3rd set GAUSS assignments Financial Econometrics

Take the examples of the 1st and 2nd assignment and optimize the objective with help of the GAUSS GMM Toolbox.

1. Create a matrix containing the moment conditions

GAUSS procedure:

a) Write a procedure (modify the procedure of assignment 1) which returns the matrix

$$u = \begin{bmatrix} y_1^2 - \frac{\nu}{\nu-2} & y_1^4 - \frac{3v^2}{(v-2)(v-4)} \\ y_2^2 - \frac{\nu}{\nu-2} & y_2^4 - \frac{3v^2}{(v-2)(v-4)} \\ \vdots & \vdots \\ y_n^2 - \frac{\nu}{\nu-2} & y_n^4 - \frac{3v^2}{(v-2)(v-4)} \end{bmatrix}$$

b) Write a procedure (modify the procedure of assignment 2) which returns the matrix

$$u = \begin{bmatrix} \beta\left(\frac{c_1}{c_0}\right)^{-\gamma} R_1^1 - 1 & \beta\left(\frac{c_1}{c_0}\right)^{-\gamma} R_1^2 - 1 & \cdots & \beta\left(\frac{c_1}{c_0}\right)^{-\gamma} R_1^{10} - 1 \\ \beta\left(\frac{c_2}{c_1}\right)^{-\gamma} R_2^1 - 1 & \beta\left(\frac{c_2}{c_1}\right)^{-\gamma} R_2^2 - 1 & \cdots & \beta\left(\frac{c_2}{c_1}\right)^{-\gamma} R_2^{10} - 1 \\ \vdots & \ddots & & \vdots \\ \beta\left(\frac{c_T}{c_{T-1}}\right)^{-\gamma} R_T^1 - 1 & \beta\left(\frac{c_T}{c_{T-1}}\right)^{-\gamma} R_T^2 - 1 & \cdots & \beta\left(\frac{c_T}{c_{T-1}}\right)^{-\gamma} R_T^{10} - 1 \end{bmatrix}$$

Generally, the GMM procedure in the GMM toolbox needs as input the raw matrix of moment conditions without taking sample means of the respective moment conditions.

2. Call the estimation procedure using the GMM toolbox

GAUSS procedure:

Write a GAUSS procedure containing all the global settings and the estimation procedure. The estimation procedure is called in the following way:

```
gmm(initial,model,matrix1,matrix2,matrix3);
```

where `initial` is a column vector of initial values for your parameters, `model` is a reference to the procedure written in step 1 (e.g. if your procedure creating the moment matrix is called `cbm_moments`, then `model` would be `&cbm_moments`). For the last three arguments `matrix1` to `matrix3` assign an empty matrix and plug it in.

3. Load data and call estimation procedure

a) Use the procedure of the 1st assignment which produces a t-distributed random variable to create a data vector.

Call estimation procedure!

b) First, load the consumption growth data and the return data into a GAUSS matrix. Consumption growth data from 2nd quarter 1947 to 4th quarter 1993 are provided in the file `consgr_1947Q2_1993Q4.fmt`. Return data for ten portfolios (1st size decile to 10th size decile) from 2nd quarter 1947 to 4th quarter 1993 are provided in the file `ret_dec10_1947Q2_1993Q4.fmt`. You can load those files with the `load` command (look it up in the GAUSS Help).

Call estimation procedure!