Supplementary information

S1. Regression models for actual and expected output calculation

```
-> sector = 1

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.0197
Iteration 2:  rho = 0.0217
Iteration 3:  rho = 0.0219
Iteration 4:  rho = 0.0219
Iteration 5:  rho = 0.0219
Iteration 6:  rho = 0.0219

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =    135.68
       Model |  .062290478         1  .062290478   Prob > F        =    0.0000
    Residual |  .008263947        18  .000459108   R-squared       =    0.8829
-------------+----------------------------------   Adj R-squared   =    0.8764
       Total |  .070554425        19  .003713391   Root MSE        =    .02143

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnxzlag1 |  -.9339839   .0803009   -11.63   0.000     -1.10269   -.765278
       _cons |  -.0019495    .006633    -0.29   0.772     -.015885   .0119859
-------------+----------------------------------------------------------------
         rho |   .0219109
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.828153
Durbin-Watson statistic (transformed) 1.853269

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-------------
-> sector = 2

Iteration 0:  rho = 0.0000
```

```
Iteration 1:  rho = -0.2618
Iteration 2:  rho = -0.3429
Iteration 3:  rho = -0.3551
Iteration 4:  rho = -0.3566
Iteration 5:  rho = -0.3568
Iteration 6:  rho = -0.3568
Iteration 7:  rho = -0.3568
Iteration 8:  rho = -0.3568

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS       df       MS              Number of obs =      20
-------------+------------------------------           F(1, 18)      =   45.36
       Model |  .195947908     1  .195947908           Prob > F      =  0.0000
    Residual |  .077759205    18  .004319956           R-squared     =  0.7159
-------------+------------------------------           Adj R-squared =  0.7001
       Total |  .273707113    19  .014405638           Root MSE      =  .06573

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.6830926   .1014683    -6.73   0.000    -.8962694   -.4699157
       _cons |  -.0119557   .0110732    -1.08   0.295    -.0352197    .0113082
-------------+----------------------------------------------------------------
         rho |  -.3568361
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    2.391008
Durbin-Watson statistic (transformed) 1.994619

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-------------
-> sector = 3

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.0704
Iteration 2:  rho = 0.0719
Iteration 3:  rho = 0.0720
Iteration 4:  rho = 0.0720
Iteration 5:  rho = 0.0720

Prais-Winsten AR(1) regression -- iterated estimates
```

```
      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =    243.17
       Model |  .062734666         1  .062734666   Prob > F        =    0.0000
    Residual |  .004643751        18  .000257986   R-squared       =    0.9311
-------------+----------------------------------   Adj R-squared   =    0.9273
       Total |  .067378417        19  .003546232   Root MSE        =    .01606

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.9211008   .0596981   -15.43   0.000    -1.046522   -.7956798
       _cons |  -.0031489     .00661    -0.48   0.640     -.017036    .0107381
-------------+----------------------------------------------------------------
         rho |    .071985
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.833440
Durbin-Watson statistic (transformed) 1.904178

-------------------------------------------------------------------------------------
-------------
-> sector = 4

Iteration 0:  rho = 0.0000
Iteration 1:  rho = -0.0115
Iteration 2:  rho = -0.0118
Iteration 3:  rho = -0.0118
Iteration 4:  rho = -0.0118

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =    787.20
       Model |   1.9888163         1   1.9888163   Prob > F        =    0.0000
    Residual |   .04547605        18  .002526447   R-squared       =    0.9776
-------------+----------------------------------   Adj R-squared   =    0.9764
       Total |  2.03429235        19  .107068018   Root MSE        =    .05026

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.9972889   .0355025   -28.09   0.000    -1.071877   -.9227008
       _cons |  -.0427715   .0203917    -2.10   0.050    -.0856129    .0000698
```

```
-------------+----------------------------------------------------------------
         rho |  -.0118107
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.903034
Durbin-Watson statistic (transformed) 1.883587

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-------------
-> sector = 5

Iteration 0:  rho = 0.0000
Iteration 1:  rho = -0.4810
Iteration 2:  rho = -0.4956
Iteration 3:  rho = -0.4957
Iteration 4:  rho = -0.4957

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =   3419.35
       Model |  .640897297         1  .640897297   Prob > F        =    0.0000
    Residual |  .003373789        18  .000187433   R-squared       =    0.9948
-------------+----------------------------------   Adj R-squared   =    0.9945
       Total |  .644271085        19  .033909004   Root MSE        =    .01369

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnxzlag1 |  -1.039852    .017357   -59.91   0.000    -1.076318   -1.003387
       _cons |  -.0314529   .0048289    -6.51   0.000    -.0415979   -.0213078
-------------+----------------------------------------------------------------
         rho |  -.4957098
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    2.438898
Durbin-Watson statistic (transformed) 1.801838

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-------------
-> sector = 6

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.0035
```

```
Iteration 2:  rho = 0.0045
Iteration 3:  rho = 0.0047
Iteration 4:  rho = 0.0048
Iteration 5:  rho = 0.0048
Iteration 6:  rho = 0.0048
Iteration 7:  rho = 0.0048
Iteration 8:  rho = 0.0048

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =     21.74
       Model |  .265176722         1  .265176722   Prob > F        =    0.0002
    Residual |  .219593635        18  .012199646   R-squared       =    0.5470
-------------+----------------------------------   Adj R-squared   =    0.5218
       Total |  .484770357        19  .025514229   Root MSE        =    .11045

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.6872049   .1474458    -4.66   0.000    -.9969769   -.3774328
       _cons |  -.0071741    .027479    -0.26   0.797    -.0649053    .0505572
-------------+----------------------------------------------------------------
         rho |   .0048337
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.946973
Durbin-Watson statistic (transformed) 1.949490

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-------------
-> sector = 7

Iteration 0:  rho = 0.0000
Iteration 1:  rho = -0.2142
Iteration 2:  rho = -0.2224
Iteration 3:  rho = -0.2226
Iteration 4:  rho = -0.2226
Iteration 5:  rho = -0.2226

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
```

```
-------------+------------------------------   F(1, 18)        =    241.58
       Model |  .121185633         1  .121185633   Prob > F        =    0.0000
    Residual |  .009029474        18  .000501637   R-squared       =    0.9307
-------------+------------------------------   Adj R-squared   =    0.9268
       Total |  .130215107        19  .006853427   Root MSE        =     .0224

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.9632128   .0606137   -15.89   0.000    -1.090557   -.8358681
       _cons |  -.0069305   .0082472    -0.84   0.412    -.0242571    .0103962
-------------+----------------------------------------------------------------
         rho |  -.2225874
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    2.374441
Durbin-Watson statistic (transformed) 2.088109

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-------------
-> sector = 8

Iteration 0:  rho = 0.0000
Iteration 1:  rho = -0.1063
Iteration 2:  rho = -0.1076
Iteration 3:  rho = -0.1076
Iteration 4:  rho = -0.1076

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+------------------------------   F(1, 18)        =    401.68
       Model |  .320722297         1  .320722297   Prob > F        =    0.0000
    Residual |  .014372247        18  .000798458   R-squared       =    0.9571
-------------+------------------------------   Adj R-squared   =    0.9547
       Total |  .335094545        19  .017636555   Root MSE        =    .02826

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.9930812   .0489432   -20.29   0.000    -1.095907   -.8902553
       _cons |  -.0187028    .012454    -1.50   0.151    -.0448676     .007462
-------------+----------------------------------------------------------------
```

```
         rho |  -.1076293
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    2.114150
Durbin-Watson statistic (transformed) 1.954108

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-------------
-> sector = 9

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.1308
Iteration 2:  rho = 0.1380
Iteration 3:  rho = 0.1385
Iteration 4:  rho = 0.1386
Iteration 5:  rho = 0.1386
Iteration 6:  rho = 0.1386

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =    324.43
       Model |  .127960785         1  .127960785   Prob > F        =    0.0000
    Residual |  .007099612        18  .000394423   R-squared       =    0.9474
-------------+----------------------------------   Adj R-squared   =    0.9445
       Total |  .135060397        19  .007108442   Root MSE        =    .01986

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -1.057822   .0600357   -17.62   0.000    -1.183952   -.9316914
       _cons |  -.0246289   .0125634    -1.96   0.066    -.0510238    .0017659
-------------+----------------------------------------------------------------
         rho |   .1385793
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.672565
Durbin-Watson statistic (transformed) 1.869361

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-------------
-> sector = 10

Iteration 0:  rho = 0.0000
```

```
Iteration 1:  rho = -0.0444
Iteration 2:  rho = -0.0519
Iteration 3:  rho = -0.0531
Iteration 4:  rho = -0.0533
Iteration 5:  rho = -0.0533
Iteration 6:  rho = -0.0533
Iteration 7:  rho = -0.0533

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =    105.97
       Model |  .035057345         1  .035057345   Prob > F        =    0.0000
    Residual |  .005955075        18  .000330838   R-squared       =    0.8548
-------------+----------------------------------   Adj R-squared   =    0.8467
       Total |  .041012421        19  .002158548   Root MSE        =    .01819

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -1.024814   .0987838   -10.37   0.000    -1.232352   -.8172773
       _cons |  -.0079344   .0097042    -0.82   0.424    -.0283221    .0124534
-------------+----------------------------------------------------------------
         rho |   -.053282
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.818995
Durbin-Watson statistic (transformed) 1.732596

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-------------
-> sector = 11

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.3283
Iteration 2:  rho = 0.3317
Iteration 3:  rho = 0.3318
Iteration 4:  rho = 0.3318
Iteration 5:  rho = 0.3318

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
```

```
-------------+------------------------------   F(1, 18)        =    496.72
       Model |  .685528874         1  .685528874   Prob > F        =    0.0000
    Residual |  .024842111        18  .001380117   R-squared       =    0.9650
-------------+------------------------------   Adj R-squared   =    0.9631
       Total |  .710370985        19  .037387947   Root MSE        =    .03715

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.9748956   .0468148   -20.82   0.000     -1.07325   -.8765413
       _cons |  -.0300405   .0228114    -1.32   0.204    -.0779655    .0178844
-------------+----------------------------------------------------------------
         rho |   .3317553
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.337110
Durbin-Watson statistic (transformed) 1.844032

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-------------
-> sector = 12

Iteration 0:  rho = 0.0000
Iteration 1:  rho = -0.0049
Iteration 2:  rho = -0.0050
Iteration 3:  rho = -0.0050
Iteration 4:  rho = -0.0050

