

Radio Station Ownership Structure and the Provision of Programming
to Minority Audiences: Evidence from 2005-2009

Joel Waldfogel

The Carlson School and Department of Economics
University of Minnesota

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1. Introduction

The goal of this study is to assess recent evidence on the relationship between ownership structure and the provision of radio programming to minority (African-American and Hispanic) audiences.¹

Ownership structure might affect programming by one (or more) of three basic mechanisms. First, having multiple stations owned by the same entity can reduce the costs of operating additional stations – and additional programming formats. A firm facing lower costs can operate more – and perhaps also more varied – stations within a market. Hence, an owner of multiple stations might be able to operate more minority-targeted stations for a given level of revenue. A second complementary mechanism concerns the internalization of business stealing externalities. Suppose that two separately owned stations in a geographic market operate in the same programming format. If they were instead jointly owned, their owner would have an incentive to separate them in product space, possibly creating more variety in the local market. This mechanism could give rise, again, to more variety throughout product space, including additional minority-targeted stations.²

The identity of owners – for example whether they are ethnic minorities – can also affect programming. For example, black station owners may be better informed about programming of interest to their target audiences. If so, then black-owned stations may serve audience niches that would otherwise be unserved. Related, black owners may derive some non-monetary benefit from serving black audiences that encourage them to program in ways

¹ A companion study examines the relationship between ownership structure and the provision of news programming. See Waldfoegel (2011).

² These mechanisms are explored in Steiner (1952), Rogers & Woodbury (1996), Alexander (1997), Berry and Waldfoegel (2001), DiCola (2010), and Sweeting (2010).

that non-minority owners would not. Under either rationale, the number of black-owned stations in a market would affect the amount of black-targeted programming available in the market.³

The amount of variety is potentially important for consumer well-being. Given consumers' heterogeneous tastes, adding varieties in a market can attract a greater share of the population to consumption, in this case radio listening.⁴ Thus, it is possible to learn something about how satisfying consumers find their radio options from examining the determinants of overall radio listening. Of course, the last decade has been a period of overall declines in radio listening, so the question here is simply whether markets with, say, higher ownership concentration have more or less radio listening, after accounting for other determinants, including overall time trends.

It is well documented that blacks and whites – and Hispanics and non-Hispanics – tend to prefer very different radio programming options (Waldfogel, 2003). Hence, the availability of options targeting minority preferences may have large effects on their well-being as consumers of radio programming. It is worth noting at the outset that radio programming is available free over the air, so we cannot infer the dollar value that listeners attach to the service. Instead, we can simply document the responsiveness of particular groups' listening to the availability of different programming. A large increase in black listening in response to an additional black-targeted station would be suggestive that the marginal station offers a service differentiated from other stations on the dial.

³ See Dubin and Spitzer (1993) or Siegelman and Waldfogel (2001) for evidence of the impact of minority ownership on programming availability.

⁴ Berry and Waldfogel (1999) estimate a model of radio listening and entry where the listening share has an explicit utility interpretation.

These links between ownership – both ownership concentration and minority ownership – and programming have been studied empirically in prior work. Using data for 1993, Berry and Waldfogel (1999) examine the extent of business stealing in radio, concluding that the status quo produces 2-3 times more stations than would be needed to maximize the welfare of the buyers and sellers of advertising. Using data from 1993 and 1997, Berry and Waldfogel (2001) examine the effect of the 1996 Telecommunications Act on programming variety in radio, finding that markets with larger increases in ownership concentration experienced smaller growth in the number of stations, larger growth in the number of distinct formats available in the market, and even larger growth in the number of non-duplicated varieties. Finally, Siegelman and Waldfogel (2001) examine the link between minority ownership and minority-targeted programming in 1993 and 1997, finding that markets with more minority-owned stations offer a greater quantity of minority-targeted programming.

This study revisits these questions with newer data covering the period 2005-2009. In particular, this study asks the following questions: a) how does minority ownership of radio stations affect the amount of minority-targeted programming availability in a market? b) how does ownership structure more generally (i.e. ownership concentration and large-group ownership) affect the amount of minority-targeted radio programming? c) How do ownership structure and minority ownership affect radio listening? That is, does increased ownership concentration promote radio listening overall, or in minority-targeted formats in particular? Similarly, does diversity of owners by race promote overall radio listening, particularly for minority audiences?

The questions of interest are all causal questions (e.g. how does ownership structure affect various outcomes). It is challenging to derive causal answers from observational data in

the best of circumstances. Academic studies generally have the luxury of being conducted only after some policy change or analogous “experiment” gives rise to changes that can be used for causal inference. For example the Telecommunications Act of 1996 relaxed ownership restrictions, which unleashed a significant increase in ownership concentration as well as a decrease in the number of minority-owned stations. Policy changes of this sort present researchers with auspicious circumstances for causal inference. The period covered in the present study, while it is a period of change (for example, radio listening is in slow decline), is not a period of abrupt change. Policy has conducted no “experiments.” This study is not prompted by a development that makes an answer easy to ascertain; instead, the study is prompted by policymakers’ interest in the study’s question. My strategy in conducting the study is to estimate the usual sorts of regression models but to be cognizant of what one can and cannot say about the results.

The study proceeds in three sections after the introduction. Because the introduction has already motivated the question and mentioned the relevant prior literature, the document does not include separate theory or literature review sections. Section 2 describes the data used in the study. I then turn to three results sections, comparing findings with prior findings in context. Section 3 provides the station-level analyses, for example comparing the distribution of broadcast formats for minority and non-minority owned radio stations. Section 4 provides market-level analyses, for example on the relationship between the number of minority-owned stations and the number of minority-targeted stations, using both cross sectional and panel techniques. The conclusion summarizes the findings.

II. Data

The data analyzed in this study (the “GFI”) are station-level data for up to three points in time (05, 07, 09) indicating station format, station listening (from Arbitron), and station ownership information. Whether stations are minority-owned is available for 2005 and, in a different format, for 2007 as well; but this information is not available for 2009. Arbitron listening data are available for 2005 and 2007 but not, for this study’s purpose, for 2009. The data also include radio market-level information on demographics (as well as direct measures of, say, the number of minority-owned stations that could also be calculated from the station-level data).

I have data on station ownership as of the end of each of the study years (2005, 2007, 2009). To make the Arbitron listening data comparable with the other GFI, I average Fall 2005 with Spring 2006 to create what I term 2005 data, and I average Fall 2007 with Spring 2008 to create 2007 data.

The overall (all persons aged 12 and over) listening are available for all stations. Data on black (Hispanic) listening are available for all of the stations in about 85 (62) markets in 2005 and 2007.

The data I employ exist in three separate files, two at the station level and one at the market level. The two station level data sources are LongitudinalRadio_Long.dta, provided by the FCC (in the GFI), and various radio listening data sets provided by Arbitron. The GFI include information on station ownership. In every year the data report the name of the station’s owner (parent company). The data also include some information on whether the station is owned by a minority. In 2005, the data include a binary measure, whether a station is minority-owned. In 2007, the data include a more detailed measure, whether the station is owned by blacks, Hispanics, Asians, Native Hawaiians, or American Indians.

We have two kinds of information on station ownership, whether the station is minority-owned, and the identity of the station's owner. The latter information allows me to determine the number of stations in each station's group. Because of the importance of these ownership variables to the study, we characterize the ownership data here.

The minority ownership data are not consistent across years: As Table 1 shows, of 8236 stations in metropolitan area including ownership data in 2005, 260 are coded as minority owned. Of 6382 metro stations including ownership data in 2007, 278 are coded as black owned, while another 229 are coded as Hispanic owned, 68 are coded as Asian owned, 11 are American Indian owned, and 8 are owned by native Hawaiians. There are no data indicating minority ownership for 2009.

Two features of these ownership data limit the analysis I can undertake with them. First, the apparent change in meaning between 2005 and 2007 means that it is not possible to use the difference between a station's coding in 2005 and 2007 to learn whether the station's ownership changed over that period. Accordingly, it is not prudent to use the minority ownership data for longitudinal analysis. Reinforcing this shortcoming is the absence of 2009 data. Hence, my strategy with these data will be simply to study 2005 and 2007 cross sectional relationships between minority ownership and minority targeting, etc.

Table 1 also provides information on the distribution of stations across ownership groups of different sizes. I use all of the stations in the data (14,375) to calculate the size of each station's ownership group. Among the stations located inside of a metro area, roughly one sixth of the stations are singletons (their owners have no additional stations). Just under 30 percent are in groups including 2 to 9 stations, 13-15 percent are in groups of 10 to 24, just

under 10 percent are in groups of 25 to 49, and roughly 30 percent of stations are in large (50+) station groups.

The GFI cover 14,375 stations in each of the three study years. Many of these stations are located outside of the metro areas I examine in this study. The Fall 2005 Arbitron data contain listening information for 32,886 station-metro combinations. This exceeds the number of stations, since a station appears in both its home metro as well as wherever else listeners report listening to it. In Spring 2006, the Arbitron survey contained 31,854; In Fall 2007, 32,525; and in Spring 2008, 31,667.

