from consuming local and national news, respectively. Reader i's total payoff from consuming I's bundle is thus equal to $\sum_{k \in \{L,N\}} q_{I,k} + \frac{1}{2} - p_I^R$. Similarly, reader i's payoff from consuming E's national news product is equal to $q_{E,N} + \frac{1}{2}u_i - p_E^R$. We suppose readers can purchase from one media outlet at most and set their outside option equal to zero. Figure E.1 plots readers' gross payoffs (as a function of u_i) from consuming q_L local news, from consuming q_N national news, or from consuming a bundle containing both q_L local and q_N national news.

Advertisers There exists a mass 1 of advertisers, each of whom has a valuation for reader attention determined by $v_j \sim \mathrm{U}[0,1]$. Advertisers' valuations for readers' attention across the local and national news products are perfectly negatively correlated. Let d_z^R denote media outlet z's readership. Advertiser j enjoys payoff $\frac{1}{2}\left(\beta d_z^R + 1 - v_j\right)$ when reaching d_z^R readers consuming local news and payoff $\frac{1}{2}\left(\beta d_z^R + v_j\right)$ when reaching d_z^R readers consuming national news (where $\beta > 0$).[4] Overall, advertiser j's payoff from placing an ad in I's bundle is thus equal to $\beta d_I^R + \frac{1}{2} - p_I^A$. Similarly, advertiser j's payoff from placing an ad in E's product is equal to $\frac{1}{2}\beta d_E^R + \frac{1}{2}v_j - p_E^A$. We suppose advertisers can place ads with one outlet at most and set their outside option to zero. We let d_z^A denote outlet z's quantity of ads. Figure E.2 plots advertisers' gross payoffs (as a function of v_j) from placing an ad that reaches d^R readers consuming local news, from placing an ad that reaches d^R readers consuming national news, or from placing an ad that reaches d^R readers consuming a bundle of local and national news.

We first analyze the monopoly case in which the incumbent is a monopolist in both the local news and national news markets. We then consider entry in the market for national news. In Section E.2.2 we repeat our analysis in the polar case in which readers' and advertisers' individual utility 'shocks' are perfectly positively correlated. Both versions of the model predict a decrease in the provision of local news following entry in the market for national news, but the magnitude of the decrease is larger when preferences across the local and national news products are negatively correlated. This results occurs because bundling serves a price-discrimination purpose only (i) under monopoly and (ii) when preferences across both types of products are negatively correlated and, in turn, because the incumbent has larger incentives to produce content when it extracts a larger share of surplus.

[4] Advertising exhibits constant returns: The benefit from reaching a reader twice (i.e., when she reads local and national news) is twice the benefit from reaching a consumer once (e.g., when she reads local news only).

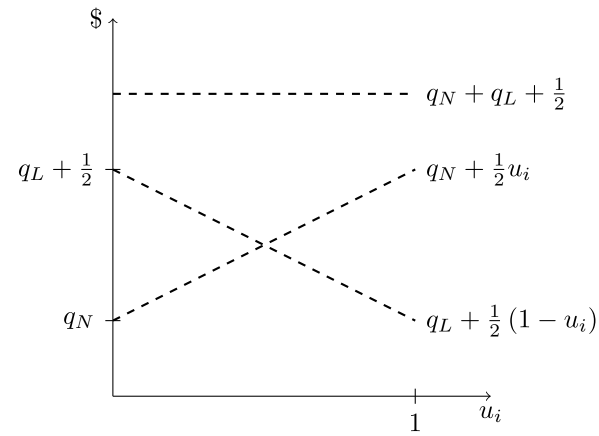


Figure E.1: Readers
The figure plots readers' gross payoff (as a function of their per-product individual utility shock u_i) from consuming a local news product containing q_L news stories (downward-sloping line), a national news product containing q_N news stories (upward-sloping line), and a bundle containing q_L local news stories and q_N national news stories. The figure assumes that $q_L = q_N$. The figure focuses on the case in which the per-product individual utility shocks are perfectly negatively correlated.

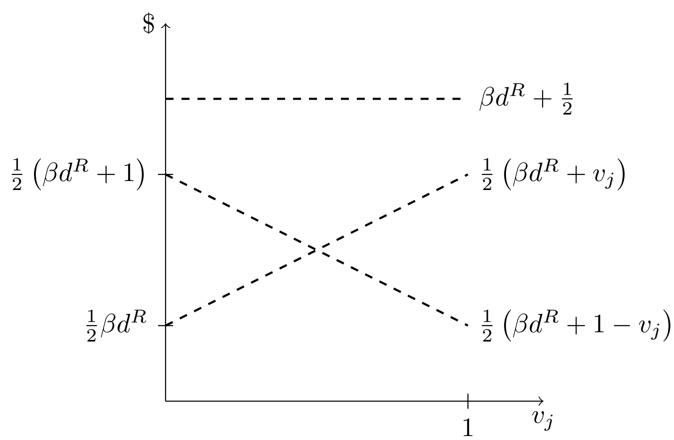


Figure E.2: Advertisers
The figure plots advertisers' gross payoff (as a function of their per-product individual utility shock v_j) from placing an ad that reaches a mass d^R of readers in a local news product (downward-sloping line), in a national news product (upward-sloping line), and in a bundle containing both products (flat line). The figure focuses on the case in which the per-product individual utility shocks are perfectly negatively correlated.

