```
Starting Dynare (version 4.4.3).
Starting preprocessing of the model file ...
Found 43 equation(s).
Evaluating expressions...done
Computing static model derivatives:
 - order 1
 - order 2
 - derivatives of Jacobian/Hessian w.r. to parameters
Computing dynamic model derivatives:
 - order 1
 - order 2
 - derivatives of Jacobian/Hessian w.r. to parameters
Processing outputs ...done
Preprocessing completed.
Starting MATLAB/Octave computing.

EIGENVALUES:
         Modulus             Real        Imaginary

        3.62e-16         3.62e-16                 0
       6.538e-15        6.538e-15                 0
       3.609e-07        2.285e-12         3.609e-07
       3.609e-07        2.285e-12        -3.609e-07
          0.3451           0.3451                 0
          0.3783          -0.3783                 0
             0.5              0.5                 0
          0.6893           0.6893                 0
             0.7              0.7                 0
             0.7              0.7                 0
             0.7              0.7                 0
             0.7              0.7                 0
             0.7              0.7                 0
             0.7              0.7                 0
            0.85             0.85                 0
            0.85             0.85                 0
             0.9              0.9                 0
             0.9              0.9                 0
          0.9877           0.9877                 0
            0.99             0.99                 0
            1.01             1.01                 0
           1.032            1.032                 0
            1.15             1.15                 0
       1.272e+15       -1.272e+15                 0
       4.028e+15       -4.028e+15                 0
       1.722e+17        1.722e+17                 0
       4.808e+17       -4.808e+17                 0
       5.342e+18       -5.342e+18                 0


There are 8 eigenvalue(s) larger than 1 in modulus
for 8 forward-looking variable(s)

The rank condition is verified.


STEADY-STATE RESULTS:

y                       0
pi_d                    0
pi_c                    0
r                       0
c                       0
n                       0
```

```
d                       0
d_b                     0
d_s                     0
b_b                     0
p_dc                    0
c_b                     0
c_s                     0
psi                     0
pi_c_h                  0
s_c                     0
y_c                     0
y_d                     0
mc_c                    0
mc_d                    0
n_c                     0
n_d                     0
wp_d                    0
wp_c                    0
n_c_b                   0
n_d_b                   0
n_c_s                   0
n_d_s                   0
i_d                     0
yf                      0
n1                      0
pi_d1                   0
a_c                     0
a_d                     0
shock_mu_c              0
shock_mu_d              0
LTV                     0
shock_d                 0
shock_d_stern           0
c_ast                   0
d_ast                   0
i_d_ast                 0
pi_c_f                  0
Loading 116 observations from data100.xlsx

Restricting the sample to observations 1 to 87. Using in total 87 observations.
Initial value of the log posterior (or likelihood): -1244276.7475
-----------------
-----------------
f at the beginning of new iteration,   1244276.7474788106
Predicted improvement: 460230781536.947080000
lambda =          1; f =      1244303.6294528
lambda =    0.33333; f =      1244278.1437110
lambda =    0.11111; f =      1511508.5622653
lambda =   0.037037; f =      1244303.1586485
lambda =   0.012346; f =      1244278.2322021
lambda =  0.0041152; f =      1244276.7528914
lambda =  0.0013717; f =        13482.7637138
lambda = 0.00045725; f =        24467.0742236
lambda = 0.00015242; f =        34019.2678960
lambda = 5.0805e-05; f =        44152.8005108
lambda = 1.6935e-05; f =        80869.4984213
lambda =  5.645e-06; f =       211079.2987893
lambda = 1.8817e-06; f =       478065.1278724
Norm of dx     9594.1
----
Improvement on iteration 1 =  1230793.983765023
-----------------
-----------------
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```
f at the beginning of new iteration,     13482.7637137880
Predicted improvement:   658076.544221884
lambda =          1; f =        13482.7638115
lambda =    0.33333; f =         1530.8380365
lambda =    0.11111; f =         1791.6281791
lambda =   0.037037; f =         2878.9118394
lambda =   0.012346; f =         5810.3285986
Norm of dx     11.472
----
Improvement on iteration 2 =    11951.925677261
-----------------
-----------------
f at the beginning of new iteration,      1530.8380365273
Predicted improvement:      100.636159854
lambda =          1; f =         1369.7688386
lambda =     1.9332; f =         1275.7713136
Norm of dx    0.14189
----
Improvement on iteration 3 =      255.066722930
-----------------
-----------------
f at the beginning of new iteration,      1275.7713135972
Predicted improvement:      163.479981433
lambda =          1; f =         1068.2575615
Norm of dx    0.37036
----
Improvement on iteration 4 =      207.513752049
-----------------
-----------------
f at the beginning of new iteration,      1068.2575615484
Predicted improvement:       20.839445772
lambda =          1; f =         1041.3249407
Norm of dx    0.14073
----
Improvement on iteration 5 =       26.932620846
-----------------
-----------------
f at the beginning of new iteration,      1041.3249407024
Predicted improvement:       10.386279094
lambda =          1; f =         1025.9200401
lambda =     1.9332; f =         1020.9276679
Norm of dx   0.092822
----
Improvement on iteration 6 =       20.397272813
-----------------
-----------------
f at the beginning of new iteration,      1020.9276678894
Predicted improvement:        2.473917589
lambda =          1; f =         1016.3191858
lambda =     1.9332; f =         1012.5808437
lambda =     3.7372; f =         1006.6858427
lambda =     7.2247; f =          999.6881933
Norm of dx   0.025968
----
Improvement on iteration 7 =       21.239474584
-----------------
-----------------
f at the beginning of new iteration,       999.6881933050
Predicted improvement:        2.082685612
lambda =          1; f =         1001.1141407
lambda =    0.33333; f =          998.5655511
lambda =    0.64439; f =          998.3214014
Norm of dx   0.067499
```

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Improvement on iteration 8 =        1.366791864
-----------------
-----------------
f at the beginning of new iteration,       998.3214014407
Predicted improvement:        1.149272062
lambda =          1; f =          996.4382791
lambda =     1.9332; f =          995.2817387
Norm of dx   0.022712
----
Improvement on iteration 9 =        3.039662783
-----------------
-----------------
f at the beginning of new iteration,       995.2817386574
Predicted improvement:        2.503121352
lambda =          1; f =          993.6558578
Norm of dx   0.077838
----
Improvement on iteration 10 =        1.625880852
-----------------
-----------------
f at the beginning of new iteration,       993.6558578059
Predicted improvement:        1.252039103
lambda =          1; f =          992.5568365
Norm of dx   0.031268
----
Improvement on iteration 11 =        1.099021340
-----------------
-----------------
f at the beginning of new iteration,       992.5568364656
Predicted improvement:        0.415137501
lambda =          1; f =          991.8267744
lambda =     1.9332; f =          991.3385004
lambda =     3.7372; f =          990.9962255
Norm of dx    0.01417
----
Improvement on iteration 12 =        1.560610964
-----------------
-----------------
f at the beginning of new iteration,       990.9962255020
Predicted improvement:        0.311054229
lambda =          1; f =          990.4450990
lambda =     1.9332; f =          990.0662080
lambda =     3.7372; f =          989.7489550
Norm of dx    0.01199
----
Improvement on iteration 13 =        1.247270525
-----------------
-----------------
f at the beginning of new iteration,       989.7489549774
Predicted improvement:        0.499854644
lambda =          1; f =          988.9621304
lambda =     1.9332; f =          988.6314579
Norm of dx   0.025925
----
Improvement on iteration 14 =        1.117497042
-----------------
-----------------
f at the beginning of new iteration,       988.6314579358
Predicted improvement:        0.442182290
lambda =          1; f =          987.9511274
lambda =     1.9332; f =          987.6592213
Norm of dx   0.023306
```

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Improvement on iteration 15 =        0.972236618
-----------------
-----------------
f at the beginning of new iteration,       987.6592213176
Predicted improvement:        0.692299554
lambda =          1; f =          986.4840979
lambda =     1.9332; f =          985.7963872
Norm of dx   0.047314
----
Improvement on iteration 16 =        1.862834136
-----------------
-----------------
f at the beginning of new iteration,       985.7963871819
Predicted improvement:        1.945545695
lambda =          1; f =          982.4921514
lambda =     1.9332; f =          980.4813020
lambda =     3.7372; f =          985.7966563
lambda =     2.5164; f =          979.9599390
Norm of dx     0.1313
----
Improvement on iteration 17 =        5.836448183
-----------------
-----------------
f at the beginning of new iteration,       979.9599389990
Predicted improvement:        2.050606836
lambda =          1; f =          977.5674556
Norm of dx   0.051274
----
Improvement on iteration 18 =        2.392483409
-----------------
-----------------
f at the beginning of new iteration,       977.5674555903
Predicted improvement:        2.132206642
lambda =          1; f =          978.7333568
lambda =    0.33333; f =          977.0955506
Norm of dx    0.17223
----
Improvement on iteration 19 =        0.471904968
-----------------
-----------------
f at the beginning of new iteration,       977.0955506218
Predicted improvement:        0.663919945
lambda =          1; f =          976.1160981
lambda =     1.9332; f =          975.9437084
Norm of dx   0.031971
----
Improvement on iteration 20 =        1.151842240
-----------------
-----------------
f at the beginning of new iteration,       975.9437083818
Predicted improvement:        0.394961972
lambda =          1; f =          975.2720817
lambda =     1.9332; f =          974.8468148
lambda =     3.7372; f =          974.5195492
Norm of dx   0.013429
----
Improvement on iteration 21 =        1.424159158
-----------------
-----------------
f at the beginning of new iteration,       974.5195492236
Predicted improvement:        0.639984879
lambda =          1; f =          973.4239341
```

```
lambda =     1.9332; f =          972.7413162
lambda =     3.7372; f =          972.4922856
Norm of dx   0.032056
----
Improvement on iteration 22 =        2.027263648
-----------------
-----------------
f at the beginning of new iteration,       972.4922855753
Predicted improvement:        0.843748330
lambda =          1; f =          971.4528621
Norm of dx    0.02616
----
Improvement on iteration 23 =        1.039423511
-----------------
-----------------
f at the beginning of new iteration,       971.4528620644
Predicted improvement:        0.591089346
lambda =          1; f =          970.4969319
lambda =     1.9332; f =          969.9943411
Norm of dx   0.057976
----
Improvement on iteration 24 =        1.458520954
-----------------
-----------------
f at the beginning of new iteration,       969.9943411101
Predicted improvement:        0.876515157
lambda =          1; f =          968.8205398
Norm of dx    0.12728
----
Improvement on iteration 25 =        1.173801283
-----------------
-----------------
f at the beginning of new iteration,       968.8205398274
Predicted improvement:        0.827774414
lambda =          1; f =          967.9239613
Norm of dx    0.15988
----
Improvement on iteration 26 =        0.896578485
-----------------
-----------------
f at the beginning of new iteration,       967.9239613420
Predicted improvement:        0.313197196
lambda =          1; f =          967.5903977
Norm of dx   0.019111
----
Improvement on iteration 27 =        0.333563657
-----------------
-----------------
f at the beginning of new iteration,       967.5903976847
Predicted improvement:        0.436687366
lambda =          1; f =          966.8743058
lambda =     1.9332; f =          966.6015031
Norm of dx   0.032105
----
Improvement on iteration 28 =        0.988894593
-----------------
-----------------
f at the beginning of new iteration,       966.6015030913
Predicted improvement:        0.316485636
lambda =          1; f =          966.0641572
lambda =     1.9332; f =          965.7351794
lambda =     3.7372; f =          965.5783436
Norm of dx   0.019185
```

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----
Improvement on iteration 29 =        1.023159451
-----------------
-----------------
f at the beginning of new iteration,       965.5783436405
Predicted improvement:        0.872622871
lambda =          1; f =          964.3847295
Norm of dx   0.074185
----
Improvement on iteration 30 =        1.193614127
-----------------
-----------------
f at the beginning of new iteration,       964.3847295130
Predicted improvement:        2.365471017
lambda =          1; f =          964.3898877
lambda =    0.33333; f =          963.3063292
Norm of dx    0.26988
----
Improvement on iteration 31 =        1.078400349
-----------------
-----------------
f at the beginning of new iteration,       963.3063291640
Predicted improvement:        1.876998572
lambda =          1; f =          962.1872311
lambda =    0.33333; f =          962.4400308
Norm of dx    0.15263
----
Improvement on iteration 32 =        1.119098096
-----------------
-----------------
f at the beginning of new iteration,       962.1872310684
Predicted improvement:        0.365725538
lambda =          1; f =          961.6007941
lambda =     1.9332; f =          961.8969868
lambda =     1.3017; f =          961.5323701
Norm of dx   0.033814
----
Improvement on iteration 33 =        0.654860932
-----------------
-----------------
f at the beginning of new iteration,       961.5323701365
Predicted improvement:        0.170251291
lambda =          1; f =          961.2566833
lambda =     1.9332; f =          961.1398193
Norm of dx   0.011033
----
Improvement on iteration 34 =        0.392550866
-----------------
-----------------
f at the beginning of new iteration,       961.1398192704
Predicted improvement:        0.342003701
lambda =          1; f =          961.0114936
lambda =    0.33333; f =          960.9835014
Norm of dx   0.036876
----
Improvement on iteration 35 =        0.156317911
-----------------
-----------------
f at the beginning of new iteration,       960.9835013595
Predicted improvement:        0.267381622
lambda =          1; f =          960.5736341
lambda =     1.9332; f =          960.4263028
Norm of dx   0.039316
```

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----
Improvement on iteration 36 =        0.557198606
-----------------
-----------------
f at the beginning of new iteration,       960.4263027539
Predicted improvement:        0.323077147
lambda =          1; f =          959.9193554
lambda =     1.9332; f =          959.6760046
Norm of dx   0.029641
----
Improvement on iteration 37 =        0.750298122
-----------------
-----------------
f at the beginning of new iteration,       959.6760046316
Predicted improvement:        0.201331559
lambda =          1; f =          959.3785268
lambda =     1.9332; f =          959.3015833
Norm of dx    0.03329
----
Improvement on iteration 38 =        0.374421367
-----------------
-----------------
f at the beginning of new iteration,       959.3015832645
Predicted improvement:        0.047620274
lambda =          1; f =          959.2252761
lambda =     1.9332; f =          959.1871943
Norm of dx  0.0057906
----
Improvement on iteration 39 =        0.114388918
-----------------
-----------------
f at the beginning of new iteration,       959.1871943467
Predicted improvement:        0.053081013
lambda =          1; f =          959.1011154
lambda =     1.9332; f =          959.0590043
Norm of dx   0.010691
----
Improvement on iteration 40 =        0.128190005
-----------------
-----------------
f at the beginning of new iteration,       959.0590043420
Predicted improvement:        0.111465236
lambda =          1; f =          958.8583019
lambda =     1.9332; f =          958.7075736
lambda =     3.7372; f =          958.5036212
Norm of dx   0.019114
----
Improvement on iteration 41 =        0.555383182
-----------------
-----------------
f at the beginning of new iteration,       958.5036211604
Predicted improvement:        0.452726312
lambda =          1; f =          957.6839226
lambda =     1.9332; f =          956.9973271
lambda =     3.7372; f =          955.6218628
lambda =     7.2247; f =          955.1113745
Norm of dx   0.086814
----
Improvement on iteration 42 =        3.392246677
-----------------
-----------------
f at the beginning of new iteration,       955.1113744834
Predicted improvement:       83.347040553
```

```
lambda =          1; f =          958.0109310
lambda =    0.33333; f =          954.5171952
lambda =    0.11111; f =          952.5634620
lambda =   0.037037; f =          952.5278089
Norm of dx    0.59982
----
Improvement on iteration 43 =        2.583565614
-----------------
-----------------
f at the beginning of new iteration,       952.5278088689
Predicted improvement:        1.170809345
lambda =          1; f =          951.3367272
Norm of dx    0.10976
----
Improvement on iteration 44 =        1.191081678
-----------------
-----------------
f at the beginning of new iteration,       951.3367271905
Predicted improvement:        0.518840400
lambda =          1; f =          950.5588674
lambda =     1.9332; f =          950.3075603
Norm of dx   0.030345
----
Improvement on iteration 45 =        1.029166927
-----------------
-----------------
f at the beginning of new iteration,       950.3075602635
Predicted improvement:        0.270843433
lambda =          1; f =          949.8389057
lambda =     1.9332; f =          949.5634781
lambda =     3.7372; f =          949.8030069
lambda =     2.5164; f =          949.5005922
Norm of dx   0.018659
----
Improvement on iteration 46 =        0.806968030
-----------------
-----------------
f at the beginning of new iteration,       949.5005922333
Predicted improvement:        0.192629733
lambda =          1; f =          949.2084317
lambda =     1.9332; f =          949.0872164
Norm of dx   0.028381
----
Improvement on iteration 47 =        0.413375850
-----------------
-----------------
f at the beginning of new iteration,       949.0872163832
Predicted improvement:        0.335357638
lambda =          1; f =          948.4713023
lambda =     1.9332; f =          948.0100121
lambda =     3.7372; f =          947.6102298
Norm of dx   0.030341
----
Improvement on iteration 48 =        1.476986623
-----------------
-----------------
f at the beginning of new iteration,       947.6102297597
Predicted improvement:        2.274754164
lambda =          1; f =          947.6123648
lambda =    0.33333; f =          946.9415381
Norm of dx    0.15746
----
Improvement on iteration 49 =        0.668691671
```

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-----------------
-----------------
f at the beginning of new iteration,       946.9415380883
Predicted improvement:        2.519790375
lambda =          1; f =          945.0158802
Norm of dx   0.081012
----
Improvement on iteration 50 =        1.925657873
-----------------
-----------------
f at the beginning of new iteration,       945.0158802152
Predicted improvement:        0.593914044
lambda =          1; f =          944.1766186
lambda =     1.9332; f =          944.5501230
lambda =     1.3017; f =          944.1152438
Norm of dx   0.030846
----
Improvement on iteration 51 =        0.900636429
-----------------
-----------------
f at the beginning of new iteration,       944.1152437863
Predicted improvement:        0.163951578
lambda =          1; f =          944.0324386
lambda =    0.33333; f =          944.0342072
lambda =    0.64439; f =          944.0074933
Norm of dx    0.02663
----
Improvement on iteration 52 =        0.107750459
-----------------
-----------------
f at the beginning of new iteration,       944.0074933270
Predicted improvement:        0.038159842
lambda =          1; f =          943.9532010
lambda =     1.9332; f =          943.9450687
Norm of dx   0.006687
----
Improvement on iteration 53 =        0.062424625
-----------------
-----------------
f at the beginning of new iteration,       943.9450687021
Predicted improvement:        0.033062057
lambda =          1; f =          943.8976354
lambda =     1.9332; f =          943.8857399
Norm of dx   0.005072
----
Improvement on iteration 54 =        0.059328824
-----------------
-----------------
f at the beginning of new iteration,       943.8857398783
Predicted improvement:        0.038597370
lambda =          1; f =          943.8156229
lambda =     1.9332; f =          943.7629960
lambda =     3.7372; f =          943.6967062
Norm of dx  0.0087324
----
Improvement on iteration 55 =        0.189033700
-----------------
-----------------
f at the beginning of new iteration,       943.6967061783
Predicted improvement:        0.158752248
lambda =          1; f =          943.4425761
lambda =     1.9332; f =          943.3225357
Norm of dx   0.034284
```

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----
Improvement on iteration 56 =        0.374170459
-----------------
-----------------
f at the beginning of new iteration,       943.3225357190
Predicted improvement:        0.183819257
lambda =          1; f =          943.0158313
lambda =     1.9332; f =          942.8385872
Norm of dx   0.042275
----
Improvement on iteration 57 =        0.483948558
-----------------
-----------------
f at the beginning of new iteration,       942.8385871609
Predicted improvement:        0.261628522
lambda =          1; f =          942.4572845
lambda =     1.9332; f =          942.3436185
Norm of dx   0.069036
----
Improvement on iteration 58 =        0.494968667
-----------------
-----------------
f at the beginning of new iteration,       942.3436184940
Predicted improvement:        0.116878907
lambda =          1; f =          942.1618126
lambda =     1.9332; f =          942.0922320
Norm of dx   0.011601
----
Improvement on iteration 59 =        0.251386479
-----------------
-----------------
f at the beginning of new iteration,       942.0922320148
Predicted improvement:        0.031842141
lambda =          1; f =          942.0353712
lambda =     1.9332; f =          941.9946933
lambda =     3.7372; f =          941.9504829
Norm of dx  0.0080067
----
Improvement on iteration 60 =        0.141749130
-----------------
-----------------
f at the beginning of new iteration,       941.9504828847
Predicted improvement:        0.077260413
lambda =          1; f =          941.8166902
lambda =     1.9332; f =          941.7273755
lambda =     3.7372; f =          941.6436057
Norm of dx    0.02228
----
Improvement on iteration 61 =        0.306877215
-----------------
-----------------
f at the beginning of new iteration,       941.6436056695
Predicted improvement:        0.154703959
lambda =          1; f =          941.3800372
lambda =     1.9332; f =          941.2146524
lambda =     3.7372; f =          941.1105657
Norm of dx   0.035822
----
Improvement on iteration 62 =        0.533040006
-----------------
-----------------
f at the beginning of new iteration,       941.1105656635
Predicted improvement:        0.143203161
```

```
lambda =          1; f =          940.8672152
lambda =     1.9332; f =          940.7186452
lambda =     3.7372; f =          940.6528139
Norm of dx   0.016249
----
Improvement on iteration 63 =        0.457751798
-----------------
-----------------
f at the beginning of new iteration,       940.6528138657
Predicted improvement:        0.120989737
lambda =          1; f =          940.4698731
lambda =     1.9332; f =          940.4057212
Norm of dx   0.051131
----
Improvement on iteration 64 =        0.247092697
-----------------
-----------------
f at the beginning of new iteration,       940.4057211688
Predicted improvement:        0.075354720
lambda =          1; f =          940.2753167
lambda =     1.9332; f =          940.1904475
lambda =     3.7372; f =          940.1287268
Norm of dx    0.02433
----
Improvement on iteration 65 =        0.276994377
-----------------
-----------------
f at the beginning of new iteration,       940.1287267922
Predicted improvement:        0.138157015
lambda =          1; f =          939.8686660
lambda =     1.9332; f =          939.6620632
lambda =     3.7372; f =          939.4220843
Norm of dx   0.013282
----
Improvement on iteration 66 =        0.706642498
-----------------
-----------------
f at the beginning of new iteration,       939.4220842944
Predicted improvement:        0.255906016
lambda =          1; f =          939.1098102
Norm of dx   0.079471
----
Improvement on iteration 67 =        0.312274049
-----------------
-----------------
f at the beginning of new iteration,       939.1098102454
Predicted improvement:        0.128075545
lambda =          1; f =          939.0315374
Norm of dx   0.050652
----
Improvement on iteration 68 =        0.078272815
-----------------
-----------------
f at the beginning of new iteration,       939.0315374303
Predicted improvement:        0.065931664
lambda =          1; f =          938.9486398
Norm of dx   0.011724
----
Improvement on iteration 69 =        0.082897580
-----------------
-----------------
f at the beginning of new iteration,       938.9486398500
Predicted improvement:        0.047861979
```

```
lambda =          1; f =          938.8708939
lambda =     1.9332; f =          938.8322296
Norm of dx   0.012677
----
Improvement on iteration 70 =        0.116410282
-----------------
-----------------
f at the beginning of new iteration,       938.8322295676
Predicted improvement:        0.110369790
lambda =          1; f =          938.6410362
lambda =     1.9332; f =          938.5176042
lambda =     3.7372; f =          938.4400105
Norm of dx   0.023898
----
Improvement on iteration 71 =        0.392219046
-----------------
-----------------
f at the beginning of new iteration,       938.4400105220
Predicted improvement:        0.210400745
lambda =          1; f =          938.1449356
lambda =     1.9332; f =          938.0648716
Norm of dx   0.052015
----
Improvement on iteration 72 =        0.375138912
-----------------
-----------------
f at the beginning of new iteration,       938.0648716098
Predicted improvement:        0.033226096
lambda =          1; f =          938.0186356
Norm of dx   0.011217
----
Improvement on iteration 73 =        0.046236054
-----------------
-----------------
f at the beginning of new iteration,       938.0186355555
Predicted improvement:        0.020867681
lambda =          1; f =          937.9887387
lambda =     1.9332; f =          937.9830600
Norm of dx  0.0096002
----
Improvement on iteration 74 =        0.035575552
-----------------
-----------------
f at the beginning of new iteration,       937.9830600036
Predicted improvement:        0.016811930
lambda =          1; f =          937.9530314
lambda =     1.9332; f =          937.9312216
lambda =     3.7372; f =          937.9047361
Norm of dx   0.004043
----
Improvement on iteration 75 =        0.078323946
-----------------
-----------------
f at the beginning of new iteration,       937.9047360579
Predicted improvement:        0.048308396
lambda =          1; f =          937.8274024
lambda =     1.9332; f =          937.7898276
Norm of dx   0.025505
----
Improvement on iteration 76 =        0.114908478
-----------------
-----------------
f at the beginning of new iteration,       937.7898275802
```

```
Predicted improvement:        0.050420098
lambda =          1; f =          937.7128782
lambda =     1.9332; f =          937.6843564
Norm of dx     0.0212
----
Improvement on iteration 77 =        0.105471174
-----------------
-----------------
f at the beginning of new iteration,       937.6843564059
Predicted improvement:        0.035404187
lambda =          1; f =          937.6365708
Norm of dx   0.018517
----
Improvement on iteration 78 =        0.047785627
-----------------
-----------------
f at the beginning of new iteration,       937.6365707784
Predicted improvement:        0.017532171
lambda =          1; f =          937.6157045
Norm of dx  0.0051476
----
Improvement on iteration 79 =        0.020866284
-----------------
-----------------
f at the beginning of new iteration,       937.6157044944
Predicted improvement:        0.005565239
lambda =          1; f =          937.6071895
lambda =     1.9332; f =          937.6041073
Norm of dx  0.0034317
----
Improvement on iteration 80 =        0.011597224
-----------------
-----------------
f at the beginning of new iteration,       937.6041072704
Predicted improvement:        0.003562742
lambda =          1; f =          937.5984547
lambda =     1.9332; f =          937.5957901
Norm of dx  0.0035125
----
Improvement on iteration 81 =        0.008317189
-----------------
-----------------
f at the beginning of new iteration,       937.5957900816
Predicted improvement:        0.003981692
lambda =          1; f =          937.5885174
lambda =     1.9332; f =          937.5829766
lambda =     3.7372; f =          937.5756437
Norm of dx  0.0029878
----
Improvement on iteration 82 =        0.020146424
-----------------
-----------------
f at the beginning of new iteration,       937.5756436572
Predicted improvement:        0.016371121
lambda =          1; f =          937.5487633
lambda =     1.9332; f =          937.5342741
Norm of dx   0.011447
----
Improvement on iteration 83 =        0.041369516
-----------------
-----------------
f at the beginning of new iteration,       937.5342741411
Predicted improvement:        0.018334531
```

```
lambda =          1; f =          937.5085535
lambda =     1.9332; f =          937.5045746
Norm of dx   0.013087
----
Improvement on iteration 84 =        0.029699529
-----------------
-----------------
f at the beginning of new iteration,       937.5045746116
Predicted improvement:        0.003882979
lambda =          1; f =          937.4995262
Norm of dx  0.0068581
----
Improvement on iteration 85 =        0.005048423
-----------------
-----------------
f at the beginning of new iteration,       937.4995261886
Predicted improvement:        0.001531974
lambda =          1; f =          937.4970359
lambda =     1.9332; f =          937.4957419
Norm of dx  0.0022671
----
Improvement on iteration 86 =        0.003784264
-----------------
-----------------
f at the beginning of new iteration,       937.4957419251
Predicted improvement:        0.002764611
lambda =          1; f =          937.4905802
lambda =     1.9332; f =          937.4864238
lambda =     3.7372; f =          937.4801851
lambda =     7.2247; f =          937.4747762
Norm of dx   0.002223
----
Improvement on iteration 87 =        0.020965706
-----------------
-----------------
f at the beginning of new iteration,       937.4747762192
Predicted improvement:        0.016188734
lambda =          1; f =          937.4438204
lambda =     1.9332; f =          937.4175215
lambda =     3.7372; f =          937.3738417
lambda =     7.2247; f =          937.3169239
Norm of dx   0.014339
----
Improvement on iteration 88 =        0.157852285
-----------------
-----------------
f at the beginning of new iteration,       937.3169239341
Predicted improvement:        0.045258457
lambda =          1; f =          937.2629240
Norm of dx   0.059349
----
Improvement on iteration 89 =        0.053999968
-----------------
-----------------
f at the beginning of new iteration,       937.2629239658
Predicted improvement:        0.005894440
lambda =          1; f =          937.2554338
Norm of dx  0.0098694
----
Improvement on iteration 90 =        0.007490199
-----------------
-----------------
f at the beginning of new iteration,       937.2554337670
```

```
Predicted improvement:        0.002169114
lambda =          1; f =          937.2521053
lambda =     1.9332; f =          937.2508463
Norm of dx  0.0044054
----
Improvement on iteration 91 =        0.004587457
-----------------
-----------------
f at the beginning of new iteration,       937.2508463097
Predicted improvement:        0.002398830
lambda =          1; f =          937.2463380
lambda =     1.9332; f =          937.2426491
lambda =     3.7372; f =          937.2369230
lambda =     7.2247; f =          937.2310238
Norm of dx  0.0018011
----
Improvement on iteration 92 =        0.019822524
-----------------
-----------------
f at the beginning of new iteration,       937.2310237852
Predicted improvement:        0.016383035
lambda =          1; f =          937.2029977
lambda =     1.9332; f =          937.1854193
lambda =     3.7372; f =          937.1750713
Norm of dx   0.016684
----
Improvement on iteration 93 =        0.055952497
-----------------
-----------------
f at the beginning of new iteration,       937.1750712886
Predicted improvement:        0.017704162
lambda =          1; f =          937.1510903
Norm of dx   0.017689
----
Improvement on iteration 94 =        0.023981020
-----------------
-----------------
f at the beginning of new iteration,       937.1510902690
Predicted improvement:        0.006227311
lambda =          1; f =          937.1445990
Norm of dx   0.015892
----
Improvement on iteration 95 =        0.006491307
-----------------
-----------------
f at the beginning of new iteration,       937.1445989618
Predicted improvement:        0.000534522
lambda =          1; f =          937.1436303
lambda =     1.9332; f =          937.1429058
lambda =     3.7372; f =          937.1419966
Norm of dx  0.0019141
----
Improvement on iteration 96 =        0.002602343
-----------------
-----------------
f at the beginning of new iteration,       937.1419966190
Predicted improvement:        0.002381611
lambda =          1; f =          937.1376807
lambda =     1.9332; f =          937.1344575
lambda =     3.7372; f =          937.1304412
Norm of dx  0.0034571
----
Improvement on iteration 97 =        0.011555428
```

```
-----------------
-----------------
f at the beginning of new iteration,       937.1304411912
Predicted improvement:        0.011372224
lambda =          1; f =          937.1094577
lambda =     1.9332; f =          937.0930736
lambda =     3.7372; f =          937.0703150
lambda =     7.2247; f =          937.0608323
Norm of dx   0.015538
----
Improvement on iteration 98 =        0.069608935
-----------------
-----------------
f at the beginning of new iteration,       937.0608322557
Predicted improvement:        0.050626411
lambda =          1; f =          936.9756190
lambda =     1.9332; f =          936.9243160
Norm of dx   0.044313
----
Improvement on iteration 99 =        0.136516278
-----------------
-----------------
f at the beginning of new iteration,       936.9243159781
Predicted improvement:        0.048431818
lambda =          1; f =          936.8710385
Norm of dx    0.11918
----
Improvement on iteration 100 =        0.053277520
-----------------
-----------------
f at the beginning of new iteration,       936.8710384581
Predicted improvement:        0.001383993
lambda =          1; f =          936.8693567
Norm of dx   0.020168
----
Improvement on iteration 101 =        0.001681799
-----------------
-----------------
f at the beginning of new iteration,       936.8693566594
Predicted improvement:        0.000286594
lambda =          1; f =          936.8688871
lambda =     1.9332; f =          936.8686373
Norm of dx  0.0048163
----
Improvement on iteration 102 =        0.000719342
-----------------
-----------------
f at the beginning of new iteration,       936.8686373171
Predicted improvement:        0.000547833
lambda =          1; f =          936.8676341
lambda =     1.9332; f =          936.8668529
lambda =     3.7372; f =          936.8657672
lambda =     7.2247; f =          936.8652588
Norm of dx  0.0042439
----
Improvement on iteration 103 =        0.003378536
-----------------
-----------------
f at the beginning of new iteration,       936.8652587810
Predicted improvement:        0.003004297
lambda =          1; f =          936.8594010
lambda =     1.9332; f =          936.8542082
lambda =     3.7372; f =          936.8449140
```

lambda =   7.2247; f =   936.8297041
lambda =   13.967; f =   936.8104458
Norm of dx 0.0038304

Improvement on iteration 104 =   0.054813027

----
f at the beginning of new iteration,   936.8104457535
Predicted improvement: 0.038390484
lambda =   1; f =   936.7520252
lambda =   1.9332; f =   936.7305946
Norm of dx   0.088503

Improvement on iteration 105 =   0.079851150

----
f at the beginning of new iteration,   936.7305946036
Predicted improvement: 0.010555228
lambda =   1; f =   936.7166641
Norm of dx   0.072433

Improvement on iteration 106 =   0.013930531

----
f at the beginning of new iteration,   936.7166640725
Predicted improvement: 0.001812601
lambda =   1; f =   936.7148025
Norm of dx   0.033018

Improvement on iteration 107 =   0.001861595

----
f at the beginning of new iteration,   936.7148024777
Predicted improvement: 0.000060616
lambda =   1; f =   936.7146892
lambda =   1.9332; f =   936.7145976
lambda =   3.7372; f =   936.7144595
lambda =   7.2247; f =   936.7143379
Norm of dx 0.0014695

Improvement on iteration 108 =   0.000464627

----
f at the beginning of new iteration,   936.7143378504
Predicted improvement: 0.000357802
lambda =   1; f =   936.7136516
lambda =   1.9332; f =   936.7130625
lambda =   3.7372; f =   936.7120645
lambda =   7.2247; f =   936.7106614
lambda =   13.967; f =   936.7099185
Norm of dx 0.00084986

Improvement on iteration 109 =   0.004419349

----
f at the beginning of new iteration,   936.7099185017
Predicted improvement: 0.001228913
lambda =   1; f =   936.7083506
Norm of dx 0.0055111

Improvement on iteration 110 =   0.001567949


```
f at the beginning of new iteration,       936.7083505523
Predicted improvement:        0.000185496
lambda =          1; f =          936.7081574
Norm of dx  0.0034649
----
Improvement on iteration 111 =        0.000193140
-----------------
-----------------
f at the beginning of new iteration,       936.7081574128
Correct for low angle: 0.0034321
Predicted improvement:        0.000006623
lambda =          1; f =          936.7081464
lambda =     1.9332; f =          936.7081398
Norm of dx 0.00048688
----
Improvement on iteration 112 =        0.000017619
-----------------
-----------------
f at the beginning of new iteration,       936.7081397937
Correct for low angle: 0.00481654
Predicted improvement:        0.000015434
lambda =          1; f =          936.7081144
lambda =     1.9332; f =          936.7080993
Norm of dx  0.0011346
----
Improvement on iteration 113 =        0.000040508
-----------------
-----------------
f at the beginning of new iteration,       936.7080992854
Predicted improvement:        0.000045528
lambda =          1; f =          936.7080163
lambda =     1.9332; f =          936.7079535
lambda =     3.7372; f =          936.7078722
Norm of dx 0.00072045
----
Improvement on iteration 114 =        0.000227050
-----------------
-----------------
f at the beginning of new iteration,       936.7078722353
Predicted improvement:        0.000238662
lambda =          1; f =          936.7074236
lambda =     1.9332; f =          936.7070572
lambda =     3.7372; f =          936.7064925
lambda =     7.2247; f =          936.7059413
Norm of dx  0.0015831
----
Improvement on iteration 115 =        0.001930886
-----------------
-----------------
f at the beginning of new iteration,       936.7059413498
Predicted improvement:        0.001751073
lambda =          1; f =          936.7024768
lambda =     1.9332; f =          936.6993144
lambda =     3.7372; f =          936.6933946
lambda =     7.2247; f =          936.6826763
lambda =     13.967; f =          936.6646813
lambda =         27; f =          936.6401865
Norm of dx  0.0018863
----
Improvement on iteration 116 =        0.065754842
-----------------
-----------------
f at the beginning of new iteration,       936.6401865077
```

```
Predicted improvement:        0.062508793
lambda =          1; f =          936.5450076
lambda =     1.9332; f =          936.5107121
Norm of dx   0.072742
----
Improvement on iteration 117 =        0.129474433
-----------------
-----------------
f at the beginning of new iteration,       936.5107120746
Predicted improvement:        0.018507261
lambda =          1; f =          936.4871468
Norm of dx   0.016121
----
Improvement on iteration 118 =        0.023565314
-----------------
-----------------
f at the beginning of new iteration,       936.4871467606
Predicted improvement:        0.002440801
lambda =          1; f =          936.4843855
Norm of dx  0.0047165
----
Improvement on iteration 119 =        0.002761262
-----------------
-----------------
f at the beginning of new iteration,       936.4843854990
Predicted improvement:        0.000417282
lambda =          1; f =          936.4836127
lambda =     1.9332; f =          936.4830013
lambda =     3.7372; f =          936.4821205
lambda =     7.2247; f =          936.4815445
Norm of dx  0.0030924
----
Improvement on iteration 120 =        0.002840962
-----------------
-----------------
f at the beginning of new iteration,       936.4815445370
Predicted improvement:        0.002387141
lambda =          1; f =          936.4767963
lambda =     1.9332; f =          936.4724126
lambda =     3.7372; f =          936.4640679
lambda =     7.2247; f =          936.4484210
lambda =     13.967; f =          936.4199890
lambda =         27; f =          936.3718422
lambda =     52.196; f =          936.3045110
lambda =      100.9; f =          936.2731985
Norm of dx  0.0012166
----
Improvement on iteration 121 =        0.208346021
-----------------
-----------------
f at the beginning of new iteration,       936.2731985164
Predicted improvement:        0.193266749
lambda =          1; f =          935.8968051
lambda =     1.9332; f =          935.5631657
lambda =     3.7372; f =          934.9632047
lambda =     7.2247; f =          933.9566199
lambda =     13.967; f =          932.5236678
Norm of dx   0.063265
----
Improvement on iteration 122 =        3.749530700
-----------------
-----------------
f at the beginning of new iteration,       932.5236678166
```

```
Predicted improvement:        5.235869264
lambda =          1; f =          922.5261899
lambda =     1.9332; f =          915.2615057
lambda =     3.7372; f =          946.3525516
lambda =     2.5164; f =          914.0186863
lambda =     3.1904; f =          921.5607533
Norm of dx     2.1802
----
Improvement on iteration 123 =       18.504981482
-----------------
-----------------
f at the beginning of new iteration,       914.0186863347
Predicted improvement:       13.949547450
lambda =          1; f =         1003.1616608
lambda =    0.33333; f =          911.1584346
Norm of dx      4.017
----
Improvement on iteration 124 =        2.860251738
-----------------
-----------------
f at the beginning of new iteration,       911.1584345970
Predicted improvement:       12.796294977
lambda =          1; f =          910.4967853
lambda =    0.33333; f =          906.3883950
Norm of dx     2.0049
----
Improvement on iteration 125 =        4.770039604
-----------------
-----------------
f at the beginning of new iteration,       906.3883949929
Predicted improvement:        2.846598932
lambda =          1; f =          904.2020432
Norm of dx    0.62592
----
Improvement on iteration 126 =        2.186351830
-----------------
-----------------
f at the beginning of new iteration,       904.2020431628
Predicted improvement:        1.283703254
lambda =          1; f =          902.8674190
Norm of dx    0.51017
----
Improvement on iteration 127 =        1.334624168
-----------------
-----------------
f at the beginning of new iteration,       902.8674189944
Predicted improvement:        0.433554271
lambda =          1; f =          902.2689280
Norm of dx   0.087311
----
Improvement on iteration 128 =        0.598490961
-----------------
-----------------
f at the beginning of new iteration,       902.2689280331
Predicted improvement:        0.461911835
lambda =          1; f =          901.7309439
Norm of dx    0.14571
----
Improvement on iteration 129 =        0.537984173
-----------------
-----------------
f at the beginning of new iteration,       901.7309438599
Predicted improvement:        0.236773702
```

lambda =   1; f =   901.4232631
Norm of dx   0.11441

Improvement on iteration 130 =   0.307680729

----
f at the beginning of new iteration,   901.4232631313
Predicted improvement: 0.241794325
lambda =   1; f =   901.1178692
Norm of dx   0.14728

Improvement on iteration 131 =   0.305393949

----
f at the beginning of new iteration,   901.1178691820
Predicted improvement: 0.102237650
lambda =   1; f =   901.0177094
Norm of dx   0.09191

Improvement on iteration 132 =   0.100159797

----
f at the beginning of new iteration,   901.0177093853
Predicted improvement: 0.034195555
lambda =   1; f =   900.9734095
Norm of dx   0.04306

Improvement on iteration 133 =   0.044299871

----
f at the beginning of new iteration,   900.9734095139
Predicted improvement: 0.022041774
lambda =   1; f =   900.9554724
Norm of dx   0.040083

Improvement on iteration 134 =   0.017937094

----
f at the beginning of new iteration,   900.9554724200
Predicted improvement: 0.012717169
lambda =   1; f =   900.9390303
Norm of dx 0.0077574

Improvement on iteration 135 =   0.016442149

----
f at the beginning of new iteration,   900.9390302709
Predicted improvement: 0.014921898
lambda =   1; f =   900.9122525
lambda =   1.9332; f =   900.8927237
lambda =   3.7372; f =   900.8695767
Norm of dx   0.014474

