```
********************************************************************************
********************************************************************************
               MONTE CARLO EXPERIMENT #          5.000
********************************************************************************
********************************************************************************

********************************************************************************
   COMPUTING A MPE OF THE DYNAMIC GAME
********************************************************************************

--------------------------------------------------------------------------------
       Values of the structural parameters

                       Fixed cost firm 1   =          -1.900
                       Fixed cost firm 2   =          -1.800
                       Fixed cost firm 3   =          -1.700
                       Fixed cost firm 4   =          -1.600
                       Fixed cost firm 5   =          -1.500
       Parameter of market size (theta_rs) =           1.000
Parameter of competition effect (theta_rn) =           1.000
                     Entry cost (theta_ec) =           2.000
                       Discount factor     =          0.9500
                    Std. Dev. epsilons     =           1.000

--------------------------------------------------------------------------------

       BEST RESPONSE MAPPING ITERATIONS

         Best response mapping iteration  =          1.000
         Convergence criterion =           1000.

         Best response mapping iteration  =          2.000
         Convergence criterion =          0.9774

         Best response mapping iteration  =          3.000
         Convergence criterion =          0.3539

         Best response mapping iteration  =          4.000
         Convergence criterion =          0.1535

         Best response mapping iteration  =          5.000
         Convergence criterion =         0.08525

         Best response mapping iteration  =          6.000
         Convergence criterion =         0.04840

         Best response mapping iteration  =          7.000
         Convergence criterion =         0.02597

         Best response mapping iteration  =          8.000
         Convergence criterion =         0.01382

         Best response mapping iteration  =          9.000
```

```
Convergence criterion =        0.007230

Best response mapping iteration  =          10.00
Convergence criterion =        0.003758

Best response mapping iteration  =          11.00
Convergence criterion =        0.001940

Best response mapping iteration  =          12.00
Convergence criterion =       0.0009990

Best response mapping iteration  =          13.00
Convergence criterion =       0.0005136

Best response mapping iteration  =          14.00
Convergence criterion =       0.0002690

Best response mapping iteration  =          15.00
Convergence criterion =       0.0001419

Best response mapping iteration  =          16.00
Convergence criterion =      7.470e-005

Best response mapping iteration  =          17.00
Convergence criterion =      3.926e-005

Best response mapping iteration  =          18.00
Convergence criterion =      2.061e-005

Best response mapping iteration  =          19.00
Convergence criterion =      1.081e-005

--------------------------------------------------------------------------------
CONVERGENCE ACHIEVED AFTER           20.00 BEST RESPONSE ITERATIONS
--------------------------------------------------------------------------------
EQUILIBRIUM PROBABILITIES

0.05919         0.06836         0.07944         0.09291
 0.1094
0.04754         0.05480         0.06354         0.07414
 0.4864
0.04861         0.05606         0.06502          0.4407
0.08923
0.04165         0.04796         0.05555          0.3837
 0.4338
0.04962         0.05723          0.3984         0.07757
0.09121
0.04227         0.04868          0.3441         0.06576
 0.4396
0.04302         0.04956          0.3498          0.3954
0.07868
0.03799         0.04372          0.3123          0.3535
 0.4005
```

