
CHANNELING DIVERSITY IN THE PUBLIC SPECTRUM: WHO QUALIFIES TO BID FOR WHICH FCC LICENSES?

By Philip N. Howard and Stephanie Smith

Over the last decade, the FCC has licensed the use of the public spectrum with an online auction system. Has this auction system, which requires potential licensees to first apply to qualify as bidders, increased the diversity of ownership, and, if not, why? Analyzing data on 28,354 applicants for 16,383 licenses, we find that while one in ten applicant businesses were minority-owned, only one in thirteen qualified bidders and fewer than one in fourteen bid winners were minority-owned. Controlling for other factors, minority-owned businesses and first-time applicants are much more likely to be interested in a media broadcast license than a license to operate other communications services on the public spectrum. Businesses that are minority-owned or woman-owned, or first-time applicants, are less likely than other types of businesses to successfully qualify to bid.



During the last decade, the Federal Communications Commission (FCC) has raised some \$43 billion by auctioning access to the public broadcast spectrum. Since 1994, the FCC has used a system of online auctioning as a means of assigning broadcast and wireless licenses to the highest bidder. According to the FCC, the auction system has assigned licenses more effectively than either comparative hearings or lotteries, and this system has reduced the average time from initial application to license award to less than one year.¹ Moreover, the public has received direct financial benefit from the competitive bidding process, which raises funds that ultimately go to the U.S. Treasury.²

Because the older system assigned licenses based on the assessment of good character, and was blamed for discouraging diversity in media ownership, some observers argued that the new, transparent auction system might improve the number of woman-owned and minority-owned media by simply awarding licenses to the highest bidder.³

Philip N. Howard is an assistant professor in the Department of Communication at the University of Washington, where Stephanie Smith was a graduate student. This research is based in part on her thesis, though both authors contributed equally to this article. The authors are grateful to David Donke and Crispin Thurlow at Washington and Amardo Rodriguez at Syracuse University for advice on early stages of this research, and to the anonymous reviewers. Support for this research was provided by both the Department of Communication and the Ethnic Studies Program at the University of Washington.

J&MC Quarterly
Vol. 84, No. 2
Summer 2007
215-230
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This article, examining a data set on FCC-administered auctions of the public spectrum between 1995 and 2006, seeks to advance current research on three fronts. First, in addition to describing diversity in ownership of radio and television broadcast licenses, we extend our descriptive analysis to include licenses for communications services that use other parts of the auctioned spectrum. Second, we analyze all auction data made available by the FCC while distinguishing between licenses for media broadcast and licenses for other communication services. Third, we model multiple factors, including applicant demographics and license type, on the probability that applicants are interested in licenses for media broadcast over the other communication services, and the probability of making it from the application stage through the qualification stage to the bidding stage.

***Diversity
in Ownership
of Broadcast
Media
and Communication
Services***

Poor representation of ethnic diversity within media industries and in media content has important social consequences. Researchers have found that media stereotypes reinforce public stereotypes and feed both racial conflict among groups and psychological insecurities among both minority and non-minority children.⁴ Moreover, inferior communication services can be another discrepancy in the quality of infrastructure available in minority neighborhoods.⁵

Historically, research by Ivy Planning Group shows, there were multiple barriers to minority businesses interested in entering the communication markets regulated by the FCC.⁶ Discrimination in the capital markets may have caused limited access to the equity, at reasonable interest rates, that minority-owned businesses require to finance acquisition of broadcast licenses. The research argues that the advertising industry discriminated against minority-owned and formatted stations, excluding minority owners from deals and networks of deal-makers.