Improvement on iteration 136 =   0.069453542

----
f at the beginning of new iteration,   900.8695767285
Predicted improvement: 0.054888558
lambda =   1; f =   900.7682865
lambda =   1.9332; f =   900.6887908
lambda =   3.7372; f =   900.5747968
lambda =   7.2247; f =   900.4952399
Norm of dx   0.027673

```
----
Improvement on iteration 137 =        0.374336870
-----------------
-----------------
f at the beginning of new iteration,       900.4952398589
Predicted improvement:        0.198176008
lambda =          1; f =          900.1569244
lambda =     1.9332; f =          899.9448578
lambda =     3.7372; f =          899.8183705
Norm of dx   0.079127
----
Improvement on iteration 138 =        0.676869335
-----------------
-----------------
f at the beginning of new iteration,       899.8183705243
Predicted improvement:        0.240143835
lambda =          1; f =          899.5256995
Norm of dx    0.11762
----
Improvement on iteration 139 =        0.292670977
-----------------
-----------------
f at the beginning of new iteration,       899.5256995478
Predicted improvement:        0.167185641
lambda =          1; f =          899.3614232
Norm of dx    0.12586
----
Improvement on iteration 140 =        0.164276379
-----------------
-----------------
f at the beginning of new iteration,       899.3614231687
Predicted improvement:        0.025295860
lambda =          1; f =          899.3299046
Norm of dx   0.031035
----
Improvement on iteration 141 =        0.031518594
-----------------
-----------------
f at the beginning of new iteration,       899.3299045751
Predicted improvement:        0.004504505
lambda =          1; f =          899.3249072
Norm of dx   0.017057
----
Improvement on iteration 142 =        0.004997416
-----------------
-----------------
f at the beginning of new iteration,       899.3249071590
Predicted improvement:        0.000451954
lambda =          1; f =          899.3242580
lambda =     1.9332; f =          899.3241190
Norm of dx  0.0042757
----
Improvement on iteration 143 =        0.000788173
-----------------
-----------------
f at the beginning of new iteration,       899.3241189861
Predicted improvement:        0.000160404
lambda =          1; f =          899.3238478
lambda =     1.9332; f =          899.3236834
lambda =     3.7372; f =          899.3236079
Norm of dx  0.0012596
----
Improvement on iteration 144 =        0.000511099
```

```
-----------------
-----------------
f at the beginning of new iteration,       899.3236078871
Predicted improvement:        0.000362057
lambda =          1; f =          899.3229186
lambda =     1.9332; f =          899.3223376
lambda =     3.7372; f =          899.3213838
lambda =     7.2247; f =          899.3201691
Norm of dx  0.0012774
----
Improvement on iteration 145 =        0.003438744
-----------------
-----------------
f at the beginning of new iteration,       899.3201691431
Predicted improvement:        0.003586194
lambda =          1; f =          899.3137668
lambda =     1.9332; f =          899.3091694
lambda =     3.7372; f =          899.3040376
Norm of dx  0.0094612
----
Improvement on iteration 146 =        0.016131589
-----------------
-----------------
f at the beginning of new iteration,       899.3040375537
Predicted improvement:        0.009976294
lambda =          1; f =          899.2872823
lambda =     1.9332; f =          899.2773912
Norm of dx   0.021288
----
Improvement on iteration 147 =        0.026646371
-----------------
-----------------
f at the beginning of new iteration,       899.2773911823
Predicted improvement:        0.009726439
lambda =          1; f =          899.2659779
Norm of dx   0.029799
----
Improvement on iteration 148 =        0.011413322
-----------------
-----------------
f at the beginning of new iteration,       899.2659778606
Predicted improvement:        0.000874640
lambda =          1; f =          899.2650001
Norm of dx  0.0080213
----
Improvement on iteration 149 =        0.000977720
-----------------
-----------------
f at the beginning of new iteration,       899.2650001408
Predicted improvement:        0.000033814
lambda =          1; f =          899.2649643
Norm of dx  0.0016915
----
Improvement on iteration 150 =        0.000035841
-----------------
-----------------
f at the beginning of new iteration,       899.2649643003
Predicted improvement:        0.000001699
lambda =          1; f =          899.2649627
Norm of dx  0.0011031
----
Improvement on iteration 151 =        0.000001633
-----------------
```

```
-----------------
f at the beginning of new iteration,       899.2649626674
Predicted improvement:        0.000000311
lambda =          1; f =          899.2649630
lambda =    0.33333; f =          899.2649627
lambda =    0.11111; f =          899.2649627
lambda =   0.037037; f =          899.2649627
lambda =   0.012346; f =          899.2649627
lambda =  0.0041152; f =          899.2649627
lambda =  0.0013717; f =          899.2649627
lambda = 0.00045725; f =          899.2649627
lambda = 0.00015242; f =          899.2649627
lambda = 5.0805e-05; f =          899.2649627
lambda = 1.6935e-05; f =          899.2649627
lambda =  5.645e-06; f =          899.2649627
lambda = 1.8817e-06; f =          899.2649627
lambda = 6.2723e-07; f =          899.2649627
lambda = 2.0908e-07; f =          899.2649627
lambda = 6.9692e-08; f =          899.2649627
lambda = 2.3231e-08; f =          899.2649627
lambda = 7.7435e-09; f =          899.2649627
lambda = 2.5812e-09; f =          899.2649627
Norm of dx  0.0006207
----
Improvement on iteration 152 =        0.000000003
improvement < crit termination
smallest step still improving too slow
Objective function at mode: 899.264963

RESULTS FROM POSTERIOR ESTIMATION
parameters
         prior mean     mode    s.d. prior pstdev

rho_a_c      0.500   0.2136  0.0837 beta  0.2000
rho_a_d      0.500   0.4994  0.2774 beta  0.2000
rho_mu_c     0.500   0.5007  0.2774 beta  0.2000
rho_mu_d     0.500   0.5000  0.2774 beta  0.2000
rho_LTV      0.500   0.4955  0.2749 beta  0.2000
rho_d        0.500   0.5090  0.2769 beta  0.2000
rho_d_stern   0.500   0.8886  0.0197 beta  0.2000
rho_c_ast    0.500   0.6126  0.2569 beta  0.2000
rho_d_ast    0.500   0.5000  0.2773 beta  0.2000
rho_s_c      0.500   0.4429  0.1047 beta  0.2000
rho_r        0.500   0.6903  0.0903 beta  0.2000
rho_p       -0.500  -0.4978  0.2000 norm  0.2000
theta_c      0.750   0.3025  0.0690 beta  0.1500
sigma        1.000   1.8931  0.1065 norm  0.3700
phi          2.000   4.8621  0.7652 gamm  0.7000
omega        0.200   0.0995  0.0636 beta  0.1000
h_c          0.500   0.2880  0.0532 beta  0.1000
alpha_c      0.500   0.4013  0.0320 beta  0.1000

standard deviation of shocks
         prior mean     mode    s.d. prior pstdev

epsa_c       0.100   2.3375  0.1844 invg  2.0000
epsa_d       0.100   0.0461  0.0189 invg  2.0000
epsmu_c      0.100   0.0461  0.0188 invg  2.0000
epsmu_d      0.100   0.0461  0.0188 invg  2.0000
epsLTV       0.100   0.0461  0.0188 invg  2.0000
epsd         0.100   0.0459  0.0186 invg  2.0000
epsc_ast     0.100   0.0392  0.0125 invg  2.0000
epsd_ast     0.100   0.0461  0.0188 invg  2.0000
```

```
epsd_stern    0.100   0.6151  0.1103 invg  2.0000
epss_c        0.100   1.1355  0.1015 invg  2.0000
epsr          0.100   0.6050  0.1824 invg  2.0000
epsyf         0.100   0.0461  0.0189 invg  2.0000
epsn          0.010   0.8545  0.0680 invg  0.1000
epspi_d       0.010   5.7114  0.4368 invg  0.1000


Log data density [Laplace approximation] is -952.459083.

Estimation::mcmc: Multiple chains mode.
Estimation::mcmc: Searching for initial values...
Estimation::mcmc: Initial values found!

Estimation::mcmc: Write details about the MCMC... Ok!
Estimation::mcmc: Details about the MCMC are available in
code_87/metropolis\code_mh_history_0.mat

[ Warning: Matrix is close to singular or badly scaled. Results may be inaccurate.
RCOND =
4.318762e-17.]
[ > In <a href="matlab:
opentoline('C:\dynare\4.4.3\matlab\lyapunov_symm.m',162,1)">lyapunov_symm at 162</a>
  In <a href="matlab:
opentoline('C:\dynare\4.4.3\matlab\dsge_likelihood.m',374,1)">dsge_likelihood at
374</a>
  In <a href="matlab:
opentoline('C:\dynare\4.4.3\matlab\random_walk_metropolis_hastings_core.m',167,1)">r
andom_walk_metropolis_hastings_core at 167</a>
  In <a href="matlab:
opentoline('C:\dynare\4.4.3\matlab\random_walk_metropolis_hastings.m',117,1)">random
_walk_metropolis_hastings at 117</a>
  In <a href="matlab:
opentoline('C:\dynare\4.4.3\matlab\dynare_estimation_1.m',782,1)">dynare_estimation_
1 at 782</a>
  In <a href="matlab:
opentoline('C:\dynare\4.4.3\matlab\dynare_estimation.m',77,1)">dynare_estimation at
77</a>
  In <a href="matlab: opentoline('C:\Users\English\Desktop\forecasting no news
shock\code.m',526,1)">code at 526</a>
  In <a href="matlab: opentoline('C:\dynare\4.4.3\matlab\dynare.m',180,1)">dynare at
180</a>]

Estimation::mcmc: Number of mh files: 55 per block.
Estimation::mcmc: Total number of generated files: 110.
Estimation::mcmc: Total number of iterations: 200000.
Estimation::mcmc: Current acceptance ratio per chain:
                                                    Chain  1: 33.1098%
                                                    Chain  2: 33.2308%
Estimation::mcmc::diagnostics: Univariate convergence diagnostic, Brooks and Gelman
(1998):
    Parameter 1...  Done!
    Parameter 2...  Done!
    Parameter 3...  Done!
    Parameter 4...  Done!
    Parameter 5...  Done!
    Parameter 6...  Done!
    Parameter 7...  Done!
    Parameter 8...  Done!
    Parameter 9...  Done!
    Parameter 10...  Done!
    Parameter 11...  Done!
    Parameter 12...  Done!
```

```
    Parameter 13...  Done!
    Parameter 14...  Done!
    Parameter 15...  Done!
    Parameter 16...  Done!
    Parameter 17...  Done!
    Parameter 18...  Done!
    Parameter 19...  Done!
    Parameter 20...  Done!
    Parameter 21...  Done!
    Parameter 22...  Done!
    Parameter 23...  Done!
    Parameter 24...  Done!
    Parameter 25...  Done!
    Parameter 26...  Done!
    Parameter 27...  Done!
    Parameter 28...  Done!
    Parameter 29...  Done!
    Parameter 30...  Done!
    Parameter 31...  Done!
    Parameter 32...  Done!

Estimation::mcmc: Total number of MH draws: 200000.
Estimation::mcmc: Total number of generated MH files: 55.
Estimation::mcmc: I'll use mh-files 28 to 55.
Estimation::mcmc: In MH-file number 28 I'll start at line 721.
Estimation::mcmc: Finally I keep 100000 draws.

Estimation::marginal density: I'm computing the posterior mean and covariance...
Done!
Estimation::marginal density: I'm computing the posterior log marginal density
(modified harmonic mean)... Done!


ESTIMATION RESULTS

Log data density is -950.365918.
posterior_moments: There are not enough draws computes to compute HPD Intervals.
Skipping their computation.
posterior_moments: There are not enough draws computes to compute deciles. Skipping
their computation.

parameters
             prior mean   post. mean        90% HPD interval    prior       pstdev

rho_a_c           0.500       0.2235      0.0936      0.3550   beta        0.2000
rho_a_d           0.500       0.4988      0.1749      0.8288   beta        0.2000
rho_mu_c          0.500       0.5021      0.1680      0.8270   beta        0.2000
rho_mu_d          0.500       0.5102      0.1814      0.8399   beta        0.2000
rho_LTV           0.500       0.4954      0.1643      0.8125   beta        0.2000
rho_d             0.500       0.5318      0.2089      0.8606   beta        0.2000
rho_d_stern        0.500       0.8876      0.8542      0.9212   beta        0.2000
rho_c_ast         0.500       0.6234      0.3278      0.9233   beta        0.2000
rho_d_ast         0.500       0.4950      0.1726      0.8292   beta        0.2000
rho_s_c           0.500       0.4397      0.2665      0.6047   beta        0.2000
rho_r             0.500       0.6107      0.4033      0.8056   beta        0.2000
rho_p            -0.500      -0.4900     -0.8202     -0.1725   norm        0.2000
theta_c           0.750       0.2933      0.1801      0.4047   beta        0.1500
sigma             1.000       1.9436      1.7600      2.1218   norm        0.3700
phi               2.000       5.0408      3.7563      6.3142   gamma       0.7000
omega             0.200       0.1301      0.0294      0.2301   beta        0.1000
h_c               0.500       0.2807      0.1935      0.3647   beta        0.1000
alpha_c           0.500       0.4037      0.3483      0.4554   beta        0.1000
```

```
standard deviation of shocks
              prior mean   post. mean        90% HPD interval    prior       pstdev

epsa_c            0.100       2.3871      2.0675      2.6942   invg        2.0000
epsa_d            0.100       0.0905      0.0240      0.1803   invg        2.0000
epsmu_c           0.100       0.0780      0.0243      0.1432   invg        2.0000
epsmu_d           0.100       0.0927      0.0220      0.1668   invg        2.0000
epsLTV            0.100       0.0805      0.0238      0.1421   invg        2.0000
epsd              0.100       0.0814      0.0240      0.1477   invg        2.0000
epsc_ast          0.100       0.0461      0.0226      0.0694   invg        2.0000
epsd_ast          0.100       0.1043      0.0208      0.2093   invg        2.0000
epsd_stern        0.100       0.5790      0.3978      0.7530   invg        2.0000
epss_c            0.100       1.1542      0.9869      1.3327   invg        2.0000
epsr              0.100       0.7745      0.3708      1.2205   invg        2.0000
epsyf             0.100       0.0952      0.0212      0.1969   invg        2.0000
epsn              0.010       0.8712      0.7590      0.9845   invg        0.1000
epspi_d           0.010       5.8147      5.0703      6.5231   invg        0.1000
Estimation::mcmc: Posterior (dsge) IRFs...
Estimation::mcmc: Posterior IRFs, done!
Estimation::mcmc: Forecasted variables (mean)
Estimation::mcmc: Forecasted variables (mean), done!
Estimation::mcmc: Forecasted variables (point)
Estimation::mcmc: Forecasted variables (point), done!

Loading 116 observations from data100.xlsx

Restricting the sample to observations 1 to 88. Using in total 88 observations.
Initial value of the log posterior (or likelihood): -906.842
-----------------
-----------------
f at the beginning of new iteration,       906.8420213410
Predicted improvement:        0.001400309
lambda =          1; f =          906.8397889
lambda =     1.9332; f =          906.8387411
Norm of dx 0.00052921
----
Improvement on iteration 1 =        0.003280234
-----------------
-----------------
f at the beginning of new iteration,       906.8387411073
Predicted improvement:        0.000667978
lambda =          1; f =          906.8376894
lambda =     1.9332; f =          906.8372222
Norm of dx 0.00056594
----
Improvement on iteration 2 =        0.001518919
-----------------
-----------------
f at the beginning of new iteration,       906.8372221888
Predicted improvement:        0.000513155
lambda =          1; f =          906.8364113
lambda =     1.9332; f =          906.8360424
Norm of dx 0.00055034
----
Improvement on iteration 3 =        0.001179770
-----------------
-----------------
f at the beginning of new iteration,       906.8360424191
Predicted improvement:        0.000386497
lambda =          1; f =          906.8353783
lambda =     1.9332; f =          906.8349535
lambda =     3.7372; f =          906.8346634
Norm of dx  0.0005253
```

```
----
Improvement on iteration 4 =        0.001379053
-----------------
-----------------
f at the beginning of new iteration,       906.8346633657
Predicted improvement:        0.000589983
lambda =          1; f =          906.8336642
lambda =     1.9332; f =          906.8330585
lambda =     3.7372; f =          906.8327845
Norm of dx 0.00058931
----
Improvement on iteration 5 =        0.001878837
-----------------
-----------------
f at the beginning of new iteration,       906.8327845291
Predicted improvement:        0.000260475
lambda =          1; f =          906.8323713
lambda =     1.9332; f =          906.8321794
Norm of dx 0.00035124
----
Improvement on iteration 6 =        0.000605129
-----------------
-----------------
f at the beginning of new iteration,       906.8321793997
Predicted improvement:        0.000255524
lambda =          1; f =          906.8317465
lambda =     1.9332; f =          906.8314836
lambda =     3.7372; f =          906.8313606
Norm of dx 0.00064729
----
Improvement on iteration 7 =        0.000818779
-----------------
-----------------
f at the beginning of new iteration,       906.8313606205
Predicted improvement:        0.000254870
lambda =          1; f =          906.8309785
lambda =     1.9332; f =          906.8308534
Norm of dx 0.00026988
----
Improvement on iteration 8 =        0.000507258
-----------------
-----------------
f at the beginning of new iteration,       906.8308533629
Predicted improvement:        0.000045857
lambda =          1; f =          906.8307842
lambda =     1.9332; f =          906.8307598
Norm of dx 0.00035988
----
Improvement on iteration 9 =        0.000093514
-----------------
-----------------
f at the beginning of new iteration,       906.8307598484
Predicted improvement:        0.000033403
lambda =          1; f =          906.8306946
lambda =     1.9332; f =          906.8306362
lambda =     3.7372; f =          906.8305305
lambda =     7.2247; f =          906.8303525
lambda =     13.967; f =          906.8301072
Norm of dx 0.00014326
----
Improvement on iteration 10 =        0.000652668
-----------------
-----------------
```

```
f at the beginning of new iteration,       906.8301071800
Predicted improvement:        0.000494205
lambda =          1; f =          906.8294125
lambda =     1.9332; f =          906.8292892
Norm of dx  0.0025111
----
Improvement on iteration 11 =        0.000818010
-----------------
-----------------
f at the beginning of new iteration,       906.8292891696
Predicted improvement:        0.000111370
lambda =          1; f =          906.8291394
Norm of dx 0.00070116
----
Improvement on iteration 12 =        0.000149749
-----------------
-----------------
f at the beginning of new iteration,       906.8291394205
Predicted improvement:        0.000040581
lambda =          1; f =          906.8290817
lambda =     1.9332; f =          906.8290705
Norm of dx 0.00016744
----
Improvement on iteration 13 =        0.000068946
-----------------
-----------------
f at the beginning of new iteration,       906.8290704744
Predicted improvement:        0.000023941
lambda =          1; f =          906.8290276
lambda =     1.9332; f =          906.8289965
lambda =     3.7372; f =          906.8289604
Norm of dx 0.00022676
----
Improvement on iteration 14 =        0.000110068
-----------------
-----------------
f at the beginning of new iteration,       906.8289604069
Predicted improvement:        0.000041484
lambda =          1; f =          906.8288938
lambda =     1.9332; f =          906.8288606
Norm of dx 0.00044882
----
Improvement on iteration 15 =        0.000099852
-----------------
-----------------
f at the beginning of new iteration,       906.8288605554
Predicted improvement:        0.000058525
lambda =          1; f =          906.8287559
lambda =     1.9332; f =          906.8286805
lambda =     3.7372; f =          906.8285961
Norm of dx 0.00051451
----
Improvement on iteration 16 =        0.000264447
-----------------
-----------------
f at the beginning of new iteration,       906.8285961088
Predicted improvement:        0.000125997
lambda =          1; f =          906.8284099
lambda =     1.9332; f =          906.8283545
Norm of dx 0.00081676
----
Improvement on iteration 17 =        0.000241653
-----------------
```

```
-----------------
f at the beginning of new iteration,       906.8283544562
Predicted improvement:        0.000015535
lambda =          1; f =          906.8283331
Norm of dx 0.00033755
----
Improvement on iteration 18 =        0.000021327
-----------------
-----------------
f at the beginning of new iteration,       906.8283331297
Predicted improvement:        0.000009796
lambda =          1; f =          906.8283171
lambda =     1.9332; f =          906.8283086
Norm of dx 0.00016238
----
Improvement on iteration 19 =        0.000024528
-----------------
-----------------
f at the beginning of new iteration,       906.8283086015
Predicted improvement:        0.000017994
lambda =          1; f =          906.8282761
lambda =     1.9332; f =          906.8282520
lambda =     3.7372; f =          906.8282223
Norm of dx 0.00016181
----
Improvement on iteration 20 =        0.000086275
-----------------
-----------------
f at the beginning of new iteration,       906.8282223269
Predicted improvement:        0.000055859
lambda =          1; f =          906.8281344
lambda =     1.9332; f =          906.8280955
Norm of dx 0.00082492
----
Improvement on iteration 21 =        0.000126823
-----------------
-----------------
f at the beginning of new iteration,       906.8280955040
Predicted improvement:        0.000023328
lambda =          1; f =          906.8280632
Norm of dx 0.00054604
----
Improvement on iteration 22 =        0.000032270
-----------------
-----------------
f at the beginning of new iteration,       906.8280632338
Predicted improvement:        0.000015272
lambda =          1; f =          906.8280391
lambda =     1.9332; f =          906.8280280
Norm of dx 0.00038155
----
Improvement on iteration 23 =        0.000035204
-----------------
-----------------
f at the beginning of new iteration,       906.8280280295
Predicted improvement:        0.000022398
lambda =          1; f =          906.8279857
lambda =     1.9332; f =          906.8279506
lambda =     3.7372; f =          906.8278947
lambda =     7.2247; f =          906.8278314
Norm of dx 0.00034964
----
Improvement on iteration 24 =        0.000196635
```

```
-----------------
-----------------
f at the beginning of new iteration,       906.8278313946
Predicted improvement:        0.000116743
lambda =          1; f =          906.8276540
lambda =     1.9332; f =          906.8275882
Norm of dx   0.001425
----
Improvement on iteration 25 =        0.000243224
-----------------
-----------------
f at the beginning of new iteration,       906.8275881710
Predicted improvement:        0.000017967
lambda =          1; f =          906.8275666
Norm of dx 0.00043677
----
Improvement on iteration 26 =        0.000021613
-----------------
-----------------
f at the beginning of new iteration,       906.8275665577
Predicted improvement:        0.000002805
lambda =          1; f =          906.8275619
lambda =     1.9332; f =          906.8275596
Norm of dx 9.5395e-05
----
Improvement on iteration 27 =        0.000006997
-----------------
-----------------
f at the beginning of new iteration,       906.8275595603
Predicted improvement:        0.000004107
lambda =          1; f =          906.8275524
lambda =     1.9332; f =          906.8275477
lambda =     3.7372; f =          906.8275439
Norm of dx 6.5538e-05
----
Improvement on iteration 28 =        0.000015644
-----------------
-----------------
f at the beginning of new iteration,       906.8275439166
Predicted improvement:        0.000006510
lambda =          1; f =          906.8275324
lambda =     1.9332; f =          906.8275242
lambda =     3.7372; f =          906.8275158
Norm of dx 0.00025097
----
Improvement on iteration 29 =        0.000028097
-----------------
-----------------
f at the beginning of new iteration,       906.8275158193
Predicted improvement:        0.000013164
lambda =          1; f =          906.8274917
lambda =     1.9332; f =          906.8274728
lambda =     3.7372; f =          906.8274466
lambda =     7.2247; f =          906.8274336
Norm of dx 0.00031387
----
Improvement on iteration 30 =        0.000082230
-----------------
-----------------
f at the beginning of new iteration,       906.8274335893
Predicted improvement:        0.000027417
lambda =          1; f =          906.8273960
Norm of dx 0.00057647
```

```
----
Improvement on iteration 31 =        0.000037569
-----------------
-----------------
f at the beginning of new iteration,       906.8273960206
Predicted improvement:        0.000008521
lambda =          1; f =          906.8273855
Norm of dx 0.00028988
----
Improvement on iteration 32 =        0.000010555
-----------------
-----------------
f at the beginning of new iteration,       906.8273854657
Predicted improvement:        0.000003414
lambda =          1; f =          906.8273793
lambda =     1.9332; f =          906.8273747
lambda =     3.7372; f =          906.8273691
Norm of dx 0.00011235
----
Improvement on iteration 33 =        0.000016356
-----------------
-----------------
f at the beginning of new iteration,       906.8273691099
Predicted improvement:        0.000015057
lambda =          1; f =          906.8273409
lambda =     1.9332; f =          906.8273179
lambda =     3.7372; f =          906.8272827
lambda =     7.2247; f =          906.8272493
Norm of dx 0.00039371
----
Improvement on iteration 34 =        0.000119858
-----------------
-----------------
f at the beginning of new iteration,       906.8272492520
Predicted improvement:        0.000078021
lambda =          1; f =          906.8271156
lambda =     1.9332; f =          906.8270312
lambda =     3.7372; f =          906.8269786
Norm of dx  0.0017477
----
Improvement on iteration 35 =        0.000270631
-----------------
-----------------
f at the beginning of new iteration,       906.8269786208
Predicted improvement:        0.000012041
lambda =          1; f =          906.8269639
Norm of dx 0.00095469
----
Improvement on iteration 36 =        0.000014691
-----------------
-----------------
f at the beginning of new iteration,       906.8269639299
Predicted improvement:        0.000003269
lambda =          1; f =          906.8269582
lambda =     1.9332; f =          906.8269545
lambda =     3.7372; f =          906.8269514
Norm of dx 0.00016378
----
Improvement on iteration 37 =        0.000012545
-----------------
-----------------
f at the beginning of new iteration,       906.8269513849
Predicted improvement:        0.000007117
```

```
lambda =          1; f =          906.8269382
lambda =     1.9332; f =          906.8269280
lambda =     3.7372; f =          906.8269135
lambda =     7.2247; f =          906.8269057
Norm of dx 0.00030516
----
Improvement on iteration 38 =        0.000045683
-----------------
-----------------
f at the beginning of new iteration,       906.8269057015
Predicted improvement:        0.000012548
lambda =          1; f =          906.8268821
lambda =     1.9332; f =          906.8268630
lambda =     3.7372; f =          906.8268339
lambda =     7.2247; f =          906.8268069
Norm of dx 0.00023402
----
Improvement on iteration 39 =        0.000098782
-----------------
-----------------
f at the beginning of new iteration,       906.8268069190
Predicted improvement:        0.000049690
lambda =          1; f =          906.8267288
lambda =     1.9332; f =          906.8266947
Norm of dx  0.0014066
----
Improvement on iteration 40 =        0.000112178
-----------------
-----------------
f at the beginning of new iteration,       906.8266947408
Predicted improvement:        0.000004939
lambda =          1; f =          906.8266895
Norm of dx 0.00049144
----
Improvement on iteration 41 =        0.000005247
-----------------
-----------------
f at the beginning of new iteration,       906.8266894941
Predicted improvement:        0.000000356
lambda =          1; f =          906.8266888
lambda =     1.9332; f =          906.8266882
lambda =     3.7372; f =          906.8266872
lambda =     7.2247; f =          906.8266859
lambda =     13.967; f =          906.8266854
Norm of dx 3.0803e-05
----
Improvement on iteration 42 =        0.000004129
-----------------
-----------------
f at the beginning of new iteration,       906.8266853653
Predicted improvement:        0.000003396
lambda =          1; f =          906.8266793
lambda =     1.9332; f =          906.8266748
lambda =     3.7372; f =          906.8266694
Norm of dx 0.00013835
----
Improvement on iteration 43 =        0.000015983
-----------------
-----------------
f at the beginning of new iteration,       906.8266693819
Predicted improvement:        0.000004000
lambda =          1; f =          906.8266644
Norm of dx 0.00031555
```

```
----
Improvement on iteration 44 =        0.000005010
-----------------
-----------------
f at the beginning of new iteration,       906.8266643716
Predicted improvement:        0.000000801
lambda =          1; f =          906.8266632
lambda =     1.9332; f =          906.8266628
Norm of dx 0.00012253
----
Improvement on iteration 45 =        0.000001581
-----------------
-----------------
f at the beginning of new iteration,       906.8266627903
Predicted improvement:        0.000000436
lambda =          1; f =          906.8266620
lambda =     1.9332; f =          906.8266616
lambda =     3.7372; f =          906.8266614
Norm of dx 6.6405e-05
----
Improvement on iteration 46 =        0.000001384
-----------------
-----------------
f at the beginning of new iteration,       906.8266614058
Predicted improvement:        0.000000297
lambda =          1; f =          906.8266609
lambda =     1.9332; f =          906.8266607
Norm of dx 0.00011139
----
Improvement on iteration 47 =        0.000000717
-----------------
-----------------
f at the beginning of new iteration,       906.8266606886
Predicted improvement:        0.000000593
lambda =          1; f =          906.8266596
lambda =     1.9332; f =          906.8266587
lambda =     3.7372; f =          906.8266575
lambda =     7.2247; f =          906.8266570
Norm of dx 9.3439e-05
----
Improvement on iteration 48 =        0.000003720
-----------------
-----------------
f at the beginning of new iteration,       906.8266569684
Predicted improvement:        0.000002325
lambda =          1; f =          906.8266529
lambda =     1.9332; f =          906.8266503
lambda =     3.7372; f =          906.8266486
Norm of dx 0.00015464
----
Improvement on iteration 49 =        0.000008343
-----------------
-----------------
f at the beginning of new iteration,       906.8266486250
Predicted improvement:        0.000000731
lambda =          1; f =          906.8266477
Norm of dx 8.8023e-05
----
Improvement on iteration 50 =        0.000000947
-----------------
-----------------
f at the beginning of new iteration,       906.8266476778
Predicted improvement:        0.000000337
```

```
lambda =          1; f =          906.8266472
Norm of dx  8.461e-05
----
Improvement on iteration 51 =        0.000000444
-----------------
-----------------
f at the beginning of new iteration,       906.8266472341
Predicted improvement:        0.000000500
lambda =          1; f =          906.8266464
lambda =     1.9332; f =          906.8266458
lambda =     3.7372; f =          906.8266455
Norm of dx 9.1692e-05
----
Improvement on iteration 52 =        0.000001744
-----------------
-----------------
f at the beginning of new iteration,       906.8266454904
Predicted improvement:        0.000001365
lambda =          1; f =          906.8266428
lambda =     1.9332; f =          906.8266406
lambda =     3.7372; f =          906.8266367
lambda =     7.2247; f =          906.8266313
lambda =     13.967; f =          906.8266282
Norm of dx 0.00013748
----
Improvement on iteration 53 =        0.000017291
-----------------
-----------------
f at the beginning of new iteration,       906.8266281990
Predicted improvement:        0.000005624
lambda =          1; f =          906.8266203
lambda =     1.9332; f =          906.8266190
Norm of dx 0.00065112
----
Improvement on iteration 54 =        0.000009198
-----------------
-----------------
f at the beginning of new iteration,       906.8266190014
Predicted improvement:        0.000000445
lambda =          1; f =          906.8266185
Norm of dx 0.00015785
----
Improvement on iteration 55 =        0.000000469
-----------------
-----------------
f at the beginning of new iteration,       906.8266185327
Predicted improvement:        0.000000093
lambda =          1; f =          906.8266185
Norm of dx 0.00012096
----
Improvement on iteration 56 =        0.000000076
improvement < crit termination
Objective function at mode: 906.826618

RESULTS FROM POSTERIOR ESTIMATION
parameters
         prior mean     mode    s.d. prior pstdev

rho_a_c      0.500   0.2139  0.0831 beta  0.2000
rho_a_d      0.500   0.5000  0.2774 beta  0.2000
rho_mu_c     0.500   0.5001  0.2774 beta  0.2000
rho_mu_d     0.500   0.5000  0.2774 beta  0.2000
rho_LTV      0.500   0.4952  0.2749 beta  0.2000
```

```
                                        code.log
rho_d         0.500   0.5093  0.2769 beta  0.2000
rho_d_stern   0.500   0.8890  0.0196 beta  0.2000
rho_c_ast     0.500   0.6155  0.2561 beta  0.2000
rho_d_ast     0.500   0.5000  0.2773 beta  0.2000
rho_s_c       0.500   0.4414  0.1041 beta  0.2000
rho_r         0.500   0.6881  0.0909 beta  0.2000
rho_p        -0.500  -0.4978  0.2000 norm  0.2000
theta_c       0.750   0.3021  0.0688 beta  0.1500
sigma         1.000   1.8993  0.1081 norm  0.3700
phi           2.000   4.8694  0.7636 gamm  0.7000
omega         0.200   0.0981  0.0628 beta  0.1000
h_c           0.500   0.2862  0.0529 beta  0.1000
alpha_c       0.500   0.4003  0.0318 beta  0.1000

standard deviation of shocks
          prior mean     mode    s.d. prior pstdev

epsa_c        0.100   2.3250  0.1825 invg  2.0000
epsa_d        0.100   0.0461  0.0189 invg  2.0000
epsmu_c       0.100   0.0461  0.0188 invg  2.0000
epsmu_d       0.100   0.0461  0.0188 invg  2.0000
epsLTV        0.100   0.0461  0.0188 invg  2.0000
epsd          0.100   0.0459  0.0186 invg  2.0000
epsc_ast      0.100   0.0391  0.0124 invg  2.0000
epsd_ast      0.100   0.0461  0.0188 invg  2.0000
epsd_stern    0.100   0.6092  0.1094 invg  2.0000
epss_c        0.100   1.1311  0.1006 invg  2.0000
epsr          0.100   0.6085  0.1831 invg  2.0000
epsyf         0.100   0.0461  0.0188 invg  2.0000
epsn          0.010   0.8496  0.0672 invg  0.1000
epspi_d       0.010   5.6854  0.4325 invg  0.1000


Log data density [Laplace approximation] is -960.112080.

Estimation::mcmc: Multiple chains mode.
Estimation::mcmc: Searching for initial values...
Estimation::mcmc: Initial values found!

Estimation::mcmc: Write details about the MCMC... Ok!
Estimation::mcmc: Details about the MCMC are available in
code_88/metropolis\code_mh_history_0.mat


Estimation::mcmc: Number of mh files: 55 per block.
Estimation::mcmc: Total number of generated files: 110.
Estimation::mcmc: Total number of iterations: 200000.
Estimation::mcmc: Current acceptance ratio per chain:
                                                    Chain  1: 32.9763%
                                                    Chain  2: 33.7668%
Estimation::mcmc::diagnostics: Univariate convergence diagnostic, Brooks and Gelman
(1998):
    Parameter 1...  Done!
    Parameter 2...  Done!
    Parameter 3...  Done!
    Parameter 4...  Done!
    Parameter 5...  Done!
    Parameter 6...  Done!
    Parameter 7...  Done!
    Parameter 8...  Done!
    Parameter 9...  Done!
    Parameter 10...  Done!
    Parameter 11...  Done!
```

```
    Parameter 12...  Done!
    Parameter 13...  Done!
    Parameter 14...  Done!
    Parameter 15...  Done!
    Parameter 16...  Done!
    Parameter 17...  Done!
    Parameter 18...  Done!
    Parameter 19...  Done!
    Parameter 20...  Done!
    Parameter 21...  Done!
    Parameter 22...  Done!
    Parameter 23...  Done!
    Parameter 24...  Done!
    Parameter 25...  Done!
    Parameter 26...  Done!
    Parameter 27...  Done!
    Parameter 28...  Done!
    Parameter 29...  Done!
    Parameter 30...  Done!
    Parameter 31...  Done!
    Parameter 32...  Done!

Estimation::mcmc: Total number of MH draws: 200000.
Estimation::mcmc: Total number of generated MH files: 55.
Estimation::mcmc: I'll use mh-files 28 to 55.
Estimation::mcmc: In MH-file number 28 I'll start at line 721.
Estimation::mcmc: Finally I keep 100000 draws.

Estimation::marginal density: I'm computing the posterior mean and covariance...
Done!
Estimation::marginal density: I'm computing the posterior log marginal density
(modified harmonic mean)... Done!


ESTIMATION RESULTS

Log data density is -960.402676.
posterior_moments: There are not enough draws computes to compute HPD Intervals.
Skipping their computation.
posterior_moments: There are not enough draws computes to compute deciles. Skipping
their computation.

parameters
             prior mean   post. mean        90% HPD interval    prior       pstdev

rho_a_c           0.500       0.2305      0.0948      0.3580   beta        0.2000
rho_a_d           0.500       0.5058      0.1761      0.8294   beta        0.2000
rho_mu_c          0.500       0.5039      0.1721      0.8247   beta        0.2000
rho_mu_d          0.500       0.4969      0.1775      0.8356   beta        0.2000
rho_LTV           0.500       0.4883      0.1744      0.8183   beta        0.2000
rho_d             0.500       0.5240      0.2042      0.8470   beta        0.2000
rho_d_stern        0.500       0.8879      0.8556      0.9209   beta        0.2000
rho_c_ast         0.500       0.6198      0.3170      0.9234   beta        0.2000
rho_d_ast         0.500       0.4970      0.1593      0.8157   beta        0.2000
rho_s_c           0.500       0.4404      0.2793      0.6149   beta        0.2000
rho_r             0.500       0.6295      0.4600      0.8021   beta        0.2000
rho_p            -0.500      -0.4929     -0.8332     -0.1806   norm        0.2000
theta_c           0.750       0.2935      0.1859      0.4026   beta        0.1500
sigma             1.000       1.9501      1.7573      2.1318   norm        0.3700
phi               2.000       5.0573      3.7710      6.3102   gamma       0.7000
omega             0.200       0.1271      0.0275      0.2205   beta        0.1000
h_c               0.500       0.2786      0.1922      0.3626   beta        0.1000
alpha_c           0.500       0.4003      0.3469      0.4504   beta        0.1000
```

```
standard deviation of shocks
             prior mean   post. mean        90% HPD interval    prior       pstdev

epsa_c            0.100       2.3642      2.0596      2.6631   invg        2.0000
epsa_d            0.100       0.2009      0.0212      0.6919   invg        2.0000
epsmu_c           0.100       0.0806      0.0233      0.1562   invg        2.0000
epsmu_d           0.100       0.0818      0.0232      0.1564   invg        2.0000
epsLTV            0.100       0.0839      0.0235      0.1592   invg        2.0000
epsd              0.100       0.0900      0.0225      0.1790   invg        2.0000
epsc_ast          0.100       0.0466      0.0226      0.0706   invg        2.0000
epsd_ast          0.100       0.3444      0.0210      1.1394   invg        2.0000
epsd_stern        0.100       0.5781      0.4094      0.7437   invg        2.0000
epss_c            0.100       1.1506      0.9811      1.3138   invg        2.0000
epsr              0.100       0.7360      0.3870      1.0961   invg        2.0000
epsyf             0.100       0.0866      0.0224      0.1607   invg        2.0000
epsn              0.010       0.8668      0.7527      0.9804   invg        0.1000
epspi_d           0.010       5.7640      5.0310      6.4906   invg        0.1000
Estimation::mcmc: Posterior (dsge) IRFs...
Estimation::mcmc: Posterior IRFs, done!
Estimation::mcmc: Forecasted variables (mean)
Estimation::mcmc: Forecasted variables (mean), done!
Estimation::mcmc: Forecasted variables (point)
Estimation::mcmc: Forecasted variables (point), done!

Loading 116 observations from data100.xlsx

Restricting the sample to observations 1 to 89. Using in total 89 observations.
Initial value of the log posterior (or likelihood): -914.5645
-----------------
-----------------
f at the beginning of new iteration,       914.5644610714
Predicted improvement:        0.001596439
lambda =          1; f =          914.5620527
lambda =     1.9332; f =          914.5612395
Norm of dx 0.00056506
----
Improvement on iteration 1 =        0.003221566
-----------------
-----------------
f at the beginning of new iteration,       914.5612395058
Predicted improvement:        0.000315823
lambda =          1; f =          914.5607142
lambda =     1.9332; f =          914.5604162
Norm of dx 0.00029249
----
Improvement on iteration 2 =        0.000823271
-----------------
-----------------
f at the beginning of new iteration,       914.5604162346
Predicted improvement:        0.000213305
lambda =          1; f =          914.5601332
Norm of dx 0.00038748
----
Improvement on iteration 3 =        0.000283064
-----------------
-----------------
f at the beginning of new iteration,       914.5601331702
Predicted improvement:        0.000125430
lambda =          1; f =          914.5599245
lambda =     1.9332; f =          914.5598050
Norm of dx 0.00032967
----
```

Improvement on iteration 4 =   0.000328164

---
f at the beginning of new iteration,   914.5598050058
Predicted improvement: 0.000261141
lambda =   1; f =   914.5593561
lambda =   1.9332; f =   914.5590682
lambda =   3.7372; f =   914.5588705
Norm of dx 0.00072864

Improvement on iteration 5 =   0.000934482

---
f at the beginning of new iteration,   914.5588705235
Predicted improvement: 0.000434320
lambda =   1; f =   914.5581461
lambda =   1.9332; f =   914.5577310
Norm of dx 0.00059029

Improvement on iteration 6 =   0.001139548

---
f at the beginning of new iteration,   914.5577309753
Predicted improvement: 0.000240564
lambda =   1; f =   914.5574361
Norm of dx 0.0010076

Improvement on iteration 7 =   0.000294851

---
f at the beginning of new iteration,   914.5574361239
Predicted improvement: 0.000074136
lambda =   1; f =   914.5573086
lambda =   1.9332; f =   914.5572274
lambda =   3.7372; f =   914.5571731
Norm of dx 0.00043867

Improvement on iteration 8 =   0.000263007

---
f at the beginning of new iteration,   914.5571731172
Predicted improvement: 0.000143564
lambda =   1; f =   914.5569156
lambda =   1.9332; f =   914.5567283
lambda =   3.7372; f =   914.5565116
Norm of dx 0.00028246

Improvement on iteration 9 =   0.000661551

---
f at the beginning of new iteration,   914.5565115662
Predicted improvement: 0.000111402
lambda =   1; f =   914.5563542
lambda =   1.9332; f =   914.5563253
Norm of dx 0.00078547

Improvement on iteration 10 =   0.000186291

---
f at the beginning of new iteration,   914.5563252754
Predicted improvement: 0.000060382
lambda =   1; f =   914.5562151
lambda =   1.9332; f =   914.5561315

```
lambda =     3.7372; f =          914.5560226
Norm of dx 0.00012358
----
Improvement on iteration 11 =        0.000302713
-----------------
-----------------
f at the beginning of new iteration,       914.5560225619
Predicted improvement:        0.000192572
lambda =          1; f =          914.5557298
lambda =     1.9332; f =          914.5556221
Norm of dx 0.00099848
----
Improvement on iteration 12 =        0.000400442
-----------------
-----------------
f at the beginning of new iteration,       914.5556221200
Predicted improvement:        0.000082938
lambda =          1; f =          914.5554994
lambda =     1.9332; f =          914.5554629
Norm of dx 0.00065513
----
Improvement on iteration 13 =        0.000159243
-----------------
-----------------
f at the beginning of new iteration,       914.5554628769
Predicted improvement:        0.000024703
lambda =          1; f =          914.5554163
lambda =     1.9332; f =          914.5553780
lambda =     3.7372; f =          914.5553181
lambda =     7.2247; f =          914.5552552
Norm of dx 8.5743e-05
----
Improvement on iteration 14 =        0.000207712
-----------------
-----------------
f at the beginning of new iteration,       914.5552551649
Predicted improvement:        0.000080223
lambda =          1; f =          914.5551291
lambda =     1.9332; f =          914.5550741
Norm of dx 0.00080616
----
Improvement on iteration 15 =        0.000181043
-----------------
-----------------
f at the beginning of new iteration,       914.5550741223
Predicted improvement:        0.000053824
lambda =          1; f =          914.5549819
lambda =     1.9332; f =          914.5549240
lambda =     3.7372; f =          914.5548887
Norm of dx 0.00059716
----
Improvement on iteration 16 =        0.000185405
-----------------
-----------------
f at the beginning of new iteration,       914.5548887177
Predicted improvement:        0.000059237
lambda =          1; f =          914.5548006
lambda =     1.9332; f =          914.5547737
Norm of dx 0.00046995
----
Improvement on iteration 17 =        0.000115003
-----------------
-----------------
```

```
f at the beginning of new iteration,       914.5547737145
Predicted improvement:        0.000008059
lambda =          1; f =          914.5547585
lambda =     1.9332; f =          914.5547462
lambda =     3.7372; f =          914.5547272
lambda =     7.2247; f =          914.5547088
Norm of dx 0.00018362
----
Improvement on iteration 18 =        0.000064923
-----------------
-----------------
f at the beginning of new iteration,       914.5547087916
Predicted improvement:        0.000051930
lambda =          1; f =          914.5546096
lambda =     1.9332; f =          914.5545252
lambda =     3.7372; f =          914.5543845
lambda =     7.2247; f =          914.5541966
Norm of dx 0.00050818
----
Improvement on iteration 19 =        0.000512184
-----------------
-----------------
f at the beginning of new iteration,       914.5541966074
Predicted improvement:        0.000180632
lambda =          1; f =          914.5539929
Norm of dx  0.0018128
----
Improvement on iteration 20 =        0.000203716
-----------------
-----------------
f at the beginning of new iteration,       914.5539928919
Predicted improvement:        0.000011355
lambda =          1; f =          914.5539752
lambda =     1.9332; f =          914.5539677
Norm of dx 0.00020659
----
Improvement on iteration 21 =        0.000025190
-----------------
-----------------
f at the beginning of new iteration,       914.5539677017
Predicted improvement:        0.000014044
lambda =          1; f =          914.5539406
lambda =     1.9332; f =          914.5539172
lambda =     3.7372; f =          914.5538771
lambda =     7.2247; f =          914.5538183
lambda =     13.967; f =          914.5537756
Norm of dx 0.00013579
----
Improvement on iteration 22 =        0.000192121
-----------------
-----------------
f at the beginning of new iteration,       914.5537755802
Predicted improvement:        0.000109353
lambda =          1; f =          914.5535977
lambda =     1.9332; f =          914.5535042
Norm of dx  0.0012507
----
Improvement on iteration 23 =        0.000271373
-----------------
-----------------
f at the beginning of new iteration,       914.5535042076
Predicted improvement:        0.000035532
lambda =          1; f =          914.5534596
```

```
Norm of dx  0.0011184
----
Improvement on iteration 24 =        0.000044603
-----------------
-----------------
f at the beginning of new iteration,       914.5534596048
Predicted improvement:        0.000011645
lambda =          1; f =          914.5534415
lambda =     1.9332; f =          914.5534339
Norm of dx 0.00042592
----
Improvement on iteration 25 =        0.000025669
-----------------
-----------------
f at the beginning of new iteration,       914.5534339360
Predicted improvement:        0.000008467
lambda =          1; f =          914.5534202
lambda =     1.9332; f =          914.5534134
Norm of dx 0.00013592
----
Improvement on iteration 26 =        0.000020564
-----------------
-----------------
f at the beginning of new iteration,       914.5534133716
Predicted improvement:        0.000007066
lambda =          1; f =          914.5534011
lambda =     1.9332; f =          914.5533930
lambda =     3.7372; f =          914.5533867
Norm of dx 0.00018092
----
Improvement on iteration 27 =        0.000026717
-----------------
-----------------
f at the beginning of new iteration,       914.5533866542
Predicted improvement:        0.000018311
lambda =          1; f =          914.5533510
lambda =     1.9332; f =          914.5533193
lambda =     3.7372; f =          914.5532627
lambda =     7.2247; f =          914.5531702
lambda =     13.967; f =          914.5530546
Norm of dx 0.00026035
----
Improvement on iteration 28 =        0.000332069
-----------------
-----------------
f at the beginning of new iteration,       914.5530545855
Predicted improvement:        0.000042741
lambda =          1; f =          914.5530071
Norm of dx  0.0019184
----
Improvement on iteration 29 =        0.000047436
-----------------
-----------------
f at the beginning of new iteration,       914.5530071497
Predicted improvement:        0.000004343
lambda =          1; f =          914.5529989
lambda =     1.9332; f =          914.5529922
lambda =     3.7372; f =          914.5529817
lambda =     7.2247; f =          914.5529710
Norm of dx 0.00026769
----
Improvement on iteration 30 =        0.000036143
-----------------
```

```
-----------------
f at the beginning of new iteration,       914.5529710062
Predicted improvement:        0.000030434
lambda =          1; f =          914.5529135
lambda =     1.9332; f =          914.5528653
lambda =     3.7372; f =          914.5527872
lambda =     7.2247; f =          914.5526924
Norm of dx 0.00068957
----
Improvement on iteration 31 =        0.000278617
-----------------
-----------------
f at the beginning of new iteration,       914.5526923895
Predicted improvement:        0.000125536
lambda =          1; f =          914.5525161
lambda =     1.9332; f =          914.5524847
Norm of dx  0.0015186
----
Improvement on iteration 32 =        0.000207680
-----------------
-----------------
f at the beginning of new iteration,       914.5524847095
Predicted improvement:        0.000046122
lambda =          1; f =          914.5524085
lambda =     1.9332; f =          914.5523661
Norm of dx 0.00037819
----
Improvement on iteration 33 =        0.000118586
-----------------
-----------------
f at the beginning of new iteration,       914.5523661233
Predicted improvement:        0.000047907
lambda =          1; f =          914.5523027
Norm of dx  0.0014929
----
Improvement on iteration 34 =        0.000063409
-----------------
-----------------
f at the beginning of new iteration,       914.5523027146
Predicted improvement:        0.000015993
lambda =          1; f =          914.5522791
lambda =     1.9332; f =          914.5522732
Norm of dx  0.0012677
----
Improvement on iteration 35 =        0.000029557
-----------------
-----------------
f at the beginning of new iteration,       914.5522731575
Predicted improvement:        0.000010894
lambda =          1; f =          914.5522520
lambda =     1.9332; f =          914.5522332
lambda =     3.7372; f =          914.5521995
lambda =     7.2247; f =          914.5521442
lambda =     13.967; f =          914.5520744
Norm of dx 0.00019988
----
Improvement on iteration 36 =        0.000198771
-----------------
-----------------
f at the beginning of new iteration,       914.5520743861
Predicted improvement:        0.000142098
lambda =          1; f =          914.5518496
lambda =     1.9332; f =          914.5517469
```

```
Norm of dx  0.0032066
----
Improvement on iteration 37 =        0.000327440
-----------------
-----------------
f at the beginning of new iteration,       914.5517469463
Predicted improvement:        0.000065354
lambda =          1; f =          914.5516690
Norm of dx  0.0011373
----
Improvement on iteration 38 =        0.000077938
-----------------
-----------------
f at the beginning of new iteration,       914.5516690084
Predicted improvement:        0.000007388
lambda =          1; f =          914.5516597
Norm of dx 0.00049671
----
Improvement on iteration 39 =        0.000009356
-----------------
-----------------
f at the beginning of new iteration,       914.5516596527
Predicted improvement:        0.000003359
lambda =          1; f =          914.5516537
lambda =     1.9332; f =          914.5516494
lambda =     3.7372; f =          914.5516448
Norm of dx 7.1494e-05
----
Improvement on iteration 40 =        0.000014890
-----------------
-----------------
f at the beginning of new iteration,       914.5516447630
Predicted improvement:        0.000011796
lambda =          1; f =          914.5516224
lambda =     1.9332; f =          914.5516039
lambda =     3.7372; f =          914.5515742
lambda =     7.2247; f =          914.5515401
Norm of dx 0.00016939
----
Improvement on iteration 41 =        0.000104629
-----------------
-----------------
f at the beginning of new iteration,       914.5515401344
Predicted improvement:        0.000053767
lambda =          1; f =          914.5514642
lambda =     1.9332; f =          914.5514508
Norm of dx  0.0021578
----
Improvement on iteration 42 =        0.000089331
-----------------
-----------------
f at the beginning of new iteration,       914.5514508035
Predicted improvement:        0.000005798
lambda =          1; f =          914.5514439
Norm of dx 0.00040549
----
Improvement on iteration 43 =        0.000006895
-----------------
-----------------
f at the beginning of new iteration,       914.5514439087
Predicted improvement:        0.000001185
lambda =          1; f =          914.5514421
lambda =     1.9332; f =          914.5514412
```

```
Norm of dx 0.00024138
----
Improvement on iteration 44 =        0.000002675
-----------------
-----------------
f at the beginning of new iteration,       914.5514412342
Predicted improvement:        0.000002851
lambda =          1; f =          914.5514361
lambda =     1.9332; f =          914.5514323
lambda =     3.7372; f =          914.5514274
Norm of dx 0.00018786
----
Improvement on iteration 45 =        0.000013837
-----------------
-----------------
f at the beginning of new iteration,       914.5514273974
Predicted improvement:        0.000012636
lambda =          1; f =          914.5514066
lambda =     1.9332; f =          914.5513950
Norm of dx 0.00055531
----
Improvement on iteration 46 =        0.000032431
-----------------
-----------------
f at the beginning of new iteration,       914.5513949664
Predicted improvement:        0.000012044
lambda =          1; f =          914.5513791
Norm of dx 0.00057603
----
Improvement on iteration 47 =        0.000015889
-----------------
-----------------
f at the beginning of new iteration,       914.5513790774
Predicted improvement:        0.000004435
lambda =          1; f =          914.5513727
lambda =     1.9332; f =          914.5513711
Norm of dx  0.0002732
----
Improvement on iteration 48 =        0.000007928
-----------------
-----------------
f at the beginning of new iteration,       914.5513711497
Predicted improvement:        0.000002386
lambda =          1; f =          914.5513670
lambda =     1.9332; f =          914.5513643
lambda =     3.7372; f =          914.5513620
Norm of dx 9.5914e-05
----
Improvement on iteration 49 =        0.000009125
-----------------
-----------------
f at the beginning of new iteration,       914.5513620249
Predicted improvement:        0.000002049
lambda =          1; f =          914.5513585
lambda =     1.9332; f =          914.5513558
lambda =     3.7372; f =          914.5513525
Norm of dx 0.00022802
----
Improvement on iteration 50 =        0.000009515
-----------------
-----------------
f at the beginning of new iteration,       914.5513525098
Predicted improvement:        0.000008789
```

```
lambda =          1; f =          914.5513365
lambda =     1.9332; f =          914.5513239
lambda =     3.7372; f =          914.5513062
lambda =     7.2247; f =          914.5512965
Norm of dx 0.00057605
----
Improvement on iteration 51 =        0.000056049
-----------------
-----------------
f at the beginning of new iteration,       914.5512964607
Predicted improvement:        0.000037603
lambda =          1; f =          914.5512305
lambda =     1.9332; f =          914.5511859
lambda =     3.7372; f =          914.5511456
Norm of dx 0.00051773
----
Improvement on iteration 52 =        0.000150857
-----------------
-----------------
f at the beginning of new iteration,       914.5511456036
Predicted improvement:        0.000009581
lambda =          1; f =          914.5511366
Norm of dx  0.0013763
----
Improvement on iteration 53 =        0.000009035
-----------------
-----------------
f at the beginning of new iteration,       914.5511365688
Predicted improvement:        0.000000503
lambda =          1; f =          914.5511357
lambda =     1.9332; f =          914.5511352
lambda =     3.7372; f =          914.5511347
Norm of dx 0.00011045
----
Improvement on iteration 54 =        0.000001874
-----------------
-----------------
f at the beginning of new iteration,       914.5511346946
Predicted improvement:        0.000001682
lambda =          1; f =          914.5511316
lambda =     1.9332; f =          914.5511291
lambda =     3.7372; f =          914.5511256
lambda =     7.2247; f =          914.5511234
Norm of dx 0.00029828
----
Improvement on iteration 55 =        0.000011253
-----------------
-----------------
f at the beginning of new iteration,       914.5511234416
Predicted improvement:        0.000008746
lambda =          1; f =          914.5511074
lambda =     1.9332; f =          914.5510945
lambda =     3.7372; f =          914.5510755
lambda =     7.2247; f =          914.5510608
Norm of dx 0.00035633
----
Improvement on iteration 56 =        0.000062616
-----------------
-----------------
f at the beginning of new iteration,       914.5510608261
Predicted improvement:        0.000025143
lambda =          1; f =          914.5510213
lambda =     1.9332; f =          914.5510037
```

```
Norm of dx  0.0014146
----
Improvement on iteration 57 =        0.000057139
-----------------
-----------------
f at the beginning of new iteration,       914.5510036871
Predicted improvement:        0.000004863
lambda =          1; f =          914.5509990
Norm of dx  0.0014594
----
Improvement on iteration 58 =        0.000004731
-----------------
-----------------
f at the beginning of new iteration,       914.5509989557
Predicted improvement:        0.000000807
lambda =          1; f =          914.5509974
lambda =     1.9332; f =          914.5509961
lambda =     3.7372; f =          914.5509939
lambda =     7.2247; f =          914.5509910
Norm of dx 9.1662e-05
----
Improvement on iteration 59 =        0.000007920
-----------------
-----------------
f at the beginning of new iteration,       914.5509910359
Predicted improvement:        0.000007196
lambda =          1; f =          914.5509816
Norm of dx 0.00091911
----
Improvement on iteration 60 =        0.000009453
-----------------
-----------------
f at the beginning of new iteration,       914.5509815833
Predicted improvement:        0.000009855
lambda =          1; f =          914.5509660
lambda =     1.9332; f =          914.5509583
Norm of dx 0.00041567
----
Improvement on iteration 61 =        0.000023318
-----------------
-----------------
f at the beginning of new iteration,       914.5509582649
Predicted improvement:        0.000014793
lambda =          1; f =          914.5509311
lambda =     1.9332; f =          914.5509105
lambda =     3.7372; f =          914.5508836
Norm of dx 0.00067338
----
Improvement on iteration 62 =        0.000074649
-----------------
-----------------
f at the beginning of new iteration,       914.5508836161
Predicted improvement:        0.000055698
lambda =          1; f =          914.5507961
lambda =     1.9332; f =          914.5507577
Norm of dx  0.0026403
----
Improvement on iteration 63 =        0.000125939
-----------------
-----------------
f at the beginning of new iteration,       914.5507576773
Predicted improvement:        0.000028769
lambda =          1; f =          914.5507203
```

```
Norm of dx  0.0027378
----
Improvement on iteration 64 =        0.000037359
-----------------
-----------------
f at the beginning of new iteration,       914.5507203179
Predicted improvement:        0.000005005
lambda =          1; f =          914.5507158
Norm of dx  0.0015417
----
Improvement on iteration 65 =        0.000004514
-----------------
-----------------
f at the beginning of new iteration,       914.5507158042
Predicted improvement:        0.000000237
lambda =          1; f =          914.5507157
lambda =    0.33333; f =          914.5507157
Norm of dx 0.00034396
----
Improvement on iteration 66 =        0.000000131
-----------------
-----------------
f at the beginning of new iteration,       914.5507156732
Predicted improvement:        0.000000170
lambda =          1; f =          914.5507154
Norm of dx 0.00010887
----
Improvement on iteration 67 =        0.000000231
-----------------
-----------------
f at the beginning of new iteration,       914.5507154419
Predicted improvement:        0.000000503
lambda =          1; f =          914.5507145
lambda =     1.9332; f =          914.5507139
lambda =     3.7372; f =          914.5507131
Norm of dx 9.3349e-05
----
Improvement on iteration 68 =        0.000002382
-----------------
-----------------
f at the beginning of new iteration,       914.5507130595
Predicted improvement:        0.000002562
lambda =          1; f =          914.5507085
lambda =     1.9332; f =          914.5507051
lambda =     3.7372; f =          914.5507011
Norm of dx 0.00061302
----
Improvement on iteration 69 =        0.000011933
-----------------
-----------------
f at the beginning of new iteration,       914.5507011265
Predicted improvement:        0.000007390
lambda =          1; f =          914.5506899
lambda =     1.9332; f =          914.5506857
Norm of dx  0.0015869
----
Improvement on iteration 70 =        0.000015393
-----------------
-----------------
f at the beginning of new iteration,       914.5506857337
Predicted improvement:        0.000003149
lambda =          1; f =          914.5506806
lambda =     1.9332; f =          914.5506778
```

```
Norm of dx 0.00037077
----
Improvement on iteration 71 =        0.000007924
-----------------
-----------------
f at the beginning of new iteration,       914.5506778099
Predicted improvement:        0.000004681
lambda =          1; f =          914.5506701
lambda =     1.9332; f =          914.5506660
Norm of dx 0.00083036
----
Improvement on iteration 72 =        0.000011855
-----------------
-----------------
f at the beginning of new iteration,       914.5506659552
Predicted improvement:        0.000005470
lambda =          1; f =          914.5506591
Norm of dx  0.0010313
----
Improvement on iteration 73 =        0.000006865
-----------------
-----------------
f at the beginning of new iteration,       914.5506590903
Predicted improvement:        0.000001967
lambda =          1; f =          914.5506569
Norm of dx 0.00049727
----
Improvement on iteration 74 =        0.000002176
-----------------
-----------------
f at the beginning of new iteration,       914.5506569145
Predicted improvement:        0.000000321
lambda =          1; f =          914.5506565
Norm of dx 0.00022372
----
Improvement on iteration 75 =        0.000000400
-----------------
-----------------
f at the beginning of new iteration,       914.5506565143
Predicted improvement:        0.000000209
lambda =          1; f =          914.5506563
Norm of dx  0.0001078
----
Improvement on iteration 76 =        0.000000187
-----------------
-----------------
f at the beginning of new iteration,       914.5506563277
Predicted improvement:        0.000000124
lambda =          1; f =          914.5506562
Norm of dx 0.00016747
----
Improvement on iteration 77 =        0.000000086
improvement < crit termination
Objective function at mode: 914.550656

RESULTS FROM POSTERIOR ESTIMATION
parameters
         prior mean     mode    s.d. prior pstdev

rho_a_c      0.500   0.2157  0.0830 beta  0.2000
rho_a_d      0.500   0.5000  0.2774 beta  0.2000
rho_mu_c     0.500   0.5002  0.2774 beta  0.2000
rho_mu_d     0.500   0.5000  0.2773 beta  0.2000
```

```
                                        code.log
rho_LTV       0.500   0.4952  0.2749 beta  0.2000
rho_d         0.500   0.5093  0.2769 beta  0.2000
rho_d_stern   0.500   0.8895  0.0195 beta  0.2000
rho_c_ast     0.500   0.6158  0.2560 beta  0.2000
rho_d_ast     0.500   0.5000  0.2773 beta  0.2000
rho_s_c       0.500   0.4393  0.1035 beta  0.2000
rho_r         0.500   0.6907  0.0895 beta  0.2000
rho_p        -0.500  -0.4977  0.2000 norm  0.2000
theta_c       0.750   0.3015  0.0689 beta  0.1500
sigma         1.000   1.9050  0.1082 norm  0.3700
phi           2.000   4.9232  0.7690 gamm  0.7000
omega         0.200   0.0974  0.0624 beta  0.1000
h_c           0.500   0.2863  0.0528 beta  0.1000
alpha_c       0.500   0.4006  0.0317 beta  0.1000

standard deviation of shocks
          prior mean     mode    s.d. prior pstdev

epsa_c        0.100   2.3122  0.1805 invg  2.0000
epsa_d        0.100   0.0461  0.0189 invg  2.0000
epsmu_c       0.100   0.0461  0.0188 invg  2.0000
epsmu_d       0.100   0.0461  0.0188 invg  2.0000
epsLTV        0.100   0.0461  0.0188 invg  2.0000
epsd          0.100   0.0459  0.0186 invg  2.0000
epsc_ast      0.100   0.0390  0.0124 invg  2.0000
epsd_ast      0.100   0.0461  0.0188 invg  2.0000
epsd_stern    0.100   0.6077  0.1088 invg  2.0000
epss_c        0.100   1.1249  0.0996 invg  2.0000
epsr          0.100   0.6008  0.1794 invg  2.0000
epsyf         0.100   0.0461  0.0188 invg  2.0000
epsn          0.010   0.8475  0.0667 invg  0.1000
epspi_d       0.010   5.6596  0.4285 invg  0.1000


Log data density [Laplace approximation] is -967.936256.

Estimation::mcmc: Multiple chains mode.
Estimation::mcmc: Searching for initial values...
Estimation::mcmc: Initial values found!

Estimation::mcmc: Write details about the MCMC... Ok!
Estimation::mcmc: Details about the MCMC are available in
code_89/metropolis\code_mh_history_0.mat

[ Warning: Matrix is close to singular or badly scaled. Results may be inaccurate.
RCOND =
8.922177e-21.]
[ > In <a href="matlab:
opentoline('C:\dynare\4.4.3\matlab\lyapunov_symm.m',162,1)">lyapunov_symm at 162</a>
  In <a href="matlab:
opentoline('C:\dynare\4.4.3\matlab\dsge_likelihood.m',374,1)">dsge_likelihood at
374</a>
  In <a href="matlab:
opentoline('C:\dynare\4.4.3\matlab\random_walk_metropolis_hastings_core.m',167,1)">r
andom_walk_metropolis_hastings_core at 167</a>
  In <a href="matlab:
opentoline('C:\dynare\4.4.3\matlab\random_walk_metropolis_hastings.m',117,1)">random
_walk_metropolis_hastings at 117</a>
  In <a href="matlab:
opentoline('C:\dynare\4.4.3\matlab\dynare_estimation_1.m',782,1)">dynare_estimation_
1 at 782</a>
  In <a href="matlab:
opentoline('C:\dynare\4.4.3\matlab\dynare_estimation.m',77,1)">dynare_estimation at
```

```
77</a>
  In <a href="matlab: opentoline('C:\Users\English\Desktop\forecasting no news
shock\code.m',526,1)">code at 526</a>
  In <a href="matlab: opentoline('C:\dynare\4.4.3\matlab\dynare.m',180,1)">dynare at
180</a>]

Estimation::mcmc: Number of mh files: 55 per block.
Estimation::mcmc: Total number of generated files: 110.
Estimation::mcmc: Total number of iterations: 200000.
Estimation::mcmc: Current acceptance ratio per chain:
                                                    Chain  1: 32.9148%
                                                    Chain  2: 33.5098%
Estimation::mcmc::diagnostics: Univariate convergence diagnostic, Brooks and Gelman
(1998):
    Parameter 1...  Done!
    Parameter 2...  Done!
    Parameter 3...  Done!
    Parameter 4...  Done!
    Parameter 5...  Done!
    Parameter 6...  Done!
    Parameter 7...  Done!
    Parameter 8...  Done!
    Parameter 9...  Done!
    Parameter 10...  Done!
    Parameter 11...  Done!
    Parameter 12...  Done!
    Parameter 13...  Done!
    Parameter 14...  Done!
    Parameter 15...  Done!
    Parameter 16...  Done!
    Parameter 17...  Done!
    Parameter 18...  Done!
    Parameter 19...  Done!
    Parameter 20...  Done!
    Parameter 21...  Done!
    Parameter 22...  Done!
    Parameter 23...  Done!
    Parameter 24...  Done!
    Parameter 25...  Done!
    Parameter 26...  Done!
    Parameter 27...  Done!
    Parameter 28...  Done!
    Parameter 29...  Done!
    Parameter 30...  Done!
    Parameter 31...  Done!
    Parameter 32...  Done!

Estimation::mcmc: Total number of MH draws: 200000.
Estimation::mcmc: Total number of generated MH files: 55.
Estimation::mcmc: I'll use mh-files 28 to 55.
Estimation::mcmc: In MH-file number 28 I'll start at line 721.
Estimation::mcmc: Finally I keep 100000 draws.

Estimation::marginal density: I'm computing the posterior mean and covariance...
Done!
Estimation::marginal density: I'm computing the posterior log marginal density
(modified harmonic mean)... Done!


ESTIMATION RESULTS

Log data density is -966.160303.
posterior_moments: There are not enough draws computes to compute HPD Intervals.
```

Skipping their computation.
posterior_moments: There are not enough draws computes to compute deciles. Skipping their computation.

parameters

	prior mean	post. mean	90% HPD interval		prior	pstdev
rho_a_c	0.500	0.2241	0.0947	0.3524	beta	0.2000
rho_a_d	0.500	0.4920	0.1619	0.8213	beta	0.2000
rho_mu_c	0.500	0.5022	0.1676	0.8190	beta	0.2000
rho_mu_d	0.500	0.5017	0.1659	0.8271	beta	0.2000
rho_LTV	0.500	0.4963	0.1767	0.8291	beta	0.2000
rho_d	0.500	0.5224	0.1938	0.8438	beta	0.2000
rho_d_stern	0.500	0.8879	0.8561	0.9197	beta	0.2000
rho_c_ast	0.500	0.6140	0.3130	0.9242	beta	0.2000
rho_d_ast	0.500	0.4965	0.1661	0.8256	beta	0.2000
rho_s_c	0.500	0.4453	0.2801	0.6114	beta	0.2000
rho_r	0.500	0.6343	0.4695	0.8040	beta	0.2000
rho_p	-0.500	-0.4957	-0.8235	-0.1525	norm	0.2000
theta_c	0.750	0.2942	0.1877	0.4069	beta	0.1500
sigma	1.000	1.9551	1.7641	2.1429	norm	0.3700
phi	2.000	5.0822	3.8128	6.2968	gamma	0.7000
omega	0.200	0.1268	0.0253	0.2249	beta	0.1000
h_c	0.500	0.2781	0.1948	0.3617	beta	0.1000
alpha_c	0.500	0.4001	0.3479	0.4529	beta	0.1000

standard deviation of shocks

	prior mean	post. mean	90% HPD interval		prior	pstdev
epsa_c	0.100	2.3506	2.0480	2.6590	invg	2.0000
epsa_d	0.100	0.0784	0.0239	0.1392	invg	2.0000
epsmu_c	0.100	0.0860	0.0222	0.1581	invg	2.0000
epsmu_d	0.100	0.1014	0.0223	0.1926	invg	2.0000
epsLTV	0.100	0.0802	0.0239	0.1397	invg	2.0000
epsd	0.100	0.0787	0.0238	0.1373	invg	2.0000
epsc_ast	0.100	0.0464	0.0228	0.0699	invg	2.0000
epsd_ast	0.100	0.0880	0.0239	0.1600	invg	2.0000
epsd_stern	0.100	0.5764	0.4094	0.7412	invg	2.0000
epss_c	0.100	1.1502	0.9727	1.3195	invg	2.0000
epsr	0.100	0.7271	0.3791	1.0773	invg	2.0000
epsyf	0.100	0.0811	0.0240	0.1494	invg	2.0000
epsn	0.010	0.8626	0.7511	0.9722	invg	0.1000
epspi_d	0.010	5.7491	5.0565	6.4608	invg	0.1000

Estimation::mcmc: Posterior (dsge) IRFs...
Estimation::mcmc: Posterior IRFs, done!
Estimation::mcmc: Forecasted variables (mean)
Estimation::mcmc: Forecasted variables (mean), done!
Estimation::mcmc: Forecasted variables (point)
Estimation::mcmc: Forecasted variables (point), done!

