

Homework

Econometrics

October 24, 2001

1 General Instructions

Most of these exercises can be found in Greene's book which also includes the numerical results for some of the problems found below. Feel free to use the book to provide check figures for key results.

You may turn in your answers in the form of annotated notes made on your GAUSS output. Otherwise, make sure your results and answers are easy to identify and supported by relevant GAUSS programs and output. In order to obtain credit for the exercises you must turn in both the GAUSS programs and output. Each of the hypothesis tests need to be carried out fully, meaning that you should state the null and alternative hypotheses, the distribution of your test statistic under the null hypothesis, your decision criterion, and your decision. Unless otherwise stated, conduct all hypothesis tests at the 5% level.

Problem 4

Data on U.S. consumption and GNP for the years 1950-1985 appear in Table A7.2 of Greene and in the file on my website. Consider the following model:

$$C_t = \alpha + \beta Y_t + \gamma C_{t-1} + e_t \quad (1)$$

In this model the short-run MPC is β and the long-run MPC is $\delta = \beta/(1-\gamma)$.

1. Test the null hypothesis that $\delta = 1$ against the alternative that it is not at the 5% level.
2. Test the (joint) null hypothesis that $\delta = 1$ and $\beta = .5$ against the alternative $\delta \neq 1$ or $\beta \neq .5$ at the 5% level

Problem 5

Consider the model based on Problem 1 of your last homework assignment.

$$\ln G/Pop = \beta_1 + \beta_{P_g} \ln P_g + \beta_Y \ln Y + \beta_{nc} \ln P_{nc} + \beta_{uc} \ln P_{uc} + \beta_{Year} Year + e \quad (2)$$

1. Reproduce the results in Table 7.3 of Greene (2000). Essentially, you will run regressions for the following different sample periods: 1960-1995, 1960-1973, and 1974-1995. Note, the dependent variable in this model is $\ln(G/Pop)$. Also, your slope estimates will match those in the book, but the intercepts may differ.
2. Perform the Chow test for parameter stability at the 5% level under the assumption that the subset equation variances are the same.
3. Perform the Chow test for parameter stability at the 5% level under the assumption that the subset equation variances are not the same.
4. Reproduce the results in (Greene 2000) Table 7.4. Hint: You will have to rearrange your data so that X and Y in the pooled model have 36 observations. Also, the last two columns are from table 7.3.
5. Test the hypothesis that the two automobile price elasticities and the coefficient on the time trend are unchanged in the sample. See Example 7.10 on page 291 of Greene for more information.
6. Compute the CUSUM and its upper and lower bounds using GAUSS. Graph your results. You may confirm your results using PROC AUTOREG which permits you to output these statistics into a data set which can in turn be printed. There is an example of the SAS statements needed to accomplish this posted at the end of these exercises.

SAS Programming Examples

```
DATA ONE;                                * creates a data set called ONE ;
INFILE 'c:\ex6_22.dat' firstobs=2;      * reads data, skip line 1;
input Y x2 x3 x4;                        * reads variables y, x2, x3, and x4;
                                          * into DATA ONE;
      lx2=log(x2);                        * take natural logs of variables ;
      lx3=log(x3);
      lx4=log(x4);
      x4_lag=lag(x4);                     * takes the lag of X4;
```

```

ly=log(y);
int=1;

Proc AutoReg;
  model y = x2 x3 x4/reset;      * run a regression and report reset test;
  Test x2=x4,x3=0;              * performs a joint hypothesis test;
  output out=two recres=recur cusum=c1 cusumlb=lb cusumub=ub; * output CUSUM;
proc print data=two;

Proc Autoreg;
  model y = x2 x3 x4;           * run RLS;
  restrict x2=x4,x3=0;

```

References

- Gaver, K. and M. Geisel**, “Discriminating Among Alternative Models: Bayesian and Non-Bayesian Methods,” *Frontiers in Econometrics*, 1974.
- Greene, William H.**, *Econometric Analysis*, 4th ed., Prentice-Hall, 2000.
- Longley, J.**, “An Appraisal of Least Squares Programs from the Point of the User,” *The Journal of the American Statistical Association*, 1967, 62, 819–841.