

ECO 521
Quantitative Methods II
Spring Semester 2021

Problem Set 4

Solutions are due **by noon, Sunday, May 9, 2021**. NO EXCEPTIONS! You should submit a copy of the SAS program **you** wrote in order to solve the problem, the output and any relevant charts, and of course **your** analysis of and solution to the problem.

Please follow the specifications for submitting the problems as provided on Blackboard and as discussed in class. Failure to do so will result in a 10 percent penalty on the problem set.

IMPORTANT NOTE: **You may not seek or obtain assistance in interpreting any of your results.**

LATE PROBLEM SETS WILL NOT BE ACCEPTED!

1. The Excel workbook posted to Blackboard contains versions of four of the series analyzed by Nelson and Plosser in their 1982 paper. (But these are **not** the identical series.) You should take logs of the real GDP and industrial production series. Then:

A. Plot each time series and state your initial impressions regarding the series.

B. Use SAS to obtain the ACF and comment on it. You are **not to identify a time series model!**

C. Find the **maximum lag length** and “**test down**” to find the appropriate lag length. Only turn in your **final regression**.

D. Use **both** the Enders and the Elder & Kennedy approaches to perform unit root tests. Explain your results. **Make sure to distinguish between the two approaches.** (If you do this using PROC ARIMA, **throw out the “identification” output** if you can – I don’t want to see it.)

E. Use the KPSS test to do confirmatory testing. What do you find?

In case you need them, **the critical values from the Enders textbook are:**

- To test the null that trend = 0 *given* a unit root: 2.79 (for $\alpha = 0.05$) and 3.53 (for $\alpha = 0.01$);
- To test the null that drift = 0 *given* a unit root: 2.54 (for $\alpha = 0.05$) and 3.22 (for $\alpha = 0.01$.)