Industry insiders have reported that market deregulation and consolidation in the mid-1990s, the lack of industry experience and employment opportunities for minorities, and the failure of the FCC to enforce Equal Employment and Opportunity rules have all discouraged minority ownership. Insiders have also reported that the absence of community advocacy groups has meant that the FCC is slow to learn of grievances and that non-minority firms have misused the FCC's minority ownership programs for their own benefit.⁷ The erosion of rules limiting the numbers of broadcast outlets any single person or corporation can own has had the effect of diminishing ownership diversity.⁸

Media and communication services in the United States are predominantly owned and operated by non-minority males.⁹ Large, vertically integrated media corporations are frequently accused of poor minority promotion and hiring practices.¹⁰ The differential quality and quantity of minority media content is often attributed to limited diversity in ownership and employment within the media industry.¹¹

Content analyses reveal frequent negative racial stereotypes over time, stereotypes that appear because minority groups lack access to media that would allow them more influence over how they are repre-

sented.¹² Television news misrepresents—in fact overrepresents—African Americans and Latinos as criminals and Caucasians as victims.¹³ Broadcast television also underrepresents minorities in prime-time entertainment programming, and while cable programming contains more diversity in on-screen portrayals, research suggests that such portrayals still misrepresent minorities by showcasing negative stereotypes.¹⁴

Even though most of the literature on diversity in media ownership has focused on radio and television, today's media environment includes a plethora of content sources and delivery systems. Thus, there are several reasons why it is necessary to expand our purview from ownership patterns of radio and television broadcast licenses to include wireless data and communication infrastructure licenses.

First, this wireless data and communication infrastructure is increasingly used to deliver news and entertainment to mobile phones and computers connected to the Internet. Of course many people still rely on radio and television as their primary sources of news and culture, but 65% of the adult population uses the Internet for e-mail, news, and entertainment on a daily basis.¹⁵ A large number of news organizations repackage content for delivery over the Internet or to mobile phones. If diversity in the ownership of news sources has an impact on the diversity of personalities delivering the news and the diversity of stories covered, this outcome will be noticeable whether we are listening to the news on a radio or streaming to our computers, and whether we are watching a video feed on a television, on a computer equipped with a tuner card, or on a computer with a broadband Internet connection.

Second, just as improving ownership diversity among radio and television stations improves the range of services and local competition for communities underserved in terms of broadcast media, such diversity may improve the range of services and local competition for communities underserved in terms of other types of infrastructure relevant in today's communication environment: wireless data services, broadband services, and specialized mobile radio services.

Third, only 27% of the auctions during the period studied were for media broadcast licenses, and in total these drew in 34% of the applicants; instead, most applicants are interested in the larger portion of licenses for other types of communication services. Diversity is important because its absence has an impact on the news, entertainment, and other cultural content distributed through these services and the quality of neighborhood infrastructure. Because these other communication services actually account for the larger share of the public spectrum licensed for use by private businesses, minority-owned businesses should have access to these opportunities.

Certainly, not all media distribution systems are equal in their social impact. A lack of diversity may result in discrepancies in the quality of communication infrastructure, whether this results in weak television reception or slower broadband connections. But a news or entertainment company can produce race and gender stereotypes that are

distributed by television networks or over the Internet. In short, it is important to represent diversity across all news and entertainment media. While scholars and community groups have often advocated diversity in the ownership of radio and television stations, today we must seek this diversity in the ownership of the full range of media and communication services.

Attaining an FCC license to broadcast over an existing transmission infrastructure, or gaining permission to build a new one, allows a business to own and control a valuable communication system. In order to obtain this license, companies must successfully make it through all stages of the auction system. To get a broadcast license, a business must first apply for permission to participate in the auction, must then qualify to enter the auction as a bidder, and must then have the highest bid in the auction.

Research Questions

Access to data on 28,354 applications for 16,383 licenses enabled us to pose two research questions, based on the literature review:

RQ1: How has minority participation in the applying and qualifying stages of the FCC auction system changed over the last decade?

RQ2: In the final stage, the license simply goes to the highest bidder, but are the applying and qualifying stages a measurable barrier to minority participation in the auction process?

To address the research questions, we provide an overview of twelve years of FCC auction data, focusing on percentages that describe who the applicants were, what licenses they were seeking, and the outcome. Then, we develop two statistical models designed to answer RQ2.

FCC Data on Minority Participation in the Auction Process

RQ1 asked how minority participation in the applying and qualifying stages of the FCC auction system has changed during the last decade. To measure the level of interest in owning different types of licenses and the likelihood of qualifying to bid, data on auction history were extracted from the FCC records between 1995 and 2006.¹⁶ This unique data set on 4,459 applicants includes the names of the businesses applying to participate in the auction, whether the FCC approved their participation, and any information the applicants offered about their ownership status.