0.05054 0.3595 0.06770 0.07910
0.09304
0.04283 0.3085 0.05717 0.06667
0.4448
0.04361 0.3137 0.05825 0.4004
0.07984
0.03840 0.2790 0.05116 0.3569
0.4043
0.04432 0.3185 0.3597 0.06915
0.08126
0.03888 0.2822 0.3190 0.06040
0.4090
0.03946 0.2862 0.3235 0.3662
0.07204
0.03548 0.2594 0.2935 0.3326
0.3774
0.3242 0.05932 0.06887 0.08048
0.09469
0.2766 0.04992 0.05785 0.06748
0.4495
0.2814 0.05087 0.05898 0.4048
0.08086
0.2494 0.04460 0.05164 0.3600
0.4077
0.2858 0.05174 0.3638 0.07006
0.08234
0.2524 0.04519 0.3218 0.06100
0.4125
0.2560 0.04590 0.3264 0.3695
0.07279
0.2315 0.04114 0.2956 0.3350
0.3801
0.2898 0.3268 0.06095 0.07117
0.08367
0.2550 0.2877 0.05295 0.06172
0.4168
0.2588 0.2919 0.05382 0.3735
0.07370
0.2335 0.2636 0.04806 0.3379
0.3833
0.2621 0.2958 0.3343 0.06370
0.07482
0.2360 0.2663 0.3013 0.05665
0.3873
0.2389 0.2697 0.3051 0.3457
0.06743
0.2188 0.2471 0.2797 0.3172
0.3603
0.1405 0.1642 0.1924 0.2258
0.2650
0.1135 0.1325 0.1551 0.1820
0.7449
0.1146 0.1338 0.1567 0.7025

0.2161
0.09670 0.1128 0.1320 0.6383
0.6879
0.1159 0.1354 0.6580 0.1863
0.2190
0.09777 0.1141 0.5918 0.1568
0.6923
0.09872 0.1152 0.5958 0.6469
0.1863
0.08581 0.1000 0.5436 0.5946
0.6454
0.1175 0.6123 0.1609 0.1889
0.2221
0.09891 0.5455 0.1352 0.1587
0.6968
0.09987 0.5493 0.1366 0.6516
0.1887
0.08669 0.4976 0.1183 0.5985
0.6493
0.1010 0.5537 0.6050 0.1623
0.1910
0.08757 0.5013 0.5513 0.1404
0.6533
0.08839 0.5048 0.5550 0.6064
0.1670
0.07838 0.4630 0.5116 0.5622
0.6134
0.5665 0.1392 0.1632 0.1917
0.2253
0.5002 0.1168 0.1368 0.1607
0.7013
0.5039 0.1180 0.1382 0.6562
0.1910
0.4535 0.1021 0.1195 0.6023
0.6531
0.5080 0.1193 0.6097 0.1643
0.1933
0.4570 0.1032 0.5551 0.1419
0.6571
0.4602 0.1042 0.5589 0.6103
0.1687
0.4201 0.09217 0.5147 0.5654
0.6167
0.5125 0.5629 0.1416 0.1664
0.1958
0.4606 0.5088 0.1221 0.1435
0.6612
0.4639 0.5123 0.1234 0.6144
0.1706
0.4230 0.4692 0.1089 0.5689
0.6202
0.4675 0.5162 0.5670 0.1466
0.1726

0.4261	0.4724	0.5216	0.1292
0.6239			
0.4290	0.4756	0.5250	0.5761
0.1536			
0.3955	0.4399	0.4875	0.5376
0.5889			
0.3004	0.3434	0.3898	0.4386
0.4884			
0.2699	0.3095	0.3526	0.3986
0.8836			
0.2685	0.3080	0.3510	0.8618
0.4445			
0.2414	0.2776	0.3175	0.8378
0.8618			
0.2676	0.3070	0.8364	0.3958
0.4435			
0.2409	0.2770	0.8096	0.3599
0.8615			
0.2400	0.2760	0.8088	0.8368
0.4041			
0.2165	0.2496	0.7817	0.8125
0.8394			
0.2672	0.8073	0.3496	0.3955
0.4431			
0.2408	0.7778	0.3169	0.3599
0.8616			
0.2399	0.7769	0.3158	0.8369
0.4042			
0.2167	0.7474	0.2867	0.8128
0.8397			
0.2394	0.7765	0.8085	0.3583
0.4037			
0.2165	0.7472	0.7819	0.3268
0.8397			
0.2160	0.7466	0.7814	0.8123
0.3692			
0.1960	0.7178	0.7549	0.7883
0.8179			
0.7747	0.3068	0.3499	0.3958
0.4435			
0.7428	0.2774	0.3174	0.3606
0.8621			
0.7417	0.2765	0.3164	0.8374
0.4049			
0.7101	0.2505	0.2875	0.8135
0.8404			
0.7412	0.2760	0.8091	0.3590
0.4044			
0.7099	0.2503	0.7827	0.3277
0.8403			
0.7091	0.2497	0.7821	0.8130
0.3701			
0.6786	0.2272	0.7558	0.7892

