Response to Review of Study 4 Section IV "The Effect of Ownership and Market Structure on News Operations" by Pedro Almoguera

The following is a response to the peer-review of Section IV of the 2006 Media Ownership Study #4 prepared by Dr. Phillip Leslie. I thank the reviewer for his meaningful comments and suggestions.

1. Data
   - *Newspapers identity*
   The reviewer questioned how the newspaper markets were assigned in the study. The newspaper geographic classification was taken from 2006 SRDS Circulation book. The SRDS Circulation books present the circulation of each newspaper by Metropolitan Statistical Areas (MSA). SRDS Circulation also provides data available by county or by Designated Market Area (DMA).

   - *National newspapers*
   The reviewer follows up the example from page IV-5 noting that national newspapers were not included in the analysis. Even though TNS provided data on national newspapers, SRDS Circulation does not provide circulation data by MSA on such papers (only by state for most); therefore, national newspapers were completely excluded from the study. Elaborating on the example from page IV-5, the Winchester MSA has a total circulation of 24,401 where 17,702 belong to the Winchester Star, giving it a market share of 72%. The other newspapers circulating in the same MSA are Northern Virginia Daily (with a circulation of 2,525), Washington Post (2,100), Cumberland Times-News (1,779) and Martinsburg Journal (295).

   - *"General News" Limitations*
   As explained in the study, the analysis is based only on the "General News" section as defined by TNS. Due to time limitations and discrepancies with the data, all other sections were omitted. However, I agree with Dr. Leslie and acknowledge the limitations of using only this section, but to the best of our knowledge, it was the most suitable dataset available.

2. Methodology and Assumptions
   - *Independent variables broken down by Cross-Ownership variables*
   The reviewer suggested expanding Table IV.4 to include not only the dependent variables but to also to observe the effect of cross ownership on the rest of the explanatory variables, keeping everything else constant. Table 1 presents the expansion of Table IV.4 including all the explanatory variables broken down by cross-ownership variables. The table presents no significance differences on the explanatory variables, suggesting that media cross-ownership between newspapers and TV or radio stations have no significant effect on the other independent variables used in this study.

- *Newspaper fixed-effect estimation*

The reviewer commented on the significance of estimating the model using newspaper fixed effects rather than market fixed effects. As stated before, the main research question of the study is the effect of cross-owned media on news operations. As was noted by the reviewer, while Table IV.5 provides some insightful results, this estimation was dismissed due to the instability of the main coefficients, which in this case, are the TV and radio cross ownership with a newspaper. For the same reason, Column 3 of Table IV.6 (and Table IV.9) presents the estimation without the market dummies to avoid multicollinearity problems.

- Tables IV.6 and IV.9 have been updated in the reviewed version enclosed below.

3. Conclusions

As noted by the reviewer, the variable measuring the effect of the number of newspapers owned by the same group within the same market shows a negative and significant effect on the absolute amount of news, but are positive and significant in the relative amount of news. This suggests that each additional newspaper with the same owner (holding the number of newspapers constant) decreases the amount of news that is being published, but at the same time the newspapers seem to devote a larger percentage of their space to "General News." This result could be explained by: 1. Increased advertising rates, leading to fewer ads and a larger Newshole. 2. The number of newspapers in the group may proxy for the overall number of newspapers in the MSA, so that newspapers in more competitive markets need to have a larger percentage of news in order to keep their readers.

Table 1
Variables by Media Cross-Ownership

Cross-Ownership	Variable	Obs	Mean	Std. Dev.	Min	Max
	Amount of News	107	968.0138	399.8074	194.5208	2914.7020
	Newshole	107	59.3039	10.6210	32.8564	90.3628
	Dailies within Market	107	2.7009	2.8656	1	12.0000
Same City Radio=0	Dailies Outside Market	107	25.8224	28.7595	0	88.0000
	JOA	107	0.1028	0.3051	0	1
	Households	107	1,668,266	1,875,915	17,900	6,829,200
	Income	107	56,139	8,984	37,204	93,581
	HHI	107	4962.3260	2406.1530	1398.2320	9978.0830
	Amount of News	27	1065.1420	275.0972	231.9231	1602
	Newshole	27	56.8722	9.6364	38.3940	86.4043
	Dailies within Market	27	2.0370	2.9020	1	12
Same City Radio=1	Dailies Outside Market	27	14.1852	9.4423	0	37
	JOA	27	0	0	0	0
	Households	27	1,116,285	1,002,629	176,000	4,279,100
	Income	27	59,594	12,615	46,032	93,581
	HHI	27	4971.0860	2156.9550	1398.2320	9572.8260
	Amount of News	122	976.2042	388.4749	194.5208	2914.7020
	Newshole	122	59.5968	10.2191	33.8802	90.3628
	Dailies within Market	122	2.6803	2.9855	1	12
Same City TV=0	Dailies Outside Market	122	24.2787	26.6400	0	88
	JOA	122	0.0902	0.2876	0	1
	Households	122	1,505,977	1,728,852	17,900	6,829,200
	Income	122	56,948	10,227	37,204	93,581
	HHI	122	5005.2880	2388.9860	1398.2320	9978.0830
	Amount of News	12	1103.2830	248.2356	839.5893	1602.1070
	Newshole	12	50.8547	9.6685	32.8564	65.3005
	Dailies within Market	12	1.4167	0.5149	1	2
Same City TV=1	Dailies Outside Market	12	15.3333	23.6733	0	87.0000
	JOA	12	0	0	0	0
	Households	12	2,076,250	1,919,106	343,200	6,829,200
	Income	12	55,687	5,012	47,345	61,736
	HHI	12	4545.2530	1948.6670	1398.2320	7722.2330

Section IV

The Effect of Ownership and Market Structure on News Operations[1]

Pedro Almoguera

Executive Summary:

In this section of FCC Media Ownership Study #4, the effect of ownership on newspapers news operations is studied. Using a sample of 134 newspapers for the year 2005 from the top 60 Designated Market Areas (DMA), we use the absolute amount of space allocated for news in the "General News" section as a measure of news operation. We do not observe a relationship between news operations and cross-ownership with a TV station or radio station in the same market. On the other hand, newspapers that are co-owned with other newspapers within the same Metropolitan Statistical Area (MSA) are associated with a 5% drop in the absolute amount of news. Co-owned newspapers outside the market present no effect on news operations. The effect of the level of concentration in the market (measured by the HHI) has no effect on news operations; a similar result is found for papers belonging to a Joint Operating Agreement (JOA). Lastly, results show that Sunday is the day of the week that presents the largest amount of news (approximately 23% over an average Wednesday), followed by Friday (12%) and Thursday (8%); Tuesday, Wednesday and Saturday present similar amount of news; lastly, Monday is the day of the week with the smallest amount of news with a 9% decrease over an average Wednesday.

Introduction

Within the media industry, the newspaper market shares few similarities with the radio and TV industries. Therefore, measuring quality and/or quantity of newspapers' news also follows a different approach than broadcast media. As explained in the previous sections of FCC Media Ownership Study #4, over-the-air news can be observed as a percent of total daily programming, or in terms of programming formats. With a TV or radio station it is important to estimate the chances of selecting a station with news program, whereas, the newspaper industry works in a different manner. Consumers purchasing a newspaper primarily to read news know that the extra benefit is limited, and that the format of the newspaper is fairly predictable. For example, if there is a developing story or breaking news, the newspaper is unlikely to stop having one of the other sections, it will simply publish a larger newspaper, whereas with a radio or TV station, when there is a developing story the previously scheduled programming might be jeopardized. Being able to manage the format, size and circulation of the next day's publication could be interpreted as an advantage that newspapers have over broadcast media. But in reality newspapers have a more complicated decision because they have to manage not only other news articles, but also the amount of advertising space. Even though subscribers are charged for a newspaper, the main source of revenue for a newspaper comes from advertisements. Hence the newspaper must maximize the number of pages with news and ads, conditional on how many pages they can afford.

The amount of ads also reflects the number of pages that the newspaper will be able to afford. Therefore, the decision of how much news is circulated in a newspaper is not an easy task; some of the most important factors include newspaper management, staff size, and budget. If a newspaper is co-owned with other newspapers, should they have a different strategy for their news operations? Is it different if the newspaper is co-owned with a TV or radio station? Does the newspaper's market provide any additional information? This section of the study focuses on answering these questions. News operations will be measured by the absolute and relative amount of news published in each of the newspapers in the sample. It most be noted that the absolute amount of news measures the amount of news published; hence, newspapers with more pages or a bigger page size will tend to have a higher amount of column inch news compared to other

newspapers. As will be explained below, measuring news operations with this variable has its limitations and disadvantages, but seems to be the best variable available to measure the amount of news that is been published, which is the main research question of this FCC Media Ownership Study.