The FCC goes to great lengths to teach applicants about the rules and procedures for applying to bid in an auction for licenses to use the public spectrum (see www.fcc.gov). Table 1 reveals the categorizations used by the FCC when applicants seek to bid on a broadcast license: entrepreneur, minority, new entrant to the auction process, rural business, small or very small business, or a woman-owned business. The category

TABLE 1

Participation in the Application and Qualifying Stage of License Auctions, All Years

	All Applied	Communications Services			Media Broadcast		
		Applied	Did Not Qualify	Did Qualify	Applied	Did Not Qualify	Did Qualify
Entrepreneur	11.6	17.4	18.7	17.0	..	..	..
Minority	10.2	9.9	17.2	7.5	10.9	16.4	8.2
New Entrant	20.5	5.4	6.4	5.0	50.6	53.6	49.1
Rural	7.2	10.1	3.3	12.2	1.4	1.0	1.6
Small or Very Small	46.0	62.5	62.6	62.4	13.4	10.1	15.1
Women	8.1	8.1	11.0	7.2	8.0	10.1	7.0
Total Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total Number	4,459	2,964	717	2,247	1,495	487	1,008

Note: Based on authors' calculation of data available at www.fcc.gov. Categories are not mutually exclusive.

of entrepreneur was not used in auctions for media broadcast licenses. Most new entrants are more interested in media broadcast licenses than other communications licenses. This table reveals important differences among the pool of applicants for broadcast licenses and the pool of bidders who are given permission to bid on a license.

Given that roughly 25% of the U.S. population self-identifies with a racial or ethnic minority, should we take the fact that, overall, 10.2% of the applicant pool self-identifies as a minority as *prima facie* evidence that minorities are not interested in or lack the resources for media ownership? Following the first stage of applying to become a bidder, the second stage of being approved as a bidder yields a smaller pool of businesses with proportionally fewer minority bidders. Only 8.2% of the businesses that were qualified to bid on a media broadcast license self-identified as minority, and only 7.5% of the businesses qualified to bid on another type of license self-identified as minority.

In other words, one in ten applicants in the applicant pool self-describe as being minority. But in the pool of applicants who successfully qualified to bid on media broadcast licenses, only one in twelve self-described as being minority, and in the pool of applicants who qualified to bid on other communication services, only one in thirteen self-described as being minority. In fact, there were three categories of business (minority-owned, woman-owned, and new entrants) that were smaller in the pool of qualified bidders than in the pool of applicants.

Ultimately, during the period under study, 748 of the 16,383 licenses were actually *won* by 455 different minority bidders, so, during the period, one in twenty-two licenses were awarded to minority bidders.

Table 2 examines **RQ1** more directly, showing how the diversity of the applicant pool has fluctuated from year to year. For example, three

TABLE 2

Participation of Minority-Owned Businesses in the Application and Qualifying Stage of License Auctions, by Years

Year	All Licenses		Communication Service Licenses			Media Broadcast Licenses		
	Column %	Annual % of All Applicants Who Were Minority-Owned	Annual % of Minority-Owned Businesses Who Applied to Bid	Ratio of Qualified Minority Bidders to Disqualified Minority Bidders	Ratio of Qualified Non-Minority Bidders to Disqualified Non-Minority Bidders	Annual % of Minority-Owned Businesses Who Applied to Bid	Ratio of Qualified Minority Bidders to Disqualified Minority Bidders	Ratio of Qualified Non-Minority Bidders to Disqualified Non-Minority Bidders
1995	1.8	10.3	10.3	..	0.8	..	..	..
1996	27.5	16.0	13.2	1.2	3.1	2.8	1.0	4.5
1997	7.7	9.3	8.8	1.8	3.1	0.5	1.0	1.5
1998	4.2	6.5	6.5	1.4	2.8	..	..	..
1999	10.8	8.6	8.4	1.8	3.0	0.2	..	..
2000	6.4	11.1	8.8	1.9	4.9	2.3	0.5	0.9
2001	5.7	7.1	7.1	1.9	6.6	..	..	..
2002	2.6	5.8	2.4	0.7	4.4	3.4	0.4	1.0
2003	2.4	5.6	5.1	4.0	9.4	0.5	..	1.0
2004	16.7	10.1	0.4	..	2.9	9.7	0.9	2.1
2005	4.6	11.5	7.7	1.0	3.1	3.8	1.3	1.5
2006	9.7	11.3	..	..	..	11.3	1.4	2.7
	100.0	10.2	6.5	1.4	3.5	3.7	1.0	2.3
Total N	455	455		292			163	

