Do Local Owners Deliver More Localism?
Some Evidence From Local Broadcast News

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Abstract

Stromberg (forthcoming) and George and Waldfogel (2002) suggest
that information consumed at the local level has substantial
political-economic consequences. We estimate the impact of local
ownership on the number of local news seconds and local on-
location news seconds during each station's half-hour local news
broadcast. OLS results suggest that local ownership adds almost
five and one-half minutes of local news, and over three minutes of
local on-location news. These findings may have policy implications
for both Congress and the Federal Communications Commission.

1. Introduction

On August 20, 2003, the Federal Communications Commission (FCC) announced the launch of a 'Localism Task Force' to evaluate the performance of broadcasters in local markets. At that time, FCC Chairman Michael Powell stated:

> I created the Localism Task Force to evaluate how broadcasters are serving their local communities. Broadcasters must serve the public interest, and the Commission has consistently interpreted this to require broadcast licensees to air programming that is responsive to the interests and needs of their communities.

Given that the recent work of Stromberg (forthcoming) and George and Waldfogel (2002) demonstrates the importance of *local news* content on political-economic outcomes, the FCC's localism initiative and ownership policies may have implications for news content and resultant political-economic outcomes.

It seems, therefore, that economists and policymakers would benefit from exploring possible effects of ownership structure on local news content. Perhaps surprisingly, very little is known about the effect of ownership structure on news content, and even less is known about the effect of ownership structure on the local focus of news content. To help fill this void, we construct a measure of localism and analyze the actual *output* of local broadcast news stations and then relate our measure of local content back to ownership structure. Employing a large, granular database of broadcast news stories, we observe news stories that we then categorize (using necessary and sufficient conditions) as local or non-local. Then, controlling for all unobservable market characteristics, we explore the relationship between station characteristics, including ownership characteristics, and total news content and local news content.

Our study suggests that locally owned television broadcast stations air more local news than network owned-and-operated and non-locally owned stations, even adjusting for the number of stations owned by the corporate parent. We find that local ownership of television stations adds almost five and one-half minutes of local news and over three minutes of local on-location news.

An explicit theory relating local broadcast news content and ownership characteristics is well beyond the space considerations of this paper. However, we suggest several plausible reasons why some owners might produce more local content.

Economies of scale in program distribution favor non-local content. Simply, given a fixed cost of producing news content, multi-station owners can spread those fixed costs over more stations by distributing the same content across many localities. This content will be non-local for most localities. It is possible that owners with a single station or very few stations cannot capture these efficiencies, and thus a smaller owner has a higher cost of providing non-local content. This higher cost, ceteris paribus, induces a smaller owner to favor local content.[1]

Even after adjusting for scale effects, a local owner may still cover more local news for other reasons. First, local owners may have a lower relative cost of accessing local advertisers. If there exist complementarities between local news coverage and local advertising, this may induce the local owner to favor local programming.[2] Second, because of the owner's physical proximity to actual local events, a local owner may have relatively lower monitoring costs for local news content than a non-local owner, which may increase the number of local news seconds.[3] Finally, a local owner may have additional local interests that drive their local news coverage. For example, if the local owner also develops real estate locally, they may cover the local zoning board in a way that favors the owner's real estate interests.

Each of these reasons likely influences the local content of broadcast news.[4] As we note below, this finding may have implications for broadcast ownership rules.

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[1] FCC rulemakings and public information given by television and radio broadcasters during merger applications often include efficiencies as a motivating factor. We are simply taking this explanation at face value.

[2] Brown and Cavazos (2004) find that advertisers prefer certain content on national network prime time programming.

[3] The (generic) plausibility of this agency explanation is not contradicted by recent events at the New York Times and USA Today, in which reporters appear to have inaccurately covered a number of stories, in part because the reporter did not go on location.

[4] It is worth noting that non-local content may be more appealing to viewers than local content.

Extant literature relating to localism has explored, among other things, the implications of, and possible linkages between, structure, broadcast content, and economic, social, and political outcomes. Political and cultural rationales for localism includes the works of Briffault (1988, 1990), Bernard (1973), Donner (1998), Neuman (1991), Morgan (1986), Collins (1980), Pateman (1970), Emig (1995), all of which Napoli (1997a, 1998a, 2001) neatly summarizes. Much of this output focuses on distinctive cultural values and traditions within local communities and the function media plays in reinforcing or diminishing these values and traditions. In addition, this literature explores the relationship between localism and the diffusion of political power, and posits media organizations as critical institutions in the political process. In particular, this literature suggests that media can provide incentives for political participation, as well as information that is (generically) voter-relevant.

