ECOM30003/ECOM90003: Applied Microeconometric Modelling
Tutorial 3

This tutorial is based on "Minimum wages and employment: A case study of the fast food industry in New Jersey and Pennsylvania" by David Card and Alan Krueger, published in the American Economic Review in 1994.

Card and Krueger study the impact of an increase in the minimum wage in New Jersey, USA on employment. To do so, the authors surveyed 410 fast food restaurants in New Jersey and eastern Pennsylvania (more than one month) before the minimum wage was raised in New Jersey, and then again (about 8 months) after the minimum wage was increased in New Jersey. The increase in New Jersey's minimum wage was legislated two years prior to its implementation, when the economy was relatively healthy. However, at the time the rise came into effect, the economy was in recession. The fast food restaurants chain included in the survey are: Burger King, KFC, Roy Rogers and Wendy's.

Note that your are not **required** to read the full paper but you will need to read it to understand the data. The data set that I have provided you for this tutorial is not the full raw data set used by the authors,so you will not be able to replicate all results in the paper.

Please provide **brief** and to the **point** answers to the following questions.

1. Why is the fast food industry well suited to studying the impact of increasing the minimum wage on employment? Provide at least 2 reasons.

2. How can the natural experiment framework be used to estimate the causal impact of the increase in New Jersey's minimum wage?

3. What is the role of (information from fast food restaurants in) Pennsylvania in the natural experiment set-up? Why is it important in the context of measuring the employment impacts of New Jersey's minimum wage increase?

4. Write down an econometric model that could be used to obtain the difference in difference (DD) estimator of the average treatment effect of New Jersey's increase in minimum wage on employment in New Jersey (average treatment effect on the treated). For now, assume that you do not have any"additional" control variables. Define all terms in the model. Which coefficient measures the treatment effect.

5. Using the econometric model, take conditional expectations of employment for treatment and controls groups before and after treatment. Use the conditional expectations to interpret each coefficient in the econometrics model.

6. Using the data provided, demonstrate that New Jersey's increase in minimum wage is evident in the Card and Krueger sample. Use the sample of firms that are open in both periods and for which wage data are available in both periods. Make sure you use robust standard errors.

7. Estimate this DD model that you wrote down using the data provided. In doing so, ensure that you include in your estimation sample firms that were open in the first period but closed in the second period in addition to firms that are open in both waves of the survey and for which wage data are observed in each period. On the basis of the results, what do you conclude about the impact of the increase in the minimum wage on employment in New Jersey?

8. Re-estimate the DD model including controls for the chain the restaurant belong to and for ownership type (co-owned). Does this change your conclusion about the impact of the increase in the minimum wage on employment?

9. What is the key assumption required in order for the DD estimator to identify the average treatment effect on employment in New Jersey of increasing its the minimum wage? What might lead to a failure of this assumption in the context of the time the study was undertaken?

10. Are you able to test or investigate this identifying assumption? What additional information would allow you to do so?