Both the GFI and Arbitron datasets contain variables for call sign, and whether the station broadcasts in AM or FM. However, the data do not match perfectly. When I merge the BIA and Arbitron data for 2005 and 2007, 10,667 stations in the Arbitron data do not match with BIA, while 27,370 do. Fewer (622 of 14,375) BIA station observations do not match with Arbitron. The match rate for 2007 is very similar. Many non-matching stations in 2005 are Canadian (142 have call signs beginning with “C”). Another 7637 Arbitron stations report zero or missing AQH listening shares. In 2005, the matching stations account for 88 percent of Arbitron listening. In 2007, the matching stations account for 93 percent of total listening. For market-level analyses, I aggregate the FCC and Arbitron data, then merge them by market rather than by station.

III. Station Level Analyses

a. Do Minority Listening Preferences Differ?

Our goal is to see how extensively minority consumers listen to the radio and, in particular, to see whether station ownership affects this. If minority and white listeners had identical tastes in radio programming, then there would be no separate question of whether minorities are well served. Before proceeding further, it is useful to check whether the rather stark differences between black and white –and between Hispanic and non-Hispanic – listening tendencies documented elsewhere are visible in data for a more recent period.⁵ Table 2 reports total AQH listening (aggregated across Fall 2005, Spring 2006, Fall 2007, and Spring 2008) to each of the BIA broad formats (what are termed “Format Categories” in the GFI). Only listening in markets where Arbitron tallies black listening are included in this table. The formats are listed in descending order by the amount of black listening. The table shows that a single format – Urban – attracts half (51.2 percent of black listening), while it attracts less than five percent of nonblack listening. Urban, along with two more formats – religion and Contemporary Hit Radio – account for 71 percent of black listening. And five formats – the five arrived at with the addition of Jazz and Adult Contemporary – collectively account for 84 percent of black listening. These five formats collectively attract a third percent of nonblack listening (from in the markets where Arbitron tallies black listening separately). Although the particular format designations differ from the studies of the 1990s, the broad pattern remains quite similar: blacks and whites listen to stations broadcasting in different formats. Table 2 also reports the share of each format’s audience that is black. Urban stations’ audiences are 73 percent black, and jazz and religion stations’ audiences are roughly 40 percent black.

Table 3 repeats the exercise, juxtaposing Hispanic and non-Hispanic listening (for markets where Arbitron separately tallies Hispanic listening). The differences are also large.

⁵ Waldfogel (2003) documents that in 1993 and 1997, radio broadcast formats attracting two thirds of black listening collectively attracted 5 percent of non-black listening. Related, Spanish-language programming attracted roughly half of Hispanic listening and just 2 percent of non-Hispanic listening.

Spanish radio stations collectively attract 48 percent of Hispanic listening and only 0.6 percent of non-Hispanic listening. Spanish-language station audiences are 96 percent Hispanic. This pattern echoes the pattern observed in the 1990s.

Minority listeners prefer programming in different formats. This suggests that the availability of programming in these distinct formats affects the well-being of minority consumers, in their capacity as radio listeners.

b. Minority Ownership and Minority-Targeted Programming

The simplest way to document a relationship between minority ownership and targeting is to examine the joint distribution of minority ownership and targeting. Table 4 does this. Of the 8236 DMA stations with ownership data in 2005, 260 (3.1 percent) are minority owned. Yet, the share of stations owned by minorities differs substantially across formats (one rejects independence with a chi squared test, at p-values near 0). Minority ownership is relatively common for Spanish stations (16.6 percent are minority owned), Urban (11.0), and Religion (4.6). Recalling that these formats attract disproportionate shares of minority listening, it is clear that formats with relatively high minority ownership are also formats that cater to minorities.

Of the 260 minority owned stations in 2005, over one third (38 percent) were Spanish, 22 percent were Religious, and 15 percent were Urban. That is, three quarters of minority-owned stations were in formats that have proportionally large minority audiences. Yet, as Table 4 indicates, the vast majority of stations in these formats are not minority-owned.

The latter half of Table 4 examines 2007 separately, revealing similar patterns. The finer ownership variable, which breaks minority ownership into black, Hispanic, and other

constituent parts, reveals elevated black ownership among Urban stations (108 of 331 Urban stations, or 33 percent, were black owned in 2007) and Religious stations (15 percent) .

Operation of Spanish stations is elevated among Hispanic owners: 185 of 548 Spanish stations (34 percent) were Hispanic owned in 2007.

As in the 1990s, most minority-owned stations broadcast in formats that appeal disproportionately to minorities. But also as in the 1990s, most stations broadcasting in these formats are not minority owned. See Siegelman and Waldfogel (2001).

The disproportionate tendency for minority-owned stations to broadcast in formats that appeal to minority listeners provides suggestive evidence that minority ownership is beneficial to minority audiences. But the fact that minority-owned stations are likely to broadcast in formats appealing to minorities does not, by itself, indicate that the presence of minority-owned stations raises the availability of minority-targeted programming, since non-minority-owned stations are also active in the provision of minority-targeted programming. (The answer to that question depends on whether minority-owned stations displace other stations targeting the same audiences, and addressing that question requires analysis at the market level, which we undertake below).

c. Group Ownership and the Availability of Stations by Format

Since the Telecommunications Act of 1996 liberalized ownership, many stations have come to be owned by large radio station groups.⁶ The effects of these ownership groups on programming is unclear *a priori*. Lower costs could allow groups to operate more stations, offering more variety. Local ownership concentration might also induce jointly owned local

⁶ See Berry and Waldfogel (2001) for evidence of the ownership consolidation surrounding the Telecom Act of 1996.

stations to spread out in product space, increasing variety. Of course, common ownership of multiple stations could also promote homogeneity, particularly across geographic areas but possibly within areas as well. Group ownership could also allow firms to spread investments in programming quality across more stations.

The station level data allow us, as a first step, to simply examine the relationship between group ownership and formats. Table 5 summarizes these data. First, stations are classified according to the size of the groups including them. This classification is done using all of the active 14,375 stations in the GFI. This table reports the joint distribution for the 8650 metro area stations operating in 2009. As the table shows, 18 percent of stations are singletons, 31 percent are in groups of 2-9, 15 percent are in groups of 10-24, 10 percent are in groups of 25 to 49, and 27 percent are in groups of 50 or more.

Group size is not independent of format, however. Not only can one reject independence in a chi-squared test, but the deviation from independence is large. For example, nearly half of jazz stations are singletons, as are 20 percent of Spanish stations. At the other extreme, nearly half of contemporary hit radio stations – and nearly half of urban stations - are in groups of 50 or more, as are about a third of country and sports stations. On the other hand, relatively few (15 percent) of Spanish stations are in groups of 50 or more, as are even fewer (9 percent) of jazz stations. The point emerging from Table 5 is that there is no single relationship between group size and the provision of programming of interest to minority listeners.

We can also ask how listening varies across stations with the size of the stations' underlying ownership groups. The latter three columns of Tables 6a and 6b examine this question, via regression of log AQH listening on broad and narrow format dummies, respectively (what are termed “Format Categories” and “Format Groups,” respectively, in the

GFI), metro area dummies, and a dummy for 2007, along with dummies for whether the station is part of a group of 2-9, 10-24, 25-49, or 50+. Standalone stations are the excluded category. Column (4) shows that overall listening is higher for stations in larger groups, and the size effect is monotonic in size. Relative to singletons, stations in groups of 2-9 have 11 percent higher listening. Stations in groups of 50 or more have 48 percent higher listening than standalone stations, again, compared with stations in the same market and format. Black and Hispanic listening also bear monotonic, positive relationships with the station's group size. Relative to standalone stations, Hispanic listening is 9 percent higher at stations in groups of 2-9, and it is 58 percent higher at stations in groups of 50 or more. We obtain similar results with dummies for broad formats ("format categories"), in Table 6b.

If the size of the audience that a station can attract provides an indirect measure of the station's appeal, the fact that stations in larger groups attract larger black, white, and overall audiences than do their geographic and format peers in smaller groups suggests that group ownership produces some benefit for listeners. It should be noted, however, that stations differ in the power of their signals. It is possible that stations owned by larger groups have stronger signals which allow them to reach more listeners. In the absence of data on signal strength, it is difficult to draw strong conclusions.

d. Station Listening and Minority Ownership

The station-level data also allow us to examine the appeal of minority-owned stations (relative to non-minority-owned stations) directly in terms of listenership. Do minority-owned stations attract more listeners than their non-minority-owned counterparts? Because average station listenership may vary across metro areas and across formats, this comparison is more

reasonably done with statistical controls (in this case dummies) for both format and metro area. See Tables 6a for an analysis controlling for narrow formats, or “format groups” and 6b for an analysis controlling for broad formats, or “format categories.”