Economic contributions relating to ownership structure of the media include Coase (1974), Besley and Burgess (2002), and Besley and Pratt (2002), all of whom suggest that a competitive market structure induces greater accuracy in the reporting of news. Mullainathan and Shleifer (2003) suggest that competition in media does not produce greater accuracy in reporting (one can think of competition as being a necessary, but not sufficient condition); rather, a taste for content heterogeneity among consumers (within a competitive market environment) produces a convergence to some "average truth."

Perhaps of more importance for this project, two recent economic studies illustrate the potential political-economic implications in the provision of local news. George and Waldfogel (2002) find that an increase in local penetration by the New York Times decreases local penetration by the local newspaper, reducing local news content, and participation in local elections. This result provides empirical evidence that consumption of local media may confer consumption externalities. In addition, Stromberg (forthcoming) explores the introduction of a new source of information, specifically radio, and the flow of federal funds in the New Deal era. According to Stromberg, radio improved the relative ability of rural America to attract government transfers; the funds allocated to a rural county, relative to an identical urban county, increased by approximately 50%

after the introduction of radio in those counties. Simply put, Stromberg finds that radio's role in informing voters had a large and significant influence relating to the actual local destinations of federal funds. Given the explorations of Coase (1974), Besley and Burgess (2002), Besley and Pratt (2002), and Mullainathan and Shleifer (2003) relating to the importance of ownership structure, as well as the work of Stromberg (forthcoming) and George and Waldfogel (2002) that suggest the importance of local news content on political-economic outcomes, we take a natural next step in the analysis - examining the effect of ownership structure, if any, on local news content.

We organize the paper as follows. In Section Two, we introduce our measure of localism. In Section Three, we discuss our data and methodology. In Section Four, we present our results. In Section Five, we discuss our results. In Section Six, we make some concluding remarks.

2. A Definition and Measure of Localism

As we noted above, in this paper we utilize a new database of actual news stories broadcast on local television news and establish a set of necessary and sufficient conditions for defining a given news story as local.

Our definition and measure of localism is determined, in part, by the delineation of designated market areas (DMA) as determined by Nielsen Media Research, an independent, third-party audience measurement system. According to Nielsen, "In designing the DMA regions, Nielsen Media Research uses proprietary criteria, testing methodologies and data to partition regions of the United States into geographically distinct television viewing areas, and then expresses them in unique, carefully defined regions that are meaningful to the specific business we conduct."[5] The "specific business" referred to above is the sale of advertising time and space to advertisers. According to the California Newspaper Publishers Association:

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[5] Federal Communications Commission document, letter from Nielsen Media Research to the Commission, April 3, 2003, 98-206. Geographic continuity is a standard feature of all 210 DMAs except three.

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DMA is a term used by advertising agencies to define specific geographical areas where groups of people tend to live, work and conduct their normal day-to-day activities similar to others in the same general region. DMA boundaries are often defined by significant geographical changes in a region's landscape such as mountain ranges, deserts, or sparsely populated areas. These "natural barriers" often tend to create different and unique lifestyles among entire populations of people, creating unique and identifiable designated market areas. Each DMA generally has its own unique market characteristics and measurable consumer media usage patterns used by media buyers to help identify the newspapers, TV and radio stations most likely to reach the audience targeted by the client.[6]

In what follows, we base our measure of localism on the conceptual framework established by the construction of designated market areas. Thus, the "necessary" part of our necessary and sufficient conditions for localism is that the story takes place within the DMA.

A second element of localism, our "sufficient" condition, concerns the news stories themselves, i.e., when is a story reported by a station within the DMA a "local" story? Our decision rule is that the story is local if the story is of at least marginally greater importance to the mean individual residing within the DMA, and if we believe the mean individual within the DMA would identify the story as local. Thus, it is the value of the story to the individual within a DMA, and that individual's perception of the story as local relative to individuals in other DMAs, that gives the story its "sufficient" local context.[7]

For example, Federal budget negotiations in Washington, D.C., take place within that DMA and, given the large population of local interested parties, the mean individual in the Washington, D.C., DMA is likely more interested in the Federal budget negotiations than the mean individual in other DMAs. However, even the mean individuals in the Washington, D.C., DMA would likely perceive the Federal budget negotiations as a national issue. Hence, Federal budget

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[6]California Newspaper Publishers Association, http://www.cnpa.com/snap/dma_map.htm

[7] Everyday weather and sports were not included in the original data set, and are not reflected in our analysis. However, exceptional weather events (e.g., tornado, avalanche, heat wave, sandstorm, blizzard, fire, flood, earthquake, hurricane, typhoon, tsunami, meteor impacts), were covered as news.

negotiations are classified as non-local even within the Washington, D.C., DMA. Note that these "hard cases" are the exception rather than the rule.

