L A M P I R A N

Lampiran 1. Hasil Estimasi Fungsi Produksi Frontier Cobb-Douglas tanpa Variabel Perubahan Teknologi Netral Hicksian

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Output from the program FRONTIER (Version 4.1c)


instruction file = terminal
data file =        tcdm2-d.txt


 Tech. Eff. Effects Frontier (see B&C 1993)
 The model is a production function
 The dependent variable is logged


the ols estimates are :

                 coefficient     standard-error    t-ratio

  beta 0        -0.20955559E+00  0.21411609E+00 -0.97870078E+00
  beta 1         0.65544200E+00  0.57450983E-01  0.11408717E+02
  beta 2         0.44490946E-01  0.92335717E-01  0.48183896E+00
  beta 3         0.39156012E+00  0.54881030E-01  0.71347079E+01
  sigma-squared  0.92127271E-01

log likelihood function =  -0.16989108E+02

the estimates after the grid search were :

  beta 0        -0.15584635E+00
  beta 1         0.65544200E+00
  beta 2         0.44490946E-01
  beta 3         0.39156012E+00
  delta 0        0.00000000E+00
  delta 1        0.00000000E+00
  delta 2        0.00000000E+00
  delta 3        0.00000000E+00
  delta 4        0.00000000E+00
  delta 5        0.00000000E+00
  delta 6        0.00000000E+00
  sigma-squared  0.90624939E-01
  gamma          0.50000000E-01


 iteration =     0  func evals =     20  llf = -0.16998573E+02
    -0.15584635E+00 0.65544200E+00 0.44490946E-01 0.39156012E+00 0.00000000E+00
     0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00
     0.00000000E+00 0.90624939E-01 0.50000000E-01
 gradient step
 iteration =     5  func evals =     45  llf = -0.14509038E+02
    -0.15581706E+00 0.65475550E+00 0.43980398E-01 0.39092071E+00 0.92360333E-05
    -0.75995062E-03-0.33598916E-02 0.12979067E-02-0.53006938E-03-0.47953856E-03
     0.30569416E-02 0.90110407E-01 0.50126578E-01
 iteration =    10  func evals =     73  llf = -0.13470061E+02
     0.57604034E-01 0.75844630E+00-0.34958095E-01 0.31172441E+00-0.57789361E-01
    -0.28452032E-02-0.10668562E-02 0.12474820E-01-0.50708583E-03-0.41970998E-02
     0.42902147E-02 0.87295316E-01 0.26820235E+00
 iteration =    15  func evals =    130  llf =  0.63696029E+01
     0.17415688E+01 0.51814951E+00 0.21530756E+00 0.23533877E+00 0.83039234E+00
    -0.10448468E-01-0.11815025E-01 0.13904741E-01-0.19442790E-02-0.19472784E-01
     0.10728357E-01 0.57754228E-01 0.76661071E+00
 pt better than entering pt cannot be found
 iteration =    20  func evals =    221  llf =  0.12225449E+02
     0.22819253E+01 0.43682295E+00 0.27068015E+00 0.23028406E+00 0.67996413E+00
    -0.27787209E-02-0.11977277E-01 0.17732342E-02-0.29325743E-02-0.33463085E-01
     0.11175149E-01 0.54986832E-01 0.95930366E+00


the final mle estimates are :

                 coefficient     standard-error    t-ratio

  beta 0         0.22819253E+01  0.33759893E+00  0.67592787E+01
  beta 1         0.43682295E+00  0.71408326E-01  0.61172552E+01
  beta 2         0.27068015E+00  0.11674617E+00  0.23185355E+01
  beta 3         0.23028406E+00  0.56597093E-01  0.40688320E+01
  delta 0        0.67996413E+00  0.59929316E+00  0.11346102E+01
  delta 1       -0.27787209E-02  0.36963953E-02 -0.75173803E+00
  delta 2       -0.11977277E-01  0.44886148E-02 -0.26683682E+01
  delta 3        0.17732342E-02  0.11711912E-01  0.15140433E+00
  delta 4       -0.29325743E-02  0.28586625E-02 -0.10258554E+01
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  delta 5       -0.33463085E-01  0.69699819E-02 -0.48010289E+01
  delta 6        0.11175149E-01  0.47890467E-02  0.23334809E+01
  sigma-squared  0.54986832E-01  0.14554254E-01  0.37780592E+01
  gamma          0.95930366E+00  0.96972088E-01  0.98925751E+01

log likelihood function =   0.12225449E+02

LR test of the one-sided error =   0.58429115E+02
with number of restrictions = 8
 [note that this statistic has a mixed chi-square distribution]

number of iterations =     20

(maximum number of iterations set at :   100)

number of cross-sections =     12

number of time periods =      7

total number of observations =     84

thus there are:      0  obsns not in the panel


covariance matrix :