Another often used measure of news is the relative amount of news (rather than the absolute amount), which is often referred to within the industry as the Newshole. This term is defined as the percentage of news compared to ads (e.g. a 60% Newshole implies that 60% of the paper consists of news and the remaining 40% are ads). The Newshole is not a measure for the amount of news been published; rather it measures the space allocated for news compared to ads. The correlation between the absolute amount of news and the Newshole could be positive or negative. It seems logical to think that the quantity of news and the Newshole are positively correlated since the more news published should take more space; however, this is not true if the number of ads increase faster than the number of news being published. The space allocated for news could have to be decreased on a day with several news articles. The solution might be to reduce the length of the articles, resulting in a smaller Newshole with a greater number of articles. Moreover, the Newshole does not only depend on the number of pages available but also on the number and size of ads to be published since it is a proportion measure; while the amount of news is indirectly related with the number of ads. It is worth mentioning that both variables provide a measure of the quantity of news, but they remain separate from any analysis on the quality of the news.

The purpose of this study is to "analyze the relationship between the nature of the news operations and market characteristics, including ownership structure and robustness";[2] this is done by estimating the effect of market structure and newspaper specific variables on the absolute amount of news rather than the relative amount of news. Estimations involving the Newshole are included in the Appendix. The rest of the study is divided as follows; Section V.2 presents the most relevant literature with respect to our study. Section V.3 describes the data and the model to be used. Section V.4 shows the main results. Section V.5 presents the concluding remarks.

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[2] http://www.fcc.gov/ownership/studies.html

Literature Review

The early work in DuBick (1978) finds that in order to estimate news operation effects, the level of competition among newspapers is a more relevant variable than the market attributes. His study is based on a sample of 67 morning newspapers published daily. While the study does not control for ownership, the level of competition was measured using the proportion of the two largest newspapers in the market, suggesting a negative effect on staff distribution. Litman and Bridges (1986) study how news operations are affected by ownership and cross ownership measured with indicator variables, market conditions, and specific newspaper attributes. Their data consists of 101 newspapers surveyed by a private questionnaire. News operation is measured with three different dependent variables: paper's Newshole, full time news staff and the number of subscriptions to news services (e.g. Associated Press). With respect to the Newshole findings, their results show that joint newspapers have a lower amount of news, while competitive newspapers have a larger number of news articles compared to monopolists and two-edition monopolist newspapers (which will be defined below). Also, newspapers with Sunday publications are estimated to have a Newshole between 2.7% and 4.4% less than papers without a Sunday edition. Dertouzos and Trautman (1990) estimate a simultaneous equation model for the demand and supply of advertising space. Its main finding is that lack of competition in the same market is a source of economies of scope for news and advertisement, which implies that the fewer newspapers available in one market, the more market power they have over the advertising companies to negotiate ad rates. Also, for their sample, local media broadcast does not affect news operation. It must be noted that competition was calculated as the proportion of households in the primary geographic market of the newspaper in which competing newspapers have penetrated. Broadcast media is measured as the number of radio and TV stations, representing a penetration rate of this market which is taken as the substitute good. That differs from our study as our main interest is in cross ownership, which is the effect of sharing the same owner rather than the effect of the presence of other media on news operation. Lacy (1991) finds that newspaper ownership has no effect on news allocation, but large newspapers tend to use less space per story. This study uses a random sample of 115 national newspapers. It presents some ambiguity, as in previous literature, with

mixed results in answering the question of the relationship between newspaper group ownership and news content. Edmonds (2004) suggests that besides newspaper staff or revising newspapers' budget, a third approach to measure news operations is with the Newshole. Another important remark of this work is that the size of the Newshole has almost doubled from 1964 to 1999.

Our study resembles that of Litman and Bridges (1986). However, instead of estimating the other media penetration rates, our main research question is calculating the effect of media cross ownership on newspapers' news operations, which is calculated as the absolute amount of news rather than the Newshole.

Data and the Model

The data consists of 134 daily newspapers for the year 2005. TNS provided the data on advertisements. It originally consisted of 210 newspapers, including Hispanic newspapers, but the BIA data which provides all the relevant information needed with respect to ownership, does not include Hispanic newspapers. Hence, the sample had to be limited to the newspapers that appeared in both datasets.[3] The newspaper data was collected by TNS from the top 60 Designated Market Areas (DMA). In order to provide a more comprehensive analysis in this section of the FCC Media Ownership Study #4, instead of defining markets by DMA, they are defined by Metropolitan Statistical Area (MSA). This definition allows for a more realistic representation of the market structure where each newspaper circulates, since using a DMA definition is too broad for the newspaper industry. For example, at the DMA level the Winchester Star circulates in Washington DC, but when we look at the MSA level, the Winchester Star belongs to Winchester which is roughly 70 miles from Washington DC. Hence, it keeps its monopoly status in the Winchester MSA, instead of being a newspaper in the Washington DMA with a very small circulation compared with the big competitors of the MSA like the Washington Post and the Washington Times.

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[3] There are roughly 2,000 newspapers in the US. BIA had data for 1,452 newspapers across the country.

Following Riffe, Aust and Lacy (1993), a sample of 14 random days was chosen in order to construct two random weeks of observations.[4] The random selection criteria excluded Christmas day, Thanksgiving and the day after each of the two holidays to avoid outliers in the sample. The chosen dates are shown in Table IV.1.

The effect of the amount of news is measured by the total amount of column inches allocated for news of the "General News" section.[5] Equations 1 presents the expression to be used:

$$Amount\_news_i = size\ of\ page_i * number\ of\ pages_i - ads_i \tag{1}$$

where $size\ of\ page_i$ is the size of the page for newspaper i, $number\ of\ pages_i$ is the number of pages of the "General News" section for paper i in a specific publication, and ads_i is the sum of the size of the ads measured in column inches for that same observation.[6]

TNS provided advertising data. The data list the page number and size of each advertisement, but it has limitations. First, the data are classified by the cost of each ad; hence, editorials or ads with no cost (e.g. subscription "house ads") are considered part of the news space. We anticipate that this limitation should not account for little more than 3% of the total quantity of news space.[7]

Second, the provided classification of multi-page ads was not always consistent with the actual publications.[8] Where possible, those observations that looked problematic were compared to the microfilms from the Library of Congress and corrected as needed.

Third, this study is based only on the portion of the paper that TNS identified as "General News "section, which typically covers approximately the first 10 pages, or the first section, of the newspaper. This choice was made in order to obtain consistency across newspapers and the data classification (e.g. some newspapers might consider the "Metro" section as part of the "National" section, but for others the "Nightlife" section is part of "Metro" section). Moreover, some sections like "Sports" might circulate with an

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[4] Riffe, Aust and Lacy (1993) compares simple random, constructed week and consecutive day samples on news content finding that a two-week constructed sample was the superior method.
[5] See below for explanation.
[6] The use of column inches is explained below.
[7] Drew and Wilhoit (1976) find that the average editorial space devoted to editorial articles is 3%.
[8] The most common issue involved two-page ads: The total ad space was often listed on each space, which resulted in double counting of ad space.

extra insert depending on special events. Examples include the day before the Super Bowl, Final Four, or other college events, where there might be a separate insert with more in depth coverage. This can be problematic because TNS often classifies such additional sections simply as "Sports", which is indistinguishable from the normal sports section. This would then cause us to overestimate the ad space in the Sports section. Some tabloids were harder to classify since sometimes their "General News" section were not continuous. For example, it could start on page 1 continuing until page 3, followed by "Metro" section news from pages 4 to 6, and then resume the "General News" section from pages 7 to 12. To maintain consistency among newspapers, for this example if the "Metro" section was not clearly defined, then pages 1 through 12 were redefined as "General News".[9]

Finally, TNS data does not differentiate preprints from regular ads on the pages. Preprint ads are advertising pages included inside a newspaper, however, they are not part of the configuration of the page (e.g. pizza specials or coupons). This generalization was addressed as well since, in some cases, this problem invoked pages where the sum of the ads exceeded the size of the page. For the cases where a microfilm of the page was unavailable, and the total sum of ads for that page exceeded the page size, then the sum of the ads was set to the size of the page. Despite these limitations, to the Commission's knowledge, the TNS database is the most reliable source of data available to construct the news operation variable.

