

Local Media Ownership and Media Quality

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Adam D. Rennhoff
Assistant Professor, Jones College of Business
Middle Tennessee State University
P.O. Box 27
Murfreesboro, TN 37132
615-898-2931
rennhoff@mtsu.edu

Kenneth C. Wilbur
Assistant Professor, Fuqua School of Business
Duke University
100 Fuqua Drive, Box 90120
Durham, North Carolina 27708-0210
919-926-8536
Kenneth.Wilbur@Duke.edu
[Http://Kennethwilbur.com](http://Kennethwilbur.com)

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Executive Summary

The United States Federal Communications Commission regulates local media ownership to promote competition, diversity and the provision of local programming. This study investigates how local media cross-ownership, co-ownership and ownership diversity are associated with media market outcomes. It does so by regressing local-market media quality variables on local-market media ownership variables, controlling for unobserved market characteristics. Scant evidence is found to indicate that local media ownership affects local media usage or programming.

1. Introduction

This study was written for the United States Federal Communications Commission (“FCC”) as part of its 2010 Quadrennial Review of Media Ownership Rules. The study analyzes media usage and ownership data to determine how changes in local media market ownership structure are associated with changes in local media market outcomes, mainly from the standpoint of competition and the provision of local programming.

Section 1.1 explains the relevant rules that the FCC is reviewing and section 1.2 discusses the relevant academic literature. Section 2 describes the conceptual background for the analysis, the technical details, and the data. Section 3 presents the results and section 4 relates the results to the specific media ownership rules to be reviewed.

The FCC’s policy goals for its Review of Media Ownership Rules are competition, localism and ownership diversity. The current analysis will produce three sets of descriptive results that are relevant to these goals. First, it will examine how media cross-ownership and co-ownership are associated with media competition from a consumer perspective, as measured by media usage. Second, it will determine how media cross-ownership and co-ownership are associated with localism, as measured by the amount of local news provided in the market. The term “media quality” is used to refer to the collection of variables measuring media usage and local news provision. Third, it will determine how media ownership diversity, as measured by station owner characteristics, is related to media quality.

1.1. Regulatory Background

Three media ownership rules are relevant to the present analysis. This section gives a brief overview of the rules. FCC (2010) provides a complete explanation.

Newspaper/Broadcast Cross-Ownership Rule: Since 1975, the FCC has restricted the common ownership of a broadcast station and a newspaper when, roughly speaking, the station's footprint contains the newspaper's distribution area. Waivers to this rule may be granted when common ownership is judged to be aligned with the public interest. In 2007, the waiver criteria were relaxed so that common ownership would be presumed to be not inconsistent with the public interest in the 20 largest media markets. Common ownership is still presumed to be inconsistent with the public interest in smaller media markets unless (1) one of the two media outlets were "failed" or "failing," or (2) the joint entity would significantly increase the amount of news available in the market.

Local TV Ownership Limit: One entity may own multiple television stations within the same market if (1) their signals do not overlap (this case is rare), or (2) one of the stations is not ranked in the top four stations in the market based on market share, and there are at least eight independently-owned stations in the market. This second provision essentially rules out multiple station ownership in smaller markets, as they are typically served by fewer than eight stations.

Local Radio/TV Cross-Ownership Rule: The application of this rule depends on the number of "voices"—TV stations, radio stations, newspapers and a cable system—in a media market. In markets with at least 20 independently-owned voices, one entity may own one TV station and up to seven radio stations or two TV stations and up to six radio stations, subject to the Local TV Ownership Limit. In markets with 10-19 independently-owned voices, one entity may own up to two TV stations and up to four radio stations. In smaller markets, an entity that owns a TV station may not own more than one radio station.

Among these rules, the Newspaper/Broadcast Cross-Ownership Rule is of particular interest. Newspaper advertising revenues (print and online) fell 44% in the three years ended December 31, 2009, and circulation revenues fell 6% over the same period. These changes led newspapers to reduce their professional editorial staff by 25%. The situation continues to worsen, as newspapers were the only medium in which ad revenue fell in 2010 (PEJ 2011).

These changes are troubling from a policy perspective, as newspaper readership has been positively associated with voter information and participation. Historically, the entry of a

newspaper into a local market increased voter turnout (Gentzkow, Shapiro and Sinkinson, forthcoming). Subsequent television station entry into local markets correlated with sharp drops in both newspaper consumption and voter turnout (Gentzkow 2011). Survey evidence suggests that knowledge of local politics drops during newspaper strikes (Mondak 1995). Taken together, these findings suggest that newspapers have played a special role in informing the public about local politics.

