

Econ 312: Problem Set 5

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Due Thursday, May 7 before the lecture

This exercise uses data from Feb-Mar and Nov-Dec 1992 on employment at fast food restaurants in the US States of New Jersey and Pennsylvania taken from Card and Krueger in The American Economic Review, Vol. 84(4). The data are described in the output below. We are interested in how the minimum wage affects employment decisions in these restaurants. In April 1992, New Jersey increased the minimum wage from \$4.25 to \$5.05. In Pennsylvania, the minimum wage was unchanged, and we assume it to be \$3.80 for this exercise.

Read the attached data into Stata (see attached to the PSet and in Modules section on Canvas)

1. Describe the data (-codebook- if you use Stata).
2. Estimate the following regression on the sample of fast food restaurants in Feb-Mar 1992:

$$empft_{ikt} = \alpha + \gamma minwage_{kt} + \beta_1 nregs_{ikt} + \beta_2 hrsopen_{ikt} + \sum_{j=2}^4 \eta_j d_j + \epsilon_{ikt}$$

where i denotes restaurant, k denotes state, and $t = 0$ if the observation is from Feb-Mar and $t = 1$ if the observation is from Nov-Dec.

3. Interpret the coefficient γ , and calculate a 90% confidence interval.
4. Use the Sum of squares table from the regression output to calculate the R^2 and the standard error of the regression (Root MSE).

5. Give an economic interpretation of the coefficients $\eta_2 - \eta_4$. What might explain the relatively large coefficient on -d4-?

6. Test $H_0 : \eta_2 = \eta_3 = 0$.

7. Test the hypothesis $H_0 : \eta_2 = \eta_3$ using the estimated covariance matrix of the coefficients (-mat list e(V)- if you use Stata). Verify your answer by running the test in Stata using -test-, and/or by performing an F-test.

We now want to control for potential selection issues by using the panel structure of our data.

8. Explain why the previous estimate of γ is likely to suffer from omitted variable bias.

9. Assume that $\epsilon_{ikt} = \mu_k + \zeta_t + u_{ikt}$ and that $E[u_{ikt}|X_{ikt}] = 0$ (where X_{ikt} is the vector of RHS-variables in (2) except -minwage-). Explain how you can then use the increase in the minimum wage in New Jersey and a difference-in-differences (DD) model to identify the effect of the minimum wage on employment. Give an example where the necessary assumption(s) are violated.

10. Generate a table of means, a table of standard errors and a table of frequencies for -empft- in each state and each time period (post = 1 and post = 0).

11. Using these statistics, calculate a DD estimate of the impact of the minimum wage law on employment.

12. Specify and estimate the corresponding regression.

13. How much does this suggest that the minimum wage affects full time employment in fast food restaurants?

14. Explain why the t-test from the regression above may understate the uncertainty in the effect of the minimum wage on full time employment. How could you correct the standard error? Compare the t-values with and without this correction.

15. What regression would you run to estimate the DD model including control variables? Run the regression using robust standard errors.

16. How might you test the key identifying assumptions underlying your DiD-estimation in this application, and in general?