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Final Report

Utilization Rates, Win Rates, and Disparity Ratios for Broadcast Licenses Awarded by the FCC

Prepared for the FCC as a deliverable under the contract "Estimation of Utilization Rates/Probabilities of Obtaining Broadcast Licenses from the Federal Communications Commission or of Obtaining Broadcast and Wireless Licenses through Secondary Market Transactions"

prepared by
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For
Federal Communications Commission

November, 2000

I. Introduction

KPMG LLP has prepared this report for the Federal Communications Commission (FCC). The FCC engaged KPMG to prepare a study of utilization rates and probability of obtaining broadcast licenses from the FCC. The study will assist the FCC as part of a series of studies to determine if there has been previous discrimination by the agency or passive participation by the FCC in discrimination by the private sector.

This study measures license award rates by gender and race during periods of time when the FCC's stated policy was to provide preferences to minorities and women. During this period, the FCC awarded licenses under two regimes. First, the FCC would award a license to individual applicants (singletons) who were judged as qualified when only a single application was received. Second, if more than one applicant applied for the same license, then the FCC used Comparative Hearings, an administrative hearing process, to allocate broadcast licenses during the period from the 1940s until 1993.[1]

In this report, KPMG presents its findings regarding participation rates and utilization rates for participants who were involved in Comparative Hearings from 1978-81 and 1989-93. A comparative hearing was the administrative process that the FCC used to allocate broadcast licenses during the period from the 1940s until 1993.[2] This report provides results developed from data collected and compiled on the participation and success of minorities and women in the FCC's comparative hearing award process for radio and TV licenses.[3]

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[1] After comparative hearings, the FCC used auctions to award licenses. The first auction took place in 1999.

[2] While the FCC's Request for Proposal focused on utilization, and participation, we also measure disparity. We define utilization differently than it is defined in the FCC's RFP. The RFP describes utilization as the percentage of wins for each racial group, e.g. wins for group divided by the number of participants for group. While we make this calculation, we refer to it as a win rate rather than utilization rate. The standard literature on utilization refers to a utilization rate as the percentage of licenses won by each racial group. E.g. total wins for each group divided by total awards (for all groups combined). Participation (or availability) refers to the percentage of total availability that is comprised of each racial group. Disparity is a measure of utilization relative to availability. Typically in the literature on disparity studies, if the disparity ratio is substantively less than 1, say .8, then it is not unreasonable to suspect the possibility that discrimination may be present.

[3] There are two companion pieces to this study that were prepared by KPMG. The first is "History of the Broadcast License Application Process". This report describes the license application and award process in great detail. The second companion study prepared by KPMG, "Logistic Regression Models of the Broadcast License Award Process for Licenses Awarded by the FCC", presents models of the license award process that attempt to determine how race, gender and other factors influenced the allocation of licenses awarded by the FCC.

The report is organized as follows.

Section II, Comparative Hearings and Minority and Female Credit provides a brief overview of the comparative hearing process and an introduction to minority and female credit.

Section III, *Data Collection*, outlines the efforts taken to collect these data.

Section IV, *Definitions of Win Rates, Availability and Disparity Ratios*, reviews some of the properties of these measures.

Section V, *Participation by Race and Gender in Comparative Hearings*, summarizes participation statistics by demographic group.

Section VI, *Win Rates and Disparity Ratios by Race and Gender in Comparative Hearings*, contains the central results of this memo. The section includes various formulations of win rates and disparity ratios.

Section VII *Win Rates and Disparity Ratios by Race and Gender, Based on Definition of Control,* considers win rates and disparity ratios based on a variety of definitions of which group controls an application.

Section VIII, *Level of Competition within Hearings*, looks at variation in the level of competition within hearings by examining the average number of parties per application and average number of applications per hearing across various demographic groups.

Appendix I provides the data collection form used to acquire these data.

Appendix II, *Standard Deviations*, discusses the impact of statistical uncertainly on each of the estimates presented in the previous sections.

II. Comparative Hearings and Minority and Female Credit[4]

Comparative Hearing Process

Comparative Hearings began soon after the FCC was created by the Communications Act of 1934 (the "Act").[5] The Act granted the FCC the authority to regulate "communications by wire and radio so as to make available to all the people of the United States a rapid, efficient, nation-wide, and worldwide wire and radio communication service." This Act also empowers the FCC to issue broadcasting licenses "as public convenience, interest, and necessity requires."[6]

One landmark court case that was resolved in 1945 reinforced the importance of the comparative hearing process in awarding a broadcast license when there are multiple applicants. In *Ashbacker Radio Corp. v. FCC*, 326 U.S. 327 (1945), the Supreme Court of the United States held that:

> Where the Federal Communications Commission has before it two applications for broadcasting permits which are mutually exclusive, it may not, in view of the provisions of the Act for a hearing where an application is not granted upon examination, exercise its statutory authority to grant an application upon examination without a hearing.

This decision set the legal precedent that a publicly distributed license must be assigned through a process that does not exclude competition for the license.

A comparative hearing was necessary when more than one applicant applied for the same broadcast license. In the event of multiple applicants, the FCC would hold a

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[4] This section is an abbreviated discussion. More detail is provided in the KPMG report, "History of the Broadcast License Application Process".

[5] Communications Act of 1934, ch. 652, 48 Stat. 1064, 73rd Cong., 2d Sess. (1934) codified as amended at 47 U.S.C. §151 et seq. (1937).

[6] Lawmakers anticipated the possibility that disputes might arise in the process of awarding broadcast licenses. Section 309 (a) of the Act grants authority to the FCC to assign any dispute over a license to a judicial hearing: If upon examination of any application for a station license or for the renewal or modification of a station license the Commission shall determine that public interest, convenience, or necessity would be served by the granting thereof, it shall authorize the issuance, renewal, or modification thereof in accordance with said finding. In the event the Commission upon examination of any such application does not reach such a decision with respect thereto, it shall notify the applicant thereof, shall fix and give notice of a time and place for the hearing thereon, and shall afford such applicant an opportunity to be heard under such rules and regulations as it may prescribe.

comparative hearing, a proceeding that was presided over by an Administrative Law Judge (ALJ). The purpose of the comparative hearing was to determine which applicant for a broadcast license is best qualified to hold the license.

In the period from 1970-1993, 2,437 licenses were awarded by comparative hearing while 6,178, or the majority of the licenses, were awarded to singleton applications because these applications were never challenged. Factors that the FCC described as determinative of license award were:

1. Diversification of control of the media of mass communications.
2. Full-time participation in station operation by owners.
3. Proposed program service.
4. Past broadcast record.
5. Efficient use of frequency.
6. Character of the applicants.
7. Other factors.

While the measures of success in acquiring a license that are presented in this report were influenced by these factors, we do not control for these factors in the measures that we present in this report. A companion report, “Logistic Regression Models of the Broadcast License Award Process for Licenses Awarded by the FCC“ develops models of win rates by minority and gender status that control for some of these factors.

Minority and Gender Credit in Comparative Hearings

While the criteria set forth by the FCC in 1965 included diversification of control, initially the FCC refused to include the racial composition of an applicant group as a relevant factor in a comparative hearing. This position was challenged in 1965 by the Comint Corp applicant group in the comparative hearing for a TV broadcast license in Orlando, Florida.

In 1965, the D.C. Court of Appeals vacated the decision that awarded the TV license to Mid Florida Corp. and opened the license to competition. Eight applicants filed for ownership and the matter went to comparative hearing. In the comparative hearing, one of the applicants, Comint Corp., filed an application that included two black owners with a 14% shared interest. The proposed community for the license awarded had a 25% minority population. Comint argued that minority ownership should be given comparative credit on the basis of the 1965 statement on comparative hearings (1 F.C.C.2d 393 (1965)) which stated that the "two primary objectives toward which the process of comparison . . . are . . . the best practicable service to the public, and . . . a maximum diffusion of control of the media of mass communications." The FCC noted that while it:

> "is sympathetic with Comint's argument and recognizes the validity of the goal of increased minority ownership of the media of mass

> communications …. however, the Communications Act, like the Constitution, is color blind and therefore, in a comparative broadcast proceeding, which is governed by the Commission's Policy Statement . . . Black ownership cannot and should not be an independent comparative factor . . . rather, such ownership must be shown on the record to result in some public interest."

