From Many, One: Cross-Media Ownership and Story Choice in Local News

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Abstract

We develop a model of product choice in media markets and combine the model with a unique data set to explore the effect of cross-media ownership on local broadcasters' provision of local news. We find that newspaper ownership in another city decreases local news stories and increases non-local news stories. Cross-radio ownership decreases local news stories. Radio station ownership in another market increases non-local news stories. WCAX, the sole locally-owned single-station in the sample, airs more local news. WSB, the sole television station in our sample that owns a newspaper within the market, airs more local and non-local news stories.

1 Introduction

Firms, especially media firms, often create a single product by combining different individual sub-products. For example, newspapers combine different articles, comedy shows combine different comedic vignettes, and news programs combine different news stories. Economists have not yet explored how firms choose and combine these sub-products. In short, how do media firms choose and combine media sub-products into products? We model a firm choosing across different types of sub-products and combining them into a single product. While there is a well-developed literature on multi-product firms as such, our model explores the number of sub-products of different types, and the amount of each sub-product.

We test the model using a unique granular data set on local broadcast news stories. The broadcast stations are media firms combining differing types of media sub-products, in this case local and non-local news, into a single product, the local

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news broadcast. The model enables us to infer the effects of broadcast station characteristics on the fixed costs and marginal opportunity costs of local and non-local news. We can therefore estimate the effect of cross-media ownership on the mix of local and non-local stories during the local news broadcast. We find that newspaper ownership in another city raises the marginal opportunity cost of local news and lowers the marginal opportunity cost of non-local news. Cross-radio ownership increases the marginal cost of local news and may increase the fixed cost of non-local news. Radio station ownership in another market lowers the marginal cost of non-local news. WSB, the sole television station in our sample that owns a newspaper within the market, faces lower marginal costs of local news and lower marginal costs of non-local news.

The effects of cross-media ownership on local news matter to policy makers. 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 (2004a) 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 percent after the introduction of radio in those counties. Stromberg finds that radio's role in informing voters had a large and significant influence relating to the actual local destinations of federal funds. Stromberg (2004b) models the effect of increasing returns to scale technology and advertising financing on news provision by mass media. Stromberg finds that mass media firms provide more news to large groups and groups that are valuable to advertisers. According to Stromberg, this may introduce a bias in public policy. Gentzkow (2006) avers that the introduction of television significantly lowered turnout in local elections, because consumers substituted from more informative media to television. According to Gentzkow, the introduction of television explains between one quarter and one half of the reduction in voter turnout since the 1950s.

George and Waldfogel (2002), Stromberg (2004a, 2004b), and Gentzkow (2006) suggest the importance of local news content on political-economic outcomes. We take a natural next step in the analysis by examining the effect of cross-media ownership on local news content.[1]

[1]Alexander and Brown (2004), relate the amount of local and total news aired during local news broadcasts to station and market characteristics. Because Alexander and Brown observe each station on multiple days, they employ market-day interaction fixed effects to control for

2 Model

A station owner chooses the number and length of news stories. Let l_i denote the length of a local story i, $L = \sum l_i$ denote total local news seconds, and n denote the number of local stories. Also let k_j denote the length of a non-local story j, $K = \sum k_i$ denote total non-local news seconds, and m denote the number of non-local stories. The owner's per viewer profit is:

$$\pi = \sum_i bR(l_i) + \sum_j gQ(k_j) - \sum_i c_L l_i - \sum_j c_K k_j - nF_L - mF_K - \delta E(L, K) \quad (1)$$