Note: Based on authors' calculation of data available at www.fcc.gov. In 1999 and 2003, there was only one minority applicant for a media broadcast license, and this business successfully qualified to bid.

particular years account for 55% of all the applications from minority-owned businesses: 1996, 1999, and 2004. It also appears that many of the minority-owned businesses applied to bid on communication service licenses, and a smaller number of them were interested in media broadcast licenses. While more minority-owned businesses applied to bid on communication service licenses, more non-minority businesses were able to qualify to bid.

In twelve years of auctions for communication service licenses, for every 100 minority applicants who were disqualified, 140 minority applicants were successful, while for every 100 non-minority applicants who were disqualified, 350 non-minority applicants were successful. In twelve years of auctions for media broadcast licenses, for every 100 minority applicants who were disqualified, 100 successfully qualified to bid, while for every 100 non-minority applicants who were disqualified, 230 non-minority applicants successfully qualified to bid.

In other words, more minority-owned businesses qualified to bid in auctions for communication service licenses than for media broadcast licenses, but non-minority businesses qualified at much greater rates, especially in the competition for communication service licenses.

Tables 1 and 2 suggest that minority-owned businesses are interested in bidding on licenses to use many parts of the public spectrum, not just in owning AM, FM, and television broadcast stations; that interest fluctuates from year to year; and that there may be a relationship between the type of license sought and the likelihood of successfully qualifying to bid on the license. There are several plausible reasons for the lack of diversity in the ownership of media. First, it may be that minority-owned businesses do not apply for licenses, either because they are unwilling or unable to start the application process. It may be that the large media consortia are so powerful that they do not allow the opportunity for minority businesses to compete for similar markets in the communications industry, or that minorities bid on a license and then quickly sell out when the price is right.¹⁷ Minorities may lack the knowledge and economic capital necessary for ownership.¹⁸ Through consolidation and oligopoly, non-minority media owners may have gained the economic and cultural capital to make them powerful gatekeepers who work to keep minorities out of the industry.¹⁹ For minority businesses interested in applying for a license, the capital demands may put such business ventures out of reach.²⁰

Second, it may be that the FCC's auction system hinders diversity. The government may serve the interests of big media over new applicants through complex procedures, unreasonably high expectations for advance payments, or expectations of technical competence that only large, existing media conglomerates can meet.²¹ Thus, the existing research on these themes suggests that if the FCC auction program is an administrative barrier to minority media ownership, then the odds of being a minority-owned business and qualifying to participate in the auctions will be lower, controlling for other factors, than the odds for businesses not owned by minorities.

RQ2 asked whether the applying and qualifying stages represent a measurable barrier to minority participation in the auction process. Before seeking that answer, we will address the data used in our statistical models.

Minorities are defined by the FCC, in accordance with the Code of Federal Regulation, as "individuals of Black or African American, Hispanic or Latino, American Indian or Alaskan Native, Asian, and Native Hawaiian or Pacific Islander extraction."²² In the process of qualifying to participate in the auction, participants can self-identify as minorities. To receive status as a woman-owned or minority-owned business, a company must have 51% ownership by women or by minorities. The size standards for small and very small business status are set by the Small Business Administration. They are based on the value of company assets and revenue, and vary depending on the specific type

Statistical Models

of communication service industry. Entrepreneurs generally have more revenues than small businesses, but to receive status as an entrepreneur, applicants must meet specific standards in their annual revenues in the previous three years. Rural businesses are defined by the population reach of the service they provide. New entrants are businesses that hold no prior company assets in the type of communications service industry in which they are trying to bid on licenses. These attributes are self-reported and not mutually exclusive.