0.8187			
0.7412	0.7771	0.3159	0.3590
0.4045			
0.7102	0.7483	0.2876	0.3280
0.8406			
0.7095	0.7477	0.2870	0.8133
0.3705			
0.6792	0.7194	0.2619	0.7897
0.8192			
0.7093	0.7476	0.7824	0.3272
0.3704			
0.6793	0.7195	0.7565	0.2999
0.8193			
0.6789	0.7191	0.7562	0.7896
0.3405			
0.6501	0.6918	0.7308	0.7664
0.7982			
0.5500	0.5919	0.6315	0.6683
0.7020			
0.5324	0.5745	0.6145	0.6519
0.9469			
0.5306	0.5727	0.6128	0.9386
0.6849			
0.5127	0.5549	0.5953	0.9339
0.9424			
0.5288	0.5709	0.9288	0.6486
0.6833			
0.5109	0.5531	0.9234	0.6317
0.9420			
0.5091	0.5513	0.9228	0.9330
0.6656			
0.4909	0.5331	0.9170	0.9279
0.9372			
0.5269	0.9171	0.6093	0.6469
0.6817			
0.5091	0.9109	0.5918	0.6300
0.9416			
0.5073	0.9103	0.5901	0.9325
0.6640			
0.4892	0.9037	0.5722	0.9275
0.9368			
0.5056	0.9097	0.9218	0.6267
0.6625			
0.4875	0.9030	0.9159	0.6093
0.9364			
0.4858	0.9024	0.9154	0.9265
0.6442			
0.4675	0.8952	0.9091	0.9210
0.9311			
0.9033	0.5673	0.6076	0.6453
0.6802			
0.8962	0.5496	0.5902	0.6284
0.9413			