This special role may come from fundamental differences in the way that television and newspaper media present the news, since television faces tighter time constraints and often requires supplementary video. Milburn and McGrail (2001) argued that television news presentation typically follows a dramatic narrative arc. A controlled experiment showed that dramatic presentation simplifies consumer thinking and reduces recall of news stories. Chiricos, Eschholz, and Gertz (1997) found that individual consumers' fear of crime is positively correlated with television and radio news consumption but not with newspaper or news magazine consumption.

Further, newspapers and television differ in the range of news stories they cover. Baldwin et al. (2010) found that local newspapers provided far more coverage of city government than local television stations. Semetko and Valkenburg (2001) found that newspapers devoted a higher proportion of coverage to crime and education stories than television news programs. TV news reported proportionally more foreign affairs and "human interest" stories.

It seems possible that allowing mergers between newspapers and television stations could lead to substantial economies of scope and may improve product offerings by enabling cross-media promotions and integrated delivery. Many newspapers now offer some video content online, and many television stations' websites provide large repositories of text news stories. To better understand the potential consequences of such mergers, however, it is necessary to discern how they correlate with local news availability and quality.

1.2. *Literature Review*

Academic research on the impact of media ownership on media market outcomes goes back at least to Steiner (1952). Steiner showed that commonality in viewer preferences regarding program types can result in a tyranny of the majority in program provision. When there are two broadcasters and two program types, one of which is preferred by more than two-thirds of the

viewing population, both broadcasters will air a program of the popular type. Attracting half of the larger audience is more profitable than attracting all of the smaller audience, so the less popular program is not offered. A two-channel monopoly can deliver better results than duopoly because it airs both programs and serves the entire market. Steiner argued that the degree to which this result holds in a multi-period model with competing broadcasters depends on the “shiftability” of consumer preferences—the extent to which media consumers prefer certain programs at certain times, such as news in the morning, or entertainment after dinner.

Modern treatments of media markets recognize that media outlets serve multiple groups of customers, including viewers, advertisers and content producers. This framework is called “multi-sided platform industries” (or “two-sided markets”), and its key insight is that user charges reflect both the cost of platform provision and the effect of the agent’s platform usage on agents of other types. The pioneering treatment in this area was Anderson and Coate (2005), whose model captured the nonrival nature of television program consumption by viewers, the influence of viewers on advertising revenues, and the negative impact of advertising sales on audiences. These authors predicted that ownership consolidation raises media and advertiser profits at the expense of consumer welfare, with an ambiguous effect on social welfare. This occurs because media consolidation reduces competition for viewers and increases the amount of advertising carried by the media.

The subsequent theoretical literature pushed the bounds of the Anderson-Coate framework in a number of directions. The following discussion is limited only to those papers that directly examine the effects of entry or consolidation on competition, and the findings are discussed in the context of the television industry, although most of these models could be applied to any mass media industry. Crampes, Haritchabalet and Jullien (2009) showed that, with endogenous program quality decisions, free entry may lead to a suboptimally high number of media outlets, as program development costs are inefficiently spread across a larger number of media outlets. Cunningham and Alexander (2004), in contrast, found that greater concentration among media may either increase or reduce the amount of programming time served to consumers, depending on the elasticity of viewing in response to advertising time. Dukes (2006) endogenizes advertiser competition in the product market and finds, counterintuitively, that advertisers may be better off with greater media concentration, since this may lead to an equilibrium where their messages are more dispersed, softening price competition. Gal-Or and

Dukes (2006) investigate mergers among media stations, and find, in contrast with standard results in product market oligopoly, nonconsolidating media mergers become increasingly profitable as media concentration falls. Gentzkow and Shapiro (2008) reviewed a large body of literature and argued that media competition depends crucially on the number of consumers who receive news from multiple sources, as this constrains the degree to which news media compete in the marketplace of ideas. Kind, Nilssen and Sorgard (2009) consider how two types of competition influence media outlets' business models. They found that media content differentiation leads to greater reliance on advertising-supported models, while a greater number of media outlets encourages subscription pricing. Reisinger, Ressler and Schmidtke (2009) model TV stations which compete for advertisers as well as viewers. Their model overturns many of the previous literature's results, finding, for example, media profits and advertising levels can actually *rise* with the number of independent media outlets.

To summarize the theoretical literature, competition may either increase or decrease media market economic performance, depending primarily on (1) differentiation among media platforms, (2) the number of media platforms, (3) the rate at which viewers switch media in response to advertising, (4) the elasticity of advertiser demand, and (5) the degree to which platforms compete for advertisers. Regrettably, the literature contains many opposing predictions, so general conclusions are not available.

There has been a limited amount of empirical work related to the questions of interest in this study. Perhaps closest is Brown and Alexander (2005), who used 1952 TV station license allocations as an instrument to identify the effect of media ownership consolidation on station ratings and ad prices. The identifying assumption was that the number of station licenses granted in 1952 was likely to be correlated with media market structure in 1998 but independent of unobserved determinants of ratings and advertising in 1998. Using a system of equations estimated on a cross section of US media markets, they found that a 20% increase in concentration raises advertising price by 9% and ratings by 0.8%.