This analysis includes not only radio and television broadcast licenses but the segments of spectrum used for wireless data services. As argued above, this larger scope is justified because ownership diversity is not simply a problem in the distribution of news and entertainment content, but also in the distribution of communication infrastructure that carries content. Researchers often make theoretical distinctions between broadcast or mass media and other communications services. The task of distinguishing between types of FCC licenses, however, is increasingly difficult because of blended organizational structures, production processes, and mixed-used spectrum.

For example, FCC auctions 44, 49, and 60 covered the lower 700 megahertz band. This band consisted of 48 megahertz of spectrum, 698-746 MHz, previously allocated to television stations on channels 52-59. A licensee on the lower 700 MHz band is permitted to provide fixed, mobile, and broadcast services. Possible uses of this spectrum include mobile and other new digital broadcast operations, fixed and mobile wireless commercial services (including FDD- and TDD-based services), as well as fixed and mobile wireless uses for private, internal radio needs. In other words, the spectrum was once reserved for mass media, and potentially will be used for both broadcast and personal communication services. Wireless Internet service over this spectrum would allow users to watch news on CNN.com or to download Hollywood movies. Because this portion of the spectrum was not being used for television broadcast at the time it was auctioned, we assigned it to the category of communication services. The upper 700 MHz band was also withdrawn from television broadcast and will likely be used for high-speed wireless Internet service.

In another example, FCC auctions 42 and 59 consisted of spectrum for terrestrial point-to-multipoint and point-to-point fixed and mobile transmissions of a licensee's products or services, excluding video entertainment. The spectrum is for mass communication, though not for entertainment, so we classified this as a communication service. In contrast, spectrum that is reserved for direct broadcast satellite service also encompasses both point-to-point and point-to-multipoint services. Because this service largely delivers news and entertainment content, we code it as a media broadcast license.

Thus, for this analysis we distinguish between broadcast services that provide commercial radio and television news and entertainment, and communication services that either provide personal data services or are part of the national information telecommunications infrastructure. Media broadcast licenses include: instructional television fixed services,

full power television station construction permits, direct broadcast television services, television transmission and retransmission, AM and FM broadcast, and digitized FM broadcast.

In contrast, communication services include: wireless radio service (voice, data, paging, and fixed communications); maritime and coastal weather and safety radio broadcasting; point-to-point wireless Internet service; transportation location systems; ship radio stations and ship-to-land telephone systems; high-capacity two-way video communications; wireless mobile phone services; digital, rather than analog, specialized mobile radio services, allowing new features and services such as two-way paging and inventory tracking, credit card authorizations, automatic vehicle location monitoring, fleet management, remote database access, and voice mail; multi-channel video distribution; and other data services.

To answer **RQ2** and distinguish among the impacts of these applicant demographic variables, type of license sought, and even the year of application, we test two statistical models: one for predicting the likelihood that an applicant applied to bid on a media broadcast license instead of a license for other communication services, and one for predicting the likelihood that an applicant made it through the application process regardless of the type of license sought. Although it is common to report the coefficients from the binary logistic regression of independent variables onto a dependent variable, the exponentiated coefficients represent the more intuitive odds ratios. The odds ratio is the probability that one variable, controlling for all the other factors in a model, will correctly predict whether or not an applicant qualified to bid for a broadcast license.

For example, in Table 3, the odds that a minority applicant applied to bid on a media broadcast license over a license to provide other communication services are 35.2% greater $((1.352-1) \times 100)$ than the odds for an applicant that was not a minority-owned business. Moreover, this binary logistic regression allows us to predict the odds that any *particular* applicant qualified to bid. The odds that a non-minority applicant applied for a media broadcast license in 2005, the eleventh year of the program, and was self-reported as a small, male-owned business—new to the auctions process but not an entrepreneur or rural business—are almost 1.6 to 1. In contrast, if a minority-owned business applied in that same year of the program and was similar in all other respects, the odds that the business applied for a media broadcast license rise to 2.2 to 1.²³ We speculate that the other factors explaining variation in the sample are related to a bidder's capacity to make the financial deposit in a timely manner or on the bidder's ability to prove sufficient technical competence. These factors probably explain some of the variation in our sample, but relevant data are not provided by the FCC.

