

1 Simulated method of moment

To estimate a DSGE model using SMM:

1. Set a seed by typing `rng('default')` in Matlab, and generate white noises of the model.
2. Given some model parameter Θ , generate the simulation realizations y_t^{sim} of the observed variables.
3. Use y_t^{sim} to compute the simulated moments $m(\Theta)$
4. The estimated parameter Θ^* solves:

$$\Theta^* = \operatorname{argmin}(m(\Theta) - m^*)'W(m(\Theta) - m^*) \quad (1)$$

where W is a weighting matrix. m^* is the data moments of data realizations y_t^{data} .

2 Minimizing the sum of squares error

Repeat Step 1 and 2 as above. Then, the estimated parameter Θ^* solves:

$$\Theta^* = \operatorname{argmin} \sum_{t=1}^T (y_t^{data} - y_t^{sim})^2 \quad (2)$$

It seems that the second method is not subject to the moments picked by the researchers and should be more accurate (or close to the estimation result of MLE?).

We can simulate N replications of $y_{i,t}^{sim}$, $i = 1, \dots, N$, and solve

$$\Theta^* = \operatorname{argmin} \frac{1}{N} \sum_{i=1}^N \sum_{t=1}^T (y_t^{data} - y_{i,t}^{sim})^2 \quad (3)$$