Econ 418
Extra-Credit Takehome Assignment
STATA Computer Instructions

You will need a (USB) flash drive to copy the data set onto.

How to download the data to your flash drive

You may download the data for this assignment either as a STATA file (the easiest), an Excel spreadsheet file, or as an ASCII text file.

1. Use your favorite web browser and go to http://u.arizona.edu/~rlo/ to download the data file **e418XCreditData.dta.**
2. You can download and save the STATA file to a directory of your choosing.
3. You now have a copy of the data on your diskette or flash drive.

** If you opt for the STATA file, follow the instructions immediately listed below, otherwise skip ahead to the spreadsheet or text file instructions.

** Spreadsheet file instructions

1. Use your favorite web browser and go to http://u.arizona.edu/~rlo/ to download the data file **e418XCreditData.xls.**
2. You would click on **e418XCreditData.xls** and the data file will appear on your screen.
3. Click on the **File** menu at the top of the screen and then click on **Save As.** From here you would use the dialogue box to save the excel file to a directory of your choosing.
4. You now have a copy of the data on your diskette or flash drive.

** Text file instructions

1. Use your favorite web browser and go to http://u.arizona.edu/~rlo/ to download the data file **e418XCreditData.txt.**
2. You would click on **e418XCreditData.txt** and the data file will appear on your screen.
3. Click on the **File** menu at the top of the screen and then click on **Save As.** From here you would use the dialogue box to save the text file to a directory of your choosing.
4. You now have a copy of the data on your diskette or flash drive.

How to read your data set into STATA

** If you opted to use the STATA **dta** file, follow the instructions immediately listed below, otherwise skip ahead to the spreadsheet or text file instructions.

1. If you simply click on the STATA file **e418XCreditData.dta,** the STATA program will automatically open and read in your data.

2. You can now skip ahead to section on 'How to complete the extra credit assignment'.

** If you did not opt to use the STATA **dta** file, you will need to start STATA by clicking on the STATA icon on the Windows desktop . If the STATA icon is not on the Windows desktop, you will need to hunt it down via the 'start' tab at the bottom of the screen and then click on 'All Programs'.

** If you opted for the spreadsheet file, follow the instructions immediately listed below, otherwise skip ahead to the text file instructions

1. After you are in STATA type **edit** in the area marked **"STATA Command"**, then press return (enter). A spread sheet will now pop up.

2. Reopen your excel file, and copy all the data, including the top line which gives the name of the variables. Return to STATA and press either CRTL+V or go to the **edit** menu and select **paste** to paste the data to the editor. Close the editor window (if a dialogue box appears, click **OK** in the dialogue box to accept the changes you made).

3. So that you can use this data in the future without having to recopy it from excel, go to the file menu and select **Save As.** In the dialogue box, let STATA know the name you want to give the data file and the directory to which you wish to save it. Click on the **Save** button to exit. The saved file will have a **dta** extension, e.g. **e418XCreditData.dta**. In the future, you can simply start STATA, select **Open** from the file menu, and find this data set.

** Text file instructions for reading your data set into STATA

1. Click on the **File** menu at the top of the screen, select **Import,** and then click on **ASCII data created by a spreadsheet.**

2. In the dialogue box that pops up, simply choose the **Browse** option and go to the location where you placed the file **e418XCreditData.txt** on your flash drive.. A new dialogue box pops up. At the bottom of the dialogue box appears **Files of type** from which you will select **Text Files (*.txt).**

3. The data file **e418XCreditData.txt** will appear in the dialogue box. Select this file and click **Open** in the **File name** option at the bottom of the dialogue box.

4. A new dialogue box appears with the name and location of your data file **e418XCreditData.txt**. Simply click on the **OK** button at the bottom of the dialogue box.

5. The computer screen will now acknowledge that the data set has been read into the STATA program.

6. So that you can use this data in the future without having to recopy it, go to the file menu and select **Save As.** In the dialogue box, let STATA know the name you want to give the data file and the directory on your flash drive to which you wish to save it. Click on the **Save** button to exit. The saved file will have a **dta** extension, e.g. **e418XCreditData.dta**. In the future, you can simply start STATA, select **Open** from the file menu, and find this data set.

How to complete the extra credit assignment

1. You will want to create a log of your output for later printing. To start a log of your output, find the **Log** option in the file menu. Choose **Begin** from the sub-menu. Click on the **Save as type** drop box and select **Log (*.log)**. Give your log file a name in the **File Name** text box and click on the **save** button to save the log to a convenient directory of your choosing. Everything you do in STATA will be written to this log file until you type **log close** in the command box. If you wish to temporarily stop writing to the log file, type **log off**. When you wish to continue writing to the log file, type **log on**.