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+------------------------------   F(1, 18)        =    264.00
       Model |  .187505231         1  .187505231   Prob > F        =    0.0000
    Residual |   .01278449        18  .000710249   R-squared       =    0.9362
-------------+------------------------------   Adj R-squared   =    0.9326
       Total |  .200289721        19  .010541564   Root MSE        =    .02665

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.9883327   .0607802   -16.26   0.000    -1.116027   -.8606383
       _cons |  -.0153354   .0133602    -1.15   0.266    -.0434041    .0127333
-------------+----------------------------------------------------------------
```

```
         rho |   -.005027
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.947205
Durbin-Watson statistic (transformed) 1.938754

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-------------
-> sector = 13

Iteration 0:  rho = 0.0000
Iteration 1:  rho = -0.3888
Iteration 2:  rho = -0.4285
Iteration 3:  rho = -0.4298
Iteration 4:  rho = -0.4299
Iteration 5:  rho = -0.4299
Iteration 6:  rho = -0.4299

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =    410.34
       Model |  .226106511         1  .226106511   Prob > F        =    0.0000
    Residual |  .009918499        18  .000551028   R-squared       =    0.9580
-------------+----------------------------------   Adj R-squared   =    0.9556
       Total |   .23602501        19  .012422369   Root MSE        =    .02347

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |   -.988785   .0477674   -20.70   0.000    -1.089141   -.8884294
       _cons |  -.0121476    .007862    -1.55   0.140     -.028665    .0043698
-------------+----------------------------------------------------------------
         rho |  -.4298558
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    2.768623
Durbin-Watson statistic (transformed) 2.208364

-------------------------------------------------------------------------------------
-------------
-> sector = 14

Iteration 0:  rho = 0.0000
```

```
Iteration 1:  rho = 0.0530
Iteration 2:  rho = 0.0659
Iteration 3:  rho = 0.0696
Iteration 4:  rho = 0.0707
Iteration 5:  rho = 0.0711
Iteration 6:  rho = 0.0712
Iteration 7:  rho = 0.0712
Iteration 8:  rho = 0.0712
Iteration 9:  rho = 0.0712
Iteration 10:  rho = 0.0712

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =     53.13
       Model |  .04495167         1  .04495167     Prob > F        =    0.0000
    Residual | .015228701        18  .000846039    R-squared       =    0.7469
-------------+----------------------------------   Adj R-squared   =    0.7329
       Total | .060180371        19  .003167388    Root MSE        =    .02909

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.8911719    .122091    -7.30   0.000    -1.147676   -.6346683
       _cons |   .0042078   .0106708     0.39   0.698    -.0182107    .0266264
-------------+----------------------------------------------------------------
         rho |   .0712093
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.886650
Durbin-Watson statistic (transformed) 2.029984

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-------------
-> sector = 15

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.0768
Iteration 2:  rho = 0.0796
Iteration 3:  rho = 0.0798
Iteration 4:  rho = 0.0798
Iteration 5:  rho = 0.0798
```

```
Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =    150.05
       Model |  .045527084         1  .045527084   Prob > F        =    0.0000
    Residual |  .005461288        18  .000303405   R-squared       =    0.8929
-------------+----------------------------------   Adj R-squared   =    0.8869
       Total |  .050988372        19  .002683599   Root MSE        =    .01742

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.9677776   .0799213   -12.11   0.000    -1.135686   -.7998692
       _cons |  -.0044268   .0079793    -0.55   0.586    -.0211907    .0123372
-------------+----------------------------------------------------------------
         rho |   .0797678
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.714318
Durbin-Watson statistic (transformed) 1.887529

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-------------
-> sector = 16

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.1664
Iteration 2:  rho = 0.1802
Iteration 3:  rho = 0.1820
Iteration 4:  rho = 0.1823
Iteration 5:  rho = 0.1823
Iteration 6:  rho = 0.1823
Iteration 7:  rho = 0.1823

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =    166.27
       Model |  .243228754         1  .243228754   Prob > F        =    0.0000
    Residual |  .026331121        18   .00146284   R-squared       =    0.9023
-------------+----------------------------------   Adj R-squared   =    0.8969
       Total |  .269559875        19  .014187362   Root MSE        =    .03825
```

```
------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.9583014     .07531   -12.72   0.000    -1.116522    -.800081
       _cons |   .0058055   .0151823     0.38   0.707    -.0260913    .0377023
-------------+----------------------------------------------------------------
         rho |   .1823321
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.616301
Durbin-Watson statistic (transformed) 2.133394

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-------------
-> sector = 17

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.0892
Iteration 2:  rho = 0.1192
Iteration 3:  rho = 0.1323
Iteration 4:  rho = 0.1385
Iteration 5:  rho = 0.1417
Iteration 6:  rho = 0.1433
Iteration 7:  rho = 0.1441
Iteration 8:  rho = 0.1445
Iteration 9:  rho = 0.1448
Iteration 10:  rho = 0.1449
Iteration 11:  rho = 0.1449
Iteration 12:  rho = 0.1450
Iteration 13:  rho = 0.1450
Iteration 14:  rho = 0.1450
Iteration 15:  rho = 0.1450
Iteration 16:  rho = 0.1450
Iteration 17:  rho = 0.1450
Iteration 18:  rho = 0.1450

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =     19.61
       Model |  .019310103         1  .019310103   Prob > F        =    0.0003
    Residual |  .017724591        18    .0009847   R-squared       =    0.5214
-------------+----------------------------------   Adj R-squared   =    0.4948
```

```
       Total |  .037034695        19  .001949194   Root MSE        =    .03138

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.7245227   .1627901    -4.45   0.000    -1.066532   -.3825134
       _cons |   .0040371   .0085037     0.47   0.641    -.0138285    .0219027
-------------+----------------------------------------------------------------
         rho |   .1449936
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.740042
Durbin-Watson statistic (transformed) 1.958079

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-------------
-> sector = 18

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.2570
Iteration 2:  rho = 0.3133
Iteration 3:  rho = 0.3371
Iteration 4:  rho = 0.3491
Iteration 5:  rho = 0.3557
Iteration 6:  rho = 0.3594
Iteration 7:  rho = 0.3615
Iteration 8:  rho = 0.3628
Iteration 9:  rho = 0.3635
Iteration 10:  rho = 0.3640
Iteration 11:  rho = 0.3643
Iteration 12:  rho = 0.3644
Iteration 13:  rho = 0.3645
Iteration 14:  rho = 0.3646
Iteration 15:  rho = 0.3646
Iteration 16:  rho = 0.3646
Iteration 17:  rho = 0.3646
Iteration 18:  rho = 0.3646
Iteration 19:  rho = 0.3646
Iteration 20:  rho = 0.3647
Iteration 21:  rho = 0.3647
Iteration 22:  rho = 0.3647

Prais-Winsten AR(1) regression -- iterated estimates
```

```
      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =     44.67
       Model |  .002064594         1  .002064594   Prob > F        =    0.0000
    Residual |  .000831884        18  .000046216   R-squared       =    0.7128
-------------+----------------------------------   Adj R-squared   =    0.6968
       Total |  .002896478        19  .000152446   Root MSE        =     .0068

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.8481395   .1298187    -6.53   0.000    -1.120879   -.5754006
       _cons |  -.0018527   .0033236    -0.56   0.584    -.0088354    .0051299
-------------+----------------------------------------------------------------
         rho |   .3646544
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.456596
Durbin-Watson statistic (transformed) 2.007550

-------------------------------------------------------------------------------------
------------
-> sector = 19

Iteration 0:  rho = 0.0000
Iteration 1:  rho = -0.0574
Iteration 2:  rho = -0.0722
Iteration 3:  rho = -0.0753
Iteration 4:  rho = -0.0760
Iteration 5:  rho = -0.0761
Iteration 6:  rho = -0.0761
Iteration 7:  rho = -0.0761
Iteration 8:  rho = -0.0761
Iteration 9:  rho = -0.0761

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =     39.19
       Model |  .022750467         1  .022750467   Prob > F        =    0.0000
    Residual |  .010450382        18  .000580577   R-squared       =    0.6852
-------------+----------------------------------   Adj R-squared   =    0.6678
       Total |   .03320085        19  .001747413   Root MSE        =     .0241
```

```
------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.8017228   .1282099    -6.25   0.000    -1.071082   -.5323639
       _cons |   .0026127   .0050362     0.52   0.610     -.007968    .0131934
-------------+----------------------------------------------------------------
         rho |  -.0761372
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.953694
Durbin-Watson statistic (transformed) 1.821767

------------------------------------------------------------------------------------
-------------
-> sector = 20

Iteration 0:  rho = 0.0000
Iteration 1:  rho = -0.1473
Iteration 2:  rho = -0.1716
Iteration 3:  rho = -0.1740
Iteration 4:  rho = -0.1743
Iteration 5:  rho = -0.1743
Iteration 6:  rho = -0.1743
Iteration 7:  rho = -0.1743

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =     88.48
       Model |   .01576281         1   .01576281   Prob > F        =    0.0000
    Residual |  .003206679        18  .000178149   R-squared       =    0.8310
-------------+----------------------------------   Adj R-squared   =    0.8216
       Total |  .018969489        19  .000998394   Root MSE        =    .01335

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -1.015373   .1084607    -9.36   0.000     -1.24324   -.7875052
       _cons |  -.0032978   .0065153    -0.51   0.619     -.016986    .0103904
-------------+----------------------------------------------------------------
         rho |  -.1742998
------------------------------------------------------------------------------
```

```
Durbin-Watson statistic (original)    2.222358
Durbin-Watson statistic (transformed) 1.885567

------------------------------------------------------------------------------------
-------------
-> sector = 21

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.3289
Iteration 2:  rho = 0.3823
Iteration 3:  rho = 0.4003
Iteration 4:  rho = 0.4074
Iteration 5:  rho = 0.4103
Iteration 6:  rho = 0.4115
Iteration 7:  rho = 0.4120
Iteration 8:  rho = 0.4123
Iteration 9:  rho = 0.4123
Iteration 10:  rho = 0.4124
Iteration 11:  rho = 0.4124
Iteration 12:  rho = 0.4124
Iteration 13:  rho = 0.4124
Iteration 14:  rho = 0.4124
Iteration 15:  rho = 0.4124

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =     71.57
       Model |  .012954595         1  .012954595   Prob > F        =    0.0000
    Residual |  .003257976        18  .000180999   R-squared       =    0.7990
-------------+----------------------------------   Adj R-squared   =    0.7879
       Total |  .016212571        19  .000853293   Root MSE        =    .01345

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.8942401   .1150066    -7.78   0.000     -1.13586   -.6526202
       _cons |  -.0028553   .0085465    -0.33   0.742    -.0208108    .0151003
-------------+----------------------------------------------------------------
         rho |   .4124153
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.232047
```

```
Durbin-Watson statistic (transformed) 1.718027

------------------------------------------------------------------------------------
-------------
-> sector = 22

Iteration 0:  rho = 0.0000
Iteration 1:  rho = -0.2395
Iteration 2:  rho = -0.2786
Iteration 3:  rho = -0.2813
Iteration 4:  rho = -0.2815
Iteration 5:  rho = -0.2815
Iteration 6:  rho = -0.2815

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =     60.16