0.8955	0.5479	0.5885	0.9321
0.6625			
0.8880	0.5298	0.5706	0.9270
0.9364			
0.8948	0.5461	0.9213	0.6252
0.6610			
0.8872	0.5281	0.9154	0.6078
0.9360			
0.8865	0.5264	0.9149	0.9261
0.6428			
0.8784	0.5081	0.9086	0.9206
0.9308			
0.8941	0.9085	0.5851	0.6236
0.6595			
0.8865	0.9018	0.5673	0.6063
0.9356			
0.8858	0.9012	0.5657	0.9256
0.6413			
0.8777	0.8940	0.5475	0.9201
0.9304			
0.8851	0.9006	0.9138	0.6031
0.6398			
0.8769	0.8934	0.9075	0.5853
0.9299			
0.8762	0.8928	0.9070	0.9191
0.6211			
0.8675	0.8851	0.9002	0.9132
0.9243			
0.7803	0.8029	0.8231	0.8412
0.8573			
0.7752	0.7982	0.8188	0.8372
0.9781			
0.7746	0.7976	0.8183	0.9752
0.8533			
0.7693	0.7927	0.8137	0.9745
0.9773			
0.7739	0.7970	0.9719	0.8362
0.8528			
0.7686	0.7921	0.9711	0.8321
0.9773			
0.7680	0.7915	0.9710	0.9743
0.8485			
0.7625	0.7864	0.9701	0.9735
0.9765			
0.7732	0.9681	0.8171	0.8357
0.8523			
0.7678	0.9671	0.8126	0.8315
0.9772			
0.7672	0.9670	0.8120	0.9742
0.8480			
0.7617	0.9660	0.8073	0.9734
0.9764			
0.7666	0.9668	0.9707	0.8305

```
        0.8476
        0.7610          0.9658          0.9698          0.8261
        0.9763
        0.7604          0.9657          0.9697          0.9732
        0.8431
        0.7547          0.9646          0.9688          0.9724
        0.9755
        0.9635          0.7956          0.8164          0.8351
        0.8517
        0.9624          0.7907          0.8119          0.8309
        0.9771
        0.9623          0.7901          0.8114          0.9741
        0.8475
        0.9612          0.7850          0.8066          0.9733
        0.9763
        0.9622          0.7895          0.9706          0.8299
        0.8470
        0.9610          0.7843          0.9697          0.8255
        0.9762
        0.9609          0.7837          0.9696          0.9731
        0.8425
        0.9597          0.7784          0.9686          0.9722
        0.9754
        0.9620          0.9666          0.8102          0.8293
        0.8465
        0.9608          0.9655          0.8054          0.8249
        0.9761
        0.9607          0.9654          0.8048          0.9730
        0.8420
        0.9595          0.9643          0.7999          0.9721
        0.9753
        0.9606          0.9653          0.9694          0.8239
        0.8415
        0.9593          0.9642          0.9684          0.8193
        0.9752
        0.9592          0.9641          0.9683          0.9719
        0.8368
        0.9579          0.9629          0.9673          0.9710
        0.9743
--------------------------------------------------------------------------------
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********************************************************************************
   DESCRIPTIVE STATISTICS FROM THE EQUILIBRIUM
   BASED ON      5.000e+004 OBSERVATIONS

   TABLE 2 OF THE PAPER AGUIRREGABIRIA AND MIRA (2007)
********************************************************************************



--------------------------------------------------------------------------------
       (1)    Average number of active firms   =          2.797
--------------------------------------------------------------------------------
```

```
      (2)    Std. Dev. number of firms        =           1.776
--------------------------------------------------------------------------------
      (3)    Regression N[t] on N[t-1]        =          0.8192
--------------------------------------------------------------------------------
      (4)    Average number of entrants       =          0.4695
--------------------------------------------------------------------------------
      (5)    Average number of exits          =          0.4614
--------------------------------------------------------------------------------
      (6)    Excess turnover (in # of firms)  =          0.2076
--------------------------------------------------------------------------------
      (7)    Correlation entries and exits    =         -0.1445
--------------------------------------------------------------------------------
      (8)    Frequencies of being active      =
         0.4892
         0.5238
         0.5578
         0.5922
         0.6342
--------------------------------------------------------------------------------


********************************************************************************
       MONTE CARLO EXPERIMENT #          5.000
********************************************************************************

     Replication =           1.000
         (a)     Simulations of x's and a's
         (b.1)   Estimation of initial CCPs (Non-Parametric)
         (b.2)   NPL algorithm using frequency estimates as initial CCPs
         (c.1)   Estimation of initial CCPs (Semi-Parametric: Logit)
         (c.2)   NPL algorithm using Logit estimates as initial CCPs
         (d.1)   Estimation of initial CCPs (Completely Random)
         (d.2)   NPL algorithm using U(0,1) random draws as initial CCPs
         (e)     NPL algorithm using true values as initial CCPs
     Replication =         2.00000
         (a)     Simulations of x's and a's
         (b.1)   Estimation of initial CCPs (Non-Parametric)
         (b.2)   NPL algorithm using frequency estimates as initial CCPs
         (c.1)   Estimation of initial CCPs (Semi-Parametric: Logit)
         (c.2)   NPL algorithm using Logit estimates as initial CCPs
         (d.1)   Estimation of initial CCPs (Completely Random)
         (d.2)   NPL algorithm using U(0,1) random draws as initial CCPs
         (e)     NPL algorithm using true values as initial CCPs

...

     Replication =         999.000
         (a)     Simulations of x's and a's
         (b.1)   Estimation of initial CCPs (Non-Parametric)
         (b.2)   NPL algorithm using frequency estimates as initial CCPs
         (c.1)   Estimation of initial CCPs (Semi-Parametric: Logit)
         (c.2)   NPL algorithm using Logit estimates as initial CCPs
         (d.1)   Estimation of initial CCPs (Completely Random)
```

```
     (d.2)   NPL algorithm using U(0,1) random draws as initial CCPs
     (e)     NPL algorithm using true values as initial CCPs
 Replication =        1000.00
     (a)     Simulations of x's and a's
     (b.1)   Estimation of initial CCPs (Non-Parametric)
     (b.2)   NPL algorithm using frequency estimates as initial CCPs
     (c.1)   Estimation of initial CCPs (Semi-Parametric: Logit)
     (c.2)   NPL algorithm using Logit estimates as initial CCPs
     (d.1)   Estimation of initial CCPs (Completely Random)
     (d.2)   NPL algorithm using U(0,1) random draws as initial CCPs
     (e)     NPL algorithm using true values as initial CCPs

      Number of Re-drawings due to Multicollinearity =       0.000000
```