3. Data and Methodology

Our database consists of 4,078 individual news stories measured in seconds, from five different days and sixty stations across 20 DMAs.

The data, all from 1998 local news broadcasts, were obtained from the University of Delaware, and were originally gathered by the Project for Excellence in Journalism (hereafter PEJ).[8] According to the PEJ, "market selection was performed based on Nielsen Media Research market rankings. Markets were grouped into four quartiles on the basis of the number of television households in each. Markets were then chosen randomly within each quartile, after stratification in order to ensure geographic diversity. Within each market, the highest-rated half-hour timeslot for news was studied." In Table One, we list the DMAs and their market size ranking.

We categorized each story as either local or non-local, based on the necessary and sufficient criteria given in Section 3.[9] We also categorized the stories as to whether the station utilized live location reporting on those stories. This yielded 275 station-level observations on the number of total news seconds, the number of local news seconds, and the number of local live location seconds.[10]

We adjust for all circumstance of "time and place" by creating a series of 97 dummy variables that interact the day and the DMA.[11] These dummies adjust for all DMA characteristics, including market size. Because we have DMA day dummies, and all of the stations in a given DMA on a given day share the same time slot, our DMA dummy completely accounts for all time slot variation. This

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[8] www.localtvnews.org

[9] We classified the news clips before we observed the station characteristics (or even the stations) that comprise our set of independent variables.

[10] Not every station was in the sample on every day, which is why we obtain 275 (not 300) station level observations. Appendix A displays the list of stations, their DMAs, and their owners. In addition, Appendix A lists the means, minima, and maxima of the number of total news seconds, local news seconds, and local live location news seconds.

[11] Not all DMAs are present in every sample day; therefore we have a total of 98 DMA day pairs (rather than 100).

allows us to adjust for all unobserved heterogeneity created by events on any particular day in any particular DMA (e.g., a fire in Wichita on March 9th).

We regress the number of seconds of total news, local news, and on-location local news on thirteen station characteristics, which we list and describe in Table Two.[12] All data on station characteristics is derived from the May 1998 BIA Television Database and the website www.business.com.

Before discussing our specifications and results, we first introduce the characteristics (see Table Two) and give a brief discussion regarding our priors on the anticipated signs of the regression coefficients.

1. Owned and Operated. Owned-and-operated refers to stations that are owned-and-operated by a network itself. For example, KNBC in Los Angeles is owned-and-operated by NBC. Ex-ante, owned-and-operated stations may air more or less total news because they have a lower cost of non-local content relative to non-owned and operated stations, which may lead to more total news. However, owned-and-operated stations may face a greater demand for advertising time, which might lead them to air more advertisements and less total news. Given our conjecture about the relative cost of local to non-local programming, an owned-and-operated station would air fewer seconds of local news. We do not have a prior regarding local live location news seconds. Owned-and-operated stations may air less local live location news seconds because they may air fewer local news seconds in total. However, some may contend that owned-and-operated stations may have more resources with which to go on location.

2. Owned DMAs. Owned DMAs refers to the total number of DMAs in which the owner owns a station. The advantages of having stations in many DMAs may be similar to the advantage of being network owned-and-operated. A many station owner may enjoy lower costs for non-local content and may be able

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[12] Our sample consists of stations from a stratified random sample of markets. We can consistently estimate the effect of our exogenous variables on localism, because any possible sample selection takes place on an independent variable, and our independent variables are exogenous. As Wooldridge (2002, p.555) notes: "When x is exogenous and we apply OLS to the selected sample...we can select the sample on the basis of explanatory variables." Since the selection indicator does not correlate with the dependent variable (which means that $E(u|x,s)=0$), our estimates are consistent.

to access a larger group of advertisers. Therefore, our expectation is similar to owned-and-operated in the case of total news seconds. We anticipate, given our conjecture about the relative cost of local to non-local programming, that increasing the number of owned DMAs decreases local news seconds. Finally, local live-location seconds may increase or decrease in the number of owned DMAs.

