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Exercise 1

Durbin Watson

If you have not yet downloaded and installed GRETL, you can find it here

<http://gretl.sourceforge.net/>

Name:

This exercise focuses on the Durbin Watson test. Answer the following short answer questions.

1. What is the issue using multiple regression on a data set that is ordered by time? What bad thing happens?
   1. You are making predictions about the future without being a time wizard! Catastrophic events can happen that will throw off your predictions. Time complicates everything because *things change*.
2. Pick one of the data sets provided (retail 1 to retail 6). Open the data in GRETL. Plot the time series data set. Does your examination by Mark I eyeball suggest that the problem that you mention in answer #1 above is present? Why or why not?
   1. I picked retail 4

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* 1. To my eyes, there does not seem to be a trend.
  2. There is a large peak at the end that might hint that there isn’t constant correlation.

1. Using the Durbin Watson tables for alpha = .05 and tell me what the DL and DU boundaries are.
   1. Sample size = 30
   2. Number of regressors = 1?
   3. dL = 1.352
   4. dU = 1.489
2. Run OLS regression on the data set and obtain the Durbin Watson statistic. What is the value?

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* 1. DW = 2.053

1. Compare the Durbin Watson statistic to the boundaries in question #3. What is your conclusion?
   1. H0: First order autocorrelation does not exist.

Halt: First-order autocorrelation exists

How are ^these tied into this

* 1. *Further more.*
     1. If DW < dL: data positively autocorrelated
     2. If DW > dU: No evidence the data is positively autocorrelated.
     3. If DW in range(dL, dU): inconclusive
  2. **2.053 > 1.264 (DW > dU)**
  3. We can conclude that there is no evidence that our data is positively autocorrelated.

1. Randomly pick another retail data set from retail1 to retail6. Repeat steps 2 through 5 for that data set.
2. Pick one of the data sets provided (retail 1 to retail 6). Open the data in GRETL. Plot the time series data set. Does your examination by Mark I eyeball suggest that the problem that you mention in answer #1 above is present? Why or why not?
   1. I picked retail 5



* 1. To my eyes, this looks unpredictable. There may be a small positive trend.

1. Using the Durbin Watson tables for alpha = .05 and tell me what the DL and DU boundaries are.
   1. n = 36
   2. dL = 1.411
   3. dU = 1.525
2. Run OLS regression on the data set and obtain the Durbin Watson statistic. What is the value?

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DW = 2.090

1. Compare the Durbin Watson statistic to the boundaries in question #3. What is your conclusion?
   1. 2.090 > 1.525 (DW > dU)
   2. We can conclude that there is no evidence that our data is positively autocorrelated.