Econometric Software and Application

Problem Set 3

Due date: April 10

* Write a do-file solving the problem set and save the do-file with the following name "PS3_[first name].do". Turn in the do-file and the log-file. Make use of comments as appropriate.

0. Download the state-level economic and welfare data covering the years 1980-2021 (UKCPR_National_Welfare_Data_Update_020623.xlsx) from the website https://ukcpr.org/resources/national-welfare-data. Save the data in the folder "C:\Intro_Stata".

* Note: see sheet "2021 Data Updates and Sources" for a description of each variable in the data file.

1. Use a log file called "PS3.log" to record all commands and outputs from here on

2. Import the data in sheet "data" in the excel file into Stata. Use the values in the first rows as variable names.

3. Change the name of variable "PovertyRate", "Unemploymentrate", "FederalMinimumWage", and "StateMinimumWage" to "PR", "UR", "FMW", and "SMW", respectively.

4. Move the following variables to the beginning of the dataset: year, state_name, Population, PR, UR, GrossStateProduct, Personalincome, FMW, SMW, and FoodStampSNAPRecipients.

5. Create a variable "gsp_pc" that contains gross state product per capita. Create a variable "inc_pc" that contains state personal income per capita. Create a variable "FS_pr" that contains the fraction of state population that receive Food Stamp (SNAP) benefits in a given year.

6. Using command "outreg2", create an excel file "sumstats.xls" that contains the mean, median, and standard deviation of the following four variables: year, UR, PR, gsp_pc, and inc_pc. Use "Summary Statistics" as the title of the table.

7. Test whether the average unemployment rate of states in 2021 was 5% (alpha: 5%).

8. Test whether the average poverty rate of states in 2020 is different from that in 2021 (alpha: 5%). Assume equal variances.

9. When the federal and state minimum wages differ, the higher must be paid, except for workers who are not covered by the Fair Labor Standards Act (FLSA). For observations with the value of SMW being smaller than that of FMW, replace the value of SMW with the value of FMW. Create an indicator variable "high_SMW" which takes a value of 1 if the state's minimum wage is greater than the average minimum wage of states in a given year.

10. Suppose that a state's unemployment rate is determined by 1) time-invariant state characteristics (state fixed effects), national shocks common to all states (year fixed effects), and SMW. Examine the relationship between UR and SMW by regressing UR on SMW, state fixed effects, and year fixed effects. Which year and

state are treated as the reference year and state? Interpret the coefficients on SMW and the indicator variable for year 2020.

11. Which state increased SMW most frequently between 1980 and 2021? How many times did the state increased SMW during the period?

12. Plot a figure that compares trends in SMW between California and Texas.

13. Drop observations with years before 2010. Virginia's SMW was $7.25 between 2010 and 2020, and then increased to $9.50 in 2021. Use a difference-in-difference model to examine whether the SMW increase leads to an increase in UR. In the model, use year 2021 as the post-event period, and use all states that didn't change SMW between 2010 and 2021 as a control group. Interpret the DD coefficient.

14. Restore the data that you had before answering Q13. Run the following two regressions using loop and macros. Each regression specification has one of the two variables (PR and UR) as a dependent variable. Both regression specifications use the same set of independent variables: SMW, Population, year fixed effects, and state fixed effects. Create an excel file that contains a table reporting coefficients from these regressions. The table should 1) have "regression results" as a title, 2) use the name of the dependent variable as the column title, 3) report the coefficient on SMW and it's standard error, the number of observations, and R-squared. Display only two decimal places for the coefficient and the standard error.