$$subject\ to\ \sum_i l_i = L,\ \sum_j k_j = K \quad (2)$$

where parameters b, g, c_L, c_K, F_L, F_K, and δ are positive. $R(.)$ and $Q(.)$ are local and national story specific per viewer revenue functions, respectively, with $R(0) = Q(0) = 0$, $R' > 0$, $Q' > 0$, $R'' < 0$, and $Q'' < 0$. $E()$ is a diminishing marginal return function related to total local and non-local news. We assume that $E(0,0) = 0$, $E_L > 0$, $E_K > 0$, $E_{LL} > 0$, $E_{KK} > 0$, and $E_{LL}E_{KK} - E_{LK}^2 > 0$. $E_{LK} > 0$ if local and non-local news are substitutes, and $E_{LK} < 0$ if local and non-local news are complements. c_L is a story specific per viewer marginal cost for local news, F_L is a story specific per viewer fixed cost for local news, c_K is a story specific per viewer marginal cost for non-local news, F_K is a story specific per viewer fixed cost for non-local news, and δ is a diminishing marginal return parameter related to total local and non-local news seconds.

The station equalizes per viewer marginal revenue from each local story; $R'(l_1) = R'(l_2) = ... = R'(l_n)$. [2] For simplicity, we assume that all local stories are identical. This implies that $l = l_i$ for all $i \leq n$. Similarly, assuming that all non-local stories are identical implies that $k = k_j$ for all $j \leq m$. Further, for simplicity, we assume that n and m are continuous. Then, the owner's per viewer profit is:

$$\pi = nbR(l) + mgQ(k) - nc_L l - mc_K k - nF_L - mF_K - \delta E(L, K) \quad (3)$$

$$subject\ to\ nl = L,\ mk = K \quad (4)$$

Simplifying the profit function yields:

unobserved heterogeneity across markets and days. For example, market-day fixed effects would control for market size and even news events that affected all of the stations in a given market on a given day. Alexander and Brown provide some evidence that local owners may produce more local news.

[2] If the marginal revenues from local stories are not equal, the broadcasting firm could increase its total revenue by reducing the length of a lower marginal revenue story and increasing the length of a higher marginal revenue story.

$$\pi(l, L, k, K) = bL\frac{R(l)}{l} + gK\frac{Q(k)}{k} - c_L L - c_K K - F_L\frac{L}{l} - F_K\frac{K}{k} - \delta E(L, K) \quad (5)$$

Assuming there is an interior solution, we derive the first-order conditions.[3]

$$bL\frac{R'(l)l - R(l)}{l^2} + L\frac{F_L}{l^2} = 0 \quad (6)$$

$$b\frac{R(l)}{l} - c_L - \frac{F_L}{l} - \delta E_L(L, K) = 0 \quad (7)$$

$$gK\frac{Q'(k)k - Q(k)}{k^2} + K\frac{F_K}{k^2} = 0 \quad (8)$$

$$g\frac{Q(k)}{k} - c_K - \frac{F_K}{k} - \delta E_K(L, K) = 0 \quad (9)$$

We assume that the per viewer profit function is strictly concave. Then, the first order conditions are necessary and sufficient. The first term in condition (**??**) is a change in total revenue from increasing the length of a local story by one unit while keeping the length of total local seconds constant. The second term in condition (**??**) is a change in local fixed costs due to a one-unit increase of local story length. Note that the optimal story length is not a function of total local news seconds. The reasons for this result are that we assumed all stories are identical and revenue derived from each story is independent from the lengths of other stories.[4] The first term in condition (**??**) is the marginal revenue from increasing total local news seconds by one unit. The last three terms in condition (**??**) are changes in costs from increasing total local news seconds by one unit. The interpretation of conditions (**??**) and (**??**) are symmetric to the interpretation of the first two first order conditions.

Next, we consider comparative statics results.[5] For convenience, denote $X(l) = R(l)/l$ and $Y(k) = Q(k)/k$. This implies that $X'(l) = (R'(l)l - R(l))/l^2$ and $Y'(k) = (Q'(k)k - R(k))/k^2$. We note that $X'(l) < 0$ because $R'(l) < R(l)/l$ for a concave function passing through the origin. By symmetry, $Y'(k) < 0$. Also note that condition (**??**) implies that $-l^2/X'(l) = b/F_L$ and condition (**??**) implies that $-k^2/Y'(k) = g/F_K$. Thus, optimal story length is a function of the revenue to

[3]Note that $\pi_2 \leq 0$ if $L = 0$ and $\pi_4 \leq 0$ if $K = 0$.