E.1.2 Monopoly

Suppose I is a monopolist on both sides of the local news and national news markets. We impose $\beta < 1$ and $\overline{q} \leq \frac{1}{4}(2+\beta)(1-\beta)$ to ensure that $0 < d_I^A(\cdot), d_I^R(\cdot) \leq 1$ in equilibrium. All readers' and advertisers' valuations for the bundle are homogeneous (see Figures E.1 and E.2). As a result, I is able to serve all consumers and extract the entire consumer surplus on both sides of the market for any choices $q_{I,L}$ and $q_{I,N}$ it makes.

Lemma 1 *The incumbent finds it optimal to set* $p_I^R = \sum_{k\in\{L,N\}} q_{I,k} + \frac{1}{2}$ *and* $p_I^A = \beta + \frac{1}{2}$*, and its revenues are equal to* $\pi_I^M = \sum_{k\in\{L,N\}} q_{I,k} + 1 + \beta$*. Finally, the incumbent sets* $(q_{I,L}, q_{I,N}) = (\overline{q}, \overline{q})$ *if* $F \leq \tilde{F}^M \equiv \triangle q$ *and otherwise* $(q_{I,L}, q_{I,N}) = (\underline{q}, \underline{q})$*.*

Raising one product's quantity increases reader surplus by an amount equal to $\triangle q$. Because I serves all readers and extracts the entirety of reader surplus, it thus sets $q_{I,k} = \overline{q}$ if and only if $F \leq \tilde{F}^M = \triangle q$. We now show that entry in the market for national news lowers the incumbent's incentives to produce content.

E.1.3 Entry

E enters the market for national news. I chooses its content $(q_{I,L}, q_{I,N})$ in a first stage and I and E set their prices (p_z^R, p_z^A) simultaneously in a second stage. We focus on outcomes such that (i) both media outlets are active on both sides of the market and (ii) all readers and advertisers make a purchase. To this end, we impose $\sum_{k\in\{L,N\}} q_{I,k} - q_{E,N} \in \left(\frac{1}{2}\left(-2-\beta+2\beta^2\right), \frac{1}{2}\left(1-\beta-4\beta^2\right)\right)$; that is, we limit the superiority in content any outlet can achieve relative to its rival. We also impose $\beta < \frac{1}{5}$, which ensures positive profits.[5]

We now compute the demand functions. The marginal reader $\tilde{u}$ is given by:

$$\begin{aligned} &\sum_{k\in\{L,N\}} q_{I,k} + \frac{1}{2} - p_I^R = q_{E,N} + \frac{1}{2}\tilde{u} - p_E^R \quad \Rightarrow \\ &d_I^R\left(p_I^R, p_E^R, q_{I,L}, q_{I,N}\right) = \tilde{u} = 2\left(\frac{1}{2} + \sum_{k\in\{L,N\}} q_{I,k} - q_{E,N} + p_E^R - p_I^R\right). \end{aligned} \tag{1}$$

Similarly, the marginal advertiser $\tilde{v}$ is found using condition:

$$\begin{aligned} &\beta d_I^R + \frac{1}{2} - p_I^A = \frac{1}{2}\beta\left(1 - d_I^R\right) + \frac{1}{2}\tilde{v} - p_E^A \quad \Rightarrow \\ &d_I^A\left(p_I^A, p_E^A, d_I^R\right) = \tilde{v} = 2\left(\frac{1}{2} + \beta\left(\frac{3}{2}d_I^R - \frac{1}{2}\right) + p_E^A - p_I^A\right). \end{aligned} \tag{2}$$

[5] These restrictions guarantee both (i) that E finds it optimal to enter and (ii) that I finds it optimal not to exit following E's entry. This region of parameter values is a subset of that considered in the monopoly case. To ensure nonnegative prices, the condition above is replaced by the tighter condition $\sum_{k\in\{L,N\}} q_{I,k} - q_{E,N} \in \left(\frac{5\beta(1+\beta)-9\beta^3-2}{2\left(1-3\beta^2\right)}, \frac{1+12\beta^3-4\beta(1+\beta)}{2\left(1-3\beta^2\right)}\right)$.

Consumers differ in the extent to which they prefer one outlet over the other by an amount equal to a random variable uniformly distributed over the $\left[0, \frac{1}{2}\right]$ interval. As a result, our duopoly setting amounts to a vertical differentiation environment in which the value taken by $\sum_{k\in\{L,N\}} q_{I,k} - q_{E,N}$ determines the identity of the 'high quality' firm (c.f. Whinston, 1990).

In the pricing stage, I chooses $\left(p_I^R, p_I^A\right)$ to maximize $\pi_I^D = p_I^R d_I^R(\cdot) + p_I^A d_I^A(\cdot)$ and E chooses $\left(p_E^R, p_E^A\right)$ to maximize $\pi_E^D = p_E^R\left(1 - d_I^R(\cdot)\right) + p_E^A\left(1 - d_I^A(\cdot)\right)$. The next lemma states I's solution. Its proof, as well as the expressions for all the listed thresholds and E's prices and revenues, can be found in Appendix E.2.1. In what follows, let $\Delta\tilde{q} \equiv \sum_{k\in\{L,N\}} q_{I,k} - q_{E,N}$.

