

MACROECONOMETRÍA

Segundo Cuatrimestre (curso 2006/07), Depto. de Economía, UC3M

Excercise set 1

Question 1. Replace the Excel file “datos.xls” in the EViews program below with your own Excel file containing a private nominal consumption series of your country of choice, and then change the EViews program as needed before running it. (Alternatively, make a similar program in your preferred software and then run it.) Provide the Teaching Assistant (TA) with a printout of your program and a printout of the graph of your consumption series.

```
'create workfile with quarterly frequency:
workfile proyecto.wf1 q 1970:1 2008:4

'import data (1 series, first observation in b2):
read(b2) datos.xls 1

'make graph of consumption series:
graph consumo.line oe_esp_cpvq
```

Question 2. Let $\{Y_t\}$ be a stationary process, that is, $E(Y_t) = \mu$ and $Cov(Y_t, Y_{t-k}) = \gamma_k$ for all t . Show that the series $\{\Delta Y_t\}$ also is stationary. Suggest at least one situation in which it may be a good idea to apply the difference operator Δ on a series although it is already stationary. [Hint: Read 7.10 in Patterson (2000).]

Question 3. Consider the model

$$Y_t = 0.6 + 0.3t + \epsilon_t, \quad (1)$$

where $t = 0, 1, \dots$, and where $\{\epsilon_t\}$ is White Noise with $E(\epsilon_t) = 0$ and $\sqrt{Var(\epsilon_t)} = 0.9$.

- What kind of model is (1)? Compute $E(Y_t)$ and $Cov(Y_t, Y_{t-k})$. Is $\{Y_t\}$ stationary?
- Define $Z_t = Y_t - E(Y_t)$, and compute $E(Z_t)$ and $Cov(Z_t, Z_{t-k})$. Is the series $\{Z_t\}$ stationary?
- Compute $E(\Delta Y_t)$ and $Cov(\Delta Y_t, \Delta Y_{t-k})$. Is the series $\{\Delta Y_t\}$ stationary?
- What kind of model is ΔY_t ? Is the model invertible?

Question 4. Consider the ARIMA(0, 1, 2) model

$$\Delta Y_t = 0.2 + \epsilon_t + 0.3\epsilon_{t-1} + 0.1\epsilon_{t-2}.$$

Give the Beveridge-Nelson decomposition of Y_t .