Loading 116 observations from data100.xlsx

Restricting the sample to observations 1 to 90. Using in total 90 observations.
Initial value of the log posterior (or likelihood): -921.8436

----
f at the beginning of new iteration, 921.8436416431
Predicted improvement: 0.001729223
lambda = 1; f = 921.8410503
lambda = 1.9332; f = 921.8402173
Norm of dx 0.00058809

Improvement on iteration 1 = 0.003424330

```
-----------------
-----------------
f at the beginning of new iteration,       921.8402173129
Predicted improvement:        0.000402377
lambda =          1; f =          921.8395187
lambda =     1.9332; f =          921.8390583
lambda =     3.7372; f =          921.8386929
Norm of dx 0.00032396
----
Improvement on iteration 2 =        0.001524450
-----------------
-----------------
f at the beginning of new iteration,       921.8386928626
Predicted improvement:        0.000199629
lambda =          1; f =          921.8383343
lambda =     1.9332; f =          921.8380724
lambda =     3.7372; f =          921.8377649
Norm of dx 0.00025211
----
Improvement on iteration 3 =        0.000927948
-----------------
-----------------
f at the beginning of new iteration,       921.8377649149
Predicted improvement:        0.000400744
lambda =          1; f =          921.8371086
lambda =     1.9332; f =          921.8367575
Norm of dx 0.00078799
----
Improvement on iteration 4 =        0.001007398
-----------------
-----------------
f at the beginning of new iteration,       921.8367575168
Predicted improvement:        0.000448690
lambda =          1; f =          921.8361176
lambda =     1.9332; f =          921.8359857
Norm of dx  0.0010115
----
Improvement on iteration 5 =        0.000771852
-----------------
-----------------
f at the beginning of new iteration,       921.8359856646
Predicted improvement:        0.000135091
lambda =          1; f =          921.8357666
lambda =     1.9332; f =          921.8356549
Norm of dx 0.00032585
----
Improvement on iteration 6 =        0.000330736
-----------------
-----------------
f at the beginning of new iteration,       921.8356549291
Predicted improvement:        0.000163886
lambda =          1; f =          921.8353758
lambda =     1.9332; f =          921.8352032
lambda =     3.7372; f =          921.8351094
Norm of dx 0.00039075
----
Improvement on iteration 7 =        0.000545544
-----------------
-----------------
f at the beginning of new iteration,       921.8351093853
Predicted improvement:        0.000194389
lambda =          1; f =          921.8348150
lambda =     1.9332; f =          921.8347099
```

```
Norm of dx 0.00063054
----
Improvement on iteration 8 =        0.000399517
-----------------
-----------------
f at the beginning of new iteration,       921.8347098687
Predicted improvement:        0.000037116
lambda =          1; f =          921.8346445
lambda =     1.9332; f =          921.8345990
lambda =     3.7372; f =          921.8345539
Norm of dx 0.00029228
----
Improvement on iteration 9 =        0.000155929
-----------------
-----------------
f at the beginning of new iteration,       921.8345539397
Predicted improvement:        0.000098846
lambda =          1; f =          921.8343755
lambda =     1.9332; f =          921.8342437
lambda =     3.7372; f =          921.8340837
Norm of dx 0.00041086
----
Improvement on iteration 10 =        0.000470209
-----------------
-----------------
f at the beginning of new iteration,       921.8340837302
Predicted improvement:        0.000094023
lambda =          1; f =          921.8339714
Norm of dx 0.00047866
----
Improvement on iteration 11 =        0.000112316
-----------------
-----------------
f at the beginning of new iteration,       921.8339714140
Predicted improvement:        0.000018413
lambda =          1; f =          921.8339397
lambda =     1.9332; f =          921.8339193
lambda =     3.7372; f =          921.8339052
Norm of dx 0.00014156
----
Improvement on iteration 12 =        0.000066242
-----------------
-----------------
f at the beginning of new iteration,       921.8339051724
Predicted improvement:        0.000042003
lambda =          1; f =          921.8338255
lambda =     1.9332; f =          921.8337590
lambda =     3.7372; f =          921.8336518
lambda =     7.2247; f =          921.8335251
Norm of dx 0.00021224
----
Improvement on iteration 13 =        0.000380050
-----------------
-----------------
f at the beginning of new iteration,       921.8335251223
Predicted improvement:        0.000099613
lambda =          1; f =          921.8333660
lambda =     1.9332; f =          921.8332896
Norm of dx  0.0011079
----
Improvement on iteration 14 =        0.000235493
-----------------
-----------------
```

```
f at the beginning of new iteration,       921.8332896297
Predicted improvement:        0.000117840
lambda =          1; f =          921.8330974
lambda =     1.9332; f =          921.8329968
Norm of dx   0.001022
----
Improvement on iteration 15 =        0.000292845
-----------------
-----------------
f at the beginning of new iteration,       921.8329967845
Predicted improvement:        0.000068676
lambda =          1; f =          921.8329145
Norm of dx 0.00029947
----
Improvement on iteration 16 =        0.000082277
-----------------
-----------------
f at the beginning of new iteration,       921.8329145073
Predicted improvement:        0.000009262
lambda =          1; f =          921.8329000
lambda =     1.9332; f =          921.8328937
Norm of dx 0.00012966
----
Improvement on iteration 17 =        0.000020770
-----------------
-----------------
f at the beginning of new iteration,       921.8328937376
Predicted improvement:        0.000011426
lambda =          1; f =          921.8328716
lambda =     1.9332; f =          921.8328522
lambda =     3.7372; f =          921.8328182
lambda =     7.2247; f =          921.8327655
lambda =     13.967; f =          921.8327125
Norm of dx 9.1523e-05
----
Improvement on iteration 18 =        0.000181226
-----------------
-----------------
f at the beginning of new iteration,       921.8327125113
Predicted improvement:        0.000126802
lambda =          1; f =          921.8324969
lambda =     1.9332; f =          921.8323639
lambda =     3.7372; f =          921.8322934
Norm of dx  0.0014238
----
Improvement on iteration 19 =        0.000419125
-----------------
-----------------
f at the beginning of new iteration,       921.8322933868
Predicted improvement:        0.000029235
lambda =          1; f =          921.8322592
Norm of dx 0.00062406
----
Improvement on iteration 20 =        0.000034218
-----------------
-----------------
f at the beginning of new iteration,       921.8322591687
Predicted improvement:        0.000005180
lambda =          1; f =          921.8322498
lambda =     1.9332; f =          921.8322431
lambda =     3.7372; f =          921.8322353
Norm of dx 8.9484e-05
----
```

```
Improvement on iteration 21 =        0.000023876
-----------------
-----------------
f at the beginning of new iteration,       921.8322352931
Predicted improvement:        0.000019457
lambda =          1; f =          921.8321990
lambda =     1.9332; f =          921.8321699
lambda =     3.7372; f =          921.8321269
lambda =     7.2247; f =          921.8320933
Norm of dx 0.00024159
----
Improvement on iteration 22 =        0.000141998
-----------------
-----------------
f at the beginning of new iteration,       921.8320932955
Predicted improvement:        0.000056268
lambda =          1; f =          921.8320095
lambda =     1.9332; f =          921.8319829
Norm of dx  0.0009251
----
Improvement on iteration 23 =        0.000110417
-----------------
-----------------
f at the beginning of new iteration,       921.8319828788
Predicted improvement:        0.000005438
lambda =          1; f =          921.8319731
lambda =     1.9332; f =          921.8319660
lambda =     3.7372; f =          921.8319579
Norm of dx 6.8763e-05
----
Improvement on iteration 24 =        0.000025015
-----------------
-----------------
f at the beginning of new iteration,       921.8319578633
Predicted improvement:        0.000004137
lambda =          1; f =          921.8319515
lambda =     1.9332; f =          921.8319490
Norm of dx 0.00012732
----
Improvement on iteration 25 =        0.000008822
-----------------
-----------------
f at the beginning of new iteration,       921.8319490417
Predicted improvement:        0.000004414
lambda =          1; f =          921.8319404
lambda =     1.9332; f =          921.8319325
lambda =     3.7372; f =          921.8319182
lambda =     7.2247; f =          921.8318933
lambda =     13.967; f =          921.8318559
lambda =         27; f =          921.8318236
Norm of dx 9.1463e-05
----
Improvement on iteration 26 =        0.000125474
-----------------
-----------------
f at the beginning of new iteration,       921.8318235679
Predicted improvement:        0.000059768
lambda =          1; f =          921.8317333
lambda =     1.9332; f =          921.8317019
Norm of dx 0.00093357
----
Improvement on iteration 27 =        0.000121626
-----------------
```

```
-----------------
f at the beginning of new iteration,       921.8317019420
Predicted improvement:        0.000004620
lambda =          1; f =          921.8316936
lambda =     1.9332; f =          921.8316873
lambda =     3.7372; f =          921.8316792
Norm of dx 0.00010144
----
Improvement on iteration 28 =        0.000022780
-----------------
-----------------
f at the beginning of new iteration,       921.8316791620
Predicted improvement:        0.000019600
lambda =          1; f =          921.8316450
lambda =     1.9332; f =          921.8316222
lambda =     3.7372; f =          921.8316032
Norm of dx  0.0004544
----
Improvement on iteration 29 =        0.000075929
-----------------
-----------------
f at the beginning of new iteration,       921.8316032332
Predicted improvement:        0.000034024
lambda =          1; f =          921.8315437
lambda =     1.9332; f =          921.8315033
lambda =     3.7372; f =          921.8314664
Norm of dx   0.000648
----
Improvement on iteration 30 =        0.000136793
-----------------
-----------------
f at the beginning of new iteration,       921.8314664400
Predicted improvement:        0.000046406
lambda =          1; f =          921.8313822
lambda =     1.9332; f =          921.8313188
lambda =     3.7372; f =          921.8312383
Norm of dx  0.0009698
----
Improvement on iteration 31 =        0.000228168
-----------------
-----------------
f at the beginning of new iteration,       921.8312382721
Predicted improvement:        0.000051334
lambda =          1; f =          921.8311817
Norm of dx  0.0017521
----
Improvement on iteration 32 =        0.000056620
-----------------
-----------------
f at the beginning of new iteration,       921.8311816523
Predicted improvement:        0.000004051
lambda =          1; f =          921.8311744
lambda =     1.9332; f =          921.8311692
lambda =     3.7372; f =          921.8311636
Norm of dx 0.00015796
----
Improvement on iteration 33 =        0.000018039
-----------------
-----------------
f at the beginning of new iteration,       921.8311636136
Predicted improvement:        0.000014090
lambda =          1; f =          921.8311369
lambda =     1.9332; f =          921.8311147
```

```
lambda =     3.7372; f =          921.8310789
lambda =     7.2247; f =          921.8310367
Norm of dx  0.0003944
----
Improvement on iteration 34 =        0.000126899
-----------------
-----------------
f at the beginning of new iteration,       921.8310367143
Predicted improvement:        0.000066988
lambda =          1; f =          921.8309431
Norm of dx  0.0015284
----
Improvement on iteration 35 =        0.000093633
-----------------
-----------------
f at the beginning of new iteration,       921.8309430808
Predicted improvement:        0.000022898
lambda =          1; f =          921.8309197
Norm of dx 0.00077113
----
Improvement on iteration 36 =        0.000023419
-----------------
-----------------
f at the beginning of new iteration,       921.8309196616
Predicted improvement:        0.000000162
lambda =          1; f =          921.8309194
lambda =     1.9332; f =          921.8309192
lambda =     3.7372; f =          921.8309192
Norm of dx 2.7069e-05
----
Improvement on iteration 37 =        0.000000511
-----------------
-----------------
f at the beginning of new iteration,       921.8309191507
Predicted improvement:        0.000000331
lambda =          1; f =          921.8309185
lambda =     1.9332; f =          921.8309180
lambda =     3.7372; f =          921.8309171
lambda =     7.2247; f =          921.8309160
Norm of dx 1.8672e-05
----
Improvement on iteration 38 =        0.000003165
-----------------
-----------------
f at the beginning of new iteration,       921.8309159858
Predicted improvement:        0.000002796
lambda =          1; f =          921.8309120
lambda =     1.9332; f =          921.8309107
Norm of dx 0.00016927
----
Improvement on iteration 39 =        0.000005294
-----------------
-----------------
f at the beginning of new iteration,       921.8309106917
Predicted improvement:        0.000001405
lambda =          1; f =          921.8309088
Norm of dx 0.00023714
----
Improvement on iteration 40 =        0.000001936
-----------------
-----------------
f at the beginning of new iteration,       921.8309087562
Predicted improvement:        0.000000384
```

```
lambda =          1; f =          921.8309083
Norm of dx 7.2561e-05
----
Improvement on iteration 41 =        0.000000485
-----------------
-----------------
f at the beginning of new iteration,       921.8309082715
Predicted improvement:        0.000000128
lambda =          1; f =          921.8309081
lambda =     1.9332; f =          921.8309080
Norm of dx 4.9877e-05
----
Improvement on iteration 42 =        0.000000276
-----------------
-----------------
f at the beginning of new iteration,       921.8309079951
Predicted improvement:        0.000000113
lambda =          1; f =          921.8309078
lambda =     1.9332; f =          921.8309078
Norm of dx 2.0038e-05
----
Improvement on iteration 43 =        0.000000221
-----------------
-----------------
f at the beginning of new iteration,       921.8309077743
Predicted improvement:        0.000000106
lambda =          1; f =          921.8309076
lambda =     1.9332; f =          921.8309076
Norm of dx  8.195e-05
----
Improvement on iteration 44 =        0.000000221
-----------------
-----------------
f at the beginning of new iteration,       921.8309075532
Predicted improvement:        0.000000193
lambda =          1; f =          921.8309073
lambda =     1.9332; f =          921.8309071
Norm of dx 8.2372e-05
----
Improvement on iteration 45 =        0.000000446
-----------------
-----------------
f at the beginning of new iteration,       921.8309071072
Predicted improvement:        0.000000437
lambda =          1; f =          921.8309064
lambda =     1.9332; f =          921.8309061
Norm of dx 5.2422e-05
----
Improvement on iteration 46 =        0.000001026
-----------------
-----------------
f at the beginning of new iteration,       921.8309060812
Predicted improvement:        0.000000168
lambda =          1; f =          921.8309059
Norm of dx 0.00011946
----
Improvement on iteration 47 =        0.000000225
-----------------
-----------------
f at the beginning of new iteration,       921.8309058557
Predicted improvement:        0.000000040
lambda =          1; f =          921.8309058
lambda =     1.9332; f =          921.8309058
```

```
Norm of dx 6.7916e-05
----
Improvement on iteration 48 =        0.000000096
improvement < crit termination
Objective function at mode: 921.830906

RESULTS FROM POSTERIOR ESTIMATION
parameters
         prior mean     mode    s.d. prior pstdev

rho_a_c      0.500   0.2171  0.0827 beta  0.2000
rho_a_d      0.500   0.5000  0.2774 beta  0.2000
rho_mu_c     0.500   0.5002  0.2774 beta  0.2000
rho_mu_d     0.500   0.5000  0.2774 beta  0.2000
rho_LTV      0.500   0.4951  0.2748 beta  0.2000
rho_d        0.500   0.5096  0.2769 beta  0.2000
rho_d_stern   0.500   0.8896  0.0194 beta  0.2000
rho_c_ast    0.500   0.6183  0.2552 beta  0.2000
rho_d_ast    0.500   0.5000  0.2773 beta  0.2000
rho_s_c      0.500   0.4388  0.1031 beta  0.2000
rho_r        0.500   0.6897  0.0896 beta  0.2000
rho_p       -0.500  -0.4977  0.2000 norm  0.2000
theta_c      0.750   0.3013  0.0688 beta  0.1500
sigma        1.000   1.9025  0.1077 norm  0.3700
phi          2.000   4.9269  0.7675 gamm  0.7000
omega        0.200   0.0974  0.0624 beta  0.1000
h_c          0.500   0.2865  0.0527 beta  0.1000
alpha_c      0.500   0.4003  0.0315 beta  0.1000

standard deviation of shocks
         prior mean     mode    s.d. prior pstdev

epsa_c       0.100   2.3017  0.1788 invg  2.0000
epsa_d       0.100   0.0461  0.0189 invg  2.0000
epsmu_c      0.100   0.0461  0.0188 invg  2.0000
epsmu_d      0.100   0.0461  0.0188 invg  2.0000
epsLTV       0.100   0.0461  0.0188 invg  2.0000
epsd         0.100   0.0459  0.0186 invg  2.0000
epsc_ast     0.100   0.0390  0.0124 invg  2.0000
epsd_ast     0.100   0.0461  0.0188 invg  2.0000
epsd_stern   0.100   0.6052  0.1079 invg  2.0000
epss_c       0.100   1.1198  0.0986 invg  2.0000
epsr         0.100   0.6010  0.1792 invg  2.0000
epsyf        0.100   0.0461  0.0188 invg  2.0000
epsn         0.010   0.8430  0.0660 invg  0.1000
epspi_d      0.010   5.6311  0.4241 invg  0.1000


Log data density [Laplace approximation] is -975.312853.

Estimation::mcmc: Multiple chains mode.
Estimation::mcmc: Searching for initial values...
Estimation::mcmc: Initial values found!

Estimation::mcmc: Write details about the MCMC... Ok!
Estimation::mcmc: Details about the MCMC are available in
code_90/metropolis\code_mh_history_0.mat


Estimation::mcmc: Number of mh files: 55 per block.
Estimation::mcmc: Total number of generated files: 110.
Estimation::mcmc: Total number of iterations: 200000.
Estimation::mcmc: Current acceptance ratio per chain:
```

```
                                                    Chain  1: 33.3248%
                                                    Chain  2: 33.3698%
Estimation::mcmc::diagnostics: Univariate convergence diagnostic, Brooks and Gelman
(1998):
    Parameter 1...  Done!
    Parameter 2...  Done!
    Parameter 3...  Done!
    Parameter 4...  Done!
    Parameter 5...  Done!
    Parameter 6...  Done!
    Parameter 7...  Done!
    Parameter 8...  Done!
    Parameter 9...  Done!
    Parameter 10...  Done!
    Parameter 11...  Done!
    Parameter 12...  Done!
    Parameter 13...  Done!
    Parameter 14...  Done!
    Parameter 15...  Done!
    Parameter 16...  Done!
    Parameter 17...  Done!
    Parameter 18...  Done!
    Parameter 19...  Done!
    Parameter 20...  Done!
    Parameter 21...  Done!
    Parameter 22...  Done!
    Parameter 23...  Done!
    Parameter 24...  Done!
    Parameter 25...  Done!
    Parameter 26...  Done!
    Parameter 27...  Done!
    Parameter 28...  Done!
    Parameter 29...  Done!
    Parameter 30...  Done!
    Parameter 31...  Done!
    Parameter 32...  Done!

Estimation::mcmc: Total number of MH draws: 200000.
Estimation::mcmc: Total number of generated MH files: 55.
Estimation::mcmc: I'll use mh-files 28 to 55.
Estimation::mcmc: In MH-file number 28 I'll start at line 721.
Estimation::mcmc: Finally I keep 100000 draws.

Estimation::marginal density: I'm computing the posterior mean and covariance...
Done!
Estimation::marginal density: I'm computing the posterior log marginal density
(modified harmonic mean)... Done!


ESTIMATION RESULTS

Log data density is -973.671413.
posterior_moments: There are not enough draws computes to compute HPD Intervals.
Skipping their computation.
posterior_moments: There are not enough draws computes to compute deciles. Skipping
their computation.

parameters
             prior mean   post. mean        90% HPD interval    prior       pstdev

rho_a_c           0.500       0.2279      0.0979      0.3557   beta        0.2000
rho_a_d           0.500       0.4993      0.1765      0.8265   beta        0.2000
rho_mu_c          0.500       0.5080      0.1743      0.8345   beta        0.2000
```

rho_mu_d	0.500	0.5013	0.1751	0.8334	beta	0.2000
rho_LTV	0.500	0.5001	0.1774	0.8302	beta	0.2000
rho_d	0.500	0.5306	0.2089	0.8610	beta	0.2000
rho_d_stern	0.500	0.8880	0.8567	0.9209	beta	0.2000
rho_c_ast	0.500	0.6219	0.3206	0.9165	beta	0.2000
rho_d_ast	0.500	0.4977	0.1747	0.8303	beta	0.2000
rho_s_c	0.500	0.4385	0.2714	0.6019	beta	0.2000
rho_r	0.500	0.6199	0.4309	0.8064	beta	0.2000
rho_p	-0.500	-0.4951	-0.8123	-0.1698	norm	0.2000
theta_c	0.750	0.2924	0.1812	0.3997	beta	0.1500
sigma	1.000	1.9535	1.7697	2.1376	norm	0.3700
phi	2.000	5.1322	3.8105	6.3873	gamma	0.7000
omega	0.200	0.1265	0.0276	0.2246	beta	0.1000
h_c	0.500	0.2793	0.1952	0.3633	beta	0.1000
alpha_c	0.500	0.4025	0.3485	0.4534	beta	0.1000

standard deviation of shocks

	prior mean	post. mean	90% HPD interval		prior	pstdev
epsa_c	0.100	2.3390	2.0332	2.6441	invg	2.0000
epsa_d	0.100	0.0827	0.0230	0.1515	invg	2.0000
epsmu_c	0.100	0.0852	0.0240	0.1547	invg	2.0000
epsmu_d	0.100	0.0858	0.0248	0.1585	invg	2.0000
epsLTV	0.100	0.0793	0.0237	0.1519	invg	2.0000
epsd	0.100	0.0807	0.0222	0.1501	invg	2.0000
epsc_ast	0.100	0.0447	0.0230	0.0662	invg	2.0000
epsd_ast	0.100	0.0859	0.0233	0.1639	invg	2.0000
epsd_stern	0.100	0.5703	0.4014	0.7343	invg	2.0000
epss_c	0.100	1.1401	0.9755	1.3039	invg	2.0000
epsr	0.100	0.7454	0.3704	1.1214	invg	2.0000
epsyf	0.100	0.0748	0.0251	0.1295	invg	2.0000
epsn	0.010	0.8600	0.7471	0.9720	invg	0.1000
epspi_d	0.010	5.7177	4.9806	6.4192	invg	0.1000

```
Estimation::mcmc: Posterior (dsge) IRFs...
Estimation::mcmc: Posterior IRFs, done!
Estimation::mcmc: Forecasted variables (mean)
Estimation::mcmc: Forecasted variables (mean), done!
Estimation::mcmc: Forecasted variables (point)
Estimation::mcmc: Forecasted variables (point), done!

Loading 116 observations from data100.xlsx

Restricting the sample to observations 1 to 91. Using in total 91 observations.
Initial value of the log posterior (or likelihood): -930.1221
-----------------
-----------------
f at the beginning of new iteration,       930.1221177331
Predicted improvement:        0.001578992
lambda =          1; f =          930.1197961
lambda =     1.9332; f =          930.1191600
Norm of dx 0.00056196
----
Improvement on iteration 1 =        0.002957748
-----------------
-----------------
f at the beginning of new iteration,       930.1191599848
Predicted improvement:        0.000376761
lambda =          1; f =          930.1184817
lambda =     1.9332; f =          930.1179840
lambda =     3.7372; f =          930.1173913
Norm of dx 0.00028816
----
Improvement on iteration 2 =        0.001768733
```

```
-----------------
-----------------
f at the beginning of new iteration,       930.1173912517
Predicted improvement:        0.000498721
lambda =          1; f =          930.1166241
lambda =     1.9332; f =          930.1163245
Norm of dx 0.00078095
----
Improvement on iteration 3 =        0.001066720
-----------------
-----------------
f at the beginning of new iteration,       930.1163245322
Predicted improvement:        0.000416291
lambda =          1; f =          930.1155869
lambda =     1.9332; f =          930.1150693
lambda =     3.7372; f =          930.1145383
Norm of dx  0.0005806
----
Improvement on iteration 4 =        0.001786266
-----------------
-----------------
f at the beginning of new iteration,       930.1145382658
Predicted improvement:        0.000500026
lambda =          1; f =          930.1137692
lambda =     1.9332; f =          930.1134688
Norm of dx 0.00073626
----
Improvement on iteration 5 =        0.001069478
-----------------
-----------------
f at the beginning of new iteration,       930.1134687878
Predicted improvement:        0.000193417
lambda =          1; f =          930.1131632
lambda =     1.9332; f =          930.1130256
Norm of dx 0.00037037
----
Improvement on iteration 6 =        0.000443183
-----------------
-----------------
f at the beginning of new iteration,       930.1130256050
Predicted improvement:        0.000157839
lambda =          1; f =          930.1127547
lambda =     1.9332; f =          930.1125830
lambda =     3.7372; f =          930.1124726
Norm of dx 0.00041508
----
Improvement on iteration 7 =        0.000553032
-----------------
-----------------
f at the beginning of new iteration,       930.1124725729
Predicted improvement:        0.000138839
lambda =          1; f =          930.1122773
lambda =     1.9332; f =          930.1122440
Norm of dx 0.00019787
----
Improvement on iteration 8 =        0.000228611
-----------------
-----------------
f at the beginning of new iteration,       930.1122439615
Predicted improvement:        0.000025284
lambda =          1; f =          930.1121996
lambda =     1.9332; f =          930.1121698
lambda =     3.7372; f =          930.1121436
```

```
Norm of dx 0.00011394
----
Improvement on iteration 9 =        0.000100374
-----------------
-----------------
f at the beginning of new iteration,       930.1121435871
Predicted improvement:        0.000069424
lambda =          1; f =          930.1120107
lambda =     1.9332; f =          930.1118973
lambda =     3.7372; f =          930.1117073
lambda =     7.2247; f =          930.1114488
Norm of dx 0.00030302
----
Improvement on iteration 10 =        0.000694775
-----------------
-----------------
f at the beginning of new iteration,       930.1114488126
Predicted improvement:        0.000175601
lambda =          1; f =          930.1112558
Norm of dx  0.0014005
----
Improvement on iteration 11 =        0.000193022
-----------------
-----------------
f at the beginning of new iteration,       930.1112557910
Predicted improvement:        0.000018318
lambda =          1; f =          930.1112224
lambda =     1.9332; f =          930.1111970
lambda =     3.7372; f =          930.1111636
Norm of dx 0.00020445
----
Improvement on iteration 12 =        0.000092194
-----------------
-----------------
f at the beginning of new iteration,       930.1111635974
Predicted improvement:        0.000070868
lambda =          1; f =          930.1110511
lambda =     1.9332; f =          930.1109987
Norm of dx 0.00054598
----
Improvement on iteration 13 =        0.000164922
-----------------
-----------------
f at the beginning of new iteration,       930.1109986751
Predicted improvement:        0.000053227
lambda =          1; f =          930.1109163
lambda =     1.9332; f =          930.1108839
Norm of dx 0.00029592
----
Improvement on iteration 14 =        0.000114790
-----------------
-----------------
f at the beginning of new iteration,       930.1108838851
Predicted improvement:        0.000031543
lambda =          1; f =          930.1108309
lambda =     1.9332; f =          930.1107999
Norm of dx  0.0001529
----
Improvement on iteration 15 =        0.000083945
-----------------
-----------------
f at the beginning of new iteration,       930.1107999402
Predicted improvement:        0.000029831
```

```
lambda =          1; f =          930.1107629
Norm of dx 0.00040698
----
Improvement on iteration 16 =        0.000037037
-----------------
-----------------
f at the beginning of new iteration,       930.1107629028
Predicted improvement:        0.000007299
lambda =          1; f =          930.1107513
lambda =     1.9332; f =          930.1107459
Norm of dx 0.00021278
----
Improvement on iteration 17 =        0.000016961
-----------------
-----------------
f at the beginning of new iteration,       930.1107459421
Predicted improvement:        0.000010337
lambda =          1; f =          930.1107268
lambda =     1.9332; f =          930.1107114
lambda =     3.7372; f =          930.1106887
lambda =     7.2247; f =          930.1106705
Norm of dx 0.00019301
----
Improvement on iteration 18 =        0.000075471
-----------------
-----------------
f at the beginning of new iteration,       930.1106704709
Predicted improvement:        0.000043685
lambda =          1; f =          930.1105976
lambda =     1.9332; f =          930.1105564
Norm of dx 0.00034661
----
Improvement on iteration 19 =        0.000114037
-----------------
-----------------
f at the beginning of new iteration,       930.1105564337
Predicted improvement:        0.000017606
lambda =          1; f =          930.1105374
Norm of dx 0.00036726
----
Improvement on iteration 20 =        0.000019039
-----------------
-----------------
f at the beginning of new iteration,       930.1105373942
Predicted improvement:        0.000001639
lambda =          1; f =          930.1105342
lambda =     1.9332; f =          930.1105314
lambda =     3.7372; f =          930.1105266
lambda =     7.2247; f =          930.1105194
lambda =     13.967; f =          930.1105133
Norm of dx 4.2952e-05
----
Improvement on iteration 21 =        0.000024143
-----------------
-----------------
f at the beginning of new iteration,       930.1105132516
Predicted improvement:        0.000019208
lambda =          1; f =          930.1104773
lambda =     1.9332; f =          930.1104479
lambda =     3.7372; f =          930.1104024
lambda =     7.2247; f =          930.1103570
Norm of dx 0.00030371
----
```

```
Improvement on iteration 22 =        0.000156223
-----------------
-----------------
f at the beginning of new iteration,       930.1103570290
Predicted improvement:        0.000009121
lambda =          1; f =          930.1103457
Norm of dx 0.00029137
----
Improvement on iteration 23 =        0.000011347
-----------------
-----------------
f at the beginning of new iteration,       930.1103456823
Predicted improvement:        0.000002906
lambda =          1; f =          930.1103412
lambda =     1.9332; f =          930.1103395
Norm of dx 0.00012483
----
Improvement on iteration 24 =        0.000006180
-----------------
-----------------
f at the beginning of new iteration,       930.1103395018
Predicted improvement:        0.000001934
lambda =          1; f =          930.1103363
lambda =     1.9332; f =          930.1103345
Norm of dx 3.9243e-05
----
Improvement on iteration 25 =        0.000005022
-----------------
-----------------
f at the beginning of new iteration,       930.1103344795
Predicted improvement:        0.000001846
lambda =          1; f =          930.1103314
lambda =     1.9332; f =          930.1103298
Norm of dx 6.0234e-05
----
Improvement on iteration 26 =        0.000004687
-----------------
-----------------
f at the beginning of new iteration,       930.1103297930
Predicted improvement:        0.000003510
lambda =          1; f =          930.1103234
lambda =     1.9332; f =          930.1103187
lambda =     3.7372; f =          930.1103127
Norm of dx 0.00010822
----
Improvement on iteration 27 =        0.000017050
-----------------
-----------------
f at the beginning of new iteration,       930.1103127426
Predicted improvement:        0.000011724
lambda =          1; f =          930.1102947
lambda =     1.9332; f =          930.1102872
Norm of dx 0.00039763
----
Improvement on iteration 28 =        0.000025519
-----------------
-----------------
f at the beginning of new iteration,       930.1102872233
Predicted improvement:        0.000003834
lambda =          1; f =          930.1102826
Norm of dx 0.00012356
----
Improvement on iteration 29 =        0.000004659
```

```
-----------------
-----------------
f at the beginning of new iteration,       930.1102825647
Predicted improvement:        0.000000728
lambda =          1; f =          930.1102815
lambda =     1.9332; f =          930.1102813
Norm of dx 3.8467e-05
----
Improvement on iteration 30 =        0.000001303
-----------------
-----------------
f at the beginning of new iteration,       930.1102812614
Predicted improvement:        0.000000681
lambda =          1; f =          930.1102799
lambda =     1.9332; f =          930.1102787
lambda =     3.7372; f =          930.1102764
lambda =     7.2247; f =          930.1102725
lambda =     13.967; f =          930.1102663
lambda =         27; f =          930.1102598
Norm of dx 2.1158e-05
----
Improvement on iteration 31 =        0.000021465
-----------------
-----------------
f at the beginning of new iteration,       930.1102597966
Predicted improvement:        0.000007227
lambda =          1; f =          930.1102497
lambda =     1.9332; f =          930.1102477
Norm of dx 0.00049806
----
Improvement on iteration 32 =        0.000012071
-----------------
-----------------
f at the beginning of new iteration,       930.1102477254
Predicted improvement:        0.000002365
lambda =          1; f =          930.1102438
lambda =     1.9332; f =          930.1102415
Norm of dx 7.3123e-05
----
Improvement on iteration 33 =        0.000006269
-----------------
-----------------
f at the beginning of new iteration,       930.1102414563
Predicted improvement:        0.000002897
lambda =          1; f =          930.1102376
Norm of dx 0.00015092
----
Improvement on iteration 34 =        0.000003839
-----------------
-----------------
f at the beginning of new iteration,       930.1102376172
Predicted improvement:        0.000001166
lambda =          1; f =          930.1102357
lambda =     1.9332; f =          930.1102349
Norm of dx 0.00015104
----
Improvement on iteration 35 =        0.000002720
-----------------
-----------------
f at the beginning of new iteration,       930.1102348969
Predicted improvement:        0.000001469
lambda =          1; f =          930.1102321
lambda =     1.9332; f =          930.1102299
```

```
lambda =     3.7372; f =          930.1102263
lambda =     7.2247; f =          930.1102223
Norm of dx 0.00014119
----
Improvement on iteration 36 =        0.000012577
-----------------
-----------------
f at the beginning of new iteration,       930.1102223201
Predicted improvement:        0.000012012
lambda =          1; f =          930.1102004
lambda =     1.9332; f =          930.1101829
lambda =     3.7372; f =          930.1101573
lambda =     7.2247; f =          930.1101387
Norm of dx 0.00067664
----
Improvement on iteration 37 =        0.000083626
-----------------
-----------------
f at the beginning of new iteration,       930.1101386946
Predicted improvement:        0.000028184
lambda =          1; f =          930.1100996
Norm of dx  0.0004378
----
Improvement on iteration 38 =        0.000039128
-----------------
-----------------
f at the beginning of new iteration,       930.1100995664
Predicted improvement:        0.000008008
lambda =          1; f =          930.1100917
Norm of dx 0.00033631
----
Improvement on iteration 39 =        0.000007835
-----------------
-----------------
f at the beginning of new iteration,       930.1100917311
Predicted improvement:        0.000000542
lambda =          1; f =          930.1100906
lambda =     1.9332; f =          930.1100897
lambda =     3.7372; f =          930.1100880
lambda =     7.2247; f =          930.1100855
lambda =     13.967; f =          930.1100832
Norm of dx 0.00010877
----
Improvement on iteration 40 =        0.000008544
-----------------
-----------------
f at the beginning of new iteration,       930.1100831868
Predicted improvement:        0.000006528
lambda =          1; f =          930.1100708
lambda =     1.9332; f =          930.1100605
lambda =     3.7372; f =          930.1100441
lambda =     7.2247; f =          930.1100253
Norm of dx 0.00039744
----
Improvement on iteration 41 =        0.000057871
-----------------
-----------------
f at the beginning of new iteration,       930.1100253160
Predicted improvement:        0.000011511
lambda =          1; f =          930.1100129
Norm of dx 0.00069825
----
Improvement on iteration 42 =        0.000012388
```

```
-----------------
-----------------
f at the beginning of new iteration,       930.1100129276
Predicted improvement:        0.000000368
lambda =          1; f =          930.1100124
lambda =     1.9332; f =          930.1100122
Norm of dx 0.00017528
----
Improvement on iteration 43 =        0.000000756
-----------------
-----------------
f at the beginning of new iteration,       930.1100121712
Predicted improvement:        0.000000429
lambda =          1; f =          930.1100115
lambda =     1.9332; f =          930.1100111
Norm of dx 0.00012626
----
Improvement on iteration 44 =        0.000001081
-----------------
-----------------
f at the beginning of new iteration,       930.1100110900
Predicted improvement:        0.000000577
lambda =          1; f =          930.1100102
lambda =     1.9332; f =          930.1100099
Norm of dx  0.0001104
----
Improvement on iteration 45 =        0.000001217
-----------------
-----------------
f at the beginning of new iteration,       930.1100098726
Predicted improvement:        0.000000602
lambda =          1; f =          930.1100087
lambda =     1.9332; f =          930.1100077
lambda =     3.7372; f =          930.1100059
lambda =     7.2247; f =          930.1100030
lambda =     13.967; f =          930.1099993
Norm of dx 6.3484e-05
----
Improvement on iteration 46 =        0.000010608
-----------------
-----------------
f at the beginning of new iteration,       930.1099992647
Predicted improvement:        0.000010910
lambda =          1; f =          930.1099799
lambda =     1.9332; f =          930.1099663
lambda =     3.7372; f =          930.1099526
Norm of dx 0.00057157
----
Improvement on iteration 47 =        0.000046676
-----------------
-----------------
f at the beginning of new iteration,       930.1099525892
Predicted improvement:        0.000016637
lambda =          1; f =          930.1099263
lambda =     1.9332; f =          930.1099151
Norm of dx  0.0020376
----
Improvement on iteration 48 =        0.000037462
-----------------
-----------------
f at the beginning of new iteration,       930.1099151274
Predicted improvement:        0.000002483
lambda =          1; f =          930.1099121
```

```
Norm of dx  0.0010029
----
Improvement on iteration 49 =        0.000003048
-----------------
-----------------
f at the beginning of new iteration,       930.1099120795
Predicted improvement:        0.000000153
lambda =          1; f =          930.1099118
lambda =     1.9332; f =          930.1099117
Norm of dx 0.00013597
----
Improvement on iteration 50 =        0.000000369
-----------------
-----------------
f at the beginning of new iteration,       930.1099117107
Predicted improvement:        0.000000235
lambda =          1; f =          930.1099115
Norm of dx 0.00014587
----
Improvement on iteration 51 =        0.000000212
-----------------
-----------------
f at the beginning of new iteration,       930.1099114987
Predicted improvement:        0.000000732
lambda =          1; f =          930.1099102
lambda =     1.9332; f =          930.1099093
lambda =     3.7372; f =          930.1099083
Norm of dx 0.00011897
----
Improvement on iteration 52 =        0.000003243
-----------------
-----------------
f at the beginning of new iteration,       930.1099082555
Predicted improvement:        0.000001898
lambda =          1; f =          930.1099049
lambda =     1.9332; f =          930.1099027
lambda =     3.7372; f =          930.1099008
Norm of dx 0.00016789
----
Improvement on iteration 53 =        0.000007425
-----------------
-----------------
f at the beginning of new iteration,       930.1099008305
Predicted improvement:        0.000001361
lambda =          1; f =          930.1098985
lambda =     1.9332; f =          930.1098972
Norm of dx 0.00038651
----
Improvement on iteration 54 =        0.000003618
-----------------
-----------------
f at the beginning of new iteration,       930.1098972126
Predicted improvement:        0.000000983
lambda =          1; f =          930.1098953
lambda =     1.9332; f =          930.1098946
Norm of dx 0.00055676
----
Improvement on iteration 55 =        0.000002656
-----------------
-----------------
f at the beginning of new iteration,       930.1098945563
Predicted improvement:        0.000000460
lambda =          1; f =          930.1098942
```

```
Norm of dx 0.00050139
----
Improvement on iteration 56 =        0.000000370
-----------------
-----------------
f at the beginning of new iteration,       930.1098941867
Predicted improvement:        0.000000312
lambda =          1; f =          930.1098938
Norm of dx 0.00015359
----
Improvement on iteration 57 =        0.000000435
-----------------
-----------------
f at the beginning of new iteration,       930.1098937520
Predicted improvement:        0.000000683
lambda =          1; f =          930.1098927
lambda =     1.9332; f =          930.1098923
Norm of dx 0.00030749
----
Improvement on iteration 58 =        0.000001461
-----------------
-----------------
f at the beginning of new iteration,       930.1098922906
Predicted improvement:        0.000000959
lambda =          1; f =          930.1098907
lambda =     1.9332; f =          930.1098897
Norm of dx 0.00012933
----
Improvement on iteration 59 =        0.000002560
-----------------
-----------------
f at the beginning of new iteration,       930.1098897302
Predicted improvement:        0.000003534
lambda =          1; f =          930.1098848
Norm of dx 0.00048048
----
Improvement on iteration 60 =        0.000004915
-----------------
-----------------
f at the beginning of new iteration,       930.1098848154
Predicted improvement:        0.000002326
lambda =          1; f =          930.1098819
Norm of dx 0.00043652
----
Improvement on iteration 61 =        0.000002889
-----------------
-----------------
f at the beginning of new iteration,       930.1098819266
Predicted improvement:        0.000000568
lambda =          1; f =          930.1098810
lambda =     1.9332; f =          930.1098807
Norm of dx 0.00031199
----
Improvement on iteration 62 =        0.000001212
-----------------
-----------------
f at the beginning of new iteration,       930.1098807149
Predicted improvement:        0.000000299
lambda =          1; f =          930.1098802
lambda =     1.9332; f =          930.1098799
lambda =     3.7372; f =          930.1098798
Norm of dx 0.00016579
----
```

```
Improvement on iteration 63 =        0.000000900
-----------------
-----------------
f at the beginning of new iteration,       930.1098798146
Predicted improvement:        0.000000501
lambda =          1; f =          930.1098792
Norm of dx 0.00029669
----
Improvement on iteration 64 =        0.000000621
-----------------
-----------------
f at the beginning of new iteration,       930.1098791932
Predicted improvement:        0.000002444
lambda =          1; f =          930.1098757
lambda =     1.9332; f =          930.1098748
Norm of dx 0.00028815
----
Improvement on iteration 65 =        0.000004365
-----------------
-----------------
f at the beginning of new iteration,       930.1098748284
Predicted improvement:        0.000002980
lambda =          1; f =          930.1098696
lambda =     1.9332; f =          930.1098658
lambda =     3.7372; f =          930.1098616
Norm of dx 0.00027929
----
Improvement on iteration 66 =        0.000013262
-----------------
-----------------
f at the beginning of new iteration,       930.1098615667
Predicted improvement:        0.000002252
lambda =          1; f =          930.1098577
lambda =     1.9332; f =          930.1098557
Norm of dx 0.00042643
----
Improvement on iteration 67 =        0.000005839
-----------------
-----------------
f at the beginning of new iteration,       930.1098557276
Predicted improvement:        0.000002056
lambda =          1; f =          930.1098533
Norm of dx 0.00053657
----
Improvement on iteration 68 =        0.000002409
-----------------
-----------------
f at the beginning of new iteration,       930.1098533181
Predicted improvement:        0.000000547
lambda =          1; f =          930.1098527
Norm of dx 0.00013094
----
Improvement on iteration 69 =        0.000000626
-----------------
-----------------
f at the beginning of new iteration,       930.1098526924
Predicted improvement:        0.000000061
lambda =          1; f =          930.1098526
Norm of dx 4.9188e-05
----
Improvement on iteration 70 =        0.000000057
improvement < crit termination
Objective function at mode: 930.109853
```

```
RESULTS FROM POSTERIOR ESTIMATION
parameters
         prior mean     mode    s.d. prior pstdev

rho_a_c      0.500   0.2192  0.0826 beta  0.2000
rho_a_d      0.500   0.5000  0.2774 beta  0.2000
rho_mu_c     0.500   0.5002  0.2774 beta  0.2000
rho_mu_d     0.500   0.5000  0.2774 beta  0.2000
rho_LTV      0.500   0.4950  0.2748 beta  0.2000
rho_d        0.500   0.5097  0.2769 beta  0.2000
rho_d_stern   0.500   0.8907  0.0192 beta  0.2000
rho_c_ast    0.500   0.6197  0.2548 beta  0.2000
rho_d_ast    0.500   0.5000  0.2773 beta  0.2000
rho_s_c      0.500   0.4384  0.1026 beta  0.2000
rho_r        0.500   0.6884  0.0899 beta  0.2000
rho_p       -0.500  -0.4977  0.2000 norm  0.2000
theta_c      0.750   0.3015  0.0687 beta  0.1500
sigma        1.000   1.9093  0.1075 norm  0.3700
phi          2.000   4.9478  0.7686 gamm  0.7000
omega        0.200   0.0973  0.0623 beta  0.1000
h_c          0.500   0.2862  0.0526 beta  0.1000
alpha_c      0.500   0.3996  0.0314 beta  0.1000

standard deviation of shocks
         prior mean     mode    s.d. prior pstdev

epsa_c       0.100   2.2914  0.1770 invg  2.0000
epsa_d       0.100   0.0461  0.0189 invg  2.0000
epsmu_c      0.100   0.0461  0.0188 invg  2.0000
epsmu_d      0.100   0.0461  0.0188 invg  2.0000
epsLTV       0.100   0.0461  0.0188 invg  2.0000
epsd         0.100   0.0459  0.0186 invg  2.0000
epsc_ast     0.100   0.0388  0.0123 invg  2.0000
epsd_ast     0.100   0.0461  0.0188 invg  2.0000
epsd_stern   0.100   0.6025  0.1073 invg  2.0000
epss_c       0.100   1.1158  0.0979 invg  2.0000
epsr         0.100   0.6035  0.1795 invg  2.0000
epsyf        0.100   0.0461  0.0188 invg  2.0000
epsn         0.010   0.8385  0.0653 invg  0.1000
epspi_d      0.010   5.6408  0.4225 invg  0.1000


Log data density [Laplace approximation] is -983.669165.

Estimation::mcmc: Multiple chains mode.
Estimation::mcmc: Searching for initial values...
Estimation::mcmc: Initial values found!

Estimation::mcmc: Write details about the MCMC... Ok!
Estimation::mcmc: Details about the MCMC are available in
code_91/metropolis\code_mh_history_0.mat


Estimation::mcmc: Number of mh files: 55 per block.
Estimation::mcmc: Total number of generated files: 110.
Estimation::mcmc: Total number of iterations: 200000.
Estimation::mcmc: Current acceptance ratio per chain:
                                                    Chain  1: 33.0018%
                                                    Chain  2: 33.4303%
Estimation::mcmc::diagnostics: Univariate convergence diagnostic, Brooks and Gelman
(1998):
    Parameter 1...  Done!
```

```
    Parameter 2...  Done!
    Parameter 3...  Done!
    Parameter 4...  Done!
    Parameter 5...  Done!
    Parameter 6...  Done!
    Parameter 7...  Done!
    Parameter 8...  Done!
    Parameter 9...  Done!
    Parameter 10...  Done!
    Parameter 11...  Done!
    Parameter 12...  Done!
    Parameter 13...  Done!
    Parameter 14...  Done!
    Parameter 15...  Done!
    Parameter 16...  Done!
    Parameter 17...  Done!
    Parameter 18...  Done!
    Parameter 19...  Done!
    Parameter 20...  Done!
    Parameter 21...  Done!
    Parameter 22...  Done!
    Parameter 23...  Done!
    Parameter 24...  Done!
    Parameter 25...  Done!
    Parameter 26...  Done!
    Parameter 27...  Done!
    Parameter 28...  Done!
    Parameter 29...  Done!
    Parameter 30...  Done!
    Parameter 31...  Done!
    Parameter 32...  Done!

Estimation::mcmc: Total number of MH draws: 200000.
Estimation::mcmc: Total number of generated MH files: 55.
Estimation::mcmc: I'll use mh-files 28 to 55.
Estimation::mcmc: In MH-file number 28 I'll start at line 721.
Estimation::mcmc: Finally I keep 100000 draws.

Estimation::marginal density: I'm computing the posterior mean and covariance...
Done!
Estimation::marginal density: I'm computing the posterior log marginal density
(modified harmonic mean)... Done!


ESTIMATION RESULTS

Log data density is -982.019743.
posterior_moments: There are not enough draws computes to compute HPD Intervals.
Skipping their computation.
posterior_moments: There are not enough draws computes to compute deciles. Skipping
their computation.

parameters
              prior mean   post. mean        90% HPD interval    prior       pstdev

rho_a_c           0.500       0.2271      0.0960      0.3577   beta        0.2000
rho_a_d           0.500       0.4941      0.1682      0.8261   beta        0.2000
rho_mu_c          0.500       0.4981      0.1813      0.8361   beta        0.2000
rho_mu_d          0.500       0.4978      0.1620      0.8163   beta        0.2000
rho_LTV           0.500       0.4934      0.1720      0.8189   beta        0.2000
rho_d             0.500       0.5201      0.1963      0.8446   beta        0.2000
rho_d_stern        0.500       0.8885      0.8574      0.9213   beta        0.2000
rho_c_ast         0.500       0.6216      0.3284      0.9242   beta        0.2000
```

rho_d_ast	0.500	0.5037	0.1683	0.8230	beta	0.2000
rho_s_c	0.500	0.4400	0.2759	0.6032	beta	0.2000
rho_r	0.500	0.6220	0.4465	0.8006	beta	0.2000
rho_p	-0.500	-0.5010	-0.8128	-0.1615	norm	0.2000
theta_c	0.750	0.2913	0.1861	0.4019	beta	0.1500
sigma	1.000	1.9623	1.7696	2.1436	norm	0.3700
phi	2.000	5.1198	3.8292	6.4344	gamma	0.7000
omega	0.200	0.1249	0.0252	0.2194	beta	0.1000
h_c	0.500	0.2789	0.1940	0.3614	beta	0.1000
alpha_c	0.500	0.4008	0.3485	0.4520	beta	0.1000

standard deviation of shocks

	prior mean	post. mean	90% HPD interval		prior	pstdev
epsa_c	0.100	2.3262	2.0165	2.6225	invg	2.0000
epsa_d	0.100	0.0785	0.0242	0.1390	invg	2.0000
epsmu_c	0.100	0.0857	0.0243	0.1543	invg	2.0000
epsmu_d	0.100	0.1163	0.0235	0.2592	invg	2.0000
epsLTV	0.100	0.0998	0.0223	0.2046	invg	2.0000
epsd	0.100	0.0784	0.0238	0.1380	invg	2.0000
epsc_ast	0.100	0.0459	0.0227	0.0688	invg	2.0000
epsd_ast	0.100	0.0888	0.0211	0.1741	invg	2.0000
epsd_stern	0.100	0.5643	0.3986	0.7325	invg	2.0000
epss_c	0.100	1.1374	0.9749	1.3011	invg	2.0000
epsr	0.100	0.7449	0.3858	1.0991	invg	2.0000
epsyf	0.100	0.0773	0.0241	0.1453	invg	2.0000
epsn	0.010	0.8543	0.7364	0.9615	invg	0.1000
epspi_d	0.010	5.7310	5.0251	6.4116	invg	0.1000

```
Estimation::mcmc: Posterior (dsge) IRFs...
Estimation::mcmc: Posterior IRFs, done!
Estimation::mcmc: Forecasted variables (mean)
Estimation::mcmc: Forecasted variables (mean), done!
Estimation::mcmc: Forecasted variables (point)
Estimation::mcmc: Forecasted variables (point), done!

Loading 116 observations from data100.xlsx

Restricting the sample to observations 1 to 92. Using in total 92 observations.
Initial value of the log posterior (or likelihood): -938.2407
-----------------
-----------------
f at the beginning of new iteration,       938.2407044652
Predicted improvement:        0.001307393
lambda =          1; f =          938.2385336
lambda =     1.9332; f =          938.2373065
Norm of dx 0.00051135
----
Improvement on iteration 1 =        0.003398004
-----------------
-----------------
f at the beginning of new iteration,       938.2373064610
Predicted improvement:        0.000831528
lambda =          1; f =          938.2362574
Norm of dx 0.00072011
----
Improvement on iteration 2 =        0.001049047
-----------------
-----------------
f at the beginning of new iteration,       938.2362574137
Predicted improvement:        0.000252625
lambda =          1; f =          938.2358735
lambda =     1.9332; f =          938.2357352
Norm of dx 0.00038648
```

```
----
Improvement on iteration 3 =        0.000522175
-----------------
-----------------
f at the beginning of new iteration,       938.2357352384
Predicted improvement:        0.000199298
lambda =          1; f =          938.2353641
lambda =     1.9332; f =          938.2350682
lambda =     3.7372; f =          938.2346343
lambda =     7.2247; f =          938.2343139
Norm of dx 0.00029972
----
Improvement on iteration 4 =        0.001421383
-----------------
-----------------
f at the beginning of new iteration,       938.2343138558
Predicted improvement:        0.000562353
lambda =          1; f =          938.2333721
lambda =     1.9332; f =          938.2328222
Norm of dx 0.00077893
----
Improvement on iteration 5 =        0.001491671
-----------------
-----------------
f at the beginning of new iteration,       938.2328221847
Predicted improvement:        0.000358321
lambda =          1; f =          938.2324109
Norm of dx  0.0013156
----
Improvement on iteration 6 =        0.000411321
-----------------
-----------------
f at the beginning of new iteration,       938.2324108632
Predicted improvement:        0.000058065
lambda =          1; f =          938.2323090
lambda =     1.9332; f =          938.2322397
lambda =     3.7372; f =          938.2321762
Norm of dx 0.00031947
----
Improvement on iteration 7 =        0.000234630
-----------------
-----------------
f at the beginning of new iteration,       938.2321762330
Predicted improvement:        0.000125525
lambda =          1; f =          938.2319591
lambda =     1.9332; f =          938.2318182
lambda =     3.7372; f =          938.2317143
Norm of dx 0.00032664
----
Improvement on iteration 8 =        0.000461901
-----------------
-----------------
f at the beginning of new iteration,       938.2317143323
Predicted improvement:        0.000047917
lambda =          1; f =          938.2316341
lambda =     1.9332; f =          938.2315874
Norm of dx 0.00015659
----
Improvement on iteration 9 =        0.000126960
-----------------
-----------------
f at the beginning of new iteration,       938.2315873724
Predicted improvement:        0.000090685
```

```
lambda =          1; f =          938.2314336
lambda =     1.9332; f =          938.2313397
lambda =     3.7372; f =          938.2312932
Norm of dx 0.00038053
----
Improvement on iteration 10 =        0.000294206
-----------------
-----------------
f at the beginning of new iteration,       938.2312931661
Predicted improvement:        0.000152525
lambda =          1; f =          938.2310297
lambda =     1.9332; f =          938.2308586
lambda =     3.7372; f =          938.2307334
Norm of dx  0.0005265
----
Improvement on iteration 11 =        0.000559762
-----------------
-----------------
f at the beginning of new iteration,       938.2307334037
Predicted improvement:        0.000065562
lambda =          1; f =          938.2306364
lambda =     1.9332; f =          938.2306073
Norm of dx 0.00059285
----
Improvement on iteration 12 =        0.000126058
-----------------
-----------------
f at the beginning of new iteration,       938.2306073461
Predicted improvement:        0.000040655
lambda =          1; f =          938.2305313
lambda =     1.9332; f =          938.2304696
lambda =     3.7372; f =          938.2303761
lambda =     7.2247; f =          938.2302917
Norm of dx 0.00015454
----
Improvement on iteration 13 =        0.000315662
-----------------
-----------------
f at the beginning of new iteration,       938.2302916840
Predicted improvement:        0.000053154
lambda =          1; f =          938.2301969
lambda =     1.9332; f =          938.2301291
lambda =     3.7372; f =          938.2300549
Norm of dx  0.0004683
----
Improvement on iteration 14 =        0.000236739
-----------------
-----------------
f at the beginning of new iteration,       938.2300549446
Predicted improvement:        0.000103057
lambda =          1; f =          938.2298958
lambda =     1.9332; f =          938.2298318
Norm of dx 0.00067577
----
Improvement on iteration 15 =        0.000223102
-----------------
-----------------
f at the beginning of new iteration,       938.2298318427
Predicted improvement:        0.000024693
lambda =          1; f =          938.2297995
Norm of dx 0.00028285
----
Improvement on iteration 16 =        0.000032293
```

```
-----------------
-----------------
f at the beginning of new iteration,       938.2297995498
Predicted improvement:        0.000010115
lambda =          1; f =          938.2297829
lambda =     1.9332; f =          938.2297738
Norm of dx 0.00014265
----
Improvement on iteration 17 =        0.000025762
-----------------
-----------------
f at the beginning of new iteration,       938.2297737879
Predicted improvement:        0.000020543
lambda =          1; f =          938.2297365
lambda =     1.9332; f =          938.2297085
lambda =     3.7372; f =          938.2296729
Norm of dx 0.00019997
----
Improvement on iteration 18 =        0.000100864
-----------------
-----------------
f at the beginning of new iteration,       938.2296729236
Predicted improvement:        0.000080926
lambda =          1; f =          938.2295400
lambda =     1.9332; f =          938.2294679
Norm of dx  0.0009253
----
Improvement on iteration 19 =        0.000205034
-----------------
-----------------
f at the beginning of new iteration,       938.2294678892
Predicted improvement:        0.000067584
lambda =          1; f =          938.2293853
Norm of dx  0.0010407
----
Improvement on iteration 20 =        0.000082625
-----------------
-----------------
f at the beginning of new iteration,       938.2293852640
Predicted improvement:        0.000009179
lambda =          1; f =          938.2293734
Norm of dx 0.00024512
----
Improvement on iteration 21 =        0.000011867
-----------------
-----------------
f at the beginning of new iteration,       938.2293733969
Predicted improvement:        0.000004625
lambda =          1; f =          938.2293655
lambda =     1.9332; f =          938.2293606
lambda =     3.7372; f =          938.2293578
Norm of dx 9.8971e-05
----
Improvement on iteration 22 =        0.000015577
-----------------
-----------------
f at the beginning of new iteration,       938.2293578200
Predicted improvement:        0.000010484
lambda =          1; f =          938.2293379
lambda =     1.9332; f =          938.2293210
lambda =     3.7372; f =          938.2292933
lambda =     7.2247; f =          938.2292575
Norm of dx  0.0001165
```

```
----
Improvement on iteration 23 =        0.000100300
-----------------
-----------------
f at the beginning of new iteration,       938.2292575200
Predicted improvement:        0.000029187
lambda =          1; f =          938.2292231
Norm of dx 0.00075382
----
Improvement on iteration 24 =        0.000034387
-----------------
-----------------
f at the beginning of new iteration,       938.2292231327
Predicted improvement:        0.000004184
lambda =          1; f =          938.2292169
lambda =     1.9332; f =          938.2292148
Norm of dx 0.00018577
----
Improvement on iteration 25 =        0.000008340
-----------------
-----------------
f at the beginning of new iteration,       938.2292147929
Predicted improvement:        0.000002018
lambda =          1; f =          938.2292117
lambda =     1.9332; f =          938.2292106
Norm of dx 5.3937e-05
----
Improvement on iteration 26 =        0.000004228
-----------------
-----------------
f at the beginning of new iteration,       938.2292105646
Predicted improvement:        0.000000322
lambda =          1; f =          938.2292100
lambda =     1.9332; f =          938.2292095
lambda =     3.7372; f =          938.2292088
lambda =     7.2247; f =          938.2292084
Norm of dx 2.9544e-05
----
Improvement on iteration 27 =        0.000002189
-----------------
-----------------
f at the beginning of new iteration,       938.2292083755
Predicted improvement:        0.000001661
lambda =          1; f =          938.2292052
lambda =     1.9332; f =          938.2292026
lambda =     3.7372; f =          938.2291983
lambda =     7.2247; f =          938.2291931
Norm of dx 6.6648e-05
----
Improvement on iteration 28 =        0.000015302
-----------------
-----------------
f at the beginning of new iteration,       938.2291930730
Predicted improvement:        0.000002933
lambda =          1; f =          938.2291898
Norm of dx 0.00022634
----
Improvement on iteration 29 =        0.000003287
-----------------
-----------------
f at the beginning of new iteration,       938.2291897858
Predicted improvement:        0.000000345
lambda =          1; f =          938.2291892
```

```
lambda =     1.9332; f =          938.2291887
lambda =     3.7372; f =          938.2291883
Norm of dx 3.6904e-05
----
Improvement on iteration 30 =        0.000001521
-----------------
-----------------
f at the beginning of new iteration,       938.2291882650
Predicted improvement:        0.000001142
lambda =          1; f =          938.2291861
lambda =     1.9332; f =          938.2291843
lambda =     3.7372; f =          938.2291816
lambda =     7.2247; f =          938.2291790
Norm of dx 6.2371e-05
----
Improvement on iteration 31 =        0.000009298
-----------------
-----------------
f at the beginning of new iteration,       938.2291789666
Predicted improvement:        0.000004458
lambda =          1; f =          938.2291714
lambda =     1.9332; f =          938.2291667
lambda =     3.7372; f =          938.2291643
Norm of dx 0.00020658
----
Improvement on iteration 32 =        0.000014648
-----------------
-----------------
f at the beginning of new iteration,       938.2291643185
Predicted improvement:        0.000006436
lambda =          1; f =          938.2291525
lambda =     1.9332; f =          938.2291434
lambda =     3.7372; f =          938.2291310
Norm of dx 0.00017129
----
Improvement on iteration 33 =        0.000033312
-----------------
-----------------
f at the beginning of new iteration,       938.2291310065
Predicted improvement:        0.000013580
lambda =          1; f =          938.2291147
Norm of dx  0.0011838
----
Improvement on iteration 34 =        0.000016329
-----------------
-----------------
f at the beginning of new iteration,       938.2291146777
Predicted improvement:        0.000001251
lambda =          1; f =          938.2291128
lambda =     1.9332; f =          938.2291124
Norm of dx 0.00033005
----
Improvement on iteration 35 =        0.000002237
-----------------
-----------------
f at the beginning of new iteration,       938.2291124408
Predicted improvement:        0.000000790
lambda =          1; f =          938.2291110
lambda =     1.9332; f =          938.2291097
lambda =     3.7372; f =          938.2291077
lambda =     7.2247; f =          938.2291050
Norm of dx 6.8371e-05
----
```

```
Improvement on iteration 36 =        0.000007418
-----------------
-----------------
f at the beginning of new iteration,       938.2291050225
Predicted improvement:        0.000007938
lambda =          1; f =          938.2290909
lambda =     1.9332; f =          938.2290807
lambda =     3.7372; f =          938.2290695
Norm of dx 0.00025657
----
Improvement on iteration 37 =        0.000035529
-----------------
-----------------
f at the beginning of new iteration,       938.2290694936
Predicted improvement:        0.000017437
lambda =          1; f =          938.2290439
lambda =     1.9332; f =          938.2290362
Norm of dx  0.0016171
----
Improvement on iteration 38 =        0.000033255
-----------------
-----------------
f at the beginning of new iteration,       938.2290362387
Predicted improvement:        0.000002044
lambda =          1; f =          938.2290338
Norm of dx 0.00018127
----
Improvement on iteration 39 =        0.000002438
-----------------
-----------------
f at the beginning of new iteration,       938.2290338011
Predicted improvement:        0.000000445
lambda =          1; f =          938.2290332
Norm of dx 0.00013476
----
Improvement on iteration 40 =        0.000000579
-----------------
-----------------
f at the beginning of new iteration,       938.2290332217
Predicted improvement:        0.000000945
lambda =          1; f =          938.2290317
lambda =     1.9332; f =          938.2290309
Norm of dx 7.6034e-05
----
Improvement on iteration 41 =        0.000002349
-----------------
-----------------
f at the beginning of new iteration,       938.2290308731
Predicted improvement:        0.000002128
lambda =          1; f =          938.2290271
lambda =     1.9332; f =          938.2290244
lambda =     3.7372; f =          938.2290216
Norm of dx 0.00013743
----
Improvement on iteration 42 =        0.000009280
-----------------
-----------------
f at the beginning of new iteration,       938.2290215935
Predicted improvement:        0.000004105
lambda =          1; f =          938.2290156
lambda =     1.9332; f =          938.2290138
Norm of dx 0.00033816
----
```

```
Improvement on iteration 43 =        0.000007825
-----------------
-----------------
f at the beginning of new iteration,       938.2290137681
Predicted improvement:        0.000000814
lambda =          1; f =          938.2290126
lambda =     1.9332; f =          938.2290122
Norm of dx 8.8269e-05
----
Improvement on iteration 44 =        0.000001617
-----------------
-----------------
f at the beginning of new iteration,       938.2290121511
Predicted improvement:        0.000000398
lambda =          1; f =          938.2290115
lambda =     1.9332; f =          938.2290112
Norm of dx 4.5897e-05
----
Improvement on iteration 45 =        0.000000957
-----------------
-----------------
f at the beginning of new iteration,       938.2290111946
Predicted improvement:        0.000000291
lambda =          1; f =          938.2290108
Norm of dx  5.103e-05
----
Improvement on iteration 46 =        0.000000352
-----------------
-----------------
f at the beginning of new iteration,       938.2290108430
Predicted improvement:        0.000000322
lambda =          1; f =          938.2290104
lambda =     1.9332; f =          938.2290101
Norm of dx 6.7632e-05
----
Improvement on iteration 47 =        0.000000696
-----------------
-----------------
f at the beginning of new iteration,       938.2290101466
Predicted improvement:        0.000000601
lambda =          1; f =          938.2290091
lambda =     1.9332; f =          938.2290083
lambda =     3.7372; f =          938.2290073
Norm of dx 9.7754e-05
----
Improvement on iteration 48 =        0.000002826
-----------------
-----------------
f at the beginning of new iteration,       938.2290073210
Predicted improvement:        0.000002054
lambda =          1; f =          938.2290043
lambda =     1.9332; f =          938.2290037
Norm of dx 0.00021306
----
Improvement on iteration 49 =        0.000003624
-----------------
-----------------
f at the beginning of new iteration,       938.2290036969
Predicted improvement:        0.000000236
lambda =          1; f =          938.2290034
Norm of dx 0.00012223
----
Improvement on iteration 50 =        0.000000301
```

```
-----------------
-----------------
f at the beginning of new iteration,       938.2290033964
Predicted improvement:        0.000000191
lambda =          1; f =          938.2290033
lambda =    0.33333; f =          938.2290033
Norm of dx 0.00019272
----
Improvement on iteration 51 =        0.000000109
-----------------
-----------------
f at the beginning of new iteration,       938.2290032877
Predicted improvement:        0.000000092
lambda =          1; f =          938.2290031
lambda =     1.9332; f =          938.2290030
lambda =     3.7372; f =          938.2290028
lambda =     7.2247; f =          938.2290027
Norm of dx 3.7303e-05
----
Improvement on iteration 52 =        0.000000631
-----------------
-----------------
f at the beginning of new iteration,       938.2290026567
Predicted improvement:        0.000000446
lambda =          1; f =          938.2290018
lambda =     1.9332; f =          938.2290011
lambda =     3.7372; f =          938.2289999
lambda =     7.2247; f =          938.2289984
Norm of dx 7.2394e-05
----
Improvement on iteration 53 =        0.000004305
-----------------
-----------------
f at the beginning of new iteration,       938.2289983515
Predicted improvement:        0.000003945
lambda =          1; f =          938.2289921
lambda =     1.9332; f =          938.2289889
Norm of dx 0.00058249
----
Improvement on iteration 54 =        0.000009475
-----------------
-----------------
f at the beginning of new iteration,       938.2289888765
Predicted improvement:        0.000005505
lambda =          1; f =          938.2289811
lambda =     1.9332; f =          938.2289792
Norm of dx 0.00065285
----
Improvement on iteration 55 =        0.000009640
-----------------
-----------------
f at the beginning of new iteration,       938.2289792365
Predicted improvement:        0.000001263
lambda =          1; f =          938.2289780
Norm of dx 0.00031927
----
Improvement on iteration 56 =        0.000001224
-----------------
-----------------
f at the beginning of new iteration,       938.2289780120
Predicted improvement:        0.000000121
lambda =          1; f =          938.2289778
lambda =     1.9332; f =          938.2289777
```

```
Norm of dx  6.357e-05
----
Improvement on iteration 57 =        0.000000270
-----------------
-----------------
f at the beginning of new iteration,       938.2289777422
Predicted improvement:        0.000000141
lambda =          1; f =          938.2289775
lambda =     1.9332; f =          938.2289774
Norm of dx 0.00013723
----
Improvement on iteration 58 =        0.000000349
-----------------
-----------------
f at the beginning of new iteration,       938.2289773935
Predicted improvement:        0.000000342
lambda =          1; f =          938.2289768
lambda =     1.9332; f =          938.2289763
lambda =     3.7372; f =          938.2289756
Norm of dx 4.7928e-05
----
Improvement on iteration 59 =        0.000001786
-----------------
-----------------
f at the beginning of new iteration,       938.2289756072
Predicted improvement:        0.000001461
lambda =          1; f =          938.2289734
lambda =     1.9332; f =          938.2289725
Norm of dx 0.00032486
----
Improvement on iteration 60 =        0.000003090
-----------------
-----------------
f at the beginning of new iteration,       938.2289725173
Predicted improvement:        0.000001506
lambda =          1; f =          938.2289701
lambda =     1.9332; f =          938.2289688
Norm of dx 0.00023526
----
Improvement on iteration 61 =        0.000003706
-----------------
-----------------
f at the beginning of new iteration,       938.2289688111
Predicted improvement:        0.000000789
lambda =          1; f =          938.2289679
Norm of dx 0.00021655
----
Improvement on iteration 62 =        0.000000878
-----------------
-----------------
f at the beginning of new iteration,       938.2289679336
Predicted improvement:        0.000000188
lambda =          1; f =          938.2289677
Norm of dx 5.8577e-05
----
Improvement on iteration 63 =        0.000000253
-----------------
-----------------
f at the beginning of new iteration,       938.2289676804
Predicted improvement:        0.000000177
lambda =          1; f =          938.2289675
Norm of dx  5.304e-05
----
```

```
Improvement on iteration 64 =        0.000000206
-----------------
-----------------
f at the beginning of new iteration,       938.2289674742
Predicted improvement:        0.000000136
lambda =          1; f =          938.2289674
lambda =    0.33333; f =          938.2289674
Norm of dx 7.7037e-05
----
Improvement on iteration 65 =        0.000000061
improvement < crit termination
Objective function at mode: 938.228967

RESULTS FROM POSTERIOR ESTIMATION
parameters
         prior mean     mode    s.d. prior pstdev

rho_a_c      0.500   0.2192  0.0823 beta  0.2000
rho_a_d      0.500   0.5000  0.2774 beta  0.2000
rho_mu_c     0.500   0.5001  0.2774 beta  0.2000
rho_mu_d     0.500   0.5000  0.2774 beta  0.2000
rho_LTV      0.500   0.4950  0.2747 beta  0.2000
rho_d        0.500   0.5099  0.2769 beta  0.2000
rho_d_stern   0.500   0.8914  0.0191 beta  0.2000
rho_c_ast    0.500   0.6218  0.2541 beta  0.2000
rho_d_ast    0.500   0.5000  0.2774 beta  0.2000
rho_s_c      0.500   0.4381  0.1021 beta  0.2000
rho_r        0.500   0.6863  0.0901 beta  0.2000
rho_p       -0.500  -0.4976  0.2000 norm  0.2000
theta_c      0.750   0.3009  0.0686 beta  0.1500
sigma        1.000   1.9079  0.1078 norm  0.3700
phi          2.000   4.9566  0.7680 gamm  0.7000
omega        0.200   0.0969  0.0621 beta  0.1000
h_c          0.500   0.2859  0.0525 beta  0.1000
alpha_c      0.500   0.3993  0.0312 beta  0.1000

standard deviation of shocks
         prior mean     mode    s.d. prior pstdev

epsa_c       0.100   2.2777  0.1750 invg  2.0000
epsa_d       0.100   0.0462  0.0189 invg  2.0000
epsmu_c      0.100   0.0461  0.0188 invg  2.0000
epsmu_d      0.100   0.0461  0.0188 invg  2.0000
epsLTV       0.100   0.0461  0.0188 invg  2.0000
epsd         0.100   0.0459  0.0185 invg  2.0000
epsc_ast     0.100   0.0388  0.0122 invg  2.0000
epsd_ast     0.100   0.0461  0.0188 invg  2.0000
epsd_stern   0.100   0.6054  0.1072 invg  2.0000
epss_c       0.100   1.1104  0.0969 invg  2.0000
epsr         0.100   0.6050  0.1790 invg  2.0000
epsyf        0.100   0.0461  0.0188 invg  2.0000
epsn         0.010   0.8342  0.0646 invg  0.1000
epspi_d      0.010   5.6302  0.4189 invg  0.1000


Log data density [Laplace approximation] is -991.864594.

Estimation::mcmc: Multiple chains mode.
Estimation::mcmc: Searching for initial values...
Estimation::mcmc: Initial values found!

Estimation::mcmc: Write details about the MCMC... Ok!
Estimation::mcmc: Details about the MCMC are available in
```