Lemma 2 *In the equilibrium of the pricing game, the incumbent finds it optimal to set:*

$$p_I^R = \frac{\gamma_I + 2\left(1 - 3\beta^2\right)\Delta\tilde{q}}{6\left(1 - 2\beta^2\right)}, \quad p_I^A = \frac{\mu_I + 2\beta\Delta\tilde{q}}{6\left(1 - 2\beta^2\right)}, \tag{3}$$

where γ_I, μ_I are positive constants. The incumbent's revenues are equal to:

$$\pi_I^D = \frac{\kappa_I + \left(4 - 3\beta^2\right)\Delta\tilde{q} + 2\Delta\tilde{q}^2}{9\left(1 - 2\beta^2\right)}, \tag{4}$$

where κ_I is a positive constant.

I's prices are increasing in its own provision of local and national news and decreasing in E's offering of national news. The following lemma analyzes I's incentives to produce content. Its proof can be found in Appendix E.2.1.

Lemma 3 *The incumbent chooses $(q_{I,L}, q_{I,N}) = (\overline{q}, \overline{q})$ if:*

$$F \leq \tilde{F}^D \equiv \frac{\left(4 - 3\beta^2\right)\Delta q + 4\left(\overline{q}^2 - \underline{q}^2 - q_{E,N}\Delta q\right)}{9\left(1 - 2\beta^2\right)}. \tag{5}$$

Otherwise, it chooses $(q_{I,L}, q_{I,N}) = \left(\underline{q}, \underline{q}\right)$.

The higher the amount of national news supplied by E is (and/or the higher its quality is), the lower the prices I is able to charge readers and advertisers, and thus the lower are its incentives to produce local and national news. The following proposition summarizes the impact of E's entry on I's prices and content, helping us rationalize the empirical findings presented in Sections 4 and 5.[6] Its proof (as well as the proof of Corollary 2 below) can be found in Appendix E.2.5.

Proposition 1 *In the equilibrium of the duopoly game, the incumbent (i) produces a weakly lower amount of local and national news $q_{I,L}$ and $q_{I,N}$ (i.e., $\tilde{F}^M - \tilde{F}^D > 0$) and (ii) charges lower reader and advertising prices compared to the equilibrium of the monopoly game.*

[6] Predictions regarding the impact of E's entry on I's readership and quantity of advertising are ambiguous. Intuitively, E's entry leads to a fall in I's readership and advertising if $\sum_{k\in\{L,N\}} q_{I,k} - q_{E,N}$ is sufficiently low, that is, if E's content is sufficiently superior. We do not report the exact conditions for the sake of brevity.

Entry in the market for national news reduces both reader and advertising prices. This effect, in turn, lowers I's incentives to expand demand by producing either type of content.[7]

We assumed that I is better off selling local and national news as a pure bundle. Lemma E.2 in Section E.2.4 shows that bundling is strictly optimal in the monopoly case because consumers' valuations for the local and national news products are perfectly negatively correlated. Bundling is especially profitable given the two-sided nature of the newspaper industry: it allows I (i) to reduce the dispersion in readers' valuations for content and (ii) to sell a 'bundle of readers' to advertisers, thereby reducing the dispersion in their valuations also. Overall, bundling allows I to extract the whole consumer surplus and, therefore, creates strong incentives to produce content.

In Section E.2.2, we solve for the polar case of perfect positive correlation in which the local and national news products are effectively no longer distinct products. Bundling under monopoly becomes only weakly optimal and does not raise I's incentives to produce content (see Lemma E.1 in Section E.2.3). By contrast, the duopoly case is identical independently of the correlation in consumers' tastes for both products, because competition removes I's ability to use bundling as a price discrimination device.[8] Thus, although we find that E's entry reduces I's incentives to produce content in both cases, the effect is stronger if valuations are negatively correlated.[9]

To summarize, we find that increased competition for readers and advertisers in the market for national news decreases the incumbent's incentives to produce local news. This negative effect is especially pronounced if the bundling of local and national news is strictly optimal under monopoly, which, although we cannot directly test empirically, is indirectly suggested by its widespread use by the newspapers in our data.

Corollary 2 *The difference $\tilde{F}^M - \tilde{F}^D$ is higher when the values attached to the local and national news products are perfectly negatively correlated.*

[7] Note that it is sufficient for only one price to decrease following television entry (either the reader price or the advertising price) for the results stated in Proposition 1 to continue to qualitatively hold. If, for example, for some exogenous reasons, reader prices cannot decrease, newspapers would still have lower incentives to produce content following television's entry due to lower advertising prices.

[8] Under bundling, the dispersion in consumers' valuations for the bundle relative to E's product is determined by a random variable uniformly distributed over the $\left[0, \frac{1}{2}\right]$ interval (see (1) and (2)). If it was to sell local and national news independently, I would enjoy monopoly profits in the market for local news and engage in Bertrand pricing in the market for national news. The dispersion in consumers' valuations over its local news product would again be determined by a random variable uniformly distributed over $\left[0, \frac{1}{2}\right]$. Bundling local and national news, therefore, cannot help I extract greater consumer surplus by reducing the per-product dispersion in valuations. Nevertheless, bundling is optimal when it allows I to soften competition in the market for national news by vertically differentiating itself from E (Whinston, 1990; Nalebuff, 2004). Sufficient conditions that ensure the optimality of bundling under competition are $2\underline{q} > \frac{2}{5} + \overline{q}$ and $\beta < \frac{1}{10}$.

[9] Note that, as is standard, bundling is profitable as long as valuations are not too positively correlated. Thus, our finding that the fall in local news should be particularly severe in case bundling serves a price-discrimination motive holds more generally than the extreme case of perfect negative correlation assumed here.