Model 1 reveals that, overall, being a minority and a new entrant in the later years of the program greatly increases the odds that an applicant is interested in a license for media broadcast, not in other commu-

Results

TABLE 3

Binary Logistic Regression Models on Type of License Sought and Successful Qualification to Bid in FCC Auctions

	Model 1: Applied to Bid on Media Broadcast License over Communication Service License		Model 2: Qualified to Bid on All Licenses	
	Exp B	Standard Errors	Exp B	Standard Errors
Constant	0.068	0.135	2.194	0.106
Entrepreneur	0.001	1,644.363	0.737	0.117
Minority	1.352	0.160	0.463	0.106
New Entrant	4.012	0.114	0.841	0.103
Rural	0.502	0.250	3.486	0.202
Small or Very Small	0.390	0.105	1.248	0.088
Woman	0.903	0.173	0.836	0.122
Year of Auction	1.369	0.015	1.063	0.013
Media Broadcast License	..	..	0.632	0.096
Nagelkerke R ²		0.568		0.059
Unweighted N		4,459		4,459

Note: Based on authors' calculation of data available at www.fcc.gov.

nications services. Model 1 explains a majority of the variation in the sample and shows that being a new entrant is the single largest, statistically significant effect. Controlling for other factors, being a rural, small, or woman-owned business decreases the likelihood that an applicant is interested in media broadcast licenses. This may be interpreted to mean that non-minority businesses, experienced with the FCC's auction system, are more interested in licenses for operating other communication services over the public spectrum. Being an entrepreneur is a small effect with a large standard error because this indicator was only used in a few years and is not normally distributed across the population.

Though offering a small amount of explained variation, Model 2 demonstrates that being an entrepreneurial, minority-owned, new entrant or woman-owned business decreases the odds that the applicant successfully qualified to bid in an auction.²⁴ Being a small or very small business, a rural applicant, or applying in the later years of the program increases the odds that the applicant qualified successfully to bid. The single largest statistically significant negative effect is being a minority-owned business. The single largest statistically significant positive effect is being a rural applicant: holding all other factors constant, the rural applicant is more than three times more likely to qualify as a bidder than non-rural applicants. Moreover, applicants in the later years in the program are more likely to qualify successfully, suggesting either that the administration of the program became more efficient over time or that applicants grew familiar with the program in its later years. Thus, minorities participating in the program in the last year of the program are slightly more likely to qualify than in the early year of the program, holding all other factors constant.

Table 2 reveals that most of minority-owned businesses were interested in licenses to provide a range of communication services. Since many of these categories of diversity can overlap, Model 1 actually allows us to disentangle these different aspects of diversity, and reveals that controlling for other factors, minority-owned businesses are more likely to apply for media broadcast licenses. This is especially true for minority-owned businesses that are also new entrants and applicants in the later years of the program. If a minority-owned business was also a small, rural, or woman-owned business, it would be more likely to apply to bid on communication service licenses.

Interestingly, even though Model 1 reveals that minority applicants were more likely to be interested in a media broadcast license instead of a license for other communication services, Model 2 reveals that the odds of successfully qualifying to bid are lower, controlling for other factors, if the applicant is actually seeking such a media broadcast license. In other words, minority businesses are more likely to be interested in media broadcast licenses, but pursuing a media broadcast license decreases the odds that the business will qualify successfully to bid.

Has the FCC auction system had an impact on the diversity in the ownership of media and communication services? Unfortunately, between 1995 and 2006, the odds that a minority-owned or woman-owned business even qualified to bid are lower than the odds for other types of businesses. Holding other factors constant, the regression model demonstrates that in later years of the program, applicants stood a greater chance of qualifying to bid on licenses.

The current auction process is a modest administrative barrier to minority media ownership, because the odds of being a minority-owned business and qualifying to participate in the auctions are lower, controlling for other factors, than the odds for businesses not owned by minorities. The primary contribution of our analysis has been to actually measure the effect of being a business that represents community diversity on the type of license sought and the likelihood of qualifying to bid on that license.

