

Confidence Intervals: Earnings

Dr. Patrick Toche

Textbook:

James H. Stock and Mark W. Watson, *Introduction to Econometrics*, 4th Edition, Pearson.

Other references:

Joshua D. Angrist and Jörn-Steffen Pischke, *Mostly Harmless Econometrics: An Empiricist's Companion*, 1st Edition, Princeton University Press.

Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach*, 7th Edition, Cengage Learning.

The textbook comes with online resources and study guides. Other references will be given from time to time.

Dependent variable: average hourly earnings (AHE).

Regressor	(1)	(2)	(3)
College (X_1)	10.47 (0.29)	10.44 (0.29)	10.42 (0.29)
Female (X_2)	-4.69 (0.29)	-4.56 (0.29)	-4.57 (0.29)
Age (X_3)		0.61 (0.05)	0.61 (0.05)
Northeast (X_4)			0.74 (0.47)
Midwest (X_5)			-1.54 (0.40)
South (X_6)			-0.44 (0.37)
Intercept	18.15 (0.19)	0.11 (1.46)	0.33 (1.47)
Summary Statistics and Joint Tests			
F -statistic testing regional effects = 0			9.32
SER	12.15	12.03	12.01
R^2	0.165	0.182	0.185
n	7178	7178	7178

Problems and Applications

Stock & Watson, Introduction (4th), Chapter 7, Exercise 3.

Using the regression results in column (2):

- a. Is age an important determinant of earnings? Use an appropriate statistical test and/or confidence interval to explain your answer.
- b. Sally is a 29-year-old female college graduate. Betsy is a 34-year-old female college graduate. Construct a 95% confidence interval for the expected difference between their earnings.

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The t -statistic is $0.61/0.05 = 12.2 > 1.96$, so the coefficient on *Age* is statistically significant at the 5% level. *Age* is therefore an important determinant of earnings. A 95% confidence interval for the population coefficient on *Age* is:

$$[0.61 \pm 1.96 \times 0.05] = [0.512, 0.708]$$

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The age difference is $\Delta Age = 34 - 29 = 5$ years, and so the expected difference between mean earnings for an age difference of 5 years is:

$$\begin{aligned}\Delta Age \times [0.61 \pm 1.96 \times 0.05] &= 5 \times [0.512, 0.708] \\ &= [2.56, 3.54]\end{aligned}$$

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