EC1410-Spring 2023
Problem Set 10

(Updated 1 February 2023)

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When you write up your answers, your goals should be to (1) be correct, and (2) convince your reader that your answer is correct. It is always helpful if your work is legible and if all steps are presented, possibly with a line of explanation. Answers that do not achieve these goals will not be awarded full credit.

Problems

1. The standard deviation of the sprawl index in Eid et al. (2008) is 0.281. Use this to evaluate the relationship between a one standard deviation change in sprawl and BMI (using the results from both the cross-sectional regression and the first-differences regression).

2. Use Allcott et al. (2019) to determine, on average, by how much does a \$20,000 increase in household income change the grams of sugar added per 1,000 calories of food on your grocery store shelf? Explain.

3. (a) Using the right two panels of Figure 1 of Bayer et al. (2007), estimate the willingness to pay per point for a neighborhood with better test scores.

    (b) Using the same logic, estimate the value of a 1 percentage point higher college share, black share, and \$1,000 in neighborhood income.

    (c) Using these four estimates, what is the implied price increase when you cross the boundary into a higher quality school district?

    (d) Compare this to the actual price increase. Your estimate should have been much bigger than what is observed. Why did this happen?

4. In this problem, we will work through an example of a hedonic model. Consider a housing market where houses are differentiated only by quality z. Let $p(z)$ be the market price for a house of quality z.

    (a) Let the firms cost function be $c(z,\theta) = \frac{z^{1/\beta}}{\theta}$. Set up the firms profit maximization problem. Derive the first order condition.

    (b) Each household consumes unit housing to attain a utility $u(z, p(z); \gamma) = \gamma z^{\alpha} + m - p(z)$. Set up the households profit maximization problem. Derive the first order condition.

    (c) Let $p(z) = z^2$, $\alpha = 2$ and $\beta = \frac{1}{3}$. Assuming perfectly assortative matching, solve for the optimal housing quality that clears the market. What is the number of firms making houses with the optimal housing quality?