Comint challenged the FCC's refusal to explicitly consider race in the comparative hearing process and appealed the FCC's ruling to the DC Court of Appeals.

In the 1974 decision 495 F.2d 929 (D.C. Cir. 1974), the DC Court of Appeals reversed the result of the Mid-Florida comparative hearing. The Court held that comparative merit should be awarded to an applicant, two of whose stockholders, each owning approximately seven percent of the applicant's stock, were Black and would participate in the operation of the station. The Court pointed out that both of the Black principals were local residents of the community being applied for who had been active in advancing the interests of Black members of the community, and that 25 percent of the population of the area applied for were Black. It also noted that since the highest interest owned by any of the applicant's principals was ten percent, the two stockholders' individual and combined ownership was substantial. In addition, no Blacks were then participating in the ownership or management of any of the media of mass communications in that community. In these circumstances, the Court concluded that minority stock ownership is "a consideration relevant to a choice among applicants of broader community representation and practicable service to the public." (161 U.S. App. D.C. at 357, 495 F.2d at 937.) The court went on to comment:

> It is consistent with the primary objective of maximum diversification of ownership of mass communications media for the Commission in a comparative license proceeding to afford favorable consideration to an applicant who, not as a mere token but in good faith, as broadening community representation, gives a local minority group media entrepreneurship.... We hold only that when minority ownership is likely to increase diversity of content, especially on opinion and viewpoint, merit should be awarded. (TV 9 Inc. v. FCC, 495 F.2d 929 (D.C. Cir. 1973), cert. denied, 418 U.S. 986 (1974)).

Accordingly, without recommending or requiring any quota system, the Court held that merit should be awarded for minority ownership where it is likely to increase the diversity of program content, especially of opinion and viewpoint. In a Supplemental Opinion, the Court emphasized that it was not holding that merit should be based on Black ownership alone, but rather in that case upon a meaningful combination of ownership and participation in station affairs which indicated that Black persons having

a substantial identification with minority rights would be able to translate their positions and their ownership stake into meaningful effect on this aspect of station programming. The Court also explained that "merit" meant only "favorable consideration," or a plus-factor, not a "preference," and that it was to be weighed along with other relevant factors in determining which applicant is to be awarded a preference. (161 U.S. App. D.C. at 361, 495 F.2d at 941.)

This decision set a new precedent for the incorporation of minority participation as a factor in the comparative hearing process.

Not long after the Court of Appeals decided that minority credit for integrated minority owners was appropriate, Administrative Law Judges began deciding cases on this basis. Additionally, administrative law judges at the FCC expanded on the TV 9 decision. In particular, the considerations applied to race in the *TV 9* decision were applied to gender in the *Rosemore* decision.

In *Rosemore Broadcasting, Co., Inc*., (54 F.C.C. 2d 394, 418 (1975)), the FCC reasoned that integrated female ownership should be awarded credit in comparative hearings because women, like minorities, are "likely to increase diversity of content." The FCC went on to state that female participation in an application can be given credit when it "reflects broader community representation." Because two of the three individuals associated with *Rosemore Broadcasting Co.'s* application were female and these women planned on playing a significant role in the day-to-day operation of the broadcast station, the *Rosemore* application was enhanced in the FCC's eyes. The *Rosemore Broadcasting Company* went on to win the license in the comparative hearing.

Since the DC Court of Appeals in 1974 had set in place minority ownership and employment policies within comparative hearings the FCC and Administrative Law Judges had started awarding minority credit to applicants for broadcast licenses. However, in 1978 the FCC observed a "continuation of an extreme disparity between the representation of minorities in our population and in the broadcasting industry" and subsequently issued "further Commission action" or Statement of Policy on Minority Ownership of Broadcasting Facilities (See 68 F.C.C.2d 979, 982). This statement formalized the use of minority merits in the comparative hearing process.

Metro Broadcasting, Inc.

Reviewing the FCC's policies under intermediate scrutiny, the Supreme Court held that the FCC's policy of minority ownership and employment in comparative hearings which gave enhancement credit for minority ownership and participation and the policy of allowing "distress sales" to FCC-approved minority-owned firms did not violate equal protection under the Fifth Amendment.

The Court reasoned:

> Minority preference policies adopted by the Federal Communications Commission (FCC)-- do not violate the equal protection component of the Federal Constitution's Fifth Amendment, where Congress has enacted appropriations legislation (101 Stat 1329-31, 102 Stat 2216, and 103 Stat 1020) prohibiting the FCC from spending any appropriated funds to examine or change its minority ownership polices, because (1) the policies in question have been mandated by Congress; (2) the interest in enhancing broadcast diversity is, at the very least, an important governmental objective; and (3) the policies in question are substantially related to the achievement of the government's interest, since (a) both the FCC and Congress--whose joint determination must be given great weight--have concluded that there is a relationship between expanded minority ownership and greater broadcast diversity, (b) this judgment is based on extensive empirical evidence rather than on impermissible stereotyping, and (c) the policies are in other relevant respects substantially related to the goal of promoting broadcast diversity**…**

Gender Ownership Policies

Gainesville Media, Inc.

Approximately one month after the Commission issued Statement of Policy on Minority Ownership of Broadcasting Facilities, a Review Board hearing the Gainesville Media, Inc. case reanalyzed its decision regarding female ownership credit in comparative hearings. Initially, the board held that . . .

> since there was no evidence in the record of the extent of female ownership in the mass media in Gainesville, we had no basis on which to conclude that such participation would achieve a public interest benefit. Upon further reflection, we now believe the better course is to consider female ownership and participation, despite the absence of record evidence regarding the ownership situations at other stations (see Gainesville Media, Inc., 70 F.C.C.2d 143, 149 (Rev. Bd. 1978)).

Soon after the Gainesville decision, a review board clarified the justification and reasoning for female ownership policies. The Board concluded:

> ... merit for female ownership and participation is warranted upon essentially the same basis as the merit given for black ownership and participation, but that it is a merit of lesser significance. The basic policy considerations are the same. Women are a general population group which has suffered from a discriminatory attitude in various fields of activity, and one which, partly as a

> consequence, has certain separate needs and interests with respect to which the inclusion of women in broadcast ownership and operation can be of value. On the other hand, it is equally obvious that the need for diversity and sensitivity reflected in the structure of a broadcast station is not so pressing with respect to women as it is with respect to blacks--women have not been excluded from the mainstream of society as have black people (see Mid-Florida Television Corp., 70 F.C.C.2d 281, 326 (Rev. Bd. 1978), set aside on other grounds, 87 F.C.C.2d 203 (1981)).

This decision demonstrated that credit is applied for female participation in a broadcast license application, but that credit is not as significant as the credit applied for minority participation in a broadcast license application.

In 1993's *Bechtel* decision 10 F.3d 875 (D.C. Cir. 1993), the D.C. Circuit Court found that the "continued application of the integration credit is arbitrary and capricious, and therefore unlawful." The court stated that the policy of extending additional credit to applicants who intended to personally manage and operate the broadcast stations was "without foundation." By invalidating the integration credit the court effectively eliminated gender and race ownership and employment policies associated with the integration credit. In 1994 the FCC suspended all active comparative hearings until an adequate resolution to the issues raised in *Bechtel* could be formulated.

The Telecommunications Act of 1996 eliminated the role of comparative hearings in the renewal of broadcast licenses. The 1994 suspension of the comparative hearing process effectively became permanent in 1997 when Congress mandated that the FCC utilize a competitive bidding process for the distribution of all future commercial broadcast license awards.[7] The first auction associated with this mandate occurred in October of 1999 and generated (unofficially) about $58 million from the distribution of 116 broadcast licenses and included several frozen license applications from the *Bechtel* ruling.

While minority ownership policies were not included in this auction process, first-time broadcasters and "small" broadcasters were accorded with auction credits to assist in their bidding.

After the suspension of the comparative hearing process due to the *Bechtel* decision, but before the implementation of the broadcast license auctions, two important court cases were decided which will impact the ability of the FCC to implement minority and female ownership and employment policies in the future.