3. Local Owner. Local owner refers to the location of the corporate headquarters of the broadcaster. We define a local owner as one whose headquarters is within the DMA.[13] Given that owned and operated and owned DMAs captures the effects of our cost story, we cannot explain the effect of local ownership on total, local, and local on-location news seconds using a cost-based explanation. However, in a principal-agent context, a local owner may have relatively lower monitoring costs for local news content than a non-local owner, which may increase the number of local and local on-location news seconds. In addition, a local owner may have other economic interests within the community that generate greater levels of local news coverage - if a local owner's real estate interests are affected by the local zoning board, that may effect coverage of the zoning board. Finally, if local owners have a lower relative cost of accessing local advertisers and if there are complementarities between local advertising and local news coverage, we would expect a local owner to produce more local news coverage.

4. Owns Newspapers. Owns newspapers refers to the case where the broadcaster owns one or more newspapers outside the DMA. Our priors in this instance are that the television broadcaster would produce less local news, more or less total news, and likely, less live location, since the broadcaster would reduce costs by utilizing news stories covered by the non-local newspaper.

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[13] This approach is similar to that used by PEJ. According to PEJ, "we defined a local owner as one whose headquarters is located in the metropolitan area of the station. For example, Sinclair Broadcast Group would be a local owner for its Baltimore, Maryland station WBFF, but not for its St. Louis station, KDNL. "

5. Cross Radio. Cross radio refers to the case where the broadcaster owns a radio station within the DMA. In this case, we are uncertain about complementarities that might be derived from cross-radio ownership. It is possible that television and radio are complements in news production, the strength of which may differ across non-local and local news. In addition, television news and radio news may be complements or substitutes in consumption. The strength of those relationships may also vary across non-local, local, and on-location local news. Therefore, we have no priors on cross-radios effect on total, local, and local on-location news.

6. UHF. UHF proxies the signal strength of the station. If the stations signal is weak, that may change the stations incentives in news production. Our prior is that stations with weaker signals produce more local news. We have no prior on total and on-location local news.

7. Local Owner * Owned DMAs. (Local owner) * (owned DMAs) refers to the number of DMAs in which a local owner owns stations. Ex-ante, we believe a local owner with stations in other DMAs may cover more local news to send to their stations in other DMAs. Conversely, owning stations in more DMAs may change a local owner's relative monitoring costs between local and non-local news content. In addition, owning stations in more DMAs may change a local owner's joint optimization between local news and other business interests. Finally, owning stations in other DMAs may change the composition of advertisers that the local owner accesses. If complementarities exist between advertising and news content, this could change the composition of news content. Therefore, we have no prior on this variable's effect on total, local, and local on-location news content.

8. Local Owner * Owns Newspapers. Ex-ante, we believe a local owner with at least one newspaper in another DMA may cover more local news to send to their newspaper in another DMA. Conversely, owning a newspaper in another DMA may change a local owner's relative monitoring costs between local and non-local news content. In addition, owning a newspaper in another DMA may change a local owner's joint optimization between local news coverage and

other business interests. Finally, owning a newspaper in another DMA may change the composition of advertisers that the local owner accesses. If complementarities exist between advertising and news content, this could change the composition of news content. Therefore, we have no prior on this variable's effect on total, local, and local on-location news content.

9. Local Owner * Cross Radio. Ex-ante, directional complementarities may interact with lower monitoring costs for local owners to induce a greater level of local news production on television. If a local television station owner has lower monitoring costs for local news and local news across television and radio is a substitute (complement) in consumption for media consumers and/or advertisers, then acquisition of a local radio station could lead to less (more) local television news coverage. In addition, owning a radio station within the DMA may change a local owner's joint optimization between local news coverage and other business interests. Therefore, we do not have a prior on the expected sign.

10. Owned Radio. Owned radio refers to the case where an owner owns a radio station in another DMA. Ex-ante, we think that the cost of non-local coverage drops across the entirety of the geographically diverse media holdings. Hover, directional complementarities may lead the television station owner to distribute both local and non-local news to the radio station in the other DMA. Thus, we would expect more total news and an ambiguous effect on local news.

11. Owned Radio DMAs. Owned radio DMAs refers to the number of DMAs in which an owner owns a radio station. For the same reason suggested in (10), we do not expect an increase in local content as a television owner expands their radio presence to a progressively greater number of DMAs.

12. Local Owner * Owned Radio. This is an interaction dummy indicating whether a local owner owns a radio station outside the DMA. Ownership of a radio station elsewhere could raise a local owner's monitoring cost of local news and/or could lower a local owner's monitoring costs of non-local news. These factors could lead to less local news and more/less total news. With directional complementarities, ownership of a radio station outside the DMA could interact with the local owner's lower monitoring costs of local news to

induce more local news production. In addition, owning a radio station in another DMA may change a local owner's joint optimization between local news and other business interests. Therefore, we do not have a prior regarding the sign of this coefficient.