Two empirical studies of the newspaper industry are related to the questions posed here. Chandra and Collard-Wexler (2009) examined data from a four-year merger wave in which 75% of Canadian newspapers changed hands. They found that newspaper prices rose substantially during this period, but subscription price rises were no higher at acquired newspapers than at non-acquired newspapers. Argentesi and Fillistrucchi (2009) proposed a structural framework to

estimate reader responsiveness to newspaper cover price and advertising quantity on one side, and advertiser responsiveness to advertising price and circulation figures on the other. They used their estimates to infer Italian newspaper markups under a variety of competition/collusion assumptions. Comparing their results to markup data in newspaper financial reports, they found evidence consistent with collusive behavior on cover prices and competitive behavior on advertising prices.

Another body of relevant literature is the research commissioned by the FCC during its previous ownership reviews. Most closely related is Shiman et al. (2007), who estimated a panel regression controlling for market, affiliated network and time-specific factors with three-way fixed effects. They found that television stations that are cross-owned with newspapers or radio stations provided more news than other stations, but other ownership variables did not have any impact on news provision.

2. Research Methodology

This section describes the research design, the empirical approach and the data.

2.1. Research Design

Three observations guided the research design.

First, the usage of each station in a market depends on the programming of all stations in that market, and the programming of each station in the market depends on the ownership of all stations in the market, as was explored in depth in section 1.2. This observation leads logically to a data analysis done at the level of the media market rather than the individual media outlet, since individual media outlets' choices are made interdependent by market competition.

Second, it is exceedingly difficult to disentangle media market ownership from media market competition and localism. Ownership decisions may be made in anticipation of long-run trends in media supply or demand that are observable to the station owners but not in the available data. This suggests a possible correlation in the media ownership variables and the residuals in any regression, a problem that has no clear solution. Therefore, this study is purely descriptive; it makes no claims of causality. Causal interpretations of the empirical results would need to rely on the assumption that media ownership variables are determined prior to media quality variables. An alternate research design would be to rely on an instrumental-variables

approach. A candidate instrument would have to be correlated with the media outlet's market share but uncorrelated with its profits, since station ownership decisions are likely based on station profits. However, since profits typically rely on market share, finding such an instrument is a challenging task.

Third, purely cross-sectional or purely intertemporal analyses may produce misleading results, so panel analysis is required. Cross-sectional regressions risk spurious findings because unobserved variables may influence both media ownership and media quality. For example, George and Waldfogel (2003) found that newspapers in cities with larger concentrations of black, white or Hispanic consumers have higher proportional readerships among these groups relative to cities with less minority representation. The implication is that newspaper content is responsive to local demographic composition. This market characteristic may be imperfectly measured using traditional demographic statistics, but may be correlated with both media market structure and media usage. A cross-sectional regression might find a spurious correlation between media ownership and media quality due entirely to the dependence of each variable on cultural homogeneity. Only a panel analysis can rule out spurious correlation due to market-specific factors.

2.2. Empirical Approach

The analysis undertaken here regresses a vector of local market media quality variables on a set of local media ownership variables and exogenous controls. The model is designed to fit the available data, which is characterized by the "large N , small T " property common to many survey panel datasets.

2.2.1. Model

This section presents the model. y_{mt}^q represents quality variable q in market $m = 1, \dots, M$ in time $t \in \{1, 2, 3\}$ (corresponding to 2005, 2007 and 2009). x_{mt} represents a vector of media ownership variables. Variable selection and definitions are discussed in section 2.3.

Equation (1) is used to predict media quality variable q ,

$$y_{mt}^q = \alpha_m^q + \alpha_t^q + x_{mt}\beta_q + \varepsilon_{mt}^q, \quad (1)$$

where α_m^q represents all market characteristics that may influence media quality, α_t^q is a time fixed effect, β_q is a parameter vector to be estimated and the object of primary interest, and ε_{mt}^q captures shocks that may covary across markets, time periods and quality variables. Media usage is typically thought to be influenced by long-term habit formation, so equation (1) should be thought of as a moving-average representation that likely includes serial correlation in ε_{mt}^q . If the precise form of the serial correlation were known, equation (1) could equivalently be expressed as an auto-regressive model with lags of the dependent variable appearing as regressors on the right-hand side.