We conclude this section by discussing how the model relates to several features of our empirical application.

Heterogeneous costs of content production. For simplicity, we have assumed identical production technologies for local and national news. In our empirical context, producing original local news was much more expensive than printing syndicated national stories. Modifying the setting to allow for higher costs of producing local news would lead I to reduce local news by a weakly greater amount following entry in the market for national news. In the extreme, if the cost of printing extra national news is independent of the total number of stories (e.g., because, as in our application, the newspaper relies entirely on its subscription to a wire service for its national news), the entry of a national news outlet may have little to no effect on the incumbent's provision of national news. A newspaper would cease to print national news only if the revenues it loses by doing so are more than offset by the subscription fee.

Distinct advertising technologies. The model endows incumbent and entrant with identical advertising technologies. Television was likely a far superior advertising platform. Not surprisingly, generalizing the model in this direction would make the fall in the incumbent's production of content even more pronounced.

Entertainment. In our application, television stations and newspapers offered not only news but also entertainment. Generalizing the model to allow for (i) newspapers to include entertainment in their bundle and (ii) television stations to bundle entertainment alongside national news would not modify our main predictions. Entry in the market for national news and entertainment news would lower the incumbent newspaper's incentives to produce all contents, including local news. If anything, we would expect an ever larger decrease in the provision of local news following television's entry because the quality-enhancing effect of bundling is even stronger under monopoly if newspapers include entertainment in their bundle. Finally, much like for national news, we would expect the decrease in newspapers' provision of local news to be more pronounced than that in entertainment news because newspapers relied on wire agencies for the latter type of content.

Superior national news content and multihoming. As discussed in the main text, it is likely that newspapers' coverage of national and international events during our time period was perceived as superior compared to television's by most consumers. Capturing this feature in the model is akin to reducing $q_{E,N}$ and increasing $\Delta\tilde{q}$, which would dampen but not reverse newspapers' incentives to decrease their provision of local and national news following television's entry. The higher the relative quality of newspapers' content the lower the downward pressure on newspapers' subscription and advertising prices and, in turn, the lower the reduction in newspapers' incentive to produce content.

Relatedly, it is plausible that a large number of newspaper readers adopted television without canceling their newspaper subscriptions (e.g., because of newspaper's superior coverage of national news). Similarly, some advertisers may have found it beneficial to reach consumers through both types of media. Explicitly modeling multihoming on both sides of the industry in our setting would complicate the analysis significantly. We conjecture that allowing readers and advertisers to buy both media outlets' products would reduce price competition and, therefore, dampen but not reverse incumbents' incentives to decrease their provision of local news following television's introduction.

Multiple newspapers and television stations. Roughly 10% of our newspaper markets are oligopolies. How does the model's predictions change if multiple newspapers compete for subscription and advertising revenues prior to television's entry? We conjecture that modifying the model to allow for competition between newspapers would lead to lower prices and, in turn, to lower incentives to produce content prior to television entry.[10] As a result, all else equal, the negative effect of television entry on newspaper content would be qualitatively unchanged but quantitatively lower.[11] By contrast, allowing for entry by multiple television stations in the market for national news would exacerbate the negative shock on incumbent newspapers and lead to weakly stronger decreases in newspaper content.

E.2 Proofs and Additional Results

E.2.1 Proofs of Lemma 2 and Lemma 3

We begin by stating the expressions for the thresholds listed in Lemma 2 and below:

$$\begin{aligned} \gamma_I &= 2 + 9\beta^3 - 5\beta - 5\beta^2, & \mu_E &= 1 - \beta - 3\beta^2, \\ \gamma_E &= 1 + 12\beta^3 - 4\beta - 4\beta^2, & \kappa_I &= \frac{1}{2}\left(8 + 9\beta^3 - 14\beta^2 - 4\beta\right), \\ \mu_I &= 2 + \beta - 3\beta^2, & \kappa_E &= \frac{1}{2}\left(2 + 18\beta^3 - 2\beta^2 - 7\beta\right). \end{aligned}$$

Condition $\beta \leq \frac{1}{5}$ ensures these thresholds are positive. Also, E's equilibrium prices are:

[10] To avoid cut-throat price competition (in a two-sided markets with network effects), the model would also need to be modified to include an element of horizontal differentiation across newspapers. Note also that we are implicitly assuming that competing newspapers would continue to find it optimal to bundle local and national news, as seems to be the case in our dataset.

[11] Naturally, oligopoly markets differ from monopoly markets (e.g., higher demand, more advertising, etc.) in ways that would also matter for the effect of television entry on outcomes.

$$p_E^R = \frac{\gamma_E + 2\left(1-3\beta^2\right)\left(q_{E,N} - \sum_{k\in\{L,N\}} q_{I,k}\right)}{6\left(1-2\beta^2\right)}, \tag{6}$$

$$p_E^A = \frac{\mu_E + 2\beta\left(q_{E,N} - \sum_{k\in\{L,N\}} q_{I,k}\right)}{6\left(1-2\beta^2\right)}, \tag{7}$$

where $\gamma_E, \mu_E > 0$.

Further, E's profits are equal to:

$$\pi_E^M = \frac{\kappa_E + \left(2-3\beta-6\beta^2\right)\left(q_{E,N} - q_{I,L} - q_{I,N}\right) + 2\left(q_{E,N} - q_{I,L} - q_{I,N}\right)^2}{9\left(1-2\beta^2\right)}. \tag{8}$$

Conditions $\beta \leq \frac{1}{5}$ and $\sum_{k\in\{L,N\}} q_{I,k} - q_{E,N} \in \left(\frac{1}{2}\left(-2-\beta+2\beta^2\right), \frac{1}{2}\left(1-\beta-4\beta^2\right)\right)$ ensure that $\pi_E^M > 0$, that is, that entry by E is rational.