13. Local Owned * Owned Radio DMAs. The effect of owning radio stations in more DMAs, may amplify the effects we outline in (12). However, the degree of amplification may vary across the different types of news coverage; thus, we do not have a prior.

14. Local Owned * Cross Radio * Owned Radio DMAs. A triple interactive term. This is an interaction of the interactive effects outlined in (9) and (13). A priori, we cannot know which factors dominate.

Finally, one important concern relating to nearly all empirical studies is sample selection. In our study, we observe news seconds for only those stations airing local news during our sampled time slot. If local ownership decreases the likelihood of airing a local news program (because local owners do not enjoy the cost advantages in non-local news content that may stem from non-local ownership), this could bias standard regression estimates.

However, we observe all of the original three network affiliates/O&Os in our sample DMAs. This is not surprising, as the original three networks air national news broadcasts and air a 10:00PM-11:00PM hour of network programming, both of which provide their local stations with two unique characteristics that lead all of these stations to air local news at particular times during the day. This implies that if we did observe all of the characteristics of all of the stations in all of our markets and ran a first-stage Heckman selection probit, being an "original three" network O&O/affiliate (or, equivalently, having the unique characteristics thereof) would be a perfect predictor of selection success. We can therefore employ a sample consisting only of "original three" network affiliates and employ standard regression techniques, because the inverse mills ratio derived from the first-stage Heckman selection probit would not vary among these observations.

4. Specification and Results

A. Specifications. We estimate three models: two OLS models estimating the effect of station characteristics on total news seconds and local news seconds and one Tobit model estimating the effect of station characteristics on local on-location news seconds. For the first two models (total news and local news), we also employ robust regression to adjust for possible outliers.[14] Specifically, we estimate:

(1) Total News Seconds $= \alpha_0 + \alpha_1$(Owned & Operated) $+ \alpha_2$(Own Cities) $+ \alpha_3$(Local Owner) $+ \alpha_4$(Owns Newspapers) $+ \alpha_5$(Cross Radio) $+ \alpha_6(UHF) + \alpha_7$(Local Owner * Own Cities) $+ \alpha_8$(Local Owner * Owns Newspapers) $+ \alpha_9$(Local Owner * Cross Radio) $+ \alpha_{10}$(Owned Radio) $+ \alpha_{11}$(Owned RadioCities) $+ \alpha_{12}$(Local Owner * Own Radio) $+ \alpha_{13}$(Local Owner * Owned Radio Cities) $+ \alpha_{14}$(Local Owned * Cross Radio * Owned Radio Cities) $+ X_{DMA-Day} + \varepsilon_\alpha$

(2) Total Local News Seconds $= \beta_0 + \beta_1$(Owned & Operated) $+ \beta_2$(Own Cities) $+ \beta_3$(Local Owner) $+ \beta_4$(Owns Newspapers) $+ \beta_5$(Cross Radio) $+ \beta_6(UHF) + \beta_7$(Local Owner * Own Cities) $+ \beta_8$(Local Owner * Owns Newspapers) $+ \beta_9$(Local Owner * Cross Radio) $+ \beta_{10}$(Owned Radio) $+ \beta_{11}$(Owned RadioCities) $+ \beta_{12}$(Local Owner * Own Radio) $+ \beta_{13}$(Local Owner * Owned Radio Cities) $+ \beta_{14}$(Local Owned * Cross Radio * Owned Radio Cities) $+ X_{DMA-Day} + \varepsilon_\alpha$

(3) Total On Location Local News Seconds $= \varphi_0 + \varphi_1$(Owned & Operated) $+ \varphi_2$(Own Cities) $+ \varphi_3$(Local Owner) $+ \varphi_4$(Owns Newspapers) $+ \varphi_5$(Cross Radio) $+ \varphi_6(UHF) + \varphi_7$(Local Owner * Own Cities) $+ \varphi_8$(Local Owner * Owns Newspapers) $+ \varphi_9$(Local Owner * Cross Radio) $+ \varphi_{10}$(Owned Radio) $+ \varphi_{11}$(Owned RadioCities) $+ \varphi_{12}$(Local Owner * Own Radio) $+ \varphi_{13}$(Local Owner * Owned Radio Cities) $+ \varphi_{14}$(Local Owned * Cross Radio * Owned Radio Cities) $+ X_{DMA-Day} + \varepsilon_\alpha$

B. Results. Table Three reports the results of Regression 1 relating the number of total news seconds to station characteristics. Columns (a) and (b) in Table Three report the OLS and Robust Regression coefficient of each variable, which is the number of seconds of total news added or subtracted by a station characteristic. We discuss only those statistically significant OLS results that are also statistically significant under robust regression.

