

ECON 5101: Questions to seminar 6.

22 April, 2014.

Exercises to Seminar 6

1. In the file named *Sem6data.xls* there are 5 time series variables. Try to determine the order of integration of the series, i.e., whether a series is $I(0)$, $I(1)$ or $I(2)$.

These are artificial data series, and to ensure comparability of results, do not log transform the variables before analysing them. The data is undated, but you can think of the period as annual. Use the whole available sample length.

- (a) It is not uncommon that researchers conclude (or imply) that “inflation is non-stationary”. However it is not clear from the outset whether this is due to deterministic non-stationarity or to unit-root stationarity. Try to clarify this issue for the Norwegian rate of inflation INF in the file *Inf1814-2009.xls*.
 - (b) The data set also contains the unemployment percentage (*Ledighetsrate*). Is there robust evidence of a long-run unit-root (and thus long-memory hysteresis) in the Norwegian rate of unemployment? If the answer is no; can a “natural rate of unemployment” be estimated?
 - (c) With reference to 2a): Can a “natural rate of inflation” be estimated?
2. Solve the exercise at the end on the lecture note (posted with slide set 10) about the Engle-Granger representation theorem.
 3. Assume the following model

$$(1) \quad x_{1t} + \alpha x_{2t} = u_{1t}, \quad u_{1t} = u_{1t-1} + \varepsilon_{1t}$$

$$(2) \quad x_{1t} + \beta x_{2t} = u_{2t}, \quad u_{2t} = \rho u_{2t-1} + \varepsilon_{2t}, \quad |\rho| < 1$$

where ε_{1t} and ε_{2t} are uncorrelated Gaussian variables. Discuss the possibility of estimating α and/or β consistently by OLS.