Setting the total amount of news in column inches ($amount\_news$) as the dependent variable, the model will be specified as defined in Equation 2, where the explanatory variables can be separated into two groups, and are defined below.

$$\ln(amount\_news)_i = \alpha_0 + \alpha_1 daily\_within\_market_i + \alpha_2 daily\_outside\_market_i$$
$$+ \alpha_3 same\_city\_tv_i + \alpha_4 same\_city\_radio_i + \alpha_5 JOA_i + \alpha_6 HHI_i +$$
$$+ \alpha_7 \ln(income_i) + \alpha_8 \ln(household_i) + \alpha_9 monday_i + \alpha_{10} tuesday_i + \alpha_{11} thursday_i +$$
$$+ \alpha_{12} friday_i + \alpha_{13} saturday_i + \alpha_{14} sunday_i + \alpha_{15} market\_dummies + u_i$$

$$(2)$$

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[9] If the "Metro" Section was explicitly defined, then "General News" for this example would be pages 1-3 and then 7-12 for a total of 9 pages with their corresponding ads.

The first group consists of newspaper ownership attributes: newspaper ownership is divided into the number of other daily newspapers owned by the same consortium within the same MSA ($daily\_within\_market_i$) and the number of dailies owned by the same group outside the MSA ($daily\_outside\_market_i$). These variables were constructed using the ownership information from the BIA dataset, and then matched with the MSA circulation information from the SRDS Circulation book. If a group owns several newspapers, then we expect the consortium will benefit from economies of scope in terms of news articles. Moreover, the consortium might obtain cheaper news if there is any overlap on the editorial staff, or they could obtain bundled wired news (e.g. Associated Press). The consortium may also have the power to raise ad prices, so *a priori* the effect of α_1 is not clear. A cross-ownership indicator variable with TV stations ($same\_city\_tv_i$) is included to measure the effect of a group that owns a newspaper and a TV. This variable is a cross-owned newspaper/TV station combo that would violate current FCC's cross-ownership rule. This rule is triggered if the co-owned TV station signal contour covers the city where the co-owned newspaper is published. Therefore, a 1 in this variable indicates a grandfathered combination or a permanent/temporary waiver of the cross-ownership rule within the same city.[10] The variable $same\_city\_radio_i$ equals 1 if there is a similar agreement between a newspaper and a radio station and 0 otherwise.[11] We have no *a priori* prediction on the sign of these variables; because we do not know how much benefit cross ownership with other media helps the newspaper.

The next variable in Equation 2, JOA_i, controls for the effect of Joint Operating Agreements on the amount of news. The biggest difference between a JOA and two newspapers owned by the same group, is that the former combines assets, circulation and advertisement of two newspapers in the same geographic market but does not share editorial staff, whereas the latter has merged its editorial staff. The purpose of creating such an agreement is to keep diversity among newspapers in the same market. JOAs are time constrained, assets and revenues are divided and, while the two newspapers share

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[10] See FCC Media Ownership Study #2 for more information on how these variables were created.
[11] TV and Radio cross-ownership variables were not available at MSA level.

ads and circulation, they still compete for editorials.[12] In the Detroit JOA, for example, the division of assets and revenues is 50% between the Detroit News and the Free Press, whereas, with the Cincinnati JOA assets and revenues are divided with 80% for The Enquirer and 20% for The Post. While a JOA's circulation and advertising pricing might be different than that in a competitive market, it is uncertain if they can still reproduce a competitive market's environment, and how they allocate their news space might be more complicated. As previously mentioned, JOAs share ads but not editorials; hence, while they could accomplish economies of scope as a monopolist, there is also the possible tradeoff of having fewer editorials and becoming a less attractive newspaper.

The second group observes market specific attributes that includes the Herfindahl-Hirschman Index (HHI_i) to control for the market structure concentration. This variable was chosen over the number of competing newspapers since its measure considers not only the number of total newspapers in the market, but also its market share, which is the ultimate and often most accurate measure for competition in a market. This concept is best illustrated with an example: in the Albany-Schenectady-Troy MSA, 11 newspapers circulate. The Times Union presents a market share of 42%, the next closest newspaper is the Daily Gazette with a share of 23%, followed by the Record with a share of roughly 10.1%, after that no other newspaper has a share larger than 6%. Clearly, the Times-Union has control over the market, but if we use the number of competitors as the concentration measure, it would be misleading to say that 10 more newspapers compete with the Times Union. On the other hand, the HHI for this market is 3312, showing a concentrated industry.[13] The HHI was constructed using the circulation information

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[12]When the Congress enacted the Newspaper Preservation Act (NPA) in 1970, it gave antitrust immunity for mergers between newspapers in the same market if one of them was about to fold, hence protecting existing JOAs and promoting the creation of more. These agreements were granted mostly to avoid the weaker newspaper (often the afternoon publication) from folding and instead allowing its acquisition by the morning newspaper. People opposed to the NPA have stated that a JOA does little more than give a stronger newspaper *carte blanch* to acquire its competition and become a monopolist. Throughout the past, what JOAs have accomplished is to delay the closure of the weak newspaper for the length of the agreement. In every instance, after the JOA is terminated the weak newspaper ends up folding and the strong newspaper, as expected, becomes the monopolist (e.g. The Tulsa JOA was terminated in 1992 with the result of the Tulsa Tribune folding and the Tulsa World becoming the monopolist of the market). The effect of a newspaper belonging to a JOA on news operations (α_8) is not clear. See Romeo, Pittman and Familant (2003).

[13] The Antitrust Division of the Department of Justice considers an industry to be concentrated when it has a HHI larger than 1800.

available from the SRDS Circulation books corresponding to year 2005, and ownership data from the 2007 FCC Media Ownership Study #2.

The remaining market characteristic variables include the natural logarithm of the number of households by MSA, $\ln(household_i)$, and average income per household, $\ln(income_i)$, provided by SRDS Circulation (in levels). Finally, a day of the week indicator to control for changes in news operations on the "General News" section is added. The general understanding is that Sunday publications have a higher percentage of ads, while Mondays and Tuesdays have relative fewer articles. For this study Wednesday has been taken as the average day so that the other indicator variables represent the change in the amount of news compared to that of a Wednesday. Market dummy variables ($market\_dummies_i$) have also been included to represent the 73 MSAs available. Lastly, an error term (u_i) is included and assumed to be distributed $N(0,\sigma^2)$.

In contrast to the TV and radio sections of the FCC Media Ownership Study #4, newspaper ownership data for years prior to 2005 were not available. Therefore, Equation 2 will be estimated through an Ordinary Least Square regression clustering for each newspaper, as the sample consists of daily observations within 2005.[14] Also, dummy variables accounting for each MSA are added. The effect of the market dummies is similar to a fixed effect regression for a panel data as in Section III of this study. Nonetheless, there is one drawback with the inclusion of market dummies, which is possible multicollinearity among the market specific variables. Since none of the market variables present any variability across time (because all observations are from the year 2005), these dummy variables are highly correlated with the market characteristic variables. This correlation affects not only the statistical significance of the coefficients of the collinear variables, but also the coefficients' sign and magnitudes can change drastically depending on the model specification.[15]

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[14] Since there are 14 observations for each newspaper, if the regression is not clustered, then the coefficients will be calculated without grouping the observations for each newspaper and would instead consider them to be independent.

[15] Before including the market dummies, the model was estimated instead using newspaper dummies. This specification completely changed the magnitude and asymptotic properties of some of the cross-ownership variables due to its high correlation. See Greene (2000) for a more detailed explanation.

Equation 3 presents a second regression, where all 14 days of observations are aggregated up to the newspaper level, creating a "true" cross-section:

$$\ln(amount\_news)_i = \alpha_0 + \alpha_1 daily\_within\_market_i + \alpha_2 daily\_outside\_market_i$$
$$+ \alpha_3 same\_city\_tv_i + \alpha_4 same\_city\_radio_i + \alpha_5 HHI_i + \alpha_6 JOA_i +$$
$$+ \alpha_7 \ln(income_i) + \alpha_8 \ln(household_i) + u_i \qquad (3)$$

This specification includes neither the market nor the day-of-the-week dummy variables. This eliminates the multicollinearity issues previously addressed.

