

FINANCIAL ECONOMETRICS
SHANGHAI JIAO TONG UNIVERSITY
SUMMER SCHOOL 2025
EMPIRICAL EXERCISE – 1 –

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Reference: Stock, J.H. and Watson, M.W., Introduction to Econometrics (4th Edition, Global Edition)

Data: CPS96_15.csv from <http://www.pearsonglobaleditions.com>

Empirical Exercise 3.1. On the text website, you will find the data file `CPS96_15`, which contains an extended version of the data set used in Table 3.1 of the text for the years 1996 and 2015. It contains data on full-time workers, ages 25–34, with a high school diploma or a B.A./B.S. as their highest degree. A detailed description is given in `CPS96_15_Description`, available on the website. Use these data to complete the following.

(a) Using the data for both years:

- (i) Compute the sample mean for average hourly earnings (AHE) in 1996 and 2015.
- (ii) Compute the sample standard deviation for AHE in 1996 and 2015.
- (iii) Construct a 95% confidence interval for the population means of AHE in 1996 and 2015.
- (iv) Construct a 95% confidence interval for the change in the population means of AHE between 1996 and 2015.

(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.

- (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.
- (d) Using the data for 2015:
- (i) Construct a 95% confidence interval for the mean of AHE for high school graduates.
 - (ii) Construct a 95% confidence interval for the mean of AHE for workers with a college degree.
 - (iii) Construct a 95% confidence interval for the difference between the two means.
- (e) Repeat (d) using the 1996 data expressed in \$2015.
- (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?
 - (ii) Did real wages of college graduates increase?
 - (iii) Did the gap between earnings of college and high school graduates increase? Explain.
- (g) Table 3.1 presents information on the gender gap for college graduates. Prepare a similar table for high school graduates, using the 1996 and 2015 data. Are there any notable differences between the results for high school and college graduates?

Table 3.1: Gender Gap in Average Hourly Earnings for College Graduates

(All values in real 2015 dollars)

Year	Men			Women			Difference (M – W)		
	$\bar{Y}_m$	s_m	n_m	$\bar{Y}_w$	s_w	n_w	$\bar{Y}_m - \bar{Y}_w$	SE	95% CI
1996	24.22	9.54	1594	20.56	7.69	1368	3.66	0.32	(3.04, 4.28)
2015	28.25	13.89	1728	23.23	10.45	1934	5.02	0.40	(4.23, 5.81)

Source: Current Population Survey (CPS). Sample: Full-time workers, ages 25–34, with a B.A./B.S.

Calculations performed using Stata. See accompanying `E3_1_solution.do` file.