

MICROECONOMETRICS

CLASS 10

Wiktor Budziński

PROGRAMMING ML

Maximum Likelihood method is convenient estimator for programming

If we know what distribution represents the given model well it is straightforward to program any likelihood function in most programming software

- All is needed is some optimization function that will maximize it for us
- That's usually not a problem

Standard errors for the estimates can be also easily obtained by using an inverse of the hessian from the optimization

ADVANTAGES OF PROGRAMMING

1. Programming the model forces you to understand the data generating process behind it
 - Kind of like simulations
2. If something doesn't work for the particular dataset it is easy to look for what is causing the error
 - Otherwise, you often have to guess
3. Once you have basic models in place it is relatively easy to add some extensions

EXERCISE 1: DYNAMIC PANEL MODELS

1. Analyze the linear regression programmed in *RegCodes.R*
 - Check how it works using simulated data
2. Analyze the (dynamic) panel data models programmed in *MLPanels.R*
 - Check how they work using simulated data
3. Compare the models with the GMM on the RiceFarm dataset.

WORKBOOK 10

1. Program the random effect model with a time lag of the dependent variable as well as time lag of the error term. Namely,

$$y_{it} = \rho_1 y_{it-1} + X_{it} \beta + \mu_i + \varepsilon_{it} + \rho_2 \varepsilon_{it-1}$$

2. Test how it works on the *RiceFarm* dataset.