  0.11397304E+00 -0.22355117E-01  0.25492380E-01 -0.52260242E-02  0.45864361E-01
  0.26459699E-03 -0.45119975E-03 -0.14830077E-02 -0.32274264E-03 -0.10805322E-02
  0.15849432E-03 -0.55479777E-03  0.22074037E-01
 -0.22355117E-01  0.50991491E-02 -0.63986838E-02  0.13114732E-02 -0.91364971E-02
 -0.70597221E-04  0.11015053E-03  0.38907573E-03  0.68310456E-04  0.19331824E-03
 -0.27535851E-04  0.25297468E-03 -0.33094644E-02
  0.25492380E-01 -0.63986838E-02  0.13629669E-01 -0.55702806E-02  0.33779757E-01
 -0.64755025E-05 -0.23401720E-03 -0.37194803E-03 -0.95367083E-04  0.57877182E-04
 -0.15059620E-03 -0.16757616E-03  0.18923936E-03
 -0.52260242E-02  0.13114732E-02 -0.55702806E-02  0.32032310E-02 -0.19670887E-01
  0.59200645E-04  0.95941403E-04 -0.96598572E-05  0.26570966E-04 -0.15274384E-03
  0.12916272E-03 -0.10284317E-03  0.14962696E-02
  0.45864361E-01 -0.91364971E-02  0.33779757E-01 -0.19670887E-01  0.35915230E+00
 -0.91639929E-03 -0.30783099E-03 -0.19925080E-02 -0.57072049E-03  0.79249139E-03
 -0.25236248E-02  0.24019853E-03 -0.11015133E-01
  0.26459699E-03 -0.70597221E-04 -0.64755025E-05  0.59200645E-04 -0.91639929E-03
  0.13663338E-04 -0.60249194E-05 -0.12254056E-04 -0.25672756E-05 -0.81167391E-05
  0.67630008E-05 -0.11713229E-04  0.10966011E-03
 -0.45119975E-03  0.11015053E-03 -0.23401720E-03  0.95941403E-04 -0.30783099E-03
 -0.60249194E-05  0.20147663E-04  0.90257798E-05 -0.45076918E-06 -0.51429635E-05
 -0.23949002E-05  0.10782696E-04 -0.85398614E-05
 -0.14830077E-02  0.38907573E-03 -0.37194803E-03 -0.96598572E-05 -0.19925080E-02
 -0.12254056E-04  0.90257798E-05  0.13716887E-03  0.41908410E-05  0.30444638E-04
  0.23570042E-05  0.33753928E-04 -0.26409498E-03
 -0.32274264E-03  0.68310456E-04 -0.95367083E-04  0.26570966E-04 -0.57072049E-03
 -0.25672756E-05 -0.45076918E-06  0.41908410E-05  0.81719511E-05 -0.29557840E-06
  0.29720353E-05 -0.30155582E-06 -0.33155476E-04
 -0.10805322E-02  0.19331824E-03  0.57877182E-04 -0.15274384E-03  0.79249139E-03
 -0.81167391E-05 -0.51429635E-05  0.30444638E-04 -0.29557840E-06  0.48580648E-04
 -0.98849416E-05  0.87125407E-05 -0.46211851E-03
  0.15849432E-03 -0.27535851E-04 -0.15059620E-03  0.12916272E-03 -0.25236248E-02
  0.67630008E-05 -0.23949002E-05  0.23570042E-05  0.29720353E-05 -0.98849416E-05
  0.22934968E-04 -0.38807377E-05  0.18850527E-03
 -0.55479777E-03  0.25297468E-03 -0.16757616E-03 -0.10284317E-03  0.24019853E-03
 -0.11713229E-04  0.10782696E-04  0.33753928E-04 -0.30155582E-06  0.87125407E-05
 -0.38807377E-05  0.21182630E-03  0.22323367E-04
  0.22074037E-01 -0.33094644E-02  0.18923936E-03  0.14962696E-02 -0.11015133E-01
  0.10966011E-03 -0.85398614E-05 -0.26409498E-03 -0.33155476E-04 -0.46211851E-03
  0.18850527E-03  0.22323367E-04  0.94035858E-02


technical efficiency estimates :

     firm  year             eff.-est.

       1     1          0.52487207E+00
       2     1          0.95951864E+00
       3     1          0.32210165E+00
       4     1          0.36088329E+00
       5     1          0.68307585E+00
       6     1          0.34999532E+00
       7     1          0.57257288E+00
       8     1          0.22913180E+00
       9     1          0.27668077E+00
      10     1          0.35144206E+00
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11	1	0.50409585E+00
12	1	0.51327805E+00
1	2	0.51214961E+00
2	2	0.94911666E+00
3	2	0.31729081E+00
4	2	0.39582529E+00
5	2	0.50125568E+00
6	2	0.34957747E+00
7	2	0.52500202E+00
8	2	0.23884662E+00
9	2	0.27954064E+00
10	2	0.24162860E+00
11	2	0.34935428E+00
12	2	0.48371756E+00
1	3	0.55894802E+00
2	3	0.96201142E+00
3	3	0.34108214E+00
4	3	0.40678785E+00
5	3	0.63663952E+00
6	3	0.38725631E+00
7	3	0.56786151E+00
8	3	0.24884135E+00
9	3	0.33789736E+00
10	3	0.24426382E+00
11	3	0.39772305E+00
12	3	0.52506485E+00
1	4	0.65025253E+00
2	4	0.98242194E+00
3	4	0.34745199E+00
4	4	0.42300802E+00
5	4	0.74012929E+00
6	4	0.41317955E+00
7	4	0.59677882E+00
8	4	0.24245649E+00
9	4	0.39820927E+00
10	4	0.25889501E+00
11	4	0.41965761E+00
12	4	0.57041378E+00
1	5	0.57574081E+00
2	5	0.96761824E+00
3	5	0.31198995E+00
4	5	0.40267610E+00
5	5	0.64982566E+00
6	5	0.38138576E+00
7	5	0.51363876E+00
8	5	0.21191572E+00
9	5	0.39202122E+00
10	5	0.23682270E+00
11	5	0.38358249E+00
12	5	0.66233862E+00
1	6	0.62320486E+00
2	6	0.98439776E+00
3	6	0.32942863E+00
4	6	0.42843253E+00
5	6	0.68648518E+00
6	6	0.41215665E+00
7	6	0.58930609E+00
8	6	0.24809731E+00
9	6	0.45191533E+00
10	6	0.25777511E+00
11	6	0.43163147E+00
12	6	0.75583163E+00
1	7	0.64041023E+00
2	7	0.98303750E+00
3	7	0.34775403E+00
4	7	0.42081546E+00
5	7	0.81383393E+00
6	7	0.42495133E+00
7	7	0.60382713E+00
8	7	0.22447041E+00
9	7	0.45374020E+00
10	7	0.25769058E+00
11	7	0.41707261E+00
12	7	0.81386009E+00

mean efficiency = 0.48497461E+00

```
summary of panel of observations:
(1 = observed, 0 = not observed)

  t:   1   2   3   4   5   6   7
   n
   1   1   1   1   1   1   1   1   7
   2   1   1   1   1   1   1   1   7
   3   1   1   1   1   1   1   1   7
   4   1   1   1   1   1   1   1   7
   5   1   1   1   1   1   1   1   7
   6   1   1   1   1   1   1   1   7
   7   1   1   1   1   1   1   1   7
   8   1   1   1   1   1   1   1   7
   9   1   1   1   1   1   1   1   7
  10   1   1   1   1   1   1   1   7
  11   1   1   1   1   1   1   1   7
  12   1   1   1   1   1   1   1   7

      12  12  12  12  12  12  12  84
```

