Chonwanee Katemukda 6004641061

answer ① i and iii can cause the t statistics not to have t distribution under H_0 as homoskedasticity is one of the CLM assumptions, and omitting an important explanatory variable may violate Assumption MLR.4. Moreover, a sample correlation of 0.95 does not violate Assumption MLR.3

i) need to meet the assumption of homoskedasticity

ii) the correlation just has to be less than 1, refers no exact linear between x $E(u|x)=0$

iii) if the omitted x is correlated to other Explanatory variables, $E(u|x)=0$ is violated.

② i) The hypotheses are $H_0: \beta_3 = 0$, $H_a: \beta_3 > 0$

ii) Everything else being equal, and increase if ros by 50 points is predicted to increase salary by 100(0.00024)(50) = 1.2%. The effect of ros on salary is not large.

iii) As $n = 209$, then $df = 209-3-1 = 205$. So we can use $df = \infty$. The 10% critical value for a one-tailed test is then 1.282. The t statistic on ros is $\frac{0.00024}{0.00054} \approx 0.44$, which is below the critical value 1.282, so we cannot reject H_0 at the 10% significance level. Therefore, β_{ros} is not significant, which implies that ros does not have a significant effect on salary.

iv) Based on the t-test only, we may consider removing this variable from the model. However, we should perform the F test for joint significance of a group of independent variables as well before deciding whether or not to remove an independent variable from the model

---

C1 i) The 1% change in campaign expenditure by candidates A changes the vote received by candidate A by $\frac{\beta_1}{100}$ percentage points.

ii) $H_0: \beta_1 = -\beta_2$ or $\beta_1 + \beta_2 = 0$ → This means that if expenditure by A and by B change by the same percentage vote A remain unchanged.

iii) from the model, The estimated equation is

$$\underset{(11.48)}{VoteA = 45.1} + \underset{(15.92)}{6.08\log(ExpendA)} - \underset{(-17.46)}{6.62\log(ExpendB)} + \underset{(2.45)}{0.152(prtystrA)}$$

The coefficient on log(ExpendA) is very significant (t-statistic is 15.92), as is the coefficient on log(ExpendB) (t statistic is −17.45)

The estimates imply that a 10% ceteris paribus increase in spending by candidate A increases the predicted share of the vote going to A by about 61% points. Similarly, a 10% ceteris paribus increase in spending by B reduces vote A by about .66 percentage points. These effects certainly cannot be ignored. The coefficients on log (expendA) and log (expendB) are of opposite insign. Hence there will need to test the hypothesis from ii

iv) $\widehat{voteA} = \beta_0 + \theta_1 \log(ExpendA) + \beta_2 [\log(ExpendB) - \log(ExpendA)] + \beta_3 prtystrA$
from the model
we can see that $\hat{\theta}_1 \approx -0.532$ and $se(\hat{\theta}_1) \approx 0.533$. The t-statistic for the hypothesis testing in part (ii) is $\frac{-0.532}{0.533} \approx -1$. Therefore, we fail to reject $H_0: \beta_1 = -\beta_2$.

*

C8 i) from the dataset, the variable fsize is used for family size.

- Therefore, there are 2017 single people in the sample of 9275

ii) when other variables = 0 then net financial wealth = -43.03987

when age increase 1 unit, net financial wealth will increase 842.7

when income increase 1 unit, net financial welth will increase 7993.1

Not surprising here

iii) ~~Yes, it does. When β_0 or interception rise one unit (like in this case), It mean that holding other factors = 0, net financial wealth increase \$1,000~~

$\hat{\beta}_0 = -43.04$. This is an individual's net financial wealt when their income is \$0 and their age is 0, so this is the net financial wealth of newborn babies which we are unlikely to be interested in

iv) $\hat{\beta}_2 = 0.843$

$H_0: \beta_2 = 1$, $H_a: \beta_2 < 1$

$\rightarrow t = \frac{\hat{\beta}_2 - \beta_2}{s.e(\hat{\beta}_2)} = \frac{0.843 - 1}{0.092} = -1.7065$

the p-value is $P(T < -1.71) \approx 0.044$ which we can find from table

Therefore we can reject the null hypothesis at the 5% significance level but not at 1% significance level.

v) We get an estimate of $\hat{\beta}_1 = 0.821$ which is not very different from the estimate of 0.799 in the last regression. Since this is an omitted variable question we need to know the correlated between age & income, which we find to be only 0.039. This explains why the coefficient does not change much

C6 i) $H_0: \beta_2 - \beta_3 = 0$

$H_a: \beta_2 - \beta_3 \neq 0$

Chonwanee katemunda
1600461061

ii) $d.f. = 935-3-1 = 931$

$$t = \frac{(\hat{\beta}_2 - \hat{\beta}_3) - 0}{s.e.(\hat{\beta}_2 - \hat{\beta}_3)}$$

let $\hat{\theta}_1 = \hat{\beta}_2 - \hat{\beta}_3$

$H_0: \hat{\theta}_1 = 0$

$H_a: \hat{\theta}_1 \neq 0$

$\hat{\beta}_2 = \hat{\theta}_1 + \hat{\beta}_3$

$\log(wage) = \beta_0 + \beta_1 educ + (\theta + \beta_3) exper + \beta_3 tenure + u$

$\log(wage) = \beta_0 + \beta_1 educ + \theta_1 exper + \beta_3 (exper + tenure) + u$

$\hat{\theta}_1 = 0.00195$, $s.e.(\hat{\theta}_1) = 0.00474$

The 95% CI for $\hat{\theta}_1 = [0.00195 - 2.06(0.00474), 0.00195 + 2.06(0.00474)]$

$= [-0.0078, 0.0117]$

Since $\hat{\theta}_1 = 0.00195$ is the value in the value in the confidence interval, we accept H_0 at 95% confidence interval. Therefore, exper and tenure generate has no the same impact on log(wage)