

Problem Set 5: Maximum Score Estimation

ECON833

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1 Model description

I analyze a one-to-one matching market representing radio station mergers consisting of buyers and targets in 2007 and 2008 based on the given data. Each year there is a national market where radio station owners target new stations. These markets are independent across years. There are two models to estimate for the current assignment. First, I estimate the parameters of a payoff function without transfers that represent the relative importance of corporate ownership and geographic proximity compared to size sorting. The payoff to the merger between radio station buyer b and target t in market m is given by:

$$f_m(b, t) = x_{1bm}y_{1tm} + \alpha x_{2bm}y_{1tm} + \beta \text{distance}_{btm} + \epsilon_{btm} \quad (1)$$

, where x_{1bm} is the number of stations owned by the parent company of the buyer and y_{1tm} is the population in range of the target in market m , x_{2bm} is an indicator for corporate ownership, and distance_{btm} is the distance (in miles) between the buyer and target. The match-specific error term, ϵ_{btm} is independent across matches.

Then, I estimate the version of the above model with target characteristics and transfers (the prices paid to acquire the target station).

$$f_m(b, t) = \delta x_{1bm}y_{1tm} + \alpha x_{2bm}y_{1tm} + \gamma HHI_{tm} + \beta \text{distance}_{btm} + \epsilon_{btm} \quad (2)$$

, where HHI_{tm} is the Hindahl-Hirschman Index measuring market concentration (a higher index means a more concentrated market) in the location of the target in market m .

I use the data on the of the merger and a different inequality in my score function. The ultimate goal of the current assignment is to estimate the parameters of the models, (α, β) , and $(\delta, \alpha, \gamma, \beta)$ and the maximum score estimator of each model.

2 Results and Interpretation

The parameter estimates for the first model, $\alpha = 8120.438061312973$ and $\beta = -9725.873801367017$, which implies that the impact of corporate ownership on a match is much higher than the number of stations owned by the parent company of the buyer. In other words, corporately owned stations is more likely to gain more value from such mergers. On the other hand, I find that geographical proximity has a negative impact on the payoff obtained from a merger. The closer a station is to the buyer, the more payoff the buyer gains from the merger.

For the second model considering the prices paid to acquire the target station, The parameter estimates are $\delta = 86589.50075189037$, $\alpha = -77204.03635534909$, $\gamma = -1116.4157129738173$, and $\beta = -9725.873801367017$. This finding indicates that 1) buyers having more number of stations obtain higher payoffs from these mergers (δ), 2) buyers that are corporately owned obtain less payoffs from these mergers than non-corporately owned ones (α), 3) When buyers buy targets in more concentrated markets, they attain lower payoffs(γ), and 4) the distance between buyers and targets has a negative impact on the payoffs from such mergers(β). When it comes to the magnitude of the coefficient estimates, the number of stations owned by buyers has a far more pronounced impact on the payoffs while the market concentration of the target location is considerably marginal relative to other variables.