Following Romeo, Pittman and Familant (2003), four market structures are considered using circulation data from SRDS Circulation; they are defined as: a) monopoly markets where there is only one predominant newspaper (e.g. Atlanta Journal Constitution); b) two-edition monopolist newspapers are papers that are editorially dependent and published by a single owner (e.g. Philadelphia Daily News and Philadelphia Inquirer are both owned by Philadelphia Media Holdings LLC); c) competitive markets, where several newspapers compete for readers in the same market without any single one having a clear advantage in circulation (e.g. Chicago Tribune and Chicago Sun-Times); and, d) markets with Joint Operating Agreements (JOA) (e.g. the Detroit News and Free Press entered a 100 year JOA in 1987).[16] The market structure indicators show that 7.1% of the newspapers belong to a JOA, 50.8% are in a competitive market, 8% are part of two-edition monopoly markets, and the remaining 34.1% are monopolist newspapers as shows Figure IV.1.[17]

Table IV.2 presents descriptive statistics for the variables to be used. The size of the page is in terms of column inches in order to match it with the available advertisement data (e.g. a page size of an average broad sheet is 127.4, which is calculated by multiplying the number of columns by the height of the columns, in this case 6*21.23=127.4). We acknowledge that analyzing the amount of news in column inches creates another limitation; not all newspapers have 6 columns, most have between 4 and 6. Moreover, column width is not constant among newspapers, especially when broad sheet newspapers are compared to tabloids. To estimate the model using the

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[16] See Busterna and Picard (2003) for a more detailed explanation and coverage on JOAs.
[17] The classification used of market structure by MSA is also consistent with Romeo, Pittman and Familant (2005).

amount of news defined in Equation 1, tabloid newspapers were omitted in order to compare newspapers with similar dimensions.[18]

The ownership variable across newspapers indicates that, on average, a newspaper belongs to a conglomerate of 2.5 other newspapers in the same MSA and to 23.3 other newspapers outside the MSA. In our sample 116 newspapers (or 86.5%) are part of a venture with other newspapers. This number shows a consistent trend of newspaper concentration; in 1920, 8% of daily newspapers were owned by other groups, by 1986 the number increased to 70%.[19] Gannett Company Inc is the newspaper group with the highest amount of dailies owning 89 newspapers nationwide. With respect to the cross-ownership variables, 20.5% of the newspapers are associated with a radio station

The variable TV cross-ownership from Table IV.2 shows that only 12 of our newspaper sample (9%) belong to this group. The BIA dataset presented a total of 28 or 9% of the 1,452 available newspapers were cross owned with a TV, so it appears that we have a consistent sub sample of newspapers.

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Table IV.3 presents the amount of news and its proportion relative ads, broken down by the day of the week. The appendix of this study presents the results of examining the newspapers' Newshole, so Table IV.3 includes that information as well. Sunday has the highest amount of news; it also has the highest number of pages and ads. The lowest amount of news is circulated on Monday; it also has the fewest number of pages. As can be expected, there is a high correlation between the number of pages and the amount of news being published.

In Table IV.4 the amount of news is presented broken down by the cross-ownership variables. It most be noted that this table only controls for the radio and TV cross-ownership assuming all other variables to be constant. Newspapers co-owned with a radio station have a mean of 1,065 column inches of news, whereas non co-owned

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[18] All the broad sheet newspapers provided by TNS have 6 columns.
[19] See Busterna (1988).
[20] The classification used of market structure by MSA is also consistent with Romeo, Pittman and Familant (2005).

newspapers have on average 968 column inches of news, suggesting that when all other variables remain constant, newspapers co-owned with a radio station in the same city present a slightly higher amount of news. Newspapers co-owned with TV stations had an average of 1,103 column inches of news, relative to 976 column inches for newspapers not cross owned with a TV sation.

Table IV.7 provides a list of all the newspapers in our sample and their MSA, market structure, size of page, and other specifications. For example, the first entry is the Akron Beacon Journal (ABJ), which operates in the Akron MSA in the state of Ohio. This newspaper has a page size of 132 column inches. Table IV.7 also shows that the ABJ is a broad sheet newspaper (tabloid indicator equals 0) and is cross-owned in conjunction with 2 other daily papers outside the MSA, but has no ownership with other newspapers within the MSA, or cross-ownership with TV or radio stations. The last two columns of Table IV.7 show the number of pages in the "General News" section and the amount of news in column inches; to continue the example from above, the ABJ had a "General News" section with 8 pages and averages 643.5 column inches of news.

Results

Before providing the estimation of Equations 2 and 3, Table IV.5 shows the model estimation when newspaper dummies are used instead of market dummies. This regression presented a high degree of multicollinearity that made the coefficients flip in sign, magnitude and statistical significance depending on which of the newspaper dummies was left out. As was explained before, the only variables available for radio and TV cross-ownership are indicators that equal 1 if there is a venture and 0 otherwise. We illustrate the issue/problem here. Suppose that the Washington Post is the only newspaper co-owned with a radio station, then this variable equals 1 for the Washington Post and 0 for every other newspaper. But then the radio indicator is identical to the Washington Post dummy variables; hence, if we leave inside the model the Washington Post dummy, we have perfect collinearity since we have two identical variables. If we leave out the Washington Post dummy, we still have perfect collinearity because the radio dummy replaces the Washington Post and we have perfect multicollinearity between the radio indicator and the rest of the newspaper dummies. If instead there are only two

newspapers co-owned with a radio station, then the radio station equals the sum of the respective two newspaper dummies and we have the same problem. Hence, including newspaper dummies creates a high degree of multicollinearity in the model which causes asymptotic properties and magnitude switches in the variables involved. Since the cross-ownership variables are the most important independent variables in the model, this specification has to be dropped.

Column (1) shows the model omitting the dummy variable for the Washington Post which is cross-owned with a radio station. For this specification none of the media cross-ownership variables are statistically significant. Column (2) excludes the Atlanta Journal Constitution which is cross-owned with both a radio and a TV station. For this model the radio cross-ownership variable becomes significant; however, results should not change depending on which dummy variable is left out unless there are data problems, like in our case multicollinearity. When the Akron Beacon Journal is the excluded dummy variable, Column (3) shows how the TV cross-ownership is significant instead of the radio variable. The difference is that the Akron Beacon Journal is not cross-owned with a radio or TV station. Finally, Column (4) presents the same model but excludes the dummy variable for the Arizona Republic, which is co-owned with a TV station. With this specification, both media cross-ownership variables become significant.

The estimation of Equations 2 and 3 are presented in Table IV.6. Column (1) estimates Equation 2 without the market dummy variables. Column (2) includes the market dummy variables. Lastly, Column (3) presents the results of estimating Equation 3 which is the reduced dataset where each observation consists of the average of the 14 days as explained in the previous section.

Column (1) shows that every additional co-owned newspaper in the same market is associated with a 5.4% drop in news. The addition of a co-owned newspaper outside the MSA has no effect on the amount of news as the coefficient is not statistically significant. The coefficients of cross-ownership with a radio or TV station within the same market are not found to affect on the amount of news that is circulated in the newspaper. The previous sections of this study suggest that radio and TV stations do benefit from ventures with newspapers. It may be that the venture in term of news operations is more beneficial to the radio or TV station than to the newspaper. A

plausible explanation for this result is that the source of a reasonable amount of news broadcasted by radio and TV stations comes from newspaper articles. Once a station is co-owned with a newspaper, it presumably has more access to the newspaper' stories which enables increasing its own news operations. On the other hand, this non-result may also be due to the relatively small sample size of newspaper data available to us.

The JOA coefficient suggests that newspapers in such agreements show no evidence of circulating a different amount of news than "independent" newspapers; however as was shown in Figure IV.1, only 7% of the sample belongs to such agreements. With respect to the market variables, the HHI suggests that the level of concentration in the market has no effect on news operations. It must be noted that in our context, concentration is only measured among newspapers, thus, the market share of other broadcasting media such as radio, TV, and nowadays more importantly, the Internet are not included. The number of households suggests that a 1% increase in the number of households implies a 1.4% increase in the amount of news. The average income per household at the MSA level has no effect on the amount of news. Finally, the dummies measuring the effect of each day of the week show that Sunday presents the largest amount of news, with 23.4% more news than an average Wednesday, followed by Friday with 12.2%, and Thursday with 8.1%; Saturday and Thursday present no statistical difference with Wednesday. Lastly, Monday is the day of the week with the lowest amount of news with a drop of 9.4% with respect to Wednesday. Notice that the day of the week estimates are consistent with the descriptive statistics shown in Table IV.3.

