Econometrics-Damodar N. Gujarati / Chapter 8

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$$Multiple\ Regression\ Analysis: The\ Problem\ \ of\ Inference$$

$$t = \frac{\left(\hat{\beta}_1 - \beta_1\right)}{\left(se(\hat{\beta}_1)\right)} \tag{8.1.1}$$

$$\cdots$$
$$\cdots$$
$$\cdots$$

```
options(scipen = 999)

library(gujarati)

library(ggplot2)

fix(Table6_4)

MODEL1 = lm(Table6_4$CM ~ Table6_4$PGNP + Table6_4$FLR)
summary(MODEL1)

# To find P-values, below formula can be used


library(AER)
2*(1 - pt(abs(coeftest(MODEL1, vcov. = vcovHC, type = "HC1")[2, 3]),
            df = MODEL1$df.residual))

#For Confidence Interval

confint(MODEL1,level = 0.95)
```

$$\hat{CM}_i = \underset{(11.593179)}{263.64} - \underset{(0.002003)}{0.005647} PGNPi - \underset{(0.209947)}{2.231586} FLR_i \tag{8.1.4}$$
$$t = (22.7411) \qquad (-2.8187) \qquad (-10.6293)$$

$$Hypothesis\ Testing\ in\ Multiple\ Regression$$

$$H_0: \beta_2 = 0$$
$$H_1: \beta_2 \neq 0$$

$$F = \frac{\left((R^2_{UR} - R^2_R)/m\right)}{\left(1 - R^2_{UR}\right)/(n-k)} \tag{8.6.10}$$

```
attach(Table6_4)
fix(Table6_4)


library(car)

MODEL1 = lm(CM ~ PGNP + FLR)
summary(MODEL1)

H0=c("PGNP","FLR")

linearHypothesis(MODEL1,H0)
```

The Chow Test

```
options(scipen = 999)

fix(Table8_9)

MODEL2 = lm(Table8_9$SAVINGS ~ Table8_9$INCOME)
summary(MODEL2)

library(strucchange)
sctest(Table8_9$SAVINGS ~ Table8_9$INCOME, type = "Chow", point = 12)

#Point is the year that the change occured


library(tidyverse)



new1 = Table8_9[Table8_9$YEAR >= "1970" & Table8_9$YEAR <= "1981",]

new2 = Table8_9[Table8_9$YEAR >= "1982" & Table8_9$YEAR <= "1995",]
par(mfrow=c(2,2))

plot(new1$INCOME,new1$SAVINGS,col = "steelblue",
     pch = 20,xlab = "INCOME",ylab = "SAVINGS")

plot(new2$INCOME,new2$SAVINGS,col = "steelblue",
     pch = 20,xlab = "INCOME",ylab = "SAVINGS")
```

Testing the Functional Form of Regression

```
options(scipen = 999)

fix(Table7_6)

MODEL3 = lm(Table7_6$Y ~ Table7_6$X2 + Table7_6$X3)
summary(MODEL3)

MODEL4 = lm(log(Table7_6$Y) ~ log(Table7_6$X2) + log(Table7_6$X3))
summary(MODEL4)

library(stargazer)
stargazer(list(MODEL3,MODEL4),type = "text")


library(lmtest)
petest(MODEL3, MODEL4, data = Table7_6)
```