       Model |  .00706195         1  .00706195   Prob > F        =    0.0000
    Residual | .002112944        18  .000117386   R-squared       =    0.7697
-------------+----------------------------------   Adj R-squared   =    0.7569
       Total | .009174894        19  .000482889   Root MSE        =    .01083

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnxzlag1 |  -.8951679   .1109038    -8.07   0.000    -1.128168   -.6621677
       _cons |  -.0005179   .0037177    -0.14   0.891    -.0083284    .0072926
-------------+----------------------------------------------------------------
         rho |  -.2814705
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    2.139845
Durbin-Watson statistic (transformed) 1.709354

------------------------------------------------------------------------------------
-------------
-> sector = 23

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.1646
Iteration 2:  rho = 0.2335
Iteration 3:  rho = 0.2740
```

```
Iteration 4:  rho = 0.3013
Iteration 5:  rho = 0.3210
Iteration 6:  rho = 0.3358
Iteration 7:  rho = 0.3473
Iteration 8:  rho = 0.3565
Iteration 9:  rho = 0.3638
Iteration 10:  rho = 0.3698
Iteration 11:  rho = 0.3746
Iteration 12:  rho = 0.3787
Iteration 13:  rho = 0.3820
Iteration 14:  rho = 0.3847
Iteration 15:  rho = 0.3870
Iteration 16:  rho = 0.3890
Iteration 17:  rho = 0.3906
Iteration 18:  rho = 0.3919
Iteration 19:  rho = 0.3931
Iteration 20:  rho = 0.3940
Iteration 21:  rho = 0.3948
Iteration 22:  rho = 0.3955
Iteration 23:  rho = 0.3961
Iteration 24:  rho = 0.3966
Iteration 25:  rho = 0.3970
Iteration 26:  rho = 0.3973
Iteration 27:  rho = 0.3976
Iteration 28:  rho = 0.3979
Iteration 29:  rho = 0.3981
Iteration 30:  rho = 0.3983
Iteration 31:  rho = 0.3984
Iteration 32:  rho = 0.3985
Iteration 33:  rho = 0.3986
Iteration 34:  rho = 0.3987
Iteration 35:  rho = 0.3988
Iteration 36:  rho = 0.3989
Iteration 37:  rho = 0.3989
Iteration 38:  rho = 0.3990
Iteration 39:  rho = 0.3990
Iteration 40:  rho = 0.3990
Iteration 41:  rho = 0.3991
Iteration 42:  rho = 0.3991
Iteration 43:  rho = 0.3991
Iteration 44:  rho = 0.3991
Iteration 45:  rho = 0.3991
```

```
Iteration 46:  rho = 0.3992
Iteration 47:  rho = 0.3992
Iteration 48:  rho = 0.3992
Iteration 49:  rho = 0.3992
Iteration 50:  rho = 0.3992
Iteration 51:  rho = 0.3992
Iteration 52:  rho = 0.3992
Iteration 53:  rho = 0.3992
Iteration 54:  rho = 0.3992
Iteration 55:  rho = 0.3992
Iteration 56:  rho = 0.3992
Iteration 57:  rho = 0.3992
Iteration 58:  rho = 0.3992
Iteration 59:  rho = 0.3992
Iteration 60:  rho = 0.3992
Iteration 61:  rho = 0.3992

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =      3.58
       Model |  .002336758         1  .002336758   Prob > F        =    0.0747
    Residual |  .011751313        18  .000652851   R-squared       =    0.1659
-------------+----------------------------------   Adj R-squared   =    0.1195
       Total |  .014088071        19  .000741477   Root MSE        =    .02555

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |   -.489634   .2341884    -2.09   0.051    -.9816455    .0023775
       _cons |   .0343583   .0198361     1.73   0.100    -.0073158    .0760325
-------------+----------------------------------------------------------------
         rho |   .3992232
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.602732
Durbin-Watson statistic (transformed) 1.988230

-------------------------------------------------------------------------------------
-------------
-> sector = 24

Iteration 0:  rho = 0.0000
```

```
Iteration 1:  rho = -0.0086
Iteration 2:  rho = -0.0092
Iteration 3:  rho = -0.0092
Iteration 4:  rho = -0.0092
Iteration 5:  rho = -0.0092

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =     64.66
       Model |  .009682819         1  .009682819   Prob > F        =    0.0000
    Residual |  .002695679        18   .00014976   R-squared       =    0.7822
-------------+----------------------------------   Adj R-squared   =    0.7701
       Total |  .012378498        19    .0006515   Root MSE        =    .01224

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.7526746   .0936386    -8.04   0.000    -.9494019   -.5559472
       _cons |    .003842   .0027233     1.41   0.175    -.0018795    .0095635
-------------+----------------------------------------------------------------
         rho |  -.0092447
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.900218
Durbin-Watson statistic (transformed) 1.878934

-------------------------------------------------------------------------------------
-------------
-> sector = 25

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.0205
Iteration 2:  rho = 0.0338
Iteration 3:  rho = 0.0428
Iteration 4:  rho = 0.0492
Iteration 5:  rho = 0.0537
Iteration 6:  rho = 0.0569
Iteration 7:  rho = 0.0592
Iteration 8:  rho = 0.0609
Iteration 9:  rho = 0.0622
Iteration 10:  rho = 0.0631
Iteration 11:  rho = 0.0638
```

```
Iteration 12:  rho = 0.0643
Iteration 13:  rho = 0.0647
Iteration 14:  rho = 0.0649
Iteration 15:  rho = 0.0651
Iteration 16:  rho = 0.0653
Iteration 17:  rho = 0.0654
Iteration 18:  rho = 0.0655
Iteration 19:  rho = 0.0655
Iteration 20:  rho = 0.0656
Iteration 21:  rho = 0.0656
Iteration 22:  rho = 0.0657
Iteration 23:  rho = 0.0657
Iteration 24:  rho = 0.0657
Iteration 25:  rho = 0.0657
Iteration 26:  rho = 0.0657
Iteration 27:  rho = 0.0657
Iteration 28:  rho = 0.0657
Iteration 29:  rho = 0.0657
Iteration 30:  rho = 0.0657
Iteration 31:  rho = 0.0657
Iteration 32:  rho = 0.0657
Iteration 33:  rho = 0.0657

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =      3.94
       Model |  .003940577         1  .003940577   Prob > F        =    0.0627
    Residual |  .018013435        18  .001000746   R-squared       =    0.1795
-------------+----------------------------------   Adj R-squared   =    0.1339
       Total |  .021954012        19  .001155474   Root MSE        =    .03163

------------------------------------------------------------------------------
         lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     lnzxlag1 |  -.4512048     .23298    -1.94   0.069    -.9406776     .038268
       _cons |   -.034402   .0184913    -1.86   0.079    -.0732507    .0044467
-------------+----------------------------------------------------------------
         rho |   .0657232
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.853398
Durbin-Watson statistic (transformed) 1.856981
```

```
--------------------------------------------------------------------------------
-------------
-> sector = 26

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.0721
Iteration 2:  rho = 0.0795
Iteration 3:  rho = 0.0804
Iteration 4:  rho = 0.0806
Iteration 5:  rho = 0.0806
Iteration 6:  rho = 0.0806
Iteration 7:  rho = 0.0806

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =     73.62
       Model |  .001990517         1  .001990517   Prob > F        =    0.0000
    Residual |   .00048665        18  .000027036   R-squared       =    0.8035
-------------+----------------------------------   Adj R-squared   =    0.7926
       Total |  .002477167        19  .000130377   Root MSE        =     .0052

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.8672191   .1007233    -8.61   0.000    -1.078831   -.6556073
       _cons |   .0010749   .0013272     0.81   0.429    -.0017134    .0038633
-------------+----------------------------------------------------------------
         rho |   .0805705
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.783245
Durbin-Watson statistic (transformed) 1.965515

--------------------------------------------------------------------------------
-------------
-> sector = 27

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.0797
Iteration 2:  rho = 0.0811
Iteration 3:  rho = 0.0811
```

```
Iteration 4:  rho = 0.0811

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =   1073.01
       Model |   .24518931         1   .24518931   Prob > F        =    0.0000
    Residual |  .004113103        18  .000228506   R-squared       =    0.9835
-------------+----------------------------------   Adj R-squared   =    0.9826
       Total |  .249302413        19   .01312118   Root MSE        =    .01512

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.9518906    .029373   -32.41   0.000    -1.013601   -.8901803
       _cons |   .0108405   .0061696     1.76   0.096    -.0021214    .0238023
-------------+----------------------------------------------------------------
         rho |   .0810988
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.743892
Durbin-Watson statistic (transformed) 1.916119

---------------------------------------------------------------------------------
-------------
-> sector = 28

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.2774
Iteration 2:  rho = 0.3279
Iteration 3:  rho = 0.3455
Iteration 4:  rho = 0.3525
Iteration 5:  rho = 0.3554
Iteration 6:  rho = 0.3567
Iteration 7:  rho = 0.3572
Iteration 8:  rho = 0.3574
Iteration 9:  rho = 0.3575
Iteration 10:  rho = 0.3576
Iteration 11:  rho = 0.3576
Iteration 12:  rho = 0.3576
Iteration 13:  rho = 0.3576
Iteration 14:  rho = 0.3576
Iteration 15:  rho = 0.3576
```

```
Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =     15.48
       Model |  .003062506         1  .003062506   Prob > F        =    0.0010
    Residual |  .003560094        18  .000197783   R-squared       =    0.4624
-------------+----------------------------------   Adj R-squared   =    0.4326
       Total |    .0066226        19  .000348558   Root MSE        =    .01406

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.6839773   .1667962    -4.10   0.001    -1.034403   -.3335515
       _cons |   -.004895   .0052226    -0.94   0.361    -.0158672    .0060772
-------------+----------------------------------------------------------------
         rho |   .3575916
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.395372
Durbin-Watson statistic (transformed) 1.796672

-------------------------------------------------------------------------------------
-------------
-> sector = 29

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.2004
Iteration 2:  rho = 0.2682
Iteration 3:  rho = 0.3043
Iteration 4:  rho = 0.3269
Iteration 5:  rho = 0.3423
Iteration 6:  rho = 0.3533
Iteration 7:  rho = 0.3614
Iteration 8:  rho = 0.3675
Iteration 9:  rho = 0.3722
Iteration 10:  rho = 0.3758
Iteration 11:  rho = 0.3787
Iteration 12:  rho = 0.3809
Iteration 13:  rho = 0.3827
Iteration 14:  rho = 0.3841
Iteration 15:  rho = 0.3853
Iteration 16:  rho = 0.3862
```

```
Iteration 17:  rho = 0.3869
Iteration 18:  rho = 0.3875
Iteration 19:  rho = 0.3880
Iteration 20:  rho = 0.3884
Iteration 21:  rho = 0.3887
Iteration 22:  rho = 0.3889
Iteration 23:  rho = 0.3891
Iteration 24:  rho = 0.3893
Iteration 25:  rho = 0.3894
Iteration 26:  rho = 0.3895
Iteration 27:  rho = 0.3896
Iteration 28:  rho = 0.3897
Iteration 29:  rho = 0.3898
Iteration 30:  rho = 0.3898
Iteration 31:  rho = 0.3898
Iteration 32:  rho = 0.3899
Iteration 33:  rho = 0.3899
Iteration 34:  rho = 0.3899
Iteration 35:  rho = 0.3899
Iteration 36:  rho = 0.3899
Iteration 37:  rho = 0.3899
Iteration 38:  rho = 0.3900
Iteration 39:  rho = 0.3900
Iteration 40:  rho = 0.3900
Iteration 41:  rho = 0.3900
Iteration 42:  rho = 0.3900
Iteration 43:  rho = 0.3900
Iteration 44:  rho = 0.3900
Iteration 45:  rho = 0.3900
Iteration 46:  rho = 0.3900
Iteration 47:  rho = 0.3900
Iteration 48:  rho = 0.3900
Iteration 49:  rho = 0.3900

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =      8.20
       Model |  .005931465         1  .005931465   Prob > F        =    0.0103
    Residual |  .013018692        18  .000723261   R-squared       =    0.3130
-------------+----------------------------------   Adj R-squared   =    0.2748
       Total |  .018950157        19  .000997377   Root MSE        =    .02689
```

```
------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.5996045   .1969876    -3.04   0.007     -1.01346   -.1857489
       _cons |    .027047   .0168182     1.61   0.125    -.0082867    .0623806
-------------+----------------------------------------------------------------
         rho |   .3899899
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.581285
Durbin-Watson statistic (transformed) 2.003406

-------------------------------------------------------------------------------------