2. The variables of interest are Q, P, and C. When imported into STATA their names are converted to lower case q, p, and c. It might be easier to rename the variables in STATA so that they are upper case again. This is accomplished by the following commands:

   a. In the command box type the command **rename q Q** (followed by the 'enter' key).
   This command changes the name from q to Q.

   b. In the command box type the command **rename p P** (followed by the 'enter' key).
   This command changes the name from p to P.

   c. In the command box type the command **rename c C** (followed by the 'enter' key).
   This command changes the name from c to C.

   From here on you will need to remember that every command you type in the command box must be followed by the 'enter' key.

3. To estimate the linear form $Q_t = \beta_0 + \beta_1 P_t + u_t$ do the following:

   a. In the command box type the command **regress Q P**

   b. That's it! The regression results will appear on the screen and will be captured in the special file.

   c. Your estimates $\hat{\beta}_0$ and $\hat{\beta}_1$ will appear in the column headed by "Coef. ". $\hat{\beta}_1$ is the value that appears next to the variable P and $\hat{\beta}_0$ is the value that appears next to the variable *_cons* (this is the constant or intercept term)..

4. You can calculate the residuals $\hat{u}_t$ in a number of ways. Here are a few.

   a. Type the command **generate uhat1 = Q -**$\hat{\beta}_0 - \hat{\beta}_1$***P**

   You have created a new variable named **uhat1** which is the name you have assigned to the residuals $\hat{u}_t$. You substitute the appropriate values for $\hat{\beta}_0$ and $\hat{\beta}_1$ in the **generate** command. What this does is carry out the calculation $\hat{u}_t = Q_t - \hat{\beta}_0 - \hat{\beta}_1 P_t$.

b. Another way is to calculate the residuals as the difference between the actual values of Q and its predicted values $\hat{Q}$ from the estimated regression. First type the command **predict Qhat1**

This creates a new variable named **Qhat1** which the computer created by carrying out the computation $\hat{Q}_t = \hat{\beta}_0 + \hat{\beta}_1 P_t$.

Next type the command **generate uhat1 =Q - Qhat1**

This command creates a new variable **uhat1** which the computer created by carrying out the computation $\hat{u}_t = Q_t - \hat{\beta}_0 - \hat{\beta}_1 P_t$.

c. An alternative way to obtain the residuals is easier but less instructive. Immediately after you have finished the **regress** command, type the command
predict uhat1, resid

You have created a new variable named **uhat1** which is the name you have assigned to the residuals $\hat{u}_t$.

5. To verify that the sample mean of your residuals is equal to 0, type the command **summarize uhat1**

This command lists the sample mean of the variable **uhat1** as well as its standard deviation, minimum value, and maximum value. STATA uses scientific notation for very small or very large numbers, e.g., -1.01e^{-08} = -1.01x10^{-8} which is -1.01 with the decimal point moved over to the left by eight places. So -1.01$e^{-08} \approx 0$.

6. Consider a new variable obtained by multiplying the residual variable $\hat{u}_t$ by the variable P_t. Let's call this new variable M_t.

a. Type the command **generate M = uhat1*P**

What this command does is carry out the calculation $M_t = \hat{u}_t \cdot P_t$.

b. To verify that the sample mean of the variable M_t is equal to 0, type the command **summarize M**

7. To estimate the linear form $Q_t = \beta_0 + \beta_1 P_t + \beta_2 C_t + u_t$, do the following:

a. Type the command **regress Q P C**

b. Your estimates $\hat{\beta}_0$, $\hat{\beta}_1$ and $\hat{\beta}_2$ will appear in the column headed by "Coef. ". $\hat{\beta}_1$ is the value that appears next to the variable P, $\hat{\beta}_2$ is the value that appears next to the variable C, and $\hat{\beta}_0$ is the value that appears next to the variable *_cons*. Note that the values of $\hat{\beta}_0$ and $\hat{\beta}_1$ are different from those obtained from the simple regression.

8. As before, you can calculate the residuals $\hat{u}_t$ in a number of ways.

a. Type the command **generate uhat2 = Q -**$\hat{\beta}_0$**−**$\hat{\beta}_1$***P −**$\hat{\beta}_2$***C**

You have created a new variable named **uhat2** which is the name you have assigned to the residuals $\hat{u}_t$ from the multiple regression. You substitute the appropriate values for $\hat{\beta}_0$, $\hat{\beta}_1$and $\hat{\beta}_2$ in the **generate** command. What this does is carry out the calculation $\hat{u}_t = Q_t - \hat{\beta}_0 - \hat{\beta}_1 P_t - \hat{\beta}_2 C_t$.

b. Another way is to calculate the residuals as the difference between the actual values of Q and its predicted values $\hat{Q}$ from the estimated regression. First type the command **predict Qhat2**

This creates a new variable named **Qhat2** which the computer created by carrying out the computation $\hat{Q}_t = \hat{\beta}_0 + \hat{\beta}_1 P_t + \hat{\beta}_2 C_t$. Next type the command **generate uhat2 =Q - Qhat2**

The command creates a new variable **uhat2** which the computer created by carrying out the computation $\hat{u}_t = Q_t - \hat{\beta}_0 - \hat{\beta}_1 P_t - \hat{\beta}_2 C_t$.

c. An alternative way to obtain the residuals is easier but less instructive. Immediately after you have finished the **regress** command type the command **predict uhat2, resid**

You have created a new variable named **uhat2** which is the name you have assigned to the residuals $\hat{u}_t$ from the multiple regression.