The market-specific intercepts, α_m^q , in equation (1) are likely to be correlated with the media ownership variables. The panel is too short to estimate these intercepts precisely, so two standard approaches to estimation, first differencing (FD) and fixed effects (FE), are employed so that they drop out of the estimating equations. The FD approach lags the dependent variable to transform equation (1) into

$$(y_{mt}^q - y_{mt-1}^q) = (\alpha_t^q - \alpha_{t-1}^q) + (x_{mt} - x_{mt-1})\beta_q + (\varepsilon_{mt}^q - \varepsilon_{mt-1}^q). \quad (2)$$

The FE approach drops time-invariant terms, changing equation (1) into

$$(y_{mt}^q - \bar{y}_m^q) = (\alpha_t^q - \bar{\alpha}^q) + (x_{mt} - \bar{x}_m)\beta_q + (\varepsilon_{mt}^q - \bar{\varepsilon}_m^q), \quad (3)$$

where $\bar{y}_m^q = T^{-1} \sum_1^T y_{mt}^q$, $\bar{\alpha}^q = T^{-1} \sum_1^T \alpha_t^q$, $\bar{x}_m = T^{-1} \sum_1^T x_{mt}$ and $\bar{\varepsilon}_m^q = T^{-1} \sum_1^T \varepsilon_{mt}^q$. Both FD and FE estimates are provided below. When the sample contains exactly two time periods, FD and FE provide identical parameter estimates. When the sample contains more than two time periods, they provide different estimates. FD is more efficient when ε_{mt}^q follows a random walk while FE is more efficient when ε_{mt}^q is serially uncorrelated (Wooldridge 2010). Given the likelihood of habit formation in media usage discussed above, FD estimates will be preferred to FE estimates. However, we present both types of estimates to facilitate comparison.

2.2.2. Estimation

In the FD estimation approach, equation (2) is “stacked” for each media quality variable and estimated using the Seemingly Unrelated Regressions approach of Zellner (1962). The same procedure is used in the FE estimation approach.

Two sets of standard errors are presented for each of equations (2) and (3). The common approach would be to apply Ordinary Least-Squares (OLS) regression to equations (2) and (3). This is commonly known as the “difference-in-differences” estimate in the case of equation (2) and the “pooled OLS” estimator in the case of equation (3).

The problem with the OLS approach is that, when serial correlation is present in the errors, the standard errors of the parameter estimates may be severely biased. This has been known since Cochrane and Orcutt (1949). Recently, Bertrand, Duflo and Mullainathan (2004) explored the extent to which this issue affects policy-oriented econometric research. They generated random treatments in their data and estimated the effects of these “placebo laws” on female wages. They found that 45% of the placebo treatments’ parameter estimates were statistically significant at the 95% confidence level, strong evidence against OLS estimation of equations (2) and (3). Yet while OLS is not viewed as a desirable model in the current setting, it is presented in section 3 to provide a familiar benchmark.

Bertrand, Duflo and Mullainathan (2004, §IV.E) advocate using clustered standard errors, showing that this alternative to OLS performs about as well as nonparametric estimation in monte carlo simulations. The second set of estimates presented below follows this advice. This allows for autocorrelation in the errors and uses an unstructured “sandwich” estimator to control for possible correlation among the error terms, as in Arellano (1987).

A word is in order about one estimation technique that is not used. The recent dynamic panel estimation literature (e.g., Arellano and Bond 1991) advocates using lags and previous levels as instruments for endogenous variables. In our application, that would imply using $(x_{mt} - x_{mt-1})$ as an instrument for x_{mt-1} and assuming that $(x_{mt} - x_{mt-1})$ is uncorrelated with ε_{mt}^q . This exogeneity assumption is problematic in the context of media stations, as it would be in most industrial organization settings. The valuation of a media outlet such as a television station or a newspaper is typically calculated as the discounted sum of the station’s future earnings, and this value influences the media outlet’s price. The exogeneity assumption required by the Arellano/Bond approach would imply that media station owners and potential buyers are either unable to foresee future market-specific shocks to media quality, or that they disregard those shocks in their media station retention/acquisition decisions. This assumption is not testable and not considered to be credible. This is the primary reason why this paper takes a descriptive approach rather than claiming to infer causality.

2.3. Data

This section describes the dataset, variables and definitions.

2.3.1. Data Sources, Markets, Time Periods, and Exogenous Controls

The dataset contains information about 210 local media markets in each of three time periods from two sources. Media ownership variables and market demographic variables were provided by the FCC. Media ownership variables correspond to three snapshots in time: December 31, 2005, December 31, 2007, and December 31, 2009.

The second dataset consists of television ratings provided by Nielsen Media Research Galaxy ProFile. The ratings correspond to the November and May “sweeps” months in the 2005-06, 2007-08 and 2009-10 television seasons. Nielsen selects participants through geographic randomization and provides financial incentives to participate. In larger media markets, Nielsen measures television viewing with PeopleMeters, which record television usage and tuning continuously and prompt viewers to indicate their presence via remote control once or twice per hour. In smaller markets, audimeters attached to televisions measure set usage and tuning continuously. Viewer presence is measured via self-reported diaries. Nonresponsive participants are removed from the sample quickly. Other participants are replaced every few years.