Condition $\beta \leq \frac{1}{5}$ also ensures that both media outlets' objective functions are strictly concave in prices. Differentiating I's profit function with respect to p_I^R and p_I^A, differentiating E's profit function with respect to p_E^R and p_E^A, setting all four first-order derivatives equal to zero, and solving the resulting system of equations for $\left(p_I^R, p_I^A, p_E^R, p_E^A\right)$ yields the expressions stated in Lemma 2 as well as expressions (6), (7), and (8).

Finally, one verifies that $\sum_{k\in\{L,N\}} q_{I,k} - q_{E,N} \in \left(\frac{1}{2}\left(-2-\beta+2\beta^2\right), \frac{1}{2}\left(1-\beta-4\beta^2\right)\right)$ and $\beta \leq \frac{1}{5}$ ensure that:

$$\begin{aligned} d_I^R &= \frac{2+\beta-2\beta^2+2\left(\sum_{k\in\{L,N\}} q_{I,k} - q_{E,N}\right)}{3-6\beta^2} \in (0,1), \\ d_I^A &= \frac{2+\beta-3\beta^2+2\beta\left(\sum_{k\in\{L,N\}} q_{I,k} - q_{E,N}\right)}{3-6\beta^2} \in (0,1). \end{aligned} \tag{9}$$

The proof for the derivation of $\tilde{F}^D$ (Lemma 3) is almost identical to that for $\tilde{F}^M$ provided below in the proof of Lemma 4 (using expression (4) instead of (12)).

E.2.2 Perfect Positive Correlation

We solve the version of the model in which readers and advertisers' valuations for the local news and national news products are perfectly positively correlated. Reader i enjoys gross payoff $q_{I,k} + \frac{1}{2}(1-u_i)$ per-product $k = L, N$ when reading I's bundle. Reader i's total payoff from consuming I's bundle is thus equal to $\sum_{k\in\{L,N\}} q_{I,k} + (1-u_i) - p_I^R$. Similarly, reader i's payoff from consuming E's national news product is equal to $q_{E,N} + \frac{1}{2}(1-u_i) - p_E^R$. Figure E.3 plots readers' gross payoffs (as a function of u_i) from consuming q_L local news, from consuming q_N national news product, or from consuming a bundle containing both q_L local and q_N national news. Further, advertiser j enjoys payoff $2 \times \frac{1}{2}\left(\beta d_I^R + 1 - v_j\right) - p_I^A$ when placing an ad in I's bundle, where $\frac{1}{2}\left(\beta d_I^R + 1 - v_j\right)$ represents the per-product k payoff and $\beta > 0$ the importance attached to readership. Further, advertiser j's payoff from placing an ad in E's product is equal to $\frac{1}{2}\beta d_E^R + \frac{1}{2}(1 - v_j) - p_E^A$. Figure E.4 plots advertisers' gross payoffs (as a function of v_j) from placing an ad that reaches d^R readers consuming local news, from placing an ad that reaches d^R readers consuming national news, or from placing an ad that reaches d^R readers consuming a bundle of local and national news. The setting is otherwise identical to that described above.

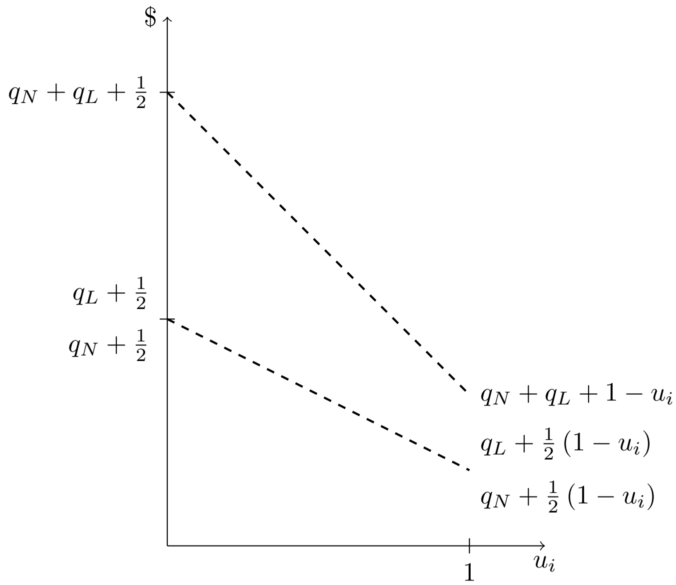


Figure E.3: Readers

The figure plots readers' gross payoff (as a function of their per-product individual utility shock u_i) from consuming either a local news product or a national news product (lower downward-sloping line), and from consuming a bundle containing both products (higher downward-sloping line). The figure assumes that $q_L = q_N$. The figure focuses on the case in which the per-product individual utility s hocks are perfectly positively correlated.

