Readme file of estimating a HANK_Model_CT

Main M files

- main_est_model_HANK_2job.m
- main_smc_2job.m
- main_j2_result.m

How to estimate a HANK_CT model

- You run a M file "**main_est_model_HANK_2job.m"**, and then, this code call the M file "**main_smc_2job.m**" which loads a csv file as data and read a csv file as prior setting from "data" folder.
- You can change the following setting of SMC in M file "**main_est_model_HANK_2job.m**".

```
39  disp('Start SMC^2 ')
40  ncores  =  8  % number of core of CPU for parallel computing
41
42  data_country = 1  % 1: Japan, 2:US
43  def_switch   = 1  % 1st deference for GDP = 1, level = 0
44
45  %% setting of SMC procedure
46  nsim      = ncores*50   % # of particles of parameters
47  nstage    = 5           % # of stages
48  npara     = 18;         % # of parameters
49  cc1       =   0.5 ;  % adjustment coefficient of SMC
50  N_Blocks = 5;     % Number of random Blocks of sampling
51
```

- You can change the following setting of HANK in M file "**main_est_model_HANK_2job.m**".

```
17  %% setting of  environment of HANK model
18    I   = 100;   % number of grids of one ASSET
19    J   = 2;      % number of grids of states of JOB
20    n_v = I*J + 1;    % number of JUMP variables (value function + inflation)
21    n_g = I*J + 2 ;   % number of ENDOGENOUS state variables (distribution + monetary + Fiscal policy)
22    n_p = 6;          % number of static relations: bond-market clearing, labor market clearing, consumption, output, tc
23    n_shocks = 3;     % number of SHOCKS, i.e., monetary policy shock, fiscal policy shock, TFP shock.
24    nEErrors = n_v;
25    nVars = n_v + n_g + n_p;
26
```

- After estimating, this code makes a output file in "OUTPUT" folder. And also it print it at command windows as follows.

```
 nstage = 2, particle (para) = 800
-------------------------------------------------------------------------------

                [ESTIMATION RESULT]
-------------------------------------------------------------------------------
 Parameter        Mean      Stdev    95%Low    95%Up   Geweke    Inef.
-------------------------------------------------------------------------------
coefrra          1.0925     0.0001    1.0922    1.0927    0.742    0.345
frisch           0.4047     0.0001    0.4045    0.4050    0.562    0.266
adjfricshgridfrac    0.7716     0.0001    0.7713    0.7718    0.000    0.327
priceadjust      119.5237     0.0001  119.5235  119.5240    0.000    0.235
taylor_inflation     1.4890     0.0001    1.4887    1.4892    0.000    0.271
taylor_outputgap     0.0328     0.0001    0.0326    0.0331    0.002    0.290
ssigma_MP          0.0327     0.0001    0.0325    0.0330    0.389    0.535
ttheta_MP          0.2649     0.0002    0.2647    0.2652    0.000    0.635
ssigma_FP          0.1168     0.0001    0.1165    0.1170    0.223    1.371
ttheta_FP          0.0619     0.0001    0.0617    0.0622    0.242    0.233
ssigma_TFP         0.1329     0.0001    0.1326    0.1331    0.000    0.255
ttheta_TFP         0.1091     0.0001    0.1089    0.1094    0.364    0.856
TP_labor_22        0.0282     0.0002    0.0279    0.0285    0.031    0.022
-------------------------------------------------------------------------------
post          -292.2740     0.2101 -292.6241 -291.9122    0.860    0.539
lik           -303.3682     0.2085 -303.7155 -303.0268    0.857    0.562
-------------------------------------------------------------------------------
                0.9075     0.2899    0.0000    1.0000    0.083    0.822
rrho            0.0052     0.0000    0.0052    0.0052    0.629    0.271
accept_rate(1)       0.0000     0.0000    0.0000    0.0000      NaN      NaN
accept_rate(2)       0.9075     0.2899    0.0000    0.0000    0.083    0.822
-------------------------------------------------------------------------------
```

How to summarize results

- You run a M file "**main_j2_results.m**". Before run the file, you should set the same options and parameters as what you DID estimate as below

```
28
29      %% setting for reading output file
30      data_country = 1 % 1: Japan, 2:US
31      def_switch   = 1 % 1st def=1
32      npara      =   18;
33      nshock     =    3;
34      nsim       =  800;    % # of particles of parameters
35      nstage     =    2;   % # of stages
36
```

- This code calculates a variance decomposition, and draws graphs of Value functions and stationary distribution of Agents, IRFs and historical decomposition as below.