-------------
-> sector = 30

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.5060
Iteration 2:  rho = 0.5839
Iteration 3:  rho = 0.6173
Iteration 4:  rho = 0.6346
Iteration 5:  rho = 0.6442
Iteration 6:  rho = 0.6498
Iteration 7:  rho = 0.6531
Iteration 8:  rho = 0.6551
Iteration 9:  rho = 0.6562
Iteration 10:  rho = 0.6569
Iteration 11:  rho = 0.6574
Iteration 12:  rho = 0.6576
Iteration 13:  rho = 0.6578
Iteration 14:  rho = 0.6579
Iteration 15:  rho = 0.6580
Iteration 16:  rho = 0.6580
Iteration 17:  rho = 0.6580
Iteration 18:  rho = 0.6580
Iteration 19:  rho = 0.6580
Iteration 20:  rho = 0.6580
Iteration 21:  rho = 0.6580
Iteration 22:  rho = 0.6580
Iteration 23:  rho = 0.6580
Iteration 24:  rho = 0.6580
```

```
Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =     13.47
       Model |  .004079485         1  .004079485   Prob > F        =    0.0018
    Residual |  .005452166        18  .000302898   R-squared       =    0.4280
-------------+----------------------------------   Adj R-squared   =    0.3962
       Total |  .009531651        19  .000501666   Root MSE        =     .0174

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |   -.682688   .1615069    -4.23   0.001    -1.022001   -.3433746
       _cons |   .0188504   .0136904     1.38   0.185    -.0099121    .0476128
-------------+----------------------------------------------------------------
         rho |   .6580465
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    0.971750
Durbin-Watson statistic (transformed) 1.995589

--------------------------------------------------------------------------------
-------------
-> sector = 31

Iteration 0:  rho = 0.0000
Iteration 1:  rho = -0.2219
Iteration 2:  rho = -0.2276
Iteration 3:  rho = -0.2277
Iteration 4:  rho = -0.2277
Iteration 5:  rho = -0.2277

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =   1376.38
       Model |  .007012159         1  .007012159   Prob > F        =    0.0000
    Residual |  .000091704        18  5.0947e-06   R-squared       =    0.9871
-------------+----------------------------------   Adj R-squared   =    0.9864
       Total |  .007103863        19  .000373888   Root MSE        =    .00226

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
```

```
-------------+----------------------------------------------------------------
    lnzxlag1 |   -.933229   .0246332   -37.88   0.000    -.9849814   -.8814765
       _cons |   .0012759   .0007352     1.74   0.100    -.0002686    .0028205
-------------+----------------------------------------------------------------
         rho |   -.227668
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    2.435349
Durbin-Watson statistic (transformed) 2.014972

-----------------------------------------------------------------------------------------------
-------------
-> sector = 32

Iteration 0:  rho = 0.0000
Iteration 1:  rho = -0.3334
Iteration 2:  rho = -0.3746
Iteration 3:  rho = -0.3764
Iteration 4:  rho = -0.3765
Iteration 5:  rho = -0.3765
Iteration 6:  rho = -0.3765

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =    178.16
       Model |   .00168828         1   .00168828   Prob > F        =    0.0000
    Residual |  .000170568        18  9.4760e-06   R-squared       =    0.9082
-------------+----------------------------------   Adj R-squared   =    0.9031
       Total |  .001858847        19  .000097834   Root MSE        =    .00308

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -1.058953    .076756   -13.80   0.000    -1.220211   -.8976943
       _cons |   .0026438   .0015704     1.68   0.110    -.0006555    .0059432
-------------+----------------------------------------------------------------
         rho |  -.3765285
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    2.650337
Durbin-Watson statistic (transformed) 1.934012
```

```
-------------------------------------------------------------------------------------
-------------
-> sector = 33

Iteration 0:  rho = 0.0000
Iteration 1:  rho = -0.1393
Iteration 2:  rho = -0.1852
Iteration 3:  rho = -0.1963
Iteration 4:  rho = -0.1987
Iteration 5:  rho = -0.1992
Iteration 6:  rho = -0.1993
Iteration 7:  rho = -0.1993
Iteration 8:  rho = -0.1993
Iteration 9:  rho = -0.1993
Iteration 10:  rho = -0.1993

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =    192.06
       Model |  .001739391         1  .001739391   Prob > F        =    0.0000
    Residual |  .000163015        18  9.0564e-06   R-squared       =    0.9143
-------------+----------------------------------   Adj R-squared   =    0.9096
       Total |  .001902406        19  .000100127   Root MSE        =    .00301

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnxzlag1 |  -1.127538   .0817645   -13.79   0.000    -1.299319   -.9557571
       _cons |   .0034877   .0017018     2.05   0.055    -.0000875     .007063
-------------+----------------------------------------------------------------
         rho |  -.1993442
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    2.202470
Durbin-Watson statistic (transformed) 1.835842

-------------------------------------------------------------------------------------
-------------
-> sector = 34

Iteration 0:  rho = 0.0000
Iteration 1:  rho = -0.2473
```

```
Iteration 2:  rho = -0.3672
Iteration 3:  rho = -0.3891
Iteration 4:  rho = -0.3919
Iteration 5:  rho = -0.3922
Iteration 6:  rho = -0.3922
Iteration 7:  rho = -0.3922
Iteration 8:  rho = -0.3922

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =     50.69
       Model |  .001303831         1  .001303831   Prob > F        =    0.0000
    Residual |  .000463028        18  .000025724   R-squared       =    0.7379
-------------+----------------------------------   Adj R-squared   =    0.7234
       Total |  .001766859        19  .000092993   Root MSE        =    .00507

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |    -.88573   .1236535    -7.16   0.000    -1.145516   -.6259437
       _cons |   .0003886   .0013631     0.29   0.779    -.0024751    .0032523
-------------+----------------------------------------------------------------
         rho |  -.3922476
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    2.469419
Durbin-Watson statistic (transformed) 1.929053

-----------------------------------------------------------------------------------
-------------
-> sector = 35

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.0693
Iteration 2:  rho = 0.1157
Iteration 3:  rho = 0.1493
Iteration 4:  rho = 0.1746
Iteration 5:  rho = 0.1939
Iteration 6:  rho = 0.2086
Iteration 7:  rho = 0.2200
Iteration 8:  rho = 0.2286
Iteration 9:  rho = 0.2353
```

```
Iteration 10:  rho = 0.2403
Iteration 11:  rho = 0.2441
Iteration 12:  rho = 0.2470
Iteration 13:  rho = 0.2492
Iteration 14:  rho = 0.2508
Iteration 15:  rho = 0.2521
Iteration 16:  rho = 0.2530
Iteration 17:  rho = 0.2537
Iteration 18:  rho = 0.2543
Iteration 19:  rho = 0.2547
Iteration 20:  rho = 0.2550
Iteration 21:  rho = 0.2552
Iteration 22:  rho = 0.2554
Iteration 23:  rho = 0.2555
Iteration 24:  rho = 0.2556
Iteration 25:  rho = 0.2557
Iteration 26:  rho = 0.2557
Iteration 27:  rho = 0.2558
Iteration 28:  rho = 0.2558
Iteration 29:  rho = 0.2558
Iteration 30:  rho = 0.2558
Iteration 31:  rho = 0.2558
Iteration 32:  rho = 0.2558
Iteration 33:  rho = 0.2559
Iteration 34:  rho = 0.2559
Iteration 35:  rho = 0.2559
Iteration 36:  rho = 0.2559
Iteration 37:  rho = 0.2559
Iteration 38:  rho = 0.2559
Iteration 39:  rho = 0.2559
Iteration 40:  rho = 0.2559

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =      0.45
       Model |  .000064946         1  .000064946   Prob > F        =    0.5103
    Residual |  .002590461        18  .000143915   R-squared       =    0.0245
-------------+----------------------------------   Adj R-squared   =   -0.0297
       Total |  .002655407        19  .000139758   Root MSE        =      .012

------------------------------------------------------------------------------
```

```
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.1387411     .23153    -0.60   0.556    -.6251676    .3476854
       _cons |  -.0016677   .0035626    -0.47   0.645    -.0091525    .0058171
-------------+----------------------------------------------------------------
         rho |   .2558695
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.731926
Durbin-Watson statistic (transformed) 1.841459

-------------------------------------------------------------------------------------
-------------
-> sector = 36

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.1950
Iteration 2:  rho = 0.2419
Iteration 3:  rho = 0.2602
Iteration 4:  rho = 0.2683
Iteration 5:  rho = 0.2721
Iteration 6:  rho = 0.2739
Iteration 7:  rho = 0.2748
Iteration 8:  rho = 0.2752
Iteration 9:  rho = 0.2754
Iteration 10:  rho = 0.2755
Iteration 11:  rho = 0.2756
Iteration 12:  rho = 0.2756
Iteration 13:  rho = 0.2756
Iteration 14:  rho = 0.2756
Iteration 15:  rho = 0.2756
Iteration 16:  rho = 0.2756
Iteration 17:  rho = 0.2756

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =     20.38
       Model |  .003110885         1  .003110885   Prob > F        =    0.0003
    Residual |  .002747811        18  .000152656   R-squared       =    0.5310
-------------+----------------------------------   Adj R-squared   =    0.5049
       Total |  .005858696        19  .000308352   Root MSE        =    .01236
```

```
------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.6844284   .1483898    -4.61   0.000    -.9961838   -.3726729
       _cons |   .0043973    .003974     1.11   0.283    -.0039517    .0127463
-------------+----------------------------------------------------------------
         rho |   .2756355
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.599290
Durbin-Watson statistic (transformed) 1.818153

-------------------------------------------------------------------------------------
-------------
-> sector = 37

Iteration 0:  rho = 0.0000
Iteration 1:  rho = 0.4632
Iteration 2:  rho = 0.5523
Iteration 3:  rho = 0.5994
Iteration 4:  rho = 0.6316
Iteration 5:  rho = 0.6566
Iteration 6:  rho = 0.6776
Iteration 7:  rho = 0.6961
Iteration 8:  rho = 0.7130
Iteration 9:  rho = 0.7288
Iteration 10:  rho = 0.7438
Iteration 11:  rho = 0.7581
Iteration 12:  rho = 0.7717
Iteration 13:  rho = 0.7846
Iteration 14:  rho = 0.7965
Iteration 15:  rho = 0.8075
Iteration 16:  rho = 0.8173
Iteration 17:  rho = 0.8258
Iteration 18:  rho = 0.8330
Iteration 19:  rho = 0.8390
Iteration 20:  rho = 0.8438
Iteration 21:  rho = 0.8477
Iteration 22:  rho = 0.8506
Iteration 23:  rho = 0.8529
Iteration 24:  rho = 0.8546
Iteration 25:  rho = 0.8560
Iteration 26:  rho = 0.8569
```

```
Iteration 27:  rho = 0.8577
Iteration 28:  rho = 0.8582
Iteration 29:  rho = 0.8586
Iteration 30:  rho = 0.8589
Iteration 31:  rho = 0.8591
Iteration 32:  rho = 0.8592
Iteration 33:  rho = 0.8594
Iteration 34:  rho = 0.8594
Iteration 35:  rho = 0.8595
Iteration 36:  rho = 0.8596
Iteration 37:  rho = 0.8596
Iteration 38:  rho = 0.8596
Iteration 39:  rho = 0.8596
Iteration 40:  rho = 0.8596
Iteration 41:  rho = 0.8597
Iteration 42:  rho = 0.8597
Iteration 43:  rho = 0.8597
Iteration 44:  rho = 0.8597
Iteration 45:  rho = 0.8597
Iteration 46:  rho = 0.8597
Iteration 47:  rho = 0.8597
Iteration 48:  rho = 0.8597
Iteration 49:  rho = 0.8597

Prais-Winsten AR(1) regression -- iterated estimates

      Source |       SS           df       MS      Number of obs   =        20
-------------+----------------------------------   F(1, 18)        =     11.80
       Model |   .00089452         1   .00089452   Prob > F        =    0.0030
    Residual |  .001364425        18  .000075801   R-squared       =    0.3960
-------------+----------------------------------   Adj R-squared   =    0.3624
       Total |  .002258944        19  .000118892   Root MSE        =    .00871

------------------------------------------------------------------------------
        lnxz |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    lnzxlag1 |  -.6048799   .1931468    -3.13   0.006    -1.010666   -.1990935
       _cons |   .0154028   .0134766     1.14   0.268    -.0129104     .043716
-------------+----------------------------------------------------------------
         rho |   .8596809
------------------------------------------------------------------------------
Durbin-Watson statistic (original)    1.008680
```