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[14]To the degree observations are outliers, Robust Regression weights those observations inversely.

Table 3: Total News Seconds. Interpreting the statistically significant OLS results, we find that local ownership adds over 345 seconds (almost six minutes) of total news to the local broadcast.[15] When the owner is local, within-DMA cross-radio ownership subtracts over 373.06 seconds (over six minutes) of total news to the local broadcast.[16] When the owner is local, ownership of stations in additional DMAs lowers total news seconds by almost 17 seconds per additional DMA.[17] Ownership of a radio station in another DMA adds over 80 seconds (over one minute) of total news. Finally, a local owner that owns a within-DMA radio station increases the number of total news seconds by almost 15 per each additional DMA in which they own a radio station. The significance of these results are robust to Robust Regression.

Table 4: Local News Seconds. Table Four reports the results of Regression 2 relating the number of local news seconds to station characteristics. Interpreting the statistically significant results, owned and operated stations air over 128 fewer seconds (over two minutes) of local news. The number of local news seconds declines by over 3 seconds for each DMA in which the owner has a television station. Local owners air over 325 more seconds (over five and one-half minutes) of local news.[18] Finally, if the local owner also owns a radio station within the DMA, the number of seconds of local news declines by over 346.55 seconds (almost six minutes).[19] The significance of these results are robust to Robust Regression.

Table 5: On-Location News Seconds. Table Five reports the results of Tobit Regression 3 relating the number of local on-location news seconds to station characteristics. Column B reports the coefficients from the Tobit regression that includes the weights from the Robust Regression (whose results

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[15] We obtain 345.20 seconds by adding the estimated local owner effect to the estimated (local owner * own DMAs) effect from having a local owner in one city.

[16] We obtain 373.06 seconds by adding the estimated (local owner * cross-radio) effect to the cross-radio effect.

[17] We obtain 16.59 seconds by adding (local owner * owned DMAs) to owned DMAs.

[18] We obtain 325.49 seconds by adding the estimated local owner effect to the estimated (local owner * own DMAs) effect from having a local owner in one city.

[19] We obtain 346.55 seconds by adding the estimated (local owner * cross-radio) effect to the cross-radio effect.

are given in Column (B) of Table Five) as an independent variable. Local on-location news seconds may reflect a greater degree of investment in local news coverage, since on-location reporting requires the dedication of specific assets (e.g., camera crews, reporters, vehicles, etc.). Local ownership adds over 196 local on-location news seconds (over 3 minutes).[20] If the local owner also owns a radio station outside the DMA, the number of local on-location news seconds declines by over 175 (almost three minutes). In addition, local on-location news seconds decrease by almost 8 per additional DMA in which the local owner owns a radio station. Finally, UHF stations air over 48 seconds (almost one minute) more local on-location news seconds.

5. Discussion

The estimates presented in Section 4 suggest that local ownership may have significant implications for local content. In particular, local ownership appears to increase total, local, and local on-location news seconds. Moreover, the increase in total news seconds from local ownership appears to be almost entirely driven by an increase in local news.

While newspaper ownership is not a significant factor, a local television owner who owns a within-DMA radio station appears to produce significantly less local news, possibly because they substitute local radio news for local television news. Comparing results from Table 4 and Table 5, we find that the reduction in local news is not driven by any reduction in local on-location news, which is consistent with our substitution hypothesis.

As we noted, a local owner likely has lower monitoring costs of local events and personnel and can cost-effectively cover more local news. Moreover, it is possible that local content is readily substitutable between broadcast television and broadcast radio - in fact, some local content may be better utilized by consumers via radio broadcast (e.g., traffic reports). It is possible that, if television advertising commands a higher price per unit than radio advertising,

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[20] We obtain 196.08 seconds by adding the estimated local owner effect to the estimated (local owner * own DMAs) effect from having a local owner in one city.

ceteris paribus, cross-ownership might induce substitution of local news away from television towards radio.