Combining the 2005 and 2007 data, minority-owned stations attract an average of 15 percent less AQH listening overall, after accounting for metro area and narrow BIA format (standard error = 5.0 percent). If we restrict attention to black listening (in markets with black listening data), we see that minority-owned stations attract 7.3 percent greater black listening than their within-market, same-format peers, although this difference is statistically insignificant (s.e. = 6.2 percent). Restricting attention to Hispanic listening, minority-owned stations attract 17.8 percent less Hispanic listening, and this difference is statistically significant (s.e. = 6.7 percent). Regressions using broad format dummies (based on “format categories”) give similar results. See Table 6b.

The suggestive station-level evidence is thus a bit mixed. On one hand, minority ownership is positively associated with the provision of minority-targeted formats, which the minority listeners prefer over other formats. Minority-owned stations attract similar amounts of listening to non-minority-owned stations in the same narrow format and market. Minority-owned stations attract substantially less Hispanic listening, compared with other stations in the same format and metro area.⁷ If station power varies systematically with owner race, then the same caveats mentioned above apply here as well. That is, differential listening by owner race may reflect differential station power, rather than the appeal of the station’s programming per se.

⁷ Similar results emerge when we use only 2007 and include separate right-hand side measures for whether a station is black-owned, Hispanic-owned, or owned by another member of a minority group.

IV. Market-Level Analyses

Our ultimate goal is to determine whether factors that are in principle controllable with public policy – aspects of ownership structure – affect the well-being of minorities, in their capacity as radio listeners. The steps along the causal chain for this mechanism include the following: a) the possible effect of policy on ownership structure, b) the possible effect of ownership structure on program targeting, and c) the possible effect of the availability of various kinds of programming on the tendency for consumers to listen (which, we infer, generates satisfaction for the listeners).

This section attempts to address questions (b) and (c) using cross sectional data at the metro area level. We begin by simply characterizing the availability of radio programming in various formats in markets of different sizes, to get a sense of which formats are more prevalent in their availability. (If every format were available everywhere, then it would be unlikely that any particular group did not have access to its preferred programming, and there would be little scope for ownership to affect programming availability). We then ask whether additional minority-targeted stations attract a greater share of minorities to radio listening, finally turning to the question of whether additional minority-owned stations in a market raise the total amount of minority-targeted programming in the market. Throughout, I attempt to be careful about the assumptions needed for causal inference in this context and explicit about the plausibility of these assumptions.

a. Availability of Different Programming Formats

The 300 metro areas in the study had an average of 30.4 stations available (according to FCC definitions) in 2009. Because programming in different formats appeals to different

groups, it is useful to characterize the availability of stations in the various formats. We can do this two ways through numbers (the number of, say, country stations in a market) and presence (whether a market has a station in a particular format). Table 7 shows the average number of stations in each format, as well as the share of markets with a station in the format. Religious stations are the most common: markets have an average of 4.7 stations, and 95 percent of the markets have at least one. Country and news stations are the next most common. Markets have an average of 2.9 stations in each of these formats, and 95 and 94 percent of markets have country and news stations, respectively. Other common formats include album oriented rock, adult contemporary, contemporary hit radio, oldies, rock, and sports. The least commonly available formats include middle of the road, easy listening, nostalgia/big band, public, jazz, urban, Spanish, and classical.⁸

Figure 1 shows that format presence varies across markets of different sizes, in particular across population deciles. The upper left depicts the relationship between market population decile and format presence for the five least commonly available formats: easy listening, ethnic, nostalgia, middle of the road, and jazz. Moving clockwise, the panels depict more commonly available formats. Some formats, such as rock, country, news, religion, and adult contemporary music are available in markets of all sizes, while formats such as those in the upper left, as well as Spanish, jazz, and classical music, are available in few small markets.

Audiences interested in the formats depicted in the lower right panel face options virtually everywhere, while audiences interested in other format face fewer targeted options. The formats appealing most clearly to black and Hispanic audiences – urban, Spanish, and jazz are among those that are typically unavailable in markets below the median size.

⁸ “Public” is primarily educational stations. Most NPR-affiliated stations are in the “news” category along with commercial news stations. See Waldfogel (2011).

b. Targeted Programming and Group Listening

It has been clearly documented elsewhere that markets with a greater variety of programming tend to attract a greater share of consumers in the market to radio.⁹ Moreover, there is specific evidence that markets with a larger number of minority-targeted options attract greater shares of minority consumers to radio listening (Waldfogel, 2003). We now revisit this question, in particular the relationship between targeted programming and listening, using recent data.

A natural way to document whether additional variety attracts consumers to radio listening is to regress the share of a group's population listening to radio on measures of the amount of variety available locally. This could be the number of stations, the number of distinct varieties, or the number of stations in each of a number of varieties (such as the number of black-targeted stations, etc.). If our goal is to interpret the coefficients on the variety measures as causal impacts of variety on listening, there is a concern. If local radio markets were operated "experimentally," with different numbers of stations – and varieties – available in different markets for reasons unrelated to audience interest, then inference would be easy. With station availability determined randomly, any resulting variation in the share of population listening to radio would reflect the causal impact of differing station configurations.

Real life has different concerns: stations presumably enter markets where they expect sufficient interest in their programming and advertising to cover their costs. We would then see a large number of stations in places with large levels of interest in radio listening, but the relationship would not simply reflect the impact of variety on listening. Rather, the relationship might reflect the relationship between the appetite for radio listening and both station entry and

⁹ See Berry and Waldfogel (1999), Rogers and Woodbury (1996), and Alexander (1997).

listening. To say this using econometric jargon, one might be concerned that station availability is endogenous.

A solution to this problem is a source of variation in our variety measure that is not driven by tastes for radio listening. A natural candidate here is market size, measured by population. A market with larger population can support more stations for a given per-capita interest in radio listening (and resulting advertising). As long as markets of different size do not have different levels of underlying interest in radio programming, market size can serve as an instrument for a variety measure. Using instrument variables techniques, we can derive an estimate of the causal impact of additional stations on radio listening.

We are interested not just in the effect of variety on overall listening but also on the effect of minority-targeted variety on listening. We can use an analogous approach, using the size of the local minority population as an instrument for the number of minority-targeted stations. Before proceeding, a note on the description of “minority-targeted” is in order. For Hispanic targeting I simply classify Spanish-language stations as Hispanic targeted. Black targeting is less clear cut. Based on the listening data in Table 2, the urban format is more clearly black-targeted. Two other formats, jazz and religious, have substantial black listening. I thus employ two different definitions of black targeting. I employ a narrow definition of black targeting that includes only urban stations as well as a broad definition that includes urban, jazz, and religious stations.

Tables 8-11 implement these ideas. Table 8a presents regressions of the share of population listening to radio during an average quarter hour on measures of the numbers of stations targeting blacks, Hispanics, and others. We include urban, religious, and jazz stations as a broad group of formats targeted at black listeners, we treat Spanish stations as Hispanic-

targeted, and we classify the remaining formats as “white-targeted.” (Table 8b revisits the analysis with the narrow definition of black targeting). The first column of Table 8a reports a regression of overall AQH on the numbers of black, Hispanic, and white-targeted stations. Both of the statistically significant coefficients (on Spanish-language and other stations) are positive, indicating that markets with more stations in each of these categories have more radio listening. It’s also worth noting that the coefficients are small relative to the constant term. AQH listening averages roughly 12.3 percent, and the constant term is 12.1, while a market with an additional white-targeted station has AQH listening that is 0.02 percentage points higher. That is, markets with an additional white-targeted station have listening that is 0.2 percent higher.

Columns (2) and (3) examine black and non-black listening in the markets with separate black listening data. All three coefficients are positive and significant in the black regression (column 2), and the black coefficient is highest. Column (4) examines Hispanic listening. In this regression, only the Hispanic and white-targeted coefficients are significant, and the Hispanic coefficient is roughly ten times larger. The picture that emerges from this table is that a particular group’s listening is larger in markets with more stations targeting that group. In addition, it’s clear that while overall (and non-black and non-Hispanic) listening is higher in markets with more stations targeted to non-blacks and to non-Hispanics, the coefficient is smaller for this majority group than for the minority groups. Presumably, this reflects the fact that markets always have more majority-targeted stations, and the average marginal listening increment declines with the number of products targeting each group. Table 8b, using the narrow definition of black targeting, provides similar results.

Table 9 implements the instrumental variables strategy, with first-stage regressions of group-targeted entry on the sizes of the three population groups. In two of three cases (black and white-targeted entry), own coefficients exceed cross-group coefficients. Tables 10a and 10b turn to second-stage IV estimates seeking to obtain the causal relationship between targeted entry and group listening. Standard errors tend to be larger than for the OLS estimates in Table 8, but the coefficient on the relevant minority group tends to exceed the other coefficients. For example, in column (2) of Table 10a, the black AQH listening share increases by 0.28 for each additional black-targeted station, while it increases only 0.13 for each additional Spanish station and does not vary with the number of other stations. By contrast, non-black listening (in column 3) is more sensitive to white-targeted stations and less sensitive to the others. Hispanic listening (in column 4) increases 0.26 in each Spanish station but increases only 0.05 per white-targeted station and is statistically insignificantly related to black-targeted stations. Results in Table 10b are similar.