code_92/metropolis\code_mh_history_0.mat

Estimation::mcmc: Number of mh files: 55 per block.
Estimation::mcmc: Total number of generated files: 110.
Estimation::mcmc: Total number of iterations: 200000.
Estimation::mcmc: Current acceptance ratio per chain:
Chain 1: 33.2838%
Chain 2: 33.2768%
Estimation::mcmc::diagnostics: Univariate convergence diagnostic, Brooks and Gelman (1998):
Parameter 1... Done!
Parameter 2... Done!
Parameter 3... Done!
Parameter 4... Done!
Parameter 5... Done!
Parameter 6... Done!
Parameter 7... Done!
Parameter 8... Done!
Parameter 9... Done!
Parameter 10... Done!
Parameter 11... Done!
Parameter 12... Done!
Parameter 13... Done!
Parameter 14... Done!
Parameter 15... Done!
Parameter 16... Done!
Parameter 17... Done!
Parameter 18... Done!
Parameter 19... Done!
Parameter 20... Done!
Parameter 21... Done!
Parameter 22... Done!
Parameter 23... Done!
Parameter 24... Done!
Parameter 25... Done!
Parameter 26... Done!
Parameter 27... Done!
Parameter 28... Done!
Parameter 29... Done!
Parameter 30... Done!
Parameter 31... Done!
Parameter 32... Done!

Estimation::mcmc: Total number of MH draws: 200000.
Estimation::mcmc: Total number of generated MH files: 55.
Estimation::mcmc: I'll use mh-files 28 to 55.
Estimation::mcmc: In MH-file number 28 I'll start at line 721.
Estimation::mcmc: Finally I keep 100000 draws.

Estimation::marginal density: I'm computing the posterior mean and covariance... Done!
Estimation::marginal density: I'm computing the posterior log marginal density (modified harmonic mean)... Done!

ESTIMATION RESULTS

Log data density is -990.275541.
posterior_moments: There are not enough draws computes to compute HPD Intervals. Skipping their computation.
posterior_moments: There are not enough draws computes to compute deciles. Skipping their computation.

```
parameters
             prior mean   post. mean        90% HPD interval    prior       pstdev

rho_a_c           0.500       0.2282      0.0935      0.3542   beta        0.2000
rho_a_d           0.500       0.4959      0.1761      0.8315   beta        0.2000
rho_mu_c          0.500       0.5012      0.1738      0.8326   beta        0.2000
rho_mu_d          0.500       0.4988      0.1727      0.8285   beta        0.2000
rho_LTV           0.500       0.4927      0.1565      0.8080   beta        0.2000
rho_d             0.500       0.5236      0.2082      0.8576   beta        0.2000
rho_d_stern        0.500       0.8900      0.8580      0.9214   beta        0.2000
rho_c_ast         0.500       0.6232      0.3167      0.9271   beta        0.2000
rho_d_ast         0.500       0.4971      0.1740      0.8293   beta        0.2000
rho_s_c           0.500       0.4408      0.2806      0.6071   beta        0.2000
rho_r             0.500       0.6337      0.4668      0.7958   beta        0.2000
rho_p            -0.500      -0.4958     -0.8279     -0.1701   norm        0.2000
theta_c           0.750       0.2890      0.1797      0.3953   beta        0.1500
sigma             1.000       1.9580      1.7673      2.1386   norm        0.3700
phi               2.000       5.1325      3.8574      6.4022   gamma       0.7000
omega             0.200       0.1234      0.0255      0.2153   beta        0.1000
h_c               0.500       0.2782      0.1926      0.3598   beta        0.1000
alpha_c           0.500       0.4004      0.3484      0.4516   beta        0.1000

standard deviation of shocks
             prior mean   post. mean        90% HPD interval    prior       pstdev

epsa_c            0.100       2.3147      2.0184      2.5969   invg        2.0000
epsa_d            0.100       0.1906      0.0200      0.5307   invg        2.0000
epsmu_c           0.100       0.0870      0.0233      0.1626   invg        2.0000
epsmu_d           0.100       0.0848      0.0232      0.1565   invg        2.0000
epsLTV            0.100       0.0882      0.0237      0.1716   invg        2.0000
epsd              0.100       0.0924      0.0235      0.1817   invg        2.0000
epsc_ast          0.100       0.0470      0.0226      0.0713   invg        2.0000
epsd_ast          0.100       0.0817      0.0235      0.1476   invg        2.0000
epsd_stern        0.100       0.5777      0.4092      0.7453   invg        2.0000
epss_c            0.100       1.1283      0.9602      1.2903   invg        2.0000
epsr              0.100       0.7185      0.3882      1.0600   invg        2.0000
epsyf             0.100       0.0807      0.0236      0.1470   invg        2.0000
epsn              0.010       0.8488      0.7417      0.9570   invg        0.1000
epspi_d           0.010       5.7422      5.0258      6.4625   invg        0.1000
Estimation::mcmc: Posterior (dsge) IRFs...
Estimation::mcmc: Posterior IRFs, done!
Estimation::mcmc: Forecasted variables (mean)
Estimation::mcmc: Forecasted variables (mean), done!
Estimation::mcmc: Forecasted variables (point)
Estimation::mcmc: Forecasted variables (point), done!

Loading 116 observations from data100.xlsx

Restricting the sample to observations 1 to 93. Using in total 93 observations.
Initial value of the log posterior (or likelihood): -948.4493
-----------------
-----------------
f at the beginning of new iteration,       948.4493184432
Predicted improvement:        0.004288092
lambda =          1; f =          948.4430144
lambda =     1.9332; f =          948.4411847
Norm of dx 0.00092608
----
Improvement on iteration 1 =        0.008133750
-----------------
-----------------
f at the beginning of new iteration,       948.4411846935
```

```
Predicted improvement:        0.000953145
lambda =          1; f =          948.4395324
lambda =     1.9332; f =          948.4384494
lambda =     3.7372; f =          948.4376208
Norm of dx 0.00047291
----
Improvement on iteration 2 =        0.003563907
-----------------
-----------------
f at the beginning of new iteration,       948.4376207870
Predicted improvement:        0.000479844
lambda =          1; f =          948.4367535
lambda =     1.9332; f =          948.4361105
lambda =     3.7372; f =          948.4353171
Norm of dx 0.00040334
----
Improvement on iteration 3 =        0.002303724
-----------------
-----------------
f at the beginning of new iteration,       948.4353170630
Predicted improvement:        0.001129690
lambda =          1; f =          948.4334469
lambda =     1.9332; f =          948.4324014
Norm of dx  0.0014111
----
Improvement on iteration 4 =        0.002915650
-----------------
-----------------
f at the beginning of new iteration,       948.4324014128
Predicted improvement:        0.001365792
lambda =          1; f =          948.4304925
Norm of dx  0.0019827
----
Improvement on iteration 5 =        0.001908904
-----------------
-----------------
f at the beginning of new iteration,       948.4304925086
Predicted improvement:        0.000662867
lambda =          1; f =          948.4296620
Norm of dx  0.0011391
----
Improvement on iteration 6 =        0.000830477
-----------------
-----------------
f at the beginning of new iteration,       948.4296620316
Predicted improvement:        0.000226019
lambda =          1; f =          948.4292894
lambda =     1.9332; f =          948.4290852
Norm of dx 0.00046083
----
Improvement on iteration 7 =        0.000576817
-----------------
-----------------
f at the beginning of new iteration,       948.4290852144
Predicted improvement:        0.000375073
lambda =          1; f =          948.4284794
lambda =     1.9332; f =          948.4281739
Norm of dx 0.00078658
----
Improvement on iteration 8 =        0.000911297
-----------------
-----------------
f at the beginning of new iteration,       948.4281739177
```

```
Predicted improvement:        0.000296151
lambda =          1; f =          948.4277686
Norm of dx 0.00064593
----
Improvement on iteration 9 =        0.000405329
-----------------
-----------------
f at the beginning of new iteration,       948.4277685889
Predicted improvement:        0.000131179
lambda =          1; f =          948.4275816
lambda =     1.9332; f =          948.4275436
Norm of dx 0.00037134
----
Improvement on iteration 10 =        0.000225038
-----------------
-----------------
f at the beginning of new iteration,       948.4275435511
Predicted improvement:        0.000084965
lambda =          1; f =          948.4273839
lambda =     1.9332; f =          948.4272532
lambda =     3.7372; f =          948.4270509
lambda =     7.2247; f =          948.4268483
Norm of dx 0.00014623
----
Improvement on iteration 11 =        0.000695207
-----------------
-----------------
f at the beginning of new iteration,       948.4268483444
Predicted improvement:        0.000223479
lambda =          1; f =          948.4265396
Norm of dx  0.0011815
----
Improvement on iteration 12 =        0.000308730
-----------------
-----------------
f at the beginning of new iteration,       948.4265396140
Predicted improvement:        0.000083611
lambda =          1; f =          948.4264300
Norm of dx 0.00080969
----
Improvement on iteration 13 =        0.000109650
-----------------
-----------------
f at the beginning of new iteration,       948.4264299641
Predicted improvement:        0.000047604
lambda =          1; f =          948.4263477
lambda =     1.9332; f =          948.4262945
lambda =     3.7372; f =          948.4262563
Norm of dx  0.0004611
----
Improvement on iteration 14 =        0.000173703
-----------------
-----------------
f at the beginning of new iteration,       948.4262562606
Predicted improvement:        0.000109278
lambda =          1; f =          948.4260508
lambda =     1.9332; f =          948.4258823
lambda =     3.7372; f =          948.4256198
lambda =     7.2247; f =          948.4253499
Norm of dx 0.00032921
----
Improvement on iteration 15 =        0.000906392
-----------------
```

```
-----------------
f at the beginning of new iteration,       948.4253498686
Predicted improvement:        0.000109938
lambda =          1; f =          948.4251726
lambda =     1.9332; f =          948.4250833
Norm of dx 0.00099607
----
Improvement on iteration 16 =        0.000266604
-----------------
-----------------
f at the beginning of new iteration,       948.4250832650
Predicted improvement:        0.000106892
lambda =          1; f =          948.4249313
lambda =     1.9332; f =          948.4249001
Norm of dx 0.00069734
----
Improvement on iteration 17 =        0.000183131
-----------------
-----------------
f at the beginning of new iteration,       948.4249001341
Predicted improvement:        0.000019632
lambda =          1; f =          948.4248725
lambda =     1.9332; f =          948.4248676
Norm of dx 0.00048807
----
Improvement on iteration 18 =        0.000032495
-----------------
-----------------
f at the beginning of new iteration,       948.4248676393
Predicted improvement:        0.000010106
lambda =          1; f =          948.4248485
lambda =     1.9332; f =          948.4248325
lambda =     3.7372; f =          948.4248064
lambda =     7.2247; f =          948.4247744
Norm of dx 0.00018217
----
Improvement on iteration 19 =        0.000093197
-----------------
-----------------
f at the beginning of new iteration,       948.4247744424
Predicted improvement:        0.000086049
lambda =          1; f =          948.4246213
lambda =     1.9332; f =          948.4245123
lambda =     3.7372; f =          948.4243944
Norm of dx 0.00092549
----
Improvement on iteration 20 =        0.000380005
-----------------
-----------------
f at the beginning of new iteration,       948.4243944371
Predicted improvement:        0.000130378
lambda =          1; f =          948.4242145
Norm of dx  0.0010335
----
Improvement on iteration 21 =        0.000179914
-----------------
-----------------
f at the beginning of new iteration,       948.4242145231
Predicted improvement:        0.000045176
lambda =          1; f =          948.4241601
Norm of dx 0.00064372
----
Improvement on iteration 22 =        0.000054433
```

```
-----------------
-----------------
f at the beginning of new iteration,       948.4241600897
Predicted improvement:        0.000015082
lambda =          1; f =          948.4241327
lambda =     1.9332; f =          948.4241121
lambda =     3.7372; f =          948.4240859
Norm of dx 0.00021845
----
Improvement on iteration 23 =        0.000074160
-----------------
-----------------
f at the beginning of new iteration,       948.4240859301
Predicted improvement:        0.000072495
lambda =          1; f =          948.4239523
lambda =     1.9332; f =          948.4238479
lambda =     3.7372; f =          948.4237015
lambda =     7.2247; f =          948.4236257
Norm of dx 0.00083681
----
Improvement on iteration 24 =        0.000460243
-----------------
-----------------
f at the beginning of new iteration,       948.4236256871
Predicted improvement:        0.000292391
lambda =          1; f =          948.4231230
lambda =     1.9332; f =          948.4228016
lambda =     3.7372; f =          948.4225860
Norm of dx  0.0018228
----
Improvement on iteration 25 =        0.001039711
-----------------
-----------------
f at the beginning of new iteration,       948.4225859760
Predicted improvement:        0.000077988
lambda =          1; f =          948.4224824
Norm of dx  0.0020962
----
Improvement on iteration 26 =        0.000103571
-----------------
-----------------
f at the beginning of new iteration,       948.4224824054
Predicted improvement:        0.000036943
lambda =          1; f =          948.4224282
lambda =     1.9332; f =          948.4224127
Norm of dx  0.0011814
----
Improvement on iteration 27 =        0.000069722
-----------------
-----------------
f at the beginning of new iteration,       948.4224126837
Predicted improvement:        0.000019280
lambda =          1; f =          948.4223800
lambda =     1.9332; f =          948.4223601
lambda =     3.7372; f =          948.4223507
Norm of dx 0.00037854
----
Improvement on iteration 28 =        0.000061934
-----------------
-----------------
f at the beginning of new iteration,       948.4223507499
Predicted improvement:        0.000015981
lambda =          1; f =          948.4223210
```

```
lambda =     1.9332; f =          948.4222969
lambda =     3.7372; f =          948.4222599
lambda =     7.2247; f =          948.4222252
Norm of dx 0.00038669
----
Improvement on iteration 29 =        0.000125524
-----------------
-----------------
f at the beginning of new iteration,       948.4222252254
Predicted improvement:        0.000084796
lambda =          1; f =          948.4220766
lambda =     1.9332; f =          948.4219759
lambda =     3.7372; f =          948.4218853
Norm of dx 0.00089851
----
Improvement on iteration 30 =        0.000339973
-----------------
-----------------
f at the beginning of new iteration,       948.4218852521
Predicted improvement:        0.000016037
lambda =          1; f =          948.4218630
Norm of dx 0.00044543
----
Improvement on iteration 31 =        0.000022265
-----------------
-----------------
f at the beginning of new iteration,       948.4218629869
Predicted improvement:        0.000011555
lambda =          1; f =          948.4218436
lambda =     1.9332; f =          948.4218323
Norm of dx 0.00026767
----
Improvement on iteration 32 =        0.000030695
-----------------
-----------------
f at the beginning of new iteration,       948.4218322914
Predicted improvement:        0.000027627
lambda =          1; f =          948.4217829
lambda =     1.9332; f =          948.4217477
lambda =     3.7372; f =          948.4217090
Norm of dx 0.00035576
----
Improvement on iteration 33 =        0.000123256
-----------------
-----------------
f at the beginning of new iteration,       948.4217090350
Predicted improvement:        0.000089261
lambda =          1; f =          948.4215476
lambda =     1.9332; f =          948.4214293
lambda =     3.7372; f =          948.4212888
Norm of dx    0.00152
----
Improvement on iteration 34 =        0.000420224
-----------------
-----------------
f at the beginning of new iteration,       948.4212888110
Predicted improvement:        0.000150426
lambda =          1; f =          948.4210690
lambda =     1.9332; f =          948.4210117
Norm of dx  0.0029908
----
Improvement on iteration 35 =        0.000277132
-----------------
```

```
-----------------
f at the beginning of new iteration,       948.4210116795
Predicted improvement:        0.000065178
lambda =          1; f =          948.4209010
lambda =     1.9332; f =          948.4208331
lambda =     3.7372; f =          948.4207979
Norm of dx 0.00029854
----
Improvement on iteration 36 =        0.000213761
-----------------
-----------------
f at the beginning of new iteration,       948.4207979185
Predicted improvement:        0.000025631
lambda =          1; f =          948.4207602
lambda =     1.9332; f =          948.4207516
Norm of dx  0.0014059
----
Improvement on iteration 37 =        0.000046341
-----------------
-----------------
f at the beginning of new iteration,       948.4207515770
Predicted improvement:        0.000013910
lambda =          1; f =          948.4207245
lambda =     1.9332; f =          948.4207004
lambda =     3.7372; f =          948.4206574
lambda =     7.2247; f =          948.4205870
lambda =     13.967; f =          948.4204988
Norm of dx 9.5219e-05
----
Improvement on iteration 38 =        0.000252750
-----------------
-----------------
f at the beginning of new iteration,       948.4204988266
Predicted improvement:        0.000246808
lambda =          1; f =          948.4200600
lambda =     1.9332; f =          948.4197493
lambda =     3.7372; f =          948.4194192
Norm of dx  0.0039268
----
Improvement on iteration 39 =        0.001079658
-----------------
-----------------
f at the beginning of new iteration,       948.4194191684
Predicted improvement:        0.000390381
lambda =          1; f =          948.4188810
Norm of dx  0.0070987
----
Improvement on iteration 40 =        0.000538123
-----------------
-----------------
f at the beginning of new iteration,       948.4188810454
Predicted improvement:        0.000116677
lambda =          1; f =          948.4187585
Norm of dx  0.0028595
----
Improvement on iteration 41 =        0.000122506
-----------------
-----------------
f at the beginning of new iteration,       948.4187585398
Predicted improvement:        0.000007366
lambda =          1; f =          948.4187452
lambda =     1.9332; f =          948.4187341
lambda =     3.7372; f =          948.4187167
```

```
lambda =     7.2247; f =          948.4186976
Norm of dx 0.00049958
----
Improvement on iteration 42 =        0.000060922
-----------------
-----------------
f at the beginning of new iteration,       948.4186976181
Predicted improvement:        0.000056693
lambda =          1; f =          948.4185945
lambda =     1.9332; f =          948.4185160
lambda =     3.7372; f =          948.4184125
Norm of dx 0.00093365
----
Improvement on iteration 43 =        0.000285080
-----------------
-----------------
f at the beginning of new iteration,       948.4184125380
Predicted improvement:        0.000135913
lambda =          1; f =          948.4182188
lambda =     1.9332; f =          948.4181781
Norm of dx  0.0015036
----
Improvement on iteration 44 =        0.000234465
-----------------
-----------------
f at the beginning of new iteration,       948.4181780734
Predicted improvement:        0.000064236
lambda =          1; f =          948.4180704
lambda =     1.9332; f =          948.4180059
Norm of dx 0.00068648
----
Improvement on iteration 45 =        0.000172168
-----------------
-----------------
f at the beginning of new iteration,       948.4180059052
Predicted improvement:        0.000071243
lambda =          1; f =          948.4179211
Norm of dx  0.0022166
----
Improvement on iteration 46 =        0.000084767
-----------------
-----------------
f at the beginning of new iteration,       948.4179211382
Predicted improvement:        0.000009227
lambda =          1; f =          948.4179103
Norm of dx  0.0018655
----
Improvement on iteration 47 =        0.000010872
-----------------
-----------------
f at the beginning of new iteration,       948.4179102658
Predicted improvement:        0.000002047
lambda =          1; f =          948.4179064
lambda =     1.9332; f =          948.4179037
lambda =     3.7372; f =          948.4179007
Norm of dx 0.00032086
----
Improvement on iteration 48 =        0.000009551
-----------------
-----------------
f at the beginning of new iteration,       948.4179007144
Predicted improvement:        0.000006788
lambda =          1; f =          948.4178878
```

```
lambda =     1.9332; f =          948.4178769
lambda =     3.7372; f =          948.4178594
lambda =     7.2247; f =          948.4178382
Norm of dx 0.00064609
----
Improvement on iteration 49 =        0.000062542
-----------------
-----------------
f at the beginning of new iteration,       948.4178381728
Predicted improvement:        0.000056407
lambda =          1; f =          948.4177397
lambda =     1.9332; f =          948.4176745
lambda =     3.7372; f =          948.4176212
Norm of dx  0.0014337
----
Improvement on iteration 50 =        0.000216934
-----------------
-----------------
f at the beginning of new iteration,       948.4176212385
Predicted improvement:        0.000038781
lambda =          1; f =          948.4175685
Norm of dx   0.003566
----
Improvement on iteration 51 =        0.000052776
-----------------
-----------------
f at the beginning of new iteration,       948.4175684622
Predicted improvement:        0.000013290
lambda =          1; f =          948.4175519
Norm of dx  0.0022535
----
Improvement on iteration 52 =        0.000016513
-----------------
-----------------
f at the beginning of new iteration,       948.4175519491
Predicted improvement:        0.000009297
lambda =          1; f =          948.4175364
lambda =     1.9332; f =          948.4175262
lambda =     3.7372; f =          948.4175183
Norm of dx 0.00097881
----
Improvement on iteration 53 =        0.000033672
-----------------
-----------------
f at the beginning of new iteration,       948.4175182767
Predicted improvement:        0.000026096
lambda =          1; f =          948.4174681
lambda =     1.9332; f =          948.4174249
lambda =     3.7372; f =          948.4173514
lambda =     7.2247; f =          948.4172463
lambda =     13.967; f =          948.4171820
Norm of dx 0.00096254
----
Improvement on iteration 54 =        0.000336290
-----------------
-----------------
f at the beginning of new iteration,       948.4171819867
Predicted improvement:        0.000036967
lambda =          1; f =          948.4171258
lambda =     1.9332; f =          948.4171050
Norm of dx  0.0011641
----
Improvement on iteration 55 =        0.000076989
```

```
-----------------
-----------------
f at the beginning of new iteration,       948.4171049979
Predicted improvement:        0.000021776
lambda =          1; f =          948.4170705
lambda =     1.9332; f =          948.4170550
Norm of dx 0.00086706
----
Improvement on iteration 56 =        0.000049990
-----------------
-----------------
f at the beginning of new iteration,       948.4170550077
Predicted improvement:        0.000004316
lambda =          1; f =          948.4170490
Norm of dx 0.00064556
----
Improvement on iteration 57 =        0.000005958
-----------------
-----------------
f at the beginning of new iteration,       948.4170490498
Predicted improvement:        0.000003660
lambda =          1; f =          948.4170441
Norm of dx  0.0010885
----
Improvement on iteration 58 =        0.000004928
-----------------
-----------------
f at the beginning of new iteration,       948.4170441216
Predicted improvement:        0.000005759
lambda =          1; f =          948.4170337
lambda =     1.9332; f =          948.4170259
lambda =     3.7372; f =          948.4170164
Norm of dx 0.00052696
----
Improvement on iteration 59 =        0.000027692
-----------------
-----------------
f at the beginning of new iteration,       948.4170164293
Predicted improvement:        0.000022447
lambda =          1; f =          948.4169759
lambda =     1.9332; f =          948.4169463
lambda =     3.7372; f =          948.4169119
Norm of dx 0.00091077
----
Improvement on iteration 60 =        0.000104546
-----------------
-----------------
f at the beginning of new iteration,       948.4169118834
Predicted improvement:        0.000040602
lambda =          1; f =          948.4168571
Norm of dx 0.00069653
----
Improvement on iteration 61 =        0.000054810
-----------------
-----------------
f at the beginning of new iteration,       948.4168570736
Predicted improvement:        0.000012315
lambda =          1; f =          948.4168442
Norm of dx  0.0015885
----
Improvement on iteration 62 =        0.000012839
-----------------
-----------------
```

```
f at the beginning of new iteration,       948.4168442343
Predicted improvement:        0.000000533
lambda =          1; f =          948.4168432
lambda =     1.9332; f =          948.4168423
lambda =     3.7372; f =          948.4168408
lambda =     7.2247; f =          948.4168385
lambda =     13.967; f =          948.4168365
Norm of dx 3.5842e-05
----
Improvement on iteration 63 =        0.000007697
-----------------
-----------------
f at the beginning of new iteration,       948.4168365376
Predicted improvement:        0.000004972
lambda =          1; f =          948.4168275
lambda =     1.9332; f =          948.4168207
lambda =     3.7372; f =          948.4168122
Norm of dx 0.00026809
----
Improvement on iteration 64 =        0.000024316
-----------------
-----------------
f at the beginning of new iteration,       948.4168122217
Predicted improvement:        0.000011524
lambda =          1; f =          948.4167933
lambda =     1.9332; f =          948.4167821
Norm of dx 0.00075354
----
Improvement on iteration 65 =        0.000030077
-----------------
-----------------
f at the beginning of new iteration,       948.4167821447
Predicted improvement:        0.000032116
lambda =          1; f =          948.4167279
lambda =     1.9332; f =          948.4166955
Norm of dx  0.0015885
----
Improvement on iteration 66 =        0.000086661
-----------------
-----------------
f at the beginning of new iteration,       948.4166954841
Predicted improvement:        0.000060376
lambda =          1; f =          948.4166141
Norm of dx  0.0032743
----
Improvement on iteration 67 =        0.000081339
-----------------
-----------------
f at the beginning of new iteration,       948.4166141453
Predicted improvement:        0.000025555
lambda =          1; f =          948.4165861
Norm of dx  0.0012501
----
Improvement on iteration 68 =        0.000028028
-----------------
-----------------
f at the beginning of new iteration,       948.4165861171
Predicted improvement:        0.000001207
lambda =          1; f =          948.4165846
Norm of dx 0.00028928
----
Improvement on iteration 69 =        0.000001537
-----------------
```

```
-----------------
f at the beginning of new iteration,       948.4165845802
Predicted improvement:        0.000000434
lambda =          1; f =          948.4165839
lambda =     1.9332; f =          948.4165835
Norm of dx 0.00017872
----
Improvement on iteration 70 =        0.000001035
-----------------
-----------------
f at the beginning of new iteration,       948.4165835454
Predicted improvement:        0.000000970
lambda =          1; f =          948.4165823
Norm of dx 0.00057679
----
Improvement on iteration 71 =        0.000001280
-----------------
-----------------
f at the beginning of new iteration,       948.4165822657
Predicted improvement:        0.000001811
lambda =          1; f =          948.4165787
lambda =     1.9332; f =          948.4165757
lambda =     3.7372; f =          948.4165709
lambda =     7.2247; f =          948.4165651
Norm of dx 0.00034935
----
Improvement on iteration 72 =        0.000017139
-----------------
-----------------
f at the beginning of new iteration,       948.4165651268
Predicted improvement:        0.000012000
lambda =          1; f =          948.4165452
lambda =     1.9332; f =          948.4165339
Norm of dx  0.0018386
----
Improvement on iteration 73 =        0.000031229
-----------------
-----------------
f at the beginning of new iteration,       948.4165338981
Predicted improvement:        0.000020900
lambda =          1; f =          948.4165012
lambda =     1.9332; f =          948.4164870
Norm of dx  0.0015741
----
Improvement on iteration 74 =        0.000046852
-----------------
-----------------
f at the beginning of new iteration,       948.4164870461
Predicted improvement:        0.000013292
lambda =          1; f =          948.4164677
lambda =     1.9332; f =          948.4164637
Norm of dx  0.0022975
----
Improvement on iteration 75 =        0.000023386
-----------------
-----------------
f at the beginning of new iteration,       948.4164636599
Predicted improvement:        0.000001407
lambda =          1; f =          948.4164624
Norm of dx 0.00057278
----
Improvement on iteration 76 =        0.000001302
-----------------
```

```
-----------------
f at the beginning of new iteration,       948.4164623575
Predicted improvement:        0.000000136
lambda =          1; f =          948.4164623
lambda =    0.33333; f =          948.4164623
Norm of dx 0.00032959
----
Improvement on iteration 77 =        0.000000069
improvement < crit termination
Objective function at mode: 948.416462

RESULTS FROM POSTERIOR ESTIMATION
parameters
         prior mean     mode    s.d. prior pstdev

rho_a_c      0.500   0.2202  0.0825 beta  0.2000
rho_a_d      0.500   0.5000  0.2774 beta  0.2000
rho_mu_c     0.500   0.5001  0.2774 beta  0.2000
rho_mu_d     0.500   0.5000  0.2773 beta  0.2000
rho_LTV      0.500   0.4952  0.2749 beta  0.2000
rho_d        0.500   0.5100  0.2768 beta  0.2000
rho_d_stern   0.500   0.8916  0.0190 beta  0.2000
rho_c_ast    0.500   0.6268  0.2523 beta  0.2000
rho_d_ast    0.500   0.5000  0.2773 beta  0.2000
rho_s_c      0.500   0.4345  0.1016 beta  0.2000
rho_r        0.500   0.6793  0.0923 beta  0.2000
rho_p       -0.500  -0.4978  0.2000 norm  0.2000
theta_c      0.750   0.2946  0.0693 beta  0.1500
sigma        1.000   1.9061  0.1072 norm  0.3700
phi          2.000   5.0527  0.7791 gamm  0.7000
omega        0.200   0.0967  0.0620 beta  0.1000
h_c          0.500   0.2885  0.0525 beta  0.1000
alpha_c      0.500   0.3977  0.0309 beta  0.1000

standard deviation of shocks
         prior mean     mode    s.d. prior pstdev

epsa_c       0.100   2.2775  0.1740 invg  2.0000
epsa_d       0.100   0.0462  0.0189 invg  2.0000
epsmu_c      0.100   0.0461  0.0188 invg  2.0000
epsmu_d      0.100   0.0461  0.0188 invg  2.0000
epsLTV       0.100   0.0461  0.0188 invg  2.0000
epsd         0.100   0.0458  0.0185 invg  2.0000
epsc_ast     0.100   0.0385  0.0121 invg  2.0000
epsd_ast     0.100   0.0461  0.0188 invg  2.0000
epsd_stern   0.100   0.6055  0.1066 invg  2.0000
epss_c       0.100   1.1106  0.0964 invg  2.0000
epsr         0.100   0.6169  0.1829 invg  2.0000
epsyf        0.100   0.0461  0.0188 invg  2.0000
epsn         0.010   0.8351  0.0644 invg  0.1000
epspi_d      0.010   5.6121  0.4157 invg  0.1000


Log data density [Laplace approximation] is -1002.062413.

Estimation::mcmc: Multiple chains mode.
Estimation::mcmc: Searching for initial values...
Estimation::mcmc: Initial values found!

Estimation::mcmc: Write details about the MCMC... Ok!
Estimation::mcmc: Details about the MCMC are available in
code_93/metropolis\code_mh_history_0.mat
```

```
Estimation::mcmc: Number of mh files: 55 per block.
Estimation::mcmc: Total number of generated files: 110.
Estimation::mcmc: Total number of iterations: 200000.
Estimation::mcmc: Current acceptance ratio per chain:
                                                    Chain  1: 33.2533%
                                                    Chain  2: 33.4783%
Estimation::mcmc::diagnostics: Univariate convergence diagnostic, Brooks and Gelman
(1998):
    Parameter 1...  Done!
    Parameter 2...  Done!
    Parameter 3...  Done!
    Parameter 4...  Done!
    Parameter 5...  Done!
    Parameter 6...  Done!
    Parameter 7...  Done!
    Parameter 8...  Done!
    Parameter 9...  Done!
    Parameter 10...  Done!
    Parameter 11...  Done!
    Parameter 12...  Done!
    Parameter 13...  Done!
    Parameter 14...  Done!
    Parameter 15...  Done!
    Parameter 16...  Done!
    Parameter 17...  Done!
    Parameter 18...  Done!
    Parameter 19...  Done!
    Parameter 20...  Done!
    Parameter 21...  Done!
    Parameter 22...  Done!
    Parameter 23...  Done!
    Parameter 24...  Done!
    Parameter 25...  Done!
    Parameter 26...  Done!
    Parameter 27...  Done!
    Parameter 28...  Done!
    Parameter 29...  Done!
    Parameter 30...  Done!
    Parameter 31...  Done!
    Parameter 32...  Done!

Estimation::mcmc: Total number of MH draws: 200000.
Estimation::mcmc: Total number of generated MH files: 55.
Estimation::mcmc: I'll use mh-files 28 to 55.
Estimation::mcmc: In MH-file number 28 I'll start at line 721.
Estimation::mcmc: Finally I keep 100000 draws.

Estimation::marginal density: I'm computing the posterior mean and covariance...
Done!
Estimation::marginal density: I'm computing the posterior log marginal density
(modified harmonic mean)... Done!


ESTIMATION RESULTS

Log data density is -1002.204641.
posterior_moments: There are not enough draws computes to compute HPD Intervals.
Skipping their computation.
posterior_moments: There are not enough draws computes to compute deciles. Skipping
their computation.

parameters
```

	prior mean	post. mean	90% HPD interval		prior	pstdev
rho_a_c	0.500	0.2306	0.1018	0.3625	beta	0.2000
rho_a_d	0.500	0.5001	0.1785	0.8394	beta	0.2000
rho_mu_c	0.500	0.5044	0.1654	0.8199	beta	0.2000
rho_mu_d	0.500	0.4987	0.1749	0.8324	beta	0.2000
rho_LTV	0.500	0.4965	0.1653	0.8198	beta	0.2000
rho_d	0.500	0.5224	0.1923	0.8441	beta	0.2000
rho_d_stern	0.500	0.8901	0.8587	0.9222	beta	0.2000
rho_c_ast	0.500	0.6203	0.3268	0.9285	beta	0.2000
rho_d_ast	0.500	0.4950	0.1555	0.8136	beta	0.2000
rho_s_c	0.500	0.4360	0.2706	0.6029	beta	0.2000
rho_r	0.500	0.6320	0.4554	0.7985	beta	0.2000
rho_p	-0.500	-0.4933	-0.8281	-0.1827	norm	0.2000
theta_c	0.750	0.2867	0.1787	0.3960	beta	0.1500
sigma	1.000	1.9487	1.7660	2.1249	norm	0.3700
phi	2.000	5.2045	3.9178	6.4909	gamma	0.7000
omega	0.200	0.1215	0.0240	0.2131	beta	0.1000
h_c	0.500	0.2794	0.1943	0.3642	beta	0.1000
alpha_c	0.500	0.3993	0.3457	0.4505	beta	0.1000

standard deviation of shocks

	prior mean	post. mean	90% HPD interval		prior	pstdev
epsa_c	0.100	2.3230	2.0250	2.6154	invg	2.0000
epsa_d	0.100	0.0903	0.0226	0.1744	invg	2.0000
epsmu_c	0.100	0.0817	0.0237	0.1545	invg	2.0000
epsmu_d	0.100	0.0761	0.0239	0.1349	invg	2.0000
epsLTV	0.100	0.0926	0.0244	0.1763	invg	2.0000
epsd	0.100	0.0771	0.0243	0.1381	invg	2.0000
epsc_ast	0.100	0.0460	0.0230	0.0690	invg	2.0000
epsd_ast	0.100	0.0852	0.0237	0.1476	invg	2.0000
epsd_stern	0.100	0.5793	0.4111	0.7384	invg	2.0000
epss_c	0.100	1.1345	0.9656	1.2994	invg	2.0000
epsr	0.100	0.7162	0.3634	1.0735	invg	2.0000
epsyf	0.100	0.1252	0.0214	0.2591	invg	2.0000
epsn	0.010	0.8487	0.7357	0.9559	invg	0.1000
epspi_d	0.010	5.7297	5.0272	6.4531	invg	0.1000

```
Estimation::mcmc: Posterior (dsge) IRFs...
Estimation::mcmc: Posterior IRFs, done!
Estimation::mcmc: Forecasted variables (mean)
Estimation::mcmc: Forecasted variables (mean), done!
Estimation::mcmc: Forecasted variables (point)
Estimation::mcmc: Forecasted variables (point), done!

Loading 116 observations from data100.xlsx

Restricting the sample to observations 1 to 94. Using in total 94 observations.
Initial value of the log posterior (or likelihood): -956.1493
-----------------
-----------------
f at the beginning of new iteration,       956.1493480240
Predicted improvement:        0.002676690
lambda =          1; f =          956.1453630
lambda =     1.9332; f =          956.1441520
Norm of dx 0.00073167
----
Improvement on iteration 1 =        0.005196034
-----------------
-----------------
f at the beginning of new iteration,       956.1441519899
Predicted improvement:        0.000760022
lambda =          1; f =          956.1428736
```

```
lambda =     1.9332; f =          956.1421165
Norm of dx 0.00043923
----
Improvement on iteration 2 =        0.002035532
-----------------
-----------------
f at the beginning of new iteration,       956.1421164583
Predicted improvement:        0.000602766
lambda =          1; f =          956.1413054
Norm of dx 0.00071801
----
Improvement on iteration 3 =        0.000811091
-----------------
-----------------
f at the beginning of new iteration,       956.1413053671
Predicted improvement:        0.000388202
lambda =          1; f =          956.1406666
lambda =     1.9332; f =          956.1403177
Norm of dx 0.00063875
----
Improvement on iteration 4 =        0.000987661
-----------------
-----------------
f at the beginning of new iteration,       956.1403177066
Predicted improvement:        0.000658004
lambda =          1; f =          956.1392292
lambda =     1.9332; f =          956.1386246
Norm of dx  0.0011028
----
Improvement on iteration 5 =        0.001693080
-----------------
-----------------
f at the beginning of new iteration,       956.1386246262
Predicted improvement:        0.000717514
lambda =          1; f =          956.1376749
Norm of dx  0.0011981
----
Improvement on iteration 6 =        0.000949767
-----------------
-----------------
f at the beginning of new iteration,       956.1376748592
Predicted improvement:        0.000214163
lambda =          1; f =          956.1373982
Norm of dx 0.00042931
----
Improvement on iteration 7 =        0.000276637
-----------------
-----------------
f at the beginning of new iteration,       956.1373982225
Predicted improvement:        0.000093314
lambda =          1; f =          956.1372408
lambda =     1.9332; f =          956.1371469
Norm of dx 0.00025506
----
Improvement on iteration 8 =        0.000251326
-----------------
-----------------
f at the beginning of new iteration,       956.1371468963
Predicted improvement:        0.000221054
lambda =          1; f =          956.1367692
lambda =     1.9332; f =          956.1365337
lambda =     3.7372; f =          956.1363979
Norm of dx 0.00069101
```

```
----
Improvement on iteration 9 =        0.000748989
-----------------
-----------------
f at the beginning of new iteration,       956.1363979076
Predicted improvement:        0.000338726
lambda =          1; f =          956.1358491
lambda =     1.9332; f =          956.1355679
Norm of dx 0.00049543
----
Improvement on iteration 10 =        0.000830038
-----------------
-----------------
f at the beginning of new iteration,       956.1355678696
Predicted improvement:        0.000095834
lambda =          1; f =          956.1354618
Norm of dx 0.00077162
----
Improvement on iteration 11 =        0.000106040
-----------------
-----------------
f at the beginning of new iteration,       956.1354618294
Predicted improvement:        0.000011359
lambda =          1; f =          956.1354417
lambda =     1.9332; f =          956.1354273
lambda =     3.7372; f =          956.1354118
Norm of dx 0.00014054
----
Improvement on iteration 12 =        0.000050066
-----------------
-----------------
f at the beginning of new iteration,       956.1354117637
Predicted improvement:        0.000025551
lambda =          1; f =          956.1353704
lambda =     1.9332; f =          956.1353497
Norm of dx 0.00016055
----
Improvement on iteration 13 =        0.000062040
-----------------
-----------------
f at the beginning of new iteration,       956.1353497240
Predicted improvement:        0.000015842
lambda =          1; f =          956.1353256
lambda =     1.9332; f =          956.1353168
Norm of dx 0.00017778
----
Improvement on iteration 14 =        0.000032928
-----------------
-----------------
f at the beginning of new iteration,       956.1353167960
Predicted improvement:        0.000013512
lambda =          1; f =          956.1352913
lambda =     1.9332; f =          956.1352704
lambda =     3.7372; f =          956.1352380
lambda =     7.2247; f =          956.1352053
Norm of dx 0.00010495
----
Improvement on iteration 15 =        0.000111532
-----------------
-----------------
f at the beginning of new iteration,       956.1352052642
Predicted improvement:        0.000032838
lambda =          1; f =          956.1351527
```

```
lambda =     1.9332; f =          956.1351268
Norm of dx  0.0004293
----
Improvement on iteration 16 =        0.000078447
-----------------
-----------------
f at the beginning of new iteration,       956.1351268172
Predicted improvement:        0.000032347
lambda =          1; f =          956.1350730
lambda =     1.9332; f =          956.1350428
Norm of dx 0.00039108
----
Improvement on iteration 17 =        0.000084002
-----------------
-----------------
f at the beginning of new iteration,       956.1350428150
Predicted improvement:        0.000038556
lambda =          1; f =          956.1349880
lambda =     1.9332; f =          956.1349784
Norm of dx 0.00045834
----
Improvement on iteration 18 =        0.000064455
-----------------
-----------------
f at the beginning of new iteration,       956.1349783604
Predicted improvement:        0.000009964
lambda =          1; f =          956.1349634
lambda =     1.9332; f =          956.1349586
Norm of dx 0.00018703
----
Improvement on iteration 19 =        0.000019806
-----------------
-----------------
f at the beginning of new iteration,       956.1349585547
Predicted improvement:        0.000006468
lambda =          1; f =          956.1349459
lambda =     1.9332; f =          956.1349348
lambda =     3.7372; f =          956.1349149
lambda =     7.2247; f =          956.1348826
lambda =     13.967; f =          956.1348434
Norm of dx 9.4207e-05
----
Improvement on iteration 20 =        0.000115119
-----------------
-----------------
f at the beginning of new iteration,       956.1348434362
Predicted improvement:        0.000092984
lambda =          1; f =          956.1346832
lambda =     1.9332; f =          956.1345800
lambda =     3.7372; f =          956.1345073
Norm of dx  0.0014296
----
Improvement on iteration 21 =        0.000336095
-----------------
-----------------
f at the beginning of new iteration,       956.1345073414
Predicted improvement:        0.000072703
lambda =          1; f =          956.1344123
Norm of dx 0.00033223
----
Improvement on iteration 22 =        0.000095049
-----------------
-----------------
```

f at the beginning of new iteration,   956.1344122920
Predicted improvement: 0.000013915
lambda =   1; f =   956.1343956
Norm of dx 0.00014585

Improvement on iteration 23 =   0.000016694

----
f at the beginning of new iteration,   956.1343955980
Predicted improvement: 0.000004587
lambda =   1; f =   956.1343874
lambda =   1.9332; f =   956.1343813
lambda =   3.7372; f =   956.1343739
Norm of dx 8.4068e-05

Improvement on iteration 24 =   0.000021671

----
f at the beginning of new iteration,   956.1343739271
Predicted improvement: 0.000019129
lambda =   1; f =   956.1343388
lambda =   1.9332; f =   956.1343115
lambda =   3.7372; f =   956.1342740
Norm of dx 0.00034502

Improvement on iteration 25 =   0.000099891

----
f at the beginning of new iteration,   956.1342740364
Predicted improvement: 0.000080360
lambda =   1; f =   956.1341517
lambda =   1.9332; f =   956.1341072
Norm of dx 0.0016088

Improvement on iteration 26 =   0.000166841

----
f at the beginning of new iteration,   956.1341071957
Predicted improvement: 0.000043963
lambda =   1; f =   956.1340349
lambda =   1.9332; f =   956.1339960
Norm of dx 0.00049314

Improvement on iteration 27 =   0.000111159

----
f at the beginning of new iteration,   956.1339960364
Predicted improvement: 0.000035602
lambda =   1; f =   956.1339453
lambda =   1.9332; f =   956.1339351
Norm of dx 0.00058842

Improvement on iteration 28 =   0.000060917

----
f at the beginning of new iteration,   956.1339351194
Predicted improvement: 0.000010837
lambda =   1; f =   956.1339192
lambda =   1.9332; f =   956.1339146
Norm of dx 0.00012436