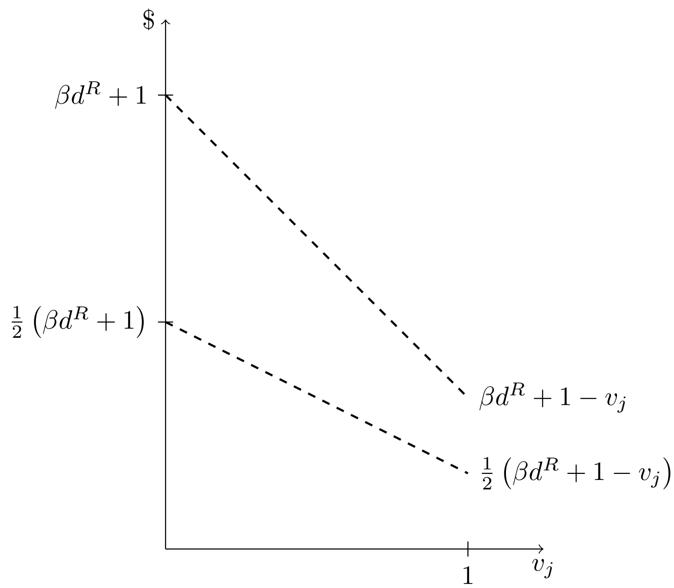


Figure E.4: Advertisers

The figure plots advertisers' gross payoff (as a function of their per-product individual utility shock v_j) from placing an ad that reaches a mass d^R of readers in either a local news product or a national news product (lower downward-sloping line), and from placing an ad in a bundle containing both products (higher downward-sloping line). The figure focuses on the case in which the per-product individual utility shocks are perfectly positively correlated.

Monopoly. I chooses $\left(q_{I,L}, q_{I,N}, p_I^A, p_I^R\right)$ to maximize its profits:

$$\begin{aligned}\pi_I^M &= p_I^R d_I^R\left(q_{I,L}, q_{I,N}, p_I^R\right) + p_I^A d_I^A\left(q_{I,L}, q_{I,N}, p_I^R, p_I^A\right) - \sum_{k\in\{L,N\}} F\left(q_{I,k}\right) \qquad (10)\\ &= p_I^R\left(1 + q_{I,L} + q_{I,N} - p_I^R\right) + p_I^A\left(1 + \beta\left(1 + q_{I,L} + q_{I,N} - p_I^R\right) - p_I^A\right) - \sum_{k\in\{L,N\}} F\left(q_{I,k}\right).\end{aligned}$$

The next lemma states the solution. Its proof follows.

Lemma 4 *Take $(q_{I,L}, q_{I,N})$ as given. The incumbent finds it optimal to set:*

$$p_I^R = \frac{2 - \beta\left(1+\beta\right) + \left(2-\beta^2\right)\sum_{k\in\{L,N\}} q_{I,k}}{4-\beta^2}, \quad p_I^A = \frac{2+\beta+\beta\sum_{k\in\{L,N\}} q_{I,k}}{4-\beta^2}, \qquad (11)$$

and its revenues are equal to:

$$\pi_I^M = \frac{1}{4-\beta^2}\left(\left(2+\beta\right)\left(1 + \sum_{k\in\{L,N\}} q_{I,k}\right) + \left(\sum_{k\in\{L,N\}} q_{I,k}\right)^2\right). \qquad (12)$$

Finally, the incumbent sets $(q_{I,L}, q_{I,N}) = (\overline{q}, \overline{q})$ if $F \leq \tilde{F}^M \equiv \frac{(2+\beta)\triangle q + 2\left(\overline{q}^2 - \underline{q}^2\right)}{4-\beta^2}$ and otherwise $(q_{I,L}, q_{I,N}) = \left(\underline{q}, \underline{q}\right)$.

Producing more news raises revenues through two channels. First, it raises readers' demand for the bundle, and thus also the number of advertisers willing to place ads in it. Second, it allows I to charge higher prices on both sides of the market. Notice that I chooses the same quantity of local and national news. This symmetry occurs because the two products exhibit complementarities, so that raising one product's quantity makes it more profitable to raise the other's. Finally, notice also that I's incentives to produce content are increasing in the weight advertisers put on the size of the readership, captured by β.[12]

Proof of Lemma 4 Condition $\beta < 1$ ensures objective function (10) is strictly concave in $\left(p_I^R, p_I^A\right)$. Differentiating (10) with respect to p_I^R and p_I^A, setting both first-order derivatives equal to zero, and solving the resulting system of equations for $\left(p_I^R, p_I^A\right)$ yields the expressions stated in Lemma 4. Last, setting $(q_L, q_N) = (\overline{q}, \overline{q})$ yields higher profits than $(q_L, q_N) = \left(\underline{q}, \underline{q}\right)$ if and only if $F \leq \tilde{F}_1 \equiv \frac{(2+\beta)\triangle q + 2\left(\overline{q}^2 - \underline{q}^2\right)}{4-\beta^2}$. Similarly, setting $(q_L, q_N) = (\overline{q}, \overline{q})$ yields higher profits than $(q_L, q_N) = \left(\underline{q}, \overline{q}\right), \left(\overline{q}, \underline{q}\right)$ if and only if $F \leq \tilde{F}_2 \equiv \frac{(2+\beta)\triangle q + 3\overline{q}^2 - 2\underline{q}\overline{q} - \underline{q}^2}{4-\beta^2}$. Finally, setting $(q_L, q_N) = \left(\underline{q}, \overline{q}\right), \left(\overline{q}, \underline{q}\right)$ yields higher profits than $(q_L, q_N) = \left(\underline{q}, \underline{q}\right)$ if and only if

[12] Lemma E.1 in Online Appendix E.2.3 shows that bundling is only weakly optimal when valuations are perfectly positively correlated. Because all consumers value the local and national news products identically, I is unable to reduce the per-product dispersion in consumers' valuations through bundling. I's pricing problem is thus unchanged by the bundling of local and national news, and so are its incentives to produce content.