Tables 8-10 – and Tables 10a and b in particular – indicate that members of minority groups listen more in markets with more stations targeted specifically at their group. Under the assumptions underlying the IV estimation, we can interpret this estimate as causal. That is, we can infer that additional minority-targeted stations would raise minority listening. If we take listening as an indicator of satisfaction that consumers derive from radio broadcast services, then we can infer that additional minority group-targeted stations would raise the well-being of minority consumers, in their capacity as radio listeners.

c. Minority Ownership and Minority Targeting

The next question is whether ownership structure affects targeting. We begin by studying the race of the owner. Recall that for 2005 we only have a variable indicating minority ownership (with no distinction among minority groups). For 2007 we can distinguish black, Hispanic, and other group ownership.

Our strategy for exploring the effect of minority ownership on the amount of programming targeting minorities is to ask whether markets with more minority-owned stations have more minority-targeted programming, after accounting for other determinants of the amount of programming diversity. This is very similar to strategies pursued in Siegelman and Waldfogel (2001). As demonstrated above in Table 9, the amount of minority-targeted programming bears a relationship to the size and mix of local population. Hence, we begin by regressing, say, the number of broadly black-targeted stations in a market in 2005 on measures of black, white, and Hispanic population, along with variables for the numbers of minority-owned and non-minority-owned stations in the market in 2005. Column (1) of Table 11 reports the result of this regression. The coefficient on the number of minority-owned stations is 0.55 (standard error =0.08). Column (2) repeats the exercise using 2007 data. The coefficient on the number of black-owned stations is 0.62 (0.06), while the Hispanic and other coefficients are roughly 0.3. Columns (3) and (4) repeat this exercise with the number of narrowly black targeted stations. Coefficient patterns are similar.

Column (5) reports the analogous 2005 regression using the number of Hispanic-targeted stations as the dependent variable. Markets with an additional minority-owned station in 2005 have an additional 0.62 Hispanic-targeted stations.

Columns (7)-(10) repeat the exercises of columns (1)-(4), adding controls for the total number of stations as well as the squares of the population terms. Patterns are somewhat

attenuated but still reflect a positive impact of minority ownership on minority targeting: conditional on the number of radio stations in the metro area (and other controls), the markets with an additional station owned by a black have roughly 0.1-0.4 additional stations targeted at blacks, while markets with an additional station owned by an Hispanic have roughly 0.2-0.45 additional stations targeted at Hispanics.

These estimates are also similar to, albeit somewhat smaller than, estimates reported in Siegelman and Waldfogel (2001) for the 1990s. SW run cross sectional regressions of black-targeted stations on terms in population as well as the number of black-owned stations, obtaining black ownership coefficients of 0.69 for 1993 and 0.90 for 1997. Their analogous estimates for Hispanic ownership are 1.14 and 1.52. Because SW have measures of ownership that are defined similarly over time, they are able to use longitudinal approaches that we cannot implement here. The period 1993-1997 also surrounded a policy change – the Telecommunications Act of 1996 – that gave rise to exogenous variation in the number of minority owners. Making use of that policy “experiment” – and instrumenting for the change in ownership with measures of market size – SW estimate black and Hispanic ownership coefficient of 0.99 and 1.14 respectively.

Although the period under study in the current study lacks a policy change or other plausible source of exogenous variation, the similarity of the estimates of minority ownership on minority targeting across time periods, approaches, and contexts provides at least suggestive evidence that the ownership coefficients measured in this study continue to reflect causal impacts.

d. Ownership Groups, Variety, and Listening

We now turn to the relationships between ownership variables (large groups, number of owners, and the largest local owner) and variety and listening. Here, the question is at the level of the market rather than the station. We have two possible approaches: we can compare levels of ownership variables and their outcomes across markets, or we can compare changes in ownership and possible outcomes across markets. The cross-market approach asks, for example, whether markets with fewer owners have more variety, given the number of stations available. This approach is vulnerable to concern of unobserved heterogeneity: markets with different numbers of owners, given the number of stations operating, may have different amounts of variety on the dial for reasons unrelated to the effect of ownership concentration. The use of market-level fixed effects avoids this problem, but the lack of a policy change in the study period casts doubt on the promise that this approach holds for measuring the relevant effects.

The first two columns of Table 12a examine the relationship between available varieties (the number of “format categories” or “format groups” available locally) and ownership variables, after accounting for the number of stations. The question these regressions seek to address is whether, with a given number of stations, a market has more or less variety if it has: fewer owners (and therefore more ownership concentration), a higher share of its stations in large ownership groups (and therefore possible operating at lower costs), two more measures of ownership concentration: the average number of commercial stations per, and the size of the largest local ownership group.

Not surprisingly, markets with more stations have more varieties, as the radio station coefficients indicate. Markets with a higher share of stations in large groups have more narrow varieties, and markets whose largest local ownership group is larger have more varieties.

Overall listening – in column (3) – is higher in markets with greater ownership concentration (fewer owners). It is also higher in markets with more of their stations in larger groups and in markets with more stations per group and a larger largest group.

However, all of these results disappear with the inclusion of metro area fixed effects in columns (6)-(9). Moreover, we reject the hypothesis that the unobservable fixed effect is independent of the explanatory variables for both variety and listening. This casts doubt on the validity of using the cross-market variation for identifying the causal impacts of these variables in Table 12a. (Table 12b reports an analogous set of regressions using the HHI rather than the number of owners as a measure of concentration). While some variables are significant in the cross market regressions of columns (1)-(3), none of the coefficients remain significant with the inclusion of the metro area fixed effects).

This leaves us unable to draw strong conclusions from a study of the relationship between ownership variables and variety (and between ownership variables and listening) using data for this recent period. The lack of a finding is not the same as a robust finding that there is no effect. Rather, it seems reasonable to infer that the variation in explanatory variables that reflect ownership does not shed particular light on the question. As mentioned in the introduction to this study, existing studies making use of the policy “experiment” provided by the Telecommunications Act of 1996, which substantially relaxed ownership restrictions and unleashed a rapid change in radio station ownership concentration, do find that elevated ownership concentration raised the number of varieties available, especially conditional on the number of stations.

Conclusion

We have examined the relationship between various aspects of radio station ownership and the provision – and consumption – of minority-targeted programming, with the following findings:

- 1) As in the 1990s, blacks and nonblacks – and Hispanics and non-Hispanics – have starkly different preferences in radio programming. Urban stations collectively attract half of black listening but only four percent of nonblack listening. Spanish stations attract nearly half of Hispanic listening and negligible amounts of non-Hispanic listening.
- 2) Some minority-targeted formats – urban, jazz, and Spanish – are among the formats that are less commonly available.
- 3) As in the 1990s, most minority-owned stations target minority listeners, but – also as in the 1990s – most minority-targeted stations are not minority-owned.
- 4) Stations in large groups tend to attract more listeners – overall, as well as among blacks and Hispanics – than do stations in smaller ownership groups, after accounting for metro area and programming format.
- 5) The availability of minority-targeted stations attracts more minorities to radio listening. This result emerges in OLS cross sectional investigations and cross sectional IV approaches but not from the within-market variation between 2005 and 2007.
- 6) The presence of minority-owned stations in market appears to raise the amount of minority-targeted programming.
- 7) The recent period provides mixed evidence on the relationship between ownership concentration and variety: cross sectional regressions suggest that higher concentration

promotes variety, but longitudinal exercises (using within-market variation) produce no statistically significant relationships. It should be noted, again, that the period 2005-2009 contains no “policy experiments” so that the absence of detected relationships may owe as much to the absence of an “experiment” as it does to the lack of a detected effect.

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Table 1: Minority and Group Radio Station Ownership, 2005 -2009

| | 2005 | 2007 | 2009 | 2005 | 2007 | 2009 |
|----------------------------|-------|-------|-------|-------|-------|-------|
| No Controlling Interest | 0 | 480 | na | 0.0% | 7.5% | |
| Non-Hispanic White | 0 | 5,308 | na | 0.0% | 83.2% | |
| Non-minority (2005 only) | 7,976 | 0 | na | 96.8% | 0.0% | |
| Minority (2005 only) | 260 | 0 | na | 3.2% | 0.0% | |
| Asian | 0 | 68 | na | 0.0% | 1.1% | |
| American Indian or Alaskan | 0 | 11 | na | 0.0% | 0.2% | |
| Black or African American | 0 | 278 | na | 0.0% | 4.4% | |
| Hispanic or Latino, | 0 | 229 | na | 0.0% | 3.6% | |
| Native Hawaiian | 0 | 8 | na | 0.0% | 0.1% | |
| total | 8236 | 6382 | na | | | |
| Group size | 2005 | 2007 | 2009 | 2005 | 2007 | 2009 |
| singleton | 1,507 | 1,519 | 1,518 | 18.3% | 17.7% | 17.5% |
| 2 to 9 | 2,328 | 2,548 | 2,646 | 28.3% | 29.7% | 30.6% |
| 10 to 24 | 1,043 | 1,284 | 1,295 | 12.7% | 15.0% | 15.0% |
| 25 to 49 | 739 | 816 | 860 | 9.0% | 9.5% | 9.9% |
| 50 and up | 2,620 | 2,404 | 2,331 | 31.8% | 28.0% | 26.9% |
| total | 8,237 | 8,571 | 8,650 | | | |