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[7] See Omnibus Budget Reconciliation Act of 1993. Pursuant to this Act, the FCC received the authority to conduct auctions. Also note that competitive bidding was not required for broadcast license awards in which only one applicant expressed interest.

In the 1995 *Adarand* decision [515 U.S. 200 (1995)], the Supreme Court held that any federal program that uses racial or ethnic criteria as a basis for decision making must serve a compelling governmental interest such as remedying past discrimination and must be narrowly tailored to serve that interest. Furthermore, the court ruled that any racial distinctions employed by a local, state, or the federal government "must be analyzed by the reviewing court under strict scrutiny," specifically overruling the standard of review used in *Metro Broadcasting*.

In *United States v. Virginia*, 518 U.S. 515 (1996), the Supreme Court considered the distinctions made by local, state, and the federal government with respect to gender. In this case the court reaffirmed that these gender distinctions need only satisfy "intermediate scrutiny". While the definition of intermediate scrutiny is somewhat vague, it is clear that intermediate scrutiny is a lower standard than strict scrutiny.

III. Data Collection

In order to develop statistics about the success of female, ethnic and minority and majority race groups in the comparative hearing process, KPMG collected data from FCC archives in Suitland Maryland during the period October, 1999 through March, 2000. Within the files on comparative hearing proceedings, maintained as paper files at the National Records Center, exist data on the declared minority status of parties to applications for broadcast licenses that were considered in the comparative hearing process. Also available are outcomes of the comparative hearings, i.e. a record of which applications have been awarded the licenses.

The data collection effort involved collecting information for 3063 parties involved in 775 applications in a sample of 230 comparative hearings over the periods 1978 to 1981, and 1989-1993. These periods were selected to satisfy a number of requirements.[8] First, these were both periods when financial information was collected in the license

[8] The FCC also requested an analysis of the period before minority preferences were in place. However, the cost of acquiring the necessary data prior to the minority and female preference period would have been prohibitive. KPMG examined the records in the FCC archives and determined that there was insufficient data on race of applicant. Therefore, analysis of this period would require KPMG to locate and survey license applicants using contact (name and address information) that was 20 or more years old. Based on a pilot survey of secondary market participants who sold a broadcast station between 1993 and 1999, KPMG estimated that only a 3.2 percent response rate could be achieved. Based on this experience and due to the fact that these contact information were approximately 20 years old, it was highly unlikely that KPMG would have been able to collect sufficient data for the pre-preference period; therefore this part of the study was terminated.

application.[9] Second, during these periods, the FCC's stated policy was to provide credit for minority applicants.

KPMG retrieved documents from a random sample of the hearings that occurred during these two time periods. The universe of available hearings was made available to KPMG in two formats. For the period prior to 1983, the Administrative Law Judge Listing was used. This is a paper database. For the period after 1983 we relied upon the BAPS database. The BAPS database is an electronic database containing information on each comparative hearing that took place from the early 1980's up to today. Both data sources provide the following important information with regards to each hearing:

- unique hearing identifiers
- service
- ascension number.
- call sign
- start date for hearing
- end date for hearing

Tables 1 and 2 show the population of hearings and population of applications for radio and television hearings, broken into the two time periods.

Table 1.
Number of Hearings

Years	1978-1981	1989-1993	Total
All Licenses	421	142	563
Radio	286	134	420
AM	85	0	85
FM	201	134	335
TV	135	8	143

[9] While financial information was not necessary for the construction of success ratios for groups in attaining broadcast licenses (utilization ratios), it was necessary for developing a regression model of the award process based on the factors and policies identified by the FCC as important to the award of a broadcast license. Although the selection of these time periods was guided by the requirements of the regression model, these periods are also useful for the construction of utilization ratios. Both of these time periods encompass the period when minority preference policies were used by the FCC in the award of broadcast licenses.

Table 2.
Number of Applications

Years	1978-1981	1989-1993	Total
All Licenses	1,064	595	1,659
Radio	716	583	1,299
AM	177	0	177
FM	539	583	1,122
TV	348	12	360

A sample of 230 comparative hearings was drawn from the population of hearings using stratified random sampling. The sample was stratified by service (AM, FM, and TV). This sample size was selected in an effort to balance the cost of data collection with the need to obtain a reasonable level of accuracy at various levels of disaggregation.

Once the sample was drawn, data collection personnel, who were primarily made up of personnel with legal or paralegal backgrounds, retrieved the files from the National Records Center in Suitland, MD. and collected the necessary data.[10] The data items that were collected for the construction of the utilization ratios come principally from the application form 301. The items from this form are shown in appendix I.

IV. Definitions of Win Rates, Availability, and Disparity Ratios

Differing definitions for availability, utilization, and disparity ratios may offer a variety of insights; accordingly, we have used these data to develop a variety of estimates.[11] The differences in the estimates that appear in this report are mainly due to differing measures of availability, which is defined as the pool of applicants or potential applicants who are willing and able to compete for a broadcast license.

Before presenting results, this section describes the measures and how they are constructed. All of the win ratios we have developed are expressed as a ratio of a measure of success (or winning applicants) and a measure of participation (or applicants). A number of different ratios are presented. They are generally presented in the order of complexity of the calculation, with the simplest calculations presented

[10] The data collected for the development of the utilization ratios was limited to a few key items. A more comprehensive data collection was performed for a subset of these hearings for the regression model.

[11] While we use the words participation and availability almost interchangeably in this document, there is a distinction. Participation refers to the people who have actually participated in the comparative hearing process. While we use this as a measure of availability, we should also point out that this measure could be biased downward if discrimination was responsible for inhibiting participation. More information on this issue is provided in section IV, "Definition of Win Rates, Availability ….".

first. While we present a number of measures, our preferred measure is called the "relative award rate" and it is presented in Table 13.

A key concept to keep in mind when reviewing these results is that there are different levels of aggregation that can be used to make calculations of success in acquiring licenses. This is due to the nature of the comparative hearing process and the fact that hearings are made up of multiple applications and applications can be made up of multiple parties of different race and gender who cooperate to bid on licenses.

The party is the lowest level for which measures of success can be calculated. Next there is the application level. Therefore, when we measure win rates, we can do it at the party level; i.e. how many parties of a particular group were involved as participants in winning applications. Or we can measure win rates at the application level, e.g. we can measure how many applications won where at least 1 party of a particular group was represented in the application or we could measure how many applications won when a particular group controlled more than 50% of the equity in the application. We present measures that use all of these definitions here.

There are strengths and weaknesses to all of the measures that we present. For example, looking at the data on a party basis, as we will do in tables 7 through 12, shows how a demographic group does overall but says nothing about the distribution of results for a group. If many parties from one demographic group were concentrated in only a few winning applications, it might appear as if the group were acquiring more licenses than it was actually acquiring because success would be attributed to a lot of parties who won few licenses. Also, accounting for equity control may be important because if that control is lacking, then what appears to be adequate participation may in fact not be meaningful participation. Finally, it is also important to distinguish win rates based on the value of licenses. It is conceivable that a group could be winning a reasonable number of licenses but if they were licenses of little value, this would not be a reasonable result. To account for this possibility, we have weighted the win rates by population of the area in which the licenses are awarded where population serves as a proxy for value of the license.[12]

Definitions for the measures that will appear in the tables that follow are provided below.

Relative win rate (party basis) = # winning parties in-group / # of parties in-group.

Relative win rate (equity basis) = equity of winning parties in group / equity of all parties in group

[12] While we have included a population weighted measure here, there are many other factors that we should control for. KPMG's companion report performs this more rigorous analysis.

Absolute win rate = # winners in-group / total # of parties in all groups combined

% of winners = # of winners in group / total number of winners
(also known in literature as a utilization rate)

% participation = # of parties in group / total number of parties

Disparity ratio = % of winners / % participation

The relative award rate *R* is defined by the following equation:

$$R = \frac{1}{N}\sum_{i=1}^{N}(z_i - m_i) = \frac{1}{N}\sum_{i=1}^{N} z_i - \frac{1}{N}\sum_{i=1}^{N} m_i$$

where N is the number of hearings, i indexes hearings, z_i takes a value of one if the license in hearing i is awarded to a minority and zero if not, and m_i is the percentage of minority applicants in hearing i. The relative award rate is defined analogously for non-minorities, males, and females.