Durbin-Watson statistic (transformed) 2.306695

S2. Sector names

The 37 NAF sector categories used in our model and the full description of each based on NACE rev.2 categories. Note: NACE (and its second revision "rev. 2") is the official European nomenclature of activities used in the EU. NAF is the French nomenclature of activities and is directly embedded in NACE rev. 2..

	37 sector categories			64 sector categories	
N°	Short label	**Code NAF**	**Sector's label**	**Code NACE rev.2**	**Sector's label**
1	Agriculture, forestry, fishing	**AZ**	AGRICULTURE, FORESTRY AND FISHING	**CPA_A01-A03**	Crop and animal production, hunting and related service activities; Forestry and logging; Fishing and aquaculture
2	Mining	**BZ**	MINING AND QUARRYING	**CPA_B**	Mining and quarrying
3	Food and tobacco	**CA**	MANUFACTURE OF FOOD PRODUCTS, BEVERAGES AND TOBACCO PRODUCTS	**CPA_C10-C12**	Manufacture of food products, beverages and tobacco products
4	Textiles	**CB**	MANUFACTURE OF TEXTILES, WEARING APPAREL AND LEATHER PRODUCTS	**CPA_C13-C15**	Manufacture of textiles, wearing apparel and leather products; Manufacture of paper and paper products; Printing and reproduction of recorded media
5	Wood, paper, printing	**CC**	MANUFACTURE OF WOOD AND PAPER PRODUCTS, AND PRINTING	**CPA_C16-C18**	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
6	Coke and refined petroleum	**CD**	MANUFACTURE OF COKE AND REFINED PETROLEUM PRODUCTS	**CPA_C19**	Manufacture of coke and refined petroleum products
7	Chemicals	**CE**	MANUFACTURE OF CHEMICALS AND CHEMICAL PRODUCTS	**CPA_C20**	Manufacture of chemicals and chemical products
8	Pharmaceutical products	**CF**	MANUFACTURE OF BASIC PHARMACEUTICAL PRODUCTS AND PHARMACEUTICAL PREPARATIONS	**CPA_C21**	Manufacture of basic pharmaceutical products and pharmaceutical preparations
9	Rubber, plastics, non-mineral products	**CG**	MANUFACTURE OF RUBBER AND PLASTICS PRODUCTS, AND OTHER NON-METALLIC MINERAL PRODUCTS	**CPA_C22-C23**	Manufacture of rubber and plastic products; Manufacture of other non-metallic mineral products
10	Metals	**CH**	MANUFACTURE OF BASIC METALS AND FABRICATED METAL PRODUCTS, EXCEPT MACHINERY AND EQUIPMENT	**CPA_C24-C25**	Manufacture of basic metals; Manufacture of fabricated metal products, except machinery and equipment
11	Computer, electronic and optical products	**CI**	MANUFACTURE OF COMPUTER, ELECTRONIC AND OPTICAL PRODUCTS	**CPA_C26**	Manufacture of computer, electronic and optical products
12	Electrical equipment	**CJ**	MANUFACTURE OF ELECTRICAL EQUIPMENT	**CPA_C27**	Manufacture of electrical equipment

13	Machinery and equipment	**CK**	MANUFACTURE OF MACHINERY AND EQUIPMENT N.E.C.	**CPA_C28**	Manufacture of machinery and equipment n.e.c.
14	Transport equipment	**CL**	MANUFACTURE OF TRANSPORT EQUIPMENT	**CPA_29-30**	Manufacture of motor vehicles, trailers and semi-trailers; Manufacture of other transport equipment
15	Furniture, repair and installation of machinery	**CM**	MANUFACTURE OF FURNITURE; OTHER MANUFACTURING; REPAIR AND INSTALLATION OF MACHINERY AND EQUIPMENT	**CPA_C31-C33**	Manufacture of furniture; other manufacturing; Repair and installation of machinery and equipment
16	Energy supply	**DZ**	ELECTRICITY, GAS, STEAM AND AIR CONDITIONING SUPPLY	**CPA_D35**	Electricity, gas, steam and air conditioning supply
17	Water supply, sewarage, waste management	**EZ**	WATER SUPPLY; SEWERAGE, WASTE MANAGEMENT AND REMEDIATION ACTIVITIES	**CPA_E36-E39**	Water collection, treatment and supply; Sewerage; waste collection, treatment and disposal activities; materials recovery; remediation activities and other waste management services
18	Construction	**FZ**	CONSTRUCTION	**CPA_F**	Construction
19	Wholesale and retail trade	**GZ**	WHOLESALE AND RETAIL TRADE, REPAIR OF MOTOR VEHICLES AND MOTORCYCLES	**CPA_G45-G47**	Wholesale and retail trade; repair of motor vehicles and motorcycles
20	Transportation	**HZ**	TRANSPORTATION AND STORAGE	**CPA-H49-H53**	Land transport and transport via pipelines; Water transport; Air transport; Warehousing and support activities for transportation; Postal and courier activities
21	Accomodation and food services	**IZ**	ACCOMMODATION AND FOOD SERVICE ACTIVITIES	**CPA_I**	Accommodation and food service activities
22	Publishing, audiovisual and radio/television broadcast	**JA**	PUBLISHING, AUDIOVISUAL AND BROADCASTING ACTIVITIES	**CPA_J58-J60**	Publishing activities; Motion picture, video and television programme production, sound recording and music publishing activities; programming and broadcasting activities
23	Telecommunications	**JB**	TELECOMMUNICATIONS	**CPA_J61**	Telecommunications
24	Computer programming, information services	**JC**	COMPUTER PROGRAMMING, CONSULTANCY AND RELATED ACTIVITIES; INFORMATION SERVICE ACTIVITIES	**CPA_J62_J63**	Computer programming, consultancy and related activities; information service activities
25	Finance and insurance	**KZ**	FINANCIAL AND INSURANCE ACTIVITIES	**CPA_K64-K66**	Financial service activities; Insurance, reinsurance and pension funding, except compulsory social security; Activities auxiliary to financial services and insurance activities
26	Real estate	**LZ**	REAL ESTATE ACTIVITIES	**CPA_L68B-L68A**	Real estate activities; Imputed rents of owner-occupied dwellings

27	Legal and accounting activities, head offices, management consultancy, architecture	**MA**	LEGAL AND ACCOUNTING ACTIVITIES; ACTIVITIES OF HEAD OFFICES; MANAGEMENT CONSULTANCY ACTIVITIES; ARCHITECTURE AND ENGINEERING ACTIVITIES; TECHNICAL TESTING AND ANALYSIS	**CPA_M69-M71**	Legal and accounting activities; activities of head offices; management consultancy activities; Architectural and engineering activities; technical testing and analysis
28	Scientific research and development	**MB**	SCIENTIFIC RESEARCH AND DEVELOPMENT	**CPA_M72**	Scientific research and development
29	Advertising, and market research, veterinaries	**MC**	ADVERTISING AND MARKET RESEARCH; OTHER PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES; VETERINARY ACTIVITIES	**CPA_M73-M75**	Advertising and market research; Other professional, scientific and technical activities; veterinary activities
30	Administrative and support services (e ;g. Rental and leasing, interim employment agencies, etc.)	**NZ**	ADMINISTRATIVE AND SUPPORT SERVICE ACTIVITIES	**CPA_N77-N82**	Rental and leasing activities; Employment activities; Travel agency, tour operator reservation service and related activities; Security and investigation activities; services to buildings and landscape activities; office administrative, office support and other business support activities
31	Public administration and defence services; compulsory social security	**OZ**	PUBLIC ADMINISTRATION AND DEFENCE; COMPULSORY SOCIAL SECURITY	**CPA_O84**	Public administration and defence services; compulsory social security
32	Education	**PZ**	EDUCATION	**CPA_P85**	Education
33	Human health activities	**QA**	HUMAN HEALTH ACTIVITIES	**CPA_Q86**	Human health activities
34	Social work activities	**QB**	SOCIAL WORK ACTIVITIES	**CPA_Q87_Q88**	Social work activities
35	Arts, entertainment and recreational activities	**RZ**	ARTS, ENTERTAINMENT AND RECREATION	**CPA_R90-R93**	Creative, arts and entertainment activities; libraries, archives, museums and other cultural activities; gambling and betting activities; Sports activities and amusement and recreation activities
36	Other service activities (e ;g., repair of computers and household goods)	**SZ**	OTHER SERVICE ACTIVITIES	**CPA_S94-S96**	Activities of membership organisations; Repair of computers and personal and household goods; Other personal service activities
37	Activities of households as employers	**TZ**	ACTIVITIES OF HOUSEHOLDS AS EMPLOYERS OF DOMESTIC PERSONNEL AND UNDIFFERENTIATED GOODS AND SERVICES PRODUCTION OF HOUSEHOLDS FOR OWN USE	**CPA_T**	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use

* n.e.c.: not elsewhere classified.

S3. The derivation of restoration schedule

Assuming restoration at constant rate, the restoration at time t can be written as

$$Restoration^{t} = at + b \quad \text{(S1)}$$

Given the target restoration, we can have

$$\int_{0}^{t_e} at + bdt = \text{Target restoration} \quad \text{(S2)}$$

By rearranging (S2), we can explain a as a function of $\text{Target restoration}$ and b,

$$a = \frac{2(Target\ restoration - bt_e)}{{t_e}^2} \quad \text{(S3)}$$

Eq.(11) computes a trapezoid of Figure 4 each year for $t_e = 10$ by applying Eq.(S3).

The restoration per year becomes as follows.

Year	Increase (b=0)	Constant (b=2.371513)	Decrease (b=5)
2013	0.24	2.37	4.74
2014	0.71	2.37	4.21
2015	1.19	2.37	3.69
2016	1.66	2.37	3.16
2017	2.13	2.37	2.63
2018	2.61	2.37	2.11
2019	3.08	2.37	1.58
2020	3.56	2.37	1.06
2021	4.03	2.37	0.53
2022	4.51	2.37	0.01
Total	23.71513km^2	23.71513km^2	23.71513km^2

Simulation results

Cumulative values

Table S1. Cumulative values of impacts of restoration schedule and cost allocation rule

	Timing \ Allocation	BAU (No)	Rule 1	Rule 2
GDP (million euros)	BAU (No)	1,261,469	-	-
	Decreasing	-	1,163,686	1,163,764
	Constant	-	1,176,848	1,176,920
	Increasing	-	1,188,699	1,188,769
Disposable Income (million euros)	BAU (No)	801,332	-	-
	Decreasing	-	751,529	751,579
	Constant	-	758,337	758,384
	Increasing	-	764,473	764,518
Nursery areas (TEV, million euros)	BAU (No)	344	-	-
	Decreasing	-	380	380
	Constant	-	376	376
	Increasing	-	372	372
Sole caught (tons)	BAU (No)	5,945	-	-
	Decreasing	-	6,636	6,636
	Constant	-	6,527	6,527
	Increasing	-	6,424	6,424

Table S2. Cumulative values of the impacts of restoration schedule and cost allocation rule on selected GOSs

	Timing \ Allocation	BAU (No)	Rule 1	Rule 2

All sectors (million euros)	BAU (No)	441,482	-	-
	Decreasing	-	392,608	392,790
	Constant	-	398,818	398,997
	Increasing	-	404,389	404,568
Transport (million euros)	BAU (No)	16,214	-	-
	Decreasing	-	15,092	15,272
	Constant	-	15,191	15,371
	Increasing	-	15,280	15,460
Construction (million euros)	BAU (No)	30,089	-	-
	Decreasing	-	26,827	26,834
	Constant	-	27,271	27,278
	Increasing	-	27,670	27,676
Textile (million euros)	BAU (No)	746	-	-
	Decreasing	-	620	620
	Constant	-	640	640
	Increasing	-	659	659

Sensitivity analysis with constant restoration, cost allocation rule 1, and varying water quality.