[4]More specifically, note that per viewer profit condition can be rewritten as:

$$\pi(l, L, k, K) = L(b\frac{R(l)}{l} - \frac{F_L}{l}) + gK\frac{Q(k)}{k} - c_L L - c_K K - F_K\frac{K}{k} - \delta E(L, K) \quad (10)$$

Obtain the optimal l by maximizing $b\frac{R(l)}{l} - \frac{F_L}{l}$, which is not a function of L.

[5]The derivation of the results is omitted from the main text.

cost ratios b/F_L for local news and g/F_K for non-local news. The effects of the local story revenue parameter b on local story length and total local news seconds are:

$$\frac{dl}{db} = \frac{-X'(l)L}{\pi_{11}} < 0 \tag{11}$$

$$\frac{dL}{db} = \frac{X(l)E_{KK}}{\delta(E_{LL}E_{KK} - E_{KL}^2)} > 0 \tag{12}$$

The intuition for the above conditions is as follows. If the local story revenue parameter increases,the local story's revenue to fixed ratio cost increases. Thus, the station owner responds by having more but shorter local news stories. Since the marginal benefit from local news stories increases in b, the station owner increases total local news seconds.

$$\frac{dk}{db} = 0 \tag{13}$$

$$\frac{dK}{db} = \frac{-X(l)E_{LK}}{\delta(E_{LL}E_{KK} - E_{KL}^2)} \tag{14}$$

The sign of the derivative in condition (**??**) is negative if local and non-local news are substitutes and positive if local and non-local news are complements. If local and non-local news are substitutes, then the station owner substitutes local news for non-local news when marginal benefits from local stories increase. Note that the length of a non-local story is not affected because the non-local story's revenue to fixed cost ratio does not change when a local story revenue parameter changes.

Applying the chain rule shows how the number of stories is affected by the local news benefit parameter.

$$\frac{dn}{db} = \frac{d(L/l)}{db} = (1/l)\frac{dL}{db} - (L/l^2)\frac{dl}{db} > 0 \tag{15}$$

$$\frac{dm}{db} = \frac{d(K/k)}{db} = (1/k)\frac{dK}{db} \tag{16}$$

Since an increase in b increases the revenue to fixed cost ratio for local news, the station owner responds by airing more local stories. The sign of the derivative in condition (**??**) is negative (positive) if local and non-local news are substitutes (complements).

Next, we consider how a change in the local story per viewer fixed cost (F_L) affects the length and the number of stories. The direction of these effects are opposite to the direction of the effects of the local news revenue parameter.

$$\frac{dl}{dF_L} = \frac{-L/l^2}{\pi_{11}} > 0 \tag{17}$$

$$\frac{dL}{dF_L} = \frac{-E_{KK}/l}{\delta(E_{LL}E_{KK} - E_{KL}^2)} < 0 \tag{18}$$

$$\frac{dk}{dF_L} = 0 \tag{19}$$

$$\frac{dn}{dF_L} = (1/l)\frac{dL}{dF_L} - (L/l^2)\frac{dl}{dF_L} < 0 \tag{20}$$

$$\frac{dK}{dF_L} = \frac{E_{LK}/l}{\delta(E_{LL}E_{KK} - E_{KL}^2)} \tag{21}$$

$$\frac{dm}{dF_L} = (1/k)\frac{dK}{dF_L} \tag{22}$$

The signs of the derivatives in conditions (**??**) and (**??**) are positive if local and non-local news are substitutes and are negative if local and non-local news are complements.