Improvement on iteration 29 =   0.000020503

```
-----------------
f at the beginning of new iteration,       956.1339146161
Predicted improvement:        0.000004380
lambda =          1; f =          956.1339063
lambda =     1.9332; f =          956.1338992
lambda =     3.7372; f =          956.1338877
lambda =     7.2247; f =          956.1338728
Norm of dx 0.00016067
----
Improvement on iteration 30 =        0.000041828
-----------------
-----------------
f at the beginning of new iteration,       956.1338727877
Predicted improvement:        0.000036135
lambda =          1; f =          956.1338110
lambda =     1.9332; f =          956.1337727
lambda =     3.7372; f =          956.1337513
Norm of dx 0.00084676
----
Improvement on iteration 31 =        0.000121457
-----------------
-----------------
f at the beginning of new iteration,       956.1337513308
Predicted improvement:        0.000033093
lambda =          1; f =          956.1337058
Norm of dx 0.00055742
----
Improvement on iteration 32 =        0.000045559
-----------------
-----------------
f at the beginning of new iteration,       956.1337057715
Predicted improvement:        0.000010691
lambda =          1; f =          956.1336933
Norm of dx 0.00026043
----
Improvement on iteration 33 =        0.000012489
-----------------
-----------------
f at the beginning of new iteration,       956.1336932829
Predicted improvement:        0.000002942
lambda =          1; f =          956.1336880
lambda =     1.9332; f =          956.1336840
lambda =     3.7372; f =          956.1336790
Norm of dx  6.572e-05
----
Improvement on iteration 34 =        0.000014259
-----------------
-----------------
f at the beginning of new iteration,       956.1336790237
Predicted improvement:        0.000012525
lambda =          1; f =          956.1336566
lambda =     1.9332; f =          956.1336405
lambda =     3.7372; f =          956.1336226
Norm of dx 0.00028062
----
Improvement on iteration 35 =        0.000056434
-----------------
-----------------
f at the beginning of new iteration,       956.1336225900
Predicted improvement:        0.000030959
lambda =          1; f =          956.1335710
lambda =     1.9332; f =          956.1335413
Norm of dx  0.0010794
```

```
----
Improvement on iteration 36 =        0.000081293
-----------------
-----------------
f at the beginning of new iteration,       956.1335412970
Predicted improvement:        0.000044277
lambda =          1; f =          956.1334729
lambda =     1.9332; f =          956.1334454
Norm of dx  0.0014133
----
Improvement on iteration 37 =        0.000095941
-----------------
-----------------
f at the beginning of new iteration,       956.1334453556
Predicted improvement:        0.000034986
lambda =          1; f =          956.1333878
lambda =     1.9332; f =          956.1333565
Norm of dx 0.00060329
----
Improvement on iteration 38 =        0.000088903
-----------------
-----------------
f at the beginning of new iteration,       956.1333564530
Predicted improvement:        0.000017541
lambda =          1; f =          956.1333358
Norm of dx 0.00043406
----
Improvement on iteration 39 =        0.000020626
-----------------
-----------------
f at the beginning of new iteration,       956.1333358266
Predicted improvement:        0.000004333
lambda =          1; f =          956.1333281
lambda =     1.9332; f =          956.1333224
lambda =     3.7372; f =          956.1333157
Norm of dx 0.00012067
----
Improvement on iteration 40 =        0.000020170
-----------------
-----------------
f at the beginning of new iteration,       956.1333156570
Predicted improvement:        0.000017088
lambda =          1; f =          956.1332844
lambda =     1.9332; f =          956.1332606
lambda =     3.7372; f =          956.1332288
Norm of dx  0.0004836
----
Improvement on iteration 41 =        0.000086886
-----------------
-----------------
f at the beginning of new iteration,       956.1332287705
Predicted improvement:        0.000048837
lambda =          1; f =          956.1331635
Norm of dx  0.0014744
----
Improvement on iteration 42 =        0.000065248
-----------------
-----------------
f at the beginning of new iteration,       956.1331635229
Predicted improvement:        0.000012402
lambda =          1; f =          956.1331507
Norm of dx  0.0007981
----
```

```
Improvement on iteration 43 =        0.000012807
-----------------
-----------------
f at the beginning of new iteration,       956.1331507162
Predicted improvement:        0.000000568
lambda =          1; f =          956.1331498
lambda =     1.9332; f =          956.1331494
Norm of dx 0.00018581
----
Improvement on iteration 44 =        0.000001281
-----------------
-----------------
f at the beginning of new iteration,       956.1331494354
Predicted improvement:        0.000000696
lambda =          1; f =          956.1331481
lambda =     1.9332; f =          956.1331470
lambda =     3.7372; f =          956.1331451
lambda =     7.2247; f =          956.1331427
Norm of dx 6.9631e-05
----
Improvement on iteration 45 =        0.000006771
-----------------
-----------------
f at the beginning of new iteration,       956.1331426639
Predicted improvement:        0.000007370
lambda =          1; f =          956.1331302
lambda =     1.9332; f =          956.1331226
lambda =     3.7372; f =          956.1331189
Norm of dx 0.00024734
----
Improvement on iteration 46 =        0.000023735
-----------------
-----------------
f at the beginning of new iteration,       956.1331189294
Predicted improvement:        0.000008346
lambda =          1; f =          956.1331076
Norm of dx 0.00098956
----
Improvement on iteration 47 =        0.000011315
-----------------
-----------------
f at the beginning of new iteration,       956.1331076146
Predicted improvement:        0.000002509
lambda =          1; f =          956.1331047
Norm of dx 0.00053914
----
Improvement on iteration 48 =        0.000002958
-----------------
-----------------
f at the beginning of new iteration,       956.1331046563
Predicted improvement:        0.000000569
lambda =          1; f =          956.1331038
lambda =     1.9332; f =          956.1331034
Norm of dx 0.00021066
----
Improvement on iteration 49 =        0.000001211
-----------------
-----------------
f at the beginning of new iteration,       956.1331034456
Predicted improvement:        0.000000989
lambda =          1; f =          956.1331017
lambda =     1.9332; f =          956.1331005
lambda =     3.7372; f =          956.1330989
```

```
Norm of dx 0.00012729
----
Improvement on iteration 50 =        0.000004552
-----------------
-----------------
f at the beginning of new iteration,       956.1330988931
Predicted improvement:        0.000003478
lambda =          1; f =          956.1330935
lambda =     1.9332; f =          956.1330911
Norm of dx 0.00022684
----
Improvement on iteration 51 =        0.000007779
-----------------
-----------------
f at the beginning of new iteration,       956.1330911140
Predicted improvement:        0.000002998
lambda =          1; f =          956.1330862
lambda =     1.9332; f =          956.1330834
Norm of dx 0.00034591
----
Improvement on iteration 52 =        0.000007717
-----------------
-----------------
f at the beginning of new iteration,       956.1330833969
Predicted improvement:        0.000004811
lambda =          1; f =          956.1330763
lambda =     1.9332; f =          956.1330741
Norm of dx 0.00023004
----
Improvement on iteration 53 =        0.000009252
-----------------
-----------------
f at the beginning of new iteration,       956.1330741449
Predicted improvement:        0.000001882
lambda =          1; f =          956.1330713
lambda =     1.9332; f =          956.1330705
Norm of dx   0.000563
----
Improvement on iteration 54 =        0.000003620
-----------------
-----------------
f at the beginning of new iteration,       956.1330705249
Predicted improvement:        0.000000460
lambda =          1; f =          956.1330697
lambda =     1.9332; f =          956.1330690
lambda =     3.7372; f =          956.1330678
lambda =     7.2247; f =          956.1330661
Norm of dx 9.1724e-05
----
Improvement on iteration 55 =        0.000004382
-----------------
-----------------
f at the beginning of new iteration,       956.1330661428
Predicted improvement:        0.000006268
lambda =          1; f =          956.1330550
lambda =     1.9332; f =          956.1330471
lambda =     3.7372; f =          956.1330382
Norm of dx 0.00046968
----
Improvement on iteration 56 =        0.000027916
-----------------
-----------------
f at the beginning of new iteration,       956.1330382270
```

```
Predicted improvement:        0.000015331
lambda =          1; f =          956.1330132
lambda =     1.9332; f =          956.1330007
Norm of dx 0.00086425
----
Improvement on iteration 57 =        0.000037560
-----------------
-----------------
f at the beginning of new iteration,       956.1330006668
Predicted improvement:        0.000005010
lambda =          1; f =          956.1329950
Norm of dx 0.00046352
----
Improvement on iteration 58 =        0.000005646
-----------------
-----------------
f at the beginning of new iteration,       956.1329950209
Predicted improvement:        0.000000238
lambda =          1; f =          956.1329947
lambda =     1.9332; f =          956.1329945
Norm of dx 8.1175e-05
----
Improvement on iteration 59 =        0.000000521
-----------------
-----------------
f at the beginning of new iteration,       956.1329944998
Predicted improvement:        0.000000530
lambda =          1; f =          956.1329935
lambda =     1.9332; f =          956.1329928
lambda =     3.7372; f =          956.1329918
Norm of dx 0.00011347
----
Improvement on iteration 60 =        0.000002702
-----------------
-----------------
f at the beginning of new iteration,       956.1329917977
Predicted improvement:        0.000002987
lambda =          1; f =          956.1329863
lambda =     1.9332; f =          956.1329819
lambda =     3.7372; f =          956.1329755
lambda =     7.2247; f =          956.1329710
Norm of dx 0.00020912
----
Improvement on iteration 61 =        0.000020816
-----------------
-----------------
f at the beginning of new iteration,       956.1329709821
Predicted improvement:        0.000011043
lambda =          1; f =          956.1329515
lambda =     1.9332; f =          956.1329389
lambda =     3.7372; f =          956.1329299
Norm of dx 0.00074682
----
Improvement on iteration 62 =        0.000041054
-----------------
-----------------
f at the beginning of new iteration,       956.1329299285
Predicted improvement:        0.000007412
lambda =          1; f =          956.1329176
lambda =     1.9332; f =          956.1329112
Norm of dx 0.00098485
----
Improvement on iteration 63 =        0.000018758
```

```
-----------------
-----------------
f at the beginning of new iteration,       956.1329111708
Predicted improvement:        0.000003954
lambda =          1; f =          956.1329059
Norm of dx 0.00093554
----
Improvement on iteration 64 =        0.000005238
-----------------
-----------------
f at the beginning of new iteration,       956.1329059328
Predicted improvement:        0.000001815
lambda =          1; f =          956.1329036
Norm of dx 0.00036957
----
Improvement on iteration 65 =        0.000002327
-----------------
-----------------
f at the beginning of new iteration,       956.1329036054
Predicted improvement:        0.000001124
lambda =          1; f =          956.1329021
Norm of dx 0.00019716
----
Improvement on iteration 66 =        0.000001494
-----------------
-----------------
f at the beginning of new iteration,       956.1329021116
Predicted improvement:        0.000002023
lambda =          1; f =          956.1328999
Norm of dx 0.00062885
----
Improvement on iteration 67 =        0.000002259
-----------------
-----------------
f at the beginning of new iteration,       956.1328998530
Predicted improvement:        0.000001334
lambda =          1; f =          956.1328973
lambda =     1.9332; f =          956.1328952
lambda =     3.7372; f =          956.1328917
lambda =     7.2247; f =          956.1328874
Norm of dx 0.00015657
----
Improvement on iteration 68 =        0.000012417
-----------------
-----------------
f at the beginning of new iteration,       956.1328874357
Predicted improvement:        0.000008691
lambda =          1; f =          956.1328722
lambda =     1.9332; f =          956.1328620
lambda =     3.7372; f =          956.1328531
Norm of dx 0.00032478
----
Improvement on iteration 69 =        0.000034344
-----------------
-----------------
f at the beginning of new iteration,       956.1328530915
Predicted improvement:        0.000018291
lambda =          1; f =          956.1328233
lambda =     1.9332; f =          956.1328061
Norm of dx  0.0022688
----
Improvement on iteration 70 =        0.000047013
-----------------
```

```
-----------------
f at the beginning of new iteration,       956.1328060780
Predicted improvement:        0.000010953
lambda =          1; f =          956.1327937
Norm of dx  0.0027772
----
Improvement on iteration 71 =        0.000012366
-----------------
-----------------
f at the beginning of new iteration,       956.1327937121
Predicted improvement:        0.000000281
lambda =          1; f =          956.1327933
lambda =     1.9332; f =          956.1327932
Norm of dx 0.00014205
----
Improvement on iteration 72 =        0.000000496
-----------------
-----------------
f at the beginning of new iteration,       956.1327932161
Predicted improvement:        0.000000131
lambda =          1; f =          956.1327931
Norm of dx 0.00021838
----
Improvement on iteration 73 =        0.000000161
-----------------
-----------------
f at the beginning of new iteration,       956.1327930549
Predicted improvement:        0.000001004
lambda =          1; f =          956.1327970
lambda =    0.33333; f =          956.1327933
lambda =    0.11111; f =          956.1327930
lambda =   0.037037; f =          956.1327930
Norm of dx  0.0021197
----
Improvement on iteration 74 =        0.000000039
improvement < crit termination
Objective function at mode: 956.132793

RESULTS FROM POSTERIOR ESTIMATION
parameters
         prior mean     mode    s.d. prior pstdev

rho_a_c      0.500   0.2279  0.0824 beta  0.2000
rho_a_d      0.500   0.5000  0.2774 beta  0.2000
rho_mu_c     0.500   0.5001  0.2774 beta  0.2000
rho_mu_d     0.500   0.5000  0.2773 beta  0.2000
rho_LTV      0.500   0.4954  0.2750 beta  0.2000
rho_d        0.500   0.5102  0.2767 beta  0.2000
rho_d_stern   0.500   0.8923  0.0188 beta  0.2000
rho_c_ast    0.500   0.6297  0.2514 beta  0.2000
rho_d_ast    0.500   0.5000  0.2774 beta  0.2000
rho_s_c      0.500   0.4386  0.1010 beta  0.2000
rho_r        0.500   0.6795  0.0917 beta  0.2000
rho_p       -0.500  -0.4979  0.2000 norm  0.2000
theta_c      0.750   0.2928  0.0695 beta  0.1500
sigma        1.000   1.9073  0.1067 norm  0.3700
phi          2.000   5.0834  0.7812 gamm  0.7000
omega        0.200   0.0968  0.0619 beta  0.1000
h_c          0.500   0.2911  0.0524 beta  0.1000
alpha_c      0.500   0.3974  0.0307 beta  0.1000

standard deviation of shocks
         prior mean     mode    s.d. prior pstdev
```

```
epsa_c       0.100   2.2725  0.1727 invg  2.0000
epsa_d       0.100   0.0462  0.0189 invg  2.0000
epsmu_c      0.100   0.0461  0.0188 invg  2.0000
epsmu_d      0.100   0.0461  0.0188 invg  2.0000
epsLTV       0.100   0.0461  0.0188 invg  2.0000
epsd         0.100   0.0458  0.0185 invg  2.0000
epsc_ast     0.100   0.0383  0.0119 invg  2.0000
epsd_ast     0.100   0.0461  0.0188 invg  2.0000
epsd_stern   0.100   0.6045  0.1057 invg  2.0000
epss_c       0.100   1.1084  0.0958 invg  2.0000
epsr         0.100   0.6135  0.1806 invg  2.0000
epsyf        0.100   0.0461  0.0188 invg  2.0000
epsn         0.010   0.8330  0.0639 invg  0.1000
epspi_d      0.010   5.5881  0.4118 invg  0.1000


Log data density [Laplace approximation] is -1009.885230.

Estimation::mcmc: Multiple chains mode.
Estimation::mcmc: Searching for initial values...
Estimation::mcmc: Initial values found!

Estimation::mcmc: Write details about the MCMC... Ok!
Estimation::mcmc: Details about the MCMC are available in
code_94/metropolis\code_mh_history_0.mat


Estimation::mcmc: Number of mh files: 55 per block.
Estimation::mcmc: Total number of generated files: 110.
Estimation::mcmc: Total number of iterations: 200000.
Estimation::mcmc: Current acceptance ratio per chain:
                                                    Chain  1: 33.2268%
                                                    Chain  2: 30.9108%
Estimation::mcmc::diagnostics: Univariate convergence diagnostic, Brooks and Gelman
(1998):
    Parameter 1...  Done!
    Parameter 2...  Done!
    Parameter 3...  Done!
    Parameter 4...  Done!
    Parameter 5...  Done!
    Parameter 6...  Done!
    Parameter 7...  Done!
    Parameter 8...  Done!
    Parameter 9...  Done!
    Parameter 10...  Done!
    Parameter 11...  Done!
    Parameter 12...  Done!
    Parameter 13...  Done!
    Parameter 14...  Done!
    Parameter 15...  Done!
    Parameter 16...  Done!
    Parameter 17...  Done!
    Parameter 18...  Done!
    Parameter 19...  Done!
    Parameter 20...  Done!
    Parameter 21...  Done!
    Parameter 22...  Done!
    Parameter 23...  Done!
    Parameter 24...  Done!
    Parameter 25...  Done!
    Parameter 26...  Done!
    Parameter 27...  Done!
```

```
    Parameter 28...  Done!
    Parameter 29...  Done!
    Parameter 30...  Done!
    Parameter 31...  Done!
    Parameter 32...  Done!

Estimation::mcmc: Total number of MH draws: 200000.
Estimation::mcmc: Total number of generated MH files: 55.
Estimation::mcmc: I'll use mh-files 28 to 55.
Estimation::mcmc: In MH-file number 28 I'll start at line 721.
Estimation::mcmc: Finally I keep 100000 draws.

Estimation::marginal density: I'm computing the posterior mean and covariance...
Done!
Estimation::marginal density: I'm computing the posterior log marginal density
(modified harmonic mean)... Done!


ESTIMATION RESULTS

Log data density is -1006.951494.
posterior_moments: There are not enough draws computes to compute HPD Intervals.
Skipping their computation.
posterior_moments: There are not enough draws computes to compute deciles. Skipping
their computation.

parameters
              prior mean   post. mean        90% HPD interval    prior       pstdev

rho_a_c            0.500       0.2201      0.0801      0.3501   beta        0.2000
rho_a_d            0.500       0.4332      0.1327      0.7635   beta        0.2000
rho_mu_c           0.500       0.5042      0.1753      0.8274   beta        0.2000
rho_mu_d           0.500       0.5027      0.1739      0.8303   beta        0.2000
rho_LTV            0.500       0.4914      0.1700      0.8252   beta        0.2000
rho_d              0.500       0.5290      0.2031      0.8601   beta        0.2000
rho_d_stern        0.500       0.8881      0.8570      0.9201   beta        0.2000
rho_c_ast          0.500       0.6178      0.3249      0.9331   beta        0.2000
rho_d_ast          0.500       0.4992      0.1795      0.8280   beta        0.2000
rho_s_c            0.500       0.4441      0.2239      0.6605   beta        0.2000
rho_r              0.500       0.6057      0.4151      0.7869   beta        0.2000
rho_p             -0.500      -0.4947     -0.8202     -0.1670   norm        0.2000
theta_c            0.750       0.3169      0.1911      0.4448   beta        0.1500
sigma              1.000       1.9221      1.7407      2.0997   norm        0.3700
phi                2.000       4.7808      3.1696      6.3026   gamma       0.7000
omega              0.200       0.1072      0.0191      0.1957   beta        0.1000
h_c                0.500       0.2265      0.0836      0.3418   beta        0.1000
alpha_c            0.500       0.3656      0.2667      0.4509   beta        0.1000

standard deviation of shocks
              prior mean   post. mean        90% HPD interval    prior       pstdev

epsa_c             0.100       2.0983      1.5610      2.5530   invg        2.0000
epsa_d             0.100       1.6400      0.0209      4.4396   invg        2.0000
epsmu_c            0.100       0.0772      0.0250      0.1374   invg        2.0000
epsmu_d            0.100       0.1097      0.0212      0.2420   invg        2.0000
epsLTV             0.100       0.0822      0.0243      0.1523   invg        2.0000
epsd               0.100       0.0930      0.0223      0.1786   invg        2.0000
epsc_ast           0.100       0.0471      0.0228      0.0711   invg        2.0000
epsd_ast           0.100       0.0854      0.0238      0.1661   invg        2.0000
epsd_stern         0.100       0.5713      0.4119      0.7315   invg        2.0000
epss_c             0.100       0.8668      0.0297      1.2259   invg        2.0000
epsr               0.100       0.7302      0.3799      1.0817   invg        2.0000
epsyf              0.100       0.0965      0.0218      0.1991   invg        2.0000
```

```
epsn              0.010       0.8507      0.7383      0.9555   invg        0.1000
epspi_d           0.010       5.6469      4.9605      6.3179   invg        0.1000
Estimation::mcmc: Posterior (dsge) IRFs...
Estimation::mcmc: Posterior IRFs, done!
Estimation::mcmc: Forecasted variables (mean)
Estimation::mcmc: Forecasted variables (mean), done!
Estimation::mcmc: Forecasted variables (point)
Estimation::mcmc: Forecasted variables (point), done!

Loading 116 observations from data100.xlsx

Restricting the sample to observations 1 to 95. Using in total 95 observations.
Initial value of the log posterior (or likelihood): -970.0178
-----------------
-----------------
f at the beginning of new iteration,       970.0177519616
Predicted improvement:        0.002021824
lambda =          1; f =          970.0142578
lambda =     1.9332; f =          970.0119954
lambda =     3.7372; f =          970.0103831
Norm of dx  0.0006359
----
Improvement on iteration 1 =        0.007368862
-----------------
-----------------
f at the beginning of new iteration,       970.0103831000
Predicted improvement:        0.002547972
lambda =          1; f =          970.0058315
lambda =     1.9332; f =          970.0025617
lambda =     3.7372; f =          969.9989008
Norm of dx  0.0010193
----
Improvement on iteration 2 =        0.011482286
-----------------
-----------------
f at the beginning of new iteration,       969.9989008141
Predicted improvement:        0.001583438
lambda =          1; f =          969.9965568
lambda =     1.9332; f =          969.9958524
Norm of dx  0.0016929
----
Improvement on iteration 3 =        0.003048416
-----------------
-----------------
f at the beginning of new iteration,       969.9958523986
Predicted improvement:        0.001160144
lambda =          1; f =          969.9936478
lambda =     1.9332; f =          969.9917987
lambda =     3.7372; f =          969.9887961
lambda =     7.2247; f =          969.9851394
Norm of dx 0.00069608
----
Improvement on iteration 4 =        0.010713012
-----------------
-----------------
f at the beginning of new iteration,       969.9851393861
Predicted improvement:        0.004418671
lambda =          1; f =          969.9787812
lambda =     1.9332; f =          969.9772926
Norm of dx  0.0047061
----
Improvement on iteration 5 =        0.007846804
-----------------
```

```
-----------------
f at the beginning of new iteration,       969.9772925817
Predicted improvement:        0.000959096
lambda =          1; f =          969.9758617
lambda =     1.9332; f =          969.9753984
Norm of dx 0.00075769
----
Improvement on iteration 6 =        0.001894136
-----------------
-----------------
f at the beginning of new iteration,       969.9753984452
Predicted improvement:        0.000557519
lambda =          1; f =          969.9743302
lambda =     1.9332; f =          969.9734177
lambda =     3.7372; f =          969.9718839
lambda =     7.2247; f =          969.9697742
Norm of dx  0.0007978
----
Improvement on iteration 7 =        0.005624245
-----------------
-----------------
f at the beginning of new iteration,       969.9697742002
Predicted improvement:        0.002765973
lambda =          1; f =          969.9661253
Norm of dx  0.0044242
----
Improvement on iteration 8 =        0.003648937
-----------------
-----------------
f at the beginning of new iteration,       969.9661252631
Predicted improvement:        0.001097964
lambda =          1; f =          969.9645066
lambda =     1.9332; f =          969.9640438
Norm of dx  0.0021981
----
Improvement on iteration 9 =        0.002081446
-----------------
-----------------
f at the beginning of new iteration,       969.9640438167
Predicted improvement:        0.000686072
lambda =          1; f =          969.9628653
lambda =     1.9332; f =          969.9621219
lambda =     3.7372; f =          969.9617004
Norm of dx 0.00045866
----
Improvement on iteration 10 =        0.002343454
-----------------
-----------------
f at the beginning of new iteration,       969.9617003630
Predicted improvement:        0.000237304
lambda =          1; f =          969.9612716
lambda =     1.9332; f =          969.9609552
lambda =     3.7372; f =          969.9605701
Norm of dx  0.0007179
----
Improvement on iteration 11 =        0.001130265
-----------------
-----------------
f at the beginning of new iteration,       969.9605700983
Predicted improvement:        0.000966336
lambda =          1; f =          969.9588295
lambda =     1.9332; f =          969.9575518
lambda =     3.7372; f =          969.9560257
```

```
Norm of dx   0.002429
----
Improvement on iteration 12 =        0.004544352
-----------------
-----------------
f at the beginning of new iteration,       969.9560257460
Predicted improvement:        0.002077709
lambda =          1; f =          969.9530772
lambda =     1.9332; f =          969.9525046
Norm of dx   0.004145
----
Improvement on iteration 13 =        0.003521155
-----------------
-----------------
f at the beginning of new iteration,       969.9525045906
Predicted improvement:        0.000332275
lambda =          1; f =          969.9520485
Norm of dx   0.002248
----
Improvement on iteration 14 =        0.000456067
-----------------
-----------------
f at the beginning of new iteration,       969.9520485235
Predicted improvement:        0.000216287
lambda =          1; f =          969.9516947
lambda =     1.9332; f =          969.9515072
Norm of dx  0.0011101
----
Improvement on iteration 15 =        0.000541323
-----------------
-----------------
f at the beginning of new iteration,       969.9515072003
Predicted improvement:        0.000406366
lambda =          1; f =          969.9507649
lambda =     1.9332; f =          969.9501983
lambda =     3.7372; f =          969.9494479
Norm of dx 0.00080471
----
Improvement on iteration 16 =        0.002059293
-----------------
-----------------
f at the beginning of new iteration,       969.9494479077
Predicted improvement:        0.001789403
lambda =          1; f =          969.9464718
lambda =     1.9332; f =          969.9447774
Norm of dx  0.0055948
----
Improvement on iteration 17 =        0.004670499
-----------------
-----------------
f at the beginning of new iteration,       969.9447774088
Predicted improvement:        0.002445459
lambda =          1; f =          969.9411736
lambda =     1.9332; f =          969.9401170
Norm of dx   0.010848
----
Improvement on iteration 18 =        0.004660430
-----------------
-----------------
f at the beginning of new iteration,       969.9401169784
Predicted improvement:        0.001147262
lambda =          1; f =          969.9381898
lambda =     1.9332; f =          969.9370572
```

```
Norm of dx 0.00061696
----
Improvement on iteration 19 =        0.003059755
-----------------
-----------------
f at the beginning of new iteration,       969.9370572238
Predicted improvement:        0.000982498
lambda =          1; f =          969.9358469
Norm of dx  0.0027315
----
Improvement on iteration 20 =        0.001210278
-----------------
-----------------
f at the beginning of new iteration,       969.9358469453
Predicted improvement:        0.000236596
lambda =          1; f =          969.9354802
lambda =     1.9332; f =          969.9353304
Norm of dx  0.0016176
----
Improvement on iteration 21 =        0.000516497
-----------------
-----------------
f at the beginning of new iteration,       969.9353304481
Predicted improvement:        0.000247369
lambda =          1; f =          969.9348578
lambda =     1.9332; f =          969.9344565
lambda =     3.7372; f =          969.9337891
lambda =     7.2247; f =          969.9329044
Norm of dx  0.0010866
----
Improvement on iteration 22 =        0.002426087
-----------------
-----------------
f at the beginning of new iteration,       969.9329043609
Predicted improvement:        0.002033917
lambda =          1; f =          969.9296479
lambda =     1.9332; f =          969.9280724
Norm of dx  0.0070501
----
Improvement on iteration 23 =        0.004831960
-----------------
-----------------
f at the beginning of new iteration,       969.9280724013
Predicted improvement:        0.001337293
lambda =          1; f =          969.9263103
Norm of dx  0.0041812
----
Improvement on iteration 24 =        0.001762058
-----------------
-----------------
f at the beginning of new iteration,       969.9263103436
Predicted improvement:        0.000333151
lambda =          1; f =          969.9258897
Norm of dx   0.001377
----
Improvement on iteration 25 =        0.000420633
-----------------
-----------------
f at the beginning of new iteration,       969.9258897109
Predicted improvement:        0.000132091
lambda =          1; f =          969.9256613
lambda =     1.9332; f =          969.9255127
lambda =     3.7372; f =          969.9254024
```

```
Norm of dx 0.00054869
----
Improvement on iteration 26 =        0.000487358
-----------------
-----------------
f at the beginning of new iteration,       969.9254023533
Predicted improvement:        0.000308802
lambda =          1; f =          969.9248165
lambda =     1.9332; f =          969.9243268
lambda =     3.7372; f =          969.9235351
lambda =     7.2247; f =          969.9225798
Norm of dx 0.00099353
----
Improvement on iteration 27 =        0.002822560
-----------------
-----------------
f at the beginning of new iteration,       969.9225797933
Predicted improvement:        0.000744314
lambda =          1; f =          969.9213865
lambda =     1.9332; f =          969.9208052
Norm of dx  0.0048291
----
Improvement on iteration 28 =        0.001774635
-----------------
-----------------
f at the beginning of new iteration,       969.9208051583
Predicted improvement:        0.000847997
lambda =          1; f =          969.9194345
lambda =     1.9332; f =          969.9187430
Norm of dx  0.0041448
----
Improvement on iteration 29 =        0.002062194
-----------------
-----------------
f at the beginning of new iteration,       969.9187429644
Predicted improvement:        0.000478243
lambda =          1; f =          969.9181684
Norm of dx 0.00085501
----
Improvement on iteration 30 =        0.000574597
-----------------
-----------------
f at the beginning of new iteration,       969.9181683672
Predicted improvement:        0.000083832
lambda =          1; f =          969.9180317
lambda =     1.9332; f =          969.9179599
Norm of dx 0.00062593
----
Improvement on iteration 31 =        0.000208467
-----------------
-----------------
f at the beginning of new iteration,       969.9179599005
Predicted improvement:        0.000162362
lambda =          1; f =          969.9176563
lambda =     1.9332; f =          969.9174110
lambda =     3.7372; f =          969.9170418
lambda =     7.2247; f =          969.9167239
Norm of dx 0.00050032
----
Improvement on iteration 32 =        0.001236024
-----------------
-----------------
f at the beginning of new iteration,       969.9167238769
```

```
Predicted improvement:        0.000994772
lambda =          1; f =          969.9148392
lambda =     1.9332; f =          969.9132708
lambda =     3.7372; f =          969.9107594
lambda =     7.2247; f =          969.9078491
Norm of dx  0.0041377
----
Improvement on iteration 33 =        0.008874737
-----------------
-----------------
f at the beginning of new iteration,       969.9078491398
Predicted improvement:        0.000858757
lambda =          1; f =          969.9069363
Norm of dx   0.013164
----
Improvement on iteration 34 =        0.000912871
-----------------
-----------------
f at the beginning of new iteration,       969.9069362685
Predicted improvement:        0.000034052
lambda =          1; f =          969.9068739
lambda =     1.9332; f =          969.9068260
lambda =     3.7372; f =          969.9067612
Norm of dx   0.001096
----
Improvement on iteration 35 =        0.000175071
-----------------
-----------------
f at the beginning of new iteration,       969.9067611974
Predicted improvement:        0.000169012
lambda =          1; f =          969.9064752
lambda =     1.9332; f =          969.9063014
lambda =     3.7372; f =          969.9062200
Norm of dx  0.0022091
----
Improvement on iteration 36 =        0.000541189
-----------------
-----------------
f at the beginning of new iteration,       969.9062200082
Predicted improvement:        0.000221401
lambda =          1; f =          969.9058695
lambda =     1.9332; f =          969.9057099
Norm of dx  0.0039952
----
Improvement on iteration 37 =        0.000510089
-----------------
-----------------
f at the beginning of new iteration,       969.9057099193
Predicted improvement:        0.000091261
lambda =          1; f =          969.9055720
lambda =     1.9332; f =          969.9055251
Norm of dx 0.00092789
----
Improvement on iteration 38 =        0.000184851
-----------------
-----------------
f at the beginning of new iteration,       969.9055250682
Predicted improvement:        0.000045356
lambda =          1; f =          969.9054553
lambda =     1.9332; f =          969.9054286
Norm of dx  0.0014981
----
Improvement on iteration 39 =        0.000096489
```

```
-----------------
-----------------
f at the beginning of new iteration,       969.9054285792
Predicted improvement:        0.000005022
lambda =          1; f =          969.9054201
lambda =     1.9332; f =          969.9054148
lambda =     3.7372; f =          969.9054119
Norm of dx   0.000259
----
Improvement on iteration 40 =        0.000016654
-----------------
-----------------
f at the beginning of new iteration,       969.9054119250
Predicted improvement:        0.000011675
lambda =          1; f =          969.9053891
lambda =     1.9332; f =          969.9053687
lambda =     3.7372; f =          969.9053318
lambda =     7.2247; f =          969.9052699
lambda =     13.967; f =          969.9051850
Norm of dx 0.00022182
----
Improvement on iteration 41 =        0.000226878
-----------------
-----------------
f at the beginning of new iteration,       969.9051850472
Predicted improvement:        0.000188409
lambda =          1; f =          969.9049076
lambda =     1.9332; f =          969.9048293
Norm of dx  0.0022376
----
Improvement on iteration 42 =        0.000355749
-----------------
-----------------
f at the beginning of new iteration,       969.9048292979
Predicted improvement:        0.000049212
lambda =          1; f =          969.9047632
Norm of dx  0.0026006
----
Improvement on iteration 43 =        0.000066078
-----------------
-----------------
f at the beginning of new iteration,       969.9047632204
Predicted improvement:        0.000014917
lambda =          1; f =          969.9047434
Norm of dx  0.0014613
----
Improvement on iteration 44 =        0.000019788
-----------------
-----------------
f at the beginning of new iteration,       969.9047434326
Predicted improvement:        0.000010159
lambda =          1; f =          969.9047252
lambda =     1.9332; f =          969.9047127
lambda =     3.7372; f =          969.9047009
Norm of dx 0.00055505
----
Improvement on iteration 45 =        0.000042547
-----------------
-----------------
f at the beginning of new iteration,       969.9047008852
Predicted improvement:        0.000026961
lambda =          1; f =          969.9046511
lambda =     1.9332; f =          969.9046116
```

```
lambda =     3.7372; f =          969.9045541
lambda =     7.2247; f =          969.9045132
Norm of dx 0.00048233
----
Improvement on iteration 46 =        0.000187639
-----------------
-----------------
f at the beginning of new iteration,       969.9045132459
Predicted improvement:        0.000065883
lambda =          1; f =          969.9044083
lambda =     1.9332; f =          969.9043588
Norm of dx  0.0023283
----
Improvement on iteration 47 =        0.000154472
-----------------
-----------------
f at the beginning of new iteration,       969.9043587737
Predicted improvement:        0.000055581
lambda =          1; f =          969.9042665
lambda =     1.9332; f =          969.9042152
Norm of dx 0.00074943
----
Improvement on iteration 48 =        0.000143562
-----------------
-----------------
f at the beginning of new iteration,       969.9042152117
Predicted improvement:        0.000049469
lambda =          1; f =          969.9041510
Norm of dx  0.0025775
----
Improvement on iteration 49 =        0.000064236
-----------------
-----------------
f at the beginning of new iteration,       969.9041509758
Predicted improvement:        0.000013383
lambda =          1; f =          969.9041326
Norm of dx  0.0015809
----
Improvement on iteration 50 =        0.000018414
-----------------
-----------------
f at the beginning of new iteration,       969.9041325614
Predicted improvement:        0.000014292
lambda =          1; f =          969.9041087
lambda =     1.9332; f =          969.9040943
Norm of dx  0.0012349
----
Improvement on iteration 51 =        0.000038308
-----------------
-----------------
f at the beginning of new iteration,       969.9040942536
Predicted improvement:        0.000039494
lambda =          1; f =          969.9040240
lambda =     1.9332; f =          969.9039740
lambda =     3.7372; f =          969.9039201
Norm of dx  0.0017533
----
Improvement on iteration 52 =        0.000174172
-----------------
-----------------
f at the beginning of new iteration,       969.9039200815
Predicted improvement:        0.000117435
lambda =          1; f =          969.9037088
```

```
lambda =     1.9332; f =          969.9035557
lambda =     3.7372; f =          969.9033805
Norm of dx  0.0017258
----
Improvement on iteration 53 =        0.000539567
-----------------
-----------------
f at the beginning of new iteration,       969.9033805147
Predicted improvement:        0.000109106
lambda =          1; f =          969.9032550
Norm of dx  0.0044633
----
Improvement on iteration 54 =        0.000125536
-----------------
-----------------
f at the beginning of new iteration,       969.9032549785
Predicted improvement:        0.000005924
lambda =          1; f =          969.9032463
lambda =     1.9332; f =          969.9032442
Norm of dx  0.0010113
----
Improvement on iteration 55 =        0.000010799
-----------------
-----------------
f at the beginning of new iteration,       969.9032441792
Predicted improvement:        0.000004394
lambda =          1; f =          969.9032357
lambda =     1.9332; f =          969.9032282
lambda =     3.7372; f =          969.9032146
lambda =     7.2247; f =          969.9031923
lambda =     13.967; f =          969.9031635
Norm of dx  0.0001356
----
Improvement on iteration 56 =        0.000080660
-----------------
-----------------
f at the beginning of new iteration,       969.9031635196
Predicted improvement:        0.000088116
lambda =          1; f =          969.9030070
lambda =     1.9332; f =          969.9028948
lambda =     3.7372; f =          969.9027703
Norm of dx   0.001587
----
Improvement on iteration 57 =        0.000393175
-----------------
-----------------
f at the beginning of new iteration,       969.9027703448
Predicted improvement:        0.000216422
lambda =          1; f =          969.9024344
lambda =     1.9332; f =          969.9022954
Norm of dx  0.0055964
----
Improvement on iteration 58 =        0.000474933
-----------------
-----------------
f at the beginning of new iteration,       969.9022954115
Predicted improvement:        0.000057447
lambda =          1; f =          969.9022241
Norm of dx  0.0032613
----
Improvement on iteration 59 =        0.000071326
-----------------
-----------------
```

```
f at the beginning of new iteration,       969.9022240856
Predicted improvement:        0.000015982
lambda =          1; f =          969.9021986
lambda =     1.9332; f =          969.9021872
Norm of dx 0.00054316
----
Improvement on iteration 60 =        0.000036863
-----------------
-----------------
f at the beginning of new iteration,       969.9021872227
Predicted improvement:        0.000016023
lambda =          1; f =          969.9021611
lambda =     1.9332; f =          969.9021473
Norm of dx  0.0006933
----
Improvement on iteration 61 =        0.000039929
-----------------
-----------------
f at the beginning of new iteration,       969.9021472937
Predicted improvement:        0.000019965
lambda =          1; f =          969.9021149
lambda =     1.9332; f =          969.9020978
Norm of dx 0.00057087
----
Improvement on iteration 62 =        0.000049526
-----------------
-----------------
f at the beginning of new iteration,       969.9020977672
Predicted improvement:        0.000036188
lambda =          1; f =          969.9020312
lambda =     1.9332; f =          969.9019792
lambda =     3.7372; f =          969.9019068
lambda =     7.2247; f =          969.9018712
Norm of dx 0.00062584
----
Improvement on iteration 63 =        0.000226610
-----------------
-----------------
f at the beginning of new iteration,       969.9018711571
Predicted improvement:        0.000181539
lambda =          1; f =          969.9015306
lambda =     1.9332; f =          969.9012510
lambda =     3.7372; f =          969.9008151
lambda =     7.2247; f =          969.9003618
Norm of dx  0.0033961
----
Improvement on iteration 64 =        0.001509355
-----------------
-----------------
f at the beginning of new iteration,       969.9003618025
Predicted improvement:        0.000233471
lambda =          1; f =          969.9000974
Norm of dx   0.009511
----
Improvement on iteration 65 =        0.000264363
-----------------
-----------------
f at the beginning of new iteration,       969.9000974393
Predicted improvement:        0.000005561
lambda =          1; f =          969.9000913
Norm of dx  0.0007771
----
Improvement on iteration 66 =        0.000006157
```

```
-----------------
-----------------
f at the beginning of new iteration,       969.9000912819
Predicted improvement:        0.000001213
lambda =          1; f =          969.9000897
Norm of dx 0.00072922
----
Improvement on iteration 67 =        0.000001569
-----------------
-----------------
f at the beginning of new iteration,       969.9000897125
Predicted improvement:        0.000002210
lambda =          1; f =          969.9000863
lambda =     1.9332; f =          969.9000845
Norm of dx 0.00084891
----
Improvement on iteration 68 =        0.000005261
-----------------
-----------------
f at the beginning of new iteration,       969.9000844513
Predicted improvement:        0.000005248
lambda =          1; f =          969.9000739
lambda =     1.9332; f =          969.9000645
lambda =     3.7372; f =          969.9000475
lambda =     7.2247; f =          969.9000190
lambda =     13.967; f =          969.8999804
lambda =         27; f =          969.8999668
Norm of dx 0.00045452
----
Improvement on iteration 69 =        0.000117630
-----------------
-----------------
f at the beginning of new iteration,       969.8999668214
Predicted improvement:        0.000067493
lambda =          1; f =          969.8998494
lambda =     1.9332; f =          969.8997740
lambda =     3.7372; f =          969.8997216
Norm of dx  0.0025222
----
Improvement on iteration 70 =        0.000245270
-----------------
-----------------
f at the beginning of new iteration,       969.8997215515
Predicted improvement:        0.000039451
lambda =          1; f =          969.8996715
Norm of dx   0.003016
----
Improvement on iteration 71 =        0.000050006
-----------------
-----------------
f at the beginning of new iteration,       969.8996715452
Predicted improvement:        0.000009584
lambda =          1; f =          969.8996602
Norm of dx 0.00079665
----
Improvement on iteration 72 =        0.000011355
-----------------
-----------------
f at the beginning of new iteration,       969.8996601906
Predicted improvement:        0.000002104
lambda =          1; f =          969.8996574
Norm of dx 0.00023145
----
```

```
Improvement on iteration 73 =        0.000002837
-----------------
-----------------
f at the beginning of new iteration,       969.8996573532
Predicted improvement:        0.000001628
lambda =          1; f =          969.8996559
Norm of dx 0.00065466
----
Improvement on iteration 74 =        0.000001468
-----------------
-----------------
f at the beginning of new iteration,       969.8996558850
Predicted improvement:        0.000000357
lambda =          1; f =          969.8996557
lambda =    0.33333; f =          969.8996558
Norm of dx 0.00040266
----
Improvement on iteration 75 =        0.000000152
-----------------
-----------------
f at the beginning of new iteration,       969.8996557334
Predicted improvement:        0.000000015
lambda =          1; f =          969.8996557
lambda =     1.9332; f =          969.8996557
lambda =     3.7372; f =          969.8996557
lambda =     2.5164; f =          969.8996557
Norm of dx 4.3572e-05
----
Improvement on iteration 76 =        0.000000051
improvement < crit termination
Objective function at mode: 969.899656

RESULTS FROM POSTERIOR ESTIMATION
parameters
         prior mean     mode    s.d. prior pstdev

rho_a_c      0.500   0.2405  0.0832 beta  0.2000
rho_a_d      0.500   0.5000  0.2774 beta  0.2000
rho_mu_c     0.500   0.5001  0.2774 beta  0.2000
rho_mu_d     0.500   0.5000  0.2773 beta  0.2000
rho_LTV      0.500   0.4958  0.2753 beta  0.2000
rho_d        0.500   0.5101  0.2767 beta  0.2000
rho_d_stern   0.500   0.8930  0.0187 beta  0.2000
rho_c_ast    0.500   0.6314  0.2511 beta  0.2000
rho_d_ast    0.500   0.5000  0.2773 beta  0.2000
rho_s_c      0.500   0.4533  0.1015 beta  0.2000
rho_r        0.500   0.6783  0.0926 beta  0.2000
rho_p       -0.500  -0.4980  0.2000 norm  0.2000
theta_c      0.750   0.3018  0.0701 beta  0.1500
sigma        1.000   1.9151  0.1093 norm  0.3700
phi          2.000   5.2101  0.7972 gamm  0.7000
omega        0.200   0.0996  0.0635 beta  0.1000
h_c          0.500   0.2934  0.0528 beta  0.1000
alpha_c      0.500   0.3938  0.0304 beta  0.1000

standard deviation of shocks
         prior mean     mode    s.d. prior pstdev

epsa_c       0.100   2.2915  0.1732 invg  2.0000
epsa_d       0.100   0.0462  0.0189 invg  2.0000
epsmu_c      0.100   0.0461  0.0188 invg  2.0000
epsmu_d      0.100   0.0461  0.0188 invg  2.0000
epsLTV       0.100   0.0461  0.0188 invg  2.0000
```

```
epsd          0.100   0.0458  0.0184 invg  2.0000
epsc_ast      0.100   0.0382  0.0119 invg  2.0000
epsd_ast      0.100   0.0461  0.0188 invg  2.0000
epsd_stern    0.100   0.5995  0.1049 invg  2.0000
epss_c        0.100   1.1150  0.0960 invg  2.0000
epsr          0.100   0.6201  0.1838 invg  2.0000
epsyf         0.100   0.0461  0.0188 invg  2.0000
epsn          0.010   0.8371  0.0640 invg  0.1000
epspi_d       0.010   5.7214  0.4199 invg  0.1000


Log data density [Laplace approximation] is -1023.559393.

Estimation::mcmc: Multiple chains mode.
Estimation::mcmc: Searching for initial values...
Estimation::mcmc: Initial values found!

Estimation::mcmc: Write details about the MCMC... Ok!
Estimation::mcmc: Details about the MCMC are available in
code_95/metropolis\code_mh_history_0.mat


Estimation::mcmc: Number of mh files: 55 per block.
Estimation::mcmc: Total number of generated files: 110.
Estimation::mcmc: Total number of iterations: 200000.
Estimation::mcmc: Current acceptance ratio per chain:
                                                    Chain  1: 33.4073%
                                                    Chain  2: 33.3248%
Estimation::mcmc::diagnostics: Univariate convergence diagnostic, Brooks and Gelman
(1998):
    Parameter 1...  Done!
    Parameter 2...  Done!
    Parameter 3...  Done!
    Parameter 4...  Done!
    Parameter 5...  Done!
    Parameter 6...  Done!
    Parameter 7...  Done!
    Parameter 8...  Done!
    Parameter 9...  Done!
    Parameter 10...  Done!
    Parameter 11...  Done!
    Parameter 12...  Done!
    Parameter 13...  Done!
    Parameter 14...  Done!
    Parameter 15...  Done!
    Parameter 16...  Done!
    Parameter 17...  Done!
    Parameter 18...  Done!
    Parameter 19...  Done!
    Parameter 20...  Done!
    Parameter 21...  Done!
    Parameter 22...  Done!
    Parameter 23...  Done!
    Parameter 24...  Done!
    Parameter 25...  Done!
    Parameter 26...  Done!
    Parameter 27...  Done!
    Parameter 28...  Done!
    Parameter 29...  Done!
    Parameter 30...  Done!
    Parameter 31...  Done!
    Parameter 32...  Done!
```

```
Estimation::mcmc: Total number of MH draws: 200000.
Estimation::mcmc: Total number of generated MH files: 55.
Estimation::mcmc: I'll use mh-files 28 to 55.
Estimation::mcmc: In MH-file number 28 I'll start at line 721.
Estimation::mcmc: Finally I keep 100000 draws.

Estimation::marginal density: I'm computing the posterior mean and covariance...
Done!
Estimation::marginal density: I'm computing the posterior log marginal density
(modified harmonic mean)... Done!


ESTIMATION RESULTS

Log data density is -1022.302415.
posterior_moments: There are not enough draws computes to compute HPD Intervals.
Skipping their computation.
posterior_moments: There are not enough draws computes to compute deciles. Skipping
their computation.

parameters
             prior mean   post. mean        90% HPD interval    prior       pstdev

rho_a_c           0.500       0.2498      0.1171      0.3765   beta        0.2000
rho_a_d           0.500       0.5053      0.1744      0.8287   beta        0.2000
rho_mu_c          0.500       0.4961      0.1615      0.8178   beta        0.2000
rho_mu_d          0.500       0.5040      0.1752      0.8323   beta        0.2000
rho_LTV           0.500       0.4981      0.1784      0.8329   beta        0.2000
rho_d             0.500       0.5208      0.1978      0.8486   beta        0.2000
rho_d_stern        0.500       0.8912      0.8608      0.9223   beta        0.2000
rho_c_ast         0.500       0.6229      0.3235      0.9242   beta        0.2000
rho_d_ast         0.500       0.4983      0.1662      0.8247   beta        0.2000
rho_s_c           0.500       0.4532      0.2886      0.6106   beta        0.2000
rho_r             0.500       0.6132      0.4255      0.7966   beta        0.2000
rho_p            -0.500      -0.5010     -0.8289     -0.1707   norm        0.2000
theta_c           0.750       0.2925      0.1819      0.4002   beta        0.1500
sigma             1.000       1.9576      1.7767      2.1415   norm        0.3700
phi               2.000       5.3375      3.9853      6.5819   gamma       0.7000
omega             0.200       0.1266      0.0245      0.2200   beta        0.1000
h_c               0.500       0.2858      0.2004      0.3690   beta        0.1000
alpha_c           0.500       0.3942      0.3424      0.4443   beta        0.1000

standard deviation of shocks
             prior mean   post. mean        90% HPD interval    prior       pstdev

epsa_c            0.100       2.3233      2.0330      2.6052   invg        2.0000
epsa_d            0.100       0.0823      0.0230      0.1583   invg        2.0000
epsmu_c           0.100       0.0848      0.0231      0.1461   invg        2.0000
epsmu_d           0.100       0.0841      0.0227      0.1665   invg        2.0000
epsLTV            0.100       0.1558      0.0205      0.4748   invg        2.0000
epsd              0.100       0.0800      0.0234      0.1447   invg        2.0000
epsc_ast          0.100       0.0438      0.0226      0.0640   invg        2.0000
epsd_ast          0.100       0.1029      0.0244      0.2122   invg        2.0000
epsd_stern        0.100       0.5719      0.3999      0.7290   invg        2.0000
epss_c            0.100       1.1400      0.9753      1.2949   invg        2.0000
epsr              0.100       0.7629      0.3979      1.1537   invg        2.0000
epsyf             0.100       0.0826      0.0231      0.1601   invg        2.0000
epsn              0.010       0.8520      0.7435      0.9587   invg        0.1000
epspi_d           0.010       5.8176      5.1135      6.5094   invg        0.1000
Estimation::mcmc: Posterior (dsge) IRFs...
Estimation::mcmc: Posterior IRFs, done!
Estimation::mcmc: Forecasted variables (mean)
Estimation::mcmc: Forecasted variables (mean), done!
```

```
Estimation::mcmc: Forecasted variables (point)
Estimation::mcmc: Forecasted variables (point), done!

Loading 116 observations from data100.xlsx

Restricting the sample to observations 1 to 96. Using in total 96 observations.
Initial value of the log posterior (or likelihood): -983.9996
-----------------
-----------------
f at the beginning of new iteration,       983.9996347146
Predicted improvement:        0.008801938
lambda =          1; f =          983.9832161
lambda =     1.9332; f =          983.9700293
lambda =     3.7372; f =          983.9503472
lambda =     7.2247; f =          983.9338160
Norm of dx  0.0013268
----
Improvement on iteration 1 =        0.065818716
-----------------
-----------------
f at the beginning of new iteration,       983.9338159984
Predicted improvement:        0.014591189
lambda =          1; f =          983.9105564
lambda =     1.9332; f =          983.8993676
Norm of dx   0.003093
----
Improvement on iteration 2 =        0.034448432
-----------------
-----------------
f at the beginning of new iteration,       983.8993675662
Predicted improvement:        0.010740053
lambda =          1; f =          983.8810490
lambda =     1.9332; f =          983.8696405
lambda =     3.7372; f =          983.8630692
Norm of dx  0.0035468
----
Improvement on iteration 3 =        0.036298411
-----------------
-----------------
f at the beginning of new iteration,       983.8630691553
Predicted improvement:        0.014731934
lambda =          1; f =          983.8385390
lambda =     1.9332; f =          983.8247224
Norm of dx  0.0021469
----
Improvement on iteration 4 =        0.038346764
-----------------
-----------------
f at the beginning of new iteration,       983.8247223913
Predicted improvement:        0.012354007
lambda =          1; f =          983.8067121
lambda =     1.9332; f =          983.8021027
Norm of dx  0.0055314
----
Improvement on iteration 5 =        0.022619696
-----------------
-----------------
f at the beginning of new iteration,       983.8021026953
Predicted improvement:        0.008838898
lambda =          1; f =          983.7863722
lambda =     1.9332; f =          983.7751776
lambda =     3.7372; f =          983.7629237
Norm of dx  0.0024318
```

```
----
Improvement on iteration 6 =        0.039179033
-----------------
-----------------
f at the beginning of new iteration,       983.7629236622
Predicted improvement:        0.004560901
lambda =          1; f =          983.7569742
Norm of dx  0.0043435
----
Improvement on iteration 7 =        0.005949479
-----------------
-----------------
f at the beginning of new iteration,       983.7569741828
Predicted improvement:        0.002033842
lambda =          1; f =          983.7536663
lambda =     1.9332; f =          983.7519497
Norm of dx   0.002271
----
Improvement on iteration 8 =        0.005024447
-----------------
-----------------
f at the beginning of new iteration,       983.7519497363
Predicted improvement:        0.003249014
lambda =          1; f =          983.7462688
lambda =     1.9332; f =          983.7424357
lambda =     3.7372; f =          983.7390262
Norm of dx  0.0026559
----
Improvement on iteration 9 =        0.012923567
-----------------
-----------------
f at the beginning of new iteration,       983.7390261692
Predicted improvement:        0.004756362
lambda =          1; f =          983.7319133
lambda =     1.9332; f =          983.7295790
Norm of dx   0.002189
----
Improvement on iteration 10 =        0.009447165
-----------------
-----------------
f at the beginning of new iteration,       983.7295790044
Predicted improvement:        0.000358319
lambda =          1; f =          983.7289391
lambda =     1.9332; f =          983.7284816
lambda =     3.7372; f =          983.7279779
Norm of dx  0.0003413
----
Improvement on iteration 11 =        0.001601063
-----------------
-----------------
f at the beginning of new iteration,       983.7279779415
Predicted improvement:        0.001085725
lambda =          1; f =          983.7259846
lambda =     1.9332; f =          983.7244461
lambda =     3.7372; f =          983.7223501
Norm of dx  0.0013979
----
Improvement on iteration 12 =        0.005627820
-----------------
-----------------
f at the beginning of new iteration,       983.7223501217
Predicted improvement:        0.003211091
lambda =          1; f =          983.7180312
```

```
Norm of dx  0.0053864
----
Improvement on iteration 13 =        0.004318938
-----------------
-----------------
f at the beginning of new iteration,       983.7180311835
Predicted improvement:        0.001176500
lambda =          1; f =          983.7165304
Norm of dx  0.0025716
----
Improvement on iteration 14 =        0.001500830
-----------------
-----------------
f at the beginning of new iteration,       983.7165303537
Predicted improvement:        0.000407726
lambda =          1; f =          983.7159221
lambda =     1.9332; f =          983.7157313
Norm of dx 0.00086251
----
Improvement on iteration 15 =        0.000799065
-----------------
-----------------
f at the beginning of new iteration,       983.7157312883
Predicted improvement:        0.000207936
lambda =          1; f =          983.7154020
lambda =     1.9332; f =          983.7152517
Norm of dx 0.00034317
----
Improvement on iteration 16 =        0.000479610
-----------------
-----------------
f at the beginning of new iteration,       983.7152516783
Predicted improvement:        0.000089382
lambda =          1; f =          983.7150948
lambda =     1.9332; f =          983.7149884
lambda =     3.7372; f =          983.7148916
Norm of dx  0.0002608
----
Improvement on iteration 17 =        0.000360109
-----------------
-----------------
f at the beginning of new iteration,       983.7148915694
Predicted improvement:        0.000246327
lambda =          1; f =          983.7144216
lambda =     1.9332; f =          983.7140240
lambda =     3.7372; f =          983.7133673
lambda =     7.2247; f =          983.7125161
Norm of dx 0.00069922
----
Improvement on iteration 18 =        0.002375473
-----------------
-----------------
f at the beginning of new iteration,       983.7125160962
Predicted improvement:        0.000591829
lambda =          1; f =          983.7118573
Norm of dx  0.0024567
----
Improvement on iteration 19 =        0.000658828
-----------------
-----------------
f at the beginning of new iteration,       983.7118572678
Predicted improvement:        0.000041912
lambda =          1; f =          983.7117873
```

```
lambda =     1.9332; f =          983.7117466
Norm of dx 0.00031918
----
Improvement on iteration 20 =        0.000110649
-----------------
-----------------
f at the beginning of new iteration,       983.7117466185
Predicted improvement:        0.000094881
lambda =          1; f =          983.7115797
lambda =     1.9332; f =          983.7114648
lambda =     3.7372; f =          983.7113548
Norm of dx 0.00052805
----
Improvement on iteration 21 =        0.000391837
-----------------
-----------------
f at the beginning of new iteration,       983.7113547820
Predicted improvement:        0.000240822
lambda =          1; f =          983.7109212
lambda =     1.9332; f =          983.7106044
lambda =     3.7372; f =          983.7102316
Norm of dx 0.00098357
----
Improvement on iteration 22 =        0.001123194
-----------------
-----------------
f at the beginning of new iteration,       983.7102315885
Predicted improvement:        0.000239304
lambda =          1; f =          983.7098964
lambda =     1.9332; f =          983.7098426
Norm of dx  0.0016007
----
Improvement on iteration 23 =        0.000388961
-----------------
-----------------
f at the beginning of new iteration,       983.7098426277
Predicted improvement:        0.000107845
lambda =          1; f =          983.7096701
lambda =     1.9332; f =          983.7095862
Norm of dx 0.00044127
----
Improvement on iteration 24 =        0.000256409
-----------------
-----------------
f at the beginning of new iteration,       983.7095862182
Predicted improvement:        0.000048967
lambda =          1; f =          983.7095250
Norm of dx 0.00060181
----
Improvement on iteration 25 =        0.000061188
-----------------
-----------------
f at the beginning of new iteration,       983.7095250298
Predicted improvement:        0.000015231
lambda =          1; f =          983.7094996
lambda =     1.9332; f =          983.7094847
Norm of dx 0.00032635
----
Improvement on iteration 26 =        0.000040341
-----------------
-----------------
f at the beginning of new iteration,       983.7094846888
Predicted improvement:        0.000036642
```

```
lambda =          1; f =          983.7094192
lambda =     1.9332; f =          983.7093722
lambda =     3.7372; f =          983.7093200
Norm of dx 0.00052427
----
Improvement on iteration 27 =        0.000164654
-----------------
-----------------
f at the beginning of new iteration,       983.7093200348
Predicted improvement:        0.000113512
lambda =          1; f =          983.7091222
lambda =     1.9332; f =          983.7089903
lambda =     3.7372; f =          983.7088795
Norm of dx 0.00087013
----
Improvement on iteration 28 =        0.000440500
-----------------
-----------------
f at the beginning of new iteration,       983.7088795347
Predicted improvement:        0.000063701
lambda =          1; f =          983.7088029
Norm of dx 0.00094951
----
Improvement on iteration 29 =        0.000076600
-----------------
-----------------
f at the beginning of new iteration,       983.7088029343
Predicted improvement:        0.000003856
lambda =          1; f =          983.7087984
Norm of dx  0.0002515
----
Improvement on iteration 30 =        0.000004494
-----------------
-----------------
f at the beginning of new iteration,       983.7087984407
Predicted improvement:        0.000000835
lambda =          1; f =          983.7087969
lambda =     1.9332; f =          983.7087957
lambda =     3.7372; f =          983.7087941
Norm of dx 5.3522e-05
----
Improvement on iteration 31 =        0.000004369
-----------------
-----------------
f at the beginning of new iteration,       983.7087940718
Predicted improvement:        0.000004907
lambda =          1; f =          983.7087855
lambda =     1.9332; f =          983.7087797
lambda =     3.7372; f =          983.7087745
Norm of dx 0.00013302
----
Improvement on iteration 32 =        0.000019535
-----------------
-----------------
f at the beginning of new iteration,       983.7087745369
Predicted improvement:        0.000009294
lambda =          1; f =          983.7087593
lambda =     1.9332; f =          983.7087510
Norm of dx   0.000295
----
Improvement on iteration 33 =        0.000023545
-----------------
-----------------
```

```
f at the beginning of new iteration,       983.7087509924
Predicted improvement:        0.000004153
lambda =          1; f =          983.7087460
Norm of dx 0.00030161
----
Improvement on iteration 34 =        0.000005020
-----------------
-----------------
f at the beginning of new iteration,       983.7087459728
Predicted improvement:        0.000001341
lambda =          1; f =          983.7087437
lambda =     1.9332; f =          983.7087424
Norm of dx 9.0124e-05
----
Improvement on iteration 35 =        0.000003562
-----------------
-----------------
f at the beginning of new iteration,       983.7087424112
Predicted improvement:        0.000002683
lambda =          1; f =          983.7087383
lambda =     1.9332; f =          983.7087366
Norm of dx 0.00010395
----
Improvement on iteration 36 =        0.000005860
-----------------
-----------------
f at the beginning of new iteration,       983.7087365508
Predicted improvement:        0.000002487
lambda =          1; f =          983.7087321
lambda =     1.9332; f =          983.7087288
lambda =     3.7372; f =          983.7087249
Norm of dx 9.8793e-05
----
Improvement on iteration 37 =        0.000011654
-----------------
-----------------
f at the beginning of new iteration,       983.7087248966
Predicted improvement:        0.000007943
lambda =          1; f =          983.7087105
lambda =     1.9332; f =          983.7086997
lambda =     3.7372; f =          983.7086861
Norm of dx 0.00025114
----
Improvement on iteration 38 =        0.000038760
-----------------
-----------------
f at the beginning of new iteration,       983.7086861366
Predicted improvement:        0.000027920
lambda =          1; f =          983.7086408
lambda =     1.9332; f =          983.7086180
Norm of dx   0.001023
----
Improvement on iteration 39 =        0.000068177
-----------------
-----------------
f at the beginning of new iteration,       983.7086179599
Predicted improvement:        0.000017081
lambda =          1; f =          983.7085975
Norm of dx 0.00098974
----
Improvement on iteration 40 =        0.000020504
-----------------
-----------------
```

```
f at the beginning of new iteration,       983.7085974554
Predicted improvement:        0.000002263
lambda =          1; f =          983.7085943
Norm of dx 0.00022569
----
Improvement on iteration 41 =        0.000003150
-----------------
-----------------
f at the beginning of new iteration,       983.7085943052
Predicted improvement:        0.000002239
lambda =          1; f =          983.7085907
lambda =     1.9332; f =          983.7085888
Norm of dx 0.00019434
----
Improvement on iteration 42 =        0.000005522
-----------------
-----------------
f at the beginning of new iteration,       983.7085887837
Predicted improvement:        0.000004924
lambda =          1; f =          983.7085797
lambda =     1.9332; f =          983.7085725
lambda =     3.7372; f =          983.7085620
lambda =     7.2247; f =          983.7085546
Norm of dx 0.00024328
----
Improvement on iteration 43 =        0.000034222
-----------------
-----------------
f at the beginning of new iteration,       983.7085545613
Predicted improvement:        0.000026334
lambda =          1; f =          983.7085051
lambda =     1.9332; f =          983.7084645
lambda =     3.7372; f =          983.7084010
lambda =     7.2247; f =          983.7083344
Norm of dx 0.00077612
----
Improvement on iteration 44 =        0.000220145
-----------------
-----------------
f at the beginning of new iteration,       983.7083344162
Predicted improvement:        0.000009299
lambda =          1; f =          983.7083244
Norm of dx  0.0012975
----
Improvement on iteration 45 =        0.000010015
-----------------
-----------------
f at the beginning of new iteration,       983.7083244015
Predicted improvement:        0.000000828
lambda =          1; f =          983.7083230
lambda =     1.9332; f =          983.7083221
lambda =     3.7372; f =          983.7083213
Norm of dx 0.00010853
----
Improvement on iteration 46 =        0.000003110
-----------------
-----------------
f at the beginning of new iteration,       983.7083212910
Predicted improvement:        0.000001643
lambda =          1; f =          983.7083185
lambda =     1.9332; f =          983.7083167
lambda =     3.7372; f =          983.7083156
Norm of dx 0.00011758
```

```
----
Improvement on iteration 47 =        0.000005663
-----------------
-----------------
f at the beginning of new iteration,       983.7083156281
Predicted improvement:        0.000001514
lambda =          1; f =          983.7083128
lambda =     1.9332; f =          983.7083105
lambda =     3.7372; f =          983.7083068
lambda =     7.2247; f =          983.7083028
Norm of dx 0.00016775
----
Improvement on iteration 48 =        0.000012850
-----------------
-----------------
f at the beginning of new iteration,       983.7083027782
Predicted improvement:        0.000006248
lambda =          1; f =          983.7082932
lambda =     1.9332; f =          983.7082895
Norm of dx 0.00025021
----
Improvement on iteration 49 =        0.000013243
-----------------
-----------------
f at the beginning of new iteration,       983.7082895353
Predicted improvement:        0.000000915
lambda =          1; f =          983.7082882
lambda =     1.9332; f =          983.7082880
Norm of dx 0.00023854
----
Improvement on iteration 50 =        0.000001555
-----------------
-----------------
f at the beginning of new iteration,       983.7082879804
Predicted improvement:        0.000000497
lambda =          1; f =          983.7082871
lambda =     1.9332; f =          983.7082864
lambda =     3.7372; f =          983.7082852
lambda =     7.2247; f =          983.7082840
Norm of dx 0.00010192
----
Improvement on iteration 51 =        0.000003931
-----------------
-----------------
f at the beginning of new iteration,       983.7082840493
Predicted improvement:        0.000003269
lambda =          1; f =          983.7082778
lambda =     1.9332; f =          983.7082727
lambda =     3.7372; f =          983.7082644
lambda =     7.2247; f =          983.7082547
Norm of dx 0.00022803
----
Improvement on iteration 52 =        0.000029307
-----------------
-----------------
f at the beginning of new iteration,       983.7082547419
Predicted improvement:        0.000007555
lambda =          1; f =          983.7082454
Norm of dx 0.00049802
----
Improvement on iteration 53 =        0.000009316
-----------------
-----------------
```

```
f at the beginning of new iteration,       983.7082454260
Predicted improvement:        0.000000761
lambda =          1; f =          983.7082444
Norm of dx 0.00014577
----
Improvement on iteration 54 =        0.000000992
-----------------
-----------------
f at the beginning of new iteration,       983.7082444339
Predicted improvement:        0.000000386
lambda =          1; f =          983.7082438
lambda =     1.9332; f =          983.7082434
Norm of dx 6.6351e-05
----
Improvement on iteration 55 =        0.000001040
-----------------
-----------------
f at the beginning of new iteration,       983.7082433935
Predicted improvement:        0.000001240
lambda =          1; f =          983.7082416
lambda =     1.9332; f =          983.7082411
Norm of dx 0.00032845
----
Improvement on iteration 56 =        0.000002271
-----------------
-----------------
f at the beginning of new iteration,       983.7082411228
Predicted improvement:        0.000002251
lambda =          1; f =          983.7082369
lambda =     1.9332; f =          983.7082332
lambda =     3.7372; f =          983.7082270
lambda =     7.2247; f =          983.7082183
lambda =     13.967; f =          983.7082136
Norm of dx 0.00019509
----
Improvement on iteration 57 =        0.000027548
-----------------
-----------------
f at the beginning of new iteration,       983.7082135750
Predicted improvement:        0.000007087
lambda =          1; f =          983.7082009
lambda =     1.9332; f =          983.7081918
lambda =     3.7372; f =          983.7081817
Norm of dx 0.00021727
----
Improvement on iteration 58 =        0.000031846
-----------------
-----------------
f at the beginning of new iteration,       983.7081817291
Predicted improvement:        0.000012643
lambda =          1; f =          983.7081624
lambda =     1.9332; f =          983.7081553
Norm of dx  0.0011617
----
Improvement on iteration 59 =        0.000026474
-----------------
-----------------
f at the beginning of new iteration,       983.7081552551
Predicted improvement:        0.000002477
lambda =          1; f =          983.7081528
Norm of dx 0.00051259
----
Improvement on iteration 60 =        0.000002453
```

```
-----------------
-----------------
f at the beginning of new iteration,       983.7081528022
Predicted improvement:        0.000000180
lambda =          1; f =          983.7081526
Norm of dx 6.7185e-05
----
Improvement on iteration 61 =        0.000000202
-----------------
-----------------
f at the beginning of new iteration,       983.7081525998
Predicted improvement:        0.000000214
lambda =          1; f =          983.7081526
lambda =    0.33333; f =          983.7081526
Norm of dx 0.00017187
----
Improvement on iteration 62 =        0.000000045
improvement < crit termination
Objective function at mode: 983.708153

RESULTS FROM POSTERIOR ESTIMATION
parameters
         prior mean     mode    s.d. prior pstdev

rho_a_c      0.500   0.2703  0.0842 beta  0.2000
rho_a_d      0.500   0.5000  0.2774 beta  0.2000
rho_mu_c     0.500   0.5002  0.2774 beta  0.2000
rho_mu_d     0.500   0.5000  0.2774 beta  0.2000
rho_LTV      0.500   0.4966  0.2757 beta  0.2000
rho_d        0.500   0.5104  0.2767 beta  0.2000
rho_d_stern   0.500   0.8933  0.0185 beta  0.2000
rho_c_ast    0.500   0.6346  0.2503 beta  0.2000
rho_d_ast    0.500   0.5000  0.2773 beta  0.2000
rho_s_c      0.500   0.4939  0.1025 beta  0.2000
rho_r        0.500   0.6764  0.0930 beta  0.2000
rho_p       -0.500  -0.4983  0.2000 norm  0.2000
theta_c      0.750   0.2955  0.0711 beta  0.1500
sigma        1.000   1.9110  0.1080 norm  0.3700
phi          2.000   5.1941  0.8003 gamm  0.7000
omega        0.200   0.0985  0.0628 beta  0.1000
h_c          0.500   0.2988  0.0529 beta  0.1000
alpha_c      0.500   0.3955  0.0304 beta  0.1000

standard deviation of shocks
         prior mean     mode    s.d. prior pstdev

epsa_c       0.100   2.3347  0.1754 invg  2.0000
epsa_d       0.100   0.0461  0.0189 invg  2.0000
epsmu_c      0.100   0.0461  0.0188 invg  2.0000
epsmu_d      0.100   0.0461  0.0188 invg  2.0000
epsLTV       0.100   0.0461  0.0188 invg  2.0000
epsd         0.100   0.0458  0.0184 invg  2.0000
epsc_ast     0.100   0.0379  0.0116 invg  2.0000
epsd_ast     0.100   0.0461  0.0188 invg  2.0000
epsd_stern   0.100   0.5996  0.1042 invg  2.0000
epss_c       0.100   1.1426  0.0977 invg  2.0000
epsr         0.100   0.6217  0.1841 invg  2.0000
epsyf        0.100   0.0461  0.0188 invg  2.0000
epsn         0.010   0.8406  0.0641 invg  0.1000
epspi_d      0.010   5.7047  0.4168 invg  0.1000


Log data density [Laplace approximation] is -1037.381884.
```

```
Estimation::mcmc: Multiple chains mode.
Estimation::mcmc: Searching for initial values...
Estimation::mcmc: Initial values found!

Estimation::mcmc: Write details about the MCMC... Ok!
Estimation::mcmc: Details about the MCMC are available in
code_96/metropolis\code_mh_history_0.mat


Estimation::mcmc: Number of mh files: 55 per block.
Estimation::mcmc: Total number of generated files: 110.
Estimation::mcmc: Total number of iterations: 200000.
Estimation::mcmc: Current acceptance ratio per chain:
                                                    Chain  1: 33.1378%
                                                    Chain  2: 33.5023%
Estimation::mcmc::diagnostics: Univariate convergence diagnostic, Brooks and Gelman
(1998):
    Parameter 1...  Done!
    Parameter 2...  Done!
    Parameter 3...  Done!
    Parameter 4...  Done!
    Parameter 5...  Done!
    Parameter 6...  Done!
    Parameter 7...  Done!
    Parameter 8...  Done!
    Parameter 9...  Done!
    Parameter 10...  Done!
    Parameter 11...  Done!
    Parameter 12...  Done!
    Parameter 13...  Done!
    Parameter 14...  Done!
    Parameter 15...  Done!
    Parameter 16...  Done!
    Parameter 17...  Done!
    Parameter 18...  Done!
    Parameter 19...  Done!
    Parameter 20...  Done!
    Parameter 21...  Done!
    Parameter 22...  Done!
    Parameter 23...  Done!
    Parameter 24...  Done!
    Parameter 25...  Done!
    Parameter 26...  Done!
    Parameter 27...  Done!
    Parameter 28...  Done!
    Parameter 29...  Done!
    Parameter 30...  Done!
    Parameter 31...  Done!
    Parameter 32...  Done!

Estimation::mcmc: Total number of MH draws: 200000.
Estimation::mcmc: Total number of generated MH files: 55.
Estimation::mcmc: I'll use mh-files 28 to 55.
Estimation::mcmc: In MH-file number 28 I'll start at line 721.
Estimation::mcmc: Finally I keep 100000 draws.

Estimation::marginal density: I'm computing the posterior mean and covariance...
Done!
Estimation::marginal density: I'm computing the posterior log marginal density
(modified harmonic mean)... Done!
```