As a local owner acquires television stations in more DMAs, they produce less total news. The large (albeit statistically insignificant) point estimates from the local news and on-location local news regressions indicate that the decrease in total news may be primarily driven by decreases in local and local on-location news seconds. In addition, owning a radio station in another DMA increases total news seconds. The small and statistically insignificant point estimates from the local and local on-location regressions indicate that much of this increase in total news is driven by increased non-local news coverage. A local owner who owns a local radio station and also owns radio stations in other DMAs increases their total news coverage by almost 15 seconds per radio DMA.

Owned-and-operated broadcast television stations produce less local news, but do not air significantly less total news or local on-location news. Therefore, it appears that owned and operated stations substitute non-local news for local news (that is not on location). This might indicate substitution of network feeds for not-on-location local content. Owned DMAs displays a similar effect. For each additional city, the owner airs over 3 seconds less of local news. However, the addition of DMAs does not appear to reduce local on-location news seconds.

5. Conclusions

We estimate station characteristics' impact on the number of total news seconds, local news seconds, and local on-location news seconds, and find that local ownership adds almost five and one-half minutes of local news and over three minutes of local on-location news. As we noted, local on-location news seconds may reflect a greater degree of actual investment in local news coverage, since on-location reporting requires the dedication of specific assets (e.g., camera crews, reporters, vehicles, etc.).

We suggest that divergent ownership patterns induce differing cost structures, advertising access, and agency problems, each of which, separately

and interactively, produce different levels of local news among these firms. The data we have presented do not contradict this hypothesis. One caveat of note is that because our data consist only of the three original network affiliates/O&Os, we cannot predict the effect of ownership structure on the amount of local news that newer network (FOX, UPN, WB) affiliates/O&Os air.

As we suggested in this paper, the FCC media ownership rule-makings and subsequent Congressional action may affect the composition of local news broadcasts.[21] This may be important, given the work of Stromberg (forthcoming) and George and Waldfogel (2002) that suggest information consumed at the local level has substantial political-economic distributional consequences.

Finally, we generate two testable hypotheses for further research. We first hypothesize that advertisers and/or consumers substitute between radio and television local news content, especially when that local content is not on-location. Therefore, we then hypothesize that joint ownership of a television and radio station by a local owner would increase the amount of local news aired on the radio station.

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[21]This finding has no clear implications for consumer welfare, since we do not explicitly model the relationship between localism and consumer welfare in our paper. However, see Stromberg (forthcoming).

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Table One: Markets and DMA Rank

DMA	Rank	DMA	Rank
New York	1	Buffalo	44
Los Angeles	2	Louisville	48
Chicago	3	Albuquerque	49
Boston	6	Jacksonville	52
Washington, D.C.	8	Wichita	65
Atlanta	10	Tucson	72
Seattle	12	Burlington	91
Minneapolis/St. Paul	14	Evansville	98
Pittsburgh	20	Lansing	107
St. Louis	21	Tallahassee	109

Table Two: Independent Variable Names and Descriptions

Variable	Description
Owned & Operated	Dummy Variable Indicating O&O
Own DMAs	Total Number of DMAs in Which the Station Owner Owns a Station
Local Owner	Dummy Variable Indicating Whether the Station Owner is Headquartered Within the DMA
Owns Newspapers	Dummy Variable Indicating Whether the Station Owner Owns Newspapers in Other DMAs
Cross Radio	Dummy Variable Indicating Whether the Station Owner Owns a Radio Station Within the DMA
UHF	Dummy Variable Indicating Channel Above 13
(Local Owner) * (Own DMAs)	The Total Number of DMAs in Which a Local Station Owner Owns a Station
(Local Owner) * (Owns Newspapers)	Interaction Dummy Indicating a Local Owner That Owns Newspapers in Other DMAs
(Local Owner) * (Cross Radio)	Interaction Dummy Indicating a Local Owner That Owns a Radio Station Within the DMA
Owned Radio	Owns a Radio Station in Another DMA
Owned Radio DMAs	Number of DMAs in Which the Owner Owns a Radio Station
(Local Owner) * (Owns Radio)	Local Owner Who Owns a Radio Station in Another DMA
(Local Owner) * (Owned Radio DMAs)	In How Many DMAs Does a Local Owner Have a Radio Station
(Local Owned)*(Cross-Radio DMAs)	Interacting Two Dummies; A Local Owner Who a Radio Station in that DMA Multiplied by the Number of Radio Station Owned in Total.