Table S3. Soles caught

	25 Percentile	50 Percentile	75 Percentile	High	Low	Standard Deviation
2012	370	370	370	370	370	0.00
2013	320	325	330	335	315	6.01
2014	284	300	316	333	269	18.85
2015	260	287	314	342	236	31.17
2016	247	282	317	352	216	40.41

2017	240	281	321	361	204	46.49
2018	238	282	325	369	199	50.35
2019	238	284	330	376	197	52.81
2020	240	287	334	381	197	54.46
2021	242	290	339	387	199	55.66
2022	245	294	343	392	201	56.63
2023	248	298	347	397	203	57.46
2024	251	302	353	403	206	58.38
2025	255	306	357	408	208	59.11
2026	257	308	360	411	210	59.58
2027	257	309	361	413	211	59.79
2028	258	309	361	413	211	59.80
2029	257	309	361	412	211	59.68
2030	256	308	359	411	210	59.49
2031	255	307	358	409	209	59.27
2032	254	306	357	408	208	59.02
Total	5474	6344	7214	8084	4691	-

Table S4. GDP

	25 Percentile	50 Percentile	75 Percentile	High	Low	Standard Deviation
2012	47345	47345	47345	47345	47345	0.000E+00
2013	47972	47972	47972	47972	47972	2.183E-11
2014	48156	48156	48156	48156	48156	3.392E-03
2015	49059	49059	49059	49059	49059	7.484E-03
2016	50478	50478	50478	50478	50478	1.098E-02
2017	50981	50981	50981	50981	50981	1.356E-02
2018	52154	52154	52154	52154	52154	1.530E-02
2019	53633	53633	53633	53633	53633	1.653E-02
2020	54839	54839	54839	54839	54839	1.761E-02
2021	55585	55585	55585	55585	55585	1.852E-02
2022	56080	56080	56080	56080	56080	1.921E-02
2023	56586	56586	56586	56586	56586	1.974E-02
2024	57466	57466	57466	57466	57466	2.006E-02
2025	58424	58424	58424	58424	58424	2.038E-02
2026	59397	59397	59397	59397	59397	2.068E-02
2027	60414	60414	60414	60414	60414	2.089E-02
2028	61460	61460	61460	61460	61460	2.105E-02
2029	62527	62527	62527	62527	62527	2.116E-02
2030	63620	63620	63620	63620	63620	2.124E-02

2031	64774	64774	64774	64774	64774	2.131E-02
2032	65897	65897	65897	65897	65897	2.137E-02
Total	1176847	1176848	1176848	1176848	1176847	-

Table S5. Disposable income

	25 Percentile	50 Percentile	75 Percentile	High	Low	Standard Deviation
2012	30218	30218	30218	30218	30218	1.455E-11
2013	30557	30557	30557	30557	30557	3.638E-12
2014	30673	30673	30673	30673	30673	3.272E-03
2015	31125	31125	31125	31125	31125	7.273E-03
2016	32430	32430	32430	32430	32430	1.068E-02
2017	32652	32652	32652	32652	32652	1.316E-02
2018	33352	33352	33352	33352	33352	1.480E-02
2019	34462	34462	34462	34462	34462	1.592E-02
2020	35456	35456	35456	35456	35456	1.690E-02
2021	36099	36099	36099	36099	36099	1.770E-02
2022	36444	36444	36444	36444	36444	1.830E-02
2023	36798	36798	36798	36799	36798	1.873E-02
2024	37300	37300	37300	37300	37300	1.903E-02
2025	37896	37896	37896	37896	37896	1.934E-02
2026	38477	38477	38477	38477	38477	1.961E-02
2027	39098	39098	39098	39098	39098	1.981E-02
2028	39729	39729	39729	39729	39729	1.995E-02
2029	40383	40383	40383	40383	40383	2.004E-02
2030	41029	41030	41030	41030	41029	2.010E-02
2031	41721	41721	41721	41721	41721	2.015E-02
2032	42438	42438	42438	42438	42438	2.020E-02
total	758336	758337	758337	758337	758336	-

Sensitivity analysis with no restoration, and varying water quality

Table S6. Soles caught

	25 Percentile	50 Percentile	75 Percentile	High	Low	Standard Deviation
2012	370	370	370	370	370	0.00
2013	320	325	330	335	315	6.01
2014	284	301	317	333	270	18.87
2015	261	287	314	341	236	31.09
2016	246	280	315	350	215	39.97

2017	236	275	315	354	201	45.45
2018	231	273	315	357	193	48.56
2019	227	271	314	357	188	50.15
2020	225	269	313	357	185	50.89
2021	223	267	312	356	183	51.16
2022	222	266	311	355	182	51.18
2023	221	265	309	353	181	51.08
2024	220	264	308	352	180	50.92
2025	219	263	307	350	179	50.72
2026	218	261	305	349	178	50.52
2027	217	260	304	347	177	50.30
2028	216	259	302	346	177	50.08
2029	215	258	301	344	176	49.87
2030	214	257	300	343	175	49.65
2031	213	256	299	341	174	49.43
2032	212	255	297	340	173	49.21
total	5006	5782	6557	7332	4308	-

Table S7. GDP

	25 Percentile	50 Percentile	75 Percentile	High	Low	Standard Deviation
2012	47345	47345	47345	47345	47345	0.000E+00
2013	47972	47972	47972	47972	47972	2.183E-11
2014	48624	48624	48624	48624	48624	3.388E-03
2015	50078	50078	50078	50078	50078	7.430E-03
2016	52062	52062	52062	52062	52062	1.079E-02
2017	53106	53106	53106	53106	53106	1.313E-02
2018	54828	54828	54828	54828	54828	1.455E-02
2019	56855	56855	56855	56855	56855	1.539E-02
2020	58603	58603	58603	58603	58603	1.605E-02
2021	59888	59888	59888	59888	59888	1.650E-02
2022	60924	60924	60924	60924	60924	1.674E-02
2023	61977	61977	61977	61977	61977	1.682E-02
2024	63050	63050	63050	63050	63050	1.684E-02
2025	64137	64137	64137	64137	64137	1.685E-02
2026	65243	65243	65243	65243	65243	1.685E-02
2027	66397	66397	66397	66397	66397	1.685E-02
2028	67584	67584	67584	67584	67584	1.685E-02
2029	68797	68797	68797	68797	68797	1.686E-02
2030	70041	70041	70041	70041	70041	1.687E-02
2031	71353	71353	71353	71353	71353	1.688E-02
2032	72605	72605	72605	72605	72605	1.689E-02

total	1261468	1261469	1261469	1261469	1261468	-

Table S8. Disposable Income

	25 Percentile	50 Percentile	75 Percentile	High	Low	Standard Deviation
2012	30218	30218	30218	30218	30218	1.455E-11
2013	30557	30557	30557	30557	30557	3.638E-12
2014	30867	30867	30867	30867	30867	3.267E-03
2015	31604	31604	31604	31604	31604	7.247E-03
2016	33201	33201	33201	33201	33201	1.058E-02
2017	33706	33706	33706	33706	33706	1.290E-02
2018	34691	34691	34691	34691	34691	1.432E-02
2019	36083	36083	36083	36083	36083	1.516E-02
2020	37358	37358	37358	37358	37358	1.582E-02
2021	38277	38277	38277	38277	38277	1.627E-02
2022	38900	38900	38900	38900	38900	1.652E-02
2023	39534	39534	39534	39534	39534	1.660E-02
2024	40173	40173	40173	40173	40173	1.663E-02
2025	40831	40831	40831	40831	40831	1.664E-02
2026	41477	41477	41477	41477	41477	1.665E-02
2027	42163	42163	42163	42163	42163	1.665E-02
2028	42862	42862	42862	42862	42862	1.665E-02
2029	43586	43586	43586	43586	43586	1.666E-02
2030	44305	44305	44305	44305	44305	1.667E-02
2031	45072	45072	45072	45072	45072	1.669E-02
2032	45867	45867	45867	45867	45867	1.670E-02
total	801331	801332	801332	801332	801331	-

S4. SD model in Powersim form

Name	Dimensions	Unit	Definition	Documentation	Note
Total surface area restored		km2/yr	ARRSUM('Restoration rate')		
Total surface of nursery areas		km2	ARRSUM('Nursery areas')		
Intermediate domestic consumptions		ton	'Intermediate rate'*'Catchable stock'		
Sole exports		ton	'Export rate'*'Catchable stock'		
Catchable stock		ton	'Fishing quota'*('Weight of soles from the internal area'+'Sole stock from the external part of the Seine')		
Weight of soles from the internal area		ton	ARRSUM('Sole stock from the internal part of the Seine'*'Weight converter')		
Common soles total		individual	ARRSUM('Sole stock from the internal part of the Seine')		
Adjusted fractional catch rate	'common soles age'	yr^-1	'Change in demand for the internal area'*'Reference fractional catch rate'		Fishing mortalities in 2002-2011 average (= part caught) {0.014,0.237,0.419,0.492,0.481,0.417,0.391,0.379,0.36,0.428} Fractional catch rates adjusted for the age 1 population of 1689913.27625525 {0.00784910864829721,0.186333847843592,0.304598910178568,0.346564

					464143444,0.340471044437491,0.303633578705682,0.288114435460225,0.280535571961616,0.268646909472662,0.3474 version 2 {0.014,0.237,0.419,0.492,0.481,0.417,0.391,0.379,0.36,0.428}*DELAYPPL('Sole stock internal of the Seine',1<<yr>>,{1689913.27625525,1497060.373169,992042.026884171,477648.395104191,195066.8280766,81799.3236856416,39517.2532725335,20105.9832925323,10477.2278937386,5658.85555768715}<<individual>>)*'Change in demand for the internal area'/'Sole stock internal of the Seine' version 1 (original but could cause a negative fish stock) {0.014,0.237,0.419,0.492,0.481,0.417,0.391,0.379,0.36,0.428}*{1689913.27625525,1497060.373169,992042.026884171,477648.395104191,195066.8280766,81799.3236856416,39517.2532725335,20105.9832925323,10477.22