Table 2: Black and White Listening Patterns (BIA Broad Formats)

| Format Category | Total listening | %black | cumul B | cumul NB |
|----------------------------------|-----------------|--------|---------|----------|
| Urban | 66507 | 75.7% | 54.4% | 3.9% |
| Religion | 24322 | 40.1% | 64.9% | 7.4% |
| Contemporary Hit Radio/Top 40 | 43750 | 19.9% | 74.3% | 15.9% |
| Jazz/New Age | 14861 | 39.1% | 80.6% | 18.1% |
| Adult Contemporary | 65016 | 7.4% | 85.8% | 32.7% |
| News | 47023 | 7.6% | 89.7% | 43.2% |
| Sports | 14322 | 10.5% | 91.3% | 46.3% |
| Talk | 16409 | 8.3% | 92.8% | 50.0% |
| Oldies | 21166 | 5.6% | 94.0% | 54.8% |
| Miscellaneous | 9678 | 11.5% | 95.2% | 56.9% |
| Rock | 40627 | 2.7% | 96.4% | 66.5% |
| Country | 45120 | 2.3% | 97.5% | 77.1% |
| Classical | 12942 | 4.6% | 98.2% | 80.1% |
| Album Oriented Rock/Classic Rock | 25224 | 1.9% | 98.7% | 86.1% |
| Spanish | 44073 | 1.0% | 99.2% | 96.7% |
| Public/Educational | 4994 | 7.2% | 99.6% | 97.8% |
| Ethnic | 1600 | 13.6% | 99.8% | 98.1% |
| Nostalgia/Big Band | 3575 | 3.1% | 99.9% | 99.0% |
| Easy Listening/Beautiful Music | 3370 | 2.0% | 100.0% | 99.8% |
| Middle of the Road | 938 | 2.1% | 100.0% | 100.0% |

Notes: total black and nonblack listening to stations in markets with separate black listening data. Surveys for Fall 2005, Spring 2006, Fall 2007, and Spring 2008 are included. This table includes only stations that match with the BIA stations, and the listed formats are BIA's Format Category variable.

Table 3: Hispanic and non-Hispanic Listening Patterns (BIA Broad Formats)

| Format Category | TOTAL | %Hispanic | cumul H | cumul NH |
|----------------------------------|-------|-----------|---------|----------|
| Spanish | 52079 | 96.4% | 51.3% | 0.6% |
| Contemporary Hit Radio/Top 40 | 37851 | 27.4% | 61.9% | 9.3% |
| Adult Contemporary | 51956 | 15.4% | 70.1% | 23.2% |
| Urban | 44745 | 15.2% | 77.0% | 35.1% |
| Rock | 32198 | 11.6% | 80.8% | 44.1% |
| Oldies | 17366 | 14.5% | 83.4% | 48.8% |
| Country | 31107 | 7.7% | 85.9% | 57.9% |
| Album Oriented Rock/Classic Rock | 20298 | 11.6% | 88.3% | 63.5% |
| News | 38228 | 6.1% | 90.7% | 74.9% |
| Religion | 15703 | 13.0% | 92.8% | 79.2% |
| Jazz/New Age | 13455 | 13.2% | 94.6% | 82.9% |
| Talk | 14146 | 8.9% | 95.9% | 86.9% |
| Miscellaneous | 8648 | 14.1% | 97.1% | 89.3% |
| Sports | 12547 | 8.7% | 98.2% | 92.9% |
| Classical | 10679 | 5.7% | 98.9% | 96.1% |
| Ethnic | 1604 | 23.9% | 99.3% | 96.5% |
| Public/Educational | 4647 | 6.2% | 99.6% | 97.8% |
| Easy Listening/Beautiful Music | 3485 | 6.0% | 99.8% | 98.9% |
| Nostalgia/Big Band | 3019 | 6.7% | 100.0% | 99.8% |
| Middle of the Road | 750 | 2.8% | 100.0% | 100.0% |

Notes: total Hispanic and non-Hispanic listening to stations in markets with separate Hispanic listening data. Surveys for Fall 2005, Spring 2006, Fall 2007, and Spring 2008 are included. This table includes only stations that match with the BIA stations, and the listed formats are BIA's Format Category variable.

Table 4: Minority Ownership and Programming Format, 2005 and 2007

| | 2005 non-minority | 2005 minority | 2005 total | 2007 white | 2007 Hispanic | 2007 Black | 2007 other | 2007 total |
|-----------------------|----------------------|------------------|---------------|---------------|------------------|---------------|---------------|---------------|
| Adult Contemporary | 766 | 7 | 773 | 607 | 4 | 5 | 54 | 670 |
| Album Oriented Rock/C | 402 | 2 | 404 | 314 | 0 | 7 | 39 | 360 |
| Classical | 190 | 1 | 191 | 20 | 0 | 0 | 1 | 21 |
| Contemporary Hit Radi | 402 | 1 | 403 | 334 | 4 | 6 | 41 | 385 |
| Country | 793 | 5 | 798 | 720 | 3 | 7 | 77 | 807 |
| Easy Listening/Beauti | 35 | 1 | 36 | 24 | 1 | 0 | 0 | 25 |
| Ethnic | 84 | 9 | 93 | 49 | 4 | 4 | 27 | 84 |
| Jazz/New Age | 125 | 4 | 129 | 46 | 1 | 6 | 3 | 56 |
| Middle of the Road | 30 | 0 | 30 | 22 | 0 | 0 | 0 | 22 |
| Miscellaneous | 415 | 2 | 417 | 139 | 1 | 3 | 55 | 198 |
| News | 739 | 7 | 746 | 525 | 4 | 11 | 43 | 583 |
| Nostalgia/Big Band | 210 | 2 | 212 | 147 | 1 | 3 | 9 | 160 |
| Oldies | 399 | 8 | 407 | 321 | 2 | 6 | 27 | 356 |
| Public/Educational | 97 | 0 | 97 | 4 | 0 | 0 | 0 | 4 |
| Religion | 1,209 | 58 | 1,267 | 473 | 6 | 84 | 17 | 580 |
| Rock | 619 | 2 | 621 | 456 | 0 | 5 | 42 | 503 |
| Spanish | 499 | 99 | 598 | 325 | 185 | 10 | 28 | 548 |
| Sports | 351 | 4 | 355 | 347 | 4 | 4 | 50 | 405 |
| Talk | 287 | 8 | 295 | 248 | 7 | 9 | 19 | 283 |
| Urban | 324 | 40 | 364 | 186 | 2 | 108 | 35 | 331 |
| Total | 7,976 | 260 | 8,236 | 5,307 | 229 | 278 | 567 | 6,381 |

Table 5: Group Size and Station Format, 2009

| | singleton | 2 to 9 | 10 to 24 | 25 to 49 | 50 and up | total |
|-----------------------|-----------|--------|----------|----------|--------------|-------|
| Adult Contemporary | 49 | 203 | 103 | 74 | 221 | 650 |
| | 7.54 | 31.23 | 15.85 | 11.38 | 34 | 100 |
| | 3.23 | 7.67 | 7.95 | 8.6 | 9.48 | 7.51 |
| Album Oriented Rock/C | 27 | 72 | 73 | 42 | 151 | 365 |
| | 7.4 | 19.73 | 20 | 11.51 | 41.37 | 100 |
| | 1.78 | 2.72 | 5.64 | 4.88 | 6.48 | 4.22 |
| Classical | 27 | 127 | 14 | 9 | 2 | 179 |
| | 15.08 | 70.95 | 7.82 | 5.03 | 1.12 | 100 |
| | 1.78 | 4.8 | 1.08 | 1.05 | 0.09 | 2.07 |
| Contemporary Hit Radi | 36 | 89 | 62 | 38 | 198 | 423 |
| | 8.51 | 21.04 | 14.66 | 8.98 | 46.81 | 100 |
| | 2.37 | 3.36 | 4.79 | 4.42 | 8.49 | 4.89 |
| Country | 65 | 258 | 140 | 99 | 259 | 821 |
| | 7.92 | 31.43 | 17.05 | 12.06 | 31.55 | 100 |
| | 4.28 | 9.75 | 10.81 | 11.51 | 11.11 | 9.49 |
| Easy Listening/Beauti | 6 | 9 | 1 | 1 | 1 | 18 |
| | 33.33 | 50 | 5.56 | 5.56 | 5.56 | 100 |
| | 0.4 | 0.34 | 0.08 | 0.12 | 0.04 | 0.21 |
| Ethnic | 34 | 21 | 7 | 29 | 9 | 100 |
| | 34 | 21 | 7 | 29 | 9 | 100 |
| | 2.24 | 0.79 | 0.54 | 3.37 | 0.39 | 1.16 |
| Jazz/New Age | 48 | 30 | 10 | 2 | 9 | 99 |
| | 48.48 | 30.3 | 10.1 | 2.02 | 9.09 | 100 |
| | 3.16 | 1.13 | 0.77 | 0.23 | 0.39 | 1.14 |
| Middle of the Road | 4 | 8 | 1 | 2 | 3 | 18 |
| | 22.22 | 44.44 | 5.56 | 11.11 | 16.67 | 100 |
| | 0.26 | 0.3 | 0.08 | 0.23 | 0.13 | 0.21 |
| Miscellaneous | 285 | 135 | 59 | 67 | 96 | 642 |