The Nielsen data contained many omissions, as many datapoints and some entire market-month datasets were missing without explanation. These issues affected the variable definitions in three ways. First, five markets (Alpena, Biloxi, Miami, New Orleans and West Palm Beach) were dropped since a balanced panel could not be constructed for these markets. Second, because the measurement technology is more reliable for households than for demographic groups, the analysis focuses on household ratings. Demographic group ratings are excluded as these are more often missing. Third, even in the household-level ratings, about 20% of the possible observations are missing. Therefore, the analysis focuses on four-week average ratings within the evening news daypart. The four-week average ratings are available in over 94% of the possible observations, making them the most reliable source of information in the data.

Nielsen’s data reporting methodology remains less than fully clear, despite repeated inquiries and careful scrutiny of all available documentation. It is thought that the five geographic markets were missing for exogenous technical reasons. Further, it is assumed that

Nielsen does not report station ratings when the number of people using television in its local sample is relatively low, since it would be difficult to reliably estimate stations' viewing shares based on a small number of viewers. The frequency of data availability (that is, the frequency with which data were not missing) was roughly constant across weekdays but slightly higher for smaller markets than for larger markets. It appeared that data availability was driven more by variation in Nielsen's sample sizes across media markets rather than by variation in television usage over time within a market.

2.3.2. *Media Quality Variables*

This section defines the set of media quality variables, y_{mt} . Quality variables were chosen according to their relevance to the FCC's policy goals and the reliability with which they could be measured. The quality variables are:

LocalEveningRating: The average percentage of households in a market watching any local station between the hours of 5-7 p.m. EST, 4-6 p.m. CST, 4-6 p.m. MST, or 5-7 p.m. PST. This is the daypart with the highest coincidence of local programming and ratings data. Since syndicated programming is typically available during this daypart, it measures the degree to which the entire television viewing market is served, not just the segment interested in local news.

LocalNewsHours: The number of hours of local news offered on all TV stations in the market.

LocalNewsRating: The average rating for all local news programs whose ratings are observed.

NewspaperCirculation: The estimated number of daily newspaper copies per capita distributed in the market over the course of one week.

RadioNewsStations: The number of radio stations in the market classified as "News" format.

Values are expressed in per capita terms to correct for the common occurrence that more populous markets are assigned more station licenses, and therefore would naturally have more radio stations. As in Berry and Waldfogel (2001), counts of stations by format are used because (a) data on stations' listenership were not available and (b) the number of stations supported should be a measure of usage as well as availability, since radio stations may easily switch formats if listeners do not patronize news stations. An additional variable, the count of stations classified as "News/Talk" format, was

considered but produced results which were qualitatively identical to *RadioNewsStations*, so this variable was dropped to simplify the exposition.

Logarithmic transformations of the variables were investigated but generally fit the data worse than linear functions. The conclusions were insensitive to functional form.

To summarize, *LocalEveningRating* addresses the FCC's competition goal; *LocalNewsHours* addresses the FCC's localism goal; and *LocalNewsRatings*, *NewspaperCirculation* and *RadioNewsStations* address both the competition and localism goals.

2.3.3. Media Ownership Variables

This section defines the set of media ownership variables. Ownership variables were chosen according to their relevance to the media ownership rules, but their number was limited to prevent multicollinearity from inflating the standard errors of the estimates. Three ownership variables were reliably measured and varied extensively:

Co-ownedTV: The number of television station parents that control more than one television station in the same media market.

TV/Radio: The number of television stations whose parent controls at least one radio station in the same market.

LocalOwnerTV: The number of television stations in the market controlled by entities located within the market.

Two additional ownership variables are available:

TV/Newspaper: The number of television stations whose parent controls at least one newspaper in the same market. This ownership variable exhibits the least variation. It changed in only one market between 2005 and 2007, and changed in five markets between 2007 and 2009.

MinorityOwnerTV: The number of television stations in the market with an identifiable controller who was a member of a minority race/ethnicity. This variable was only measured reliably in 2007 and 2009; see Turner (2006) for further discussion.

Unfortunately, *TV/Newspaper* does not show meaningful variation in 2005-2007, and *MinorityOwnerTV* data are not available for 2005. Therefore, these two variables must be excluded from the base set of ownership variables. However, both can be included in a regression based on 2007-2009 data alone.

All ownership variables are defined as count data. The large number of zeros precluded logarithmic specifications. Percentage definitions were found to be misleading, as they are influenced by changes in the base number of television stations in the market. Small independent TV stations sometimes start or stop broadcasting, which then changes all cross-ownership and co-ownership percentage variables in the market. However, because these changes typically occur on the fringe of the TV market, they seldom indicate meaningful changes in station ownership concentration.

