

## Appendix E: Net Promotional Experiments

Pandora has run experiments to quantify the net promotional impact that performances on Pandora have on the sales of recorded music. Those experiments are informative about whether there is any significant difference in net promotion between major record companies and independent record companies. My understanding of these experiments is based on the testimony of Stephan McBride (“McBride Testimony”).

Under the experimental design, Pandora would play an album or song in some geographic markets and not in others. The United States was divided into Nielsen “designated market areas” (DMAs), with the largest DMAs further divided into Nielsen “sub-designated market areas” (sub-DMAs). In total, there are 228 DMAs and sub-DMAs included in the study.

Each experiment involved a specific piece of music. One group of experiments involved entire albums that were new to Pandora. Another group of experiments involved popular “catalog” songs that were already playing on Pandora. The catalog songs used in the experiment were randomly drawn from the *Rolling Stone Top 500 Songs* and the *Pitchfork 500* lists. For each experiment, Pandora randomly determined whether or not Pandora would play the specific music over a period of several weeks to Pandora listeners within each DMA or sub-DMA. This process resulted in each album or song that constituted an experiment playing in roughly half the country. Any two experiments would very likely have different sets of DMAs and sub-DMAs in which the specific music was playing.

[REDACTED]

If Pandora listeners substitute listening to an album or song on Pandora for the purchase of that album or song, we would expect to see *lower* sales in geographic areas where an album or song is performed on Pandora. If, on the other hand, hearing an album or song on Pandora

promotes sales of that album or song, we would expect to see *higher* sales of an album or song in geographic areas where it is performed on Pandora. Of course, Pandora may have different substitutional or promotional effects for different types of listeners. The experiments and analysis conducted by Pandora answer the question of whether the average effect of performances on Pandora, measured across all listeners, is to substitute for or promote music sales.

My interest in these experiments was to learn whether Pandora's net promotional effects are the same or different between the major record companies (as a group) and independent record companies (as another group).

Using data from its experiments and ownership attribution, Pandora estimated the effect of Pandora performances on music sales separately for music owned by the Majors and music owned by independent record companies.<sup>1</sup> For newly released albums on Pandora, the estimated net promotion effect is larger for the Majors than for independent record companies by 1.2 songs sold per 1,000 spins on Pandora.<sup>2</sup> This difference is not statistically significantly different from zero given the precision of the estimates. For catalog songs, Pandora's net promotional impact on music owned by the Majors is also not statistically significantly different from Pandora's net promotional impact on music owned by independent record companies. Moreover, the point estimate of this difference is very small. The estimated net promotion effect is larger for independent record companies than for the Majors by 0.02 songs sold per 1,000 spins on Pandora.

These estimates of differences in net promotion effects do not translate dollar-for-dollar into differential royalty rates for the Major and independent record companies. In a bargaining situation, I would expect that Pandora and a record company would split the net promotional benefits in some fashion. If Pandora and the record label share the net promotional benefits, the differential in implied rates between major record companies and independent labels is less than the difference in the net promotional impact of Pandora on Majors versus independent labels.

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<sup>1</sup> McBride Report, Table 6. Note that the table converts an effect on unit sales to an effect on gross revenues by multiplying by a \$1 per track price. I report the effect on *unit* sales here and, use the unit sales net promotional effect in the calculations that follow.

<sup>2</sup> The estimation uses the SoundScan definition of Track-Equivalent Album sales, which combines album sales and track sales by assuming there are ten tracks per album.

To illustrate the impact of these estimates of relative promotional effects on implied royalty rates, suppose that the dollar benefit to a record company from each song that it sells is approximated by the \$0.70 wholesale price for track sales less a \$0.09 payment per track for mechanical rights, giving a net benefit of \$0.61 per track sold. As noted above, the point estimate of the net promotional effect for new music performed on Pandora is 1.2 songs per 1000 spins larger for the Majors than for independent record companies. This corresponds to a relative net promotion benefit that is \$0.73 (1.2 songs at \$0.61 per track) larger for the Majors than for independent record companies, per 1,000 spins on Pandora. Suppose the negotiated royalty rates reflect a 50-50 split of net promotional benefits, so half of each net promotional dollar gets passed back to Pandora in the form of lower royalty rates. With these numbers, the negotiated per-play royalty rate for a major record company would be 0.037¢ less than the per-play rate negotiated by an independent record company.

A similar exercise can be done using the point estimate for the relative net promotional benefit from catalog sales. The additional 0.02 songs per 1,000 spins for independent record companies relative to the Majors translates into an additional \$0.012 of promotional benefits for the independent record companies per 1,000 performances. Again using a 50-50 split of net promotional benefits, this implies that the per-play royalty rate for the Majors would exceed the per-play rate for independent record companies by 0.0006¢.

Pandora plays a mix of new music and catalog music, so the relative overall net promotional benefit from performances on Pandora would be some weighted average of the estimated effects for new albums and for catalog songs. Since the new music effect is far larger than the catalog music effect in absolute value, it is very likely that, based on these point estimates, the overall net promotional effect from performances on Pandora is larger for the major record companies than for independent record companies. But these estimates of the difference between Majors and independents in the net promotional effect from performances on Pandora are imprecisely estimated and are not statistically significantly different from zero.