Winner take all relative win rate = #winning parties in group where equity is controlling / #parties in group

It is informative to contrast calculated win ratios across different groups of applicants. Nevertheless, it is important to keep in mind that win rates cannot account for differences between groups that span multiple dimensions. For example, when contrasting a win rate for male applicants with a win rate for female applicants it is important to keep in mind that the ratio does not account for differences in other applicant characteristics (asset holdings for example) across the two groups. This suggests that it would be inappropriate to conclude that discrimination is taking place simply on the basis of win rates. Further analysis, which is presented in a companion study, using logistic regression models, discusses whether there are significant differences in award rates based on race or gender, while controlling for many factors that affect award rates.

The definition of the pool of "eligible participants" associated with various groups has frequently been a disputed issue in the calculation of availability ratios for studies of disparity. Typically, the broader the measure of the pool who are eligible to participate for each group, the greater the dispute because a broader pool is less likely to contain qualified and willing participants. At one extreme, the entire population of the group in question can be classified as eligible participants. But the entire population is not qualified or willing to participate in the process and therefore this is an inappropriate measure of eligibility. The Croson decision suggests a measure that contains only those

who are qualified, willing and able to participate.[13] The measure of availability used in this study is narrower and more conservative than that in Croson. In the contracting context, availability is measured by counting all pre-qualified contractors, not just those who apply for a given contract. In licensing, there is no group of pre-qualified bidders, so the study uses those who actually applied for the given license.

Consistent with the conditions of Croson, we use a measure of the pool of eligible participants for each group. For the purpose of the win rates, availability, and disparity ratios presented here, the set of eligible participants associated with each group is limited to the set of individuals in that group that we actually observed participating in a comparative hearing.[14]

It is certainly conceivable that a broader measure of the pool of eligible participants could be more relevant. A broader and theoretically more appealing measure might include those who would have liked to apply, but failed to apply, because they may have been frustrated by the process or did not have equal access to the resources required to fulfill the application requirements.

We have not attempted to develop a methodology to measure the number of eligible participants for various groups using definitions of availability that are broader than the number who have actually participated in the hearing process. We believe that this line of inquiry is certainly warranted since the availability measure is an extremely important determinant of whether one can adequately measure the existence of disparity. If the measure of availability excludes potential applicants who have not been able to apply due to the existence of discrimination, then disparity measures that do not account for this possibility will be biased against a finding of discrimination. On the other hand if the measure of availability is over-inclusive so that it were to include those who are not qualified, willing and able to participate in the process, then disparity measures using such a measure of availability would be biased towards a finding of discrimination. The measures of availability that we use in this study are certainly not over-inclusive and are more likely to be under-inclusive.

Win rate and disparity measures that are based on a narrow definition of availability, such as the one we use here, result in a conditional measure of win rates or disparity. The disparity and availability ratios are conditional in the sense that we are testing only the second of two dimensions of the process. The first dimension of the hearing process relates to who is able to participate in a hearing; i.e. who is able to apply. The second dimension relates to who wins given that they have passed the first hurdle, i.e. been able

[13] 488 U.S. 469, 109 S.Ct. 706; City of Richmond v. J.A. Croson Company (1989) U.S. Supreme Court

[14] The disparity measure that we calculate is widely used by state and local governments when calculating disparity in the award of public contracts. This measure is not necessarily the best measure for the purpose of measuring disparity in the award of licenses, which unlike recurring public contracts, are only awarded on a one-time basis. Our preferred measure is the relative award rate that is presented in Table 13.

to participate and have been included in the application and hearing process. Our analysis only considers the second of these two dimensions. If minority or female participation has been affected by impediments such as inadequate access to capital, due to discrimination, the disparity measures represented here would not capture this dimension of the licensing process.

We do note, as the following data will suggest, that minority participation in broadcasting is very low relative to minority representation in the general population. Table 3 shows the minority participation in broadcasting and minority shares of the U.S. population.

Table 3.
Participation in Comparative Hearings and Percent of U.S. Population in 1990*

	Percent of Parties in Hearings (1)	Percent of U.S. Population (2)
Total Minority	8.9%	23.8%
Black	3.4%	12.2%
Asian	.4%	2.7%
Hispanic	3.9%	8.7%
American Indian, Eskimo, Aleut	.4%	.7%
White	91.1%	76.2%
Male	79.3%	48.7%
Female	20.7%	51.3%

*Notes: (1) Detailed race and ethnic categories do not sum to total minority for the Percent of parties in hearings, due to nonreporting of this level of detail for a small portion of the minority applicants (.8% fail to report the level of detail about their minority status). (2) For the percent of U.S. population, there is slight overlap in the figure for black and Hispanic because black includes those blacks of Hispanic origin (about .5% of the 12.2% of blacks are of Hispanic origin).

There is certainly a large difference between the minority share of participants in comparative hearings and the minority share of the U.S. population.

Note that during the period that we are performing this analysis, the FCC's stated policy was to provide credit for minority participation in applications. Therefore, when we present win rates and disparity rates, one would expect that if the FCC's policy has been effective, there would be greater minority participation (and probably greater utilization) than in the absence of this policy. We can assume then that the level of female and minority participation, which is low relative to female and minority representation in the population, would have been even lower still in the absence of the FCC's stated policy.[15]

V. Participation by Race and Gender in Comparative Hearings

[15] Without collecting data from the period before preferences were in place, it is not apparent how much additional minority and female participation has resulted from the FCC's stated policy of providing credit for minority and female participation in applications. However, it has been established that ownership of broadcast licenses was as low as 10 out of 7,500 radio stations and none of the more than 1,000 television stations held in 1971 (see TV 9 Inc. v. FCC, 161 U.S. App. D.C. 349, 347, n. 28, 495 F.2d 929, 937 n. 28 (1973)).

Table 4 shows the number of hearings in our sample.[16] Tables 5 and 6 present data on participation, by demographic group, using alternative definitions of participation. Table 5 shows the number of parties to applications considered in hearings, broken out by race and gender, and the percentage of each group of the total number of participants in these 230 comparative hearings. Table 6 is similar to table 5 except that it shows the number of applications where a group has at least 1 party of a given demographic group participating in the application.

Table 4.
Number of Comparative Hearings in Sample by Type of Hearing

Radio and Television	230
Radio	155
AM	25
FM	130
Television	75

We can see from Tables 5 and 6 that there were 3082 parties in 740 applications in these 230 hearings. 91.1% of all participants were white while 8.9% were minority. Of the minority participants, about 43.1% are Black, 48.8% are Hispanic, 4.5% are Asian, and 3.7% are American Indian.[17]

Men made up 79% of all parties while females made up 21%. A strict comparison of the number of minority and female participants to the population at large would indicate low minority and female participation in the hearing process. While we have described earlier that this is not an appropriate comparison for the purposes of Croson, it does demonstrate that for at least the first dimension of the comparative hearing process, participation; minority ownership of broadcast stations is probably low because of low participation rates. This says nothing about the issue of whether the comparative hearing award process was fair or not.

Table 5.
Participation (number of parties in applications) by Minority Status and Gender in Broadcast, Radio, and TV Comparative Hearings

[16] We define a hearing as consisting of two or more applications. We define each application as consisting of one or more parties. For our purposes the word "party" and the word "individual" are synonymous.

[17] It is assumed that the discrepancy between total minority reported and the sum of the finer reporting level (by race) is equally distributed across the race categories.

	Broadcast (Radio&TV)		Radio		Television	
Total Parties	3082		1526		1556	
	Headcount	Percent	Headcount	Percent	Headcount	Percent
White male	2262	73.4%	1060	69.4%	1202	77.2%
White female	546	17.7%	306	20.1%	240	15.4%
Minority male	182	5.9%	105	6.9%	77	4.9%
Minority female	92	3.0%	55	3.6%	37	2.4%
White	2808	91.1%	1366	89.5%	1442	92.7%
Minority	274	8.9%	160	10.5%	114	7.3%
Black	106	3.4%	67	4.4%	39	2.5%
Hispanic	120	3.9%	70	4.6%	50	3.2%
Asian	11	0.4%	4	0.3%	7	0.4%
American Indian	12	0.4%	8	0.5%	4	0.3%
Male	2444	79.3%	1165	76.3%	1279	82.2%
Female	638	20.7%	361	23.7%	277	17.8%

* minorities do not add exactly to total because sometimes, parties only indicated minority status and failed to specify the details of which minority group they were in.