Now, we consider how an increase in the local story per viewer marginal cost affects the length and the number of stories. The length of individual stories should not change because the revenue to fixed cost ratio is not affected. However, an increase in local news marginal cost decreases total local news seconds. The number of local stories should decrease as well because total news seconds decrease while the length of individual local stories is not affected. If local news substitutes for non-local news, total non-local news seconds and the number of non-local news stories should increase because the owner substitutes local seconds with non-local seconds. Similarly, total non-local news seconds and the number of non-local news stories should decrease if local and non-local news are complements. These comparative statics results are given below.

$$\frac{dl}{dc_L} = 0 \tag{23}$$

$$\frac{dL}{dc_L} = \frac{-E_{KK}}{\delta(E_{LL}E_{KK} - E_{KL}^2)} < 0 \tag{24}$$

$$\frac{dn}{dc_L} = (1/l)\frac{dL}{dc_L} - (L/l^2)\frac{dl}{dc_L} < 0 \tag{25}$$

$$\frac{dk}{dc_L} = 0 \tag{26}$$

$$\frac{dK}{dc_L} = \frac{E_{LK}}{\delta(E_{LL}E_{KK} - E_{KL}^2)} \tag{27}$$

$$\frac{dm}{dF_L} = (1/k)\frac{dK}{dc_L} \tag{28}$$

The effects of g, F_K, and c_K on number, length, and total seconds for local and non-local news are symmetric to the effects of b, F_L, and c_L. Now, we consider the implications of varying δ. Intuitively, higher δ implies a higher opportunity cost of total news seconds. For example, if advertising revenues are high, δ might denote a higher opportunity cost of replacing advertising time with news seconds. It turns out that we cannot predict the signs of the effect this parameter has on number of local and non-local news stories and on total local and non-local news seconds. The signs of these effects depend on the current level of total local and non-local news seconds and the specifics of the function E. If local and non-local news are complements, then both total news seconds and the number of local and non-local news stories should decrease. If local and non-local news are substitutes, it is possible that an increase in δ increases (decreases) total local news seconds but decreases (increases) total non-local news seconds. Also note that if substitutability or complementarity between local and non-local news are small enough, i.e., if E_{LK} is small enough, an increase in δ decreases total news seconds and the number of news stories both for local and non-local news.

$$\frac{dl}{d\delta} = 0 \tag{29}$$

$$\frac{dL}{d\delta} = \frac{E_K E_{LK} - E_L E_{KK}}{\delta(E_{LL}E_{KK} - E_{KL}^2)} \tag{30}$$

$$\frac{dn}{d\delta} = (1/l)\frac{dL}{d\delta} \tag{31}$$

$$\frac{dk}{d\delta} = 0 \tag{32}$$

$$\frac{dK}{d\delta} = \frac{E_L E_{LK} - E_K E_{LL}}{\delta(E_{LL}E_{KK} - E_{KL}^2)} \tag{33}$$

$$\frac{dm}{d\delta} = (1/k)\frac{dK}{d\delta} \tag{34}$$

Comparative statics results derived in this section are summarized in table X.A for the case when local and non-local news are substitutes and in table X.B when local and non-local news are complements. Note that whenever the length of a local story increases (decreases), the number of local stories decreases (increases). This implies that we should usually observe shorter but more local stories or longer but fewer local stories. As noted earlier, we assume that the owner has access to an unlimited pool of local stories with identical revenue functions. Relaxation of this assumption implies that the owner airs longer and more local stories or shorter

and fewer local stories. For example, if the owner does not have access to an unlimited pool of high revenue ("juicy") local stories, he might decide to increase the length of existing local stories instead of airing additional stories when the benefit parameter increases. In other words, after certain number of local stories is aired, it might be more profitable to increase the length of existing stories rather than increasing the number of stories.

3 Data and Variables

3.1 Data

We obtained the data, all from 1998 local news broadcasts, from the University of Delaware.[6] According to the Project for Excellence in Journalism, which gathered the original news clips, "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 **??**, we list the DMAs and their market size ranking.