Lampiran 2. Hasil Estimasi Fungsi Produksi Frontier Cobb-Douglas dengan Variabel Perubahan Teknologi Netral Hicksian

```
Output from the program FRONTIER (Version 4.1c)


instruction file = terminal
data file =        thnm2-d.txt


 Tech. Eff. Effects Frontier (see B&C 1993)
 The model is a production function
 The dependent variable is logged


the ols estimates are :

                 coefficient     standard-error    t-ratio

  beta 0        -0.47899969E+00  0.24563068E+00 -0.19500809E+01
  beta 1         0.76805077E+00  0.77620918E-01  0.98948941E+01
  beta 2        -0.16577825E-02  0.93034362E-01 -0.17819035E-01
  beta 3         0.29660738E+00  0.70154133E-01  0.42279388E+01
  beta 4         0.56205001E-01  0.26693306E-01  0.21055841E+01
  sigma-squared  0.88336035E-01

log likelihood function =  -0.14695839E+02

the estimates after the grid search were :

  beta 0        -0.42673693E+00
  beta 1         0.76805077E+00
  beta 2        -0.16577825E-02
  beta 3         0.29660738E+00
  beta 4         0.56205001E-01
  delta 0        0.00000000E+00
  delta 1        0.00000000E+00
  delta 2        0.00000000E+00
  delta 3        0.00000000E+00
  delta 4        0.00000000E+00
  delta 5        0.00000000E+00
  delta 6        0.00000000E+00
  delta 7        0.00000000E+00
  sigma-squared  0.85809334E-01
  gamma          0.50000000E-01


 iteration =     0  func evals =     20  llf = -0.14701614E+02
    -0.42673693E+00 0.76805077E+00-0.16577825E-02 0.29660738E+00 0.56205001E-01
     0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00
     0.00000000E+00 0.00000000E+00 0.00000000E+00 0.85809334E-01 0.50000000E-01
 gradient step
 iteration =     5  func evals =     44  llf = -0.12716577E+02
    -0.42676171E+00 0.76719748E+00-0.22352704E-02 0.29583464E+00 0.55832341E-01
     0.25824091E-04-0.88562801E-03-0.36086644E-02 0.94302778E-03 0.29439639E-03
    -0.75838978E-03 0.27082749E-02 0.58998973E-03 0.85476729E-01 0.50116284E-01
 iteration =    10  func evals =     68  llf = -0.12502810E+02
    -0.42096701E+00 0.76138183E+00-0.24822002E-02 0.29113292E+00 0.71968256E-01
    -0.13291349E-02 0.50293531E-03-0.56914753E-02-0.86718898E-02-0.41231026E-03
    -0.11717764E-02 0.31925703E-02 0.20749805E-01 0.85046401E-01 0.67192287E-01
 iteration =    15  func evals =     96  llf = -0.83573385E+01
    -0.18686552E+00 0.68091931E+00 0.59620277E-01 0.31363751E+00 0.13180916E+00
    -0.87412857E+00 0.46237392E-02-0.13852349E-01-0.13929553E-01-0.40226933E-02
    -0.56986346E-02 0.11389503E-01 0.16269074E+00 0.89623899E-01 0.56099761E+00
 iteration =    20  func evals =    199  llf =  0.98428436E+01
     0.12448112E+01 0.50052294E+00 0.27481365E+00 0.23290229E+00 0.48841213E-01
     0.30834565E+00-0.85547579E-02-0.16421170E-01 0.30359973E-01-0.34805466E-02
    -0.17207026E-01 0.88153478E-02 0.10566973E+00 0.54324299E-01 0.70552884E+00
 iteration =    25  func evals =    302  llf =  0.13277805E+02
     0.15559912E+01 0.49786965E+00 0.33865359E+00 0.16202672E+00 0.46543504E-01
     0.88215435E+00-0.51224714E-02-0.18007275E-01 0.22002487E-01-0.40108822E-02
    -0.33403921E-01 0.51484450E-02 0.70148718E-01 0.58468159E-01 0.87060685E+00
 iteration =    30  func evals =    331  llf =  0.13435364E+02
     0.15773242E+01 0.49641974E+00 0.34043738E+00 0.16059679E+00 0.45274967E-01
     0.89878322E+00-0.51432490E-02-0.17838772E-01 0.21467376E-01-0.38727674E-02
    -0.34492202E-01 0.50689758E-02 0.68209504E-01 0.58542548E-01 0.87687266E+00
```

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the final mle estimates are :

                 coefficient     standard-error    t-ratio

  beta 0         0.15773242E+01  0.12844856E+01  0.12279813E+01
  beta 1         0.49641974E+00  0.11695323E+00  0.42446004E+01
  beta 2         0.34043738E+00  0.14196450E+00  0.23980459E+01
  beta 3         0.16059679E+00  0.11077847E+00  0.14497113E+01
  beta 4         0.45274967E-01  0.75353452E-01  0.60083467E+00
  delta 0        0.89878322E+00  0.11646030E+01  0.77175075E+00
  delta 1       -0.51432490E-02  0.36054331E-02 -0.14265273E+01
  delta 2       -0.17838772E-01  0.91484251E-02 -0.19499281E+01
  delta 3        0.21467376E-01  0.31342676E-01  0.68492480E+00
  delta 4       -0.38727674E-02  0.80247926E-02 -0.48260032E+00
  delta 5       -0.34492202E-01  0.59333445E-01 -0.58132815E+00
  delta 6        0.50689758E-02  0.60298257E-02  0.84065048E+00
  delta 7        0.68209504E-01  0.11153138E+00  0.61157233E+00
  sigma-squared  0.58542548E-01  0.12438132E-01  0.47066995E+01
  gamma          0.87687266E+00  0.37008823E+00  0.23693611E+01

log likelihood function =   0.13435327E+02

LR test of the one-sided error =   0.56262330E+02
with number of restrictions = 9
 [note that this statistic has a mixed chi-square distribution]

number of iterations =     30

(maximum number of iterations set at :   100)

number of cross-sections =     12

number of time periods =      7

total number of observations =     84

thus there are:      0  obsns not in the panel


covariance matrix :