Table 6.
Participation (Number of applications) by Minority Status and Gender in Comparative Hearings (with at least 1 party in this demographic group)

	Broadcast (Radio&TV)		Radio		Television	
Total applications	740	Percent	494	Percent	246	Percent
White male	662	89.5%	439	88.9%	223	90.7%
White female	332	44.9%	213	43.1%	119	48.4%
Minority male	90	12.2%	48	9.7%	42	17.1%
Minority female	67	9.1%	41	8.3%	26	10.6%
White	705	95.3%	474	96.0%	231	93.9%
Minority	122	16.5%	72	14.6%	50	20.3%
Black	50	6.8%	31	6.3%	19	7.7%
Hispanic	57	7.7%	30	6.1%	27	11.0%
Asian	8	1.1%	3	.6%	5	2.0%
American Indian	10	1.4%	6	1.2%	4	1.6%
Male	694	93.8%	458	92.7%	236	95.9%
Female	374	50.5%	239	48.4%	135	54.9%

VI. Win Rates and Participation Rates by Race, Gender in Comparative Hearings

In calculating win rates and disparity ratios, it is critical to determine which applicant actually won each hearing. The data indicating which applicants won the comparative hearings come from either the Broadcast Applications Processing System (BAPS) database or the Administrative Law Judge Listing. This data is also confirmed in the manual data collection operation where we retrieved information directly from archived comparative hearing documents. On occasion, the decision of the ALJ to award a license to a particular applicant is appealed to a higher court and there is a reversal of a decision. We have conducted the additional data collection necessary to capture these post comparative hearing reversals. In our sample of 230 hearings, this occurred 15 times.

Tables 7 through 12 show counts of the number of parties by race and gender who have participated in applications that won in a comparative hearing. The tables also show participation rates, win rates, and disparity ratios, both unadjusted and adjusted for differences in the population of areas where the licenses were granted. Population weighted participation and win rates are shown in tables 8, 10, and 12. These rates are

designed to determine if there has been any difference in the win or participation rates according to the value of the license, where the value of the license is proxied by population of the area in which the license is awarded. Population data that are used as weights come from U.S. Census data.[18]

There are two relative win rate measures in the tables. Relative win rate (party basis) is simply the number of winning parties in the group divided by the total number of participants of that group. Relative win rate (equity basis) is similar, except that wins are determined based on which group has majority equity. Relative win rate (equity basis) can differentiate between a win with minority participation but no equity, and a win with participation and equity. Wins with substantial equity participation are accorded higher weight than wins with little or no equity participation.

The tables also show each group's share of winners and share of participants. To the extent that the share of winners exceeds the participation share, the group is winning at a higher rate than would be dictated by their participation alone. To the extent that a participation rate exceeds winning share, then the group is winning less often than their participation would dictate. Based on these definitions, table 7 shows that over all hearings, non-minorities are winning at slightly lower rates (90.1% vs. 91.1%) than their rate of participation while minorities are winning at slightly higher rates (9.9% vs. 8.9%) than their participation rate.

By type of service, as shown in tables 9 and 11, there is a slightly different story. Because there does not appear to be any difference between participation and win rates in radio (0% difference between win rates and participation rates for both non-minorities and minorities) but slightly higher win rates relative to participation for minorities in TV (9.2% win rates versus 7.3% participation rate).

Both white females (19.7% vs. 17.7%) and minority females (3.5% vs. 3%) are winning at higher rates than their participation rate. White males are winning at slightly lower rates (70.5% vs. 73.3%) than their participation rates, while minority males (6.3% vs. 5.9%) are winning at a slightly higher rate than their participation rate.

This story changes slightly when participation and wins are weighted by population. Weighting by population elevates the importance of participation and wins in higher population areas. While there is not much impact on the results for broadcast as a whole, the population weighting affects the results for radio. For radio, after weighting for population, minorities do a little bit worse than non-minorities and females do a little bit worse than males. The differences between participation and win rates after weighting by population are too small to suggest that any sort of bias is occurring in the award process for radio licenses such that minorities would not be as likely to win in higher population areas.

[18] Place and County Subdivision Population Estimates, http://www.census.gov/population/www/estimates/citypop.html

Table 7.
Win Rates and Participation Rates (By race and gender) – Broadcast

Total parties	3082							
Winning Parties	# of Wins	# parties	Relative win rate (party basis)	Relative win rate (equity basis)	Absolute win rate	% of winners	% partici-pation	Disparity Ratio: %winning ÷ %participation
White male	825	2262	36.5%	30.9%	26.8%	70.5%	73.4%	.96
White female	229	546	41.9%	36.1%	7.4%	19.6%	17.7%	1.11
Minority male	75	182	41.2%	40.9%	2.4%	6.4%	5.9%	1.09
Minority female	41	92	44.6%	32.5%	1.3%	3.5%	3.0%	1.17
White	1054	2808	37.6%	31.8%	34.2%	90.1%	91.1%	.99
Minority	116	274	42.3%	38.1%	3.8%	9.9%	8.9%	1.11
Black	51	106	48.1%	44.1%	1.7%	4.4%	3.4%	1.29
Hispanic	47	120	39.2%	37.5%	1.5%	4.0%	3.9%	1.03
Asian	5	11	45.5%	69.4%	0.2%	0.4%	0.4%	1.00
American Indian	2	12	16.7%	7.1%	0.1%	0.2%	0.4%	.500
Male	900	2444	36.8%	31.7%	29.2%	76.9%	79.3%	.97
Female	270	638	42.3%	35.5%	8.8%	23.1%	20.7%	1.12

Relative win rate (party basis) = # winning parties in-group / # of parties in-group.
Relative win rate (equity basis) = winning equity in group / total equity for group
Absolute win rate = # winning parties in-group / total # of parties.
% of winners = # of winners / total number of winners
% participation = # of parties / total parties
Disparity ratio = % of winners / % participation

Table 8.
Population Weighted Win Rates (By race and gender) – Broadcast

Group	Population Weighted % of winners	% participation	Disparity Ratio %winning ÷ %participation
White male	71.4%	75.3%	.95
White female	17.5%	14.7%	1.19
Minority male	8.8%	7.9%	1.11
Minority female	2.3%	2.1%	1.10
White	88.9%	90.0%	1.0
Minority	11.1%	10.0%	1.11
Black	6.1%	4.8%	1.27
Hispanic	3.0%	4.1%	.73
Asian	0.5%	0.6%	.83
American Indian	0.2%	0.2%	1.0
Male	80.2%	83.2%	.96
Female	19.8%	16.8%	1.18

% of winners = # of winners / total number of winners – weighted by population in area of license
% participation = # of parties / total parties – weighted by population in area of license
Disparity ratio = % of winners / % participation

Table 9.
Win Rates and Participation Rates (By race and gender) – TV

Total parties	1556							
Winning Parties	# of Wins	# parties	Relative win rate (party basis)	Relative win rate (equity basis)	Absolute win rate	% of winners	% partici-pation	Disparity: %winning ÷ %participation
White male	440	1202	36.6%	29.4%	28.3%	72.6%	77.2%	.94
White female	110	240	45.8%	39.4%	7.1%	18.2%	15.4%	1.18
Minority male	36	77	46.7%	36.7%	2.3%	5.9%	4.9%	1.20
Minority female	20	37	54.0%	22.7%	1.3%	3.3%	2.4%	1.38
White	550	1442	38.1%	30.7%	35.3%	90.8%	92.7%	.98
Minority	56	114	49.1%	32.6%	3.6%	9.2%	7.3%	1.26
Black	23	39	59.0%	39.2%	1.5%	3.8%	2.5%	1.52
Hispanic	22	50	44.0%	32.1%	1.4%	3.6%	3.2%	1.13
Asian	3	7	42.9%	39.8%	1.9%	0.5%	0.4%	1.25
American Indian	1	4	25.0%	4.3%	0.1%	0.2%	0.3%	.67
Male	476	1279	37.2%	30.1%	30.6%	78.5%	82.2%	.95
Female	130	277	46.9%	35.6%	8.4%	21.5%	17.8%	1.21