Our database consists of over 4,000 individual news stories measured in seconds, from five different days and sixty stations across 20 DMAs. This yields 275 observations on the shortest local stories, the longest local stories, the shortest pooled stories, and the longest pooled stories, by station.[7]

We use necessary and sufficient conditions to define localism. The necessary condition is that the story takes place within the Designated Market Area (hereafter DMA). The sufficient condition concerns the news stories themselves, i.e., when is a story reported by a station within the DMA a " local" story? The story is local if the story is (a) of at least marginally greater importance to the mean individual residing within the DMA, and (b) if the mean individual within the DMA would identify the story as local. We only use these sufficient conditions to sort a handful of "hard cases." For example, Federal budget negotiations in Washington, D.C. and the Academy Awards in Los Angeles take place within those DMAs and may interest the mean individuals in each DMA more than the mean individuals in other DMAs. However, even mean individuals in these DMAs would likely perceive Federal budget negotiations or Academy Awards as non-local issues. Note that these "hard cases" are rare exceptions rather than the rule.

[6] We thank Danilo Yanich for this data set.

[7] We obtain 275 station-day level observations because PEJ did not sample every station on every day.

3.2 Variables

We collect ownership variables from publicly available sources. Table Two lists and describes our variables. Table Three gives the means and standard errors of our variables.

4 Estimation and Results

Our estimation results are presented in Tables Four and Five. The dependent variable from the structural model derived in Section 2 is $\bar{y} = \frac{L\, l_1^*\, l_m^*}{L - l_m^*}$. We first estimate the structural model for both local and total news, and we then estimate the total number of seconds (L), the number of stories (m), and the length of the longest story (l_1^*) for local and non-local news. Because several stations in our sample aired only one or zero non-local news stories, the structural measure is not defined in non-local news stories for these stations.

Note that the structural estimates only reveal how station characteristics drive the ratio of fixed costs to the slope of marginal costs/benefits (hereafter, $FC * MB$ ratio). If the coefficient on a variable is positive in the structural estimate, the variable either increases fixed costs or flattens the slope of the marginal revenue curve. Thus, we use the results from the total number of seconds, the number of stories, and the length of the longest story to infer how station characteristics drive the fixed costs and marginal benefits. This allows us to separate and estimate the effects of economies of scale and economies of scope on local and non-local news. For example, an increase in fixed costs, *ceteris paribus*, would decrease the number of stories.

We employ two types of specifications. One specification employs day dummy variables so that we can estimate the effects of certain market level characteristics on the provision of local and non-local news (odd numbered columns). The other specification employs market-day interaction dummy variables in order to control for all otherwise unobservable market-day characteristics (even numbered columns).[8] Columns 1-4 and 7-8 in Table Four and columns 1-2 in Table Five are OLS regressions, columns 3-4 and 7-8 in Table Five are tobit regressions, and columns 5-6 in Tables Four and Five are negative binomial regressions.

[8] In the instances when tests with interactive market-day dummies did not converge we present the results that have both market and day dummies.

4.1 Cross Radio

4.1.1 Model Predictions

If there are economies of scope, cross-radio ownership should decrease per viewer fixed cost and/or marginal cost. In addition, if the owner can direct its audio from television programs to radio broadcast, one can argue that marginal benefit parameter is higher under cross-radio ownership. Our model predicts that these changes, ignoring complementarity and substitutability of local and non-local news, would result in shorter and more news stories. If cost saving of cross-radio ownership are higher for local news relative to non-local news, cross-ownership might increase total local news seconds and decrease total non-local news seconds even if non-local per viewer costs decrease. In addition, if television and radio are substitutes, cross-radio ownership would imply higher δ. Then, the change in total local news seconds would also depend on function E and on the degree of local news cost savings relative to non-local news.