| | | | | | | |
|--------------------|-------|-------|-------|-------|-------|-------|
| | 44.39 | 21.03 | 9.19 | 10.44 | 14.95 | 100 |
| | 18.77 | 5.1 | 4.56 | 7.79 | 4.12 | 7.42 |
| News | 96 | 303 | 103 | 74 | 234 | 810 |
| | 11.85 | 37.41 | 12.72 | 9.14 | 28.89 | 100 |
| | 6.32 | 11.45 | 7.95 | 8.6 | 10.04 | 9.36 |
| Nostalgia/Big Band | 28 | 45 | 17 | 14 | 21 | 125 |
| | 22.4 | 36 | 13.6 | 11.2 | 16.8 | 100 |
| | 1.84 | 1.7 | 1.31 | 1.63 | 0.9 | 1.45 |
| Oldies | 70 | 186 | 89 | 56 | 127 | 528 |
| | 13.26 | 35.23 | 16.86 | 10.61 | 24.05 | 100 |
| | 4.61 | 7.03 | 6.87 | 6.51 | 5.45 | 6.1 |
| Public/Educational | 50 | 66 | 12 | 1 | 1 | 130 |
| | 38.46 | 50.77 | 9.23 | 0.77 | 0.77 | 100 |
| | 3.29 | 2.49 | 0.93 | 0.12 | 0.04 | 1.5 |
| Religion | 260 | 474 | 180 | 130 | 338 | 1,382 |
| | 18.81 | 34.3 | 13.02 | 9.41 | 24.46 | 100 |
| | 17.13 | 17.91 | 13.9 | 15.12 | 14.5 | 15.98 |
| Rock | 157 | 112 | 78 | 41 | 158 | 546 |
| | 28.75 | 20.51 | 14.29 | 7.51 | 28.94 | 100 |
| | 10.34 | 4.23 | 6.02 | 4.77 | 6.78 | 6.31 |
| Spanish | 147 | 227 | 154 | 92 | 110 | 730 |
| | 20.14 | 31.1 | 21.1 | 12.6 | 15.07 | 100 |
| | 9.68 | 8.58 | 11.89 | 10.7 | 4.72 | 8.44 |
| Sports | 32 | 133 | 91 | 47 | 167 | 470 |
| | 6.81 | 28.3 | 19.36 | 10 | 35.53 | 100 |
| | 2.11 | 5.03 | 7.03 | 5.47 | 7.16 | 5.43 |
| Talk | 47 | 93 | 48 | 23 | 72 | 283 |
| | 16.61 | 32.86 | 16.96 | 8.13 | 25.44 | 100 |
| | 3.1 | 3.51 | 3.71 | 2.67 | 3.09 | 3.27 |
| Urban | 50 | 55 | 53 | 19 | 154 | 331 |
| | 15.11 | 16.62 | 16.01 | 5.74 | 46.53 | 100 |
| | 3.29 | 2.08 | 4.09 | 2.21 | 6.61 | 3.83 |

| | | | | | | |
|-------|-------|-------|-------|------|-------|-------|
| Total | 1,518 | 2,646 | 1,295 | 860 | 2,331 | 8,650 |
| | 17.55 | 30.59 | 14.97 | 9.94 | 26.95 | 100 |
| | 100 | 100 | 100 | 100 | 100 | 100 |

Table 6a: Station Listening and Ownership Type (Broad Format Category Dummies)

| | (1) | (2) | (3) | (4) | (5) | (6) |
|--------------------------|----------------------|----------------------|-----------------------|----------------------|----------------------|----------------------|
| | Log AQH Listening | Log Black AQH | Log Hisp AQH | Log AQH Listening | Log Black AQH | Log Hisp AQH |
| Minority Owned | -0.1111 (0.0489)* | 0.2645 (0.0614)** | -0.2055 (0.0659)** | | | |
| group 2-9 | | | | 0.1440 (0.0316)** | 0.0579 (0.0542) | 0.1034 (0.0603) |
| group 10-24 | | | | 0.3988 (0.0358)** | 0.1549 (0.0612)* | 0.4542 (0.0654)** |
| group 25-29 | | | | 0.3860 (0.0394)** | 0.0700 (0.0686) | 0.3977 (0.0690)** |
| group 50+ | | | | 0.5322 (0.0307)** | 0.3625 (0.0505)** | 0.6069 (0.0561)** |
| Constant | 1.8067 (0.0277)** | 0.6865 (0.0468)** | 1.1207 (0.0495)** | 1.4397 (0.0382)** | 0.4429 (0.0648)** | 0.6848 (0.0696)** |
| Observations | 24325 | 6230 | 5965 | 26986 | 6777 | 6471 |
| Number of Metro areas | 306 | 135 | 101 | 306 | 135 | 101 |

Standard errors in parentheses. * significant at 5% level; ** significant at 1% level. All regressions include dummies for year, metro area and broad format.

Table 6b: Station Listening and Ownership Type (Narrow Format Group Dummies)

| | (1) | (2) | (3) | (4) | (5) | (6) |
|--------------------------|-----------------------|----------------------|-----------------------|----------------------|----------------------|----------------------|
| | Log AQH Listening | Log Black AQH | Log Hisp AQH | Log AQH Listening | Log Black AQH | Log Hisp AQH |
| Minority Owned | -0.1521 (0.0499)** | 0.0729 (0.0616) | -0.1781 (0.0666)** | | | |
| group 2-9 | | | | 0.1087 (0.0321)** | 0.0253 (0.0540) | 0.0480 (0.0620) |
| group 10-24 | | | | 0.3539 (0.0365)** | 0.1312 (0.0611)* | 0.3762 (0.0675)** |
| group 25-29 | | | | 0.3757 (0.0405)** | 0.1570 (0.0697)* | 0.3755 (0.0716)** |
| group 50+ | | | | 0.4802 (0.0318)** | 0.3403 (0.0516)** | 0.5239 (0.0588)** |
| Constant | 1.9625 (0.2254)** | 1.0670 (0.3073)** | 1.7813 (0.3730)** | 1.6070 (0.2232)** | 0.8216 (0.3062)** | 1.3022 (0.3677)** |
| Observations | 24325 | 6230 | 5965 | 26986 | 6777 | 6471 |
| Number of Metro areas | 306 | 135 | 101 | 306 | 135 | 101 |

Standard errors in parentheses. * significant at 5% level; ** significant at 1% level. All regressions include dummies for year, metro area and narrow format.

Table 7: Metro Area Station Availability, 2009

| Format | presence | number |
|--------------------------|----------|--------|
| Adult Contemporary | 91.7% | 2.3 |
| Album Oriented Rock | 79.3% | 1.3 |
| Classical | 52.0% | 0.6 |
| Contemporary Hit Radio | 81.0% | 1.5 |
| Country | 95.0% | 2.9 |
| Easy Listening/Beautiful | 5.7% | 0.1 |
| Ethnic | 12.7% | 0.4 |
| Jazz/New Age | 28.3% | 0.3 |
| Middle of the Road | 6.7% | 0.1 |
| Miscellaneous | 71.7% | 2.3 |
| News | 93.7% | 2.9 |
| Nostalgia/Big Band | 32.3% | 0.4 |
| Oldies | 84.0% | 1.8 |
| Public/Educational | 32.0% | 0.5 |
| Religion | 95.3% | 4.7 |
| Rock | 86.0% | 2.0 |
| Spanish | 49.7% | 2.6 |
| Sports | 82.3% | 1.6 |
| Talk | 53.3% | 1.0 |
| Urban | 48.3% | 1.1 |
| Total | | 30.4 |

Note: Calculations include 300 Arbitron metro areas.