$F \leq \tilde{F}_3 \equiv \frac{(2+\beta)\triangle q+\overline{q}^2+2\underline{q}\overline{q}-3\underline{q}^2}{4-\beta^2}$. Further, $\overline{q} > \underline{q}$ implies that $\tilde{F}_3 < \tilde{F}_1 < \tilde{F}_2$. It follows that setting $(q_L, q_N) = (\overline{q}, \overline{q})$ (resp. $(q_L, q_N) = (\underline{q}, \underline{q})$) when $F \leq \tilde{F}_1$ (resp. $F > \tilde{F}_1$) is optimal. Threshold $\tilde{F}_1$ is labeled as '$\tilde{F}^M$' in Lemma 4. ■

Duopoly To compute demand functions, we characterize the readers and advertisers who are indifferent between the two outlets. The marginal reader $\tilde{u}$ is given by:

$$\begin{aligned}
&\sum_{k\in\{L,N\}} q_{I,k} + 1 - \tilde{u} - p_I^R = q_{E,N} + \frac{1}{2}(1-\tilde{u}) - p_E^R \quad \Rightarrow \\
&d_I^R\left(p_I^R, p_E^R, q_{I,L}, q_{I,N}\right) = \tilde{u} = 2\left(\frac{1}{2} + \sum_{k\in\{L,N\}} q_{I,k} - q_{E,N} + p_E^R - p_I^R\right).
\end{aligned} \tag{13}$$

Similarly, the marginal advertiser is found using condition:

$$\begin{aligned}
&\beta d_I^R + 1 - \tilde{v} - p_I^A = \frac{1}{2}\beta\left(1-d_I^R\right) + \frac{1}{2}(1-\tilde{v}) - p_E^A \quad \Rightarrow \\
&d_I^A\left(p_I^A, p_E^A, d_I^R\right) = \tilde{v} = 2\left(\frac{1}{2} + \beta\left(\frac{3}{2}d_I^R - \frac{1}{2}\right) + p_E^A - p_I^A\right).
\end{aligned} \tag{14}$$

Both demand functions are identical to those derived in the perfect negative correlation case. The solution to I's problem is thus described in Lemma 3 (proven in Appendix E.2.1). The next proposition corresponds to Proposition 1 for the case of perfect positive correlation.

Proposition 3 *Suppose consumers' valuations for the local and national news products are perfectly positively correlated. In the equilibrium of the duopoly game, the incumbent (i) produces a weakly lower amount of local and national news $q_{I,L}$ and $q_{I,N}$ and (ii) charges lower reader and advertising prices compared to the equilibrium of the monopoly game.*

Proof of Proposition 3 Using Lemma 2 and Lemma 4, I charges lower reader prices under duopoly than monopoly if and only if the following inequality holds:

$$\begin{aligned}
&\frac{2-\beta(1+\beta)+\left(2-\beta^2\right)\sum_{k\in\{L,N\}} q_{I,k}}{4-\beta^2} \\
\geq\ &\frac{2+9\beta^3-5\beta-5\beta^2+2\left(1-3\beta^2\right)\left(\sum_{k\in\{L,N\}} q_{I,k} - q_{E,N}\right)}{6\left(1-2\beta^2\right)}.
\end{aligned} \tag{15}$$

Anticipating the fact that I chooses weakly lower values of $(q_{I,L}, q_{I,N})$ under duopoly than monopoly (see below), inequality (15) is verified because both (i) $\frac{2-\beta(1+\beta)}{4-\beta^2} > \frac{2+9\beta^3-5\beta-5\beta^2}{6(1-2\beta^2)}$ and (ii) $\frac{2-\beta^2}{4-\beta^2} > \frac{1\left(1-3\beta^2\right)}{3(1-2\beta^2)}$ hold when $\beta \leq \frac{1}{5}$. Similarly, I charges lower advertising prices under duopoly than monopoly if and only if:

$$\frac{2+\beta+\beta\sum_{k\in\{L,N\}}q_{I,k}}{4-\beta^2}\geq\frac{2+\beta-3\beta^2+2\beta\left(\sum_{k\in\{L,N\}}q_{I,k}-q_{E,N}\right)}{6\left(1-2\beta^2\right)}. \tag{16}$$

Again anticipating the fact that I chooses weakly lower values of $(q_{I,L},q_{I,N})$ under duopoly than monopoly, conditions $\sum_{k\in\{L,N\}}q_{I,k}-q_{E,N}\in\left(\frac{1}{2}\left(-2-\beta+2\beta^2\right),\frac{1}{2}\left(1-\beta-4\beta^2\right)\right)$ and $\beta\leq\frac{1}{5}$ ensure that inequality (16) always holds.

Finally, I chooses a weakly lower value of $(q_{I,L},q_{I,N})$ under duopoly if and only if:

$$\tilde{F}^M=\frac{(2+\beta)\triangle q+2\left(\overline{q}^2-\underline{q}^2\right)}{4-\beta^2}>\tilde{F}^D=\frac{\left(4-3\beta^2\right)\Delta q+4\left(\overline{q}^2-\underline{q}^2-q_{E,N}\Delta q\right)}{9\left(1-2\beta^2\right)}. \tag{17}$$

Inequality (17) always holds because (i) $\frac{2+\beta}{4-\beta^2}>\frac{4-3\beta^2}{9(1-2\beta^2)}$ and (ii) $\frac{2}{4-\beta^2}>\frac{4}{9(1-2\beta^2)}$ when $\beta\leq\frac{1}{5}$.