4.1.2 Local

According to the structural estimates, cross-radio ownership raises the $FC * MB$ ratio for local news. Cross-radio ownership lowers the number of local stories and raises the length of the longest local story in both specifications. We suggest that cross-radio ownership raises the fixed cost of producing a local television news story and raises the marginal benefit of adding length to a local story. In short, cross-radio ownership leads television stations to produce fewer but longer local stories. One plausible intuition driving this result is that a television station can direct the audio from a local news story to their radio station, thus increasing the marginal benefit from local news stories. According to our regression results on the total amount of local news, cross-radio ownership has a negative, but not statistically significant, effect on the total amount of local television news. Based on these results, we infer that television and radio local news are substitutes in consumption (at the story level) and complements in production (at the seconds level).

4.1.3 Non-Local

According to the structural estimates, we observe a higher $FC * MB$ ratio for pooled news. Cross-radio lowers the number of non-local stories, and reduces the length of the longest non-local story. Because cross-radio decreases the number of seconds on the longest non-local story, we conclude that cross-radio ownership decreases the marginal benefit of non-local stories to the local television broadcaster.

Cross-ownership leads a local television broadcaster to air longer local stories and shorter non-local stories, although the broadcaster still airs fewer local stories.[9]

4.2 Market Size

4.2.1 Model Predictions

The presence of economies of scale would imply that per viewer fixed costs decrease as market size increases. Our model predicts that market size increases the number of stories but decreases the length of stories. The effect on total local and non-local news seconds depends on substitutability of the two types of news programs and the degree of decrease in per viewer fixed costs in local versus non-local news programs.

4.2.2 Results

Market size has no statistically significant effect on either the fixed cost or marginal benefit of airing local news. Market size, however, apparently lowers per viewer fixed cost and increases marginal benefit of airing non-local news. If market size increases by one million viewers, the longest non-local story increases by 12 seconds, and the total amount of non-local news increases by 43 seconds during the television news broadcast. This indicates asymmetric economies of scale in market size, because market size confers economies of scale for non-local news but not for local news.

4.3 Owned Radio, Other City

Adjusting for market-day fixed effects, owning a radio station in another DMA does not appear to significantly change the number or length of local news stories aired by local television broadcasters. Owning a radio station in another DMA, however, leads a local television broadcaster to air more non-local stories. Thus, ownership of a radio station outside of the DMA appears to lower the fixed cost of airing non-local news. Ownership of a radio station outside of the DMA increases total non-local news seconds possibly because the radio station may reuse non-local television news in radio broadcast.

[9] Observing effects like fewer but longer local stories indicates that we may not have significant endogeneity problems.

4.4 Newspaper, Other City

4.4.1 Model Predictions

4.4.2 Local

If a local television broadcaster owns a newspaper outside the DMA, the local news results are analogous to the effect of radio cross-ownership within the DMA. Specifically, the local broadcaster airs fewer but longer local news stories.

4.4.3 Non-Local

If a local television broadcaster owns a newspaper outside of the DMA, the broadcast airs more non-local stories, apparently due to lower fixed costs of airing non-local news stories. On average, a local television broadcaster that owns an out-of-DMA newspaper substitutes one additional non-local story for one local story on their television news broadcast.

4.5 WSB Dummy Variable (Cross-Newspaper Ownership)

We employ a WSB dummy variable because station WSB in Atlanta was the only station in our sample that was co-owned with a newspaper within the DMA. WSB's owner, Cox Communications, also owned the Atlanta Journal-Consitution. WSB airs slightly more local stories than its Atlanta broadcast counterparts, but airs slightly fewer local news seconds. However, this latter finding is not statistically significant. WSB airs more non-local stories as well, but does not air significantly more non-local seconds. On the whole, WSB tends to air more but slightly shorter local and non-local news stories.

4.6 WCAX Dummy Variable (Single Station Local Ownership)

We employ a WCAX dummy variable because station WCAX was the only station that was both locally owned and not part of an ownership group. WCAX aired significantly more local news stories and local news seconds. In fact, WCAX aired 11 and 1/2 more local news minutes. WCAX, however, aired significantly fewer non-local news stories and aired approximately 90 seconds less non-local news.

4.7 Additional Results

Per capita income increases either local and/or non-local news benefit parameter. Our model predicts that this would result in more but shorter news stories.

