Econometrics(I) HW6

1. Fixed Effect Model

For this exercise, we use `JTRAIN_revised.dta` to determined the effect of the job training grant on hours of job training per employee. In this data, some firms received the grant in 1988, some in 1989, and all firms only received the grant at most once. Here is the basic fixed effect model:

$$hrsemp_{it} = \beta_0 + \beta_1 \cdot grant_{it} + \beta_2 \cdot \log(employ_{it}) + \alpha_i + \delta_1 \cdot year_{1t} + \delta_2 \cdot year_{2t} + e_{it}.$$

Variables	**Meanings**
$hrsemp_{it}$	Average hours of training per employee at period t in firm i
$grant_{it}$	=1 if firm i received a job training grant after period t
$employ_{it}$	Number of employees of form i ay period t
$year_{1t}$	=1 if year = 1988
$year_{2t}$	=1 if year = 1989

(a) Estimate the equation using fixed effects. How many firms are used in the estimation? (Hint: Use the command `xtreg ..., fe`)

(b) Interpret the coefficient on $grant_{it}$ and comment on its significance.

(c) If we want to compare the effect in the first year and the second year after the training grant respectively, how can we modify the basic model? Estimate the effect using the firm fixed effect model

(d) Interpret the difference of the effect in the first year and the second year.

2. Regression Discontinuity Design

To study the advantage of incumbency in the election, we use the election data of U.S. House of Representatives during 1946-1990. People have long been interested in whether representatives use the privileges and resources of their office to gain advantage for the next election. Use the `ushouse_election.dta` to answer the following question. Each observation in the data contains the election result of an elction from an electoral district.

Variables	**Meanings**
demvoteshare	Vote share received by Democrats in this election
win_dem	Whether Democrats win this election
*win_dem_t*1	Whether Democrats win in the next election

(a) What is the dependent variable? What is the running variable? What is the treatment? What is the cut-off threshold? Is this a sharp or a fuzzy RDD?

(b) Explain why the regression *win_dem_t*1 on *win_dem* cannot give us the correct answer of whether the congress use the privilege of their office to win the next election.

(c) Use the regression discontinuity design to estimate the jump in the probability of Democrats winning the next election around the cut-off point be means of nonparametric local linear regression (See: `npregress kernel`). Plot the regression graph. What is the increment in the winning probability given the incumbency of the party?