Another ownership diversity variable measured the number of television stations in each market with an identifiable controller who was female. However, the data collection methodology for this variable indicated it was only reliably available for 2007. Since the empirical approach relies on intertemporal differences, and only a single year of data was available for this variable, it was dropped from the analysis.

To summarize the ownership variables, *TV/Newspaper* is relevant to the Newspaper/Broadcast Cross-Ownership Rule; *Co-ownedTV* is relevant to the Local TV Multiple Ownership Rule; *TV/Radio* is relevant to the Local Radio/TV Cross-Ownership Rule; and *LocalOwnerTV* and *MinorityOwnerTV* are relevant to the impact of ownership diversity on media market competition and localism.

3. Empirical Results

This section presents the estimation results. First, raw correlations are discussed. Then, the full sample is used to estimate parameters for the base set of ownership variables. Finally, the second half of the sample is used to estimate parameters for the augmented set of ownership variables.

3.1. Correlations

Table 1 presents raw correlations between the changes in ownership variables and the changes in media quality variables. Two features of the correlations are notable. First, none of the correlations is particularly large and none are significant at the 95% confidence level. This suggests that the media ownership variables do not individually exert a very strong influence on the media quality variables. Second, the correlations in 2005-2007 differ substantially from the correlations in 2007-2009. For example, increases in co-ownership of television stations are negatively correlated with evening television ratings (-.09) in the first half of the sample, but this

correlation is positive (.01) in the second half of the sample. Many pairwise correlations show similar differences in sign and magnitude between the two halves of the sample. This pattern suggests that both sets of variables may be driven by common factors, such as time effects, and motivates the use of regression analysis.

3.2. Results: Base Ownership Variables, Full Sample

Table 2 reports estimation results for the base set of three ownership variables in the full sample. The first three columns report the FD point estimates and two sets of standard errors, one provided by OLS estimation and one provided by clustered standard error estimation. The second set of three columns report the FE point estimates, followed by two sets of standard errors.

The set of FD estimates with clustered standard errors is the preferred set of estimates, so the discussion focuses on these; the other estimates are provided as benchmarks. The final column of Table 2 displays 95% confidence intervals for the mean elasticity on each effect, based on the FD parameter estimates and clustered standard errors.

Three results merit discussion. First, media ownership variables and time dummies explain little of the variation in the media quality variables. Goodness of fit ranges from a .002 R-squared for the *LocalNewsRatings* quality variable to .092 for the *LocalNewsHours* quality variable. Second, none of the preferred set of estimates is statistically distinguishable from zero. Third, while the standard errors tend to be much larger than the point estimates, none of the confidence intervals admits any appreciable effect of media ownership variables on media quality variables. With just one exception, all 15 elasticities may be safely estimated to be smaller than .07 in absolute magnitude.

3.3. Results: All Ownership Variables, Limited Sample

Table 3 reports model estimation results for set of five ownership variables based on the final two years in the sample. The data were limited to the years 2007 and 2009 because *TV/Newspaper* showed almost no variation in 2005-2007 and because *MinorityOwnerTV* was not available for 2005. Since FD and FE provide identical estimates when the sample contains just two time periods, only FD estimates are presented in the table.

Model fit is even lower in the subsample than in the full sample, with R-squared statistics ranging from .007 to .038. However, some parameters which were imprecisely estimated in the

full sample were estimated more precisely in the restricted sample. Recall that the changes in media ownership variables are correlated among themselves, and that the 2005-2007 correlations were observed to differ markedly from the 2007-2009 correlations.

The results indicate that television-radio cross-ownership is associated with higher levels of local television news provision within a market, and that local television station ownership is associated with lower evening ratings of local programming. These conclusions should be drawn tentatively, as (a) they did not appear within the full sample and (b) at the 95% confidence level, one would expect one or two out of 25 estimates to be significant due purely to random chance.

Again, the confidence intervals on the mean elasticities indicate that the data do not admit the possibility of large effects. With just two exceptions, all of the elasticities can be safely estimated to be smaller than .08 in absolute value.

It is striking to note that no parameter estimate is statistically significant in *both* the full dataset in Table 2 and the 2007-2009 subsample in Table 3. This suggests a lack of consistent directional relationships between individual ownership variables and media quality variables.

4. Summary and Conclusions

This paper investigated a panel of local media markets to present evidence on how changes in media ownership variables are correlated with changes in media quality variables. This analysis produced scant evidence that local media ownership changes media competition or localism. Still, the following results may contribute to the policy discussion on the FCC's media ownership rules and media ownership diversity policies.

Newspaper/Broadcast Cross-Ownership Rule: The estimates in Table 3 indicate that the elasticities of newspaper circulation, local television news provision, and local TV news ratings with respect to the number of television stations co-owned with a newspaper are all less than .03 in absolute value. The lack of television/newspaper integration since the Newspaper/Broadcast Cross-Ownership Rule waiver criteria were loosened in 2007 leads the authors to question the economic basis for keeping the rule in place, given the influence of newspapers on voter information and turnout, the recent declines in newspaper revenues and news production expenditures, and the potential economies of scope available to joint owners of news outlets in multiple media.