Cable penetration should increase parameter δ since cable and television are substitutes. Assuming, substitutability or complementarity effects between local and non-local news are small enough, increase in δ should decrease the number of local and non-local stories and decrease total local and non-local news seconds.

UHF stations air fewer but longer local stories, as well as more non-local stories. An additional percentage point in cable penetration shortens the longest news story by slightly over two seconds and shortens the local news seconds by three. Moreover, an additional percentage point of cable penetration decreases the number of non-local news stories and decreases non-local news by four seconds. Cable penetration lowers the marginal benefit of airing additional seconds during a local news story, and raises the fixed cost of airing a non-local news story. Per capita income generates more non-local stories and more non-local news seconds.

5 Conclusion

We employed a unique data set that allowed us to uncover the effects of scope and scale on broadcast news. The data enabled us to examine the number and length of both local and non-local stories. We exploited this feature of the data to estimate the effect of scale and scope on the fixed cost of airing a local or non-local story and the marginal cost/benefit of adding seconds to a local or non-local story. In many cases, we then discovered scope effects that would not be observed in less granular data. For instance, we observed that cross-radio ownership generated fewer but longer local news stories. We would not have observed this if we had only observed the total amount of local news seconds.

Our major findings include (1) cross-radio ownership raises the fixed costs of airing a local news story but increases the marginal benefit (lowers the marginal cost) of adding seconds to a given local news story; (2) market size confers economies of scale on non-local news, but not local news; (3) out-of-DMA newspaper ownership raises the fixed costs of airing a local news story but increases the marginal benefit of adding seconds to a given local news story. In addition, out-of-DMA newspaper ownership leads the broadcaster to substitute one non-local story for one local story during the local news broadcast; (4) the sole station in our sample that was co-owned with a newspaper, aired more local and non-local stories, but did not air more local news or non-local news seconds; (5) the sole station in our sample that was both locally owned and not part of a broadcast group, aired approximately 11 and 1/2 more minutes of local news per news broadcast, aired fewer non-local stories and aired 1 and 1/2 minutes less of non-local news.

This paper also outlined a new approach for media researchers. Researchers could access PEJ data from other years and perform similar analyses across different samples. This would provide a useful test on the replicability of these results.

Researchers could also examine newspaper stories in a similar fashion, by examining the number and length of those stories and relating them back to newspaper market and ownership characteristics using this papers structural framework.

Future work with this particular data set should also examine story placement, the order in which stories occurred, and horizontal differentiation of news stories, the extent to which news stories differed across stations. These would involve different theoretical and empirical models and estimation approaches.

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Table 1: DMA's and Market Size rankings

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 2: Description of Variables

Variable	Description
Market Size	Population Within a Given DMA
Owned and Operated	Dummy Variable Indicating Owned and Operated
Own Cities	The Number of Cities in Other DMAs Where an Owner, Who Is Not Owned and Operated, Has Television Stations
Per Capita	Per Capita Income Within the DMA
Cable Penetration	Percentage Cable Penetration Within the DMA
UHF	Dummy Variable Indicating Channel Above 13
Owned Radio, Other City	Local Owner Who Owns a Radio Station in Another DMA
Newspaper, Other City	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
Average Non-Local Audience	The Average Size of the Audience Station Owner Reaches Through Stations in Other DMAs
WCAX	Station in Our Sample That Was Not Part of Any Station Group
WSB	Station in Our Sample That Was Cross-Owned With a Newspaper Within the DMA

Table 3: Mean and Standard Deviations

Variable	Mean	Standard Deviation
Market Size	1475.00	1646.58
Owned and Operated	0.21	-
Own Cities		
Per Capita	15607.37	2078.43
Cable Penetration	65.86	6.86
UHF	0.17	-
Owned Radio, Other City	0.45	-
Newspaper, Other City	0.48	-
Cross Radio	0.22	-
Average Non-Local Audience	780.12	576.95