The online auction system has several advantages over the previous system of assigning broadcast licenses. With documents about the auction process posted on the FCC web site, training courses that help applicants understand the process, and a grace period that allows applicants to make corrections to their application forms, the auction system is significantly more transparent than the previous administrative system. Because minorities fared well more recently, it may also be that persistence is paying off, as these diverse businesses come to understand the process and find the financial resources to make the required deposits. Still, the FCC's auction process is something of an entry barrier to diversity in the ownership of the public spectrum.

We have demonstrated and measured how minority participation decreases through the qualification stage of the FCC auctioning for both

Conclusions

media broadcast and communication service licenses, and our analysis is significant in three respects. First, we present quantitative data from twelve years of license auctions in examining minority entrance into the communications industry. Second, we measured the impact of being a business that represents some social diversity, whether as a minority or woman-owned business, a rural applicant, entrepreneur, small business, or new entrant, on the odds that the business applied for a media broadcast license or successfully qualified to bid on any license at all. Third, we take a larger scope than previous research by including the ownership of both mass media broadcast licenses and other forms of communications infrastructure, such as wireless data services. But with a large portion of sample variation still to explain, future research must explore factors less related to business demographics or FCC administration to help us understand the range of variables that prevent a minority-owned business from successfully qualifying to bid on a broadcast license.

While analysis of this unique data set sheds some light on the process of applying for a license to provide media and communication services, the data set has several limitations. Primarily, we are unable to control for the qualifications of different bidders. We have found that some characteristic of either the applicants or the FCC administrative process reduces the proportion of minorities from one in 10 in the applicant pool to one in 12 in the pool qualified to bid on media broadcast licenses and one in 13 in the pool qualified to bid on other types of licenses.

While we were able to identify how much the odds of diversity change at each stage of the auction process, this current data set does not allow us to say more about which particular characteristics result in wanting diversity in the pool of bidders and winners. It is also possible that soon after licenses are won by minority bidders or small businesses, the licenses—or the businesses themselves—are transferred to larger, non-minority businesses. Research on ownership patterns in a particular year is very difficult, though we know that in 2005, minorities owned 3.6% and women owned 3.4% of the 12,844 radio and television stations that filed reports with the FCC.²⁵

What is it about this stage in the process that reduces the odds of diversity in the pool of qualified bidders? It could be lack of economic capital, lack of understanding about the FCC process, or some other missing qualification. Moreover, with the data published by the FCC, it is difficult to tell whether this institutional barrier is a result of administrative procedures (some applicants have difficulty understanding the technicalities of the application process) or administrative policies (some applicants fail to make the cash deposits or illustrate sufficient technical expertise). The next step in this research will be to understand which failures of either procedures or policies do the most to reduce the pool of minority-owned businesses at different states.

In his comments to the U.S. Senate Committee on Commerce, Science and Transportation in February 2007, FCC Chairman Kevin Martin observed that “television programs are watched when and where we want them, and they are increasingly available on the internet. Cell

phones are mini-computers. They take pictures, play songs and games, send e-mail, and ... [teens] ignore the TV and stereo, downloading songs onto MP3 players and watching and posting videos on YouTube instead."²⁶ Yet our system of encouraging diversity in media ownership, and scholarly study of this system, seems to be narrowly focused on traditional radio and television radio broadcast licenses.

The lack of diversity in media ownership is not only evident in mass communication systems such as radio and television, it is even more apparent in other communication services—such as mobile phone systems and wireless Internet—that are an increasingly important part of our contemporary media environment for news and entertainment. Minorities and new entrants are much more interested in radio and TV broadcast licenses, even though the number of auctions—and proportion of the public spectrum—devoted to wireless data services has grown significantly in recent years.

Being a minority-owned business is the strongest predictor, controlling for other factors, of failing to qualify to bid in an auction. Including diverse cultural perspectives in media is not only socially responsible but can prove to be profitable given the changing demographics within the United States. Government agencies must understand the ways in which they are transparent institutions and the ways in which they construct organizational blockages to cultural diversity in broadcast and communication services.

NOTES

1. These hearings were designed to award a broadcast license based on the good character of the applicant, the applicant's access to technical expertise and proper financial backing, and an employment plan commensurate with the FCC's equal employment rules. In addition, the applicant had to show awareness of a community's programming interests, and show that holding the licenses would not exceed the legal limits on the concentration of media ownership.