Local TV Multiple Ownership Rule: In both the full sample and the subsample, the elasticities of newspaper circulation, television news provision and local news ratings may safely be estimated to be .08 or smaller in absolute magnitude. However, it is worth noting that the rule limited the amount of television station concentration that could be observed in the data, as no entity is permitted to control two large stations in a single market. The authors would hesitate to extrapolate from these results beyond the range of TV station ownership concentration observed in the data. Significant loosening of the rules may produce fundamentally different patterns in the data. This is an area in which some experimentation may be an advisable policy.

Local Radio/TV Cross-Ownership Rule: Increases in television/radio cross-ownership were negatively associated with local TV news provision in the 2007-2009 subsample. The estimate in the full sample is negative but not significantly different from zero. No other significant or sizable effects were found of radio/TV cross-ownership on media quality.

Ownership Diversity: It may be safely estimated that the elasticities of newspaper circulation, local TV news provision and local TV news ratings have elasticities with respect to Minority TV ownership and Local TV station ownership that are smaller than .05 in absolute value.

The evidence provided in this report is intended to contribute to the policy debate around the media ownership rules. However, it does not provide any conclusive basis for policymaking. This paper describes statistical relationships without any claims of causality. Its findings are limited by the range of the available data; longer panels may yield more precise estimates. The reader is reminded that an absence of evidence is not evidence of absence.

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Table 1. Correlations

Change in Media Ownership Variables	Change in Media Quality Variables				
	<i>Newspaper Circulation</i>	<i>RadioNews Stations</i>	<i>LocalNews Hours</i>	<i>LocalNews Rating</i>	<i>Local Evening Rating</i>
Full Sample (410 obs.)					
<i>TV/Newspaper</i>	0.03	0.05	-0.01	-0.02	-0.01
<i>Co-ownedTV</i>	-0.01	0.03	0.02	0.03	-0.07
<i>TV/Radio</i>	0.01	0.04	0.03	0.03	0.02
<i>LocalOwnerTV</i>	-0.03	-0.07	-0.03	0.00	-0.02
<i>MinorityOwnerTV</i>	--	--	--	--	--
2005-2007 only (205 obs.)					
<i>TV/Newspaper</i>	0.09	-0.01	0.00	0.00	0.01
<i>Co-ownedTV</i>	0.02	0.06	0.02	0.01	-0.09
<i>TV/Radio</i>	0.02	0.01	0.04	0.01	0.07
<i>LocalOwnerTV</i>	0.01	-0.10	-0.04	0.00	0.00
<i>MinorityOwnerTV</i>	--	--	--	--	--
2007-2009 only (205 obs.)					
<i>TV/Newspaper</i>	0.00	0.09	0.00	-0.05	-0.03
<i>Co-ownedTV</i>	0.03	-0.05	-0.07	0.07	0.01
<i>TV/Radio</i>	0.11	0.05	-0.10	0.10	0.00
<i>LocalOwnerTV</i>	-0.08	-0.03	-0.01	0.00	-0.07
<i>MinorityOwnerTV</i>	-0.11	0.03	0.04	-0.04	0.02