Table 8a: Listening and Station Targeting (Broad Definition of Black-Targeted)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|-------------|------------|--------------|--------------|-----------------|-------------|------------|--------------|
| | Overall AQH | Black AQH | Nonblack AQH | Hispanic AQH | NonHispanic AQH | Overall AQH | Black AQH | Hispanic AQH |
| Number of Urban, Religious, and Jazz Stations | -0.0090 | 0.1185 | -0.0338 | -0.0795 | 0.0371 | -0.0034 | 0.1345 | -0.1701 |
| | (0.0124) | (0.0327)** | (0.0191) | (0.0520) | (0.0234) | (0.0330) | (0.0955) | (0.1956) |
| Number of Spanish Stations | 0.0648 | 0.0936 | 0.0762 | 0.2105 | -0.0272 | -0.0675 | -0.0432 | -0.0278 |
| | (0.0059)** | (0.0279)** | (0.0305)* | (0.0441)** | (0.0265) | (0.0489) | (0.1458) | (0.2552) |
| Number of other Stations | 0.0217 | 0.0223 | 0.0291 | 0.0275 | 0.0214 | -0.0172 | -0.1684 | 0.0387 |
| | (0.0040)** | (0.0091)* | (0.0065)** | (0.0098)** | (0.0058)** | (0.0246) | (0.0680)* | (0.1285) |
| Constant | 12.0917 | 12.0636 | 11.5436 | 13.0986 | 11.7556 | 13.3423 | 18.0564 | 14.6896 |
| | (0.1157)** | (0.3190)** | (0.1695)** | (0.4200)** | (0.2165)** | (0.6665)** | (2.1347)** | (4.2534)** |
| Metro FE | No | No | No | No | No | Yes | Yes | yes |
| Observations | 598 | 263 | 263 | 186 | 186 | 598 | 263 | 186 |

Standard errors in parentheses. * significant at 5% level; ** significant at 1% level. Regression includes observations for both 2005 and 2007, as well as an unreported year dummy. Standard errors are clustered at the metro area level in rows (1)-(5).

Table 8b: Listening and Station Targeting (Narrow Definition of Black-Targeted)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|----------------------------|-------------|------------|--------------|------------|-------------|-------------|------------|------------|
| | Overall AQH | Black AQH | Nonblack AQH | Hisp AQH | NonHisp AQH | Overall AQH | Black AQH | Hisp AQH |
| Number of Urban Stations | -0.0228 | 0.3991 | -0.1402 | -0.3103 | 0.0547 | 0.0422 | 0.1688 | 0.0690 |
| | (0.0335) | (0.0885)** | (0.0463)** | (0.1433)* | (0.0767) | (0.0750) | (0.1999) | (0.4530) |
| Number of Spanish Stations | 0.0648 | 0.0813 | 0.0804 | 0.2149 | -0.0222 | -0.0613 | -0.0447 | 0.0217 |
| | (0.0059)** | (0.0254)** | (0.0313)* | (0.0446)** | (0.0266) | (0.0498) | (0.1483) | (0.2721) |
| Number of other Stations | 0.0207 | 0.0331 | 0.0268 | 0.0264 | 0.0254 | -0.0121 | -0.1196 | 0.0171 |
| | (0.0033)** | (0.0067)** | (0.0047)** | (0.0094)** | (0.0057)** | (0.0260) | (0.0724) | (0.1306) |
| Constant | 12.0895 | 11.8460 | 11.6478 | 13.0083 | 11.7754 | 13.1263 | 17.3744 | 13.9345 |
| | (0.1147)** | (0.3307)** | (0.1611)** | (0.4136)** | (0.2240)** | (0.7571)** | (2.5660)** | (4.7980)** |
| Metro FE | | | | | | | | |
| Observations | 598 | 263 | 263 | 186 | 186 | 598 | 263 | 186 |

Standard errors in parentheses. * significant at 5% level; ** significant at 1% level. Regression includes observations for both 2005 and 2007, as well as an unreported year dummy. Standard errors are clustered at the metro area level in rows (1)-(5).

Table 9: Station Targeting and Demographic Mix (First Stage Regressions)

| | (1) Number of Urban, Religious, and Jazz Stations (broadly black targeted) | (2) Number of Urban Stations (narrowly black targeted) | (3) Number of Spanish Stations | (4) Number of other Stations (neither Urban, Religious, Jazz, nor Spanish) | (5) Number of other Stations (neither Urban nor Spanish) |
|---------------------------------------|--|--|---|---|--|
| Black Pop(mil) | 12.6717 (3.9142)** | 4.8841 (1.0954)** | -17.1000 (13.9938) | 0.1524 (8.4954) | 7.9400 (9.9652) |
| Hispanic Pop(mil) | -3.4367 (1.4442)* | -0.4989 (0.4262) | 0.8565 (4.9768) | -4.7648 (3.4773) | -7.7027 (3.5225)* |
| Pop Not Black nor Hispanic(mil) | 1.1780 (0.6537) | -0.2001 (0.1626) | 6.6367 (5.4617) | 13.3335 (3.2604)** | 14.7116 (3.6559)** |
| Constant | 4.7161 (0.3296)** | 1.0213 (0.1064)** | 0.0312 (1.0423) | 14.3304 (0.7473)** | 18.0252 (0.8760)** |
| Observations | 598 | 598 | 598 | 598 | 598 |
| R-squared | 0.39 | 0.30 | 0.22 | 0.65 | 0.66 |

Standard errors in parentheses. * significant at 5% level; ** significant at 1% level. Regression includes observations for both 2005 and 2007, as well as an unreported year dummy. Standard errors are clustered at the metro area level.

Table 10a: IV Estimates of Listening and Station Targeting (Broad Definition of Black-Targeted)

| | (1) Overall AQH | (2) Black AQH | (3) Nonblack AQH | (4) Hisp AQH | (5) NonHisp AQH |
|---|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|
| Number of Urban, Religious, and Jazz Stations | -0.5958 (1.1211) | 0.2803 (0.0659)** | -0.0820 (0.0353)* | -0.1800 (0.1656) | 0.1025 (0.0594) |
| Number of Spanish Stations | -0.3969 (0.8438) | 0.1324 (0.0630)* | 0.0856 (0.0338)* | 0.2595 (0.0918)** | -0.0294 (0.0329) |
| Number of other Stations | 0.2926 (0.4983) | 0.0010 (0.0170) | 0.0402 (0.0091)** | 0.0511 (0.0361) | 0.0107 (0.0130) |
| Constant | 11.0993 (1.8536)** | 11.1586 (0.4119)** | 11.8915 (0.2209)** | 13.0355 (0.5336)** | 11.7260 (0.1914)** |
| Observations | 598 | 263 | 263 | 186 | 186 |

Standard errors in parentheses. * significant at 5% level; ** significant at 1% level. Regression includes observations for both 2005 and 2007, as well as an unreported year dummy. Standard errors are clustered at the metro area level. Dependent variable is the AQH share, the percent of population listening to radio during an average quarter hour.

Table 10b: IV Estimates of Listening and Station Targeting (Narrow Definition of Black-Targeted)

| | (1) Overall AQH | (2) Black AQH | (3) Nonblack AQH | (4) Hisp AQH | (5) NonHisp AQH |
|--|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|
| Number of Urban Stations | 0.8944 (0.7824) | 0.7752 (0.1987)** | -0.2986 (0.1069)** | -0.6518 (0.5701) | 0.2901 (0.2102) |
| Number of Spanish Stations | 0.2653 (0.1840) | 0.0372 (0.0590) | 0.1272 (0.0317)** | 0.3122 (0.1059)** | -0.0504 (0.0391) |
| Number of non- Urban, non-Spanish Stations | -0.0691 (0.0798) | 0.0356 (0.0099)** | 0.0251 (0.0053)** | 0.0383 (0.0259) | 0.0157 (0.0095) |
| Constant | 12.7942 (0.6959)** | 10.9288 (0.4444)** | 11.9921 (0.2391)** | 12.5859 (0.5554)** | 11.9047 (0.2048)** |
| Observations | 598 | 263 | 263 | 186 | 186 |

Standard errors in parentheses. * significant at 5% level; ** significant at 1% level. Regression includes observations for both 2005 and 2007, as well as an unreported year dummy. Standard errors are clustered at the metro area level. Dependent variable is the AQH share, the percent of population listening to radio during an average quarter hour.