E.2.3 Lemma E.1 and Proof

Lemma E.1 *In the perfect positive correlation case, bundling is only weakly optimal and does not modify the incumbent's incentives to produce content.*

Proof Suppose I sells each product k separately, for $k=L,N$. It sets $\left(p^R_{I,k},p^A_{I,k}\right)$ to maximize:

$$\pi_k=p^R_{I,k}2\left(q_{I,k}+\frac{1}{2}-p^R_{I,k}\right)+p^A_{I,k}2\left(\frac{1}{2}\beta d^R_{I,k}+\frac{1}{2}-p^A_{I,k}\right)-F\left(q_{I,k}\right). \tag{18}$$

Setting $p^R_{I,k}=\frac{1}{2}\frac{2-\beta(1+\beta)+2\left(2-\beta^2\right)q_{I,k}}{4-\beta^2}$ and $p^A_{I,k}=\frac{1}{2}\frac{2+\beta+2\beta q_{I,k}}{4-\beta^2}$ is optimal and I's per-product profits are equal to $\frac{1}{2}\frac{(2+\beta)\left(1+2q_{I,k}\right)+4q^2_{I,k}}{4-\beta^2}$. In turn, I finds it optimal to set $q_{I,k}=\overline{q}$ if and only if $F\leq\frac{(2+\beta)\triangle q+2\left(\overline{q}^2-\underline{q}^2\right)}{4-\beta^2}$. Comparing these expressions to those stated in Lemma 4 yields Lemma E.1's results. ■

E.2.4 Lemma E.2 and Proof

Lemma E.2 *In the perfect negative correlation case, bundling is strictly optimal and raises the incumbent's incentives to produce content.*

Proof Suppose first that I sells local and national news separately, by setting $q_{I,L}=q_{I,N}=q\in\left\{\underline{q},\overline{q}\right\}$. I's corresponding profits are equal to $\frac{(2+\beta)(1+2q)+4q^2}{4-\beta^2}$. Suppose now that I sells local and national news as a bundle, also by setting $q_{I,L}=q_{I,N}=q$. I's profits are then equal to $2q+1+\beta$. We show that $2q+1+\beta>\frac{(2+\beta)(1+2q)+4q^2}{4-\beta^2}$, thereby establishing the strict optimality of bundling. The latter inequality can be rewritten as:

$$\frac{(2+\beta)(1+2q)}{4-\beta^2} < 2q\left(1-\frac{2q}{4-\beta^2}\right)+1+\beta. \tag{19}$$

Using condition $\overline{q} < \frac{1}{4}(2+\beta)(1-\beta)$, one derives that a sufficient condition for inequality (19) to obtain is given by:

$$\frac{(2+\beta)(1+2q)}{4-\beta^2} < \frac{6-\beta^2+\beta}{4-\beta^2}q+1+\beta. \tag{20}$$

Inequality (20) always holds because (i) $1+\beta > \frac{2+\beta}{4-\beta^2}$ and (ii) $\frac{6-\beta^2+\beta}{4-\beta^2}q > \frac{2(2+\beta)}{4-\beta^2}q$ when $\beta < 1$. It follows that bundling is strictly optimal.

We now show that bundling always increases I's incentives to produce content. Under bundling, I sets $q_{I,L} = q_{I,N} = \overline{q}$ if and only if $F \leq \overline{q} - \underline{q}$. Similarly, under separate sales, I sets $q_{I,L} = q_{I,N} = \overline{q}$ if and only if $F \leq \frac{(2+\beta)\triangle q+2\left(\overline{q}^2-\underline{q}^2\right)}{4-\beta^2}$. It follows that I's incentives to produce content are greater under bundling than separate sales if and only if $\overline{q}-\underline{q} \geq \frac{(2+\beta)\triangle q+2\left(\overline{q}^2-\underline{q}^2\right)}{4-\beta^2}$. If $\underline{q} < \overline{q}$, the latter inequality holds as long as $\underline{q}+\overline{q} \leq \frac{1}{2}\left(2-\beta^2-\beta\right)$, which itself always holds because $\overline{q} \leq \frac{1}{4}(2+\beta)(1-\beta)$ necessarily. ■

E.2.5 Proofs of Proposition 1 and Corollary 2

Comparing the expressions stated in Lemma 4 and Lemma 1, one shows – using condition $\overline{q} \leq \frac{1}{4}(2+\beta)(1-\beta)$ – that I charges higher advertising and reader prices in the case of perfectly negative correlation compared to the case of perfectly positive correlation (under monopoly). Given Proposition 3, it follows that I charges higher prices under monopoly than duopoly also in the perfectly negative correlation case. Finally, we prove the statement whereby I chooses a weakly lower value of $(q_{I,L}, q_{I,N})$ under duopoly than monopoly. Lemma E.2 establishes that $\triangle q$ is higher than the left-hand side of (17). It follows that I's incentives to produce content are higher under monopoly than duopoly also in the case of perfect negative correlation. It also follows from Lemma E.2 that the difference between $\tilde{F}^M$ and $\tilde{F}^D$ is in fact higher in the case of perfect negative correlation, thereby establishing Corollary 2.

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