Table 2. Estimation Results: Base Ownership Variables, Full Sample

Media Quality Variable	First Differences			Fixed Effects			Mean Elasticity 95% Conf. Int. (FD, Clust. s.e.)
	Point Est.	Std. Errors		Point Est.	Std. Errors		
		<i>OLS</i>	<i>Clust.</i>		<i>OLS</i>	<i>Clust.</i>	
<i>Newspaper Circulation</i>							
<i>LocalOwnerTV</i>	-0.006	(.422)	(.006)	-0.001	(.338)	(.009)	(-.01,.00)
<i>Co-Owned TV</i>	.004	(.432)	(.005)	-0.005	(.356)	(.007)	(.00,.01)
<i>TV/Radio</i>	.010	(.547)	(.015)	.009	(.432)	(.014)	(-.01,.02)
Num. Obs.	410			615			
R-squared	.079			.431			
<i>RadioNewsStations</i>							
<i>LocalOwnerTV</i>	-.343	(.422)	(.345)	-.460	(.338)	(.355)	(-.12,.04)
<i>Co-Owned TV</i>	.070	(.432)	(.211)	-.060	(.356)	(.242)	(-.04,.05)
<i>TV/Radio</i>	.189	(.547)	(.314)	.356	(.432)	(.283)	(-.03,.06)
Num. Obs.	410			615			
R-squared	.018			.034			
<i>LocalNewsHours</i>							
<i>LocalOwnerTV</i>	-.478	(.422)	(.852)	-.932	(.338) **	(.884)	(-.04,.02)
<i>Co-Owned TV</i>	-.339	(.432)	(.929)	-.632	(.356)	(1.117)	(-.03,.02)
<i>TV/Radio</i>	-.284	(.547)	(.892)	-1.057	(.432) *	(1.204)	(-.02,.01)
Num. Obs.	410			615			
R-squared	.092			.366			
<i>LocalNewsRatings</i>							
<i>LocalOwnerTV</i>	-.007	(.422)	(.065)	.000	(.338)	(.080)	(-.02,.02)
<i>Co-Owned TV</i>	.069	(.432)	(.095)	.097	(.356)	(.096)	(-.02,.04)
<i>TV/Radio</i>	.090	(.547)	(.094)	-.033	(.432)	(.080)	(-.01,.03)
Num. Obs.	410			615			
R-squared	.002			.180			
<i>LocalEveningRatings</i>							
<i>LocalOwnerTV</i>	-.050	(.422)	(.052)	-.041	(.338)	(.058)	(-.03,.01)
<i>Co-Owned TV</i>	-.093	(.432)	(.061)	-.051	(.356)	(.063)	(-.03,.00)
<i>TV/Radio</i>	.108	(.547)	(.128)	.036	(.432)	(.117)	(-.01,.04)
Num. Obs.	410			615			
R-squared	.039			.330			

Year-specific intercept estimates excluded from table for brevity.

** Significant at the 99% confidence level. * Significant at the 95% conf. level.

Table 3. Estimation Results: All Ownership Variables, 2007-2009 Subsample

Media Quality Variable	First Differences			Mean Elasticity 95% Conf. Int. (FD, Clust. s.e.)
	Point Est.	Std. Errors OLS	Clust.	
<i>Newspaper Circulation</i>				
<i>MinorityOwnerTV</i>	-.031	(.960)	(.021)	(-.01,.00)
<i>TV/Newspaper</i>	-.003	(1.702)	(.022)	(-.01,.01)
<i>LocalOwnerTV</i>	-.019	(.725)	(.010)	(-.03,.00)
<i>Co-Owned TV</i>	.005	(.789)	(.011)	(-.01,.02)
<i>TV/Radio</i>	.039	(1.143)	(.040)	(-.02,.05)
Num. Obs.	205			
R-squared	.038			
<i>RadioNewsStations</i>				
<i>MinorityOwnerTV</i>	.153	(.960)	(.427)	(-.02,.02)
<i>TV/Newspaper</i>	1.435	(1.702)	(1.728)	(-.04,.09)
<i>LocalOwnerTV</i>	-.217	(.725)	(.341)	(-.10,.05)
<i>Co-Owned TV</i>	-.442	(.789)	(.373)	(-.12,.03)
<i>TV/Radio</i>	.449	(1.143)	(.371)	(-.02,.08)
Num. Obs.	205			
R-squared	.016			
<i>LocalNewsHours</i>				
<i>MinorityOwnerTV</i>	1.216	(.960)	(1.643)	(-.01,.02)
<i>TV/Newspaper</i>	.395	(1.702)	(2.777)	(-.01,.02)
<i>LocalOwnerTV</i>	-.252	(.725)	(1.558)	(-.06,.05)
<i>Co-Owned TV</i>	-1.694	(.789) *	(1.451)	(-.07,.02)
<i>TV/Radio</i>	-3.564	(1.143) **	(1.761) *	(-.07,.00)
Num. Obs.	205			
R-squared	.017			
<i>LocalNewsRatings</i>				
<i>MinorityOwnerTV</i>	-.109	(.960)	(.090)	(-.01,.00)
<i>TV/Newspaper</i>	-.257	(1.702)	(.131)	(-.01,.00)
<i>LocalOwnerTV</i>	-.008	(.725)	(.073)	(-.02,.02)
<i>Co-Owned TV</i>	.158	(.789)	(.135)	(-.02,.06)
<i>TV/Radio</i>	.337	(1.143)	(.239)	(-.01,.07)
Num. Obs.	205			
R-squared	.021			
<i>LocalEveningRatings</i>				
<i>MinorityOwnerTV</i>	.042	(.960)	(.092)	(.00,.01)
<i>TV/Newspaper</i>	-.155	(1.702)	(.137)	(-.01,.00)
<i>LocalOwnerTV</i>	-.138	(.725)	(.061) *	(-.04,.00)
<i>Co-Owned TV</i>	.025	(.789)	(.077)	(-.02,.03)
<i>TV/Radio</i>	.026	(1.143)	(.131)	(-.02,.03)
Num. Obs.	205			
R-squared	.007			

Year-specific intercept estimates excluded from table for brevity.

** Significant at the 99% confidence level. * Significant at the 95% conf. level.