Business and Economics Forecasting
Econ 3342

Fall, 2019
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Assignment 1 – Suggested Solutions

- Due Thursday September 26 (before the beginning of the class).
- You can work in groups of up to three students.
- Send your PDF responses by email and make sure you copy all members when submitting your PDF file.
- Make sure your PDF file shows your work on EViews.

1. Go to Yahoo Finance to download time series data for the S&P 500 (http://finance.yahoo.com/q?s=%5EGSPC). Click on "Historical Data," then select weekly data from your date of birth all the way until the day you finished high school.[1] Then click on "Apply." Right below the "Apply" icon there should find the option to download the data set in a format (.csv) that can be saved as a MS Excel file.

2. Import the file to EViews. Notice that you have to create the EViews workfile first with the appropriate selection of weekly frequency and the same initial and final dates.

3. Obtain the Summary Statistics of Open, High, Low and Close. Explain your results.

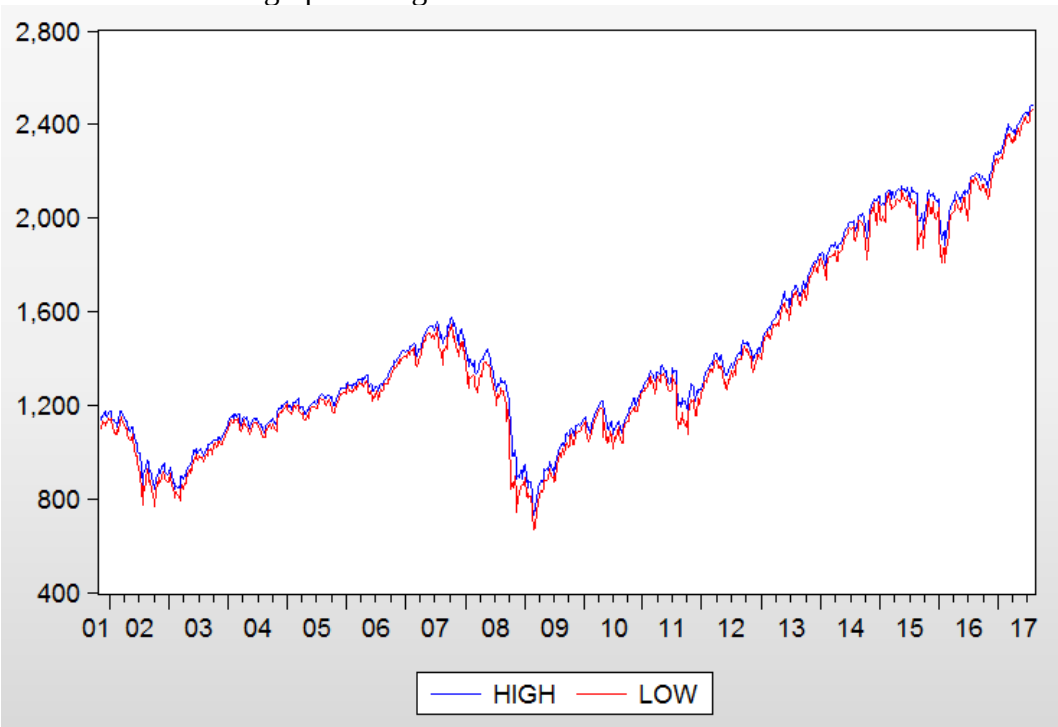
	OPEN	HIGH	LOW	CLOSE
Mean	1420.039	1439.378	1399.080	1421.568
Median	1295.510	1314.070	1281.330	1295.500
Maximum	2477.140	2490.870	2470.320	2476.830
Minimum	680.7600	729.5700	666.7900	683.3800
Std. Dev.	418.5151	418.9586	418.7632	419.8368
Skewness	0.750187	0.758047	0.741629	0.749769
Kurtosis	2.523933	2.507290	2.553135	2.522861
Jarque-Bera	84.96668	87.14555	82.29115	84.91570
Probability	0.000000	0.000000	0.000000	0.000000
Sum	1168692.	1184608.	1151443.	1169950.
Sum Sq. Dev.	1.44E+08	1.44E+08	1.44E+08	1.45E+08
Observations	823	823	823	823

4. Calculate the pair-wise correlation coefficients between these four variables. Explain your results.

[1] Yes, you can use other dates if that make you feel older or younger. Moreover, if your version of EViews does not allow you to use large datasets, just pick a later starting date to have a smaller dataset.