****
MONTE CARLO EXPERIMENT #   5.00000
EMPIRICAL MEANS AND STANDARD ERRORS

TABLE 4 OF THE PAPER AGUIRREGABIRIA AND MIRA (2007)
****

	theta_fc_1	theta_rs	theta_rn	theta_ec
TRUE VALUES	-1.90000	1.00000	1.00000	2.00000
MEAN 2step-True	-1.90764	1.00529	1.00955	2.01188
MEDIAN 2step-True	-1.90619	1.00112	0.993494	2.00937
S.E. 2step-True	0.173863	0.145032	0.368283	0.130411
MEAN 2step-Freq	-0.839605	0.373028	0.168087	1.58662
MEDIAN 2step-Freq	-0.828811	0.366443	0.144167	1.58399
S.E. 2step-Freq	0.215259	0.128743	0.290008	0.147825
MEAN NPL-Freq	-1.92130	1.01631	1.03067	2.00336

MEDIAN NPL-Freq	-1.91981	1.00364	0.985501	1.99970
S.E. NPL-Freq	0.197466	0.180926	0.445842	0.134831

MEAN 2step-Logit	-1.91779	0.996678	0.976926	2.00535
MEDIAN 2step-Logit	-1.91490	0.985050	0.938724	2.00067
S.E. 2step-Logit	0.198603	0.170397	0.414252	0.135413

MEAN NPL-Logit	-1.92116	1.01644	1.03100	2.00339
MEDIAN NPL-Logit	-1.91981	1.00364	0.985501	1.99970
S.E. NPL-Logit	0.197322	0.181282	0.446739	0.134798

MEAN 2step-Random	-1.91779	0.996678	0.976926	2.00535
MEDIAN 2step-Rando	-1.91490	0.985050	0.938724	2.00067
S.E. 2step-Random	0.198603	0.170397	0.414252	0.135413

MEAN NPL-Random	-1.92118	1.01644	1.03098	2.00338
MEDIAN NPL-Random	-1.91981	1.00364	0.985501	1.99970
S.E. NPL-Random	0.197346	0.181307	0.446721	0.134791

****

MONTE CARLO EXPERIMENT # 5.00000
SQUARE-ROOT MEAN SQUARE ERRORS
RATIOS OVER THE SQUARE-ROOT MSE OF THE 2-STEP PML USING THE TRUE CCPs

TABLE 5 OF THE PAPER AGUIRREGABIRIA AND MIRA (2007)

****

	theta_fc_1	theta_rs	theta_rn	theta_ec
SQ-MSE 2-step-TRUE	0.174030	0.145128	0.368406	0.130951
RATIO: 2step-Freq	6.21744	4.41027	2.39142	3.35254
RATIO: NPL-Freq	1.14125	1.25172	1.21305	1.02994
RATIO: 2step-Logit	1.14577	1.17434	1.12619	1.03488
RATIO: NPL-Logit	1.14033	1.25424	1.21554	1.02970
RATIO: 2step-Rando	6.33776	0.525217	2.86358	1.02274
RATIO: NPL-Random	1.14049	1.25442	1.21549	1.02964