EC200: Econometrics and Applications

In-Class: Inference

1. Suppose that a research, using data on class sizes and average test scores from 100 third-grade classes, estimates the following OLS regression:

$$\widehat{TestScore} = 520.4 - 5.82CS$$

where the $SE(\hat{\beta_0}) = 20.4$, $SE(\hat{\beta_1}) = 2.21$, $R^2 = 0.08$, and SER = 11.5

(a) Construct a 95% confidence interval for β_1

(b) Calculate the p-value for the two-sided test of the null hypothesis $H_0:\beta_1=0.$ Do you reject the null at the 5% level? The 1% level?

(c) Calculate the p-value for the two-sided test of the null hypothesis $H_0:\beta_1=\ 5.6$. Without doing any calculations, determine whether -5.6 is included in the 95% CI for β_1 .

(d) Construct a 99% confidence interval for β_0 .

2. Let X_i denote a binary variable and consider the regression $Y_i=\beta_0+\beta_1X_i+u_i$. Let \bar{Y}_0 equal the sample mean for observations with X=0 and let Y=1 equal the sample mean for observations with X = 1

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Show that $\hat{eta_0}=ar{Y_0}$, that $\hat{eta_0}+\hat{eta_1}=ar{Y_1}$, and that $\hat{eta_1}=ar{Y_1}-ar{Y_0}$