Relative win rate (party basis) = # winning parties in-group / # of parties in-group.
Relative win rate (equity basis) = winning equity in group / total equity for group
Absolute win rate = # winning parties in-group / total # of parties.
% of winners = # of winners / total number of winners
% participation = # of parties / total parties
Disparity ratio = % of winners / % participation

Table 10.
Population Weighted Win Rates (By race and gender) – TV

Group	Population Weighted % of winners	% participation	Disparity Ratio: %winning ÷ %participation
White male	74.0%	80.1%	.92
White female	18.6%	15.3%	1.22
Minority male	5.2%	3.2%	1.63
Minority female	2.1%	1.3%	1.62
White	92.6%	95.5%	.97
Minority	7.4%	4.5%	1.62
Black	1.9%	1.5%	1.27
Hispanic	3.2%	2.0%	1.60
Asian	0.5%	0.4%	1.25
American Indian	0.2%	0.2%	1.00
Male	79.2%	83.3%	.95
Female	20.8%	16.7%	1.25

% of winners = # of winners / total number of winners – weighted by population in area of license

% participation = # of parties / total parties – weighted by population in area of license

Disparity ratio = % of winners / % participation

Table 11.
Win Rates and Participation Rates (By race and gender) – Radio

Total parties Winning Parties	1526 # of Wins	# parties	Relative win rate (party basis)	Relative win rate (equity basis)	Absolute win rate	% of winners	% partici-pation	Disparity Ratio: %winning ÷ %participation
White male	385	1060	36.3%	31.7%	25.2%	68.3%	69.5%	.98
White female	119	306	38.9%	35.1%	7.8%	21.1%	20.1%	1.05
Minority male	39	105	37.2%	44.0%	2.6%	6.9%	6.9%	1.00
Minority female	21	55	38.2%	38.0%	1.4%	3.7%	3.6%	1.03
White	504	1366	36.9%	32.4%	33.0%	89.4%	89.5%	1.00
Minority	60	160	37.5%	41.9%	3.9%	10.6%	10.5%	1.01
Black	28	67	41.8%	46.4%	1.8%	5.0%	4.4%	1.14
Hispanic	25	70	35.7%	42.9%	1.6%	4.4%	4.6%	.96
Asian	2	4	50.0%	75.0%	0.1%	0.4%	0.3%	1.33
American Indian	1	8	12.5%	8.2%	0.1%	0.2%	0.5%	.40
Male	424	1165	36.3%	32.6%	27.8%	75.0%	76.3%	.98
Female	140	361	38.8%	35.5%	9.2%	24.8%	23.7%	1.05

Relative win rate (party basis) = # winning parties in-group / # of parties in-group.
Relative win rate (equity basis) = winning equity in group / total equity for group
Absolute win rate = # winning parties in-group / total # of parties.
% of winners = # of winners / total number of winners
% participation = # of parties / total parties
Disparity ratio = % of winners / % participation

Table 12.
Population Weighted Win Rates (By race and gender) – Radio

Group	Population Weighted % of winners	% participation	Disparity Ratio: %winning ÷ %participation
White male	58.3%	56.0%	1.04
White female	11.8%	12.1%	.98
Minority male	27.0%	26.7%	1.01
Minority female	2.9%	5.2%	.56
White	70.1%	68.1%	1.03
Minority	29.9%	31.9%	.94
Black	27.4%	17.8%	1.54
Hispanic	2.0%	12.4%	.16
Asian	0.1%	1.4%	.07
American Indian	0.1%	0.1%	1.00
Male	85.2%	82.7%	1.03
Female	14.7%	17.3%	.85

% of winners = # of winners / total number of winners – weighted by population in area of license
% participation = # of parties / total parties – weighted by population in area of license
Disparity ratio = % of winners / % participation

In addition to the relatively simple win rates defined above, we developed a relatively more sophisticated measure of potential win rate disparity referred to as the "relative award rate (R)". The relative award rate for minorities is the percentage of license awards to minorities relative to average minority participation. The relative award rate *R* is defined by the following equation:

$$R = \frac{1}{N}\sum_{i=1}^{N}(z_i - m_i) = \frac{1}{N}\sum_{i=1}^{N} z_i - \frac{1}{N}\sum_{i=1}^{N} m_i$$

where N is the number of hearings, i indexes hearings, z_i takes a value of one if the license in hearing i is awarded to a minority and zero if not, and m_i is the percentage of minority applicants in hearing i. The relative award rate is defined analogously for non-minorities, males, and females. These calculations take place across the 230 hearings. The determination of whether a hearing is won by a minority is dependent upon the count of minorities in the winning application versus the number of non-minorities in the winning application. When the number of minorities in the winning application exceeds the number of non-minorities, the winning application is considered as

minority. Similarly when the number of females in the winning application exceeds the number of males, the winning application is considered as female.

The calculation of the relative award rate is also performed using equity as the determinant of control of the application.

The value of *R* must lie between one and minus one. If minorities are on average awarded licenses in proportion to their participation, *R* will be zero. Thus, we define "no disparity" as $R = 0$. If minorities are awarded licenses less than suggested by their percentage of applications, *R* will be negative. If minorities are awarded licenses more than suggested by their percentage of applications, *R* will be positive.

The measure *R* has the statistical advantage, among the more sophisticated measures we considered, of being defined as a population mean. For a population of hearings, we can estimate the population mean of *R* by taking a sample of hearings, determining minority status for each application and for the winning application in each sampled hearing, and computing the sample mean corresponding to *R*. The sample mean is an unbiased and consistent estimator of the population mean R. Further, if the sample is drawn randomly the sampled hearings are independent, and the variance of the sample mean can be derived and computed with relative ease. The sample mean and variance can be used to perform a statistical test of the hypothesis that $R = 0$, i.e. the hypothesis of no disparity.

In contrast to some other measures that are presented later, such as the "winner take all win rates", the relative award rate is calculated over hearings and measures success in hearings relative to average participation in hearings.

This is our preferred measure because the calculation of *R* is based on the relative minority participation within a *hearing*. This controls for competition within hearings of different sizes (number of applications) and places minority participation and win rate within the context of its particular hearing. Other measures presented in this paper do not take advantage of hearing groups but, rather, calculates win rates for applications and parties as if they are independent of one another.

Table 13 presents the relative award rates for All Broadcast, TV, and Radio for non-minorities, minorities, males, and females (using the count of participants in each group as the determinant of which group controls the winning application).

Table 13.

Relative Award Rates
(Using majority based on body counts to define winning group)

	All Broadcast	TV	Radio
Male	.09	.09	.09
Female	-.09	-.09	-.09
Non-minority	.014	.01	.015
Minority	-.014	-.01	-.015

Table 14 presents the relative award rates for All Broadcast, TV, and Radio for non-minorities, minorities, males, and females (using the majority equity definition as the determinant of which group controls the winning application).

Table 14
Relative Award Rates
(Using majority based on equity to define winning group)

	All Broadcast	TV	Radio
Male	.02	.03	.02
Female	-.02	-.03	.-.02
Non-minority	.003	.02	-.006
Minority	-.003	-.02	.006

According to these two tables, the relative award rates for males are higher than those for females. The non-minority relative award rates are slightly higher than minority based on using a definition where the counts of the parties from each group in the application determine the winning group of the application. Using the alternative definition where the group with the most equity is defined as the winner of the winning application, there is little difference between non-minorities and minority relative award rates.

Standard errors for the estimates in Tables 13 and 14 are shown in Table II.1 in appendix II. Calculation of the 95% confidence intervals for these estimates suggests that there is a statistically significant difference between the male and female relative award rates shown in Table 13 (where the count of parties in each group determines the group who controls the winning application). This is the only instance where there is a statistically significant difference in any of these relative award rates. There are no statistically significant difference between the relative award rates for minorities and non-minorities.

It is important to note here that the period examined in this study was the period during which the FCC awarded credit for minority or female participation.[19] Thus, one might expect that minorities and women would have similar success rates to non-minorities.

VII. Win Rates and Disparity Ratios by Race and Gender, Based on Definition of Control

Table 15 shows the number of applications that each group controls from an equity perspective. We refer to the number of these applications as "winner take all" since we make an assumption that if this application wins, then it is a win for this particular group.