  0.16499032E+01 -0.12772488E+00  0.16028737E+00 -0.11017093E+00 -0.93666746E-01
  0.13239407E+01 -0.16992372E-02  0.10201863E-01 -0.36830881E-01  0.90360047E-02
 -0.74477833E-01 -0.59118420E-02 -0.13618125E+00  0.74722546E-02  0.46715041E+00
 -0.12772488E+00  0.13678058E-01 -0.14359991E-01  0.54439703E-02  0.76434163E-02
 -0.88160960E-01  0.11387137E-03 -0.70786334E-03  0.25391997E-02 -0.57146779E-03
  0.51961787E-02  0.35278164E-03  0.91739145E-02 -0.55979551E-03 -0.33066324E-01
  0.16028737E+00 -0.14359991E-01  0.20153918E-01 -0.11989377E-01 -0.87461898E-02
  0.13079915E+00 -0.11125693E-03  0.79718032E-03 -0.32843127E-02  0.72674036E-03
 -0.66803578E-02 -0.57805742E-03 -0.12450479E-01  0.67020957E-03  0.43354415E-01
 -0.11017093E+00  0.54439703E-02 -0.11989377E-01  0.12271869E-01  0.53500932E-02
 -0.10718169E+00  0.89299652E-04 -0.62471864E-03  0.26259425E-02 -0.63487049E-03
  0.52228307E-02  0.52143023E-03  0.10064063E-01 -0.50555807E-03 -0.33436790E-01
 -0.93666746E-01  0.76434163E-02 -0.87461898E-02  0.53500932E-02  0.56781427E-02
 -0.73095184E-01  0.10506918E-03 -0.58706515E-03  0.20549533E-02 -0.51663580E-03
  0.42030626E-02  0.31848291E-03  0.77711216E-02 -0.37077330E-03 -0.26084041E-01
  0.13239407E+01 -0.88160960E-01  0.13079915E+00 -0.10718169E+00 -0.73095184E-01
  0.13563001E+01 -0.14036729E-02  0.80077243E-02 -0.33573069E-01  0.71789494E-02
 -0.61898600E-01 -0.66417563E-02 -0.12061564E+00  0.43798470E-02  0.38235368E+00
 -0.16992372E-02  0.11387137E-03 -0.11125693E-03  0.89299652E-04  0.10506918E-03
 -0.14036729E-02  0.12999148E-04 -0.16930953E-04  0.34041169E-04 -0.13076307E-04
  0.81083078E-04  0.36229761E-05  0.13546589E-03 -0.86064980E-05 -0.48304955E-03
  0.10201863E-01 -0.70786334E-03  0.79718032E-03 -0.62471864E-03 -0.58706515E-03
  0.80077243E-02 -0.16930953E-04  0.83693682E-04 -0.23975953E-03  0.62695586E-04
 -0.49361783E-03 -0.37732915E-04 -0.87225449E-03  0.53145318E-04  0.29838140E-02
 -0.36830881E-01  0.25391997E-02 -0.32843127E-02  0.26259425E-02  0.20549533E-02
 -0.33573069E-01  0.34041169E-04 -0.23975953E-03  0.98236332E-03 -0.21887536E-03
  0.17429168E-02  0.15685586E-03  0.33009526E-02 -0.16203005E-03 -0.10663092E-01
  0.90360047E-02 -0.57146779E-03  0.72674036E-03 -0.63487049E-03 -0.51663580E-03
  0.71789494E-02 -0.13076307E-04  0.62695586E-04 -0.21887536E-03  0.64397296E-04
 -0.44234005E-03 -0.32486395E-04 -0.80830881E-03  0.42961906E-04  0.27031192E-02
 -0.74477833E-01  0.51961787E-02 -0.66803578E-02  0.52228307E-02  0.42030626E-02
 -0.61898600E-01  0.81083078E-04 -0.49361783E-03  0.17429168E-02 -0.44234005E-03
  0.35204577E-02  0.28942986E-03  0.63956073E-02 -0.35161378E-03 -0.21767175E-01
 -0.59118420E-02  0.35278164E-03 -0.57805742E-03  0.52143023E-03  0.31848291E-03
 -0.66417563E-02  0.36229761E-05 -0.37732915E-04  0.15685586E-03 -0.32486395E-04
  0.28942986E-03  0.36358797E-04  0.56025061E-03 -0.16527692E-04 -0.17782294E-02
 -0.13618125E+00  0.91739145E-02 -0.12450479E-01  0.10064063E-01  0.77711216E-02
 -0.12061564E+00  0.13546589E-03 -0.87225449E-03  0.33009526E-02 -0.80830881E-03
  0.63956073E-02  0.56025061E-03  0.12439248E-01 -0.52242139E-03 -0.39037678E-01
  0.74722546E-02 -0.55979551E-03  0.67020957E-03 -0.50555807E-03 -0.37077330E-03
  0.43798470E-02 -0.86064980E-05  0.53145318E-04 -0.16203005E-03  0.42961906E-04
 -0.35161378E-03 -0.16527692E-04 -0.52242139E-03  0.15470712E-03  0.22962608E-02
```

```
 0.46715041E+00 -0.33066324E-01  0.43354415E-01 -0.33436790E-01 -0.26084041E-01
 0.38235368E+00 -0.48304955E-03  0.29838140E-02 -0.10663092E-01  0.27031192E-02
-0.21767175E-01 -0.17782294E-02 -0.39037678E-01  0.22962608E-02  0.13696530E+00


technical efficiency estimates :

     firm  year             eff.-est.

       1     1          0.64461106E+00
       2     1          0.97877968E+00
       3     1          0.46547744E+00
       4     1          0.49155791E+00
       5     1          0.94365684E+00
       6     1          0.48340100E+00
       7     1          0.69150531E+00
       8     1          0.34046482E+00
       9     1          0.40344705E+00
      10     1          0.50385054E+00
      11     1          0.72503973E+00
      12     1          0.83273254E+00
       1     2          0.59538134E+00
       2     2          0.97283006E+00
       3     2          0.44237524E+00
       4     2          0.50841548E+00
       5     2          0.70595101E+00
       6     2          0.44777886E+00
       7     2          0.60774167E+00
       8     2          0.32897023E+00
       9     2          0.39488740E+00
      10     2          0.34116804E+00
      11     2          0.49663302E+00
      12     2          0.76237429E+00
       1     3          0.62462688E+00
       2     3          0.97178348E+00
       3     3          0.45117641E+00
       4     3          0.50098102E+00
       5     3          0.84599747E+00
       6     3          0.47311006E+00
       7     3          0.62653882E+00
       8     3          0.33569545E+00
       9     3          0.45028635E+00
      10     3          0.32678035E+00
      11     3          0.53836290E+00
      12     3          0.78268418E+00
       1     4          0.70214987E+00
       2     4          0.97853211E+00
       3     4          0.45292411E+00
       4     4          0.51200713E+00
       5     4          0.92837372E+00
       6     4          0.49949810E+00
       7     4          0.67509870E+00
       8     4          0.31710727E+00
       9     4          0.51592424E+00
      10     4          0.34040552E+00
      11     4          0.56299861E+00
      12     4          0.83032390E+00
       1     5          0.61989126E+00
       2     5          0.97017054E+00
       3     5          0.41087005E+00
       4     5          0.48798961E+00
       5     5          0.85866111E+00
       6     5          0.46659265E+00
       7     5          0.56828523E+00
       8     5          0.28128907E+00
       9     5          0.50475103E+00
      10     5          0.31550128E+00
      11     5          0.51687042E+00
      12     5          0.82730801E+00
       1     6          0.63209362E+00
       2     6          0.97577706E+00
       3     6          0.41295525E+00
       4     6          0.49512823E+00
       5     6          0.84334734E+00
       6     6          0.46530296E+00
       7     6          0.62590756E+00
       8     6          0.31083688E+00
       9     6          0.55432678E+00
      10     6          0.32649908E+00
      11     6          0.55973235E+00
      12     6          0.86030177E+00
```

