

**Ec317**  
**Labour Economics**  
 Problem Set 7

1. Download the dataset called “labor3.dta” from the course website. It contains data collected by David Card and Alan Krueger on fast food restaurants in New Jersey (NJ) and eastern Pennsylvania (PA) during March and November/December of 1992. On April 1, 1992 New Jersey raised its minimum wage from \$4.25 to \$5.05. The minimum in Pennsylvania remained at the federal level of \$4.25. I want to use this data to analyze the impact of the minimum wage increase in New Jersey on employment in the fast food industry.

The variables on the original dataset collected by Card and Krueger are described in the file “labor3.cdb” (I have incorporated most of the information from this codebook into the data labels of the Stata dataset; thus you should be able to get all the information you need by just looking at the data labels using the “describe” command). Throughout, variable names with a trailing “2” refer to the second (Nov./Dec.) wave of the data, the same names without any number refer to the corresponding variable from the March wave. I constructed a few additional variables not on the original dataset: “fte” and “fte2” are full time equivalent employment, it is the sum of the number of full time employees and one half the number of part time employees, excluding managers; “dfte” refers to the change in full time equivalent employment between the second and first interview (fte2 - fte); “dw” refers to the change in the starting wage between the second and first interview; “gap” is the proportionate increase in the March starting wage which is necessary to comply with the new minimum wage, or

$$gap = \begin{cases} (5.05 - wage\_st)/wage\_st & \text{if in NJ and } wage\_st < 5.05 \\ 0 & \text{if in NJ and } wage\_st \geq 5.05 \\ 0 & \text{if in PA} \end{cases}$$

and “sample” is dummy variable which is 1 if both wage and employment data are available in both the first and second interview wave, and 0 otherwise. I want you to do the following analysis for the part of the data with sample equal to 1. If you don’t specify this, Stata will make calculations with the full set of available observations for each variables, so you may not be comparing the same set of restaurants between March and November, or you may compare wages and employment for different restaurants.

- (a) Calculate the average employment separately for restaurants in NJ and in PA, both for each interview wave. Use full time equivalent employment. Calculate the difference in average employment between the second and first interviews. Now calculate the difference between NJ and PA of the time differences just obtained. What is the interpretation of such a difference-in-differences estimate of the employment effect? Under what conditions does this provide a valid estimate of the employment effect of the minimum wage increase? Interpret your finding.
- (b) Repeat the same exercise as in (a) for the starting wage. What is the impact of the minimum wage increase on relative wages in NJ restaurants?

- (c) An alternative to comparing NJ and PA restaurants is comparing restaurants within NJ who have high and low wages before the minimum wage increase. Restrict your sample to restaurants in NJ and calculate the employment and wage change for those restaurants paying starting wages of \$5.00 and more before and the minimum wage increase and those paying less than \$5.00. What is the relative impact of the minimum wage on starting wages and employment within NJ?
- (d) The difference-in-difference estimates in (a) to (c) can also be obtained by regressing the change of employment (or the change in the wage) on a constant and a dummy variable for the state you are in (called “state” in the dataset). Repeat the exercises in (a) to (c) using regressions. Regression also allows you to control for other factors. Repeat the regressions, entering a dummy variable for whether the restaurant is company owned (“co\_owned,” as compared to franchised) and three dummy variables for three of the four chains in the dataset (Burger King, KFC, Roy Rogers, and Wendy’s; you will have to construct the dummies from the variable “chain”). Do your results change?
- (e) Another way of comparing restaurants paying relatively high and low wages before the minimum wage increase in NJ and combining this with the NJ-PA contrast is by using the variable “gap.” It captures to what degree a restaurant should be affected by the minimum wage increase, but instead of grouping restaurants into high and low paying, it provides a continuous measure. You can use it by running regressions again. Run regressions of the change in employment and the change in wages on gap. How do your results compare qualitatively to those obtained with the high/low paying dummy in (a) and (d)? Now run the same regressions only for restaurants in NJ. How do they differ from your results including both states? From your results in (c) and (d)? What variation in the data does this regression use compared to using both states?
- (f) Remember that the variable gap is set to zero for all restaurants in PA because they weren’t affected by a minimum wage increase. Create a new variable just like gap for restaurants in PA, but pretend that there was a minimum wage increase to \$5.05 in PA over this period. Now run a regression of changes in employment and wages just for PA using this new variable. How do your results differ from those for NJ? Why is this last regression a check on how well our methodology is doing in uncovering effects of the minimum wage increase?
- (g) What do your results imply about the effect of an increase in the minimum wage on fast food employment? Give at least two alternative explanations for your result (I can think of about five). There are many more variables on the dataset. Would any of these allow you to shed some more light on your alternative explanations? How would you go about doing this? Try as best as you can to provide an empirical test for your alternative economic explanations.