Column (2) presents the estimation of Equation 2 including the market dummies. Due to the multicollinearity of the market dummies with the rest of the market variables, the dummies corresponding to the last four markets are excluded to account for the collinearity of each of the four market specific variables. The coefficients are very similar to Column (1); however there is a tradeoff with the inclusion of the new variables. Even though the R^2 of the regression shows an improvement from Column (1) from .1649 to .3776 in Column (2), the market dummy variables also introduce a multicollinearity effect with respect to the market specific variables; which means that the coefficient estimates of the collinear variables vary widely depending on which specification is examined. However, the multicollinearity affects only those variables that are collinear.

From this estimation, each additional co-owned newspaper within the same market suggests a smaller decrease of 4% in the amount of news. The HHI coefficient shows statistical significance; nonetheless, this coefficient is highly correlated with the market dummies which make the result questionable.[21] The rest of the coefficients in Column (2) present magnitude and asymptotic properties similar to those in Column (1).

Lastly, Column (3) presents the results form estimating Equation 3. As was explained above, aggregating the data do not only reduced the sample size, but also loses the effect of the day dummies. However, it eliminates any evidence of multicollinearity. The results are very similar from Column (1) and Column (2). Since the day of the week dummies were significant in the other regressions, Table IV.8 estimates Equation 3 but aggregating only by each day of the week. It shows how each of the parameters from Column (3) in Table IV.6 varies slightly depending on the day of the week

Concluding Remarks

In this section of Media Study #4, the effect of news operations in the newspaper industry has been measured as the absolute amount of news measured in column inches. The main findings, based on our sample, are that a newspaper that is co-owned with another newspaper in the same market has a drop in its news operations of about 5%. An additional sibling newspaper outside the market does not affect news operations. Cross-ownership variables are included to control for the effect of a newspaper co-owned with a radio and/or TV station in the same city. The regression results do not find that same city cross-ownership with radio, or TV, affects the amount of news circulated by the newspaper. This result could be because newspapers do not publish longer editions when cross owned with other media. On the other hand, the non-result may simply be an artifact of our data, and that with more, we could find another result.   Specifically, when we compare this section with the other sections of Study 4, we have only observations over one year, and for only 134 newspapers.[22] Nonetheless, radio and TV stations do benefit in their news operations when co-owned with newspapers in the same market.

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[21] The regressions were estimated using the statistical software STATA.
[22] Sections I and III of FCC Media Ownership Study #4 cover four years of data and over 6700 individual TV stations and over 8000 radio stations. Section II of Study 4 considers only one year, but has data for over 1,000 stations.

Joint Operating Agreements (JOA) present a similar amount of news to those of independent newspapers.

Market specific variables include the level of newspaper concentration in the market as measured by the Herfindahl-Hirschman Index (HHI). The HHI is not found to have an effect on news operation. To control for the macroeconomic effect of the market, the number of households by MSA and the average income per household are also included. The number of households is associated with an increase in the amount of news, whereas, average income has no effect on news operation.

Finally, Sunday is the day of the week that presents the largest amount of news (approximately 23% over an average Wednesday), followed by Friday (12%) with Monday as the weekday with the smallest amount of news.

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Figure IV.1
Market Structure Representation

Two-Edition Monopoly
7.9%

Monopoly
34.1%

Competitive
50.8%

JOA
7%
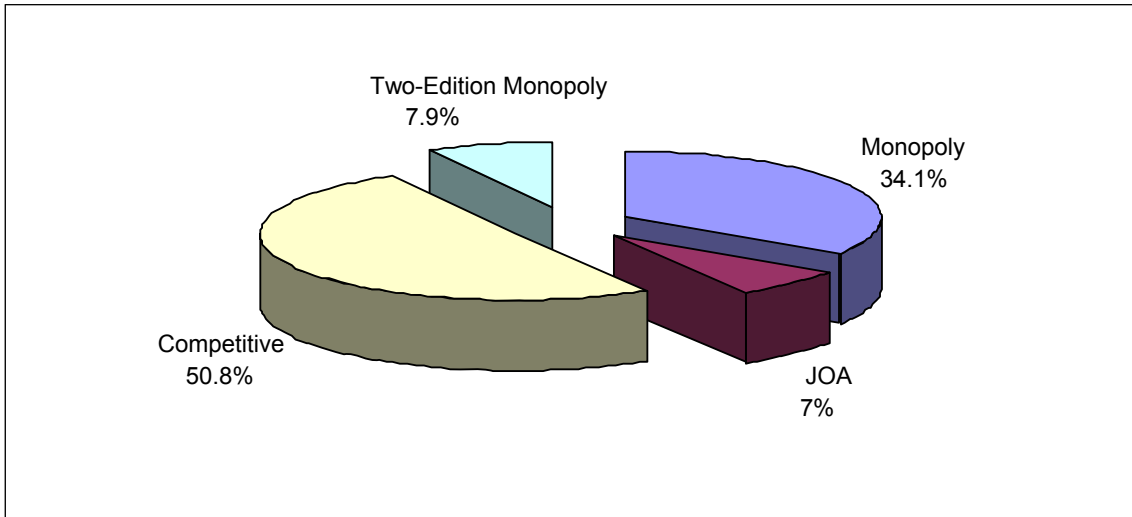
Table IV.1
Constructed Weeks Dates

	Week 1	Week 2
Sunday	12/4/2005	11/6/2005
Monday	1/3/2005	5/9/2005
Tuesday	10/11/2005	4/26/2005
Wednesday	11/23/2005	4/27/2005
Thursday	12/15/2005	1/27/2005
Friday	4/8/2005	1/21/2005
Saturday	7/2/2005	4/16/2005

Table IV.2
Descriptive Statistics

	Variable	Observations	Mean	Std. Dev.	Min	Max
Broad Sheet	Amount of News	1734	1,003.960	523.420	51.5	7692.5
	Size of Page	1734	127.401	4.801	118.5	168
	Number of Pages	1734	14.522	7.591	1	66
Tabloid	Amount of News	113	869.042	719.826	91.25	3927.5
	Size of Page	113	67.126	8.578	57.5	78
	Number of Pages	113	19.407	13.634	3	78
	Overall Newshole	1847	58.767	15.702	7.837302	97.6446
Newspaper Variables	Ownerdailies Within Market	1822	2.561	2.861	1	12
	Ownerdailies Outside Market	1822	23.369	26.184	0	88
	Within Market Radio	1833	0.205	0.404	0	1
	Within Market TV	1833	0.091	0.287	0	1
	Tabloid	1847	0.061	0.240	0	1
	JOA	1847	0.071	0.257	0	1
Market Specific Variables	HHI	1847	0.493	0.234	.139	.997
	Households	1822	1,572,121	1,755,192	17900	6829200
	Average Income per Household	1822	56,885.440	9,838.874	37204	93581

Table IV.3
News by Day of the Week

Day of the Week	Variable	Mean	Std. Dev.	Min.	Max.
Monday	Amounf of News	879.016	458.033	51.500	3927.500
	Newshole	71.279	13.092	36.910	95.736
	Pages per Section	10.459	6.196	1	54
Tuesday	Amounf of News	916.426	580.392	56	7692.500
	Newshole	64.075	13.759	7.837	94.514
	Pages per Section	12.063	6.875	1	66
Wednesday	Amounf of News	949.576	535.608	88.750	6160.750
	Newshole	55.774	15.680	21.197	97.645
	Pages per Section	14.740	7.590	1	51
Thursday	Amounf of News	1015.467	469.870	120.750	3270.250
	Newshole	54.495	14.224	18.142	94.729
	Pages per Section	16.349	8.900	2	78
Friday	Amounf of News	1063.889	526.588	88.875	4900.250
	Newshole	55.571	12.966	24.709	94.703
	Pages per Section	16.275	7.489	1	46
Saturday	Amounf of News	967.447	602.808	109.500	6004.500
	Newshole	59.281	16.844	22.404	94.065
	Pages per Section	14.304	8.123	2	48
Sunday	Amounf of News	1194.366	525.199	55	3996.500
	Newshole	50.103	13.200	16.993	94.767
	Pages per Section	20.004	8.255	1	48

Table IV.4
News by Media Cross-Ownership

Cross-Ownership Variable	Measure of News	Obs	Mean	Std. Dev.	Min	Max
same_city_radio=0	Amount of News	107	968.0138	399.8074	194.5208	2,914.7020
	Newshole	107	59.3039	10.6210	32.8564	90.3628
same_city_radio=1	Amount of News	27	1,065.1420	275.0972	231.9231	1,602.1070
	Newshole	27	56.8722	9.6364	38.3940	86.4043
same_city_tv=0	Amount of News	122	976.2042	388.4749	194.5208	2,914.7020
	Newshole	122	59.5968	10.2191	33.8802	90.3628
same_city_tv=1	Amount of News	12	1,103.2830	248.2356	839.5893	1,602.1070
	Newshole	12	50.8547	9.6685	32.8564	65.3005