```
       1     7           0.63696051E+00
       2     7           0.97363139E+00
       3     7           0.43619789E+00
       4     7           0.48208432E+00
       5     7           0.91931968E+00
       6     7           0.46695423E+00
       7     7           0.62236992E+00
       8     7           0.27860179E+00
       9     7           0.55338841E+00
      10     7           0.32429930E+00
      11     7           0.53555943E+00
      12     7           0.94807511E+00


 mean efficiency =   0.58833605E+00


summary of panel of observations:
(1 = observed, 0 = not observed)

  t:   1   2   3   4   5   6   7
   n
   1   1   1   1   1   1   1   1   7
   2   1   1   1   1   1   1   1   7
   3   1   1   1   1   1   1   1   7
   4   1   1   1   1   1   1   1   7
   5   1   1   1   1   1   1   1   7
   6   1   1   1   1   1   1   1   7
   7   1   1   1   1   1   1   1   7
   8   1   1   1   1   1   1   1   7
   9   1   1   1   1   1   1   1   7
  10   1   1   1   1   1   1   1   7
  11   1   1   1   1   1   1   1   7
  12   1   1   1   1   1   1   1   7

      12  12  12  12  12  12  12  84
```

Lampiran 3. Model Fungsi *Traditional Mean Renponse*

```
Output from the program FRONTIER (Version 4.1c)


instruction file = terminal
data file =        tcdm2-d.txt


 Tech. Eff. Effects Frontier (see B&C 1993)
 The model is a production function
 The dependent variable is logged


the ols estimates are :

                 coefficient     standard-error    t-ratio

  beta 0         0.13747996E+01  0.58868318E+00  0.23353811E+01
  beta 1         0.48793974E+00  0.82410247E-01  0.59208625E+01
  beta 2         0.19562589E+00  0.10083320E+00  0.19400941E+01
  beta 3         0.26470256E+00  0.61865319E-01  0.42786907E+01
  beta 4         0.27959966E-02  0.24159813E-02  0.11572923E+01
  beta 5         0.10426124E-01  0.32592458E-02  0.31989377E+01
  beta 6        -0.31991446E-02  0.12091302E-01 -0.26458232E+00
  beta 7         0.31905606E-02  0.25796810E-02  0.12368043E+01
  beta 8         0.86294809E-02  0.33955393E-02  0.25414169E+01
  beta 9        -0.10566329E-01  0.43002186E-02 -0.24571608E+01
  sigma-squared  0.62285480E-01

log likelihood function =   0.27258688E+01

the estimates after the grid search were :

  beta 0         0.14172732E+01
  beta 1         0.48793974E+00
  beta 2         0.19562589E+00
  beta 3         0.26470256E+00
  beta 4         0.27959966E-02
  beta 5         0.10426124E-01
  beta 6        -0.31991446E-02
  beta 7         0.31905606E-02
  beta 8         0.86294809E-02
  beta 9        -0.10566329E-01
  sigma-squared  0.56674549E-01
  gamma          0.50000000E-01


 iteration =     0  func evals =     20  llf =  0.26992796E+01
     0.14172732E+01 0.48793974E+00 0.19562589E+00 0.26470256E+00 0.27959966E-02
     0.10426124E-01-0.31991446E-02 0.31905606E-02 0.86294809E-02-0.10566329E-01
     0.56674549E-01 0.50000000E-01
 gradient step
 iteration =     5  func evals =     39  llf =  0.26993825E+01
     0.14172714E+01 0.48791151E+00 0.19560533E+00 0.26469075E+00 0.28008419E-02
     0.10412011E-01-0.32544895E-02 0.32047503E-02 0.86272237E-02-0.10559403E-01
     0.56732686E-01 0.49919516E-01
 iteration =    10  func evals =     62  llf =  0.27121773E+01
     0.14169487E+01 0.48662117E+00 0.19425558E+00 0.26469545E+00 0.28201717E-02
     0.10433763E-01-0.27939382E-02 0.32262880E-02 0.87828465E-02-0.10613844E-01
     0.55711447E-01 0.24594222E-01
 iteration =    15  func evals =    133  llf =  0.27240629E+01
     0.13816671E+01 0.48867391E+00 0.19543296E+00 0.26435968E+00 0.28104978E-02
     0.10415265E-01-0.31965141E-02 0.31966281E-02 0.86175967E-02-0.10497924E-01
     0.55130847E-01 0.72821370E-02
 iteration =    20  func evals =    235  llf =  0.27255998E+01
     0.13798505E+01 0.48834224E+00 0.19561501E+00 0.26459438E+00 0.27986650E-02
     0.10421419E-01-0.32406159E-02 0.31886481E-02 0.86125173E-02-0.10541731E-01
     0.54949138E-01 0.22227260E-02
 iteration =    25  func evals =    324  llf =  0.27258307E+01
     0.13788022E+01 0.48799326E+00 0.19562344E+00 0.26469153E+00 0.27962525E-02
     0.10425493E-01-0.32054498E-02 0.31901946E-02 0.86270652E-02-0.10563407E-01
     0.54889739E-01 0.54623922E-03
 iteration =    30  func evals =    427  llf =  0.27258576E+01
     0.13781502E+01 0.48790804E+00 0.19563212E+00 0.26471223E+00 0.27956170E-02
     0.10426538E-01-0.31972859E-02 0.31905770E-02 0.86304356E-02-0.10568563E-01
     0.54879120E-01 0.25176505E-03
 iteration =    35  func evals =    536  llf =  0.27258658E+01
     0.13767195E+01 0.48794164E+00 0.19562782E+00 0.26470275E+00 0.27959379E-02
     0.10426121E-01-0.31999226E-02 0.31904875E-02 0.86292442E-02-0.10566352E-01
     0.54874095E-01 0.10269300E-03
 iteration =    40  func evals =    642  llf =  0.27258677E+01
```

```
    0.13763179E+01 0.48792911E+00 0.19562651E+00 0.26470448E+00 0.27959527E-02
    0.10426248E-01-0.31978410E-02 0.31906446E-02 0.86299696E-02-0.10566879E-01
    0.54872503E-01 0.57098373E-04
 iteration =    45  func evals =    735  llf =  0.27258686E+01
    0.13756431E+01 0.48793758E+00 0.19562481E+00 0.26470285E+00 0.27960189E-02
    0.10426138E-01-0.31986255E-02 0.31906043E-02 0.86296537E-02-0.10566392E-01
    0.54871239E-01 0.19631610E-04
 iteration =    50  func evals =    846  llf =  0.27258687E+01
    0.13754515E+01 0.48794348E+00 0.19562301E+00 0.26470217E+00 0.27960629E-02
    0.10426055E-01-0.31991861E-02 0.31905711E-02 0.86294392E-02-0.10566085E-01
    0.54871061E-01 0.13481714E-04
 pt better than entering pt cannot be found
 iteration =    51  func evals =    854  llf =  0.27258687E+01
    0.13754515E+01 0.48794348E+00 0.19562301E+00 0.26470217E+00 0.27960629E-02
    0.10426055E-01-0.31991861E-02 0.31905711E-02 0.86294392E-02-0.10566085E-01
    0.54871061E-01 0.13481714E-04


