

**TO: William T. Lake**  
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**FROM: Paroma Sanyal**  
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**RE: Peer Review of Media Bureau’s “ Economic Study of the Impact of LPFM Stations on Full-Service Commercial FM Stations” (Appendix A.4) of “Economic Impact of Low-Power FM Stations on Commercial FM Radio: Report to Congress Pursuant to Section 8 of the Local Community radio Act of 2010”. MB Docket No. 11-83**

**DATE: December 23, 2011**

I have reviewed the analysis in Appendix A.4 entitled, “Economic Study of the Impact of LPFM Stations on Full-Service Commercial FM Stations” by the Media Bureau. The authors have done an impressive job in putting together the data from diverse and often incomplete sources, and then conducting a fairly thorough analysis of the issue at hand, within the constraints provided by the data. I start by providing an overview of the analysis and its results, and then provide suggestions that I think will further improve the quality of the analysis.

This report was written pursuant to Section 8 of the Local Community radio Act of 2010 (“LCRA”), which requires the Commission to undertake an economic impact analysis regarding the effect of low-power FM (LPFM) stations on full-service commercial FM stations. The authors analyze whether the presence and/or entry of LPFM stations in the market or contour area of full-service FM stations has any significant impact on the rating and revenues of the full-service FM stations. The main finding is that the presence of LPFM stations does not have any significant economic impact on full-service commercial FM stations.

The study is conducted over three time periods – 2005, 2007 and 2009, and thus gives a broad overview of the changing competitive landscape over time. The study has a detailed description of how market boundaries are constructed, and how and why the authors use three separate market definitions – (i) radio markets based on the antenna location of an LPFM station within or outside a Metro area, (ii) market area based on the service contour of a full-service commercial FM station based on 2011 FCC data on service contours, and (iii) a combination of the contour and market measure.

The analysis starts with a detailed discussion of revenues and ratings of full-service FM stations in markets that have no LPFM stations compared with those where LPFM stations are present. The report finds that the statistical tests of significance show that LPFM stations can either have a positive or negative impact on revenues and ratings of full-service stations depending on market definition. The study cautions about drawing any substantive conclusions from these “difference of means” tests since these do not control for market or stations characteristics, and omitting these may cause a spurious correlation. To correct for this, the study then compares the changes in revenues and ratings of full-service stations with changes in the number of LPFM

stations in the market. They find that there is no significant difference in rating of full-service stations in the presence or absence of LPFM stations. For revenues however, the presence of LPFM stations actually appear to help rather than harm revenues of full-service stations. They do a similar analysis by segregating the stations by content format (music/ foreign language/ religion/ news, talk, sports / miscellaneous) and find that there is no significant change in revenues of rating of the full-service stations with a change in the number of LPFM stations, except for ones in the religious format, where revenues appear to decline with LPFM entry.

This discussion is followed by a regression analysis where many of the factors such as the competitive landscape in the market, station and market characteristics are controlled for. The report conducts the regressions analysis using a first-differenced approach to control for station and market fixed effects and to control for any observables that do not vary over time. They find that the entry of an LPFM station has no economically significant effect on the rating of full-service FM stations in the aggregate market, while having a positive impact in religious and the miscellaneous program format categories. For the revenue metric, LPFM stations appear to have a small positive impact on the revenue of full-service stations, while the effect is negative for religious format stations. The report includes a careful discussion of these results and how the negative finding for the religious format stations is an artifact of unobserved factors not controlled for in the regression.

This report has conducted a very careful analysis of the available data and the conclusions appear to be robust to various data cuts and alternative specifications. The main conclusion is that the presence of LPFM stations does not have any significant economic impact on full-service commercial FM stations. In the following paragraphs I list some suggestions that, I think, will improve the analysis and make it easier to understand to a non-economist.

### Major Points

1. For the regression analysis it would have been very helpful to begin with a discussion of the reduced form model, an equation showing the dependent and independent variables and the expected signs. This would give the reader a sense of what to expect from the following regressions.
2. A fuller discussion of each of the dependent and independent variables would be very helpful including a basic statistics tables listing the means, medians, min, max and number of observations for each of the variables included in the regression.
3. A brief discussion of the methodology should also be included. The authors mention why they choose a first differenced method versus the fixed effect very briefly in an earlier section, but a more fully fleshed out discussion should be included here, along with how the first differenced model is being estimated, the error structure, are these estimates robust and so on. The software package, and the specific routine used by the authors to estimate the regressions should be mentioned, i.e. did the authors use STATA's first-differenced panel model to estimate their specifications?

4. Tables should include the number of observations for each column, and a goodness of fit or a joint significant test such as a chi-square, for each column. Each table should also include a footnote that shows what the estimation methodology is, the data range, what level of significance each star denotes, and any other standard error corrections included in the model.
5. For the ratings regressions, I would be interested in knowing the proportion of zeros in the dependent variable. If this is substantial then a Tobit specification may be warranted.
6. A slightly expanded discussion about endogeneity should be included. The report does discuss how unobservables may be influencing the regressions, but does not fully flesh-out the discussion. For example, LPFM entry, in theory, could influence the revenue of the full-service stations, and on the other hand, these full-service station revenues may influence the entry of LPFM stations. This may lead to results where greater LPFM entry may be associated with greater full-service revenues (pp. 35). While it is difficult to correct for such endogeneity, a slightly expanded discussion would help the lay reader understand the issue at hand.

#### Minor Points

1. Using the differenced LPFM count is a good way to capture entry, but it may not capture threshold effect. For example, the effect of the first LPFM entry may be very different from the sixth LPFM entry into the market. An alternative would be to use dummy variables.
2. Including both, the number of AM (or FM) stations in the market and contour may be subject to multicollinearity and may explain why these are not significant. Ideally one should use either the market based measure or the contour based measure, but not both. Alternatively, one could combine both measures into a single metric if that is feasible.
3. An ideal alternative to using the number of AM/FM stations would be to construct a market share variable or a concentration index such as the Hirschman-Herfindahl index based on revenues, to capture the competitive landscape. But given the constraints imposed by the data, I do not know whether this is feasible.
4. The tables should be formatted such that the t-statistics appears directly below each coefficient.
5. Table titles should be simplified, with an entry below the title that shows the dependent variable. For example: For Table 13 – a suggestion would be:  
Table 13  
Effect of LPFM Entry on Ratings of Full-Service Commercial FM Stations  
Dependent Variable: Change in AQH Rating

The footnote to the table could add the fact about both home and outside markets being included.