Table Three: Number of Total News Seconds to Station Characteristics

Variable	(a) OLS Regression Coefficient (t-statistic)	(b) Robust Regression Coefficient (t-statistic)
Owned & Operated	-59.35	-62.99*
	(-1.43)	(-1.84)
Own DMAs	-3.09**	-0.74
	(-2.22)	(-0.79)
Local Owner	358.70***	269.07***
	(3.73)	(5.52)
Owns Newspapers	-20.23	5.66
	(-0.83)	(0.34)
Cross Radio	-32.63	-45.73
	(-0.79)	(-1.37)
UHF	-6.45	35.76*
	(-0.22)	(1.90)
(Local Owner) * (Own DMAs)	-13.50**	-12.09*
	(-2.15)	(-1.78)
(Local Owner) * (Owns Newspapers)	-53.59	-43.89
	(-0.59)	(-0.50)
(Local Owner) * (Cross Radio)	-340.43***	-208.02***
	(-3.72)	(-3.28)
Owned Radio	80.91***	43.25**
	(2.76)	(2.32)
Owned Radio DMAs	-1.21	0.88
	(-0.59)	(0.75)
Local Owned Radio	-127.51	-96.34
	(-1.57)	(-1.29)
Local Owned Radio DMAs	2.13	2.27
	(0.76)	(0.65)
(Local Owned)*(Cross Radio DMAs)	14.61***	8.69**
	(3.18)	(2.19)
Observations = 275	R^2 = 0.75 Robust Standard Errors	

* = Significant at the 10% Level; ** = Significant at the 5% Level; *** = Significant at the 1% Level

Table Four: Number of Local News Seconds to Station Characteristics

Variable	(A) OLS Regression Coefficient (t-statistic)	(B) Robust Regression Coefficient (t-statistic)
Owned & Operated	-128.28***	-102.16**
	(-2.62)	(-2.01)
Own DMAs	-3.41**	-2.75*
	(-2.12)	(-1.96)
Local Owner	340.05***	165.83**
	(3.40)	(2.30)
Owns Newspapers	-28.77	3.25
	(-0.97)	(0.13)
Cross Radio	15.33	8.18
	(0.32)	(0.17)
UHF	-45.96	-24.30
	(-1.32)	(-0.87)
(Local Owner) * (Own DMAs)	-15.01*	-9.69
	(-1.95)	(-0.96)
(Local Owner) * (Owns Newspapers)	20.94	58.45
	(0.21)	(0.45)
(Local Owner) * (Cross Radio)	-361.78***	-186.33**
	(-3.49)	(-1.98)
Owned Radio	26.29	10.34
	(0.81)	(0.38)
Owned Radio DMAs	1.68	2.11
	(0.80)	(1.21)
Local Owned Radio	-158.41	-98.57
	(-1.53)	(0.89)
Local Owned Radio DMAs	-4.17	-3.72
	(-1.23)	(-0.72)
(Local Owned)*(Cross Radio DMAs)	12.86**	5.13
	(2.46)	(0.87)

Observations = 275	$R^2 = 0.69$
	Robust Standard Errors

* = Significant at the 10% Level; ** = Significant at the 5% Level; *** = Significant at the 1% Level

Table Five: Tobit Regression, Number of Local On-Location News Seconds to Station Characteristics

Variable	(A) Coefficient (t-statistic)	(B) Coefficient (t-statistic) Specification With Weight As An Independent Variable
Owned & Operated	-13.76	-14.67
	(-0.31)	(0.33)
Own DMAs	-0.17	-0.17
	(-0.14)	(-0.14)
Local Owner	209.29***	208.09***
	(3.31)	(3.28)
Owns Newspapers	-10.87	-11.96
	(-0.50)	(0.53)
Cross Radio	-12.88	-13.15
	(-0.30)	(-0.30)
UHF	48.73**	48.83**
	(2.00)	(2.00)
(Local Owner) * (Own DMAs)	-13.21	-13.21
	(-1.51)	(-1.50)
(Local Owner) * (Owns Newspapers)	165.78	166.16
	(1.47)	(1.47)
(Local Owner) * (Cross Radio)	-78.56	-76.33
	(-0.96)	(-0.92)
Owned Radio	4.43	4.57
	(0.19)	(0.19)
Owned Radio DMAs	2.32	2.31
	(1.52)	(1.51)
Local Owned Radio	-175.36*	-177.68*
	(-1.81)	(-1.82)
Local Owned Radio DMAs	-7.66*	-7.57*
	(-1.70)	(-1.68)
(Local Owned)*(Cross Radio DMAs)	8.39	8.31
	(1.64)	(1.61)
Observations = 275	Pseudo R² = 0.07	

* = Significant at the 10% Level; ** = Significant at the 5% Level; *** = Significant at the 1% Level