ESTIMATION RESULTS

Log data density is -1035.303447.
posterior_moments: There are not enough draws computes to compute HPD Intervals. Skipping their computation.
posterior_moments: There are not enough draws computes to compute deciles. Skipping their computation.

parameters

	prior mean	post. mean	90% HPD interval		prior	pstdev
rho_a_c	0.500	0.2776	0.1415	0.4075	beta	0.2000
rho_a_d	0.500	0.5000	0.1686	0.8236	beta	0.2000
rho_mu_c	0.500	0.5083	0.1885	0.8466	beta	0.2000
rho_mu_d	0.500	0.5034	0.1703	0.8312	beta	0.2000
rho_LTV	0.500	0.4965	0.1588	0.8246	beta	0.2000
rho_d	0.500	0.5153	0.1912	0.8430	beta	0.2000
rho_d_stern	0.500	0.8930	0.8621	0.9234	beta	0.2000
rho_c_ast	0.500	0.6299	0.3449	0.9258	beta	0.2000
rho_d_ast	0.500	0.5035	0.1712	0.8278	beta	0.2000
rho_s_c	0.500	0.4944	0.3268	0.6635	beta	0.2000
rho_r	0.500	0.6146	0.4300	0.7936	beta	0.2000
rho_p	-0.500	-0.4871	-0.8066	-0.1548	norm	0.2000
theta_c	0.750	0.2904	0.1752	0.4016	beta	0.1500
sigma	1.000	1.9575	1.7617	2.1391	norm	0.3700
phi	2.000	5.3625	4.0219	6.6720	gamma	0.7000
omega	0.200	0.1239	0.0260	0.2144	beta	0.1000
h_c	0.500	0.2886	0.2012	0.3751	beta	0.1000
alpha_c	0.500	0.3961	0.3472	0.4463	beta	0.1000

standard deviation of shocks

	prior mean	post. mean	90% HPD interval		prior	pstdev
epsa_c	0.100	2.3626	2.0676	2.6381	invg	2.0000
epsa_d	0.100	0.0784	0.0237	0.1461	invg	2.0000
epsmu_c	0.100	0.1603	0.0201	0.4191	invg	2.0000
epsmu_d	0.100	0.0883	0.0228	0.1559	invg	2.0000
epsLTV	0.100	0.0963	0.0232	0.1841	invg	2.0000
epsd	0.100	0.0700	0.0254	0.1202	invg	2.0000
epsc_ast	0.100	0.0438	0.0230	0.0647	invg	2.0000
epsd_ast	0.100	0.0952	0.0222	0.1702	invg	2.0000
epsd_stern	0.100	0.5745	0.4081	0.7377	invg	2.0000
epss_c	0.100	1.1631	0.9979	1.3300	invg	2.0000
epsr	0.100	0.7513	0.3838	1.1121	invg	2.0000
epsyf	0.100	0.0972	0.0236	0.2051	invg	2.0000
epsn	0.010	0.8536	0.7448	0.9596	invg	0.1000
epspi_d	0.010	5.7939	5.0807	6.4852	invg	0.1000

Estimation::mcmc: Posterior (dsge) IRFs...
Estimation::mcmc: Posterior IRFs, done!
Estimation::mcmc: Forecasted variables (mean)
Estimation::mcmc: Forecasted variables (mean), done!
Estimation::mcmc: Forecasted variables (point)
Estimation::mcmc: Forecasted variables (point), done!

Loading 116 observations from data100.xlsx

Restricting the sample to observations 1 to 97. Using in total 97 observations.
Initial value of the log posterior (or likelihood): -1000.0051

---
f at the beginning of new iteration, 1000.0051201052
Predicted improvement: 0.019742535
lambda = 1; f = 999.9707730

```
lambda =     1.9332; f =          999.9481251
lambda =     3.7372; f =          999.9308028
Norm of dx  0.0019871
----
Improvement on iteration 1 =        0.074317323
-----------------
-----------------
f at the beginning of new iteration,       999.9308027817
Predicted improvement:        0.031256371
lambda =          1; f =          999.8739641
lambda =     1.9332; f =          999.8310290
lambda =     3.7372; f =          999.7750195
Norm of dx   0.003979
----
Improvement on iteration 2 =        0.155783309
-----------------
-----------------
f at the beginning of new iteration,       999.7750194728
Predicted improvement:        0.050036700
lambda =          1; f =          999.7011007
lambda =     1.9332; f =          999.6785562
Norm of dx    0.01203
----
Improvement on iteration 3 =        0.096463259
-----------------
-----------------
f at the beginning of new iteration,       999.6785562137
Predicted improvement:        0.029633503
lambda =          1; f =          999.6262055
lambda =     1.9332; f =          999.5899383
lambda =     3.7372; f =          999.5548877
Norm of dx  0.0039323
----
Improvement on iteration 4 =        0.123668544
-----------------
-----------------
f at the beginning of new iteration,       999.5548876693
Predicted improvement:        0.013103512
lambda =          1; f =          999.5341126
lambda =     1.9332; f =          999.5244995
Norm of dx  0.0045316
----
Improvement on iteration 5 =        0.030388177
-----------------
-----------------
f at the beginning of new iteration,       999.5244994925
Predicted improvement:        0.013438593
lambda =          1; f =          999.5007083
lambda =     1.9332; f =          999.4840073
lambda =     3.7372; f =          999.4664362
Norm of dx  0.0044017
----
Improvement on iteration 6 =        0.058063251
-----------------
-----------------
f at the beginning of new iteration,       999.4664362417
Predicted improvement:        0.023261165
lambda =          1; f =          999.4292301
lambda =     1.9332; f =          999.4113386
Norm of dx  0.0061773
----
Improvement on iteration 7 =        0.055097665
-----------------
```

```
-----------------
f at the beginning of new iteration,       999.4113385770
Predicted improvement:        0.011536531
lambda =          1; f =          999.3960631
Norm of dx  0.0035684
----
Improvement on iteration 8 =        0.015275473
-----------------
-----------------
f at the beginning of new iteration,       999.3960631038
Predicted improvement:        0.005686183
lambda =          1; f =          999.3869897
lambda =     1.9332; f =          999.3827945
Norm of dx  0.0026861
----
Improvement on iteration 9 =        0.013268628
-----------------
-----------------
f at the beginning of new iteration,       999.3827944757
Predicted improvement:        0.007756484
lambda =          1; f =          999.3699005
lambda =     1.9332; f =          999.3625879
Norm of dx  0.0037603
----
Improvement on iteration 10 =        0.020206541
-----------------
-----------------
f at the beginning of new iteration,       999.3625879350
Predicted improvement:        0.005382213
lambda =          1; f =          999.3562981
Norm of dx  0.0030095
----
Improvement on iteration 11 =        0.006289848
-----------------
-----------------
f at the beginning of new iteration,       999.3562980872
Predicted improvement:        0.000929059
lambda =          1; f =          999.3546728
lambda =     1.9332; f =          999.3535742
lambda =     3.7372; f =          999.3525765
Norm of dx 0.00076011
----
Improvement on iteration 12 =        0.003721605
-----------------
-----------------
f at the beginning of new iteration,       999.3525764820
Predicted improvement:        0.002341967
lambda =          1; f =          999.3481592
lambda =     1.9332; f =          999.3445174
lambda =     3.7372; f =          999.3387935
lambda =     7.2247; f =          999.3326603
Norm of dx  0.0016829
----
Improvement on iteration 13 =        0.019916178
-----------------
-----------------
f at the beginning of new iteration,       999.3326603035
Predicted improvement:        0.003124805
lambda =          1; f =          999.3287239
Norm of dx  0.0036919
----
Improvement on iteration 14 =        0.003936402
-----------------
```

```
-----------------
f at the beginning of new iteration,       999.3287239017
Predicted improvement:        0.000775636
lambda =          1; f =          999.3275798
lambda =     1.9332; f =          999.3272551
Norm of dx   0.001374
----
Improvement on iteration 15 =        0.001468783
-----------------
-----------------
f at the beginning of new iteration,       999.3272551183
Predicted improvement:        0.000473286
lambda =          1; f =          999.3264707
lambda =     1.9332; f =          999.3260329
Norm of dx 0.00038703
----
Improvement on iteration 16 =        0.001222210
-----------------
-----------------
f at the beginning of new iteration,       999.3260329079
Predicted improvement:        0.000343707
lambda =          1; f =          999.3255060
lambda =     1.9332; f =          999.3253059
Norm of dx 0.00060698
----
Improvement on iteration 17 =        0.000726963
-----------------
-----------------
f at the beginning of new iteration,       999.3253059453
Predicted improvement:        0.000390373
lambda =          1; f =          999.3245475
lambda =     1.9332; f =          999.3238805
lambda =     3.7372; f =          999.3227024
lambda =     7.2247; f =          999.3208400
lambda =     13.967; f =          999.3187853
Norm of dx 0.00066649
----
Improvement on iteration 18 =        0.006520674
-----------------
-----------------
f at the beginning of new iteration,       999.3187852717
Predicted improvement:        0.002186101
lambda =          1; f =          999.3159588
Norm of dx  0.0046441
----
Improvement on iteration 19 =        0.002826453
-----------------
-----------------
f at the beginning of new iteration,       999.3159588188
Predicted improvement:        0.000362556
lambda =          1; f =          999.3155456
Norm of dx  0.0013946
----
Improvement on iteration 20 =        0.000413177
-----------------
-----------------
f at the beginning of new iteration,       999.3155456420
Predicted improvement:        0.000066212
lambda =          1; f =          999.3154230
lambda =     1.9332; f =          999.3153264
lambda =     3.7372; f =          999.3151879
lambda =     7.2247; f =          999.3151012
Norm of dx  0.0003038
```

```
----
Improvement on iteration 21 =        0.000444462
-----------------
-----------------
f at the beginning of new iteration,       999.3151011802
Predicted improvement:        0.000332628
lambda =          1; f =          999.3144771
lambda =     1.9332; f =          999.3139697
lambda =     3.7372; f =          999.3131933
lambda =     7.2247; f =          999.3124528
Norm of dx 0.00065473
----
Improvement on iteration 22 =        0.002648392
-----------------
-----------------
f at the beginning of new iteration,       999.3124527880
Predicted improvement:        0.000376626
lambda =          1; f =          999.3118671
lambda =     1.9332; f =          999.3116237
Norm of dx  0.0022834
----
Improvement on iteration 23 =        0.000829053
-----------------
-----------------
f at the beginning of new iteration,       999.3116237354
Predicted improvement:        0.000268245
lambda =          1; f =          999.3111948
lambda =     1.9332; f =          999.3109914
Norm of dx 0.00088046
----
Improvement on iteration 24 =        0.000632328
-----------------
-----------------
f at the beginning of new iteration,       999.3109914071
Predicted improvement:        0.000095582
lambda =          1; f =          999.3108614
Norm of dx 0.00037826
----
Improvement on iteration 25 =        0.000130041
-----------------
-----------------
f at the beginning of new iteration,       999.3108613660
Predicted improvement:        0.000069759
lambda =          1; f =          999.3107437
lambda =     1.9332; f =          999.3106731
Norm of dx 0.00028747
----
Improvement on iteration 26 =        0.000188285
-----------------
-----------------
f at the beginning of new iteration,       999.3106730810
Predicted improvement:        0.000177455
lambda =          1; f =          999.3103676
lambda =     1.9332; f =          999.3101713
lambda =     3.7372; f =          999.3100347
Norm of dx   0.000727
----
Improvement on iteration 27 =        0.000638393
-----------------
-----------------
f at the beginning of new iteration,       999.3100346882
Predicted improvement:        0.000308878
lambda =          1; f =          999.3095259
```

```
lambda =     1.9332; f =          999.3092454
Norm of dx  0.0013661
----
Improvement on iteration 28 =        0.000789336
-----------------
-----------------
f at the beginning of new iteration,       999.3092453517
Predicted improvement:        0.000099081
lambda =          1; f =          999.3091430
Norm of dx   0.001496
----
Improvement on iteration 29 =        0.000102314
-----------------
-----------------
f at the beginning of new iteration,       999.3091430381
Predicted improvement:        0.000002429
lambda =          1; f =          999.3091383
lambda =     1.9332; f =          999.3091342
lambda =     3.7372; f =          999.3091270
lambda =     7.2247; f =          999.3091158
lambda =     13.967; f =          999.3091049
Norm of dx 5.7176e-05
----
Improvement on iteration 30 =        0.000038166
-----------------
-----------------
f at the beginning of new iteration,       999.3091048725
Predicted improvement:        0.000031597
lambda =          1; f =          999.3090458
lambda =     1.9332; f =          999.3089985
lambda =     3.7372; f =          999.3089280
lambda =     7.2247; f =          999.3088708
Norm of dx 0.00035745
----
Improvement on iteration 31 =        0.000234038
-----------------
-----------------
f at the beginning of new iteration,       999.3088708345
Predicted improvement:        0.000023774
lambda =          1; f =          999.3088429
Norm of dx  0.0004139
----
Improvement on iteration 32 =        0.000027969
-----------------
-----------------
f at the beginning of new iteration,       999.3088428653
Predicted improvement:        0.000003004
lambda =          1; f =          999.3088379
lambda =     1.9332; f =          999.3088352
Norm of dx 8.7366e-05
----
Improvement on iteration 33 =        0.000007664
-----------------
-----------------
f at the beginning of new iteration,       999.3088352009
Predicted improvement:        0.000006631
lambda =          1; f =          999.3088232
lambda =     1.9332; f =          999.3088142
lambda =     3.7372; f =          999.3088027
Norm of dx 0.00012934
----
Improvement on iteration 34 =        0.000032494
-----------------
```

```
-----------------
f at the beginning of new iteration,       999.3088027065
Predicted improvement:        0.000028183
lambda =          1; f =          999.3087534
lambda =     1.9332; f =          999.3087205
lambda =     3.7372; f =          999.3086924
Norm of dx  0.0005449
----
Improvement on iteration 35 =        0.000110339
-----------------
-----------------
f at the beginning of new iteration,       999.3086923676
Predicted improvement:        0.000040630
lambda =          1; f =          999.3086272
lambda =     1.9332; f =          999.3085957
Norm of dx 0.00060926
----
Improvement on iteration 36 =        0.000096685
-----------------
-----------------
f at the beginning of new iteration,       999.3085956826
Predicted improvement:        0.000022342
lambda =          1; f =          999.3085605
lambda =     1.9332; f =          999.3085447
Norm of dx 0.00047564
----
Improvement on iteration 37 =        0.000050958
-----------------
-----------------
f at the beginning of new iteration,       999.3085447247
Predicted improvement:        0.000016370
lambda =          1; f =          999.3085199
lambda =     1.9332; f =          999.3085110
Norm of dx  0.0003738
----
Improvement on iteration 38 =        0.000033748
-----------------
-----------------
f at the beginning of new iteration,       999.3085109764
Predicted improvement:        0.000006144
lambda =          1; f =          999.3084999
lambda =     1.9332; f =          999.3084916
lambda =     3.7372; f =          999.3084814
Norm of dx 9.9369e-05
----
Improvement on iteration 39 =        0.000029607
-----------------
-----------------
f at the beginning of new iteration,       999.3084813693
Predicted improvement:        0.000026588
lambda =          1; f =          999.3084315
lambda =     1.9332; f =          999.3083907
lambda =     3.7372; f =          999.3083279
lambda =     7.2247; f =          999.3082666
Norm of dx 0.00045708
----
Improvement on iteration 40 =        0.000214740
-----------------
-----------------
f at the beginning of new iteration,       999.3082666292
Predicted improvement:        0.000176756
lambda =          1; f =          999.3079359
lambda =     1.9332; f =          999.3076678
```

```
lambda =     3.7372; f =          999.3072604
lambda =     7.2247; f =          999.3068882
Norm of dx  0.0034136
----
Improvement on iteration 41 =        0.001378430
-----------------
-----------------
f at the beginning of new iteration,       999.3068881995
Predicted improvement:        0.000163673
lambda =          1; f =          999.3067026
Norm of dx  0.0024589
----
Improvement on iteration 42 =        0.000185608
-----------------
-----------------
f at the beginning of new iteration,       999.3067025914
Predicted improvement:        0.000005229
lambda =          1; f =          999.3066954
Norm of dx 0.00020229
----
Improvement on iteration 43 =        0.000007167
-----------------
-----------------
f at the beginning of new iteration,       999.3066954245
Predicted improvement:        0.000003801
lambda =          1; f =          999.3066889
lambda =     1.9332; f =          999.3066847
lambda =     3.7372; f =          999.3066820
Norm of dx 0.00012504
----
Improvement on iteration 44 =        0.000013425
-----------------
-----------------
f at the beginning of new iteration,       999.3066819991
Predicted improvement:        0.000009461
lambda =          1; f =          999.3066636
lambda =     1.9332; f =          999.3066472
lambda =     3.7372; f =          999.3066177
lambda =     7.2247; f =          999.3065686
lambda =     13.967; f =          999.3065036
Norm of dx  0.0002843
----
Improvement on iteration 45 =        0.000178378
-----------------
-----------------
f at the beginning of new iteration,       999.3065036216
Predicted improvement:        0.000068283
lambda =          1; f =          999.3064241
Norm of dx  0.0017415
----
Improvement on iteration 46 =        0.000079532
-----------------
-----------------
f at the beginning of new iteration,       999.3064240897
Predicted improvement:        0.000006197
lambda =          1; f =          999.3064158
Norm of dx 0.00041322
----
Improvement on iteration 47 =        0.000008304
-----------------
-----------------
f at the beginning of new iteration,       999.3064157862
Predicted improvement:        0.000003024
```

```
lambda =          1; f =          999.3064115
lambda =     1.9332; f =          999.3064105
Norm of dx 0.00034502
----
Improvement on iteration 48 =        0.000005258
-----------------
-----------------
f at the beginning of new iteration,       999.3064105287
Predicted improvement:        0.000002070
lambda =          1; f =          999.3064070
lambda =     1.9332; f =          999.3064048
lambda =     3.7372; f =          999.3064034
Norm of dx 0.00036582
----
Improvement on iteration 49 =        0.000007108
-----------------
-----------------
f at the beginning of new iteration,       999.3064034211
Predicted improvement:        0.000002020
lambda =          1; f =          999.3063998
lambda =     1.9332; f =          999.3063971
lambda =     3.7372; f =          999.3063935
Norm of dx 0.00038631
----
Improvement on iteration 50 =        0.000009891
-----------------
-----------------
f at the beginning of new iteration,       999.3063935301
Predicted improvement:        0.000008927
lambda =          1; f =          999.3063780
lambda =     1.9332; f =          999.3063677
lambda =     3.7372; f =          999.3063592
Norm of dx 0.00051487
----
Improvement on iteration 51 =        0.000034298
-----------------
-----------------
f at the beginning of new iteration,       999.3063592325
Predicted improvement:        0.000015775
lambda =          1; f =          999.3063356
lambda =     1.9332; f =          999.3063257
Norm of dx  0.0017856
----
Improvement on iteration 52 =        0.000033525
-----------------
-----------------
f at the beginning of new iteration,       999.3063257075
Predicted improvement:        0.000002052
lambda =          1; f =          999.3063224
lambda =     1.9332; f =          999.3063208
Norm of dx 0.00059972
----
Improvement on iteration 53 =        0.000004945
-----------------
-----------------
f at the beginning of new iteration,       999.3063207621
Predicted improvement:        0.000003151
lambda =          1; f =          999.3063145
lambda =     1.9332; f =          999.3063091
lambda =     3.7372; f =          999.3062995
lambda =     7.2247; f =          999.3062846
lambda =     13.967; f =          999.3062691
Norm of dx 0.00030912
```

```
----
Improvement on iteration 54 =        0.000051660
-----------------
-----------------
f at the beginning of new iteration,       999.3062691022
Predicted improvement:        0.000042466
lambda =          1; f =          999.3061890
lambda =     1.9332; f =          999.3061232
lambda =     3.7372; f =          999.3060206
lambda =     7.2247; f =          999.3059136
Norm of dx  0.0017282
----
Improvement on iteration 55 =        0.000355506
-----------------
-----------------
f at the beginning of new iteration,       999.3059135957
Predicted improvement:        0.000082157
lambda =          1; f =          999.3058145
Norm of dx  0.0037136
----
Improvement on iteration 56 =        0.000099121
-----------------
-----------------
f at the beginning of new iteration,       999.3058144743
Predicted improvement:        0.000005995
lambda =          1; f =          999.3058082
Norm of dx  0.0014591
----
Improvement on iteration 57 =        0.000006279
-----------------
-----------------
f at the beginning of new iteration,       999.3058081954
Predicted improvement:        0.000000630
lambda =          1; f =          999.3058071
lambda =     1.9332; f =          999.3058062
lambda =     3.7372; f =          999.3058049
lambda =     7.2247; f =          999.3058038
Norm of dx 0.00012562
----
Improvement on iteration 58 =        0.000004385
-----------------
-----------------
f at the beginning of new iteration,       999.3058038105
Predicted improvement:        0.000003588
lambda =          1; f =          999.3057974
lambda =     1.9332; f =          999.3057927
lambda =     3.7372; f =          999.3057868
Norm of dx 0.00026245
----
Improvement on iteration 59 =        0.000016998
-----------------
-----------------
f at the beginning of new iteration,       999.3057868123
Predicted improvement:        0.000008773
lambda =          1; f =          999.3057717
lambda =     1.9332; f =          999.3057623
lambda =     3.7372; f =          999.3057575
Norm of dx 0.00056527
----
Improvement on iteration 60 =        0.000029334
-----------------
-----------------
f at the beginning of new iteration,       999.3057574784
```

```
Predicted improvement:        0.000020197
lambda =          1; f =          999.3057193
lambda =     1.9332; f =          999.3056870
lambda =     3.7372; f =          999.3056338
lambda =     7.2247; f =          999.3055652
Norm of dx  0.0011466
----
Improvement on iteration 61 =        0.000192234
-----------------
-----------------
f at the beginning of new iteration,       999.3055652447
Predicted improvement:        0.000083593
lambda =          1; f =          999.3054547
Norm of dx  0.0052157
----
Improvement on iteration 62 =        0.000110577
-----------------
-----------------
f at the beginning of new iteration,       999.3054546674
Predicted improvement:        0.000023767
lambda =          1; f =          999.3054276
Norm of dx  0.0016201
----
Improvement on iteration 63 =        0.000027095
-----------------
-----------------
f at the beginning of new iteration,       999.3054275722
Predicted improvement:        0.000000938
lambda =          1; f =          999.3054263
Norm of dx 0.00076061
----
Improvement on iteration 64 =        0.000001275
-----------------
-----------------
f at the beginning of new iteration,       999.3054262975
Predicted improvement:        0.000000201
lambda =          1; f =          999.3054262
lambda =    0.33333; f =          999.3054262
Norm of dx 0.00055653
----
Improvement on iteration 65 =        0.000000078
improvement < crit termination
Objective function at mode: 999.305426

RESULTS FROM POSTERIOR ESTIMATION
parameters
         prior mean     mode    s.d. prior pstdev

rho_a_c      0.500   0.2180  0.0813 beta  0.2000
rho_a_d      0.500   0.5000  0.2774 beta  0.2000
rho_mu_c     0.500   0.5001  0.2774 beta  0.2000
rho_mu_d     0.500   0.5000  0.2774 beta  0.2000
rho_LTV      0.500   0.4965  0.2752 beta  0.2000
rho_d        0.500   0.5105  0.2766 beta  0.2000
rho_d_stern   0.500   0.8946  0.0181 beta  0.2000
rho_c_ast    0.500   0.6360  0.2500 beta  0.2000
rho_d_ast    0.500   0.5000  0.2773 beta  0.2000
rho_s_c      0.500   0.4286  0.1008 beta  0.2000
rho_r        0.500   0.6783  0.0927 beta  0.2000
rho_p       -0.500  -0.4979  0.2000 norm  0.2000
theta_c      0.750   0.2732  0.0705 beta  0.1500
sigma        1.000   1.8942  0.1054 norm  0.3700
phi          2.000   5.2673  0.8066 gamm  0.7000
```

omega	0.200	0.1007	0.0640	beta	0.1000
h_c	0.500	0.2967	0.0522	beta	0.1000
alpha_c	0.500	0.3937	0.0300	beta	0.1000

standard deviation of shocks

	prior mean	mode	s.d.	prior	pstdev
epsa_c	0.100	2.3982	0.1783	invg	2.0000
epsa_d	0.100	0.0461	0.0189	invg	2.0000
epsmu_c	0.100	0.0461	0.0188	invg	2.0000
epsmu_d	0.100	0.0461	0.0188	invg	2.0000
epsLTV	0.100	0.0461	0.0188	invg	2.0000
epsd	0.100	0.0458	0.0184	invg	2.0000
epsc_ast	0.100	0.0380	0.0117	invg	2.0000
epsd_ast	0.100	0.0461	0.0188	invg	2.0000
epsd_stern	0.100	0.6103	0.1052	invg	2.0000
epss_c	0.100	1.1685	0.0985	invg	2.0000
epsr	0.100	0.6255	0.1857	invg	2.0000
epsyf	0.100	0.0460	0.0187	invg	2.0000
epsn	0.010	0.8375	0.0635	invg	0.1000
epspi_d	0.010	5.6852	0.4140	invg	0.1000

Log data density [Laplace approximation] is -1053.042964.

Estimation::mcmc: Multiple chains mode.
Estimation::mcmc: Searching for initial values...
Estimation::mcmc: Initial values found!

Estimation::mcmc: Write details about the MCMC... Ok!
Estimation::mcmc: Details about the MCMC are available in
code_97/metropolis\code_mh_history_0.mat

Estimation::mcmc: Number of mh files: 55 per block.
Estimation::mcmc: Total number of generated files: 110.
Estimation::mcmc: Total number of iterations: 200000.
Estimation::mcmc: Current acceptance ratio per chain:
Chain 1: 33.1388%
Chain 2: 33.5903%
Estimation::mcmc::diagnostics: Univariate convergence diagnostic, Brooks and Gelman (1998):
Parameter 1... Done!
Parameter 2... Done!
Parameter 3... Done!
Parameter 4... Done!
Parameter 5... Done!
Parameter 6... Done!
Parameter 7... Done!
Parameter 8... Done!
Parameter 9... Done!
Parameter 10... Done!
Parameter 11... Done!
Parameter 12... Done!
Parameter 13... Done!
Parameter 14... Done!
Parameter 15... Done!
Parameter 16... Done!
Parameter 17... Done!
Parameter 18... Done!
Parameter 19... Done!
Parameter 20... Done!
Parameter 21... Done!

```
    Parameter 22...  Done!
    Parameter 23...  Done!
    Parameter 24...  Done!
    Parameter 25...  Done!
    Parameter 26...  Done!
    Parameter 27...  Done!
    Parameter 28...  Done!
    Parameter 29...  Done!
    Parameter 30...  Done!
    Parameter 31...  Done!
    Parameter 32...  Done!

Estimation::mcmc: Total number of MH draws: 200000.
Estimation::mcmc: Total number of generated MH files: 55.
Estimation::mcmc: I'll use mh-files 28 to 55.
Estimation::mcmc: In MH-file number 28 I'll start at line 721.
Estimation::mcmc: Finally I keep 100000 draws.

Estimation::marginal density: I'm computing the posterior mean and covariance...
Done!
Estimation::marginal density: I'm computing the posterior log marginal density
(modified harmonic mean)... Done!


ESTIMATION RESULTS

Log data density is -1051.159062.
posterior_moments: There are not enough draws computes to compute HPD Intervals.
Skipping their computation.
posterior_moments: There are not enough draws computes to compute deciles. Skipping
their computation.

parameters
              prior mean   post. mean        90% HPD interval    prior       pstdev

rho_a_c            0.500       0.2288      0.0992      0.3564   beta        0.2000
rho_a_d            0.500       0.5031      0.1769      0.8396   beta        0.2000
rho_mu_c           0.500       0.5026      0.1790      0.8291   beta        0.2000
rho_mu_d           0.500       0.5016      0.1735      0.8350   beta        0.2000
rho_LTV            0.500       0.4980      0.1760      0.8223   beta        0.2000
rho_d              0.500       0.5235      0.1976      0.8466   beta        0.2000
rho_d_stern        0.500       0.8922      0.8613      0.9244   beta        0.2000
rho_c_ast          0.500       0.6267      0.3327      0.9286   beta        0.2000
rho_d_ast          0.500       0.5005      0.1763      0.8298   beta        0.2000
rho_s_c            0.500       0.4339      0.2779      0.5955   beta        0.2000
rho_r              0.500       0.6118      0.4239      0.7947   beta        0.2000
rho_p             -0.500      -0.4907     -0.8106     -0.1622   norm        0.2000
theta_c            0.750       0.2687      0.1613      0.3750   beta        0.1500
sigma              1.000       1.9431      1.7582      2.1176   norm        0.3700
phi                2.000       5.4696      4.0801      6.8370   gamma       0.7000
omega              0.200       0.1282      0.0289      0.2284   beta        0.1000
h_c                0.500       0.2886      0.2005      0.3731   beta        0.1000
alpha_c            0.500       0.3946      0.3440      0.4437   beta        0.1000

standard deviation of shocks
              prior mean   post. mean        90% HPD interval    prior       pstdev

epsa_c             0.100       2.4262      2.1189      2.7139   invg        2.0000
epsa_d             0.100       0.0843      0.0229      0.1547   invg        2.0000
epsmu_c            0.100       0.1016      0.0217      0.1887   invg        2.0000
epsmu_d            0.100       0.0884      0.0236      0.1764   invg        2.0000
epsLTV             0.100       0.0779      0.0239      0.1404   invg        2.0000
epsd               0.100       0.0749      0.0241      0.1279   invg        2.0000
```

```
epsc_ast          0.100       0.0438      0.0228      0.0642   invg        2.0000
epsd_ast          0.100       0.0889      0.0232      0.1753   invg        2.0000
epsd_stern        0.100       0.5780      0.4131      0.7380   invg        2.0000
epss_c            0.100       1.1928      1.0207      1.3665   invg        2.0000
epsr              0.100       0.7648      0.3968      1.1438   invg        2.0000
epsyf             0.100       0.0743      0.0237      0.1318   invg        2.0000
epsn              0.010       0.8542      0.7413      0.9605   invg        0.1000
epspi_d           0.010       5.7748      5.0977      6.4578   invg        0.1000
Estimation::mcmc: Posterior (dsge) IRFs...
Estimation::mcmc: Posterior IRFs, done!
Estimation::mcmc: Forecasted variables (mean)
Estimation::mcmc: Forecasted variables (mean), done!
Estimation::mcmc: Forecasted variables (point)
Estimation::mcmc: Forecasted variables (point), done!

Loading 116 observations from data100.xlsx

Restricting the sample to observations 1 to 98. Using in total 98 observations.
Initial value of the log posterior (or likelihood): -1008.6886
-----------------
-----------------
f at the beginning of new iteration,      1008.6885826359
Predicted improvement:        0.002095116
lambda =          1; f =         1008.6854599
lambda =     1.9332; f =         1008.6844986
Norm of dx 0.00064732
----
Improvement on iteration 1 =        0.004084019
-----------------
-----------------
f at the beginning of new iteration,      1008.6844986171
Predicted improvement:        0.000981430
lambda =          1; f =         1008.6827372
lambda =     1.9332; f =         1008.6814554
lambda =     3.7372; f =         1008.6799673
Norm of dx 0.00053788
----
Improvement on iteration 2 =        0.004531279
-----------------
-----------------
f at the beginning of new iteration,      1008.6799673380
Predicted improvement:        0.001018341
lambda =          1; f =         1008.6783445
lambda =     1.9332; f =         1008.6775727
Norm of dx  0.0011006
----
Improvement on iteration 3 =        0.002394665
-----------------
-----------------
f at the beginning of new iteration,      1008.6775726730
Predicted improvement:        0.001114005
lambda =          1; f =         1008.6757367
lambda =     1.9332; f =         1008.6747291
Norm of dx  0.0011902
----
Improvement on iteration 4 =        0.002843526
-----------------
-----------------
f at the beginning of new iteration,      1008.6747291473
Predicted improvement:        0.000922892
lambda =          1; f =         1008.6735573
Norm of dx   0.001078
----
```

```
Improvement on iteration 5 =        0.001171848
-----------------
-----------------
f at the beginning of new iteration,      1008.6735572992
Predicted improvement:        0.000236842
lambda =          1; f =         1008.6732060
lambda =     1.9332; f =         1008.6731000
Norm of dx  0.0004038
----
Improvement on iteration 6 =        0.000457303
-----------------
-----------------
f at the beginning of new iteration,      1008.6730999959
Predicted improvement:        0.000189408
lambda =          1; f =         1008.6727311
lambda =     1.9332; f =         1008.6724048
lambda =     3.7372; f =         1008.6718230
lambda =     7.2247; f =         1008.6708817
lambda =     13.967; f =         1008.6697475
Norm of dx 0.00028165
----
Improvement on iteration 7 =        0.003352490
-----------------
-----------------
f at the beginning of new iteration,      1008.6697475057
Predicted improvement:        0.001233060
lambda =          1; f =         1008.6680423
Norm of dx    0.00348
----
Improvement on iteration 8 =        0.001705176
-----------------
-----------------
f at the beginning of new iteration,      1008.6680423293
Predicted improvement:        0.000459403
lambda =          1; f =         1008.6675251
Norm of dx   0.002035
----
Improvement on iteration 9 =        0.000517277
-----------------
-----------------
f at the beginning of new iteration,      1008.6675250520
Predicted improvement:        0.000053243
lambda =          1; f =         1008.6674346
lambda =     1.9332; f =         1008.6673790
lambda =     3.7372; f =         1008.6673507
Norm of dx 0.00023894
----
Improvement on iteration 10 =        0.000174349
-----------------
-----------------
f at the beginning of new iteration,      1008.6673507029
Predicted improvement:        0.000078724
lambda =          1; f =         1008.6672218
lambda =     1.9332; f =         1008.6671534
Norm of dx 0.00023626
----
Improvement on iteration 11 =        0.000197309
-----------------
-----------------
f at the beginning of new iteration,      1008.6671533938
Predicted improvement:        0.000038979
lambda =          1; f =         1008.6671027
Norm of dx 0.00028519
```

```
----
Improvement on iteration 12 =        0.000050705
-----------------
-----------------
f at the beginning of new iteration,      1008.6671026889
Predicted improvement:        0.000019359
lambda =          1; f =         1008.6670700
lambda =     1.9332; f =         1008.6670501
lambda =     3.7372; f =         1008.6670412
Norm of dx 0.00020292
----
Improvement on iteration 13 =        0.000061463
-----------------
-----------------
f at the beginning of new iteration,      1008.6670412261
Predicted improvement:        0.000037454
lambda =          1; f =         1008.6669731
lambda =     1.9332; f =         1008.6669216
lambda =     3.7372; f =         1008.6668552
Norm of dx 0.00012415
----
Improvement on iteration 14 =        0.000186076
-----------------
-----------------
f at the beginning of new iteration,      1008.6668551504
Predicted improvement:        0.000071922
lambda =          1; f =         1008.6667561
Norm of dx 0.00069123
----
Improvement on iteration 15 =        0.000099038
-----------------
-----------------
f at the beginning of new iteration,      1008.6667561126
Predicted improvement:        0.000043794
lambda =          1; f =         1008.6666915
lambda =     1.9332; f =         1008.6666729
Norm of dx 0.00058854
----
Improvement on iteration 16 =        0.000083199
-----------------
-----------------
f at the beginning of new iteration,      1008.6666729134
Predicted improvement:        0.000022602
lambda =          1; f =         1008.6666364
lambda =     1.9332; f =         1008.6666180
Norm of dx  8.762e-05
----
Improvement on iteration 17 =        0.000054901
-----------------
-----------------
f at the beginning of new iteration,      1008.6666180122
Predicted improvement:        0.000007630
lambda =          1; f =         1008.6666066
lambda =     1.9332; f =         1008.6666030
Norm of dx 7.9445e-05
----
Improvement on iteration 18 =        0.000014993
-----------------
-----------------
f at the beginning of new iteration,      1008.6666030194
Predicted improvement:        0.000006927
lambda =          1; f =         1008.6665894
lambda =     1.9332; f =         1008.6665770
```

lambda =   3.7372; f =   1008.6665541
lambda =   7.2247; f =   1008.6665134
lambda =   13.967; f =   1008.6664484
lambda =   27; f =   1008.6663733
Norm of dx 7.2859e-05

Improvement on iteration 19 =   0.000229719

----
f at the beginning of new iteration,   1008.6663733002
Predicted improvement: 0.000023471
lambda =   1; f =   1008.6663469
Norm of dx 0.00061841

Improvement on iteration 20 =   0.000026439

----
f at the beginning of new iteration,   1008.6663468613
Predicted improvement: 0.000003458
lambda =   1; f =   1008.6663407
lambda =   1.9332; f =   1008.6663361
lambda =   3.7372; f =   1008.6663307
Norm of dx 0.00011871

Improvement on iteration 21 =   0.000016158

----
f at the beginning of new iteration,   1008.6663307035
Predicted improvement: 0.000012968
lambda =   1; f =   1008.6663074
lambda =   1.9332; f =   1008.6662903
lambda =   3.7372; f =   1008.6662700
Norm of dx 0.00024602

Improvement on iteration 22 =   0.000060707

----
f at the beginning of new iteration,   1008.6662699965
Predicted improvement: 0.000035051
lambda =   1; f =   1008.6662118
lambda =   1.9332; f =   1008.6661786
Norm of dx 0.0005062

Improvement on iteration 23 =   0.000091347

----
f at the beginning of new iteration,   1008.6661786492
Predicted improvement: 0.000057329
lambda =   1; f =   1008.6660849
lambda =   1.9332; f =   1008.6660351
Norm of dx 0.00090228

Improvement on iteration 24 =   0.000143551

----
f at the beginning of new iteration,   1008.6660350977
Predicted improvement: 0.000075698
lambda =   1; f =   1008.6659191
lambda =   1.9332; f =   1008.6658745
Norm of dx 0.0014576

