UTDT 2024

Series de Tiempo

El trabajo es individual y debe ser subido al campus antes del Lunes 1 de Julio a las 7pm. No se contestaran preguntas sobre el contenido del trabajo.

1. Using Eviews (file named a Merval.wf1),

(a) Find the preferred GARCH(p,q) model for the returns of the MERVAL. NB: The series is stock prices; you should model the returns.

(b) Choose three stocks and repeat point (a). Critically comment the difference between the results in (a) and (b).

(c) Estimate a Multivariate GARCH model using two of the stocks chosen in (b). Compare the results and comment.

2. Using Eviews (file named a money.wf1),

The data file contains the following variables for real GDP: pbi_real (using the Indec) and pbi_privado (using a private sector index). Both measures of GDP need to be seasonally adjusted. For both measures of real GDP, identify the booms and recessions of the Argentinean economy, using

(a) A Markov Switching Model.

(b) A STAR Model. Discuss which variable (of those included in the data set) should be used as a threshold, and why?

(c) The HP filter.

Interpret and compare the results obtained in a), b) and c).

3. Using Eviews (file named a money.wf1),

Estimate a Bivariate STAR model for inflation and deseasonalized output growth (use private ones). NB: You can estimate a two-state VAR where the separation is either dictated by the inflation or the growth equation.

4. Using Eviews (file named a AnnLee.wf1),

   The data file contains the variables EX3MHOLD12 EX3MHOLD24 EX3MHOLD60 EX3MHOLD120, which represent the excess (with respect to the 3 months rate) realized return of holding 3 months a bond of maturity 12 24 60 and 120 .

(a) Use the Kalman filter to extract and store a common factor that explains the movements of those returns.

(b) Use the common factor stored before to assess whether the slope and curvature are variables with explanatory power to explain those (average) returns.

5. Using the data for USA included in the file DATOS estimate for the period 1962q1-2014q4 the following equation

$$\log(m_t) - \log(p_t) = \alpha_0 + \alpha_1 i_t + \alpha_2 \log(y_t) + \varepsilon_t$$

   NB: Estimate the model using Markov Chain Monte Carlo techniques. HINT You must adapt the routine gbs_ar4 :chapter 7 by Kim and Nelson.

(a) Report your results for the whole sample.

(b) Compare the dispersion of α_1 and of α_2 for the sub-samples 1962q1-1979q3 and 1982q4-2014q4.

(c) Repeat a) and b) for the following equations

$$\Delta \log(m_t) - \Delta \log(p_t) = \alpha_0 + \alpha_1 i_t + \alpha_2 \Delta \log(y_t) + \varepsilon_t$$

and

$$\Delta \log(m_t) - \Delta \log(p_t) = \alpha_0 + \alpha_1 \Delta i_t + \alpha_2 \Delta \log(y_t) + \varepsilon_t$$

critically comment on the similarities and differences of the results of a)-b) vs the regressions in c).

- NB: When modifying the routine, you need to take into account

i) That there are 3 regressors instead of 5 as in gbsar4.
ii) That you should remove the control

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COEF = -REV(BETA_F[2:3])|1;
ROOT = POLYROOT(COEF);
ROOTMOD = ABS(ROOT);
IF MINC(ROOTMOD) GE 1.0001;
ACCEPT = 1;
ELSE;
ACCEPT = 0;
ENDIF;.
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6. Using the Eviews file named (Merval.wf1),

(a) Estimate a Markov Switching in Variance with 3 states for the returns of the MERVAL. NB: The series is stock prices; you should model the returns. HINT: You can adapt the routine gibs_s3:chapter 9 by Kim and Nelson (or code available on the web page).

Compare your results with those obtained with the GARCH model in exercise 1.

(b) Plot the histograms of the Volatility parameters. Comment the results.

(c) Estimate a two-state model using Eviews. Compare the results with those obtained in (a). Comment on the number of states.