the final mle estimates are :

                coefficient     standard-error    t-ratio

  beta 0         0.13754515E+01  0.63672910E+00  0.21601832E+01
  beta 1         0.48794348E+00  0.74522094E-01  0.65476351E+01
  beta 2         0.19562301E+00  0.94348900E-01  0.20734000E+01
  beta 3         0.26470217E+00  0.58783589E-01  0.45029944E+01
  beta 4         0.27960629E-02  0.22498094E-02  0.12427999E+01
  beta 5         0.10426055E-01  0.30487565E-02  0.34197731E+01
  beta 6        -0.31991861E-02  0.11166928E-01 -0.28648758E+00
  beta 7         0.31905711E-02  0.24169293E-02  0.13200929E+01
  beta 8         0.86294392E-02  0.30976737E-02  0.27857805E+01
  beta 9        -0.10566085E-01  0.38553814E-02 -0.27406069E+01
  sigma-squared  0.54871061E-01  0.87667137E-02  0.62590228E+01
  gamma          0.13481714E-04  0.86551153E-02  0.15576585E-02

log likelihood function =   0.27258687E+01

the likelihood value is less than that obtained
using ols! - try again using different starting values

number of iterations =     51

(maximum number of iterations set at :   100)

number of cross-sections =     12

number of time periods =      7

total number of observations =     84

thus there are:      0  obsns not in the panel


covariance matrix :

  0.40542395E+00 -0.22916421E-01 -0.31984397E-02  0.70799165E-02 -0.26638941E-03
  0.33159000E-03  0.14457873E-02 -0.25659368E-04  0.10690558E-02 -0.21025373E-02
  0.11375923E-03  0.35577021E-02
 -0.22916421E-01  0.55535426E-02 -0.38187126E-02 -0.37480044E-03  0.24130477E-04
 -0.62671952E-04 -0.59647312E-03 -0.67399953E-04 -0.11407738E-03  0.81521085E-04
 -0.11693765E-04 -0.17694790E-03
 -0.31984397E-02 -0.38187126E-02  0.89017150E-02 -0.37516614E-02 -0.32335147E-04
  0.11298930E-03  0.19465037E-03  0.71601959E-04 -0.20372308E-04  0.13269268E-03
  0.94829970E-05  0.12680715E-03
  0.70799165E-02 -0.37480044E-03 -0.37516614E-02  0.34555103E-02  0.66015756E-05
 -0.58986659E-04  0.18416274E-03 -0.14473957E-04  0.23360648E-04 -0.96618401E-04
  0.10083502E-05  0.22802024E-04
 -0.26638941E-03  0.24130477E-04 -0.32335147E-04  0.66015756E-05  0.50616424E-05
 -0.31098309E-05 -0.89573757E-06 -0.15684415E-05 -0.29762477E-06 -0.18215972E-06
 -0.19925006E-06 -0.30718368E-05
  0.33159000E-03 -0.62671952E-04  0.11298930E-03 -0.58986659E-04 -0.31098309E-05
  0.92949164E-05  0.42118442E-05 -0.97769698E-06  0.54710924E-06 -0.94421946E-06
  0.21918410E-06  0.31646151E-05
  0.14457873E-02 -0.59647312E-03  0.19465037E-03  0.18416274E-03 -0.89573757E-06
  0.42118442E-05  0.12470028E-03  0.56861348E-05  0.15764798E-04 -0.95683409E-05
  0.26422937E-06  0.25234478E-05
 -0.25659368E-04 -0.67399953E-04  0.71601959E-04 -0.14473957E-04 -0.15684415E-05
 -0.97769698E-06  0.56861348E-05  0.58415470E-05  0.56299877E-06  0.10807764E-05
 -0.31204972E-07 -0.47353650E-06
  0.10690558E-02 -0.11407738E-03 -0.20372308E-04  0.23360648E-04 -0.29762477E-06
  0.54710924E-06  0.15764798E-04  0.56299877E-06  0.95955824E-05 -0.53228590E-05
  0.12005801E-06  0.22310635E-05
 -0.21025373E-02  0.81521085E-04  0.13269268E-03 -0.96618401E-04 -0.18215972E-06
```

```
 -0.94421946E-06 -0.95683409E-05  0.10807764E-05 -0.53228590E-05  0.14863966E-04
-0.71867115E-06 -0.11717464E-04
 0.11375923E-03 -0.11693765E-04  0.94829970E-05  0.10083502E-05 -0.19925006E-06
 0.21918410E-06  0.26422937E-06 -0.31204972E-07  0.12005801E-06 -0.71867115E-06
 0.76855269E-04  0.45744012E-06
 0.35577021E-02 -0.17694790E-03  0.12680715E-03  0.22802024E-04 -0.30718368E-05
 0.31646151E-05  0.25234478E-05 -0.47353650E-06  0.22310635E-05 -0.11717464E-04
 0.45744012E-06  0.74911021E-04
```

technical efficiency estimates :

firm	year	eff.-est.
1	1	0.99931436E+00
2	1	0.99931407E+00
3	1	0.99931322E+00
4	1	0.99931324E+00
5	1	0.99931616E+00
6	1	0.99931270E+00
7	1	0.99931506E+00
8	1	0.99931300E+00
9	1	0.99931363E+00
10	1	0.99931519E+00
11	1	0.99931633E+00
12	1	0.99931350E+00
1	2	0.99931433E+00
2	2	0.99931398E+00
3	2	0.99931301E+00
4	2	0.99931356E+00
5	2	0.99931506E+00
6	2	0.99931291E+00
7	2	0.99931496E+00
8	2	0.99931331E+00
9	2	0.99931345E+00
10	2	0.99931366E+00
11	2	0.99931462E+00
12	2	0.99931282E+00
1	3	0.99931460E+00
2	3	0.99931410E+00
3	3	0.99931349E+00
4	3	0.99931377E+00
5	3	0.99931608E+00
6	3	0.99931343E+00
7	3	0.99931536E+00
8	3	0.99931330E+00
9	3	0.99931437E+00
10	3	0.99931372E+00
11	3	0.99931520E+00
12	3	0.99931319E+00
1	4	0.99931523E+00
2	4	0.99931439E+00
3	4	0.99931362E+00
4	4	0.99931395E+00
5	4	0.99931652E+00
6	4	0.99931361E+00
7	4	0.99931464E+00
8	4	0.99931319E+00
9	4	0.99931537E+00
10	4	0.99931388E+00
11	4	0.99931525E+00
12	4	0.99931305E+00
1	5	0.99931421E+00
2	5	0.99931397E+00
3	5	0.99931280E+00
4	5	0.99931321E+00
5	5	0.99931534E+00
6	5	0.99931293E+00
7	5	0.99931432E+00
8	5	0.99931228E+00
9	5	0.99931509E+00
10	5	0.99931298E+00
11	5	0.99931436E+00
12	5	0.99931652E+00
1	6	0.99931459E+00
2	6	0.99931411E+00
3	6	0.99931302E+00
4	6	0.99931346E+00
5	6	0.99931633E+00
6	6	0.99931334E+00
7	6	0.99931439E+00

