PREDICTIVE ANALYTICS ISM-E1003

Homework 4, due date 01.04. at 10:00

What is the correct answer? Correct answer 4 points, incorrect answer -1 point, no answer 0 point.

1. Which of the following are probably valid criticisms of the Dickey–Fuller methodology?

(i) The tests have a unit root under the null hypothesis and this may not be rejected due to insufficient information in the sample

(ii) The tests are poor at detecting a stationary process with a unit root close to the non-stationary boundary

(iii) The tests are highly complex to calculate in practice

(iv) The tests have low power in small samples.

(a) (i), (ii), (iii), and (iv)

**(b) (i), (ii), and (iv) only**

(c) (i) and (iii) only

(d) (ii) only.

2. Which of the following are problems associated with the Engle–Granger approach to modelling using cointegrated data?

(i) The coefficients in the cointegrating relationship are hard to calculate

(ii) This method requires the researcher to assume that one variable is the dependent variable and the others are independent variables

(iii) The Engle–Granger technique can only detect one cointegrating relationship

(iv) The Engle-Granger technique does not allow the testing of hypotheses involving the actual cointegrating relationship.

(a) (i), (ii), (iii), and (iv)

**(b) (ii), (iii), and (iv) only**

(c) (ii), (iii) only

(d) (ii) and (iv) only.

3. Which criticism of Dickey–Fuller (DF)-type tests is addressed by stationarity tests, such as the KPSS test?

**(a) DF tests have low power to reject the null hypothesis of a unit root, particularly in small samples**.

(b) DF tests are always over-sized.

(c) DF tests do not allow the researcher to test hypotheses about the cointegrating vector

(d) DF tests can only find at most one cointegrating relationship.

4. Consider the following data generating process for a series *yt*:



Which one of the following most accurately describes the process for *yt*?

* 1. A random walk with drift
  2. A non-stationary process
  3. A deterministic trend process
  4. **An explosive process.**

5. Which one of the following best describes most series of asset prices?

(a) An independently and identically distributed (iid, i.e., ‘completely random’) process

(b) **A random walk with drift**

(c) An explosive process

(d) A deterministic trend process.

6. Threshold autoregressive and Markov switching models:

(a) **Allow us to potentially capture regime switches in a dependent variable**

(b) Forecast correlations of two distinct series

(c) Maximise the threshold of autoregressive models

(d) All of the above.

7. To check for seasonality (day-of-the-week effect) in stock returns of South Korea, Malaysia, the Philippines, Taiwan, and Thailand, Brooks and Persand (2001) regress daily returns in each of these countries’ stock market on five dummy variables D1 to D5 representing each day of the week – i.e., D1 for Mondays, D2 for Tuesdays, D3 for Wednesdays, D4 for Thursdays and D5 for Fridays:



Their results were:



Which market(s) did not display any evidence of day-of-the-week effect?

(a) Thailand, Malaysia and Taiwan

(b) Philippines only

(c) South Korea only

(d) **South Korea and Philippines**.

8. A Markov process can be written mathematically as:

(a) 

(b) 

**(c)** ****

(d) .

1. The unknown parameters of a Markov switching model are usually estimated using:

(a) **Maximum likelihood**

(b) Instrumental variables

(c) Indirect least squares

(d) Ordinary least squares.

1. Suppose that a researcher wishes to test for calendar (seasonal) effects using a dummy variables approach. Which of the following regressions could be used to examine this?
2. A regression containing intercept dummies
3. A regression containing slope dummies
4. A regression containing intercept and slope dummies
5. A regression containing a dummy variable taking the value 1 for one observation and zero for all others.

(a) (ii) and (iv) only

1. (i) and (iii) only

(c) **(i), (ii), and (iii) only**

(d) (i), (ii), (iii), and (iv).