					78937386,5658.85555768715}<<individual>>*'Change in demand for the internal area'/'Sole stock internal of the Seine'
Natural mortality rate	'common soles age'	individual/ yr	'Fractional natural mortality rate'*'Sole stock from the internal part of the Seine'		
Catch rate	'common soles age'	individual/ yr	'Adjusted fractional catch rate'*'Sole stock from the internal part of the Seine'		
Age 1 common soles	1..21	individual	'Abundance multiplier'*FOR(i=1..21|DELAYPPL('Nursery areas'[i],'Delay time'[i]))*0+'Abundance multiplier'*MIN(FOR(i=1..21|DELAYPPL('Nursery areas'[i],'Delay time'[i])),FOR(i=1..21|'Nursery areas'[i]))		
Aging out	'common soles age'	individual/ yr	{'Sole stock from the internal part of the Seine'['age 1']-'Catch rate'['age 1']-'Natural mortality rate'['age 1'],'Sole stock from the internal part of the Seine'['age 2'] -'Catch rate'['age 2']-'Natural mortality rate'['age 2'],'Sole stock from the internal part of the Seine'['age 3']-'Catch rate'['age 3']-'Natural mortality rate'['age 3'],'Sole stock from the internal part of the Seine'['age 4'] -'Catch rate'['age 4']-'Natural mortality rate'['age 4'],'Sole stock from the internal part of the Seine'['age 5'] -		

			'Catch rate'['age 5']-'Natural mortality rate'['age 5'],'Sole stock from the internal part of the Seine'['age 6'] -'Catch rate'['age 6']-'Natural mortality rate'['age 6'],'Sole stock from the internal part of the Seine'['age 7'] -'Catch rate'['age 7']-'Natural mortality rate'['age 7'],'Sole stock from the internal part of the Seine'['age 8'] -'Catch rate'['age 8']-'Natural mortality rate'['age 8'],'Sole stock from the internal part of the Seine'['age 9'] -'Catch rate'['age 9']-'Natural mortality rate'['age 9'],'Sole stock from the internal part of the Seine'['age 10'] -'Catch rate'['age 10']-'Natural mortality rate'['age 10']}/1<<yr>>		
Aging in	'common soles age'	individual/ yr	{ARRSUM('Age 1 common soles'),'Aging out'['age 1'],'Aging out'['age 2'],'Aging out'['age 3'],'Aging out'['age 4'],'Aging out'['age 5'],'Aging out'['age 6'],'Aging out'['age 7'],'Aging out'['age 8'],'Aging out'['age 9']}/1<<yr>>		ARRSUM('Age 1 common soles') {1714116.60268517,1976841.10313665,1850389.04803645,1260115.79962511,682688.715528109,340215.442561704,194331.291176273,116551.783777628,70055.496365894,49511.9231960004}
Restoration rate	1..21	km2/yr	'Restoration Policy'	'Restoration Policy'*'Nursery areas'/TIMESTEP+	

b		km2	2.371513	[0,5]. 2.371513 for constant restoration rate.	2.371513
Destruction rate	1..21	km2	{0,0,0,0.0048,0.0048,0.0048,0.0048,0.0048,0.0048,0,0.0048,0.0048,0,0,0,0,0,0,0,0}*'Nursery areas'	Applied only to high density area. An expert in hydrsedimentology dynamics in the Seine estuary has estimated, based on a graph showing the evolution of hgh density nursery since 1834 untill 2004, that the total surface area of high density nurseries will be 100 km2 in 2030. Given that in 2004 the surface area is 111,74 km2, this gives an annual variation rate of -0,425%. But since our model start running in 2007, if we want to arrive to 100 km2 of nurseries in 2030 as predicted by the expert, we have to apply a 0.48% destruction rate because in our model we considered that the value of 111,74km2 is for for	

				2007 (simpyl because 2004 is the latest value available). But in fact it is a value of 2004 and was mentioned like this in the graph shown to the experts.	
Export rate			0.148305	Estimated as follows: we divided the amount of soles exported (tons) in 2012 by the The total admissible catch per year on average on the period 2002-2011 = 2118.352 tons (calculation explained above). The amount of soles exported in 2012 is calculated by dividing the total monetary value of soles exported in 2012 (3.399 Million Euros) by the unitary price of soles in 2012(0.0108199996587684 Million Euros/ton), which gives 314.16 tons in 2012. The total monetary value of soles exported is	Previous number is 0.067

				calculated by taking exports of fish in the Haute-Normandie I-O table 2012 with soles and then subtracting exports of fish in the Haute-Normandie I-O table 2012 without soles. The I-O without soles is obtained simply by subtracting from the first line for fish products consumption (agriculture and forestry are also included in our dynamic IO model aggregated to 37 sectors) the consumption of soles. The unitary price of soles is obtained from: FranceAgrimer (20/02/2014). SÉRIE HEBDOMADAIRE ESPÈCE : SOLE COMMUNE (SOL) (SCR-MER-ESPECES_HEBDO_DEPUIS_1994 _ SOLE COMMUNE (SOL)-A14). chiffres sur les ventes en halle à	

				marée - année 2014. Publié le : 20/02/2014. URL: https://visionet.franceagrimer.fr/Pages/SeriesChronologiques.aspx?menuurl=SeriesChronologiques/productions%20animales/produits%20de%20la%20mer/ventes%20en%20halle%20%C3%A0%20mar%C3%A9e/s%C3%A9ries%20hebdomadaires%20par%20esp%C3%A8ces	
Fishing quota			0.117-STEP(0.1,STARTTIME+5<<yr>>)*0-IF(TIME=2010,0.029,0)*0	Estimated as follows: we divided the Total Admissible Catch for France in zone VIId in the year 2011 (2613 tons) by the Total stock of sole in the Eastern channel (zone VIId) in 2011 (22330 tons). Source for Total Admissible Catch for France in zone VIId = 2613 tons in 2011): Commission Européenne - Directorate-General for Maritime Affairs and Fisheries	

				(acccessed in August 2014). "TACs and quotas 2011". URL: http://ec.europa.eu/fisheries/cfp/fishing_rules/tacs/index_fr.htm. Source for sole population in the Eastern channel (zone VIId) in 2011: ICES, 2012 (page 534). ICES XXXXX REPORT 2012.Sole in Sub-area VIId. Pp. 506-554. The division gives : 2613 tons / 22330 tons * 100 = 11,7%	
Intermediate rate			0.084058	Estimated as follows: we estimated the intermediate rate of sole consumption with the following division: Sole consumption by intermediate demand in 2012 (tons) /Total admissibe catch per year (average 2002-2011). The total admissible catch per year on average on the period 2002-2011 = 2118.352 tons (the calculation is similar to above except that	Previous number is 0.052

				here we do not multiply the quotas 11,7% by the stock of soles in the Eastern channel in 2011 but rather by the average stock on the period 2002-2011). Source for average stock of soles in the Eastern channel on the period 2002-2011: ICES, 2012 (page 534). ICES XXXXX REPORT 2012.Sole in Sub-area VIId. Pp. 506-554. The sole consumption by intermediate demand in 2012 (tons) is computed as follows: Share of fish consumption by intermediate demand in 2012 (=8.4058%) * Total stock of soles caught in 2012 in Haute Normandie (804.528 tons). The calculation of the later is explained above. The value of 804.528 tons is in fact an average calculated on the period 2003-2011	

				and we start the model at reference year (2012) with that value connsidering this average applies to 2012. The Share of fish consumption by intermediate demand in 2012 (=8.4058%) is coming from the I-O of Haute-Normandie 2012.	
Fractional natural mortality rate		yr^-1	0.1/1<<yr>>	ICES 2012 Stock Assessment assumes that the natural mortality rate for all ages of common soles is 0.10. Here is the source en the quote confirming that choice of onstant mortality rate for all ages: "As in previous assessments, a knife-edged maturity-ogive was used at age 3. Natural mortality are assumed at fixed values of 0.1 (i.e. 10%) for all ages and years." Source: Page 555 du rapport : ICES, 2006. ICES WGNSSK Report	

				2006.Sole in Sub-area VIId.	
Change in demand for the internal area			'Total demand allowed'/(382.069<<ton>>+110.15 <<ton>>+141.93<<ton>>)	Initial values for delays (110.15,141.93,10.00) are estimated by using the simulation. This should be modified when we synchronize. Previous equation (150219) ('Final domestic demand for sole fish'+'Intermediate domestic consumptions'+'Sole exports')/(DELAYPPL(' Final domestic demand for sole fish',1<<yr>>,382.069 <<ton>>)+DELAYPPL('I ntermediate domestic consumptions',1<<yr> >,110.15<<ton>>)+DEL AYPPL('Sole exports',1<<yr>>,141. 93<<ton>>)) ('Total demand allowed')/DELAYPPL('T otal demand allowed',1<<yr>>,(382 .069+110.15+141.93)< <ton>>)	('Final domestic demand for sole fish'<<ton>>+'Intermedia te domestic consumptions'<<ton>>+' Sole exports'<<ton>>)/ (DELAYPPL('Final domestic demand for sole fish'<<ton>>,1<<yr>>,0<< ton>>) +DELAYPPL('Intermediate domestic consumptions'<<ton>>,1 <<yr>>,0<<ton>>) +DELAYPPL('Sole exports'<<ton>>,1<<yr>> ,0<<ton>>))

Final domestic demand for sole		ton	382.069	It has been calculated multiplying the Total stock of soles caught in 2007 in Haute Normandie by the Share of fish consumption by FINAL demand (fk=1,2,3,5,6 , do not include investment and exports) in total intermediate and final demand in 2007 (60,21%) This share is calulated in % in the I-O table of Haute-Normandie of the year 2007). Regarding the Total stock of soles caught in 2007 in Haute Normandie, it is calculated as follows: we multiplied the percentage (14,311%) of soles caught the Eastern channel (zone VIId) that has been sold in the Seine estuary in 2003 (5038 tons) by the amount caught in the Eastern channel (zone VIId) in 2005 which the latest value	

				aailable (4434 tons) . Both amounts are given by ICES (2006). ICES WGNSSK Report 2006.Sole in Sub-area VIId. Page 560. Regarding the percentage (14,311%) of soles caught the Eastern channel (zone VIId) that has been sold in the Seine estuary in 2003, it is estimated as follows: we divide the amount of soles sold in the Seine estuary in 2003 which is the latest value available (721 tons) (this amount is given by: CAAM, données mises à disposition par Géolittomer LETG UMR 6554 CNRS, OFIMER 2003, European seafood magazine, CNC 2005.) per the amount of soles caught the Eastern channel (zone VIId) in 2003 (5038 tons). This division gives the percentage	

				of soles caught in the Eastern channel (zone VIId) that has been sold in the Seine estuary in 2003 (14,311%). Multiplying 14,311% by the amount caught in the Eastern channel (zone VIId) in 2005 (4434 tons) gives the Total stock of soles caught in 2007 in Haute Normandie (634,56 tons) (in fact it is in 2005 but we consider it constant untill 2007). Multiplying 634,56 tons per 60.21% gives the Final domestic demand for sole fish in the Seine estuary (382,069 tons). The remaining is consumed by intermediate demand (interindustrial exchanges) and exports.	
Water quality index		individual/ km2	0.77	Rochette, S., Rivot, E., Morin, J., Mackinson, S., Riou, P., & Le Pape, O. (2010). Effect of nursery habitat	

				degradation on flatfish population: Application to Solea solea in the Eastern Channel (Western Europe). Journal of sea Research, 64(1-2), 34-44.	
Sole stock from the internal part of the Seine	'common soles age'	individual	{2048815.7909877,1815250.7908151,1203511.27431041,578888.922943308,236186.680560869,98962.2191550043,47798.7518518671,24329.5646926003,12675.7032048448,6844.87973061618 }	The first value, 2048815,79 individuals of age 1, is calculated as explained above. Then the others values are computed like this: Starting from this value for age 1 (k = 1), the next age categories (k = 2 to 10) are computed as follows: Nk+1 = Nk * (1 - natural mortality% - Fishing mortality %). Takuro, my values are slightly different to yours.	Version 1. Fish pop. for after catch {1689913.27625525,1507657.6357182,1075964.22365223,640630.271371411,354547.557522368,198379.624557729,118306.946755203,72390.3129042848,44843.2237787724,28311.907921937} Version 2. Fish pop. for before catch at each age stage {1714116.60268517,1976841.10313665,1850389.04803645,1260115.79962511,682688.715528109,340215.442561704,194331.291176273,116551.783777628,70055.496365894,49511.9231960004} Version 3. Fish pop. without using exponents {1689913.27625525,1497060.373169,992042.026884171,477648.39510419