We classify a particular group as controlling an application if and only if that group owns greater than 50% of the equity associated with an application. We classify a particular group as having won a hearing in a winner take all setting if and only if that group owns greater than 50% of the equity in the winning application for that hearing.

According to this definition of control, non-minorities control 670 or 90.5 % of all applications while minorities' control 70 or 9.5 % of all applications. For radio, non-minorities control 451 or 91.3% of radio applications and minorities control 8.7%. For television, non-minorities control 89% of TV applications and minorities control 11%.

Table 15.
Applications where Group has Majority Equity
(by Gender and Minority Status)

	All Broadcast	Participation Share	Radio	Participation Share	TV	Participation Share
Total	740		494		246	
Non-minority	670	90.5%	451	91.3%	219	89%
Minority	64	8.6%	38	7.7%	26	11%
Male	600	81.1%	385	77.9%	215	87.4%
Female	109	14.7%	79	16.0%	30	12.2%

*Ties are excluded from these counts so shares will not sum to exactly 100%.

By gender, females have majority ownership for 109 or 14.7% of applications, which is split between 79 (16%) for radio and 30 (12.2%) for TV. Males control 600 or 81.1% of applications, which is split between 385 (77.9%) for radio and 215 (87.4%) for TV.

Table 16 shows the number of winning applications controlled by each group (see panel 1), and the total number of applications controlled by each group (see panel 2) where

[19] See footnote 8

control is defined as owning greater than 50% of equity. It also shows the total number of applications with participation by each group, regardless of control (see panel 3).[20] The number of applications (panel 1) will be used as the numerator in an alternative measure of relative win rates and disparity ratios while number of applications in panels (2) and (3) will be used as the alternative availability measures for the denominator of the relative win rates and disparity ratios.

Table 16.
Winner Take All Applications
(Applications by Gender and Minority Status where Group has Majority Equity)

	Winning (1)			Total (2) (Narrow Availability Measure)			All Apps Regardless of Control (3)* (Broad Availability Measure)		
	All	Radio	TV	All	Radio	TV	All	Radio	TV
Non-minority	213	145	68	670	451	219	705	474	231
Minority	24	17	7	64	38	26	122	72	50
Male	191	125	66	600	385	215	694	458	236
Female	38	28	10	109	79	30	374	239	135

* This measure has the property that applications will have no unique classification for any one group
Counts for each demographic group in (1) and (2) are based on having majority equity in an application.
Counts in (3) are based on having any participation by a demographic group in an application.
Counts in (1) and (2) exclude ties.

Table 17 presents a relative win rate based on the winner take all definition of success and using the narrow measure of availability, i.e. only the applications for which the demographic group has majority equity. Table 17a shows the disparity ratio using the narrow measure of availability.

Table 17.
Winner Take all Relative Win Rate using
Narrow Availability Measure (1) / (2)

	All Broadcast	Radio	TV
Non-minority	31.8%	32.2%	31.1%
Minority	37.5%	44.7%	26.9%
Male	31.8%	32.5%	30.7%
Female	34.9%	35.4%	33.3%

These calculations are based on data from Table 16; e.g.
Minority TV 7/26=26.9%.

[20] Participation, in this instance, is simply defined as the presence of at least 1 party of that demographic group in an application.

Table 17a.
Disparity Ratio Using
Narrow Availability Measure

	All Broadcast	Radio	TV
Non-minority	.98	.97	1.01
Minority	1.16	1.35	.88
Male	.99	.98	.99
Female	1.08	1.07	1.07

Disparity ratio = % winning / % availability
e.g. .Minority Broadcast = (24/237) / (64/734) = 1.16

Table 18 shows a relative win ratio based on the winner take all definition of success and using a broader measure of availability than the measure used in Table 17. Based on this measure, minority and female controlled applications have a lower probability of winning a license than non-minority and male controlled applications. Table 18a shows the corresponding disparity ratio. The broader measure of availability is based on including all applications with representation in the group, regardless of who controls the application from an equity perspective. The idea behind this ratio is that availability should include all who are ready, willing, and able to bid on a license.

Table 18.
Winner Take all Relative Win Rate using
Broader Availability Measure (1) / (3)

	All Broadcast	Radio	TV
Non-minority	30.2%	30.6%	29.4%
Minority	19.7%	23.6%	14.0%
Male	27.5%	27.3%	28.0%
Female	10.2%	11.7%	7.4%

These calculations are based on data from Table 16; e.g.
Minority TV: 7/50=14%

Table 18a.
Disparity Ratio using
Broader Availability Measure (1) / (3)

	All Broadcast	Radio	TV
Non-minority	1.05	1.03	1.10
Minority	.69	.80	.52
Male	1.28	1.24	1.37
Female	.47	.53	.36

Disparity ratio = % winning / % availability

Based on using the broader definition of availability in the relative win rates and disparity ratios, there is a statistically significant difference between both non-minority and minority relative win rates and disparity ratios and between male and female relative win rates and disparity ratios. The results from Tables 18 and 18a rely on broader definitions of availability that includes all those who have participated in the process, regardless of whether they have the capability of controlling the application from an equity perspective.

VIII. Level of Competition within Hearings

While another part of the analysis, which is presented in a companion report, will control for various differences in the characteristics of applicants, we will also provide here some basic data on the level of competition within hearings, i.e. the number of applications of various groups within hearings. The purpose of presenting these data is to get an idea of how competitive each hearing is based on the number of applicants. It will be interesting to determine if there are any differences in the number of applications in hearings with and without minority participation.

The following tables show the average number of parties in applications and the average number of applications in hearings by minority status and gender. Examination of these averages may be suggestive of the odds of winning a hearing based solely on the number of competing applications.

Table 19.

Average number of parties in applications by Race and Gender

	All Broadcast	Radio	TV
All Applications	4.2	3.1	6.3
White	4.3	3.1	6.6
Minority	5.9	4.5	7.9
Male	4.4	3.2	6.5
Female	5.5	4.2	8.0

Averages are based on using only applications with at least one party that is in group

Based on all applications, there tend to be more parties in applications with minority or female representation than there are for applications with white parties (5.9 for minority, 5.5 for female, and 4.3 for white). This is a sizable difference. For winning applications, the difference is even greater; there are 8.3 parties in winning applications with minority representation, 6.5 parties for winning applications with female representation, and only 5 parties for winning applications with white representation.

Table 20
Average number of parties per winning application
by Race and Gender

	All Broadcast	Radio	TV
All Applications	4.9	3.4	8.0
White	5.0	3.5	8.3
Minority	8.3	4.8	13.0
Male	5.1	3.6	8.4
Female	6.5	4.5	10.2

Averages are based on using only applications with at least one party that is in group

Table 21

Average number of minority parties per winning application
by Race and Gender

	All Broadcast	Radio	TV
All Applications	.5	.4	.7
White	.4	.2	.7
Minority	2.3	2.1	2.7
Male	.5	.4	.8
Female	.7	.4	1.1

Averages are based on using only applications with
at least one party that is in group

Table 22
Average Number of white parties per winning application
by Race and Gender

	All Broadcast	Radio	TV
All Applications	4.4	3.1	7.2
White	4.6	3.3	7.6
Minority	5.9	2.8	10.3
Male	4.6	3.2	7.6
Female	5.9	4.1	9.2

Averages are based on using only applications with
at least one party that is in group

Table 23 shows that there are also differences between the number of applications in hearings with and without minority participation. For those hearings where a minority is represented within an application, there are on average 3.7 applications per hearing. For those hearings with female participation, there are an average of 3.4 applications per hearing, while for those hearings without minority participation, there is an average of 3.2 applications per hearing. This suggests that the odds of winning a license may be lower in hearings with minority or female participation.

Table 23

Average Number of Applications per Hearing
by Race and Gender (where there is at least one party of type)

Hearing with at least one party	All Broadcast	Radio	TV
White	3.2	3.2	3.3
Minority	3.7	3.8	3.5
Male	3.2	3.2	3.3
Female	3.4	3.4	3.4

Averages are based on using only applications with
at least one party that is in group

The corresponding average number of applications per hearing when there is at least one application in the hearing that is controlled by a group is shown below. Recall that control is defined as having greater than 50% equity.