```
       8     6           0.99931276E+00
       9     6           0.99931561E+00
      10     6           0.99931327E+00
      11     6           0.99931437E+00
      12     6           0.99931696E+00
       1     7           0.99931465E+00
       2     7           0.99931383E+00
       3     7           0.99931247E+00
       4     7           0.99931309E+00
       5     7           0.99931754E+00
       6     7           0.99931325E+00
       7     7           0.99931479E+00
       8     7           0.99931192E+00
       9     7           0.99931511E+00
      10     7           0.99931272E+00
      11     7           0.99931364E+00
      12     7           0.99931314E+00


 mean efficiency =   0.99931412E+00


summary of panel of observations:
(1 = observed, 0 = not observed)

  t:   1   2   3   4   5   6   7
   n
   1   1   1   1   1   1   1   7
   2   1   1   1   1   1   1   7
   3   1   1   1   1   1   1   7
   4   1   1   1   1   1   1   7
   5   1   1   1   1   1   1   7
   6   1   1   1   1   1   1   7
   7   1   1   1   1   1   1   7
   8   1   1   1   1   1   1   7
   9   1   1   1   1   1   1   7
  10   1   1   1   1   1   1   7
  11   1   1   1   1   1   1   7
  12   1   1   1   1   1   1   7

      12  12  12  12  12  12  12  84
```

Lampiran 4. Model Terbaik: Tanpa varibael delta0 pada Model Efek Inefisiensi

```
Output from the program FRONTIER (Version 4.1c)

instruction file = terminal
data file =        tcdm2-d.txt

 Tech. Eff. Effects Frontier (see B&C 1993)
 The model is a production function
 The dependent variable is logged


the ols estimates are :
                 coefficient     standard-error    t-ratio

  beta 0        -0.20955559E+00  0.21411609E+00 -0.97870078E+00
  beta 1         0.65544200E+00  0.57450983E-01  0.11408717E+02
  beta 2         0.44490946E-01  0.92335717E-01  0.48183896E+00
  beta 3         0.39156012E+00  0.54881030E-01  0.71347079E+01
  sigma-squared  0.92127271E-01

log likelihood function =  -0.16989108E+02

the estimates after the grid search were :

  beta 0        -0.15584635E+00
  beta 1         0.65544200E+00
  beta 2         0.44490946E-01
  beta 3         0.39156012E+00
  delta 1        0.00000000E+00
  delta 2        0.00000000E+00
  delta 3        0.00000000E+00
  delta 4        0.00000000E+00
  delta 5        0.00000000E+00
  delta 6        0.00000000E+00
  sigma-squared  0.90624939E-01
  gamma          0.50000000E-01


 iteration =     0  func evals =     20  llf = -0.16998573E+02
    -0.15584635E+00 0.65544200E+00 0.44490946E-01 0.39156012E+00 0.00000000E+00
     0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00
     0.90624939E-01 0.50000000E-01
 gradient step
 iteration =     5  func evals =     45  llf = -0.14509034E+02
    -0.15581711E+00 0.65475545E+00 0.43980407E-01 0.39092070E+00-0.76011393E-03
    -0.33598017E-02 0.12978719E-02-0.52987685E-03-0.47967012E-03 0.30570195E-02
     0.90110647E-01 0.50126549E-01
 iteration =    10  func evals =     72  llf = -0.13504474E+02
     0.55732843E-01 0.75754577E+00-0.33912294E-01 0.31231959E+00-0.29606536E-02
    -0.10777974E-02 0.11640391E-01-0.51930105E-03-0.41501663E-02 0.38564290E-02
     0.87389229E-01 0.26643825E+00
 iteration =    15  func evals =    145  llf =  0.63250580E+01
     0.16487021E+01 0.52709455E+00 0.17522449E+00 0.26291205E+00-0.46768322E-02
    -0.12569451E-01 0.16235531E-01-0.13635149E-02-0.19466421E-01 0.14917124E-01
     0.59985760E-01 0.74071056E+00
 pt better than entering pt cannot be found
 iteration =    20  func evals =    235  llf =  0.12224340E+02
     0.22531320E+01 0.44088155E+00 0.16593522E+00 0.31042224E+00-0.12804920E-02
    -0.10219769E-01 0.24012725E-03-0.79907515E-03-0.38452537E-01 0.16623278E-01
     0.60909350E-01 0.98163770E+00


the final mle estimates are :
                 coefficient     standard-error    t-ratio

  beta 0         0.22531320E+01  0.34397166E+00  0.65503420E+01
  beta 1         0.44088155E+00  0.65703328E-01  0.67101861E+01
  beta 2         0.16593522E+00  0.97802871E-01  0.16966293E+01
  beta 3         0.31042224E+00  0.50874195E-01  0.61017622E+01
  delta 1       -0.12804920E-02  0.35038736E-02 -0.36545039E+00
  delta 2       -0.10219769E-01  0.37764612E-02 -0.27061762E+01
  delta 3        0.24012725E-03  0.10386399E-01  0.23119394E-01
  delta 4       -0.79907515E-03  0.27705581E-02 -0.28841667E+00
  delta 5       -0.38452537E-01  0.69229559E-02 -0.55543525E+01
  delta 6        0.16623278E-01  0.19960229E-02  0.83282000E+01
  sigma-squared  0.60909350E-01  0.12385995E-01  0.49175986E+01
  gamma          0.98163770E+00  0.92930045E-01  0.10563190E+02

log likelihood function =   0.12224340E+02

LR test of the one-sided error =   0.58426896E+02
```

```
with number of restrictions = 7
 [note that this statistic has a mixed chi-square distribution]

number of iterations =     20

(maximum number of iterations set at :   100)