Improvement on iteration 25 =   0.000160585

```
-----------------
f at the beginning of new iteration,      1008.6658745127
Predicted improvement:        0.000025659
lambda =          1; f =         1008.6658410
Norm of dx 0.00038415
----
Improvement on iteration 26 =        0.000033504
-----------------
-----------------
f at the beginning of new iteration,      1008.6658410090
Predicted improvement:        0.000006257
lambda =          1; f =         1008.6658324
Norm of dx 0.00013616
----
Improvement on iteration 27 =        0.000008621
-----------------
-----------------
f at the beginning of new iteration,      1008.6658323877
Predicted improvement:        0.000005453
lambda =          1; f =         1008.6658233
lambda =     1.9332; f =         1008.6658178
Norm of dx 0.00016023
----
Improvement on iteration 28 =        0.000014587
-----------------
-----------------
f at the beginning of new iteration,      1008.6658178004
Predicted improvement:        0.000014473
lambda =          1; f =         1008.6657924
lambda =     1.9332; f =         1008.6657750
lambda =     3.7372; f =         1008.6657584
Norm of dx 0.00035713
----
Improvement on iteration 29 =        0.000059445
-----------------
-----------------
f at the beginning of new iteration,      1008.6657583553
Predicted improvement:        0.000034921
lambda =          1; f =         1008.6656979
lambda =     1.9332; f =         1008.6656577
lambda =     3.7372; f =         1008.6656248
Norm of dx 0.00063614
----
Improvement on iteration 30 =        0.000133546
-----------------
-----------------
f at the beginning of new iteration,      1008.6656248094
Predicted improvement:        0.000009300
lambda =          1; f =         1008.6656122
Norm of dx 0.00018635
----
Improvement on iteration 31 =        0.000012608
-----------------
-----------------
f at the beginning of new iteration,      1008.6656122012
Predicted improvement:        0.000005727
lambda =          1; f =         1008.6656028
lambda =     1.9332; f =         1008.6655978
Norm of dx 9.3395e-05
----
Improvement on iteration 32 =        0.000014360
-----------------
-----------------
```

```
f at the beginning of new iteration,      1008.6655978414
Predicted improvement:        0.000010590
lambda =          1; f =         1008.6655789
lambda =     1.9332; f =         1008.6655654
lambda =     3.7372; f =         1008.6655506
Norm of dx 0.00026764
----
Improvement on iteration 33 =        0.000047258
-----------------
-----------------
f at the beginning of new iteration,      1008.6655505837
Predicted improvement:        0.000029792
lambda =          1; f =         1008.6654982
lambda =     1.9332; f =         1008.6654617
lambda =     3.7372; f =         1008.6654252
Norm of dx 0.00082865
----
Improvement on iteration 34 =        0.000125399
-----------------
-----------------
f at the beginning of new iteration,      1008.6654251851
Predicted improvement:        0.000062515
lambda =          1; f =         1008.6653115
lambda =     1.9332; f =         1008.6652245
lambda =     3.7372; f =         1008.6651087
Norm of dx  0.0014328
----
Improvement on iteration 35 =        0.000316446
-----------------
-----------------
f at the beginning of new iteration,      1008.6651087389
Predicted improvement:        0.000245297
lambda =          1; f =         1008.6647249
lambda =     1.9332; f =         1008.6645525
Norm of dx  0.0061974
----
Improvement on iteration 36 =        0.000556245
-----------------
-----------------
f at the beginning of new iteration,      1008.6645524943
Predicted improvement:        0.000143708
lambda =          1; f =         1008.6643584
Norm of dx  0.0031351
----
Improvement on iteration 37 =        0.000194104
-----------------
-----------------
f at the beginning of new iteration,      1008.6643583898
Predicted improvement:        0.000038463
lambda =          1; f =         1008.6643113
Norm of dx 0.00071837
----
Improvement on iteration 38 =        0.000047061
-----------------
-----------------
f at the beginning of new iteration,      1008.6643113283
Predicted improvement:        0.000011984
lambda =          1; f =         1008.6642899
lambda =     1.9332; f =         1008.6642745
lambda =     3.7372; f =         1008.6642573
Norm of dx 0.00058068
----
Improvement on iteration 39 =        0.000054021
```

```
-----------------
-----------------
f at the beginning of new iteration,      1008.6642573071
Predicted improvement:        0.000046083
lambda =          1; f =         1008.6641689
lambda =     1.9332; f =         1008.6640938
lambda =     3.7372; f =         1008.6639686
lambda =     7.2247; f =         1008.6638015
Norm of dx  0.0011361
----
Improvement on iteration 40 =        0.000455839
-----------------
-----------------
f at the beginning of new iteration,      1008.6638014681
Predicted improvement:        0.000337602
lambda =          1; f =         1008.6633205
lambda =     1.9332; f =         1008.6632163
Norm of dx  0.0089702
----
Improvement on iteration 41 =        0.000585188
-----------------
-----------------
f at the beginning of new iteration,      1008.6632162802
Predicted improvement:        0.000068612
lambda =          1; f =         1008.6631309
Norm of dx  0.0031754
----
Improvement on iteration 42 =        0.000085417
-----------------
-----------------
f at the beginning of new iteration,      1008.6631308629
Predicted improvement:        0.000013137
lambda =          1; f =         1008.6631116
lambda =     1.9332; f =         1008.6631059
Norm of dx 0.00062137
----
Improvement on iteration 43 =        0.000024935
-----------------
-----------------
f at the beginning of new iteration,      1008.6631059279
Predicted improvement:        0.000012208
lambda =          1; f =         1008.6630824
lambda =     1.9332; f =         1008.6630613
lambda =     3.7372; f =         1008.6630231
lambda =     7.2247; f =         1008.6629587
lambda =     13.967; f =         1008.6628695
Norm of dx 0.00066572
----
Improvement on iteration 44 =        0.000236407
-----------------
-----------------
f at the beginning of new iteration,      1008.6628695210
Predicted improvement:        0.000120824
lambda =          1; f =         1008.6627191
Norm of dx   0.002424
----
Improvement on iteration 45 =        0.000150441
-----------------
-----------------
f at the beginning of new iteration,      1008.6627190796
Predicted improvement:        0.000016205
lambda =          1; f =         1008.6626990
Norm of dx  0.0009691
```

```
----
Improvement on iteration 46 =        0.000020072
-----------------
-----------------
f at the beginning of new iteration,      1008.6626990078
Predicted improvement:        0.000004426
lambda =          1; f =         1008.6626937
Norm of dx   0.001253
----
Improvement on iteration 47 =        0.000005337
-----------------
-----------------
f at the beginning of new iteration,      1008.6626936710
Predicted improvement:        0.000002335
lambda =          1; f =         1008.6626902
lambda =     1.9332; f =         1008.6626890
Norm of dx 0.00023196
----
Improvement on iteration 48 =        0.000004677
-----------------
-----------------
f at the beginning of new iteration,      1008.6626889937
Predicted improvement:        0.000001165
lambda =          1; f =         1008.6626868
lambda =     1.9332; f =         1008.6626854
lambda =     3.7372; f =         1008.6626845
Norm of dx 0.00050598
----
Improvement on iteration 49 =        0.000004519
-----------------
-----------------
f at the beginning of new iteration,      1008.6626844743
Predicted improvement:        0.000001603
lambda =          1; f =         1008.6626814
lambda =     1.9332; f =         1008.6626789
lambda =     3.7372; f =         1008.6626745
lambda =     7.2247; f =         1008.6626684
Norm of dx 0.00011537
----
Improvement on iteration 50 =        0.000016069
-----------------
-----------------
f at the beginning of new iteration,      1008.6626684052
Predicted improvement:        0.000016919
lambda =          1; f =         1008.6626426
lambda =     1.9332; f =         1008.6626324
Norm of dx 0.00085973
----
Improvement on iteration 51 =        0.000036006
-----------------
-----------------
f at the beginning of new iteration,      1008.6626323990
Predicted improvement:        0.000009732
lambda =          1; f =         1008.6626192
Norm of dx 0.00033708
----
Improvement on iteration 52 =        0.000013232
-----------------
-----------------
f at the beginning of new iteration,      1008.6626191674
Predicted improvement:        0.000002558
lambda =          1; f =         1008.6626163
Norm of dx  0.0001856
```

```
----
Improvement on iteration 53 =        0.000002916
-----------------
-----------------
f at the beginning of new iteration,      1008.6626162517
Predicted improvement:        0.000000518
lambda =          1; f =         1008.6626153
lambda =     1.9332; f =         1008.6626147
lambda =     3.7372; f =         1008.6626139
Norm of dx 0.00011322
----
Improvement on iteration 54 =        0.000002343
-----------------
-----------------
f at the beginning of new iteration,      1008.6626139083
Predicted improvement:        0.000002249
lambda =          1; f =         1008.6626096
lambda =     1.9332; f =         1008.6626062
lambda =     3.7372; f =         1008.6626009
lambda =     7.2247; f =         1008.6625960
Norm of dx 9.9228e-05
----
Improvement on iteration 55 =        0.000017862
-----------------
-----------------
f at the beginning of new iteration,      1008.6625960460
Predicted improvement:        0.000006389
lambda =          1; f =         1008.6625870
lambda =     1.9332; f =         1008.6625854
Norm of dx 0.00061006
----
Improvement on iteration 56 =        0.000010689
-----------------
-----------------
f at the beginning of new iteration,      1008.6625853569
Predicted improvement:        0.000000550
lambda =          1; f =         1008.6625846
lambda =     1.9332; f =         1008.6625844
Norm of dx  0.0001139
----
Improvement on iteration 57 =        0.000000949
-----------------
-----------------
f at the beginning of new iteration,      1008.6625844078
Predicted improvement:        0.000000515
lambda =          1; f =         1008.6625837
lambda =     1.9332; f =         1008.6625832
Norm of dx 0.00034675
----
Improvement on iteration 58 =        0.000001212
-----------------
-----------------
f at the beginning of new iteration,      1008.6625831955
Predicted improvement:        0.000002192
lambda =          1; f =         1008.6625792
lambda =     1.9332; f =         1008.6625764
lambda =     3.7372; f =         1008.6625735
Norm of dx 0.00036494
----
Improvement on iteration 59 =        0.000009694
-----------------
-----------------
f at the beginning of new iteration,      1008.6625735011
```

```
Predicted improvement:        0.000005045
lambda =          1; f =         1008.6625649
lambda =     1.9332; f =         1008.6625593
lambda =     3.7372; f =         1008.6625556
Norm of dx 0.00027863
----
Improvement on iteration 60 =        0.000017889
-----------------
-----------------
f at the beginning of new iteration,      1008.6625556119
Predicted improvement:        0.000005037
lambda =          1; f =         1008.6625480
lambda =     1.9332; f =         1008.6625452
Norm of dx  0.0014084
----
Improvement on iteration 61 =        0.000010450
-----------------
-----------------
f at the beginning of new iteration,      1008.6625451621
Predicted improvement:        0.000001271
lambda =          1; f =         1008.6625434
lambda =     1.9332; f =         1008.6625432
Norm of dx 0.00055696
----
Improvement on iteration 62 =        0.000001987
-----------------
-----------------
f at the beginning of new iteration,      1008.6625431747
Predicted improvement:        0.000000127
lambda =          1; f =         1008.6625430
lambda =     1.9332; f =         1008.6625429
Norm of dx 0.00017596
----
Improvement on iteration 63 =        0.000000260
-----------------
-----------------
f at the beginning of new iteration,      1008.6625429144
Predicted improvement:        0.000000273
lambda =          1; f =         1008.6625434
lambda =    0.33333; f =         1008.6625429
lambda =    0.11111; f =         1008.6625429
lambda =   0.037037; f =         1008.6625429
lambda =   0.012346; f =         1008.6625429
Norm of dx 0.00080845
----
Improvement on iteration 64 =        0.000000011
improvement < crit termination
Objective function at mode: 1008.662543

RESULTS FROM POSTERIOR ESTIMATION
parameters
         prior mean     mode    s.d. prior pstdev

rho_a_c      0.500   0.2122  0.0799 beta  0.2000
rho_a_d      0.500   0.5000  0.2774 beta  0.2000
rho_mu_c     0.500   0.5001  0.2774 beta  0.2000
rho_mu_d     0.500   0.5000  0.2774 beta  0.2000
rho_LTV      0.500   0.4955  0.2753 beta  0.2000
rho_d        0.500   0.5108  0.2766 beta  0.2000
rho_d_stern   0.500   0.8952  0.0178 beta  0.2000
rho_c_ast    0.500   0.6379  0.2495 beta  0.2000
rho_d_ast    0.500   0.5000  0.2774 beta  0.2000
rho_s_c      0.500   0.4159  0.0988 beta  0.2000
```

```
                                        code.log
rho_r          0.500   0.6776  0.0928 beta  0.2000
rho_p         -0.500  -0.4980  0.2000 norm  0.2000
theta_c        0.750   0.2702  0.0707 beta  0.1500
sigma          1.000   1.8973  0.1060 norm  0.3700
phi            2.000   5.3404  0.8164 gamm  0.7000
omega          0.200   0.1014  0.0642 beta  0.1000
h_c            0.500   0.2957  0.0523 beta  0.1000
alpha_c        0.500   0.3934  0.0299 beta  0.1000

standard deviation of shocks
         prior mean     mode    s.d. prior pstdev

epsa_c         0.100   2.3882  0.1767 invg  2.0000
epsa_d         0.100   0.0462  0.0189 invg  2.0000
epsmu_c        0.100   0.0461  0.0188 invg  2.0000
epsmu_d        0.100   0.0461  0.0188 invg  2.0000
epsLTV         0.100   0.0461  0.0188 invg  2.0000
epsd           0.100   0.0457  0.0184 invg  2.0000
epsc_ast       0.100   0.0379  0.0117 invg  2.0000
epsd_ast       0.100   0.0461  0.0188 invg  2.0000
epsd_stern     0.100   0.6083  0.1044 invg  2.0000
epss_c         0.100   1.1645  0.0977 invg  2.0000
epsr           0.100   0.6254  0.1854 invg  2.0000
epsyf          0.100   0.0460  0.0187 invg  2.0000
epsn           0.010   0.8396  0.0634 invg  0.1000
epspi_d        0.010   5.6855  0.4120 invg  0.1000


Log data density [Laplace approximation] is -1062.476974.

Estimation::mcmc: Multiple chains mode.
Estimation::mcmc: Searching for initial values...
Estimation::mcmc: Initial values found!

Estimation::mcmc: Write details about the MCMC... Ok!
Estimation::mcmc: Details about the MCMC are available in
code_98/metropolis\code_mh_history_0.mat


Estimation::mcmc: Number of mh files: 55 per block.
Estimation::mcmc: Total number of generated files: 110.
Estimation::mcmc: Total number of iterations: 200000.
Estimation::mcmc: Current acceptance ratio per chain:
                                                    Chain  1: 33.3163%
                                                    Chain  2: 33.0988%
Estimation::mcmc::diagnostics: Univariate convergence diagnostic, Brooks and Gelman
(1998):
    Parameter 1...  Done!
    Parameter 2...  Done!
    Parameter 3...  Done!
    Parameter 4...  Done!
    Parameter 5...  Done!
    Parameter 6...  Done!
    Parameter 7...  Done!
    Parameter 8...  Done!
    Parameter 9...  Done!
    Parameter 10...  Done!
    Parameter 11...  Done!
    Parameter 12...  Done!
    Parameter 13...  Done!
    Parameter 14...  Done!
    Parameter 15...  Done!
    Parameter 16...  Done!
```

```
    Parameter 17...  Done!
    Parameter 18...  Done!
    Parameter 19...  Done!
    Parameter 20...  Done!
    Parameter 21...  Done!
    Parameter 22...  Done!
    Parameter 23...  Done!
    Parameter 24...  Done!
    Parameter 25...  Done!
    Parameter 26...  Done!
    Parameter 27...  Done!
    Parameter 28...  Done!
    Parameter 29...  Done!
    Parameter 30...  Done!
    Parameter 31...  Done!
    Parameter 32...  Done!

Estimation::mcmc: Total number of MH draws: 200000.
Estimation::mcmc: Total number of generated MH files: 55.
Estimation::mcmc: I'll use mh-files 28 to 55.
Estimation::mcmc: In MH-file number 28 I'll start at line 721.
Estimation::mcmc: Finally I keep 100000 draws.

Estimation::marginal density: I'm computing the posterior mean and covariance...
Done!
Estimation::marginal density: I'm computing the posterior log marginal density
(modified harmonic mean)... Done!


ESTIMATION RESULTS

Log data density is -1061.535116.
posterior_moments: There are not enough draws computes to compute HPD Intervals.
Skipping their computation.
posterior_moments: There are not enough draws computes to compute deciles. Skipping
their computation.

parameters
              prior mean   post. mean        90% HPD interval    prior       pstdev

rho_a_c           0.500       0.2232      0.0957      0.3522   beta        0.2000
rho_a_d           0.500       0.4926      0.1606      0.8069   beta        0.2000
rho_mu_c          0.500       0.5086      0.1812      0.8347   beta        0.2000
rho_mu_d          0.500       0.5000      0.1695      0.8273   beta        0.2000
rho_LTV           0.500       0.4991      0.1700      0.8261   beta        0.2000
rho_d             0.500       0.5258      0.2068      0.8511   beta        0.2000
rho_d_stern        0.500       0.8937      0.8663      0.9247   beta        0.2000
rho_c_ast         0.500       0.6214      0.3167      0.9190   beta        0.2000
rho_d_ast         0.500       0.4998      0.1688      0.8267   beta        0.2000
rho_s_c           0.500       0.4215      0.2616      0.5831   beta        0.2000
rho_r             0.500       0.6101      0.4217      0.7985   beta        0.2000
rho_p            -0.500      -0.5006     -0.8277     -0.1662   norm        0.2000
theta_c           0.750       0.2672      0.1570      0.3756   beta        0.1500
sigma             1.000       1.9448      1.7694      2.1238   norm        0.3700
phi               2.000       5.5176      4.1736      6.8863   gamma       0.7000
omega             0.200       0.1276      0.0292      0.2249   beta        0.1000
h_c               0.500       0.2887      0.2051      0.3710   beta        0.1000
alpha_c           0.500       0.3939      0.3445      0.4434   beta        0.1000

standard deviation of shocks
              prior mean   post. mean        90% HPD interval    prior       pstdev

epsa_c            0.100       2.4252      2.1146      2.7161   invg        2.0000
```

```
epsa_d            0.100       0.0772       0.0230       0.1327   invg         2.0000
epsmu_c           0.100       0.2001       0.0218       0.6072   invg         2.0000
epsmu_d           0.100       0.0811       0.0250       0.1497   invg         2.0000
epsLTV            0.100       0.0800       0.0237       0.1524   invg         2.0000
epsd              0.100       0.0791       0.0240       0.1439   invg         2.0000
epsc_ast          0.100       0.0436       0.0230       0.0641   invg         2.0000
epsd_ast          0.100       0.0779       0.0262       0.1390   invg         2.0000
epsd_stern        0.100       0.5768       0.4163       0.7367   invg         2.0000
epss_c            0.100       1.1847       1.0196       1.3464   invg         2.0000
epsr              0.100       0.7690       0.3924       1.1602   invg         2.0000
epsyf             0.100       0.0757       0.0240       0.1332   invg         2.0000
epsn              0.010       0.8525       0.7448       0.9577   invg         0.1000
epspi_d           0.010       5.7733       5.0572       6.4907   invg         0.1000
Estimation::mcmc: Posterior (dsge) IRFs...
Estimation::mcmc: Posterior IRFs, done!
Estimation::mcmc: Forecasted variables (mean)
Estimation::mcmc: Forecasted variables (mean), done!
Estimation::mcmc: Forecasted variables (point)
Estimation::mcmc: Forecasted variables (point), done!

Loading 116 observations from data100.xlsx

Restricting the sample to observations 1 to 99. Using in total 99 observations.
Initial value of the log posterior (or likelihood): -1017.9949
-----------------
-----------------
f at the beginning of new iteration,      1017.9949070110
Predicted improvement:        0.003050144
lambda =          1; f =         1017.9909884
Norm of dx 0.00078104
----
Improvement on iteration 1 =        0.003918573
-----------------
-----------------
f at the beginning of new iteration,      1017.9909884379
Predicted improvement:        0.000834864
lambda =          1; f =         1017.9897051
lambda =     1.9332; f =         1017.9892113
Norm of dx 0.00053632
----
Improvement on iteration 2 =        0.001777167
-----------------
-----------------
f at the beginning of new iteration,      1017.9892112707
Predicted improvement:        0.000866131
lambda =          1; f =         1017.9876104
lambda =     1.9332; f =         1017.9863536
lambda =     3.7372; f =         1017.9845729
lambda =     7.2247; f =         1017.9835551
Norm of dx 0.00070173
----
Improvement on iteration 3 =        0.005656131
-----------------
-----------------
f at the beginning of new iteration,      1017.9835551397
Predicted improvement:        0.000878326
lambda =          1; f =         1017.9823465
Norm of dx 0.00047423
----
Improvement on iteration 4 =        0.001208603
-----------------
-----------------
f at the beginning of new iteration,      1017.9823465372
```

```
Predicted improvement:        0.000517061
lambda =          1; f =         1017.9815531
lambda =     1.9332; f =         1017.9812455
Norm of dx 0.00053742
----
Improvement on iteration 5 =        0.001101042
-----------------
-----------------
f at the beginning of new iteration,      1017.9812454947
Predicted improvement:        0.000489511
lambda =          1; f =         1017.9803665
lambda =     1.9332; f =         1017.9797262
lambda =     3.7372; f =         1017.9789810
Norm of dx  0.0007594
----
Improvement on iteration 6 =        0.002264539
-----------------
-----------------
f at the beginning of new iteration,      1017.9789809561
Predicted improvement:        0.000379268
lambda =          1; f =         1017.9785255
Norm of dx 0.00087959
----
Improvement on iteration 7 =        0.000455413
-----------------
-----------------
f at the beginning of new iteration,      1017.9785255432
Predicted improvement:        0.000081748
lambda =          1; f =         1017.9783848
lambda =     1.9332; f =         1017.9782951
lambda =     3.7372; f =         1017.9782358
Norm of dx 0.00026532
----
Improvement on iteration 8 =        0.000289702
-----------------
-----------------
f at the beginning of new iteration,      1017.9782358408
Predicted improvement:        0.000169062
lambda =          1; f =         1017.9779275
lambda =     1.9332; f =         1017.9776923
lambda =     3.7372; f =         1017.9773819
Norm of dx 0.00031722
----
Improvement on iteration 9 =        0.000853944
-----------------
-----------------
f at the beginning of new iteration,      1017.9773818972
Predicted improvement:        0.000201103
lambda =          1; f =         1017.9771364
Norm of dx  0.0010661
----
Improvement on iteration 10 =        0.000245463
-----------------
-----------------
f at the beginning of new iteration,      1017.9771364341
Predicted improvement:        0.000054988
lambda =          1; f =         1017.9770483
lambda =     1.9332; f =         1017.9770053
Norm of dx  0.0004082
----
Improvement on iteration 11 =        0.000131175
-----------------
-----------------
```

```
f at the beginning of new iteration,      1017.9770052595
Predicted improvement:        0.000054114
lambda =          1; f =         1017.9769207
lambda =     1.9332; f =         1017.9768846
Norm of dx 0.00022545
----
Improvement on iteration 12 =        0.000120668
-----------------
-----------------
f at the beginning of new iteration,      1017.9768845918
Predicted improvement:        0.000035304
lambda =          1; f =         1017.9768230
lambda =     1.9332; f =         1017.9767818
lambda =     3.7372; f =         1017.9767468
Norm of dx 0.00016967
----
Improvement on iteration 13 =        0.000137759
-----------------
-----------------
f at the beginning of new iteration,      1017.9767468323
Predicted improvement:        0.000073117
lambda =          1; f =         1017.9766139
lambda =     1.9332; f =         1017.9765135
lambda =     3.7372; f =         1017.9763840
Norm of dx  0.0003494
----
Improvement on iteration 14 =        0.000362788
-----------------
-----------------
f at the beginning of new iteration,      1017.9763840439
Predicted improvement:        0.000068571
lambda =          1; f =         1017.9763113
Norm of dx 0.00097114
----
Improvement on iteration 15 =        0.000072760
-----------------
-----------------
f at the beginning of new iteration,      1017.9763112843
Predicted improvement:        0.000003307
lambda =          1; f =         1017.9763055
lambda =     1.9332; f =         1017.9763016
lambda =     3.7372; f =         1017.9762979
Norm of dx 9.4593e-05
----
Improvement on iteration 16 =        0.000013422
-----------------
-----------------
f at the beginning of new iteration,      1017.9762978619
Predicted improvement:        0.000007162
lambda =          1; f =         1017.9762851
lambda =     1.9332; f =         1017.9762761
lambda =     3.7372; f =         1017.9762664
Norm of dx 7.9169e-05
----
Improvement on iteration 17 =        0.000031442
-----------------
-----------------
f at the beginning of new iteration,      1017.9762664202
Predicted improvement:        0.000009614
lambda =          1; f =         1017.9762497
lambda =     1.9332; f =         1017.9762389
lambda =     3.7372; f =         1017.9762306
Norm of dx 0.00014479
```

```
----
Improvement on iteration 18 =        0.000035827
-----------------
-----------------
f at the beginning of new iteration,      1017.9762305935
Predicted improvement:        0.000016842
lambda =          1; f =         1017.9762022
lambda =     1.9332; f =         1017.9761851
Norm of dx 0.00022898
----
Improvement on iteration 19 =        0.000045490
-----------------
-----------------
f at the beginning of new iteration,      1017.9761851034
Predicted improvement:        0.000009814
lambda =          1; f =         1017.9761746
Norm of dx 0.00029522
----
Improvement on iteration 20 =        0.000010501
-----------------
-----------------
f at the beginning of new iteration,      1017.9761746022
Predicted improvement:        0.000000428
lambda =          1; f =         1017.9761738
lambda =     1.9332; f =         1017.9761732
lambda =     3.7372; f =         1017.9761723
lambda =     7.2247; f =         1017.9761717
Norm of dx 3.1271e-05
----
Improvement on iteration 21 =        0.000002896
-----------------
-----------------
f at the beginning of new iteration,      1017.9761717062
Predicted improvement:        0.000002278
lambda =          1; f =         1017.9761675
lambda =     1.9332; f =         1017.9761640
lambda =     3.7372; f =         1017.9761587
lambda =     7.2247; f =         1017.9761536
Norm of dx 5.5718e-05
----
Improvement on iteration 22 =        0.000018132
-----------------
-----------------
f at the beginning of new iteration,      1017.9761535738
Predicted improvement:        0.000002366
lambda =          1; f =         1017.9761505
Norm of dx 0.00018943
----
Improvement on iteration 23 =        0.000003112
-----------------
-----------------
f at the beginning of new iteration,      1017.9761504618
Predicted improvement:        0.000000835
lambda =          1; f =         1017.9761492
lambda =     1.9332; f =         1017.9761490
Norm of dx 9.9609e-05
----
Improvement on iteration 24 =        0.000001492
-----------------
-----------------
f at the beginning of new iteration,      1017.9761489697
Predicted improvement:        0.000000435
lambda =          1; f =         1017.9761482
```

```
lambda =     1.9332; f =         1017.9761477
lambda =     3.7372; f =         1017.9761472
Norm of dx 3.6306e-05
----
Improvement on iteration 25 =        0.000001741
-----------------
-----------------
f at the beginning of new iteration,      1017.9761472286
Predicted improvement:        0.000000474
lambda =          1; f =         1017.9761464
lambda =     1.9332; f =         1017.9761457
lambda =     3.7372; f =         1017.9761449
Norm of dx 4.3598e-05
----
Improvement on iteration 26 =        0.000002300
-----------------
-----------------
f at the beginning of new iteration,      1017.9761449284
Predicted improvement:        0.000001754
lambda =          1; f =         1017.9761417
lambda =     1.9332; f =         1017.9761393
lambda =     3.7372; f =         1017.9761363
Norm of dx 0.00013481
----
Improvement on iteration 27 =        0.000008678
-----------------
-----------------
f at the beginning of new iteration,      1017.9761362502
Predicted improvement:        0.000006470
lambda =          1; f =         1017.9761263
lambda =     1.9332; f =         1017.9761223
Norm of dx 0.00038097
----
Improvement on iteration 28 =        0.000013981
-----------------
-----------------
f at the beginning of new iteration,      1017.9761222688
Predicted improvement:        0.000002071
lambda =          1; f =         1017.9761198
Norm of dx 0.00010208
----
Improvement on iteration 29 =        0.000002501
-----------------
-----------------
f at the beginning of new iteration,      1017.9761197682
Predicted improvement:        0.000000264
lambda =          1; f =         1017.9761194
Norm of dx 4.3007e-05
----
Improvement on iteration 30 =        0.000000345
-----------------
-----------------
f at the beginning of new iteration,      1017.9761194231
Predicted improvement:        0.000000194
lambda =          1; f =         1017.9761191
lambda =     1.9332; f =         1017.9761190
Norm of dx 3.1439e-05
----
Improvement on iteration 31 =        0.000000443
-----------------
-----------------
f at the beginning of new iteration,      1017.9761189799
Predicted improvement:        0.000000313
```

```
lambda =          1; f =         1017.9761184
lambda =     1.9332; f =         1017.9761180
lambda =     3.7372; f =         1017.9761175
Norm of dx 2.3786e-05
----
Improvement on iteration 32 =        0.000001503
-----------------
-----------------
f at the beginning of new iteration,      1017.9761174767
Predicted improvement:        0.000000812
lambda =          1; f =         1017.9761161
lambda =     1.9332; f =         1017.9761154
Norm of dx 0.00011165
----
Improvement on iteration 33 =        0.000002062
-----------------
-----------------
f at the beginning of new iteration,      1017.9761154147
Predicted improvement:        0.000001154
lambda =          1; f =         1017.9761135
lambda =     1.9332; f =         1017.9761125
Norm of dx 0.00015368
----
Improvement on iteration 34 =        0.000002915
-----------------
-----------------
f at the beginning of new iteration,      1017.9761124993
Predicted improvement:        0.000001709
lambda =          1; f =         1017.9761100
lambda =     1.9332; f =         1017.9761094
Norm of dx 0.00015332
----
Improvement on iteration 35 =        0.000003148
-----------------
-----------------
f at the beginning of new iteration,      1017.9761093515
Predicted improvement:        0.000000434
lambda =          1; f =         1017.9761088
Norm of dx 0.00010125
----
Improvement on iteration 36 =        0.000000586
-----------------
-----------------
f at the beginning of new iteration,      1017.9761087652
Predicted improvement:        0.000000199
lambda =          1; f =         1017.9761085
Norm of dx 5.1182e-05
----
Improvement on iteration 37 =        0.000000268
-----------------
-----------------
f at the beginning of new iteration,      1017.9761084968
Predicted improvement:        0.000000246
lambda =          1; f =         1017.9761081
lambda =     1.9332; f =         1017.9761079
Norm of dx 4.7486e-05
----
Improvement on iteration 38 =        0.000000580
-----------------
-----------------
f at the beginning of new iteration,      1017.9761079168
Predicted improvement:        0.000000501
lambda =          1; f =         1017.9761070
```

```
lambda =     1.9332; f =         1017.9761063
lambda =     3.7372; f =         1017.9761052
lambda =     7.2247; f =         1017.9761044
Norm of dx 4.8474e-05
----
Improvement on iteration 39 =        0.000003488
-----------------
-----------------
f at the beginning of new iteration,      1017.9761044288
Predicted improvement:        0.000001876
lambda =          1; f =         1017.9761014
lambda =     1.9332; f =         1017.9760999
Norm of dx 0.00022315
----
Improvement on iteration 40 =        0.000004512
-----------------
-----------------
f at the beginning of new iteration,      1017.9760999171
Predicted improvement:        0.000000417
lambda =          1; f =         1017.9760994
Norm of dx 0.00015338
----
Improvement on iteration 41 =        0.000000472
-----------------
-----------------
f at the beginning of new iteration,      1017.9760994455
Predicted improvement:        0.000000090
lambda =          1; f =         1017.9760993
Norm of dx 7.1633e-05
----
Improvement on iteration 42 =        0.000000103
-----------------
-----------------
f at the beginning of new iteration,      1017.9760993422
Predicted improvement:        0.000000151
lambda =          1; f =         1017.9760991
lambda =     1.9332; f =         1017.9760988
lambda =     3.7372; f =         1017.9760985
lambda =     7.2247; f =         1017.9760983
Norm of dx 4.5797e-05
----
Improvement on iteration 43 =        0.000001009
-----------------
-----------------
f at the beginning of new iteration,      1017.9760983336
Predicted improvement:        0.000000751
lambda =          1; f =         1017.9760970
lambda =     1.9332; f =         1017.9760959
lambda =     3.7372; f =         1017.9760945
Norm of dx 6.0249e-05
----
Improvement on iteration 44 =        0.000003847
-----------------
-----------------
f at the beginning of new iteration,      1017.9760944863
Predicted improvement:        0.000002206
lambda =          1; f =         1017.9760911
lambda =     1.9332; f =         1017.9760897
Norm of dx 0.00028154
----
Improvement on iteration 45 =        0.000004782
-----------------
-----------------
```

```
f at the beginning of new iteration,      1017.9760897042
Predicted improvement:        0.000001870
lambda =          1; f =         1017.9760865
lambda =     1.9332; f =         1017.9760845
lambda =     3.7372; f =         1017.9760833
Norm of dx 0.00023341
----
Improvement on iteration 46 =        0.000006398
-----------------
-----------------
f at the beginning of new iteration,      1017.9760833059
Predicted improvement:        0.000001007
lambda =          1; f =         1017.9760819
Norm of dx 0.00011492
----
Improvement on iteration 47 =        0.000001376
-----------------
-----------------
f at the beginning of new iteration,      1017.9760819303
Predicted improvement:        0.000000425
lambda =          1; f =         1017.9760815
Norm of dx 0.00013831
----
Improvement on iteration 48 =        0.000000458
-----------------
-----------------
f at the beginning of new iteration,      1017.9760814722
Predicted improvement:        0.000000063
lambda =          1; f =         1017.9760814
Norm of dx 9.5503e-05
----
Improvement on iteration 49 =        0.000000067
improvement < crit termination
Objective function at mode: 1017.976081

RESULTS FROM POSTERIOR ESTIMATION
parameters
         prior mean     mode    s.d. prior pstdev

rho_a_c      0.500   0.2063  0.0791 beta  0.2000
rho_a_d      0.500   0.5000  0.2774 beta  0.2000
rho_mu_c     0.500   0.5001  0.2774 beta  0.2000
rho_mu_d     0.500   0.5000  0.2773 beta  0.2000
rho_LTV      0.500   0.4956  0.2751 beta  0.2000
rho_d        0.500   0.5109  0.2766 beta  0.2000
rho_d_stern   0.500   0.8962  0.0176 beta  0.2000
rho_c_ast    0.500   0.6387  0.2495 beta  0.2000
rho_d_ast    0.500   0.5000  0.2773 beta  0.2000
rho_s_c      0.500   0.4207  0.0999 beta  0.2000
rho_r        0.500   0.6784  0.0927 beta  0.2000
rho_p       -0.500  -0.4978  0.2000 norm  0.2000
theta_c      0.750   0.2716  0.0707 beta  0.1500
sigma        1.000   1.9068  0.1094 norm  0.3700
phi          2.000   5.3415  0.8159 gamm  0.7000
omega        0.200   0.1032  0.0652 beta  0.1000
h_c          0.500   0.2923  0.0522 beta  0.1000
alpha_c      0.500   0.3920  0.0298 beta  0.1000

standard deviation of shocks
         prior mean     mode    s.d. prior pstdev

epsa_c       0.100   2.3902  0.1759 invg  2.0000
epsa_d       0.100   0.0462  0.0189 invg  2.0000
```

epsmu_c	0.100	0.0461	0.0188	invg	2.0000
epsmu_d	0.100	0.0461	0.0188	invg	2.0000
epsLTV	0.100	0.0461	0.0188	invg	2.0000
epsd	0.100	0.0457	0.0184	invg	2.0000
epsc_ast	0.100	0.0379	0.0116	invg	2.0000
epsd_ast	0.100	0.0461	0.0188	invg	2.0000
epsd_stern	0.100	0.6053	0.1039	invg	2.0000
epss_c	0.100	1.1662	0.0975	invg	2.0000
epsr	0.100	0.6262	0.1859	invg	2.0000
epsyf	0.100	0.0460	0.0187	invg	2.0000
epsn	0.010	0.8359	0.0627	invg	0.1000
epspi_d	0.010	5.6813	0.4099	invg	0.1000

Log data density [Laplace approximation] is -1071.809493.

Estimation::mcmc: Multiple chains mode.
Estimation::mcmc: Searching for initial values...
Estimation::mcmc: Initial values found!

Estimation::mcmc: Write details about the MCMC... Ok!
Estimation::mcmc: Details about the MCMC are available in
code_99/metropolis\code_mh_history_0.mat

Estimation::mcmc: Number of mh files: 55 per block.
Estimation::mcmc: Total number of generated files: 110.
Estimation::mcmc: Total number of iterations: 200000.
Estimation::mcmc: Current acceptance ratio per chain:
Chain 1: 33.2938%
Chain 2: 33.1808%
Estimation::mcmc::diagnostics: Univariate convergence diagnostic, Brooks and Gelman (1998):
Parameter 1... Done!
Parameter 2... Done!
Parameter 3... Done!
Parameter 4... Done!
Parameter 5... Done!
Parameter 6... Done!
Parameter 7... Done!
Parameter 8... Done!
Parameter 9... Done!
Parameter 10... Done!
Parameter 11... Done!
Parameter 12... Done!
Parameter 13... Done!
Parameter 14... Done!
Parameter 15... Done!
Parameter 16... Done!
Parameter 17... Done!
Parameter 18... Done!
Parameter 19... Done!
Parameter 20... Done!
Parameter 21... Done!
Parameter 22... Done!
Parameter 23... Done!
Parameter 24... Done!
Parameter 25... Done!
Parameter 26... Done!
Parameter 27... Done!
Parameter 28... Done!
Parameter 29... Done!
Parameter 30... Done!

```
    Parameter 31...  Done!
    Parameter 32...  Done!

Estimation::mcmc: Total number of MH draws: 200000.
Estimation::mcmc: Total number of generated MH files: 55.
Estimation::mcmc: I'll use mh-files 28 to 55.
Estimation::mcmc: In MH-file number 28 I'll start at line 721.
Estimation::mcmc: Finally I keep 100000 draws.

Estimation::marginal density: I'm computing the posterior mean and covariance...
Done!
Estimation::marginal density: I'm computing the posterior log marginal density
(modified harmonic mean)... Done!


ESTIMATION RESULTS

Log data density is -1069.965244.
posterior_moments: There are not enough draws computes to compute HPD Intervals.
Skipping their computation.
posterior_moments: There are not enough draws computes to compute deciles. Skipping
their computation.

parameters
             prior mean   post. mean        90% HPD interval    prior       pstdev

rho_a_c           0.500       0.2171      0.0930      0.3419   beta        0.2000
rho_a_d           0.500       0.4971      0.1663      0.8184   beta        0.2000
rho_mu_c          0.500       0.4945      0.1746      0.8329   beta        0.2000
rho_mu_d          0.500       0.5092      0.1845      0.8394   beta        0.2000
rho_LTV           0.500       0.4884      0.1570      0.8023   beta        0.2000
rho_d             0.500       0.5225      0.1996      0.8510   beta        0.2000
rho_d_stern        0.500       0.8947      0.8667      0.9254   beta        0.2000
rho_c_ast         0.500       0.6311      0.3371      0.9305   beta        0.2000
rho_d_ast         0.500       0.4998      0.1734      0.8294   beta        0.2000
rho_s_c           0.500       0.4223      0.2572      0.5781   beta        0.2000
rho_r             0.500       0.6157      0.4205      0.7993   beta        0.2000
rho_p            -0.500      -0.5006     -0.8199     -0.1698   norm        0.2000
theta_c           0.750       0.2669      0.1561      0.3748   beta        0.1500
sigma             1.000       1.9463      1.7571      2.1168   norm        0.3700
phi               2.000       5.4935      4.1695      6.8083   gamma       0.7000
omega             0.200       0.1290      0.0269      0.2261   beta        0.1000
h_c               0.500       0.2830      0.2008      0.3648   beta        0.1000
alpha_c           0.500       0.3927      0.3421      0.4423   beta        0.1000

standard deviation of shocks
             prior mean   post. mean        90% HPD interval    prior       pstdev

epsa_c            0.100       2.4212      2.1277      2.7210   invg        2.0000
epsa_d            0.100       0.0900      0.0228      0.1596   invg        2.0000
epsmu_c           0.100       0.0858      0.0246      0.1618   invg        2.0000
epsmu_d           0.100       0.0903      0.0223      0.1852   invg        2.0000
epsLTV            0.100       0.1182      0.0197      0.2977   invg        2.0000
epsd              0.100       0.0734      0.0239      0.1283   invg        2.0000
epsc_ast          0.100       0.0442      0.0232      0.0655   invg        2.0000
epsd_ast          0.100       0.0791      0.0240      0.1419   invg        2.0000
epsd_stern        0.100       0.5772      0.4070      0.7312   invg        2.0000
epss_c            0.100       1.1857      1.0221      1.3460   invg        2.0000
epsr              0.100       0.7620      0.3825      1.1726   invg        2.0000
epsyf             0.100       0.0953      0.0220      0.1748   invg        2.0000
epsn              0.010       0.8505      0.7383      0.9580   invg        0.1000
epspi_d           0.010       5.7686      5.0933      6.4210   invg        0.1000
Estimation::mcmc: Posterior (dsge) IRFs...
```

```
Estimation::mcmc: Posterior IRFs, done!
Estimation::mcmc: Forecasted variables (mean)
Estimation::mcmc: Forecasted variables (mean), done!
Estimation::mcmc: Forecasted variables (point)
Estimation::mcmc: Forecasted variables (point), done!

Loading 116 observations from data100.xlsx

Restricting the sample to observations 1 to 100. Using in total 100 observations.
Initial value of the log posterior (or likelihood): -1025.0876
-----------------
-----------------
f at the beginning of new iteration,      1025.0875556403
Predicted improvement:        0.002809923
lambda =          1; f =         1025.0836717
Norm of dx 0.00074966
----
Improvement on iteration 1 =        0.003883945
-----------------
-----------------
f at the beginning of new iteration,      1025.0836716955
Predicted improvement:        0.001279782
lambda =          1; f =         1025.0820189
Norm of dx 0.00071922
----
Improvement on iteration 2 =        0.001652844
-----------------
-----------------
f at the beginning of new iteration,      1025.0820188513
Predicted improvement:        0.000432156
lambda =          1; f =         1025.0814288
Norm of dx 0.00047383
----
Improvement on iteration 3 =        0.000590086
-----------------
-----------------
f at the beginning of new iteration,      1025.0814287657
Predicted improvement:        0.000213940
lambda =          1; f =         1025.0811267
lambda =     1.9332; f =         1025.0810707
Norm of dx 0.00036188
----
Improvement on iteration 4 =        0.000358112
-----------------
-----------------
f at the beginning of new iteration,      1025.0810706539
Predicted improvement:        0.000129817
lambda =          1; f =         1025.0808276
lambda =     1.9332; f =         1025.0806305
lambda =     3.7372; f =         1025.0803311
lambda =     7.2247; f =         1025.0800567
Norm of dx 0.00016613
----
Improvement on iteration 5 =        0.001013925
-----------------
-----------------
f at the beginning of new iteration,      1025.0800567291
Predicted improvement:        0.000500206
lambda =          1; f =         1025.0792440
lambda =     1.9332; f =         1025.0788248
Norm of dx  0.0012363
----
Improvement on iteration 6 =        0.001231918
```

```
-----------------
-----------------
f at the beginning of new iteration,      1025.0788248109
Predicted improvement:        0.000186155
lambda =          1; f =         1025.0785940
Norm of dx 0.00094234
----
Improvement on iteration 7 =        0.000230854
-----------------
-----------------
f at the beginning of new iteration,      1025.0785939567
Predicted improvement:        0.000061860
lambda =          1; f =         1025.0784878
lambda =     1.9332; f =         1025.0784209
lambda =     3.7372; f =         1025.0783795
Norm of dx 0.00035696
----
Improvement on iteration 8 =        0.000214445
-----------------
-----------------
f at the beginning of new iteration,      1025.0783795118
Predicted improvement:        0.000124500
lambda =          1; f =         1025.0781533
lambda =     1.9332; f =         1025.0779836
lambda =     3.7372; f =         1025.0777683
Norm of dx 0.00025898
----
Improvement on iteration 9 =        0.000611250
-----------------
-----------------
f at the beginning of new iteration,      1025.0777682618
Predicted improvement:        0.000130913
lambda =          1; f =         1025.0776002
Norm of dx 0.00091924
----
Improvement on iteration 10 =        0.000168068
-----------------
-----------------
f at the beginning of new iteration,      1025.0776001937
Predicted improvement:        0.000060074
lambda =          1; f =         1025.0774986
lambda =     1.9332; f =         1025.0774371
lambda =     3.7372; f =         1025.0774094
Norm of dx 0.00053584
----
Improvement on iteration 11 =        0.000190808
-----------------
-----------------
f at the beginning of new iteration,      1025.0774093857
Predicted improvement:        0.000108689
lambda =          1; f =         1025.0772183
lambda =     1.9332; f =         1025.0770874
lambda =     3.7372; f =         1025.0769647
Norm of dx 0.00022744
----
Improvement on iteration 12 =        0.000444671
-----------------
-----------------
f at the beginning of new iteration,      1025.0769647149
Predicted improvement:        0.000069500
lambda =          1; f =         1025.0768648
lambda =     1.9332; f =         1025.0768417
Norm of dx 0.00084354
```

```
----
Improvement on iteration 13 =        0.000123058
-----------------
-----------------
f at the beginning of new iteration,      1025.0768416570
Predicted improvement:        0.000037752
lambda =          1; f =         1025.0767702
lambda =     1.9332; f =         1025.0767107
lambda =     3.7372; f =         1025.0766153
lambda =     7.2247; f =         1025.0765049
Norm of dx 9.7527e-05
----
Improvement on iteration 14 =        0.000336776
-----------------
-----------------
f at the beginning of new iteration,      1025.0765048815
Predicted improvement:        0.000132503
lambda =          1; f =         1025.0763084
lambda =     1.9332; f =         1025.0762489
Norm of dx  0.0012378
----
Improvement on iteration 15 =        0.000255946
-----------------
-----------------
f at the beginning of new iteration,      1025.0762489355
Predicted improvement:        0.000067633
lambda =          1; f =         1025.0761294
lambda =     1.9332; f =         1025.0760464
lambda =     3.7372; f =         1025.0759633
Norm of dx 0.00036938
----
Improvement on iteration 16 =        0.000285650
-----------------
-----------------
f at the beginning of new iteration,      1025.0759632851
Predicted improvement:        0.000044652
lambda =          1; f =         1025.0759040
Norm of dx 0.00034197
----
Improvement on iteration 17 =        0.000059269
-----------------
-----------------
f at the beginning of new iteration,      1025.0759040162
Predicted improvement:        0.000014271
lambda =          1; f =         1025.0758827
lambda =     1.9332; f =         1025.0758760
Norm of dx 0.00017663
----
Improvement on iteration 18 =        0.000028031
-----------------
-----------------
f at the beginning of new iteration,      1025.0758759857
Predicted improvement:        0.000013133
lambda =          1; f =         1025.0758500
lambda =     1.9332; f =         1025.0758262
lambda =     3.7372; f =         1025.0757817
lambda =     7.2247; f =         1025.0757010
lambda =     13.967; f =         1025.0755644
lambda =         27; f =         1025.0753739
lambda =     52.196; f =         1025.0752799
Norm of dx 0.00010195
----
Improvement on iteration 19 =        0.000596105
```

```
-----------------
-----------------
f at the beginning of new iteration,      1025.0752798806
Predicted improvement:        0.000051265
lambda =          1; f =         1025.0752165
Norm of dx 0.00032229
----
Improvement on iteration 20 =        0.000063347
-----------------
-----------------
f at the beginning of new iteration,      1025.0752165333
Predicted improvement:        0.000010658
lambda =          1; f =         1025.0752004
lambda =     1.9332; f =         1025.0751945
Norm of dx 0.00013736
----
Improvement on iteration 21 =        0.000022068
-----------------
-----------------
f at the beginning of new iteration,      1025.0751944651
Predicted improvement:        0.000011019
lambda =          1; f =         1025.0751735
lambda =     1.9332; f =         1025.0751556
lambda =     3.7372; f =         1025.0751257
lambda =     7.2247; f =         1025.0750857
Norm of dx 0.00014164
----
Improvement on iteration 22 =        0.000108814
-----------------
-----------------
f at the beginning of new iteration,      1025.0750856509
Predicted improvement:        0.000053957
lambda =          1; f =         1025.0750108
Norm of dx 0.00081309
----
Improvement on iteration 23 =        0.000074851
-----------------
-----------------
f at the beginning of new iteration,      1025.0750108000
Predicted improvement:        0.000036807
lambda =          1; f =         1025.0749563
lambda =     1.9332; f =         1025.0749397
Norm of dx 0.00063945
----
Improvement on iteration 24 =        0.000071095
-----------------
-----------------
f at the beginning of new iteration,      1025.0749397046
Predicted improvement:        0.000020610
lambda =          1; f =         1025.0749063
lambda =     1.9332; f =         1025.0748892
Norm of dx 8.9867e-05
----
Improvement on iteration 25 =        0.000050495
-----------------
-----------------
f at the beginning of new iteration,      1025.0748892101
Predicted improvement:        0.000005361
lambda =          1; f =         1025.0748824
Norm of dx 0.00012091
----
Improvement on iteration 26 =        0.000006860
-----------------
```

```
-----------------
f at the beginning of new iteration,      1025.0748823502
Predicted improvement:        0.000002532
lambda =          1; f =         1025.0748779
lambda =     1.9332; f =         1025.0748748
lambda =     3.7372; f =         1025.0748716
Norm of dx 7.4762e-05
----
Improvement on iteration 27 =        0.000010705
-----------------
-----------------
f at the beginning of new iteration,      1025.0748716455
Predicted improvement:        0.000008296
lambda =          1; f =         1025.0748554
lambda =     1.9332; f =         1025.0748411
lambda =     3.7372; f =         1025.0748153
lambda =     7.2247; f =         1025.0747733
lambda =     13.967; f =         1025.0747208
Norm of dx 0.00017116
----
Improvement on iteration 28 =        0.000150842
-----------------
-----------------
f at the beginning of new iteration,      1025.0747208030
Predicted improvement:        0.000086959
lambda =          1; f =         1025.0745958
lambda =     1.9332; f =         1025.0745679
Norm of dx    0.00178
----
Improvement on iteration 29 =        0.000152881
-----------------
-----------------
f at the beginning of new iteration,      1025.0745679223
Predicted improvement:        0.000021344
lambda =          1; f =         1025.0745342
lambda =     1.9332; f =         1025.0745192
Norm of dx 0.00046996
----
Improvement on iteration 30 =        0.000048755
-----------------
-----------------
f at the beginning of new iteration,      1025.0745191673
Predicted improvement:        0.000016753
lambda =          1; f =         1025.0744918
lambda =     1.9332; f =         1025.0744771
Norm of dx 0.00042686
----
Improvement on iteration 31 =        0.000042034
-----------------
-----------------
f at the beginning of new iteration,      1025.0744771338
Predicted improvement:        0.000015554
lambda =          1; f =         1025.0744531
lambda =     1.9332; f =         1025.0744436
Norm of dx 0.00083013
----
Improvement on iteration 32 =        0.000033505
-----------------
-----------------
f at the beginning of new iteration,      1025.0744436290
Predicted improvement:        0.000015197
lambda =          1; f =         1025.0744142
lambda =     1.9332; f =         1025.0743886
```

```
lambda =     3.7372; f =         1025.0743443
lambda =     7.2247; f =         1025.0742776
lambda =     13.967; f =         1025.0742200
Norm of dx 0.00046027
----
Improvement on iteration 33 =        0.000223644
-----------------
-----------------
f at the beginning of new iteration,      1025.0742199850
Predicted improvement:        0.000118927
lambda =          1; f =         1025.0740298
lambda =     1.9332; f =         1025.0739380
Norm of dx  0.0012063
----
Improvement on iteration 34 =        0.000281985
-----------------
-----------------
f at the beginning of new iteration,      1025.0739379999
Predicted improvement:        0.000019664
lambda =          1; f =         1025.0739171
Norm of dx 0.00047918
----
Improvement on iteration 35 =        0.000020927
-----------------
-----------------
f at the beginning of new iteration,      1025.0739170733
Predicted improvement:        0.000001674
lambda =          1; f =         1025.0739139
lambda =     1.9332; f =         1025.0739112
lambda =     3.7372; f =         1025.0739067
lambda =     7.2247; f =         1025.0739009
Norm of dx 9.2017e-05
----
Improvement on iteration 36 =        0.000016159
-----------------
-----------------
f at the beginning of new iteration,      1025.0739009144
Predicted improvement:        0.000017085
lambda =          1; f =         1025.0738705
lambda =     1.9332; f =         1025.0738488
lambda =     3.7372; f =         1025.0738251
Norm of dx  0.0006414
----
Improvement on iteration 37 =        0.000075807
-----------------
-----------------
f at the beginning of new iteration,      1025.0738251069
Predicted improvement:        0.000036774
lambda =          1; f =         1025.0737699
lambda =     1.9332; f =         1025.0737517
Norm of dx 0.00064426
----
Improvement on iteration 38 =        0.000073422
-----------------
-----------------
f at the beginning of new iteration,      1025.0737516848
Predicted improvement:        0.000003672
lambda =          1; f =         1025.0737474
Norm of dx 0.00040674
----
Improvement on iteration 39 =        0.000004332
-----------------
-----------------
```

```
f at the beginning of new iteration,      1025.0737473529
Predicted improvement:        0.000000506
lambda =          1; f =         1025.0737466
lambda =     1.9332; f =         1025.0737462
Norm of dx 4.4224e-05
----
Improvement on iteration 40 =        0.000001119
-----------------
-----------------
f at the beginning of new iteration,      1025.0737462335
Predicted improvement:        0.000000481
lambda =          1; f =         1025.0737454
lambda =     1.9332; f =         1025.0737449
Norm of dx 6.8169e-05
----
Improvement on iteration 41 =        0.000001297
-----------------
-----------------
f at the beginning of new iteration,      1025.0737449369
Predicted improvement:        0.000000634
lambda =          1; f =         1025.0737440
lambda =     1.9332; f =         1025.0737436
Norm of dx 6.3688e-05
----
Improvement on iteration 42 =        0.000001326
-----------------
-----------------
f at the beginning of new iteration,      1025.0737436106
Predicted improvement:        0.000000646
lambda =          1; f =         1025.0737423
lambda =     1.9332; f =         1025.0737412
lambda =     3.7372; f =         1025.0737393
lambda =     7.2247; f =         1025.0737361
lambda =     13.967; f =         1025.0737325
Norm of dx 4.0168e-05
----
Improvement on iteration 43 =        0.000011145
-----------------
-----------------
f at the beginning of new iteration,      1025.0737324653
Predicted improvement:        0.000003296
lambda =          1; f =         1025.0737285
Norm of dx 0.00021242
----
Improvement on iteration 44 =        0.000003917
-----------------
-----------------
f at the beginning of new iteration,      1025.0737285486
Predicted improvement:        0.000000411
lambda =          1; f =         1025.0737281
Norm of dx  0.0001725
----
Improvement on iteration 45 =        0.000000465
-----------------
-----------------
f at the beginning of new iteration,      1025.0737280834
Predicted improvement:        0.000000163
lambda =          1; f =         1025.0737278
lambda =     1.9332; f =         1025.0737277
Norm of dx 3.7648e-05
----
Improvement on iteration 46 =        0.000000392
-----------------
```

```
-----------------
f at the beginning of new iteration,      1025.0737276917
Predicted improvement:        0.000000552
lambda =          1; f =         1025.0737267
lambda =     1.9332; f =         1025.0737258
lambda =     3.7372; f =         1025.0737245
lambda =     7.2247; f =         1025.0737233
Norm of dx 6.3524e-05
----
Improvement on iteration 47 =        0.000004402
-----------------
-----------------
f at the beginning of new iteration,      1025.0737232895
Predicted improvement:        0.000003666
lambda =          1; f =         1025.0737165
lambda =     1.9332; f =         1025.0737110
lambda =     3.7372; f =         1025.0737026
lambda =     7.2247; f =         1025.0736953
Norm of dx  0.0002795
----
Improvement on iteration 48 =        0.000027964
-----------------
-----------------
f at the beginning of new iteration,      1025.0736953256
Predicted improvement:        0.000004227
lambda =          1; f =         1025.0736903
Norm of dx 0.00042144
----
Improvement on iteration 49 =        0.000005019
-----------------
-----------------
f at the beginning of new iteration,      1025.0736903067
Predicted improvement:        0.000000588
lambda =          1; f =         1025.0736896
Norm of dx 0.00016711
----
Improvement on iteration 50 =        0.000000660
-----------------
-----------------
f at the beginning of new iteration,      1025.0736896466
Predicted improvement:        0.000000499
lambda =          1; f =         1025.0736888
lambda =     1.9332; f =         1025.0736884
Norm of dx 0.00011533
----
Improvement on iteration 51 =        0.000001246
-----------------
-----------------
f at the beginning of new iteration,      1025.0736884002
Predicted improvement:        0.000000934
lambda =          1; f =         1025.0736867
lambda =     1.9332; f =         1025.0736855
lambda =     3.7372; f =         1025.0736842
Norm of dx 0.00015394
----
Improvement on iteration 52 =        0.000004213
-----------------
-----------------
f at the beginning of new iteration,      1025.0736841875
Predicted improvement:        0.000003137
lambda =          1; f =         1025.0736786
lambda =     1.9332; f =         1025.0736747
lambda =     3.7372; f =         1025.0736703
```

```
Norm of dx  0.0002705
----
Improvement on iteration 53 =        0.000013882
-----------------
-----------------
f at the beginning of new iteration,      1025.0736703054
Predicted improvement:        0.000008086
lambda =          1; f =         1025.0736584
lambda =     1.9332; f =         1025.0736529
Norm of dx   0.001099
----
Improvement on iteration 54 =        0.000017446
-----------------
-----------------
f at the beginning of new iteration,      1025.0736528594
Predicted improvement:        0.000008053
lambda =          1; f =         1025.0736402
lambda =     1.9332; f =         1025.0736342
Norm of dx 0.00092271
----
Improvement on iteration 55 =        0.000018618
-----------------
-----------------
f at the beginning of new iteration,      1025.0736342411
Predicted improvement:        0.000005059
lambda =          1; f =         1025.0736270
lambda =     1.9332; f =         1025.0736254
Norm of dx 0.00046443
----
Improvement on iteration 56 =        0.000008868
-----------------
-----------------
f at the beginning of new iteration,      1025.0736253727
Predicted improvement:        0.000001021
lambda =          1; f =         1025.0736239
lambda =     1.9332; f =         1025.0736235
Norm of dx 0.00025171
----
Improvement on iteration 57 =        0.000001854
-----------------
-----------------
f at the beginning of new iteration,      1025.0736235182
Predicted improvement:        0.000000516
lambda =          1; f =         1025.0736226
lambda =     1.9332; f =         1025.0736218
lambda =     3.7372; f =         1025.0736206
lambda =     7.2247; f =         1025.0736192
Norm of dx 9.9919e-05
----
Improvement on iteration 58 =        0.000004318
-----------------
-----------------
f at the beginning of new iteration,      1025.0736192005
Predicted improvement:        0.000003320
lambda =          1; f =         1025.0736134
lambda =     1.9332; f =         1025.0736095
lambda =     3.7372; f =         1025.0736055
Norm of dx 0.00031976
----
Improvement on iteration 59 =        0.000013657
-----------------
-----------------
f at the beginning of new iteration,      1025.0736055438
```

```
Predicted improvement:        0.000003452
lambda =          1; f =         1025.0736010
Norm of dx 0.00014072
----
Improvement on iteration 60 =        0.000004499
-----------------
-----------------
f at the beginning of new iteration,      1025.0736010445
Predicted improvement:        0.000000771
lambda =          1; f =         1025.0736001
Norm of dx 0.00015729
----
Improvement on iteration 61 =        0.000000941
-----------------
-----------------
f at the beginning of new iteration,      1025.0736001032
Predicted improvement:        0.000000520
lambda =          1; f =         1025.0735994
Norm of dx 0.00024587
----
Improvement on iteration 62 =        0.000000670
-----------------
-----------------
f at the beginning of new iteration,      1025.0735994330
Predicted improvement:        0.000000853
lambda =          1; f =         1025.0735979
lambda =     1.9332; f =         1025.0735968
lambda =     3.7372; f =         1025.0735954
Norm of dx 0.00016301
----
Improvement on iteration 63 =        0.000003984
-----------------
-----------------
f at the beginning of new iteration,      1025.0735954491
Predicted improvement:        0.000003483
lambda =          1; f =         1025.0735888
lambda =     1.9332; f =         1025.0735833
lambda =     3.7372; f =         1025.0735743
lambda =     7.2247; f =         1025.0735638
Norm of dx 0.00020633
----
Improvement on iteration 64 =        0.000031653
-----------------
-----------------
f at the beginning of new iteration,      1025.0735637965
Predicted improvement:        0.000018218
lambda =          1; f =         1025.0735336
lambda =     1.9332; f =         1025.0735173
Norm of dx  0.0020068
----
Improvement on iteration 65 =        0.000046490
-----------------
-----------------
f at the beginning of new iteration,      1025.0735173066
Predicted improvement:        0.000012533
lambda =          1; f =         1025.0734989
lambda =     1.9332; f =         1025.0734968
Norm of dx  0.0030417
----
Improvement on iteration 66 =        0.000020530
-----------------
-----------------
f at the beginning of new iteration,      1025.0734967768
```

```
Predicted improvement:        0.000002776
lambda =          1; f =         1025.0734936
Norm of dx 0.00096928
----
Improvement on iteration 67 =        0.000003181
-----------------
-----------------
f at the beginning of new iteration,      1025.0734935954
Predicted improvement:        0.000000561
lambda =          1; f =         1025.0734932
Norm of dx 0.00029308
----
Improvement on iteration 68 =        0.000000409
-----------------
-----------------
f at the beginning of new iteration,      1025.0734931869
Predicted improvement:        0.000000183
lambda =          1; f =         1025.0734934
lambda =    0.33333; f =         1025.0734932
lambda =    0.11111; f =         1025.0734932
lambda =   0.037037; f =         1025.0734932
lambda =   0.012346; f =         1025.0734932
lambda =  0.0041152; f =         1025.0734932
lambda =  0.0013717; f =         1025.0734932
lambda = 0.00045725; f =         1025.0734932
lambda = 0.00015242; f =         1025.0734932
lambda = 5.0805e-05; f =         1025.0734932
lambda = 9.8216e-05; f =         1025.0734932
lambda = 6.6133e-05; f =         1025.0734932
lambda = 5.2163e-05; f =         1025.0734932
lambda = 5.1209e-05; f =         1025.0734932
Norm of dx 0.00032906
Cliff.  Perturbing search direction.
Predicted improvement:        0.000000355
lambda =          1; f =         1025.0734935
lambda =    0.33333; f =         1025.0734932
lambda =    0.11111; f =         1025.0734932
Norm of dx 0.00034701

badg2 =

     0

----
Improvement on iteration 69 =        0.000000027
improvement < crit termination
Objective function at mode: 1025.073493

RESULTS FROM POSTERIOR ESTIMATION
parameters
         prior mean     mode    s.d. prior pstdev

rho_a_c      0.500   0.2062  0.0786 beta  0.2000
rho_a_d      0.500   0.4999  0.2774 beta  0.2000
rho_mu_c     0.500   0.5001  0.2774 beta  0.2000
rho_mu_d     0.500   0.5000  0.2774 beta  0.2000
rho_LTV      0.500   0.4956  0.2751 beta  0.2000
rho_d        0.500   0.5110  0.2766 beta  0.2000
rho_d_stern   0.500   0.8968  0.0173 beta  0.2000
rho_c_ast    0.500   0.6407  0.2489 beta  0.2000
rho_d_ast    0.500   0.5000  0.2774 beta  0.2000
rho_s_c      0.500   0.4195  0.0990 beta  0.2000
rho_r        0.500   0.6778  0.0925 beta  0.2000
```

```
                                        code.log
rho_p       -0.500  -0.4978  0.2000 norm  0.2000
theta_c      0.750   0.2710  0.0706 beta  0.1500
sigma        1.000   1.9075  0.1087 norm  0.3700
phi          2.000   5.3672  0.8170 gamm  0.7000
omega        0.200   0.1031  0.0651 beta  0.1000
h_c          0.500   0.2927  0.0520 beta  0.1000
alpha_c      0.500   0.3920  0.0297 beta  0.1000

standard deviation of shocks
         prior mean     mode    s.d. prior pstdev

epsa_c       0.100   2.3772  0.1741 invg  2.0000
epsa_d       0.100   0.0462  0.0189 invg  2.0000
epsmu_c      0.100   0.0461  0.0188 invg  2.0000
epsmu_d      0.100   0.0461  0.0188 invg  2.0000
epsLTV       0.100   0.0461  0.0188 invg  2.0000
epsd         0.100   0.0457  0.0184 invg  2.0000
epsc_ast     0.100   0.0378  0.0116 invg  2.0000
epsd_ast     0.100   0.0461  0.0188 invg  2.0000
epsd_stern   0.100   0.6042  0.1029 invg  2.0000
epss_c       0.100   1.1606  0.0965 invg  2.0000
epsr         0.100   0.6243  0.1847 invg  2.0000
epsyf        0.100   0.0460  0.0186 invg  2.0000
epsn         0.010   0.8320  0.0621 invg  0.1000
epspi_d      0.010   5.6550  0.4058 invg  0.1000


Log data density [Laplace approximation] is -1079.016359.

Estimation::mcmc: Multiple chains mode.
Estimation::mcmc: Searching for initial values...
Estimation::mcmc: Initial values found!

Estimation::mcmc: Write details about the MCMC... Ok!
Estimation::mcmc: Details about the MCMC are available in
code_100/metropolis\code_mh_history_0.mat


Estimation::mcmc: Number of mh files: 55 per block.
Estimation::mcmc: Total number of generated files: 110.
Estimation::mcmc: Total number of iterations: 200000.
Estimation::mcmc: Current acceptance ratio per chain:
                                                    Chain  1: 33.1123%
                                                    Chain  2: 33.4878%
Estimation::mcmc::diagnostics: Univariate convergence diagnostic, Brooks and Gelman
(1998):
    Parameter 1...  Done!
    Parameter 2...  Done!
    Parameter 3...  Done!
    Parameter 4...  Done!
    Parameter 5...  Done!
    Parameter 6...  Done!
    Parameter 7...  Done!
    Parameter 8...  Done!
    Parameter 9...  Done!
    Parameter 10...  Done!
    Parameter 11...  Done!
    Parameter 12...  Done!
    Parameter 13...  Done!
    Parameter 14...  Done!
    Parameter 15...  Done!
    Parameter 16...  Done!
    Parameter 17...  Done!
```

```
    Parameter 18...  Done!
    Parameter 19...  Done!
    Parameter 20...  Done!
    Parameter 21...  Done!
    Parameter 22...  Done!
    Parameter 23...  Done!
    Parameter 24...  Done!
    Parameter 25...  Done!
    Parameter 26...  Done!
    Parameter 27...  Done!
    Parameter 28...  Done!
    Parameter 29...  Done!
    Parameter 30...  Done!
    Parameter 31...  Done!
    Parameter 32...  Done!

Estimation::mcmc: Total number of MH draws: 200000.
Estimation::mcmc: Total number of generated MH files: 55.
Estimation::mcmc: I'll use mh-files 28 to 55.
Estimation::mcmc: In MH-file number 28 I'll start at line 721.
Estimation::mcmc: Finally I keep 100000 draws.

Estimation::marginal density: I'm computing the posterior mean and covariance...
Done!
Estimation::marginal density: I'm computing the posterior log marginal density
(modified harmonic mean)... Done!


ESTIMATION RESULTS

Log data density is -1077.491205.
posterior_moments: There are not enough draws computes to compute HPD Intervals.
Skipping their computation.
posterior_moments: There are not enough draws computes to compute deciles. Skipping
their computation.

parameters
              prior mean   post. mean        90% HPD interval    prior       pstdev

rho_a_c           0.500       0.2206      0.0975      0.3441   beta        0.2000
rho_a_d           0.500       0.4992      0.1735      0.8279   beta        0.2000
rho_mu_c          0.500       0.4998      0.1736      0.8312   beta        0.2000
rho_mu_d          0.500       0.5046      0.1758      0.8303   beta        0.2000
rho_LTV           0.500       0.4961      0.1559      0.8122   beta        0.2000
rho_d             0.500       0.5247      0.1982      0.8477   beta        0.2000
rho_d_stern        0.500       0.8962      0.8674      0.9252   beta        0.2000
rho_c_ast         0.500       0.6234      0.3182      0.9234   beta        0.2000
rho_d_ast         0.500       0.5001      0.1816      0.8429   beta        0.2000
rho_s_c           0.500       0.4243      0.2632      0.5909   beta        0.2000
rho_r             0.500       0.6263      0.4587      0.7859   beta        0.2000
rho_p            -0.500      -0.4998     -0.8360     -0.1673   norm        0.2000
theta_c           0.750       0.2701      0.1589      0.3788   beta        0.1500
sigma             1.000       1.9508      1.7669      2.1252   norm        0.3700
phi               2.000       5.5240      4.1875      6.8686   gamma       0.7000
omega             0.200       0.1325      0.0280      0.2292   beta        0.1000
h_c               0.500       0.2830      0.1995      0.3648   beta        0.1000
alpha_c           0.500       0.3920      0.3441      0.4409   beta        0.1000

standard deviation of shocks
              prior mean   post. mean        90% HPD interval    prior       pstdev

epsa_c            0.100       2.4204      2.1257      2.7149   invg        2.0000
epsa_d            0.100       0.1133      0.0216      0.1938   invg        2.0000
```

```
epsmu_c           0.100       0.1562       0.0215       0.4297   invg         2.0000
epsmu_d           0.100       0.0872       0.0232       0.1680   invg         2.0000
epsLTV            0.100       0.0757       0.0240       0.1289   invg         2.0000
epsd              0.100       0.0787       0.0254       0.1393   invg         2.0000
epsc_ast          0.100       0.0435       0.0223       0.0637   invg         2.0000
epsd_ast          0.100       0.0928       0.0223       0.1906   invg         2.0000
epsd_stern        0.100       0.5807       0.4183       0.7373   invg         2.0000
epss_c            0.100       1.1833       1.0147       1.3443   invg         2.0000
epsr              0.100       0.7329       0.3998       1.0657   invg         2.0000
epsyf             0.100       0.0892       0.0228       0.1660   invg         2.0000
epsn              0.010       0.8465       0.7351       0.9451   invg         0.1000
epspi_d           0.010       5.7660       5.0316       6.4349   invg         0.1000
Estimation::mcmc: Posterior (dsge) IRFs...
Estimation::mcmc: Posterior IRFs, done!
Estimation::mcmc: Forecasted variables (mean)
Estimation::mcmc: Forecasted variables (mean), done!
Estimation::mcmc: Forecasted variables (point)
Estimation::mcmc: Forecasted variables (point), done!

Loading 116 observations from data100.xlsx

Restricting the sample to observations 1 to 101. Using in total 101 observations.
Initial value of the log posterior (or likelihood): -1033.1783
-----------------
-----------------
f at the beginning of new iteration,      1033.1783142811
Predicted improvement:        0.002674159
lambda =          1; f =         1033.1749496
Norm of dx 0.00073132
----
Improvement on iteration 1 =        0.003364660
-----------------
-----------------
f at the beginning of new iteration,      1033.1749496211
Predicted improvement:        0.000587854
lambda =          1; f =         1033.1741174
lambda =     1.9332; f =         1033.1739650
Norm of dx 0.00043744
----
Improvement on iteration 2 =        0.000984613
-----------------
-----------------
f at the beginning of new iteration,      1033.1739650082
Predicted improvement:        0.000261648
lambda =          1; f =         1033.1735558
lambda =     1.9332; f =         1033.1733778
Norm of dx 0.00020804
----
Improvement on iteration 3 =        0.000587211
-----------------
-----------------
f at the beginning of new iteration,      1033.1733777968
Predicted improvement:        0.000119757
lambda =          1; f =         1033.1731820
lambda =     1.9332; f =         1033.1730779
Norm of dx 0.00029114
----
Improvement on iteration 4 =        0.000299855
-----------------
-----------------
f at the beginning of new iteration,      1033.1730779420
Predicted improvement:        0.000179874
lambda =          1; f =         1033.1727747
```

```
lambda =     1.9332; f =         1033.1725940
Norm of dx   0.000493
----
Improvement on iteration 5 =        0.000483896
-----------------
-----------------
f at the beginning of new iteration,      1033.1725940465
Predicted improvement:        0.000278979
lambda =          1; f =         1033.1722010
lambda =     1.9332; f =         1033.1721324
Norm of dx 0.00082349
----
Improvement on iteration 6 =        0.000461604
-----------------
-----------------
f at the beginning of new iteration,      1033.1721324424
Predicted improvement:        0.000108115
lambda =          1; f =         1033.1719495
lambda =     1.9332; f =         1033.1718389
lambda =     3.7372; f =         1033.1717896
Norm of dx  0.0002454
----
Improvement on iteration 7 =        0.000342827
-----------------
-----------------
f at the beginning of new iteration,      1033.1717896150
Predicted improvement:        0.000162505
lambda =          1; f =         1033.1715020
lambda =     1.9332; f =         1033.1713014
lambda =     3.7372; f =         1033.1710990
Norm of dx 0.00065715
----
Improvement on iteration 8 =        0.000690650
-----------------
-----------------
f at the beginning of new iteration,      1033.1710989652
Predicted improvement:        0.000162052
lambda =          1; f =         1033.1708848
Norm of dx 0.00076626
----
Improvement on iteration 9 =        0.000214213
-----------------
-----------------
f at the beginning of new iteration,      1033.1708847521
Predicted improvement:        0.000043315
lambda =          1; f =         1033.1708260
Norm of dx  0.0003139
----
Improvement on iteration 10 =        0.000058724
-----------------
-----------------
f at the beginning of new iteration,      1033.1708260284
Predicted improvement:        0.000032508
lambda =          1; f =         1033.1707707
lambda =     1.9332; f =         1033.1707363
lambda =     3.7372; f =         1033.1707170
Norm of dx 0.00026026
----
Improvement on iteration 11 =        0.000109029
-----------------
-----------------
f at the beginning of new iteration,      1033.1707169996
Predicted improvement:        0.000071540
```

```
lambda =          1; f =         1033.1705817
lambda =     1.9332; f =         1033.1704695
lambda =     3.7372; f =         1033.1702916
lambda =     7.2247; f =         1033.1700923
Norm of dx 0.00023682
----
Improvement on iteration 12 =        0.000624686
-----------------
-----------------
f at the beginning of new iteration,      1033.1700923137
Predicted improvement:        0.000106741
lambda =          1; f =         1033.1699679
Norm of dx  0.0013697
----
Improvement on iteration 13 =        0.000124437
-----------------
-----------------
f at the beginning of new iteration,      1033.1699678772
Predicted improvement:        0.000011463
lambda =          1; f =         1033.1699497
lambda =     1.9332; f =         1033.1699409
Norm of dx 0.00031091
----
Improvement on iteration 14 =        0.000026927
-----------------
-----------------
f at the beginning of new iteration,      1033.1699409497
Predicted improvement:        0.000015271
lambda =          1; f =         1033.1699139
lambda =     1.9332; f =         1033.1698951
lambda =     3.7372; f =         1033.1698764
Norm of dx 0.00017435
----
Improvement on iteration 15 =        0.000064529
-----------------
-----------------
f at the beginning of new iteration,      1033.1698764205
Predicted improvement:        0.000022663
lambda =          1; f =         1033.1698397
lambda =     1.9332; f =         1033.1698213
Norm of dx 0.00023658
----
Improvement on iteration 16 =        0.000055098
-----------------
-----------------
f at the beginning of new iteration,      1033.1698213222
Predicted improvement:        0.000020996
lambda =          1; f =         1033.1697865
lambda =     1.9332; f =         1033.1697672
Norm of dx 0.00020147
----
Improvement on iteration 17 =        0.000054077
-----------------
-----------------
f at the beginning of new iteration,      1033.1697672451
Predicted improvement:        0.000026986
lambda =          1; f =         1033.1697282
lambda =     1.9332; f =         1033.1697188
Norm of dx 0.00042576
----
Improvement on iteration 18 =        0.000048475
-----------------
-----------------
```

```
f at the beginning of new iteration,      1033.1697187700
Predicted improvement:        0.000009352
lambda =          1; f =         1033.1697030
lambda =     1.9332; f =         1033.1696935
Norm of dx 0.00016196
----
Improvement on iteration 19 =        0.000025276
-----------------
-----------------
f at the beginning of new iteration,      1033.1696934936
Predicted improvement:        0.000019739
lambda =          1; f =         1033.1696591
lambda =     1.9332; f =         1033.1696363
lambda =     3.7372; f =         1033.1696178
Norm of dx 0.00031413
----
Improvement on iteration 20 =        0.000075659
-----------------
-----------------
f at the beginning of new iteration,      1033.1696178350
Predicted improvement:        0.000048956
lambda =          1; f =         1033.1695248
lambda =     1.9332; f =         1033.1694472
lambda =     3.7372; f =         1033.1693220
lambda =     7.2247; f =         1033.1691733
Norm of dx 0.00056177
----
Improvement on iteration 21 =        0.000444491
-----------------
-----------------
f at the beginning of new iteration,      1033.1691733436
Predicted improvement:        0.000042978
lambda =          1; f =         1033.1691236
Norm of dx  0.0012363
----
Improvement on iteration 22 =        0.000049778
-----------------
-----------------
f at the beginning of new iteration,      1033.1691235658
Predicted improvement:        0.000008696
lambda =          1; f =         1033.1691075
lambda =     1.9332; f =         1033.1690951
lambda =     3.7372; f =         1033.1690779
lambda =     7.2247; f =         1033.1690706
Norm of dx 0.00029814
----
Improvement on iteration 23 =        0.000052948
-----------------
-----------------
f at the beginning of new iteration,      1033.1690706177
Predicted improvement:        0.000038607
lambda =          1; f =         1033.1689999
lambda =     1.9332; f =         1033.1689458
lambda =     3.7372; f =         1033.1688732
Norm of dx 0.00023388
----
Improvement on iteration 24 =        0.000197382
-----------------
-----------------
f at the beginning of new iteration,      1033.1688732360
Predicted improvement:        0.000094717
lambda =          1; f =         1033.1687399
lambda =     1.9332; f =         1033.1687163
```

```
Norm of dx  0.0016679
----
Improvement on iteration 25 =        0.000156945
-----------------
-----------------
f at the beginning of new iteration,      1033.1687162914
Predicted improvement:        0.000046801
lambda =          1; f =         1033.1686366
lambda =     1.9332; f =         1033.1685876
lambda =     3.7372; f =         1033.1685619
Norm of dx 0.00043835
----
Improvement on iteration 26 =        0.000154413
-----------------
-----------------
f at the beginning of new iteration,      1033.1685618788
Predicted improvement:        0.000026851
lambda =          1; f =         1033.1685279
Norm of dx 0.00068655
----
Improvement on iteration 27 =        0.000033930
-----------------
-----------------
f at the beginning of new iteration,      1033.1685279491
Predicted improvement:        0.000005367
lambda =          1; f =         1033.1685203
lambda =     1.9332; f =         1033.1685185
Norm of dx 0.00027849
----
Improvement on iteration 28 =        0.000009468
-----------------
-----------------
f at the beginning of new iteration,      1033.1685184809
Predicted improvement:        0.000004190
lambda =          1; f =         1033.1685102
lambda =     1.9332; f =         1033.1685027
lambda =     3.7372; f =         1033.1684888
lambda =     7.2247; f =         1033.1684641
lambda =     13.967; f =         1033.1684247
lambda =         27; f =         1033.1683794
Norm of dx 4.0089e-05
----
Improvement on iteration 29 =        0.000139128
-----------------
-----------------
f at the beginning of new iteration,      1033.1683793525
Predicted improvement:        0.000075306
lambda =          1; f =         1033.1682676
lambda =     1.9332; f =         1033.1682334
Norm of dx  0.0018776
----
Improvement on iteration 30 =        0.000145995
-----------------
-----------------
f at the beginning of new iteration,      1033.1682333574
Predicted improvement:        0.000017732
lambda =          1; f =         1033.1682048
lambda =     1.9332; f =         1033.1681906
Norm of dx  0.0003888
----
Improvement on iteration 31 =        0.000042714
-----------------
-----------------
```

```
f at the beginning of new iteration,      1033.1681906435
Predicted improvement:        0.000014225
lambda =          1; f =         1033.1681697
lambda =     1.9332; f =         1033.1681639
Norm of dx 0.00033656
----
Improvement on iteration 32 =        0.000026701
-----------------
-----------------
f at the beginning of new iteration,      1033.1681639425
Predicted improvement:        0.000004358
lambda =          1; f =         1033.1681566
lambda =     1.9332; f =         1033.1681522
Norm of dx 0.00016025
----
Improvement on iteration 33 =        0.000011737
-----------------
-----------------
f at the beginning of new iteration,      1033.1681522058
Predicted improvement:        0.000008736
lambda =          1; f =         1033.1681369
lambda =     1.9332; f =         1033.1681268
lambda =     3.7372; f =         1033.1681182
Norm of dx 0.00018763
----
Improvement on iteration 34 =        0.000034037
-----------------
-----------------
f at the beginning of new iteration,      1033.1681181684
Predicted improvement:        0.000021435
lambda =          1; f =         1033.1680785
lambda =     1.9332; f =         1033.1680473
lambda =     3.7372; f =         1033.1680024
lambda =     7.2247; f =         1033.1679739
Norm of dx 0.00047111
----
Improvement on iteration 35 =        0.000144245
-----------------
-----------------
f at the beginning of new iteration,      1033.1679739239
Predicted improvement:        0.000003748
lambda =          1; f =         1033.1679689
Norm of dx 0.00023264
----
Improvement on iteration 36 =        0.000004988
-----------------
-----------------
f at the beginning of new iteration,      1033.1679689362
Predicted improvement:        0.000002190
lambda =          1; f =         1033.1679651
lambda =     1.9332; f =         1033.1679625
lambda =     3.7372; f =         1033.1679602
Norm of dx 9.3794e-05
----
Improvement on iteration 37 =        0.000008714
-----------------
-----------------
f at the beginning of new iteration,      1033.1679602221
Predicted improvement:        0.000006151
lambda =          1; f =         1033.1679483
lambda =     1.9332; f =         1033.1679377
lambda =     3.7372; f =         1033.1679187
lambda =     7.2247; f =         1033.1678879
```

```
lambda =     13.967; f =         1033.1678498
Norm of dx 0.00015863
----
Improvement on iteration 38 =        0.000110435
-----------------
-----------------
f at the beginning of new iteration,      1033.1678497870
Predicted improvement:        0.000027616
lambda =          1; f =         1033.1678169
Norm of dx  0.0013136
----
Improvement on iteration 39 =        0.000032911
-----------------
-----------------
f at the beginning of new iteration,      1033.1678168764
Predicted improvement:        0.000004907
lambda =          1; f =         1033.1678096
lambda =     1.9332; f =         1033.1678070
Norm of dx  0.0003413
----
Improvement on iteration 40 =        0.000009922
-----------------
-----------------
f at the beginning of new iteration,      1033.1678069543
Predicted improvement:        0.000002690
lambda =          1; f =         1033.1678029
lambda =     1.9332; f =         1033.1678016
Norm of dx 0.00010803
----
Improvement on iteration 41 =        0.000005345
-----------------
-----------------
f at the beginning of new iteration,      1033.1678016093
Predicted improvement:        0.000000472
lambda =          1; f =         1033.1678008
lambda =     1.9332; f =         1033.1678001
lambda =     3.7372; f =         1033.1677994
Norm of dx 5.9478e-05
----
Improvement on iteration 42 =        0.000002219
-----------------
-----------------
f at the beginning of new iteration,      1033.1677993906
Predicted improvement:        0.000002034
lambda =          1; f =         1033.1677957
lambda =     1.9332; f =         1033.1677928
lambda =     3.7372; f =         1033.1677888
Norm of dx 8.9826e-05
----
Improvement on iteration 43 =        0.000010563
-----------------
-----------------
f at the beginning of new iteration,      1033.1677888272
Predicted improvement:        0.000008030
lambda =          1; f =         1033.1677776
Norm of dx 0.00046156
----
Improvement on iteration 44 =        0.000011194
-----------------
-----------------
f at the beginning of new iteration,      1033.1677776334
Predicted improvement:        0.000003637
lambda =          1; f =         1033.1677737
```

```
Norm of dx 0.00042191
----
Improvement on iteration 45 =        0.000003926
-----------------
-----------------
f at the beginning of new iteration,      1033.1677737071
Predicted improvement:        0.000000163
lambda =          1; f =         1033.1677735
Norm of dx 7.4402e-05
----
Improvement on iteration 46 =        0.000000197
-----------------
-----------------
f at the beginning of new iteration,      1033.1677735103
Predicted improvement:        0.000000102
lambda =          1; f =         1033.1677734
lambda =     1.9332; f =         1033.1677733
Norm of dx 3.7985e-05
----
Improvement on iteration 47 =        0.000000196
-----------------
-----------------
f at the beginning of new iteration,      1033.1677733143
Predicted improvement:        0.000000157
lambda =          1; f =         1033.1677730
lambda =     1.9332; f =         1033.1677727
lambda =     3.7372; f =         1033.1677723
lambda =     7.2247; f =         1033.1677715
lambda =     13.967; f =         1033.1677704
Norm of dx  1.315e-05
----
Improvement on iteration 48 =        0.000002876
-----------------
-----------------
f at the beginning of new iteration,      1033.1677704381
Predicted improvement:        0.000002169
lambda =          1; f =         1033.1677673
lambda =     1.9332; f =         1033.1677664
Norm of dx 0.00022254
----
Improvement on iteration 49 =        0.000004086
-----------------
-----------------
f at the beginning of new iteration,      1033.1677663521
Predicted improvement:        0.000000549
lambda =          1; f =         1033.1677657
Norm of dx 6.7082e-05
----
Improvement on iteration 50 =        0.000000695
-----------------
-----------------
f at the beginning of new iteration,      1033.1677656573
Predicted improvement:        0.000000197
lambda =          1; f =         1033.1677654
Norm of dx  4.663e-05
----
Improvement on iteration 51 =        0.000000241
-----------------
-----------------
f at the beginning of new iteration,      1033.1677654166
Predicted improvement:        0.000000119
lambda =          1; f =         1033.1677652
lambda =     1.9332; f =         1033.1677652
```

```
Norm of dx 4.1899e-05
----
Improvement on iteration 52 =        0.000000225
-----------------
-----------------
f at the beginning of new iteration,      1033.1677651914
Predicted improvement:        0.000000085
lambda =          1; f =         1033.1677650
lambda =     1.9332; f =         1033.1677650
Norm of dx  3.362e-05
----
Improvement on iteration 53 =        0.000000226
-----------------
-----------------
f at the beginning of new iteration,      1033.1677649651
Predicted improvement:        0.000000131
lambda =          1; f =         1033.1677647
lambda =     1.9332; f =         1033.1677646
lambda =     3.7372; f =         1033.1677644
Norm of dx 4.1326e-05
----
Improvement on iteration 54 =        0.000000536
-----------------
-----------------
f at the beginning of new iteration,      1033.1677644295
Predicted improvement:        0.000000347
lambda =          1; f =         1033.1677638
lambda =     1.9332; f =         1033.1677633
lambda =     3.7372; f =         1033.1677626
lambda =     7.2247; f =         1033.1677621
Norm of dx 5.6432e-05
----
Improvement on iteration 55 =        0.000002292
-----------------
-----------------
f at the beginning of new iteration,      1033.1677621377
Predicted improvement:        0.000001116
lambda =          1; f =         1033.1677605
lambda =     1.9332; f =         1033.1677600
Norm of dx 0.00010548
----
Improvement on iteration 56 =        0.000002112
-----------------
-----------------
f at the beginning of new iteration,      1033.1677600255
Predicted improvement:        0.000000154
lambda =          1; f =         1033.1677598
lambda =     1.9332; f =         1033.1677598
Norm of dx 6.0677e-05
----
Improvement on iteration 57 =        0.000000263
-----------------
-----------------
f at the beginning of new iteration,      1033.1677597624
Predicted improvement:        0.000000053
lambda =          1; f =         1033.1677597
Norm of dx  3.738e-05
----
Improvement on iteration 58 =        0.000000072
improvement < crit termination
Objective function at mode: 1033.167760

RESULTS FROM POSTERIOR ESTIMATION
```

```
parameters
         prior mean     mode    s.d. prior pstdev

rho_a_c      0.500   0.2065  0.0784 beta  0.2000
rho_a_d      0.500   0.5000  0.2774 beta  0.2000
rho_mu_c     0.500   0.5001  0.2774 beta  0.2000
rho_mu_d     0.500   0.5000  0.2773 beta  0.2000
rho_LTV      0.500   0.4953  0.2749 beta  0.2000
rho_d        0.500   0.5113  0.2766 beta  0.2000
rho_d_stern   0.500   0.8976  0.0170 beta  0.2000
rho_c_ast    0.500   0.6419  0.2486 beta  0.2000
rho_d_ast    0.500   0.5000  0.2773 beta  0.2000
rho_s_c      0.500   0.4235  0.0992 beta  0.2000
rho_r        0.500   0.6785  0.0919 beta  0.2000
rho_p       -0.500  -0.4977  0.2000 norm  0.2000
theta_c      0.750   0.2729  0.0706 beta  0.1500
sigma        1.000   1.9131  0.1089 norm  0.3700
phi          2.000   5.3710  0.8153 gamm  0.7000
omega        0.200   0.1030  0.0650 beta  0.1000
h_c          0.500   0.2918  0.0520 beta  0.1000
alpha_c      0.500   0.3922  0.0296 beta  0.1000

standard deviation of shocks
         prior mean     mode    s.d. prior pstdev

epsa_c       0.100   2.3726  0.1730 invg  2.0000
epsa_d       0.100   0.0462  0.0189 invg  2.0000
epsmu_c      0.100   0.0461  0.0188 invg  2.0000
epsmu_d      0.100   0.0461  0.0188 invg  2.0000
epsLTV       0.100   0.0461  0.0188 invg  2.0000
epsd         0.100   0.0457  0.0184 invg  2.0000
epsc_ast     0.100   0.0378  0.0115 invg  2.0000
epsd_ast     0.100   0.0461  0.0188 invg  2.0000
epsd_stern   0.100   0.6024  0.1020 invg  2.0000
epss_c       0.100   1.1605  0.0961 invg  2.0000
epsr         0.100   0.6202  0.1826 invg  2.0000
epsyf        0.100   0.0460  0.0186 invg  2.0000
epsn         0.010   0.8304  0.0617 invg  0.1000
epspi_d      0.010   5.6269  0.4017 invg  0.1000


Log data density [Laplace approximation] is -1087.194411.

Estimation::mcmc: Multiple chains mode.
Estimation::mcmc: Searching for initial values...
Estimation::mcmc: Initial values found!

Estimation::mcmc: Write details about the MCMC... Ok!
Estimation::mcmc: Details about the MCMC are available in
code_101/metropolis\code_mh_history_0.mat


Estimation::mcmc: Number of mh files: 55 per block.
Estimation::mcmc: Total number of generated files: 110.
Estimation::mcmc: Total number of iterations: 200000.
Estimation::mcmc: Current acceptance ratio per chain:
                                                    Chain  1: 33.2038%
                                                    Chain  2: 33.3233%
Estimation::mcmc::diagnostics: Univariate convergence diagnostic, Brooks and Gelman
(1998):
    Parameter 1...  Done!
    Parameter 2...  Done!
    Parameter 3...  Done!
```

```
    Parameter 4...  Done!
    Parameter 5...  Done!
    Parameter 6...  Done!
    Parameter 7...  Done!
    Parameter 8...  Done!
    Parameter 9...  Done!
    Parameter 10...  Done!
    Parameter 11...  Done!
    Parameter 12...  Done!
    Parameter 13...  Done!
    Parameter 14...  Done!
    Parameter 15...  Done!
    Parameter 16...  Done!
    Parameter 17...  Done!
    Parameter 18...  Done!
    Parameter 19...  Done!
    Parameter 20...  Done!
    Parameter 21...  Done!
    Parameter 22...  Done!
    Parameter 23...  Done!
    Parameter 24...  Done!
    Parameter 25...  Done!
    Parameter 26...  Done!
    Parameter 27...  Done!
    Parameter 28...  Done!
    Parameter 29...  Done!
    Parameter 30...  Done!
    Parameter 31...  Done!
    Parameter 32...  Done!

Estimation::mcmc: Total number of MH draws: 200000.
Estimation::mcmc: Total number of generated MH files: 55.
Estimation::mcmc: I'll use mh-files 28 to 55.
Estimation::mcmc: In MH-file number 28 I'll start at line 721.
Estimation::mcmc: Finally I keep 100000 draws.

Estimation::marginal density: I'm computing the posterior mean and covariance...
Done!
Estimation::marginal density: I'm computing the posterior log marginal density
(modified harmonic mean)... Done!


ESTIMATION RESULTS

Log data density is -1085.449747.
posterior_moments: There are not enough draws computes to compute HPD Intervals.
Skipping their computation.
posterior_moments: There are not enough draws computes to compute deciles. Skipping
their computation.

parameters
             prior mean   post. mean        90% HPD interval    prior       pstdev

rho_a_c           0.500       0.2176      0.0938      0.3412   beta        0.2000
rho_a_d           0.500       0.5024      0.1807      0.8360   beta        0.2000
rho_mu_c          0.500       0.4970      0.1553      0.8132   beta        0.2000
rho_mu_d          0.500       0.5017      0.1800      0.8313   beta        0.2000
rho_LTV           0.500       0.4912      0.1714      0.8222   beta        0.2000
rho_d             0.500       0.5261      0.2019      0.8541   beta        0.2000
rho_d_stern        0.500       0.8970      0.8695      0.9262   beta        0.2000
rho_c_ast         0.500       0.6385      0.3533      0.9431   beta        0.2000
rho_d_ast         0.500       0.5027      0.1698      0.8278   beta        0.2000
rho_s_c           0.500       0.4284      0.2714      0.5870   beta        0.2000
```