Table IV.5
Regression Results with Newspaper Dummies

	(1) Washington Post		(2) Atlanta Constitution		(3) Akron Beacon Journal		(4) Arizona Republic	
Excluded dummy:								
same_city_radio	-0.0738	0.1769 ♠	-0.7277	0.2533 ♠	0.0961	0.0915 ♠	-0.5891	0.2527 ♠
same_city_tv	0.0605	0.1775 ♠	0.0990	0.0793 ♠	0.3232	0.0621 ♠	0.2218	0.0666 ♠
owner_within	-0.0551	0.0110 **	-0.0634	0.0171 **	-0.1195	0.0086 **	-0.0653	0.0171 **
owner_out	-0.0049	0.0013 **	-0.0095	0.0033 **	-0.0010	0.0009	-0.0113	0.0033 **
joa	0.2268	0.0813 **	-0.0505	0.2787	0.9418	0.1463 **	0.0582	0.2735
hhi	-0.4308	0.2302	-0.3149	0.2105	-0.7665	0.1396 **	-0.6622	0.1421 **
sunday	0.1898	0.0337 **	0.1898	0.0337 **	0.1898	0.0337 **	0.1898	0.0337 **
monday	-0.1020	0.0299 **	-0.1020	0.0299 **	-0.1020	0.0299 **	-0.1020	0.0299 **
tuesday	-0.0576	0.0291	-0.0576	0.0291 **	-0.0576	0.0291 **	-0.0576	0.0291 **
thursday	0.0760	0.0255 **	0.0760	0.0255 **	0.0760	0.0255 **	0.0760	0.0255 **
friday	0.1197	0.0259 **	0.1197	0.0259 **	0.1197	0.0259 **	0.1197	0.0259 **
saturday	0.0080	0.0302	0.0080	0.0302	0.0080	0.0302	0.0080	0.0302
R^2	0.5869		0.5869		0.5869		0.5869	
Cross-Ownership								
same_city_radio	Yes		Yes		No		No	
same_city_tv	No		Yes		No		Yes	

Robust standard errors are provided.

** Significant at 95%. *** Significant at 99%.

♠ Coefficient and Standard Error altered due to Multicollinearity.

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Table IV.6
Regression Results: Effect of Cross-Ownership on the Amount of News

	(1) No Market Dummies			(2) Market Dummies			(3) Two-week Regression		
	Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.	
Intercept	4.1680	2.0642	**	10.3704	6.1718	**	4.1588	2.3102	
Ownerdailies Within Market	-0.0540	0.0175	**	-0.0410	0.0171	**	-0.0594	0.0187	**
Ownerdailies Outside Market	-0.0018	0.0011		-0.0020	0.0017		-0.0020	0.0012	
Radio	0.0741	0.0842		-0.0046	0.1933		0.0573	0.0873	
TV	-0.0049	0.0753		-0.0100	0.1583	♠	-0.0194	0.0737	
HHI †	0.0843	0.1797		1.0186	1.3937	♠	0.0819	0.1975	
JOA	-0.1418	0.1297		0.0737	0.1707		-0.1378	0.1364	
sunday	0.2109	0.0449		0.2045	0.0462	**			
monday	-0.0995	0.0295	**	-0.0992	0.0300	**	-0.0194	0.0737	
tuesday	-0.0545	0.0323	**	-0.0548	0.0330				
thursday	0.0780	0.0245	**	0.0788	0.0255	**			
friday	0.1159	0.0256	**	0.1215	0.0259	**			
saturday	0.0052	0.0283		0.0056	0.0283				
Ln(Households)	0.1421	0.0439	**	0.2471	0.0411	♠	0.1560	0.0512	**
Ln(Income)	0.0710	0.1712		-0.6643	0.6151	♠	0.0642	0.1841	
R^2	0.1649			0.3776			0.2574		
Number of Observations	1720			1720			126		

Robust standard errors are provided.
** Significant at 95%. *** Significant at 99%.
♠ Coefficient and Standard Error altered due to Multicollinearity.
† Scaled by 10,000.

Table IV.7
Newspaper and Market Characteristics

MSA	Newspaper	Market Structure	Tabloid	Dailies within market	Dailies Outside market	Within Market Radio	Within Market TV	Page Size	Pages for Section	Newshole	Amount of News
Akron, OH	Akron Beacon Journal	COM	0	1	2	0	0	132	8	60.938	643.5
Albany-Schenectady-Troy, NY	Albany Times-Union	MON	0	1	11	0	0	129	5	61.860	399
Albuquerque, NM	Albuquerque Journal	JOA	0	1	0	0	0	129	7	95.515	862.5
Allentown-Bethlehem, PA	Morning Call	COM	0	1	11	1	0	126	8	72.941	735.25
Allentown-Bethlehem, PA	Delaware County Daily Times	COM	1	1	26	0	0	78	36	93.795	2633.75
Allentown-Bethlehem, PA	Express-Times, The	COM	0	1	17	0	0	126	1	40.873	51.5
Asheville, NC	Asheville Citizen-Times	COM	0	1	88	0	0	129	3	74.677	289
Atlanta, GA	Atlanta Journal-Constitution	MON	0	1	15	1	1	129	5	91.240	588.5
Austin, TX	Austin American-Statesman	MON	0	1	15	1	0	126	12	87.004	1315.5
Baltimore, MD	Baltimore Sun, The	MON	0	1	11	1	0	126	10	81.329	1024.75
Birmingham, AL	Birmingham News, The	JOA	0	1	17	0	0	130.5	8	82.136	857.5
Boston, MA	Boston Globe, The/ Boston Sunday Globe	COM	0	1	16	1	0	126	14	72.619	1281
Boston, MA	Boston Herald	COM	1	4	1	0	0	66.25	27	62.999	1126.9
Bradford, PA	Daily Review, The	MON	0	1	5	0	0	124.5	7	48.652	424
Bridgeport, CT	Connecticut Post	COM	0	1	48	0	0	121.5	10	68.416	831.25
Bridgeport, CT	Greenwich Time	COM	0	2	10	1	0	129	12	71.786	1111.25
Bridgeport, CT	Advocate, The	COM	0	2	10	1	0	129	11	68.358	970
Buffalo-Niagara Falls, NY	Buffalo News, The	MON	0	1	0	0	0	120	8	95.260	914.5
Charlotte-Gastonia-Rock Hill, NC-SC	Charlotte Observer, The	MON	0	2	31	0	0	135	12	68.735	1113.5
Chicago, IL	Beacon-News, The	COM	0	7	0	0	0	126	8	83.234	839
Chicago, IL	Chicago Sun-Times/Sunday Sun-Times	COM	0	7	0	0	0	126	26	65.205	2136.13
Chicago, IL	Chicago Tribune	COM	0	1	11	1	1	126	13	50.488	827
Chicago, IL	Courier-News, The	COM	0	7	0	0	0	168	7	70.685	831.25
Chicago, IL	Herald-News, The	COM	0	7	0	0	0	126	8	73.016	736
Chicago, IL	Northwest Herald, The	COM	0	3	4	0	0	126	10	71.984	907
Chicago, IL	Daily Southtown	COM	0	7	0	0	0	126	8	90.972	917
Cincinnati, OH	Cincinnati Enquirer, The	JOA	0	1	88	0	0	129	8	68.314	705
Cleveland, OH	Plain Dealer, The	MON	0	1	17	0	0	126	10	57.540	725
Columbus, OH	Columbus Dispatch, The	MON	0	1	0	1	1	126	8	73.016	736
Dallas-Ft. Worth, TX	Dallas Morning News, The	MON	0	2	2	0	1	126	16	59.449	1198.5
Dallas-Ft. Worth, TX	Fort Worth Star-Telegram	COM	0	1	32	0	0	126	8	63.790	643
Dayton, OH	Dayton Daily News	MON	0	2	14	1	1	126	8	86.930	876.25
Daytona Beach, FL	Daytona Beach News-Journal, The	COM	0	1	0	0	0	124.5	7	79.145	689.75

