Assignment 3: Stevenson & Wolfers QJE 2006

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4/20/2020

Summary and Discussion of Stevenson's and Wolfer's Project

Stevenson and Wolfers investigate the extent to which the passage of laws that increase access to divorce affects the rates of domestic violence, suicide, and spousal homicide.

b. What is their research design?

They use a difference-in-differences research design.

c. What data do they use?
d. What is the key figure they present to illustrate their main findings in your opinion?
e. Briefly summarize what they found in 1-2 sentences.
f. Did you find the analysis convincing? If so, what specific evidence was compelling? If not, what was missing that had they done it would've potentially been more convincing?

2. What is no fault divorce and why do Stevenson and Wolfers think it's relevant to suicide and homicide? Briefly explain their theory and what it has to do with the Coase theorem.

3. Write down and explain their estimation equation. Explain what each variable means, what each coefficient means, what each summation sign means, what each subscript means, what the epsilon means. What is the main parameter of interest?

Their estimation equation for space- and time-specific suicide rate is

$$Suicide\,rate_{s,t} = \sum_k \beta_k Unilateral^k_{s,t} + \sum_s \eta_s State_s + \sum_t \lambda_t Year_t + Controls_{s,t} + \varepsilon_{s,t},$$

where β_k is the change a unilateral divorce law k years ago, η_s is the

Table of States and Treatment Dates

```
# load packages
library(tidyverse)
library(haven)
library(stargazer)
library(knitr)
library(lfe)
library(gridExtra)
library(data.table)
```

```
# read data
divorce_all <- as.data.table(read_dta("../data/sw_nofault_divorce.dta"))

# drop data not needed for the analysis
divorce <- divorce_all[,1:40]
divorce$region <- divorce_all$region
```

We can see from the table below that five states had not passed no-fault divorce laws by 2006, coded as "NRS": Arkansas, Delaware, Mississippi, New York, and Tennessee. Nine states had passed no-fault divorce laws before 1964, coded as "PRE".

```
# create state, year table
state_timing <- divorce %>%
  group_by(statename) %>%
  summarize(nfd = min(nfd))

state_timing_table = state_timing[1:25,]
state_timing_table[,3:4] = state_timing[26:50,]
state_timing_table[25,3:4] = ''

kable(state_timing_table, col.names = c('State (Column 1)', 'Year',
                                        'State (Column 2)', 'Year'))
```

State (Column 1)	Year	State (Column 2)	Year
Alabama	1971	Nebraska	1972
Arizona	1973	Nevada	1973
Arkansas	NRS	New Hampshire	1971
California	1970	New Jersey	1971
Colorado	1971	New Mexico	1973
Connecticut	1973	New York	NRS
Delaware	NRS	North Carolina	PRE
District of Columbia	1977	North Dakota	1971
Florida	1971	Ohio	1974
Georgia	1973	Oklahoma	PRE
Idaho	1971	Oregon	1973
Illinois	1984	Pennsylvania	1980
Indiana	1973	Rhode Island	1976
Iowa	1970	South Carolina	1969
Kansas	1969	South Dakota	1985
Kentucky	1972	Tennessee	NRS
Louisiana	PRE	Texas	1974
Maine	1973	Utah	PRE
Maryland	PRE	Vermont	PRE
Massachusetts	1975	Virginia	PRE

State (Column 1)	Year	State (Column 2)	Year
Michigan	1972	Washington	1973
Minnesota	1974	West Virginia	PRE
Mississippi	NRS	Wisconsin	1977
Missouri	1973	Wyoming	1977
Montana	1975		

Replication

```
# create post var
divorce$post = 0
divorce[year >= `_nfd`,]$post = 1

# run regressions without trend
homicide_fe_reg = felm(asmrh ~ post |
                        statename + year |
                        0 |
                        statename,
                      data = divorce)
suicide_fe_reg = felm(asmrs ~ post |
                       statename + year |
                       0 |
                       statename,
                     data = divorce)

# create trend var
divorce$trend = divorce$year - 1963

# run regressions with trend
homicide_fe_trend_reg = felm(asmrh ~ post |
                              as.factor(statename):trend + statename + year |
                              0 |
                              statename,
                            data = divorce)
suicide_fe_trend_reg = felm(asmrs ~ post |
                             as.factor(statename):trend + statename + year |
                             0 |
                             statename,
                           data = divorce)
```

```
# create regression table
stargazer(homicide_fe_reg,
          homicide_fe_trend_reg,
          suicide_fe_reg,
          suicide_fe_trend_reg,
          header = FALSE,
          title = "Simple DD Estimates of Effect of Unilateral Divorce on
          Female ASMR Due to Homicide and Suicide",
          dep.var.labels = c("Homicide", "Suicide"),
          covariate.labels = c("Post-Treatment"),
          add.lines = list(c('State and Year FEs', 'X', 'X', 'X', 'X'),
                           c('State-Specific Trends', ' ', 'X', ' ', 'X')),
          keep.stat = c('n'),
          notes = "Standard errors are clustered by state."
          )
```

9. What is the identifying assumption needed to estimate the variance weighted ATT when there is differential timing and using OLS?

```
# event study

# run regressions with year-distance from treatment
```

Table 2: Simple DD Estimates of Effect of Unilateral Divorce on Female ASMR Due to Homicide and Suicide

	Dependent variable:			
	Homicide		Suicide	
	(1)	(2)	(3)	(4)
Post-Treatment	−0.150	−0.172	−3.080	0.593
	(0.150)	(0.255)	(2.431)	(2.009)
State and Year FEs	X	X	X	X
State-Specific Trends		X		X
Observations	1,617	1,617	1,617	1,617
Note:	*p<0.1; **p<0.05; ***p<0.01			
	Standard errors are clustered by state.			

```
homicide_fe_leadlag_reg = felm(asmrh ~ as.factor(I(year - `_nfd`)) |
                                 statename + year | 0 | statename,
                               data = divorce)
suicide_fe_leadlag_reg = felm(asmrs ~ as.factor(I(year - `_nfd`)) |
                                statename + year | 0 | statename,
                              data = divorce)

# create data for coefficient plot
leadlag_data <- as.data.frame(
  tibble(
    label = -20:27,
    mean_homicide = coef(homicide_fe_leadlag_reg)[1:48],
    se_homicide = homicide_fe_leadlag_reg$cse[1:48],
    mean_suicide = coef(suicide_fe_leadlag_reg)[1:48],
    se_suicide = suicide_fe_leadlag_reg$cse[1:48]
    )
  )

# create homicide coefficient plot
homicide_plot <- ggplot(data = leadlag_data, aes(x = label))+
  geom_vline(xintercept = 0, color = 'red') +
  geom_point(aes(y = mean_homicide)) +
  geom_errorbar(aes(ymin = mean_homicide - 1.96*se_homicide,
                    ymax = mean_homicide +1.96*se_homicide)) +
  xlab("Years before and after no-fault divorce law passage") +
  ylab("95% CI ASMR, homicide")

# create suicide coefficient plot
suicide_plot <- ggplot(data = leadlag_data, aes(x = label)) +
  geom_vline(xintercept = 0, color = 'red') +
  geom_point(aes(y = mean_suicide)) +
  geom_errorbar(aes(ymin = mean_suicide - 1.96*se_suicide,
                    ymax = mean_suicide +1.96*se_suicide)) +
  xlab("Years before and after no-fault divorce law passage") +
  ylab("95% CI ASMR, suicide")
```

```r
# display stacked plots
grid.arrange(homicide_plot, suicide_plot, ncol=1)
```