rho_r	0.500	0.6173	0.4420	0.7926	beta	0.2000
rho_p	-0.500	-0.4938	-0.8219	-0.1725	norm	0.2000
theta_c	0.750	0.2676	0.1602	0.3805	beta	0.1500
sigma	1.000	1.9677	1.7711	2.1537	norm	0.3700
phi	2.000	5.5493	4.1613	6.9182	gamma	0.7000
omega	0.200	0.1330	0.0306	0.2358	beta	0.1000
h_c	0.500	0.2820	0.1961	0.3638	beta	0.1000
alpha_c	0.500	0.3905	0.3427	0.4388	beta	0.1000

standard deviation of shocks

	prior mean	post. mean	90% HPD interval		prior	pstdev
epsa_c	0.100	2.4089	2.1253	2.7030	invg	2.0000
epsa_d	0.100	0.0840	0.0226	0.1607	invg	2.0000
epsmu_c	0.100	0.1336	0.0209	0.3304	invg	2.0000
epsmu_d	0.100	0.0996	0.0229	0.1999	invg	2.0000
epsLTV	0.100	0.0875	0.0224	0.1734	invg	2.0000
epsd	0.100	0.0742	0.0247	0.1272	invg	2.0000
epsc_ast	0.100	0.0443	0.0232	0.0661	invg	2.0000
epsd_ast	0.100	0.0898	0.0235	0.1819	invg	2.0000
epsd_stern	0.100	0.5738	0.4098	0.7284	invg	2.0000
epss_c	0.100	1.1899	1.0205	1.3557	invg	2.0000
epsr	0.100	0.7516	0.3979	1.1132	invg	2.0000
epsyf	0.100	0.0752	0.0237	0.1298	invg	2.0000
epsn	0.010	0.8449	0.7414	0.9494	invg	0.1000
epspi_d	0.010	5.7280	5.0346	6.3852	invg	0.1000

```
Estimation::mcmc: Posterior (dsge) IRFs...
Estimation::mcmc: Posterior IRFs, done!
Estimation::mcmc: Forecasted variables (mean)
Estimation::mcmc: Forecasted variables (mean), done!
Estimation::mcmc: Forecasted variables (point)
Estimation::mcmc: Forecasted variables (point), done!

Loading 116 observations from data100.xlsx

Restricting the sample to observations 1 to 102. Using in total 102 observations.
Initial value of the log posterior (or likelihood): -1042.3538
-----------------
-----------------
f at the beginning of new iteration,      1042.3538195410
Predicted improvement:        0.004439237
lambda =          1; f =         1042.3479551
Norm of dx 0.00094226
----
Improvement on iteration 1 =        0.005864439
-----------------
-----------------
f at the beginning of new iteration,      1042.3479551016
Predicted improvement:        0.001643925
lambda =          1; f =         1042.3456480
lambda =     1.9332; f =         1042.3452641
Norm of dx 0.00078598
----
Improvement on iteration 2 =        0.002690960
-----------------
-----------------
f at the beginning of new iteration,      1042.3452641416
Predicted improvement:        0.000671745
lambda =          1; f =         1042.3442209
lambda =     1.9332; f =         1042.3437838
Norm of dx 0.00031548
----
Improvement on iteration 3 =        0.001480345
```

```
-----------------
-----------------
f at the beginning of new iteration,      1042.3437837961
Predicted improvement:        0.000361816
lambda =          1; f =         1042.3431593
lambda =     1.9332; f =         1042.3427547
lambda =     3.7372; f =         1042.3424592
Norm of dx 0.00049688
----
Improvement on iteration 4 =        0.001324588
-----------------
-----------------
f at the beginning of new iteration,      1042.3424592081
Predicted improvement:        0.000647063
lambda =          1; f =         1042.3413042
lambda =     1.9332; f =         1042.3404788
lambda =     3.7372; f =         1042.3395770
Norm of dx 0.00066133
----
Improvement on iteration 5 =        0.002882245
-----------------
-----------------
f at the beginning of new iteration,      1042.3395769634
Predicted improvement:        0.000455232
lambda =          1; f =         1042.3388336
lambda =     1.9332; f =         1042.3384410
Norm of dx  0.0011105
----
Improvement on iteration 6 =        0.001135951
-----------------
-----------------
f at the beginning of new iteration,      1042.3384410123
Predicted improvement:        0.000757508
lambda =          1; f =         1042.3371186
lambda =     1.9332; f =         1042.3362322
lambda =     3.7372; f =         1042.3354726
Norm of dx  0.0016384
----
Improvement on iteration 7 =        0.002968368
-----------------
-----------------
f at the beginning of new iteration,      1042.3354726443
Predicted improvement:        0.001124813
lambda =          1; f =         1042.3337615
lambda =     1.9332; f =         1042.3331355
Norm of dx  0.0010284
----
Improvement on iteration 8 =        0.002337186
-----------------
-----------------
f at the beginning of new iteration,      1042.3331354580
Predicted improvement:        0.000101422
lambda =          1; f =         1042.3329600
lambda =     1.9332; f =         1042.3328453
lambda =     3.7372; f =         1042.3327575
Norm of dx 0.00019992
----
Improvement on iteration 9 =        0.000377961
-----------------
-----------------
f at the beginning of new iteration,      1042.3327574970
Predicted improvement:        0.000222575
lambda =          1; f =         1042.3323509
```

```
lambda =     1.9332; f =         1042.3320420
lambda =     3.7372; f =         1042.3316373
Norm of dx 0.00058376
----
Improvement on iteration 10 =        0.001120210
-----------------
-----------------
f at the beginning of new iteration,      1042.3316372869
Predicted improvement:        0.000184934
lambda =          1; f =         1042.3314351
Norm of dx  0.0011437
----
Improvement on iteration 11 =        0.000202230
-----------------
-----------------
f at the beginning of new iteration,      1042.3314350567
Predicted improvement:        0.000015751
lambda =          1; f =         1042.3314070
lambda =     1.9332; f =         1042.3313868
lambda =     3.7372; f =         1042.3313645
Norm of dx 0.00014003
----
Improvement on iteration 12 =        0.000070509
-----------------
-----------------
f at the beginning of new iteration,      1042.3313645475
Predicted improvement:        0.000039811
lambda =          1; f =         1042.3312973
lambda =     1.9332; f =         1042.3312569
Norm of dx 0.00021084
----
Improvement on iteration 13 =        0.000107694
-----------------
-----------------
f at the beginning of new iteration,      1042.3312568540
Predicted improvement:        0.000055926
lambda =          1; f =         1042.3311744
lambda =     1.9332; f =         1042.3311505
Norm of dx 0.00037448
----
Improvement on iteration 14 =        0.000106382
-----------------
-----------------
f at the beginning of new iteration,      1042.3311504722
Predicted improvement:        0.000037893
lambda =          1; f =         1042.3310820
lambda =     1.9332; f =         1042.3310313
lambda =     3.7372; f =         1042.3309694
Norm of dx 0.00018387
----
Improvement on iteration 15 =        0.000181104
-----------------
-----------------
f at the beginning of new iteration,      1042.3309693678
Predicted improvement:        0.000024726
lambda =          1; f =         1042.3309406
Norm of dx 0.00043483
----
Improvement on iteration 16 =        0.000028721
-----------------
-----------------
f at the beginning of new iteration,      1042.3309406467
Predicted improvement:        0.000004714
```

```
lambda =          1; f =         1042.3309322
lambda =     1.9332; f =         1042.3309262
lambda =     3.7372; f =         1042.3309195
Norm of dx 0.00011555
----
Improvement on iteration 17 =        0.000021113
-----------------
-----------------
f at the beginning of new iteration,      1042.3309195332
Predicted improvement:        0.000016819
lambda =          1; f =         1042.3308874
lambda =     1.9332; f =         1042.3308603
lambda =     3.7372; f =         1042.3308156
lambda =     7.2247; f =         1042.3307584
Norm of dx 0.00022506
----
Improvement on iteration 18 =        0.000161149
-----------------
-----------------
f at the beginning of new iteration,      1042.3307583845
Predicted improvement:        0.000104561
lambda =          1; f =         1042.3306055
lambda =     1.9332; f =         1042.3305649
Norm of dx  0.0012642
----
Improvement on iteration 19 =        0.000193511
-----------------
-----------------
f at the beginning of new iteration,      1042.3305648734
Predicted improvement:        0.000020912
lambda =          1; f =         1042.3305364
Norm of dx 0.00041208
----
Improvement on iteration 20 =        0.000028515
-----------------
-----------------
f at the beginning of new iteration,      1042.3305363582
Predicted improvement:        0.000009749
lambda =          1; f =         1042.3305223
lambda =     1.9332; f =         1042.3305189
Norm of dx 0.00014315
----
Improvement on iteration 21 =        0.000017436
-----------------
-----------------
f at the beginning of new iteration,      1042.3305189220
Predicted improvement:        0.000006085
lambda =          1; f =         1042.3305079
lambda =     1.9332; f =         1042.3304997
lambda =     3.7372; f =         1042.3304898
Norm of dx 0.00016913
----
Improvement on iteration 22 =        0.000029081
-----------------
-----------------
f at the beginning of new iteration,      1042.3304898413
Predicted improvement:        0.000010235
lambda =          1; f =         1042.3304730
lambda =     1.9332; f =         1042.3304638
Norm of dx 0.00030844
----
Improvement on iteration 23 =        0.000026029
-----------------
```

```
-----------------
f at the beginning of new iteration,      1042.3304638121
Predicted improvement:        0.000017713
lambda =          1; f =         1042.3304339
lambda =     1.9332; f =         1042.3304159
lambda =     3.7372; f =         1042.3304078
Norm of dx 0.00038828
----
Improvement on iteration 24 =        0.000056048
-----------------
-----------------
f at the beginning of new iteration,      1042.3304077645
Predicted improvement:        0.000018544
lambda =          1; f =         1042.3303818
lambda =     1.9332; f =         1042.3303775
Norm of dx 0.00036916
----
Improvement on iteration 25 =        0.000030295
-----------------
-----------------
f at the beginning of new iteration,      1042.3303774699
Predicted improvement:        0.000001549
lambda =          1; f =         1042.3303757
Norm of dx 0.00019879
----
Improvement on iteration 26 =        0.000001758
-----------------
-----------------
f at the beginning of new iteration,      1042.3303757117
Predicted improvement:        0.000000234
lambda =          1; f =         1042.3303753
lambda =     1.9332; f =         1042.3303750
lambda =     3.7372; f =         1042.3303746
Norm of dx 3.4426e-05
----
Improvement on iteration 27 =        0.000001109
-----------------
-----------------
f at the beginning of new iteration,      1042.3303746022
Predicted improvement:        0.000001051
lambda =          1; f =         1042.3303726
lambda =     1.9332; f =         1042.3303710
lambda =     3.7372; f =         1042.3303685
lambda =     7.2247; f =         1042.3303662
Norm of dx 7.6048e-05
----
Improvement on iteration 28 =        0.000008404
-----------------
-----------------
f at the beginning of new iteration,      1042.3303661982
Predicted improvement:        0.000004482
lambda =          1; f =         1042.3303587
lambda =     1.9332; f =         1042.3303548
Norm of dx  0.0001877
----
Improvement on iteration 29 =        0.000011443
-----------------
-----------------
f at the beginning of new iteration,      1042.3303547555
Predicted improvement:        0.000001517
lambda =          1; f =         1042.3303527
Norm of dx 0.00014808
----
```

Improvement on iteration 30 = 0.000002060

---
f at the beginning of new iteration, 1042.3303526957
Predicted improvement: 0.000000762
lambda = 1; f = 1042.3303516
lambda = 1.9332; f = 1042.3303512
Norm of dx 9.497e-05

Improvement on iteration 31 = 0.000001497

---
f at the beginning of new iteration, 1042.3303511982
Predicted improvement: 0.000000944
lambda = 1; f = 1042.3303495
lambda = 1.9332; f = 1042.3303481
lambda = 3.7372; f = 1042.3303461
lambda = 7.2247; f = 1042.3303448
Norm of dx 2.8594e-05

Improvement on iteration 32 = 0.000006385

---
f at the beginning of new iteration, 1042.3303448136
Predicted improvement: 0.000001977
lambda = 1; f = 1042.3303411
lambda = 1.9332; f = 1042.3303382
lambda = 3.7372; f = 1042.3303338
lambda = 7.2247; f = 1042.3303301
Norm of dx 0.00013445

Improvement on iteration 33 = 0.000014677

---
f at the beginning of new iteration, 1042.3303301364
Predicted improvement: 0.000009234
lambda = 1; f = 1042.3303132
lambda = 1.9332; f = 1042.3303000
lambda = 3.7372; f = 1042.3302812
lambda = 7.2247; f = 1042.3302706
Norm of dx 0.00048589

Improvement on iteration 34 = 0.000059510

---
f at the beginning of new iteration, 1042.3302706264
Predicted improvement: 0.000005871
lambda = 1; f = 1042.3302633
Norm of dx 0.00050599

Improvement on iteration 35 = 0.000007360

---
f at the beginning of new iteration, 1042.3302632663
Predicted improvement: 0.000001520
lambda = 1; f = 1042.3302608
lambda = 1.9332; f = 1042.3302597
Norm of dx 7.5753e-05

Improvement on iteration 36 = 0.000003583

---
f at the beginning of new iteration, 1042.3302596830

```
Predicted improvement:        0.000002476
lambda =          1; f =         1042.3302551
lambda =     1.9332; f =         1042.3302512
lambda =     3.7372; f =         1042.3302452
lambda =     7.2247; f =         1042.3302385
Norm of dx 0.00014989
----
Improvement on iteration 37 =        0.000021147
-----------------
-----------------
f at the beginning of new iteration,      1042.3302385356
Predicted improvement:        0.000015734
lambda =          1; f =         1042.3302121
lambda =     1.9332; f =         1042.3301962
Norm of dx 0.00093382
----
Improvement on iteration 38 =        0.000042291
-----------------
-----------------
f at the beginning of new iteration,      1042.3301962444
Predicted improvement:        0.000012442
lambda =          1; f =         1042.3301820
Norm of dx  0.0010304
----
Improvement on iteration 39 =        0.000014237
-----------------
-----------------
f at the beginning of new iteration,      1042.3301820071
Predicted improvement:        0.000000542
lambda =          1; f =         1042.3301814
Norm of dx 0.00028955
----
Improvement on iteration 40 =        0.000000612
-----------------
-----------------
f at the beginning of new iteration,      1042.3301813948
Predicted improvement:        0.000000281
lambda =          1; f =         1042.3301809
lambda =     1.9332; f =         1042.3301805
lambda =     3.7372; f =         1042.3301800
Norm of dx  2.333e-05
----
Improvement on iteration 41 =        0.000001370
-----------------
-----------------
f at the beginning of new iteration,      1042.3301800249
Predicted improvement:        0.000000771
lambda =          1; f =         1042.3301787
lambda =     1.9332; f =         1042.3301779
lambda =     3.7372; f =         1042.3301775
Norm of dx 5.6325e-05
----
Improvement on iteration 42 =        0.000002572
-----------------
-----------------
f at the beginning of new iteration,      1042.3301774533
Predicted improvement:        0.000001185
lambda =          1; f =         1042.3301754
lambda =     1.9332; f =         1042.3301740
lambda =     3.7372; f =         1042.3301725
Norm of dx 5.1538e-05
----
Improvement on iteration 43 =        0.000004917
```

```
-----------------
-----------------
f at the beginning of new iteration,      1042.3301725366
Predicted improvement:        0.000003351
lambda =          1; f =         1042.3301664
lambda =     1.9332; f =         1042.3301615
lambda =     3.7372; f =         1042.3301548
lambda =     7.2247; f =         1042.3301513
Norm of dx 0.00021285
----
Improvement on iteration 44 =        0.000021232
-----------------
-----------------
f at the beginning of new iteration,      1042.3301513041
Predicted improvement:        0.000005551
lambda =          1; f =         1042.3301440
Norm of dx 0.00038003
----
Improvement on iteration 45 =        0.000007266
-----------------
-----------------
f at the beginning of new iteration,      1042.3301440382
Predicted improvement:        0.000000828
lambda =          1; f =         1042.3301429
Norm of dx 0.00028694
----
Improvement on iteration 46 =        0.000001104
-----------------
-----------------
f at the beginning of new iteration,      1042.3301429345
Predicted improvement:        0.000000189
lambda =          1; f =         1042.3301425
lambda =     1.9332; f =         1042.3301422
lambda =     3.7372; f =         1042.3301418
lambda =     7.2247; f =         1042.3301414
Norm of dx 8.3037e-05
----
Improvement on iteration 47 =        0.000001553
-----------------
-----------------
f at the beginning of new iteration,      1042.3301413814
Predicted improvement:        0.000001101
lambda =          1; f =         1042.3301392
lambda =     1.9332; f =         1042.3301374
lambda =     3.7372; f =         1042.3301342
lambda =     7.2247; f =         1042.3301294
lambda =     13.967; f =         1042.3301256
Norm of dx 0.00012499
----
Improvement on iteration 48 =        0.000015739
-----------------
-----------------
f at the beginning of new iteration,      1042.3301256425
Predicted improvement:        0.000006640
lambda =          1; f =         1042.3301150
lambda =     1.9332; f =         1042.3301098
Norm of dx 0.00040033
----
Improvement on iteration 49 =        0.000015826
-----------------
-----------------
f at the beginning of new iteration,      1042.3301098164
Predicted improvement:        0.000002519
```

```
lambda =          1; f =         1042.3301068
Norm of dx 0.00046382
----
Improvement on iteration 50 =        0.000003010
-----------------
-----------------
f at the beginning of new iteration,      1042.3301068061
Predicted improvement:        0.000000911
lambda =          1; f =         1042.3301056
Norm of dx 0.00030416
----
Improvement on iteration 51 =        0.000001221
-----------------
-----------------
f at the beginning of new iteration,      1042.3301055853
Predicted improvement:        0.000001782
lambda =          1; f =         1042.3301028
lambda =     1.9332; f =         1042.3301013
Norm of dx 0.00030326
----
Improvement on iteration 52 =        0.000004325
-----------------
-----------------
f at the beginning of new iteration,      1042.3301012608
Predicted improvement:        0.000004410
lambda =          1; f =         1042.3300945
lambda =     1.9332; f =         1042.3300914
Norm of dx 0.00065652
----
Improvement on iteration 53 =        0.000009817
-----------------
-----------------
f at the beginning of new iteration,      1042.3300914440
Predicted improvement:        0.000007393
lambda =          1; f =         1042.3300788
lambda =     1.9332; f =         1042.3300711
lambda =     3.7372; f =         1042.3300674
Norm of dx 0.00071957
----
Improvement on iteration 54 =        0.000024047
-----------------
-----------------
f at the beginning of new iteration,      1042.3300673971
Predicted improvement:        0.000002670
lambda =          1; f =         1042.3300639
Norm of dx 0.00040039
----
Improvement on iteration 55 =        0.000003498
-----------------
-----------------
f at the beginning of new iteration,      1042.3300638996
Predicted improvement:        0.000000844
lambda =          1; f =         1042.3300629
Norm of dx 0.00016066
----
Improvement on iteration 56 =        0.000001024
-----------------
-----------------
f at the beginning of new iteration,      1042.3300628754
Predicted improvement:        0.000000481
lambda =          1; f =         1042.3300622
Norm of dx 0.00021268
----
```

Improvement on iteration 57 =   0.000000645

---
f at the beginning of new iteration,   1042.3300622306
Predicted improvement: 0.000000253
lambda =   1; f =   1042.3300619
lambda =   1.9332; f =   1042.3300618
Norm of dx 0.00010525

Improvement on iteration 58 =   0.000000442

---
f at the beginning of new iteration,   1042.3300617889
Predicted improvement: 0.000000128
lambda =   1; f =   1042.3300616
lambda =   1.9332; f =   1042.3300614
lambda =   3.7372; f =   1042.3300613
Norm of dx 4.709e-05

Improvement on iteration 59 =   0.000000534

---
f at the beginning of new iteration,   1042.3300612549
Predicted improvement: 0.000000461
lambda =   1; f =   1042.3300604
lambda =   1.9332; f =   1042.3300598
lambda =   3.7372; f =   1042.3300587
lambda =   7.2247; f =   1042.3300577
Norm of dx 0.00010639

Improvement on iteration 60 =   0.000003513

---
f at the beginning of new iteration,   1042.3300577423
Predicted improvement: 0.000003144
lambda =   1; f =   1042.3300528
lambda =   1.9332; f =   1042.3300501
Norm of dx 0.00052766

Improvement on iteration 61 =   0.000007673

---
f at the beginning of new iteration,   1042.3300500691
Predicted improvement: 0.000003414
lambda =   1; f =   1042.3300471
Norm of dx 0.00059122

Improvement on iteration 62 =   0.000002995

---
f at the beginning of new iteration,   1042.3300470742
Predicted improvement: 0.000000196
lambda =   1; f =   1042.3300468
lambda =   1.9332; f =   1042.3300467
Norm of dx 6.5229e-05

Improvement on iteration 63 =   0.000000382

---
f at the beginning of new iteration,   1042.3300466923
Predicted improvement: 0.000000176
lambda =   1; f =   1042.3300465
Norm of dx 9.9302e-05

```
----
Improvement on iteration 64 =        0.000000219
-----------------
-----------------
f at the beginning of new iteration,      1042.3300464736
Predicted improvement:        0.000000681
lambda =          1; f =         1042.3300453
lambda =     1.9332; f =         1042.3300444
lambda =     3.7372; f =         1042.3300432
Norm of dx 9.6124e-05
----
Improvement on iteration 65 =        0.000003232
-----------------
-----------------
f at the beginning of new iteration,      1042.3300432419
Predicted improvement:        0.000003065
lambda =          1; f =         1042.3300380
lambda =     1.9332; f =         1042.3300346
lambda =     3.7372; f =         1042.3300319
Norm of dx 0.00031936
----
Improvement on iteration 66 =        0.000011297
-----------------
-----------------
f at the beginning of new iteration,      1042.3300319451
Predicted improvement:        0.000005528
lambda =          1; f =         1042.3300232
lambda =     1.9332; f =         1042.3300192
Norm of dx 0.00045173
----
Improvement on iteration 67 =        0.000012743
-----------------
-----------------
f at the beginning of new iteration,      1042.3300192019
Predicted improvement:        0.000002724
lambda =          1; f =         1042.3300149
lambda =     1.9332; f =         1042.3300131
Norm of dx 0.00073707
----
Improvement on iteration 68 =        0.000006081
-----------------
-----------------
f at the beginning of new iteration,      1042.3300131206
Predicted improvement:        0.000002245
lambda =          1; f =         1042.3300099
lambda =     1.9332; f =         1042.3300090
Norm of dx  0.0011491
----
Improvement on iteration 69 =        0.000004152
-----------------
-----------------
f at the beginning of new iteration,      1042.3300089686
Predicted improvement:        0.000000646
lambda =          1; f =         1042.3300088
lambda =    0.33333; f =         1042.3300088
Norm of dx 0.00047361
----
Improvement on iteration 70 =        0.000000205
-----------------
-----------------
f at the beginning of new iteration,      1042.3300087636
Predicted improvement:        0.000000605
lambda =          1; f =         1042.3300087
```

```
lambda =    0.33333; f =         1042.3300085
Norm of dx 0.00046585
----
Improvement on iteration 71 =        0.000000238
-----------------
-----------------
f at the beginning of new iteration,      1042.3300085251
Predicted improvement:        0.000000273
lambda =          1; f =         1042.3300086
lambda =    0.33333; f =         1042.3300085
Norm of dx 0.00036419
----
Improvement on iteration 72 =        0.000000057
improvement < crit termination
Objective function at mode: 1042.330008

RESULTS FROM POSTERIOR ESTIMATION
parameters
         prior mean     mode    s.d. prior pstdev

rho_a_c      0.500   0.2064  0.0780 beta  0.2000
rho_a_d      0.500   0.5000  0.2774 beta  0.2000
rho_mu_c     0.500   0.5001  0.2774 beta  0.2000
rho_mu_d     0.500   0.5000  0.2774 beta  0.2000
rho_LTV      0.500   0.4953  0.2750 beta  0.2000
rho_d        0.500   0.5113  0.2766 beta  0.2000
rho_d_stern   0.500   0.8985  0.0168 beta  0.2000
rho_c_ast    0.500   0.6433  0.2482 beta  0.2000
rho_d_ast    0.500   0.5000  0.2773 beta  0.2000
rho_s_c      0.500   0.4108  0.0980 beta  0.2000
rho_r        0.500   0.6778  0.0922 beta  0.2000
rho_p       -0.500  -0.4976  0.2000 norm  0.2000
theta_c      0.750   0.2702  0.0704 beta  0.1500
sigma        1.000   1.9094  0.1084 norm  0.3700
phi          2.000   5.3914  0.8173 gamm  0.7000
omega        0.200   0.1018  0.0644 beta  0.1000
h_c          0.500   0.2936  0.0520 beta  0.1000
alpha_c      0.500   0.3954  0.0296 beta  0.1000

standard deviation of shocks
         prior mean     mode    s.d. prior pstdev

epsa_c       0.100   2.3608  0.1714 invg  2.0000
epsa_d       0.100   0.0462  0.0189 invg  2.0000
epsmu_c      0.100   0.0461  0.0188 invg  2.0000
epsmu_d      0.100   0.0461  0.0188 invg  2.0000
epsLTV       0.100   0.0461  0.0188 invg  2.0000
epsd         0.100   0.0457  0.0183 invg  2.0000
epsc_ast     0.100   0.0376  0.0115 invg  2.0000
epsd_ast     0.100   0.0461  0.0188 invg  2.0000
epsd_stern   0.100   0.6037  0.1016 invg  2.0000
epss_c       0.100   1.1533  0.0949 invg  2.0000
epsr         0.100   0.6227  0.1834 invg  2.0000
epsyf        0.100   0.0460  0.0186 invg  2.0000
epsn         0.010   0.8284  0.0613 invg  0.1000
epspi_d      0.010   5.6340  0.4003 invg  0.1000


Log data density [Laplace approximation] is -1096.443776.

Estimation::mcmc: Multiple chains mode.
Estimation::mcmc: Searching for initial values...
Estimation::mcmc: Initial values found!
```

```
Estimation::mcmc: Write details about the MCMC... Ok!
Estimation::mcmc: Details about the MCMC are available in
code_102/metropolis\code_mh_history_0.mat


Estimation::mcmc: Number of mh files: 55 per block.
Estimation::mcmc: Total number of generated files: 110.
Estimation::mcmc: Total number of iterations: 200000.
Estimation::mcmc: Current acceptance ratio per chain:
                                                    Chain  1: 33.2513%
                                                    Chain  2: 33.2983%
Estimation::mcmc::diagnostics: Univariate convergence diagnostic, Brooks and Gelman
(1998):
    Parameter 1...  Done!
    Parameter 2...  Done!
    Parameter 3...  Done!
    Parameter 4...  Done!
    Parameter 5...  Done!
    Parameter 6...  Done!
    Parameter 7...  Done!
    Parameter 8...  Done!
    Parameter 9...  Done!
    Parameter 10...  Done!
    Parameter 11...  Done!
    Parameter 12...  Done!
    Parameter 13...  Done!
    Parameter 14...  Done!
    Parameter 15...  Done!
    Parameter 16...  Done!
    Parameter 17...  Done!
    Parameter 18...  Done!
    Parameter 19...  Done!
    Parameter 20...  Done!
    Parameter 21...  Done!
    Parameter 22...  Done!
    Parameter 23...  Done!
    Parameter 24...  Done!
    Parameter 25...  Done!
    Parameter 26...  Done!
    Parameter 27...  Done!
    Parameter 28...  Done!
    Parameter 29...  Done!
    Parameter 30...  Done!
    Parameter 31...  Done!
    Parameter 32...  Done!

Estimation::mcmc: Total number of MH draws: 200000.
Estimation::mcmc: Total number of generated MH files: 55.
Estimation::mcmc: I'll use mh-files 28 to 55.
Estimation::mcmc: In MH-file number 28 I'll start at line 721.
Estimation::mcmc: Finally I keep 100000 draws.

Estimation::marginal density: I'm computing the posterior mean and covariance...
Done!
Estimation::marginal density: I'm computing the posterior log marginal density
(modified harmonic mean)... Done!


ESTIMATION RESULTS

Log data density is -1094.894599.
posterior_moments: There are not enough draws computes to compute HPD Intervals.
```

```
Skipping their computation.
posterior_moments: There are not enough draws computes to compute deciles. Skipping
their computation.

parameters
             prior mean   post. mean        90% HPD interval    prior       pstdev

rho_a_c           0.500       0.2136      0.0900      0.3336   beta        0.2000
rho_a_d           0.500       0.4953      0.1622      0.8243   beta        0.2000
rho_mu_c          0.500       0.5075      0.1836      0.8408   beta        0.2000
rho_mu_d          0.500       0.4994      0.1767      0.8299   beta        0.2000
rho_LTV           0.500       0.5025      0.1760      0.8301   beta        0.2000
rho_d             0.500       0.5211      0.1982      0.8503   beta        0.2000
rho_d_stern        0.500       0.8972      0.8701      0.9247   beta        0.2000
rho_c_ast         0.500       0.6353      0.3482      0.9391   beta        0.2000
rho_d_ast         0.500       0.4990      0.1668      0.8158   beta        0.2000
rho_s_c           0.500       0.4129      0.2502      0.5682   beta        0.2000
rho_r             0.500       0.6164      0.4412      0.7952   beta        0.2000
rho_p            -0.500      -0.4970     -0.8200     -0.1667   norm        0.2000
theta_c           0.750       0.2655      0.1575      0.3720   beta        0.1500
sigma             1.000       1.9554      1.7699      2.1301   norm        0.3700
phi               2.000       5.5462      4.1540      6.8681   gamma       0.7000
omega             0.200       0.1283      0.0268      0.2234   beta        0.1000
h_c               0.500       0.2840      0.2004      0.3658   beta        0.1000
alpha_c           0.500       0.3962      0.3477      0.4447   beta        0.1000

standard deviation of shocks
             prior mean   post. mean        90% HPD interval    prior       pstdev

epsa_c            0.100       2.4051      2.1134      2.7001   invg        2.0000
epsa_d            0.100       0.0891      0.0245      0.1624   invg        2.0000
epsmu_c           0.100       0.0897      0.0218      0.1641   invg        2.0000
epsmu_d           0.100       0.0751      0.0233      0.1317   invg        2.0000
epsLTV            0.100       0.0919      0.0235      0.1690   invg        2.0000
epsd              0.100       0.0748      0.0237      0.1322   invg        2.0000
epsc_ast          0.100       0.0444      0.0222      0.0664   invg        2.0000
epsd_ast          0.100       0.0836      0.0234      0.1457   invg        2.0000
epsd_stern        0.100       0.5727      0.4126      0.7207   invg        2.0000
epss_c            0.100       1.1735      1.0108      1.3321   invg        2.0000
epsr              0.100       0.7528      0.3812      1.0991   invg        2.0000
epsyf             0.100       0.0774      0.0256      0.1361   invg        2.0000
epsn              0.010       0.8453      0.7411      0.9484   invg        0.1000
epspi_d           0.010       5.7121      5.0418      6.3770   invg        0.1000
Estimation::mcmc: Posterior (dsge) IRFs...
Estimation::mcmc: Posterior IRFs, done!
Estimation::mcmc: Forecasted variables (mean)
Estimation::mcmc: Forecasted variables (mean), done!
Estimation::mcmc: Forecasted variables (point)
Estimation::mcmc: Forecasted variables (point), done!
{ Error using <a href="matlab:helpUtils.errorDocCallback('drawnow')"
style="font-weight:bold">drawnow</a>
UIJ_AreThereWindowShowsPending - timeout waiting for window to show up

Error in <a href="matlab:helpUtils.errorDocCallback('prepare', 'C:\Program
Files\MATLAB\R2014a\toolbox\matlab\graphics\private\prepare.m', 43)"
style="font-weight:bold">prepare</a> (<a href="matlab: opentoline('C:\Program
Files\MATLAB\R2014a\toolbox\matlab\graphics\private\prepare.m',43,0)">line 43</a>)
        drawnow

Error in <a href="matlab:helpUtils.errorDocCallback('print>LocalPrint', 'C:\Program
Files\MATLAB\R2014a\toolbox\matlab\graphics\print.m', 264)"
style="font-weight:bold">print>LocalPrint</a> (<a href="matlab:
opentoline('C:\Program
```

```
Files\MATLAB\R2014a\toolbox\matlab\graphics\print.m',264,0)">line 264</a>)
        pj = prepare( pj, h );

Error in <a href="matlab:helpUtils.errorDocCallback('print', 'C:\Program
Files\MATLAB\R2014a\toolbox\matlab\graphics\print.m', 233)"
style="font-weight:bold">print</a> (<a href="matlab: opentoline('C:\Program
Files\MATLAB\R2014a\toolbox\matlab\graphics\print.m',233,0)">line 233</a>)
    LocalPrint(pj);

Error in <a href="matlab:helpUtils.errorDocCallback('dyn_saveas',
'C:\dynare\4.4.3\matlab\dyn_saveas.m', 41)" style="font-weight:bold">dyn_saveas</a>
(<a href="matlab: opentoline('C:\dynare\4.4.3\matlab\dyn_saveas.m',41,0)">line
41</a>)
    print(h,'-depsc2',[fname,'.eps'])

Error in <a href="matlab:helpUtils.errorDocCallback('dynare_estimation_1',
'C:\dynare\4.4.3\matlab\dynare_estimation_1.m', 919)"
style="font-weight:bold">dynare_estimation_1</a> (<a href="matlab:
opentoline('C:\dynare\4.4.3\matlab\dynare_estimation_1.m',919,0)">line 919</a>)
            dyn_saveas(fh,[M_.fname '_SmoothedShocks' int2str(plt)],options_);

Error in <a href="matlab:helpUtils.errorDocCallback('dynare_estimation',
'C:\dynare\4.4.3\matlab\dynare_estimation.m', 77)"
style="font-weight:bold">dynare_estimation</a> (<a href="matlab:
opentoline('C:\dynare\4.4.3\matlab\dynare_estimation.m',77,0)">line 77</a>)
        dynare_estimation_1(var_list,M_.dname);

Error in <a href="matlab:helpUtils.errorDocCallback('code',
'C:\Users\English\Desktop\forecasting no news shock\code.m', 526)"
style="font-weight:bold">code</a> (<a href="matlab:
opentoline('C:\Users\English\Desktop\forecasting no news shock\code.m',526,0)">line
526</a>)
dynare_estimation(var_list_);

Error in <a href="matlab:helpUtils.errorDocCallback('dynare',
'C:\dynare\4.4.3\matlab\dynare.m', 180)" style="font-weight:bold">dynare</a> (<a
href="matlab: opentoline('C:\dynare\4.4.3\matlab\dynare.m',180,0)">line 180</a>)
evalin('base',fname) ;
}
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