number of cross-sections =     12

number of time periods =      7

total number of observations =     84

thus there are:      0  obsns not in the panel


covariance matrix :
  0.11831650E+00 -0.19241739E-01  0.17025747E-01 -0.34945047E-02  0.47022745E-03
 -0.22410382E-03 -0.16540528E-02 -0.17105927E-03 -0.15195212E-02  0.43862202E-03
  0.73261428E-03  0.25732478E-01
 -0.19241739E-01  0.43169273E-02 -0.45844472E-02  0.51356608E-03 -0.11711237E-03
  0.63029735E-04  0.39165545E-03  0.33002509E-04  0.24377009E-03 -0.64655024E-04
  0.49388080E-04 -0.29169456E-02
  0.17025747E-01 -0.45844472E-02  0.95654015E-02 -0.36967219E-02  0.93761144E-04
 -0.13514526E-03 -0.10696543E-03 -0.44569660E-04 -0.25729711E-04  0.40420294E-04
 -0.76266622E-04  0.24504973E-03
 -0.34945047E-02  0.51356608E-03 -0.36967219E-02  0.25881837E-02  0.14460100E-04
  0.52051696E-04 -0.19301992E-03  0.13431675E-04 -0.95029711E-04 -0.31116297E-05
 -0.80673486E-04  0.32501638E-03
  0.47022745E-03 -0.11711237E-03  0.93761144E-04  0.14460100E-04  0.12277130E-04
 -0.63205194E-05 -0.15694819E-04 -0.47184171E-05 -0.77538715E-05 -0.41895004E-07
 -0.98418617E-05  0.67244231E-04
 -0.22410382E-03  0.63029735E-04 -0.13514526E-03  0.52051696E-04 -0.63205194E-05
  0.14261659E-04  0.38792004E-05 -0.90481475E-06 -0.15006898E-05 -0.21466466E-05
  0.26715518E-05  0.56693742E-05
 -0.16540528E-02  0.39165545E-03 -0.10696543E-03 -0.19301992E-03 -0.15694819E-04
  0.38792004E-05  0.10787729E-03 -0.19438553E-05  0.42658484E-04 -0.99400061E-05
  0.20127174E-04 -0.37489487E-03
 -0.17105927E-03  0.33002509E-04 -0.44569660E-04  0.13431675E-04 -0.47184171E-05
 -0.90481475E-06 -0.19438553E-05  0.76759922E-05 -0.12138059E-05 -0.16248857E-06
 -0.97776449E-06 -0.19327782E-04
 -0.15195212E-02  0.24377009E-03 -0.25729711E-04 -0.95029711E-04 -0.77538715E-05
 -0.15006898E-05  0.42658484E-04 -0.12138059E-05  0.47927318E-04 -0.55526613E-05
 -0.12105694E-04 -0.44252912E-03
  0.43862202E-03 -0.64655024E-04  0.40420294E-04 -0.31116297E-05 -0.41895004E-07
 -0.21466466E-05 -0.99400061E-05 -0.16248857E-06 -0.55526613E-05  0.39841074E-05
  0.66374850E-05  0.10764987E-03
  0.73261428E-03  0.49388080E-04 -0.76266622E-04 -0.80673486E-04 -0.98418617E-05
  0.26715518E-05  0.20127174E-04 -0.97776449E-06 -0.12105694E-04  0.66374850E-05
  0.15341286E-03  0.42772394E-03
  0.25732478E-01 -0.29169456E-02  0.24504973E-03  0.32501638E-03  0.67244231E-04
  0.56693742E-05 -0.37489487E-03 -0.19327782E-04 -0.44252912E-03  0.10764987E-03
  0.42772394E-03  0.86359933E-02


technical efficiency estimates :

     firm  year             eff.-est.

       1     1          0.51444328E+00
       2     1          0.94676317E+00
       3     1          0.29414338E+00
       4     1          0.34499232E+00
       5     1          0.58943650E+00
       6     1          0.33566593E+00
       7     1          0.60562981E+00
       8     1          0.22613474E+00
       9     1          0.27338155E+00
      10     1          0.33525596E+00
      11     1          0.46373907E+00
      12     1          0.44538593E+00
       1     2          0.51667342E+00
       2     2          0.94890752E+00
       3     2          0.29308877E+00
       4     2          0.39205973E+00
       5     2          0.45484790E+00
       6     2          0.35167946E+00
       7     2          0.56203003E+00
       8     2          0.23832510E+00
       9     2          0.27650611E+00
      10     2          0.23877879E+00
      11     2          0.33304150E+00
      12     2          0.42311937E+00
```

```
 1     3          0.56619676E+00
 2     3          0.97065798E+00
 3     3          0.32062921E+00
 4     3          0.41027268E+00
 5     3          0.59790539E+00
 6     3          0.39457601E+00
 7     3          0.61360648E+00
 8     3          0.25027943E+00
 9     3          0.34202273E+00
10     3          0.24361703E+00
11     3          0.38745615E+00
12     3          0.46557987E+00
 1     4          0.64281098E+00
 2     4          0.98500846E+00
 3     4          0.31355238E+00
 4     4          0.41044573E+00
 5     4          0.67392648E+00
 6     4          0.40210506E+00
 7     4          0.60772375E+00
 8     4          0.23220495E+00
 9     4          0.39065808E+00
10     4          0.24687644E+00
11     4          0.39113486E+00
12     4          0.49629584E+00
 1     5          0.54476140E+00
 2     5          0.94670093E+00
 3     5          0.26815304E+00
 4     5          0.37585865E+00
 5     5          0.56321128E+00
 6     5          0.35283779E+00
 7     5          0.50067918E+00
 8     5          0.19197345E+00
 9     5          0.36890836E+00
10     5          0.21474725E+00
11     5          0.34198760E+00
12     5          0.59239712E+00
 1     6          0.59933025E+00
 2     6          0.98572476E+00
 3     6          0.28569746E+00
 4     6          0.40365092E+00
 5     6          0.61194319E+00
 6     6          0.39053537E+00
 7     6          0.58405657E+00
 8     6          0.22821061E+00
 9     6          0.43008404E+00
10     6          0.23641426E+00
11     6          0.38736186E+00
12     6          0.71498039E+00
 1     7          0.60542076E+00
 2     7          0.97649813E+00
 3     7          0.29387840E+00
 4     7          0.38653652E+00
 5     7          0.72300481E+00
 6     7          0.40308938E+00
 7     7          0.58674231E+00
 8     7          0.19901744E+00
 9     7          0.41368820E+00
10     7          0.22984364E+00
11     7          0.36438612E+00
12     7          0.74090622E+00

 mean efficiency =   0.46193797E+00


summary of panel of observations:
(1 = observed, 0 = not observed)

  t:   1   2   3   4   5   6   7
   n
   1   1   1   1   1   1   1   1   7
   2   1   1   1   1   1   1   1   7
   3   1   1   1   1   1   1   1   7
   4   1   1   1   1   1   1   1   7
   5   1   1   1   1   1   1   1   7
   6   1   1   1   1   1   1   1   7
   7   1   1   1   1   1   1   1   7
   8   1   1   1   1   1   1   1   7
   9   1   1   1   1   1   1   1   7
  10   1   1   1   1   1   1   1   7
  11   1   1   1   1   1   1   1   7
  12   1   1   1   1   1   1   1   7

      12  12  12  12  12  12  12  84
```