Denver-Boulder, CO	Denver Post, The	JOA	0	1	48	0	0	120	14	40.030	672.5
Denver-Boulder, CO	Rocky Mountain News	JOA	0	3	16	0	0	120	3	79.444	286
Detroit, MI	Detroit Free Press	JOA	0	3	86	0	0	118.5	4	85.970	407.5
Detroit, MI	Detroit News, The	JOA	0	3	86	0	0	118.5	8	94.146	892.5
Durham, NC	Daily Herald	COM	0	1	11	0	0	124.5	12	65.060	972
Fresno, CA	Fresno Bee, The	MON	0	1	32	0	0	126	11	85.173	1180.5
Grand Rapids, MI	Grand Rapids Press, The	MON	0	1	7	0	0	120	8	78.203	750.75
Greensboro-Winston Salem-High Point, NC	News & Record	MON	0	1	2	0	0	129	7	77.076	696
Greenville-Spartanburg, SC	Greenville News, The	COM	0	1	88	0	0	126	5	82.619	520.5
Greenville-Spartanburg, SC	Spartanburg Herald-Journal	COM	0	1	16	1	0	126	6	78.340	592.25
Harrisburg-Lebanon-Carlisle, PA	Patriot-News, The	MON	0	1	17	0	0	126	5	83.968	529
Hartford-New Britain-Middletown, CT	Bristol Press, The	COM	1	5	22	0	0	57.5	8	55.815	256.75
Hartford-New Britain-Middletown, CT	Hartford Courant, The	MON	0	2	10	1	1	129	8	89.026	918.75
Hartford-New Britain-Middletown, CT	Journal Inquirer	COM	1	1	0	0	0	70	8	72.232	404.5
Hartford-New Britain-Middletown, CT	Record-Journal	COM	0	1	0	0	0	129	5	78.140	504
Hartford-New Britain-Middletown, CT	Middletown Press, The	COM	1	5	22	0	0	57.5	3	76.812	132.5
Hartford-New Britain-Middletown, CT	Herald, The/ Sunday Herald Press	COM	1	5	22	0	0	57.5	5	85.652	246.25
Hartford-New Britain-Middletown, CT	New Haven Register	COM	0	5	22	0	0	126	7	70.862	625
Houston-Galveston, TX	Houston Chronicle	MON	0	1	11	0	0	126	7	83.702	738.25
Indianapolis, IN	Indianapolis Star, The	MON	0	1	88	0	0	123	3	89.634	330.75
Jacksonville, FL	Florida Times-Union	MON	0	2	24	0	0	129	16	66.194	1366.25
Kansas City, MO-KS	Kansas City Star, The	MON	0	2	31	0	0	120	8	60.052	576.5
Las Vegas, NV	Las Vegas Review-Journal	JOA	0	1	10	0	0	126	14	69.218	1221
Little Rock, AR	Arkansas Democrat-Gazette	MON	0	1	8	0	0	129	6	90.472	700.25
Los Angeles, CA	Los Angeles Daily News	COM	0	5	44	0	0	126	9	56.526	641
Los Angeles, CA	Los Angeles Times	COM	0	1	11	1	1	129	18	51.626	1198.75
Los Angeles, CA	Press-Telegram	COM	0	5	44	0	0	126	9	85.097	965
Los Angeles, CA	Orange County Register, The	MON	0	1	2	0	0	129	16	58.140	1200
Los Angeles, CA	San Gabriel Valley Tribune	COM	0	5	44	0	0	127.5	13	85.460	1416.5
Louisville, KY	Courier-Journal, The	COM	0	1	88	0	0	118.5	10	77.089	913.5
Melbourne-Titusville-Cocoa, FL	Florida Today	COM	0	1	88	0	0	126	7	79.365	700
Memphis, TN	Commercial Appeal, The	MON	0	1	18	0	0	135	8	73.843	797.5
Miami-Ft. Lauderdale-Hollywood, FL	Boca Raton News	COM	0	1	0	0	0	120	18	82.199	1775.5
Miami-Ft. Lauderdale-Hollywood, FL	Miami Herald, The/El Nuevo Herald	COM	0	2	31	0	0	126	16	72.817	1468
Miami-Ft. Lauderdale-Hollywood, FL	Palm Beach Post, The	MON	0	1	15	1	0	135	14	55.357	1046.25
Miami-Ft. Lauderdale-Hollywood, FL	South Florida Sun-Sentinel	MON	0	1	11	1	1	126	16	52.629	1061
Milwaukee-Racine, WI	Milwaukee Journal Sentinel	MON	0	1	0	1	1	120	14	63.884	1073.25
Minneapolis-St. Paul, MN	Star Tribune	COM	0	1	32	0	0	126	14	73.087	1289.25
Minneapolis-St. Paul, MN	St Paul Pioneer Press	COM	0	1	48	0	0	126	7	58.163	513

Nashville, TN	Tennessean, The	MON	0	1	0	0	0	126	8	80.258	809
New Orleans, LA	Times-Picayune, The	MON	0	1	17	0	0	126	14	64.357	1135.25
New York, NY	Asbury Park Press	COM	0	5	84	0	0	126	12	83.433	1261.5
New York, NY	Record, The/The Sunday Record	COM	0	1	0	0	0	126	10	55.278	696.5
New York, NY	Bridgewater Courier News	COM	0	5	84	0	0	129	8	72.117	744.25
New York, NY	Home News Tribune	COM	0	5	84	0	0	126	8	70.511	710.75
New York, NY	Daily Record	COM	0	5	84	0	0	126	3	85.979	325
New York, NY	New York Post	COM	1	1	0	0	1	75	14	59.571	625.5
New York, NY	Star-Ledger	COM	0	3	15	0	0	129	12	67.070	1038.25
New York, NY	Daily News	COM	1	1	0	0	0	78	19	49.663	736
New York, NY	journal news	COM	0	5	84	0	0	129	6	69.412	537.25
Norfolk-Virginia Beach-Newport News, VA	Daily Press	COM	0	1	11	1	0	126	8	87.326	880.25
Norfolk-Virginia Beach-Newport News, VA	Virginian-Pilot, The	COM	0	1	2	1	0	129	12	62.758	971.5
Norwalk, OH	Norwalk Reflector	COM	0	1	5	0	0	129	11	94.609	1342.5
Oklahoma City, OK	Daily Oklahoman, The	MON	0	1	0	0	0	127.5	16	64.387	1313.5
Omaha-Council Bluffs, NE-IA	Omaha World-Herald	MON	0	1	5	0	0	124.5	1	53.414	66.5
Orlando, FL	Orlando Sentinel, The	MON	0	1	11	1	0	126	9	66.358	752.5
Oxnard-Ventura, CA	Ventura County Star/Sunday Star	COM	0	1	18	1	0	129	9	65.633	762
Philadelphia, PA	Bucks County Courier Times	ED	0	3	3	0	0	129	6	87.177	674.75
Philadelphia, PA	Burlington County Times	ED	0	3	3	0	0	129	6	84.302	652.5
Philadelphia, PA	Courier-Post	COM	0	1	88	0	0	129	8	68.968	711.75
Philadelphia, PA	Intelligencer-Record, The	ED	0	3	3	0	0	129	5	90.000	580.5
Philadelphia, PA	Reporter, The	COM	0	5	22	0	0	129	6	94.574	732
Philadelphia, PA	Philadelphia Inquirer/Philadelphia Daily News	ED	0	2	0	0	0	126	12	65.245	986.5
Phoenix, AZ	Arizona Republic, The	MON	0	2	87	0	1	126	10	57.758	727.75
Phoenix, AZ	East Valley & Scottsdale Tribune	COM	0	1	2	0	0	126	12	78.819	1191.75
Pittsburgh, PA	Tribune-Review	COM	0	4	1	0	0	132	2	83.807	221.25
Pittsburgh, PA	Pittsburgh Post-Gazette	MON	0	1	1	0	0	126	20	44.742	1127.5
Portland, OR	Oregonian, The	MON	0	1	17	0	0	129	8	80.281	828.5
Providence-Warwick-Pawtucket, RI	Providence Journal	MON	0	1	3	0	0	126	2	58.730	148
Raleigh-Durham, NC	Herald-Sun, The	COM	0	1	29	1	0	126	3	70.569	266.75
Raleigh-Durham, NC	News & Observer, The	COM	0	1	0	0	0	126	10	80.556	1015
Richmond, VA	Richmond Times-Dispatch	MON	0	1	24	0	0	126	4	76.538	385.75
Riverside-San Bernardino, CA	Inland Valley Daily Bulletin	COM	0	3	46	0	0	129	10	57.558	742.5
Riverside-San Bernardino, CA	Daily Press, The/ Sunday Press Dispatch	MON	0	2	23	1	0	126	8	63.765	642.75
Riverside-San Bernardino, CA	Sun, The	COM	0	3	46	0	0	126	8	86.062	867.5
Sacramento, CA	Sacramento Bee, The	MON	0	1	32	0	0	126	15	68.307	1291
Salt Lake City-Ogden-Provo, UT	Salt Lake Tribune, The, Deseret Morning News	JOA	0	1	48	0	0	129	8	82.098	847.25
San Antonio, TX	San Antonio Express-News	MON	0	1	11	0	0	126	8	79.712	803.5

