Econ 690
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C. Engel

Homework 9

On my website, at the address https://www.ssc.wisc.edu/~cengel/Data/RealEx/, you can download some monthly data that I have used in one of my papers.

Let's use the Canadian data and U.S. data.

On that website, click on the .zip file called Engel_(2015)_Data_Programs.zip, and then go to the folder called "data". Open the file called dat73_New.csv using a spreadsheet.

From the spreadsheet, copy the data for the U.S. dollar per Canadian dollar exchange rate, called S.CAN, the one-month Canadian interest rate called I.CAN, and the one-month U.S. interest rate called I.USA.

We will use the data that starts in January, 1990 (which is row 129 when I downloaded the data into an Excel spreadsheet) through October, 2009 (the last month of data.)

We want to use the log of the U.S. dollar per Canadian dollar exchange rate. So, do this conversion by calculating $\ln(S.CAN)$ in the spreadsheet.

The home interest rate will be the U.S. interest rate, and the foreign interest rate will be the Canadian interest rate. These are one-month interest rates but they are expressed as annual percentages. So, for example, to get the one-month interest rate, call it i_t, you need to calculate:

$$i_t = \left(1 + \frac{I.USA}{100}\right)^{\frac{1}{12}} - 1$$

Similarly, for the Canadian interest rate, i_t^*, we must use the formula:

$$i_t^* = \left(1 + \frac{I.CAN}{100}\right)^{\frac{1}{12}} - 1$$

Now, for each month, we will use two different possible predictors of the log of the next period's exchange rate. Let's call the one-month ahead prediction $\hat{s}_{t+1}$.

One predictor will be s_t, which is the prediction that the exchange rate in period $t+1$ will equal its value in period t. (For example, the prediction in January 2007 of the February 2007 log exchange rate will be simply the January 2007 log exchange rate.)

The second predictor will be based on the uncovered interest parity hypothesis. We will use $s_t + i_t - i_t^*$ as the predictor of the period $t+1$ exchange rate.

For each prediction (your first prediction will be for the February, 1990 exchange rate, and your last one will be for the October, 2009 exchange rate), calculate the prediction errors:

1. $s_{t+1} - \hat{s}_{t+1} \equiv s_{t+1} - s_t$

2. $s_{t+1} - \hat{s}_{t+1} \equiv s_{t+1} - \left(s_t + i_t - i_t^* \right)$

Then calculate the RMSE, using the formula in the book, for each of these two different predictors.

Here is what to report on your homework:

A graph of the two different prediction errors. Put them on the same graph. Label the two series clearly. Make sure that you can tell the two series apart when they are printed in black and white. Adjust the vertical scale so that the graph is meaningful. (In other words, don't make the vertical scale so big that the two series just look like straight lines.)

Then report your calculations for the RMSE for the two predictors.