2. FCC, *FCC Auctions Homepage*, 2006, <http://wireless.fcc.gov/auctions>.

3. Wat Hopkins, ed., *Communication and the Law* (Northport, AL: Vision Press, 2003).

4. Gordon Berry and Joy Asamen, "Television, Children and Multicultural Awareness: Comprehending the Medium in a Complex Multimedia Society," in *Handbook of Children and the Media*, ed. Dorothy Singer and Jerome Singer (Thousand Oaks, CA: Sage, 2001), 359-73; Travis Dixon and Daniel Linz, "Race and the Misrepresentation of Victimization on Local Television News," *Communication Research* 27 (October 2000): 547-73; Daniel Romer, Kathleen Jamieson, and Nicole de Couteau, "The Treatment of Persons of Color in Local Television News: Ethnic Blame Discourse or Realistic Group Conflict?" *Communication Research* 25 (June 1998): 286-305.

5. Leonard Baynes, "Deregulatory Injustice and the Electronic

Redlining: The Color of Access to Telecommunications," *Administrative Law Review* 56 (2004): 263-352.

6. See Ivy Planning Group, *Whose Spectrum Is It Anyway? Historical Study of Market Entry Barriers, Discrimination, and Changes in the Broadcast and Wireless Licensing, 1950-Present* (Rockville, MD: Report to the Office of the General Counsel, Federal Communications Commission, 2000).

7. Ivy Planning Group, *Whose Spectrum Is It Anyway?*

8. Robert Horwitz, "On Media Concentration and the Diversity Question," *The Information Society* 21 (August 2005): 181-204.

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16. Although the online auction system began in 1994, in that year the FCC had a special program for encouraging minority applicants. In *Adarand v. Peña* the Supreme Court ruled that federal programs that offered preferences to minority business were unconstitutional, and from 1995 onward no special incentives were offered to minority applicants. All applicants must self-identify as one or the other, but the FCC does not verify these self-reported data. The FCC scheduled 82 auctions, but only 59 took place over this period, and the rest were canceled because of low application numbers or some policy that prevented distribution of the spectrum. Data are inclusive as of May 2006. For more details on licenses covered in this dataset, contact the authors.

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23. In the first example, the odds = $0.068(\text{Constant}) * 0.001(\text{Entrepreneur}) * 1.352(\text{Minority}) * 4.012(\text{New Entrant}) * 0.502(\text{Rural}) * 0.390(\text{Small or Very Small}) * 0.903(\text{Woman}) * 1.369(\text{Year of Auction})$ and since $e(0) = 1$, the odds = $0.068(\text{Constant}) * 0.001(0) * 1.352(0) * 4.012(1) * 0.502(0) * 0.390(1) * 0.903(0) * 1.369(11) = 1.60$. A similar candidate applying in the same year of the program that was a minority-owned business has the odds = $0.068(\text{Constant}) * 0.001(0) * 1.352(1) * 4.012(1) * 0.502(0) * 0.390(1) * 0.903(0) * 1.369(11) = 2.2$.

24. In exploring how the data set satisfied the assumptions of binary logistic regression, we tested several interaction terms, such as minority-owned * woman-owned, and while some were statistically significant, none contributed to a rise in explained variation. For the sake of a parsimonious model, they were excluded from further analysis. These models are based on an analysis on a large sample of the cases, and even

though Model 2 offers a small amount of explained variation, it is a statistically significant advance over the predictive capacity of the base odds alone.

25. However, the vast majority of these woman-owned and minority-owned businesses are AM or FM radio broadcasters and located in rural areas and small towns. Carolyn Byerly, "Questioning Media Access: Analysis of Women and Minority FCC Ownership Data" in *Does Bigger Media Equal Better Media?* (Washington, DC: Benton Foundation and Social Science Research Council, 2006).

26. U.S. Senate, "Comments of The Honorable Kevin J. Martin to Hearings of the Committee on Commerce, Science and Transportation" *Assessing the Communications Marketplace: A View from the FCC*, Thursday, February 1, 2007.