Econometrics

Literature, Russian Literature

Question 3 Use the data set shorttbills. wf1. Limit the sample so that it begins in 2002. Regress the three month treasury bill rate (tb3ms) on the lagged three month rate and the twice lagged 6 month rate (tb6ms(-2)). Do the coefficients make much sense? (Okay, explain why they don't.) Test, at the 1% level, for first-order serial correlation using the Breusch-Godfrey test. Now run the regression correcting for serial correlation by including AR(1) in the regression. Do the coefficients make sense now? Correct for second order serial correlation (add AR(1) and AR(2)). How about the coefficients now?

The regression output looks like

Dependent Variable: TB3MS

Method: Least Squares

Date: 09/17/12 Time: 15: 24

Sample: 2002M01 2010M01

Included observations: 97

Variable

Coefficient

Std. Error

t-Statistic

Prob.

C

0. 063194

0. 040434

1. 562912

0. 1214

TB3MS(-1)

1. 346506

0. 090650

14. 85396

0. 0000

TB6MS(-2)

-0. 357690

0. 092599

-3. 862769

0. 0002

R-squared

0. 985022

Mean dependent var

2. 193814

Adjusted R-squared

0. 984703

S. D. dependent var

1. 628331

S. E. of regression

0. 201392

Akaike info criterion

-0. 336687

Sum squared resid

3. 812524

Schwarz criterion

-0. 257057

Log likelihood

19. 32931

Hannan-Quinn criter.

-0. 304488

F-statistic

3090. 922

Durbin-Watson stat

1. 666622

Prob(F-statistic)

0. 000000

Do the coefficients make much sense?

From the above illustrations, the coefficients are sensible. For instance an increase in six months rate can lead to a future reduction in three months rate, any coefficient bigger than 1 at intervals of three months rate may bring about a significant discharge.

Testing at the 1% level, for first-order serial correlation using the Breusch-Godfrey test we get:

If we test for one lag, it is discarded as shown by the test below.

. Breusch-Godfrey Serial Correlation LM Test:

F-statistic

5. 033116

Prob. F(1, 93)

0. 0272

Obs*R-squared

4. 980075

Prob. Chi-Square(1)

0. 0256

If we run the regression correcting for serial correlation by including AR (1) in the regression, the coefficients make sense and we get a dependant variable as indicated below.

TB3MS

Method: Least Squares

Date: 09/17/12 Time: 15: 28

Sample: 2002M01 2010M01

Included observations: 97

Convergence achieved after 5 iterations

Variable

Coefficient

Std. Error

t-Statistic

Prob.

C

0. 008697

0. 090545

0. 096051

0. 9237

TB3MS(-1)

0. 779682

0. 169038

4. 612475

0. 0000

TB6MS(-2)

0. 196326

0. 157707

1. 244879

0. 2163

AR(1)

0. 607484

0. 134082

4. 530678

0. 0000

R-squared

0. 986450

Mean dependent var

2. 193814

Adjusted R-squared

0. 986013

S. D. dependent var

1. 628331

S. E. of regression

0. 192581

Akaike info criterion

-0. 416241

Sum squared resid

3. 449118

Schwarz criterion

-0. 310068

Log likelihood

24. 18770

Hannan-Quinn criter.

-0. 373310

F-statistic

2256. 760

Durbin-Watson stat

1. 978718

Prob(F-statistic)

0. 000000

Inverted AR Roots

. 61

From the above illustration the coefficients make sense however, if we Correct for second order serial correlation (add AR(1) and AR(2)), the coefficient are more sensible from the approximations. We can say that they go hand in hand with the projections or the expectations.