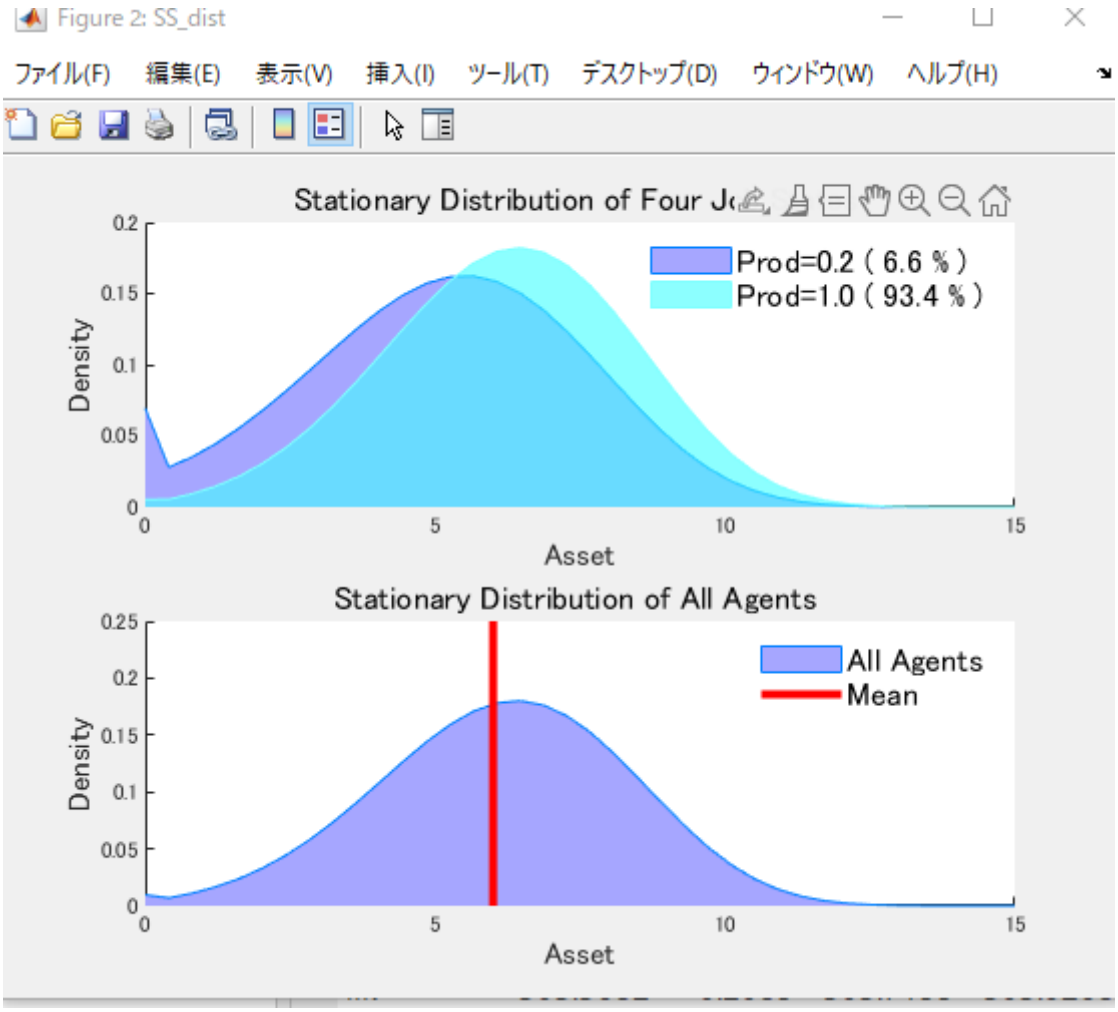
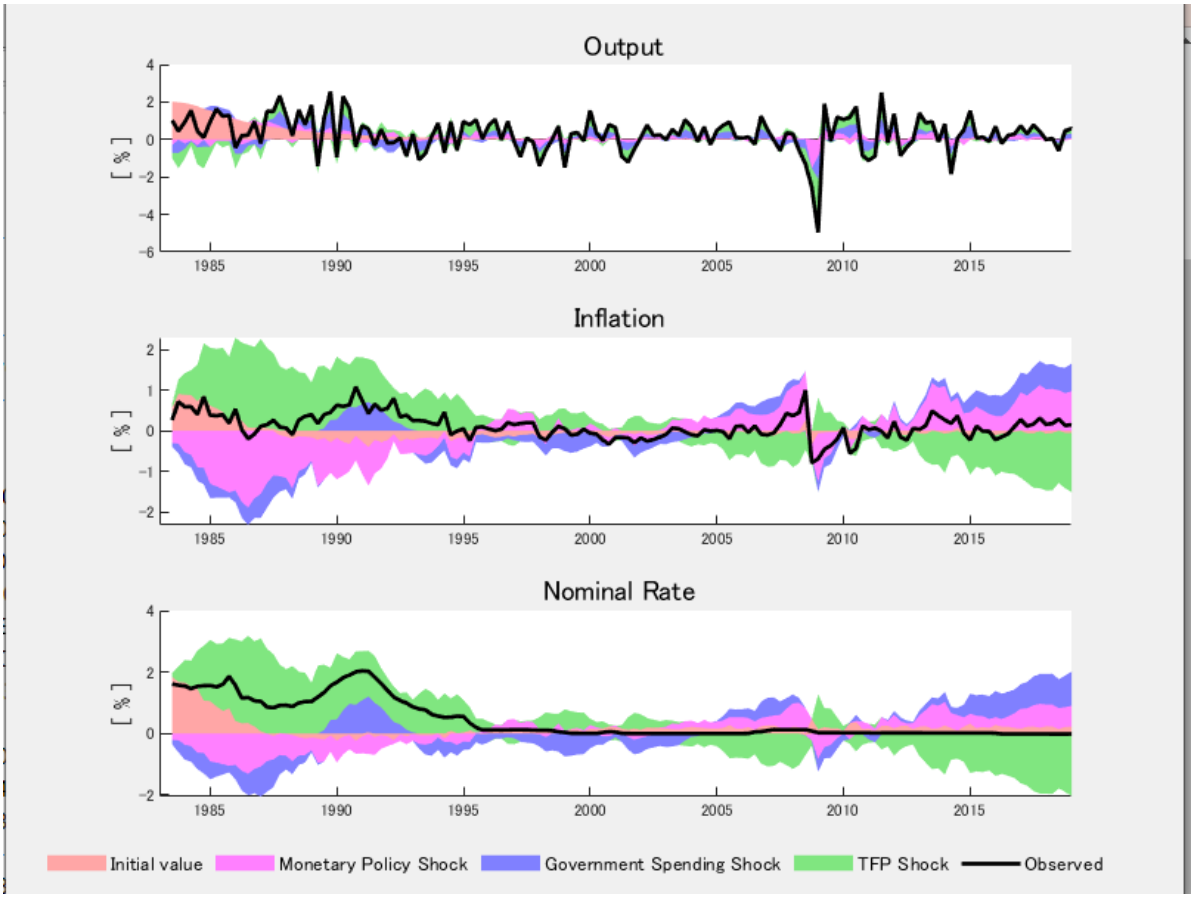


Figure 2: SS_dist
ファイル(F) 編集(E) 表示(V) 挿入(I) ツール(T) デスクトップ(D) ウィンドウ(W) ヘルプ(H)
Stationary Distribution of Four J
Prod=0.2 (6.6 %)
Prod=1.0 (93.4 %)
Density
Asset
Stationary Distribution of All Agents
All Agents
Mean
Density
Asset


Output
Inflation
Nominal Rate
[%]
1985
1990
1995
2000
2005
2010
2015
Initial value
Monetary Policy Shock
Government Spending Shock
TFP Shock
Observed