Econometrics Lab 5

Structural Changes in Linear Regression

1. Structural Breaks in the US Monetary Policy Use the Matlab package "struct-b.tar" and the data set "monetarypolicy.xls", analyze structural changes in the US monetary policy. Consider the following policy rule:

$$r_t = c_t + \beta_t \cdot gap_t + \gamma_t \cdot \pi_t + u_t,$$

where r_t is the US federal funds rate, gap_t is the GDP gap (the gap between GDP and its potential, in percentage terms), π_t is the inflation rate, (c_t, β_t, γ_t) are coefficients that may have a few common breaks. The data is quarterly.

(1) It is well known that Paul Volcker brought dramatic changes to the US monetary policy making. He became the chairman of the Federal Reserve on August 6, 1979. Test whether there exists a structural break at 1979Q3.

(2) In fact, we do not know the number of structural breaks in data. Use the procedure proposed by Bai & Perron (1998) to determine the number of breaks. And estimate each monetary regime (segment). Use structbreak_bp.m. First set the trimming parameter $\epsilon = 0.15$ (by default), then try 0.1 and 0.05.

(3) Use the Group-Fused-Lasso proposed by Qian & Su (2016) to estimate the model (use structbreak_ls.m). If you do not provide a λ, the program would select one using information criterion (IC).