San Diego, CA	North County Times	COM	0	1	37	0	0	126	10	60.694	764.75
San Diego, CA	San Diego Union Tribune	MON	0	1	8	0	0	129	12	58.834	910.75
San Francisco, CA	Contra Costa Times	ED	0	12	37	0	0	129	2	86.047	222
San Francisco, CA	Argus, The	ED	0	12	37	0	0	129	6	64.987	503
San Francisco, CA	Daily Review, The	ED	0	12	37	0	0	129	6	65.762	509
San Francisco, CA	Marin Independent Journal	ED	0	12	37	0	0	129	10	60.659	782.5
San Francisco, CA	Oakland Tribune, The	MON	0	12	37	0	0	129	6	69.509	538
San Francisco, CA	Valley Times	ED	0	12	37	1	0	129	2	86.047	222
San Francisco, CA	San Francisco Chronicle	COM	0	1	11	0	0	129	8	69.138	713.5
San Francisco, CA	San Mateo County Times	ED	0	12	37	0	0	129	8	69.913	721.5
San Francisco, CA	Vallejo Times-Herald	MON	0	12	37	1	0	129	11	80.673	1144.75
San Jose, CA	San Jose Mercury News	MON	0	1	48	0	0	129	12	49.919	772.75
Santa Rosa, CA	Press Democrat, The	COM	0	1	16	1	0	126	10	61.310	772.5
Seattle-Tacoma, WA	Seattle Times, The	JOA	0	1	2	0	0	135	10	74.296	1003
Seattle-Tacoma, WA	Seattle Post-Intelligence	JOA	0	1	11	0	0	135	8	76.667	828
Seattle-Tacoma, WA	News Tribune, The	COM	0	2	31	0	0	129	5	78.411	505.75
St. Louis, MO	St Louis Post-Dispatch	MON	0	1	12	0	0	135	5	77.667	524.25
Tampa-St. Petersburg-Clearwater, FL	St Petersburg Times	COM	0	1	0	0	0	129	12	67.862	1050.5
Tampa-St. Petersburg-Clearwater, FL	Tampa Tribune	COM	0	2	23	1	1	126	14	64.626	1140
Tulsa, OK	Tulsa World	MON	0	1	0	0	0	126	17	86.835	1860
Washington, DC	Washington Post, The	COM	0	1	0	1	0	126	14	74.065	1306.5
Washington, DC	Washington Times	COM	0	1	0	0	0	126	16	84.561	1704.75
Winchester, VA	Winchester Star, The	MON	0	1	1	0	0	129	8	81.613	842.25

Table IV.8

Regression by Day of the Week

	Monday Coef.	Error	Tuesday Coef.	Error	Wednesday Coef.	Error	Thursday Coef.	Error
Intercept	3.7005	2.9891	4.3661	2.9205	4.1949	2.9477	2.5227	3.2309
Ownerdailies Within Market	-0.0405	0.0199 **	-0.0467	0.0199 **	-0.0655	0.0195 **	-0.0623	0.0207 **
Ownerdailies Outside Market	-0.0026	0.0013	-0.0021	0.0013	-0.0019	0.0014	-0.0018	0.0012
Radio	0.0365	0.1103	0.1636	0.0933	0.0735	0.0950	0.0662	0.1006
TV	0.0662	0.1003	-0.1079	0.1046	0.0080	0.0755	0.0117	0.1011
HHI	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
JOA	-0.0148	0.1414	-0.2125	0.1874	-0.0440	0.1499	-0.0581	0.1409
Ln(Households)	0.1366	0.0636 **	0.1251	0.0594 **	0.1685	0.0631 **	0.1522	0.0699 **
Ln(Income)	0.1135	0.2354	0.0705	0.2487	0.0443	0.2522	0.2169	0.2466
R^2	0.1439		0.1626		0.2369		0.2204	

	Friday Coef.	Error	Saturday Coef.	Error	Sunday Coef.	Error
Intercept	4.8337	2.2545 **	1.3852	3.8475	4.6774	2.9226
Ownerdailies Within Market	-0.0675	0.0189 **	-0.0634	0.0223 **	-0.0553	0.0178 **
Ownerdailies Outside Market	-0.0021	0.0012	-0.0007	0.0015	-0.0019	0.0013
Radio	0.0641	0.0934	0.0683	0.1099	0.0337	0.0985
TV	-0.0805	0.1266	0.1141	0.0989	-0.0889	0.0942
HHI	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000 **
JOA	-0.1273	0.1380	-0.3333	0.2457	-0.0437	0.1677
Ln(Households)	0.1267	0.0467 **	0.1964	0.0821 **	0.2016	0.0561 **
Ln(Income)	0.0556	0.2000	0.2529	0.3046	-0.0491	0.2546
R^2	0.2382		0.2096		0.1957	

Appendix

In this section Equations 2 and 3 will be estimated using a second measure for news operations. As was defined above, the Newshole is the percentage of news in a publication. Equation 4 presents the definition of the Newshole in terms of the variables used above.

$$Newshole_i = \frac{size\ of\ page_i * number\ of\ pages_i - ads_i}{size\ of\ page_i * number\ of\ pages_i} * 100\% \qquad (4)$$

Replacing the amount of news with the Newshole, Table IV.9 presents the results equivalent to estimating the model with market dummy variables (Column (2) of Table IV.6) and the reduced regression with aggregated data (equivalent to Column (3) of Table IV.6).

The results of Table IV.9 suggest that each additional co-owned newspaper within the same market increases the Newshole by 2%. Columns (1) and (2) show how the flip in sign is evidence of multicollinearity for the regression with the market dummies. As before sibling newspapers outside the MSA show no effect on news operations. Sunday is the day of the week that presents the smallest Newshole (10%) compared to an average Wednesday; Monday and Tuesday are the days of the week with the biggest Newshole, followed by Saturday; Wednesday, Thursday and Friday are not statistically different in the proportion of news that is published for the sample used. For this set of regressions, the number of households is associated with a drop in Newshole of roughly 5%.

Table IV.9
Regression Results with Newshole as the Dependent Variable

	(1) No Market Dummies			(2) Market Dummies			(3) Two-week Regression		
	Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.	
Intercept	6.9934	0.9840	**	15.0374	2.3821	**	6.9075	1.2323	**
Ownerdailies Within Market	0.0222	0.0077	**	0.0310	0.0153	**	0.0220	0.0064	**
Ownerdailies Outside Market	-0.0010	0.0006		-0.0016	0.0009		-0.0010	0.0006	
Radio	0.0212	0.0397		0.0806	0.0683		0.0260	0.0441	
TV	-0.1599	0.0621	**	-0.2709	0.0781	**	-0.1632	0.0617	**
HHI †	-0.1211	0.0748		-0.3986	0.6055	♠	-0.1090	0.0831	
JOA	0.0100	0.0582		-0.1369	0.0878	♠	0.0302	0.0579	
sunday	-0.0951	0.0186		-0.0974	0.0193	**			
monday	0.2826	0.0179	**	0.2815	0.0180	**			
tuesday	0.1613	0.0214	**	0.1599	0.0218	**			
thursday	-0.0063	0.0170		-0.0071	0.0174				
friday	0.0088	0.0169		0.0084	0.0167				
saturday	0.0559	0.0134	**	0.0578	0.0137	**			
Ln(Households)	-0.0556	0.0172	**	0.0038	0.0212	♠	-0.0486	0.0182	**
Ln(Income)	-0.2036	0.0874	**	-0.9986	0.2337	♠	-0.1999	0.1167	*
R^2	0.2640			0.4313			0.2210		
Number of Observations	1720			1720			126		

Robust standard errors are provided.
** Significant at 95%. *** Significant at 99%.
♠ Coefficient and Standard Error altered due to Multicollinearity.
† Scaled by 10,000.