Table 11: Minority Ownership and Minority Targeting

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|----------------------------|---|---|--------------------------------|--------------------------------|----------------------------------|----------------------------------|---|---|--------------------------------|--------------------------------|----------------------------------|----------------------------------|
| | Number of Urban, Religious, and Jazz Stations | Number of Urban, Religious, and Jazz Stations | Number of Urban Stations | Number of Urban Stations | Number of Spanish Stations | Number of Spanish Stations | Number of Urban, Religious, and Jazz Stations | Number of Urban, Religious, and Jazz Stations | Number of Urban Stations | Number of Urban Stations | Number of Spanish Stations | Number of Spanish Stations |
| | 2005 | 2007 | 2005 | 2007 | 2005 | 2007 | 2005 | 2007 | 2005 | 2007 | 2005 | 2007 |
| Minority-Owned Stations | 0.5451 | | 0.1596 | | 0.6295 | | 0.1780 | | 0.0907 | | 0.2213 | |
| | (0.0849)** | | (0.0298)** | | (0.1587)** | | (0.0767)* | | (0.0298)** | | (0.0436)** | |
| Black-Owned Stations | | 0.6224 | | 0.3020 | | 0.0344 | | 0.3617 | | 0.2414 | | 0.0357 |
| | | (0.0687)** | | (0.0217)** | | (0.1331) | | (0.0617)** | | (0.0217)** | | (0.0341) |
| Hispanic-Owned Stations | | 0.3164 | | 0.0434 | | 0.8993 | | 0.0741 | | 0.0181 | | 0.4967 |
| | | (0.0731)** | | (0.0231) | | (0.1416)** | | (0.0733) | | (0.0258) | | (0.0405)** |
| Black Pop(mil) | 9.2266 | 5.6695 | 4.0061 | 1.4774 | -22.5473 | -16.9557 | 23.9098 | 16.6673 | 12.2171 | 7.7053 | -4.7122 | -3.8644 |
| | (1.8199)** | (1.6416)** | (0.6397)** | (0.5186)** | (3.4015)** | (3.1804)** | (2.7301)** | (2.8659)** | (1.0590)** | (1.0082)** | (1.5508)** | (1.5828)* |
| Hispanic Pop(mil) | -4.8804 | -3.7372 | -0.9085 | -0.0163 | 0.3915 | -5.7485 | -8.0873 | -4.5678 | -1.4661 | 0.0624 | 14.8602 | 8.5601 |
| | (0.8618)** | (0.9323)** | (0.3029)** | (0.2945) | (1.6108) | (1.8062)** | (1.3950)** | (1.6573)** | (0.5411)** | (0.5830) | (0.7924)** | (0.9153)** |
| Other Pop (mil) | 1.8694 | 1.6932 | 0.0101 | -0.0493 | 7.1949 | 7.7622 | -1.4933 | -1.2519 | -2.0948 | -1.6668 | 0.1987 | 0.6771 |
| | (0.4913)** | (0.4369)** | (0.1727) | (0.1380) | (0.9183)** | (0.8465)** | (0.8802) | (0.7826) | (0.3414)** | (0.2753)** | (0.5000) | (0.4322) |
| Black Pop Sq'd | | | | | | | -8.2602 | -5.7862 | -6.9154 | -5.0199 | 2.5109 | 1.7103 |
| | | | | | | | (2.3540)** | (2.1506)** | (0.9131)** | (0.7566)** | (1.3371) | (1.1877) |
| Hisp Pop Sq'd | | | | | | | 1.2632 | 0.7210 | -0.0576 | -0.2131 | -2.1139 | -1.5182 |
| | | | | | | | (0.3945)** | (0.3714) | (0.1530) | (0.1306) | (0.2241)** | (0.2051)** |
| Number of Varieties | | | | | | | 0.2148 | 0.1671 | 0.1122 | 0.1005 | 0.0809 | 0.0325 |
| | | | | | | | (0.0898)* | (0.0812)* | (0.0348)** | (0.0286)** | (0.0510) | (0.0449) |
| Other Pop Sq'd | | | | | | | 0.1603 | 0.0642 | 0.4910 | 0.3653 | -0.3709 | -0.1837 |
| | | | | | | | (0.2277) | (0.1833) | (0.0883)** | (0.0645)** | (0.1293)** | (0.1012) |
| RadioStations | | | | | | | 0.1273 | 0.1252 | 0.0112 | 0.0057 | 0.0379 | 0.0390 |
| | | | | | | | (0.0215)** | (0.0195)** | (0.0083) | (0.0069) | (0.0122)** | (0.0108)** |
| Constant | 3.8454 | 3.5495 | 0.7503 | 0.5416 | -0.8385 | -0.9773 | -0.8334 | -0.5197 | -0.4139 | -0.4189 | -1.1802 | -0.7411 |
| | (0.2834)** | (0.2592)** | (0.0996)** | (0.0819)** | (0.5296) | (0.5022) | (0.7673) | (0.7220) | (0.2976) | (0.2540) | (0.4359)** | (0.3988) |
| Observations | 298 | 300 | 298 | 300 | 298 | 300 | 297 | 299 | 297 | 299 | 297 | 299 |
| R-squared | 0.49 | 0.55 | 0.40 | 0.57 | 0.25 | 0.33 | 0.70 | 0.71 | 0.57 | 0.66 | 0.79 | 0.83 |

Notes: Standard errors in parentheses, clustered on metro area. * significant at 5% level; ** significant at 1% level. Regressions include observations for 2005 in odd-numbered columns and observations for 2007 in even-numbered columns. The 2005 minority ownership variable does not distinguish different groups.

Table 12a: Ownership Structure, Variety, and Listening

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|------------------------------|------------------------|----------------------|-----------------------|----------------------|---------------------|------------------------|-----------------------|----------------------|
| | Number of Varieties | Narrow Varieties | Overall AQH | Black AQH | Hisp AQH | Number of Varieties | Narrow Varieties | Overall AQH |
| Radio Stations | 0.1570 (0.0264)** | 0.2387 (0.0506)** | 0.1870 (0.0351)** | 0.2040 (0.0638)** | 0.1344 (0.0686) | 0.0586 (0.0439) | 0.2657 (0.0564)** | 0.0344 (0.0356) |
| Radio Parents | -0.0914 (0.0473) | 0.1310 (0.0911) | -0.2243 (0.0597)** | -0.2004 (0.1068) | -0.1302 (0.1110) | 0.0152 (0.0612) | -0.0199 (0.0786) | -0.0542 (0.0507) |
| Share in 25+ Groups | 0.3826 (0.4913) | 1.5942 (0.6740)* | 0.4038 (0.6229) | 3.9085 (1.4720)** | 3.8304 (2.0868) | 0.1786 (0.4983) | 1.0361 (0.6403) | 0.0116 (0.3339) |
| Avg Comm'l Stns per Owner | -0.1845 (0.2061) | -0.0847 (0.3278) | 0.6583 (0.2419)** | 0.1637 (0.4789) | 0.8401 (0.6994) | -0.0187 (0.1902) | -0.1407 (0.2444) | -0.1598 (0.1391) |
| Largest Local Owner Group | 0.3003 (0.1017)** | 0.4953 (0.1552)** | 0.2457 (0.1025)* | 0.4926 (0.2108)* | 0.4436 (0.2094)* | -0.0115 (0.0569) | -0.0714 (0.0731) | 0.0152 (0.0397) |
| Metro FE | No | No | No | No | No | Yes | Yes | Yes |
| Constant | 7.1385 (0.6784)** | 5.2117 (1.0474)** | 4.1278 (0.8445)** | 2.2707 (1.6800) | 1.8968 (2.1767) | 9.9814 (0.9894)** | 10.5630 (1.2715)** | 9.5851 (0.8088)** |
| Observations | 897 | 897 | 596 | 263 | 186 | 897 | 897 | 596 |
| Hausman test p-val | | | | | | 28.19 0.0002 | 24.70 0.0009 | 61.83 0.0000 |

Robust standard errors in parentheses.* significant at 5% level; ** significant at 1% level. Hausman test compares fixed effects estimates in columns (6)-(8) with random effects estimates (not shown).

Table 12b: Ownership Structure, Variety, and Listening (HHI Measure of Ownership Concentration)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|------------------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|-----------------------|----------------------|
| | Number of Varieties | Narrow Varieties | Overall AQH | Black AQH | Hispanic AQH | Number of Varieties | Narrow Varieties | Overall AQH |
| Radio Stations | 0.0905 (0.0145)** | 0.2983 (0.0198)** | 0.0312 (0.0094)** | 0.0495 (0.0112)** | 0.0299 (0.0120)* | -0.0030 (0.0424) | 0.1581 (0.0534)** | 0.0057 (0.0245) |
| HHI | -0.0013 (0.0003)** | -0.0014 (0.0004)** | -0.0021 (0.0005)** | -0.0036 (0.0006)** | -0.0038 (0.0006)** | -0.0001 (0.0002) | 0.0000 (0.0002) | -0.0001 (0.0001) |
| Share in 25+ Groups | 0.1942 (0.4510) | 1.0669 (0.6491) | 0.3717 (0.5202) | 2.5722 (1.2171)* | 1.0411 (1.6987) | 0.0411 (0.5784) | 1.0670 (0.7283) | -0.0075 (0.3345) |
| Avg Comm'l Stns per Owner | -0.1376 (0.1633) | -0.7310 (0.2369)** | 0.8704 (0.1817)** | 0.0770 (0.3676) | 0.3003 (0.5770) | 0.1554 (0.1913) | 0.0771 (0.2409) | -0.0689 (0.1106) |
| Largest Local Owner Group | 0.1658 (0.0940) | 0.2448 (0.1370) | 0.0881 (0.0942) | 0.2446 (0.1640) | 0.0876 (0.1874) | -0.0731 (0.0660) | -0.1342 (0.0831) | 0.0268 (0.0382) |
| Metro FE | No | No | No | No | No | Yes | Yes | Yes |
| Constant | 9.7609 (0.8949)** | 10.2774 (1.2913)** | 7.7910 (1.2346)** | 9.5909 (1.6860)** | 11.2744 (2.3518)** | 12.1123 (1.3368)** | 13.1794 (1.6832)** | 9.3684 (0.7732)** |
| Observations | 596 | 596 | 596 | 263 | 186 | 596 | 596 | 596 |
| Hausman test | | | | | | 42.61 | 42.14 | 237.99 |
| p-val | | | | | | 0.000 | 0.0000 | 0.0000 |

Robust standard errors in parentheses.* significant at 5% level; ** significant at 1% level. Hausman test compares fixed effects estimates in columns (6)-(8) with random effects estimates (not shown).

Figure 1: Format Category Presence