Table 24
Average Number of Applications per Hearing
by Race and Gender (where group has control)

Group with at least one application	All Broadcast	Radio	TV
White	3.3	3.2	3.3
Minority	4.0	4.0	4.2
Male	3.3	3.2	3.3
Female	3.9	3.9	4.0

These results are similar to those in the previous table. It appears that minority and female controlled applications may face more competition in the form of a greater number of competing applications in the comparative hearing.

Appendix I: Information Collected from Form 301 for the Development of Utilization Ratios

General Hearing Information

1. Docket number
2. Number of Applications
3. Community
4. Channel
5. Frequency
6. Service (select one) : ☐ AM ☐ FM ☐ TV

APPLICATION (form 301) INFORMATION

For each Application:

1. Name of Applying Organization:
2. Number of Parties
3. Date Application Filed
4. Winner ☐ Yes ☐ No
5. Merger ☐ Yes ☐ No
6. Dismiss: ☐ Yes ☐ No
7. Appeal: ☐ Yes ☐ No

For Each Party to an Application:

1. Party Name
2. Party number
3. Position
4. Ownership (percentage of ownership)
5. Voting (percent of control)
6. Gender (pick one) ☐ Male ☐ Female
7. Minority status: ☐ Yes ☐ No
8. Race/Ethnicity: ☐ Black ☐ Hispanic ☐ Asian ☐ American Indian/Eskimo

Appendix II. Standard Deviations of Estimates Presented in Tables

Note that all of the ratios, averages, and other calculations presented in this memo are not exact calculations generated from the population of comparative hearings. Instead, all of these calculations are estimates based off of a sample of comparative hearings drawn from the population.

For this reason, when discussing the results of this memo it is necessary to account for the uncertainty associated with any estimate. This uncertainty is stated in terms of the standard deviation of the estimate. Let us refer to the estimate as "p" and the standard deviation as "s". Then, for each of the estimates in this memo, it is appropriate to state that we are 95% confident that the true population value lies in the range:

$$[\, p - 1.96 * s \,,\, p + 1.96 * s \,]$$

Hence, knowing the standard deviation associated with each estimate is critical. The standard deviations associated with several of the more central estimates are provided in Tables II.1 and Table II.2. Table II.1 provides the standard deviations for several of the win rates presented in the report. Table II.2 provides the standard deviations for several of the averages presented in the report.

Note that the standard deviations of the population proportions in Table II.1 are relatively straightforward to calculate. These population estimates are in the form of a binomial estimate. The standard deviation of a binomial estimator is simply a function of the sample proportion and the sample size.

The calculation of the standard deviation associated with the winning percentages in Table II.1, on the other hand, is complicated. The winning percentages are in the form of ratio estimates. The standard deviation of a ratio estimate is a complicated function of the sample variances and co-variances of components of the ratio calculation and the sample size.[21]

We accounted for the finite sample size correction when calculating the standard deviations of the population proportions and the estimates of the winning percentages.

[21] See Cochran, William G., Sampling Techniques, New York: John Wiley & Sons, Inc., 1977 page 164, formula 6.44 for the estimate, and formula 6.45 for the variance of the estimate.

Table II.1
Standard Errors Associated with Selected Estimated Rates

Estimates	Standard Deviations		
	All Broadcast	TV	Radio
Relative win rate for non-minority males	0.76%	0.92%	1.46%
Relative win rate for minority males	2.11%	6.09%	0.97%
Relative win rate for white females	1.96%	2.23%	3.68%
Relative win rate for minority females	5.63%	10.03%	3.59%
Relative win rate for non-minorities	0.71%	0.86%	1.37%
Relative win rate for minorities	2.05%	5.23%	1.00%
Relative win rate for blacks	2.69%	8.92%	1.18%
Relative win rate for Hispanics	3.28%	7.74%	1.69%
Relative win rate for Asians	6.54%	13.43%	3.64%
Relative win rate for American Indians	20.40%	22.64%	43.45%
Relative win rate for females	1.85%	2.20%	2.79%
Relative win rate for males	0.72%	0.92%	1.04%
Participation rate for white males	0.60%	0.70%	1.01%
Participation rate for minority males	0.37%	0.31%	0.90%
Participation rate for white females	0.49%	0.63%	0.66%
Participation rate for minority females	0.20%	0.20%	0.45%
Participation rate for whites	0.42%	0.36%	0.95%
Participation rate for minorities	0.42%	0.36%	0.95%
Participation rate for blacks	0.30%	0.21%	0.78%
Participation rate for Hispanics	0.27%	0.25%	0.67%
Participation rate for Asians	0.11%	0.11%	0.24%
Participation rate for American Indians	0.06%	0.07%	0.07%
Participation rate for females	0.52%	0.65%	0.77%
Participation rate for males	0.52%	0.65%	0.77%

Table II.1 (cont.)
Standard Errors Associated with Selected Estimates

Estimates	Standard Deviations All Broadcast	TV	Radio
Party defined winning differential (table 13)			
Minority	1.07%	2.00%	1.50%
Non-minority	1.07%	2.00%	1.50%
Female	1.67%	2.50%	2.20%
Male	1.67%	2.50%	2.20%
Equity defined winning differential (table 14)			
Minority	1.20%	2.20%	1.30%
Non-minority	1.20%	2.20%	1.30%
Female	1.70%	2.70%	2.20%
Male	1.70%	2.70%	2.20%
Winner Take All (Narrow Measure – table 17)			
Minority	2.70%	2.77%	3.94%
Non-minority	1.29%	1.69%	1.67%
Female	1.16%	1.27%	1.64%
Male	1.26%	1.65%	1.64%
Winner Take All (Broader Measure – table 18)			
Minority	4.22%	4.76%	5.87%
Non-Minority	1.34%	1.76%	1.73%
Female	2.80%	4.73%	3.29%
Male	1.42%	1.77%	1.88%

Table II.2
Standard Errors Associated with Selected Estimated Averages

Estimate	Standard Deviations		
	All Broadcast	TV	Radio
Average parties per application			
all apps	0.17	0.38	0.14
When at least one party is:			
Minority	0.63	1.26	0.58
White	0.17	0.40	0.14
Male	0.17	0.39	0.14
Female	0.28	0.59	0.24
Average parties per winning app			
Overall	0.38	0.96	0.28
When at least one party is:			
Minority	1.33	2.50	1.03
White	0.40	0.99	0.30
Male	0.41	1.01	0.30
Female	0.60	1.32	0.47
Average apps per hearing			
Overall	0.13	0.24	0.16
When at least one party is:			
Minority	0.28	0.42	0.38
White	0.13	0.25	0.16
Male	0.13	0.25	0.16
Female	0.15	0.28	0.18

Consider some examples how uncertainty impacts the interpretation of the estimates in this report. Consider the (unweighted) relative win rate for whites, 37%, and minorities, 36.9%. The standard deviation associated with the measure for whites is .76%, a very small standard deviation. The standard deviation associated with the corresponding estimate of the minority win rate is a larger 2.11%. This implies that we can be 95% sure that the true population relative win rate for whites falls in the range (35.48%, 38.52%). The corresponding range for minorities is (32.68%, 41.12%). The measure for minorities is less precise because there are fewer minority parties in our sample.

Note that there exists significant overlap between the two 95% confidence intervals stated in the above example. This implies that we can not reject the hypothesis that the two true population relative win rates (the one for whites and the one for minorities) are equal to each other. In fact, this in ability to reject the hypothesis of equality applies to a significant percentage of all the "win rates" stated in this memo.

Consider the example of the winner take all relative win rate, for all broadcast hearings, with the broader definition of availability. Using the statistics in Table 18, the win rate

for whites is 30%, with a standard deviation of 1.29% (see Table II.1) and the win rate for minorities is 21%, with a 2.8% standard deviation. This implies that we can be 95% certain that the true population value for whites falls in the range (27.42%, 32.58%) and the true population for minorities falls in the range (18.42%, 26.6%). Note that these confidence intervals do not overlap. Hence, we can assert, with 95% confidence, that the true population values for these two statistics are not equal. Using the same methodology one can show that there is a statistically significant difference between the win rate for men and women for the same specified win rate formula.