4.

R code:

1. 读入初步整理的 excel 文件

```
filename<-"./advEconometric_homework_files/consumption_data.xlsx"
raw_data<-read.xlsx(filename,sheetName = 1,encoding = "UTF-8")
```

2. 按“空格”符号分割表内数据及重命名列名

```
col_name<-names(raw_data)
data<-cSplit(raw_data,col_name," ")
names(data)<-c("OBS","year","quarter","YD","CE")
#y_q <- paste0(data$year,"-0",data$quarter)
#y_q <- as.character.Date(y_q)
```

3. 获取前一期数据

```
log_c <- log(data$CE)
log_c_1 <- c()
log_c_1[2:200] <- log_c[1:199]
log_c_1[1] <- NA
log_y <- log(data$YD)
log_y_1 <- c()
log_y_1[2:200] <- log_y[1:199]
log_y_1[1] <- NA

data <- cbind(data,log_c)
data <- cbind(data,log_y)
data <- cbind(data,log_c_1)
data <- cbind(data,log_y_1)
```

4. 获取差分数据

```
delta_c <- c()
delta_y <- c()
delta_c[2:200] <- diff(log_c)
delta_c[1] <- NA
delta_y[2:200] <- diff(log_y)
delta_y[1] <- NA
data <- cbind(data,delta_c)
data <- cbind(data,delta_y)
#View(data)
```

5. 分别做三次回归

取 1953-1996 的数据

```
data_regression <- data[-c(1:24),]
```

对模型一进行调整 t-test

```
fit1 <- lm(log_c~log_c_1+log_y+delta_y,data = data_regression)
summary(fit1)
```

```
##
## Call:
## lm(formula = log_c ~ log_c_1 + log_y + delta_y, data = data_regression)
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -0.033875 -0.006364  0.000967  0.006110  0.025212
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.06394    0.02166   2.952   0.0036 **
## log_c_1      0.96923    0.02231  43.443  < 2e-16 ***
## log_y        0.02584    0.02105   1.227   0.2213
## delta_y      0.26515    0.05645   4.697 5.37e-06 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```
## Residual standard error: 0.0096 on 172 degrees of freedom
## Multiple R-squared:  0.9996, Adjusted R-squared:  0.9996
## F-statistic: 1.633e+05 on 3 and 172 DF,  p-value: < 2.2e-16
```

we can change the regressor so that gamma_0+gamma_1 is equal to the coefficient of log_y , t value = 1.227 not reject the null

模型二的回归

```
fit2 <- lm(delta_c~log_c_1+delta_y+log_y_1,data = data_regression)
summary(fit2)
```

```
##
## Call:
## lm(formula = delta_c ~ log_c_1 + delta_y + log_y_1, data = data_regression)
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -0.033875 -0.006364  0.000967  0.006110  0.025212
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.06394    0.02166   2.952   0.0036 **
## log_c_1     -0.03077    0.02231  -1.379   0.1696
## delta_y      0.29099    0.05511   5.280 3.86e-07 ***
## log_y_1      0.02584    0.02105   1.227   0.2213
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.0096 on 172 degrees of freedom
## Multiple R-squared:  0.1913, Adjusted R-squared:  0.1772
## F-statistic: 13.57 on 3 and 172 DF,  p-value: 5.499e-08
```

模型一的回归

```
fit3 <- lm(log_c~log_c_1+log_y+log_y_1,data = data_regression)
summary(fit3)
```

```
##
## Call:
## lm(formula = log_c ~ log_c_1 + log_y + log_y_1, data = data_regression)
```

```
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -0.033875 -0.006364  0.000967  0.006110  0.025212
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.06394    0.02166   2.952   0.0036 **
## log_c_1      0.96923    0.02231  43.443  < 2e-16 ***
## log_y        0.29099    0.05511   5.280 3.86e-07 ***
## log_y_1     -0.26515    0.05645  -4.697 5.37e-06 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.0096 on 172 degrees of freedom
## Multiple R-squared:  0.9996, Adjusted R-squared:  0.9996
## F-statistic: 1.633e+05 on 3 and 172 DF,  p-value: < 2.2e-16
```