Correlation				
	OPEN	HIGH	LOW	CLOSE
OPEN	1.000000	0.999180	0.998529	0.997656
HIGH	0.999180	1.000000	0.998449	0.998779
LOW	0.998529	0.998449	1.000000	0.998931
CLOSE	0.997656	0.998779	0.998931	1.000000

5. Obtain a time series graph of High and Low.



6. Estimate the following equation using OLS:

$$Close_t = \beta_0 + \beta_1 trend_t + u_t \qquad (1)$$

You can obtain the series "trend" using the command: "genr trend = @trend"

Dependent Variable: CLOSE
Method: Least Squares
Date: 09/18/19 Time: 04:10
Sample: 11/05/2001 8/07/2017
Included observations: 823

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	824.5893	16.64440	49.54153	0.0000
TREND	1.452502	0.035061	41.42778	0.0000

R-squared	0.676423	Mean dependent var	1421.568
Adjusted R-squared	0.676029	S.D. dependent var	419.8368
S.E. of regression	238.9647	Akaike info criterion	13.79294
Sum squared resid	46882508	Schwarz criterion	13.80439
Log likelihood	-5673.793	Hannan-Quinn criter.	13.79733
F-statistic	1716.261	Durbin-Watson stat	0.014742
Prob(F-statistic)	0.000000		

7. Can we say that Close increases over time? Respond looking at the statistical significance of the slope coefficient. What is the interpretation of this slope coefficient?

The coefficient on the trend is positive and statistically significant (it's p-value is less than 0.05). This means that Close increases over time: On average Close increases by 1.45 points every week.

8. What is the interpretation of the intercept? Is it statistically significant?

The intercept is positive and statistically significant. When Trend = 0 (the beginning of the sample: date of birth), the fitted value for Close is 824.58 (this is also in-sample forecast). This is consistent with the graph below where the fitted value (green line) is equal to 824.58 at the beginning of the sample as measured on the left-hand side axis.

9. If your parents started saving money for your college education on the date you were born, do you think investing in an S&P 500 Indexed Fund would have been a good idea?[2]

It appears is would have been a good idea as on average the S&P 500 (Close) increases by 1.45 points per week. Now, it all depends on the investment horizon. If you still hold the S&P 500 Indexed Fund now it was a good idea. However, note that after the 2007-08 market collapse, there was a huge drop in the S&P 500. Selling during 2009 would have been a bad idea.

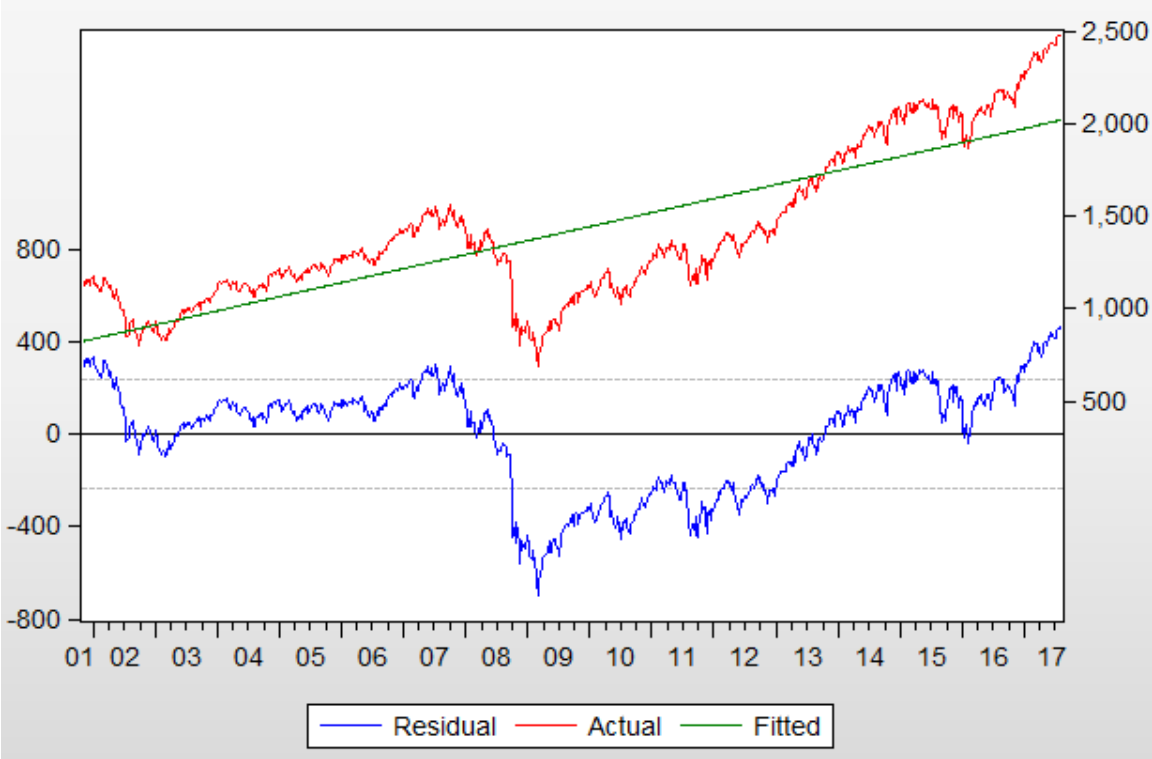
[2] This can be a very complicated question to answer from a finance point of view. However, use Equation (1) and simple intuition to guide your answer.

This linear trend model is great to capture long-run trends, but it failed to capture the 2007-08 financial crisis.

10. What is the interpretation of the R-squared in the regression?

The R-squared is 0.676. This means that 67.6% of the variation in Close is explained by this model.

11. Obtain the graph for the in-sample forecast values (fitted values) and the forecasting errors (regression residuals).



12. What is the in-sample forecast for the week you turned 10 years old?

Close = 817.