

Problem Set 6
Economics 30331
Due: A the start of class, Wednesday, March 28, 2018

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Given that this problem set is all computer programming, office hours next week will be in the computer lab in the basement of Jenkins/Nanovic, B077.

For this problem set, I want you to practice uploading data from another format into STATA. You will download 27 years of daily closing prices for a stock and test whether the stock price follows a random walk. Copy and paste the output from STATA onto a separate sheet of paper and turn this in. Please indicate at the top of the sheet the stock ticker and the company name.

- a. Go to the Yahoo Financial webpage, finance.yahoo.com. At the top of the page, enter a stock ticker ID for a company that has been around for a while. In the example below, I will request data for IBM. Enter the ticker ID and this will take you to a page with current prices.
- b. In the left hand side of the page you will notice a clickable menu (summary, chart, conversions, etc.). Click on “Historical prices”. This will take you to a page with daily data for this stock.
- c. Select data for January 2, 1990 through December 29, 2017 and hit the “Apply” button.
- d. You should see a matrix that has dates in the 1st column, and adjusted closing prices and volume, respectively, in the final two columns.
- e. At the top of the matrix, click on “download data” and this will load the data into a file that has the stock ticker name and a “csv” extension. So my data is called IBM.csv. CSV format is comma-delimited data – columns are separated by commas, rows are delimited by hard carriage returns. If you selected the dates that I outline above, your data set should have 7,056 observations. Double click on the data and CSV formatted data should load automatically into EXCEL.
- f. Make sure the data is sorted in chronological order – oldest to newest. Your data set should span columns A through G. In column H you want to add a time trend. To do this, go to element H1 and type in “time”. In element H2, type 1 and hit return. In element H3, type +h2+1 and hit return. Then copy the formula from H3 to H4 through H6554.
- g. Hit the “save as” button and save the data in **CSV format** in a file called stockprices.csv. If you have done everything correctly up to this point, the 1st 10 line of your CSV file should look like this

```
Date,Open,High,Low,Close,Adj Close,Volume,trend
1/2/1990,23.6875,24.53125,23.625,24.5,6.940224,7041600,1
1/3/1990,24.6875,24.875,24.59375,24.71875,7.002192,9464000,2
1/4/1990,24.75,25.09375,24.71875,25,7.081861,9674800,3
1/5/1990,24.96875,25.40625,24.875,24.9375,7.064157,7570000,4
1/8/1990,24.8125,25.21875,24.8125,25.09375,7.108419,4625200,5
1/9/1990,25.125,25.3125,24.84375,24.84375,7.0376,7048000,6
1/10/1990,24.875,25,24.65625,24.75,7.011044,5945600,7
1/11/1990,24.875,25.09375,24.84375,24.96875,7.073009,5905600,8
1/12/1990,24.65625,24.8125,24.40625,24.46875,6.931377,5390800,9
1/15/1990,24.40625,24.59375,24.3125,24.53125,6.949076,4035600,10
1/16/1990,24.375,25.09375,24.375,25.03125,7.090715,8220400,11
1/17/1990,25.09375,25.21875,24.59375,24.71875,7.002192,8926000,12
1/18/1990,24.5,24.90625,24.40625,24.875,7.046456,6926400,13
1/19/1990,24.9375,24.96875,24.625,24.65625,6.984488,6594800,14
1/22/1990,24.6875,24.78125,24.125,24.15625,6.842852,6882800,15
```

- h. You can now load the data into STATA. In STATA, change the program to the folder where you stored the data and now load the csv data into STATA. This is done easily by using the “insheet” command that loads excel data in CSV format into STATA. The syntax is easy and it can be done by executing the command

```
insheet using stockprices.csv, comma
```

- i. Set the data as time series by typing

```
tsset trend
```

- j. You will notice that there are 7,056 observations in your data set. The key value in the data set is the adjusted closing price which is the closing price adjusted for dividends and stock splits. This variable should be named adjclose. What I want you to do is, take the natural log of this variable [adjclose], then get the Dickey-Fuller test for the ln of the adjusted closing price.

```
gen adjclose1=ln(adjclose)
dfuller adjclose1
```

- k. Next, get the one period lag [adjclose1], construct the 1st difference [d_adjclose1] then run the Dickey Fuller on the 1st difference of ln)adjusted closing price).

```
gen adjclose11=adjclose1[_n-1]
gen d_adjclose1=adjclose1-adjclose11
dfuller d_adjclose1
```

- l. From this programming, please report the answers to the following for the problem set

- a) The company name
- b) The stock ticker symbol
- c) The 1st 10 observations in your CSV data set
- d) The descriptive statistics for the data set (type summarize once the data is loaded)
- e) The number of observations in your data set
- f) The t-statistic on the Dickey-Fuller test on *adjclose1*
 - i. The critical value of the Dickie Fuller at the 5% level
 - ii. Can you Reject/or not reject the null $H_0: \theta=0$ (the series is non-stationary)
- g) The t-statistic on the Dickey-Fuller test on *d_adjclose1*
 - i. The critical value of the Dickie Fuller at the 5% level
 - iii. Can you Reject/or not reject the null $H_0: \theta=0$ (the series is non-stationary)