					1,195066.8280766,81799.3236856416,39517.2532725335,20105.9832925323,10477.2278937386,5658.85555768715}
Nursery areas	1..21	km2	{0.5760937,6.0964641,1.6079978,0.126614,12.5094632,6.3686842,1.6269899,33.1285531,14.6998854,2.2980441,29.4884006,13.7882646,1.772596,27.0130969,5.191174,1.6269899,10.8761426,2.6335712,1.076219,23.4489128,0.4304876 }	The initial surface areas for each of the 21 nursery categories are obtained from estimations of the habitat suitability model developed by Rochette et al. (2010)	updated with the data given on Sept.22, 2014.
Abundance multiplier	1..21	individual/ km2	{2611.55272377202,4465.84076123762,6316.4998974086,11929.5869340138,17609.4820712758,21915.0311909017,11591.8703739139,16202.5608787389,19384.0331502866,7796.5065526116,11283.682094712,13837.5938335516,3536.37020879611,5642.08021459184,7479.92945463762,1104.38141694352,1895.78843573591,2691.73692587577,903.121455608231,1601.14171501423,2350.91595398308 }*'Water quality index'/0.77	These are the density of soles (number of individuals per km2 in the internal part of the estuary. I explain above how they are computed. I copy-past the explaination here: (1) First,the number of sole juvenile of age 1 in the Eastern channel zone VIId (external part of the Seine estuary) is taken from ICES (2012, page 534) and is 33419000 individuals (on average over the period 2002-2011). Multiplying this number by 14,2%	density with catch which gives 1,689,913.28 {2611.55272377202,4465.84076123762,6316.4998974086,11929.5869340138,17609.4820712758,21915.0311909017,11591.8703739139,16202.5608787389,19384.0331502866,7796.5065526116,11283.682094712,13837.5938335516,3536.37020879611,5642.08021459184,7479.92945463762,1104.38141694352,1895.78843573591,2691.73692587577,903.121455608231,1601.14171501423,2350.91595398308} Density for without catch 1714116.60268517

				(percentage given by Rochette et al., 2010), the contribution of the whole Seine estuary sector (large area of 966,9 km2) to the total stock of sole of age 0 in the Eastern channel zone VIId , gives the total stock of soles of age 1 in the Seine estuary (large area of 966,9 km2) = 4750176,66 individuals (we assume that the 14,2% applies also for age 1). This last number is then multiplied by the share of each of te 21 nursery categories in the total abundance of soles of age 0 sampled in 2004 in the Seine estuary (large area of 966,9 km2) assuming again that what works for age 0 works also for age 1 (this sampling operation do not give an absolute value of the number of	{2648.95590419243,4529.80142578822,6406.96607223927,12100.4448640001,17861.688595397,22228.902650624,11757.8914597831,16434.6171961564,19661.6551498716,7908.16967875941,11445.2892464089,14035.7786199545,3587.01881020053,5722.88721584127,7587.05850027283,1120.19858847327,1922.94029687021,2730.28852047555,916.056141719743,1624.073586885,2384.58624245922}

				individuals of age 0 because during samples, fish escape when the boat appraoch to capture them, and sometimes some juveniles pass through the net and are not counted. So sampling can only be used to compare the relative size of each nursery categories). The multiplication gives an absolute value of sole juveniles of age 1 for each of the 21 categories of nurseries. Dividing each of the 21 values per the corresponding surface area of the nursery category (from the large area of 966,9 km2) gives an absolute density of fish per km2. We use this density in our model for the internal part of the Seine (196km2) assuming that it is spatially constant.		

Reference fractional catch rate	'common soles age'		{0.014,0.237,0.419,0.492,0.481,0.417,0.391,0.379,0.36,0.428}	These values are the average Fishing mortalities calculated over the period 2002-2011. This mortality is due to fishing activityies by fishermen based in France, UK and Belgium. Source of annual fishing mortalities used to calculate the average : ICES, 2012 (page 533). ICES XXXXX REPORT 2012. Sole in Sub-area VIId. Pp. 506-554.	
Sole stock from the external part of the Seine		ton	17291.4370264999<<ton>>	This amount is obtained after subtracting the Stock total of soles in the internal part of the Seine estuary (196 km2 area) from the Stock total of soles in the Eastern channel (external part of the Seine) all expressed in tons and calculated as a yearly 2002-2011 average. The Stock total of soles in the Eastern channel = 18105.570 tons	

				(source of data for calcuation of the yearly average: ICES, 2012 (pages 521 and 534). ICES XXXXX REPORT 2012.Sole in Sub-area VIId. Pp. 506-554). Regarding Stock total of soles in the internal part of the Seine estuary (196 km2 area), it is calculated as follows: (1) First,number of sole juvenile of age 1 in the Eastern channel zone VIId (external part of the Seine estuary) is taken from ICES (2012, page 534) and is 33419000 individuals (on average over the period 2002-2011). Multiplying this number by 14,2% (percentage given by Rochette et al., 2010), the contribution of the whole Seine estuary sector (large area of 966,9 km2) to the total stock of sole of age 0 in the Eastern	

				channel zone VIId , gives the total stock of soles of age 1 in the Seine estuary (large area of 966,9 km2) = 4750176,66 individuals (we assume that the 14,2% applies also for age 1). This last number is then multiplied by the share of each of te 21 nursery categories in the total abundance of soles of age 0 sampled in 2004 in the Seine estuary (large area of 966,9 km2) assuming again that what works for age 0 works also for age 1 (this sampling operation do not give an absolute value of the number of individuals of age 0 because during samples, fish escape when the boat appraoch to capture them, and sometimes some juveniles pass through the net and	

				are not counted. So sampling can only be used to compare the relative size of each nursery categories). Tee multiplication give an absolute value of sole juveniles of age 1 for each of the 21 categories of nurseries. Dividing each of the 21 values per the corresponding surface area of the nursery category (from the large area of 966,9 km2) gives an absolute density of fish per km2. Each of the 21 absolute density is then multiplied by the surface area of each of the 21 nursery categories in the internal part of the seine estuary (196 km2). This gives the absolute number of sole juveniles of age 1 int the internal estuary per nursery category. The summ through the 21	

				categories gives the total number of sole juveniles of age 1 in the internal part of the Seine and it is 2048816 individuals of age 1. Starting from this value for age 1 (k = 1), the next age categories (k = 2 to 10) are computed as follows: Nk+1 = Nk * (1 - natural mortality% - Fishing mortality %). Then each age category is converted into tons multiplying the number of individuals by their unitary weight given by ICES (2012, page 521). The weight value is an average of the individual weights given for each yaer between 2002 and 2011. Summing through all age categories gives the following result: 987.038 tons, which is the total weight of soles in the internal part of the Seinee	

				estuary (196km2) all ages included. Then the total stock of the external part of the Seine (= the Eastern channel zone VIId except the internal part of the Seine) is obtained like this: Stock total of soles in the Eastern channel - total weight of soles in the internal part of the Seinee estuary = 18105.570 tons - 987.038 tons = 17118,5 tons. So mayb we should correct the value mentioned here on the left (17291,4 tons) by 17118,5 tons	
Sole caught		ton	ARRSUM('Weight converter'*'Catch rate')*1<<yr>>	This number is just for checking how catch rate changes over time.	
Weight converter	'common soles age'	kg/individual	{0.1039,0.1523,0.1905,0.2367,0.2778,0.3183,0.342,0.3785,0.4471,0.4364}	Weight per fish in 2002-2011 average (kg). Averages calculated from annual data published in ICES, 2012 (page 521). ICES XXXXX REPORT 2012.Sole in	The numbers were provided by Mateo on Aug.13, 2014.

				Sub-area VIId. Pp. 506-554.	
Restoration Policy	1..21	km2	{0<<km2>>,0<<km2>>,0<<km2>>,IF(TIME<2023,'restoration per category',0<<km2>>),IF(TIME<2023,'restoration per category',0<<km2>>),IF(TIME<2023,'restoration per category',0<<km2>>),IF(TIME<2023,'restoration per category',0<<km2>>),IF(TIME<2023,'restoration per category',0<<km2>>),IF(TIME<2023,'restoration per category',0<<km2>>),0<<km2>>,IF(TIME<2023,'restoration per category',0<<km2>>),IF(TIME<2023,'restoration per category',0<<km2>>),0<<km2>>,0<<km2>>,0<<km2>>,0<<km2>>,0<<km2>>,0<<km2>>,0<<km2>>,0<<km2>>,0<<km2>>}	{0,0,0,IF(TIME<2021,0.01805,0),IF(TIME<2021,0.01805,0),IF(TIME<2021,0.01805,0),IF(TIME<2021,0.01805,0),IF(TIME<2021,0.01805,0),IF(TIME<2021,0.01805,0),0,IF(TIME<2021,0.01805,0),IF(TIME<2021,0.01805,0),0,0,0,0,0,0,0,0,0}*0+ {0<<km2>>,0<<km2>>,0<<km2>>,STEP(IF(TIME<2023,'restoration per category',0<<km2>>), starttime+1<<yr>>),STEP(IF(TIME<2023,'restoration per category',0<<km2>>), starttime+1<<yr>>),STEP(IF(TIME<2023,'restoration per category',0<<km2>>), starttime+1<<yr>>),STEP(IF(TIME<2023,'restoration per category',0<<km2>>), starttime+1<<yr>>),STEP(IF(TIME<2023,'restoration per category',0<<km2>>),	{0<<km2>>,0<<km2>>,0<<km2>>,IF(TIME<2023,'restoration per category',0<<km2>>),IF(TIME<2023,'restoration per category',0<<km2>>), STARTTIME+1<<yr>>),IF(TIME<2023,'restoration per category',0<<km2>>),IF(TIME<2023,'restoration per category',0<<km2>>), STARTTIME+1<<yr>>),IF(TIME<2023,'restoration per category',0<<km2>>),IF(TIME<2023,'restoration per category',0<<km2>>), IF(TIME<2023,'restoration per category',0<<km2>>), IF(TIME<2023,'restoration per category',0<<km2>>),0<<km2>>,0<<km2>>,0<<km2>>,0<<km2>>,0<<km2>>,0<<km2>>,0<<km2>>,0<<km2>>,0<<km2>>}

				starttime+1<<yr>>),STEP(IF(TIME<2023,'restoration per category',0<<km2>>), starttime+1<<yr>>),0<<km2>>,STEP(IF(TIME<2023,'restoration per category',0<<km2>>), starttime+1<<yr>>),STEP(IF(TIME<2023,'restoration per category',0<<km2>>), starttime+1<<yr>>),0<<km2>>,0<<km2>>,0<<km2>>,0<<km2>>,0<<km2>>,0<<km2>>,0<<km2>>,0<<km2>>,0<<km2>>}	