Empirical Exercise 1, Stock and Watson Chapter 3

Econ 440 - Introduction to Econometrics

Your Name, youremail@fullerton.edu

21 March 2022

Tips

Explicitly mark the question or question number in your code. Show the output, not just the code: A few months/years from now, the packages will have been updated and the code may no longer run, so it's a good habit to keep a record of the output. Don't forget to answer the questions!

Load dataset

```
library(readxl)
df <- read_xlsx("CPS96_15.xlsx", trim_ws=TRUE)
head(df)
```

```
## # A tibble: 6 x 5
##    year   ahe bachelor female   age
##   <dbl> <dbl>    <dbl>  <dbl> <dbl>
## 1  1996 11.2        0      0    31
## 2  1996  8.65       0      1    31
## 3  1996  9.62       1      1    27
## 4  1996 11.2        1      0    26
## 5  1996  9.62       1      1    28
## 6  1996 14.4        1      0    32
```

(a)

(i)

Compute the sample mean for average hourly earnings (AHE) in 1996 and 2015.

```
mu.1996 = mean(df[df$year == 1996,]$ahe)
## 12.693
mu.2015 = mean(df[df$year == 2015,]$ahe)
## 21.237
```

(ii)

Compute the sample standard deviation for AHE in 1996 and 2015.

```
sd.1996 = sd(df[df$year == 1996,]$ahe)
## 6.359
sd.2015 = sd(df[df$year == 2015,]$ahe)
## 12.125
```

(iii)

Construct a 95% confidence interval for the population means of AHE in 1996 and 2015.

```
alpha = 0.05
n = length(df$year == 1996)
t = qt(1-alpha/2, n-1)
se = sd.1996/sqrt(n)
me = t*se
ci = c(mu.1996-me, mu.1996+me)
ci
```

```
## [1] 12.585 12.802
# 12.585 12.802
```

(iv)

Construct a 95% confidence interval for the change in the population means of AHE between 1996 and 2015.

```
## fill this space with your code
```

(b)

In 2015, the value of the Consumer Price Index (CPI) was 237.0. In 1996, the value of the CPI was 156.9. Repeat (a), but use AHE measured in real 2015 dollars ($2015); that is, adjust the 1996 data for the price inflation that occurred between 1996 and 2015.

```
## fill this space with your code
```

(c)

If you were interested in the change in workers' purchasing power from 1996 to 2015, would you use the results from (a) or (b)? Explain.

```
## fill this space with your code
```

(d)

Using the data for 2015:

(i)

Construct a 95% confidence interval for the mean of AHE for high school graduates.

```
## fill this space with your code
```

(ii)

Construct a 95% confidence interval for the mean of AHE for workers with a college degree.

```
## fill this space with your code
```

(iii)

Construct a 95% confidence interval for the difference between the two means.

```
## fill this space with your code
```

(e)

Repeat (d) using the 1996 data expressed in $2015.

fill this space with your code

(f)

Using appropriate estimates, confidence intervals, and test statistics, answer the following questions:

(i)

Did real (inflation-adjusted) wages of high school graduates increase from 1996 to 2015?

fill this space with your code

(ii)

Did real wages of college graduates increase?

fill this space with your code

(iii)

Did the gap between earnings of college and high school graduates increase? Explain.

fill this space with your code