9. To verify that the sample mean of your latest residuals is equal to 0, type the command **summarize uhat2**

This command lists the sample mean of the variable **uhat2** as well as its standard deviation, minimum value, and maximum value.

10. Consider two new variables obtained by multiplying the residual variable $\hat{u}_t$ by the variable P_t and by the variable C_t. Let's call these new variables $M1_t$ and $M2_t$.

a. Type the command **generate M1 = uhat2*P**

What this command does is to carry out the calculation $M1_t = \hat{u}_t \cdot P_t$.

b. Type the command **generate M2 = uhat2*C**

What this command does is to carry out the calculation $M2_t = \hat{u}_t \cdot C_t$.

c. To verify that the sample means of the variables $M1_t$ and $M2_t$ are equal to 0, type the command **summarize M1 M2**

11. How to generate natural logarithms of the variables Q_t, P_t, and C_t.

a. Type the command **generate LNQ = log(Q)**

This command creates a new variable named LNQ which is the natural log of the variable Q.

b. Type the command **generate LNP = log(P)**

This command creates a new variable named LNP which is the natural log of the variable P.

c. Type the command **generate LNC = log(C)**

This command creates a new variable named LNC which is the natural log of the variable C.

12. To generate the reciprocal of the variable P_t, type the command **generate RP = 1/P**

    This command creates a new variable named RP_t which is calculated as $1/P_t$.

13. To estimate the double-log model $\ell n(Q_t) = \gamma_0 + \gamma_1 \ell n(P_t) + \gamma_2 \ell n(C_t) + u_t$, do the following:

    a. Type the command **regress LNQ LNP LNC**

    b. Your estimates $\hat{\gamma}_0$, $\hat{\gamma}_1$ and $\hat{\gamma}_2$ will appear in the column headed by "Coef. ". $\hat{\gamma}_1$ is the value that appears next to the variable LNP, $\hat{\gamma}_2$ is the value that appears next to the variable LNC, and $\hat{\gamma}_0$ is the value that appears next to the variable $\_cons$.

14. To estimate the semi-log model $\ell n(Q_t) = \alpha_0 + \alpha_1 P_t + \alpha_2 C_t + u_t$, do the following:

    a. Type the command **regress LNQ P C**

    b. Your estimates $\hat{\alpha}_0$, $\hat{\alpha}_1$ and $\hat{\alpha}_2$ will appear in the column headed by "Coef. ". $\hat{\alpha}_1$ is the value that appears next to the variable P, $\hat{\alpha}_2$ is the value that appears next to the variable C, and $\hat{\alpha}_0$ is the value that appears next to the variable $\_cons$.

15. To estimate the reciprocal model $Q_t = \delta_0 + \delta_1 \left(\frac{1}{P_t}\right) + \delta_2 C_t + u_t$, do the following:

    a. Type the command **regress Q RP C**

    b. Your estimates $\hat{\delta}_0$, $\hat{\delta}_1$ and $\hat{\delta}_2$ will appear in the column headed by "Coef. ". $\hat{\delta}_1$ is the value that appears next to the variable RP, $\hat{\delta}_2$ is the value that appears next to the variable C, and $\hat{\delta}_0$ is the value that appears next to the variable $\_cons$.

16. To end your recorded session, type the command **log close** (followed by the 'enter' key). This command will save your completed session under the file name and location you had specified when you started logging your session at the beginning.

17. You are now ready to exit the STATA program so click on the **File** menu at the top and then click on **Exit**. If a dialogue box appears asking whether you want to exit without saving changes to the data, click 'yes'.

18. How to print your output file using Microsoft Word 2003 (you will have to determine how these instructions differ for Word 2007).

    a. Click on the icon for Microsoft Word and then click on the **File** menu.

    b. Click on the **Open** option. At the bottom of the dialogue box for the **Files of type** window select **all files**.

    c. At the top of the dialogue box is the **Look in** window. Browse through to the directory to which you saved your log file.

    d. Click a couple of times on your log file and your results should pop onto the screen.

    e. Click on the **File** menu and select the **Print** option. After you print out the file you can just exit windows without saving anything.

19. How to print your output file using Notepad.

    a. Browse through to the directory to which you saved your log file.

    b. Click a couple of times on your log file and your results should pop onto the screen.

    c. Click on the **File** menu and select the **Print** option. After you print out the file you can just exit windows without saving anything.

20. Don't forget to take your flash drive with you after you are finished.