

# [Econometrics](https://assignbuster.com/econometrics/)

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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.