gretl Workshop 2

Data Entry, Transformations, Graphs and Regression
Inflation & interest rate data
Loading Data

• Start gretl. Choose open data/sample files and choose jgm-data under the gretl tab
• Note variable names and definitions.
• gretl commands are case-sensitive; PI_Y is not the same as pi_y.
Graphing time series data

• Choose view/graph specified variables/time series plot, and select pi_y and r_l. Then ok. Do these two series appear to move together?
• Click on graph and choose Copy to clipboard/monochrome. Then you can paste into a windows program, such as Word, as part of your report.
Data Transformations

• Click and highlight all three interest rates.
• Choose Add/log of selected variables. This creates l_r_s, l_r_m, and l_r_l.
• Notice other pre-programmed data transformations under the Add menu.
• Choose Add/define new variable. Enter formula: r_dif=r_l-r_s. (creating new variable with formula)
<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>auto</td>
<td></td>
</tr>
<tr>
<td>inflation</td>
<td></td>
</tr>
<tr>
<td>inflation</td>
<td></td>
</tr>
</tbody>
</table>

**Add**

- Logs of selected variables
- Squares of selected variables
- Lags of selected variables
- First differences of selected variables
- Log differences of selected variables
- Seasonal differences of selected variables
- Index variable
- Time trend
- Random variable
- Periodic dummies
- Unit dummies
- Time dummies
- Dummies for selected discrete variables
- Define new variable...
Simple Regression

• Choose Model/ordinary least squares.
• Double click on r_l (dependent); add pi_y (independent); click ok.
Descriptive label

auto-generated constant
inflation rate based on the CPI
inflation rate based on the GDP deflator

**gretl: specify model**

**OLS**

<table>
<thead>
<tr>
<th>Dependent variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose -&gt;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Independent variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \text{const} )</td>
</tr>
</tbody>
</table>
Model 1: OLS estimates using the 43 observations 1952-1994  
Dependent variable: r_l

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>COEFFICIENT</th>
<th>STDERROR</th>
<th>T STAT</th>
<th>P-VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>const</td>
<td>5.48281</td>
<td>0.661486</td>
<td>8.289</td>
<td>&lt;0.00001 ***</td>
</tr>
<tr>
<td>pi_y</td>
<td>0.546308</td>
<td>0.126167</td>
<td>4.330</td>
<td>0.00009 ***</td>
</tr>
</tbody>
</table>

Mean of dependent variable = 7.79116  
Standard deviation of dep. var. = 3.06293  
Sum of squared residuals = 270.38  
Standard error of residuals = 2.568  
Unadjusted R-squared = 0.313798  
Adjusted R-squared = 0.297062  
Degrees of freedom = 41
Exercise: Fisher hypothesis

• Test the hypothesis that the coefficient on inflation equals 1.
Write output to a Word file

• Open Word or other editor.
• In output window choose Edit/copy/plain text, and Ok.
• Go to Word and hit “paste” icon.
• You can save file to flash drive for later use.
Jarque-Bera Test of Normality

• From top of equation output window choose Tests/normality of residual.
  – Top part shows histogram
  – Bottom part reports J-B test statistic. Null hypothesis is that residuals are normal. Based on p-value, what do you conclude?
Test statistic for normality:
Chi-squared(2) = 4.379 pvalue = 0.11199

$N(1.4459e-016, 2.568)$
Saving Data

• Choose File/Save data and Ok.
• Give it a file name (fisher), and use the default directory and folder.
• Or you can save it to your flashdrive.
• Exit gretl (File/exit), and say no to any questions.
Retrieving Data

- Restart gretl.
- Choose File/Open data/user file and click on fisher.gdt (gdt stands for gretl data file).
- All of your variables reappear.
Lessons

• Data files can be saved as gretl files for easy retrieval later.
• Objects such as graphs, regression output can be copied to clipboard and pasted into windows programs
Gretl Overview

• Continue with same data set (jgm-data).
• Click on the Model menu to see list of model types:
  – Set cursor on each sub-menu to see estimation methods
• Click on Help (upper right of main window) and select User’s Guide.
  – Table of contents shows list of procedures
Gretl capabilities: Overview

• Use Model/Ordinary least squares to estimate $r_l$ as a function of $r_s$ and $\pi_y$.
• From the output window choose Tests:
  – Tests of linear restrictions
  – Diagnostic tests