

Assignment 3

Q1: Heteroskedasticity is one of the assumption for MLR, and is used to find the OLS estimation. Without this, the β_0, β_1, \dots , etc. will not be efficient [$\text{Var}(U|X \dots X_k) = \sigma^2$]. Also, the explanatory variables should be included to make the OLS unbiased, in order to separate them with the error term. If our OLS has sample correlation coefficient of 0.95 between 2 independent variables, it does not wrong since it does not violate any MLR assumption

Q2: (i) Null hypothesis that, after controlling for sales and roe, ros has no effect on CEO salary

$$\rightarrow H_0: \beta_3 = 0$$

The alternative that better stock market performance increase CEO's salary

$$\rightarrow H_1: \beta_3 > 0$$

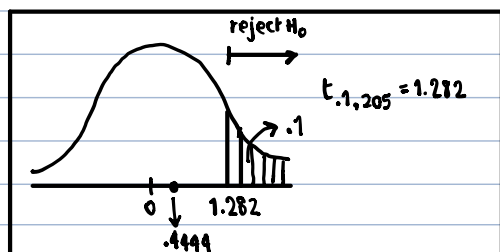
(ii) The proportionate affect of ros on salary if ros increase by 50 points is $.00024(50) = .012$. To get the percentage effect, we can just simply multiply it by 100 and we get 1.2%. Ros does not have a practically large effect on salary as a large change in ROS gives small effect on salary.

(iii) $H_0: \beta_3 = 0$ $d = .1$

$$H_1: \beta_3 > 0$$

$$n = 209, \text{ d.f.} = n - k - 1 = 209 - 3 - 1 = 205$$

$$\rightarrow \text{we can use z-table as d.f.} > 30 \Rightarrow z = \frac{\hat{\beta}_3 - \beta_3}{\text{s.e.} \hat{\beta}_3} = \frac{0.00024 - 0}{0.00054} = 0.4444$$



The z-value does not fall into the rejection region.
 \rightarrow Does not reject H_0 at .1 level of significance.
 \therefore ros has no effect on salary #

(iv) No, since we already test that ros does not have any effect on salary at .1 level of significance. Eventhough if we add, it will raise r^2 , but it will worsen the variance. We only want to put in what really explained the model #