

\$oninline

/\*

GAMS program used to estimate technical efficiency.

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This version will estimate technical efficiency based on an output oriented DEA model, with constant returns to scale. Models can be found in Fare, Grosskopf and Lovell (1994)

This version utilizes the GUSS solver in GAMS. For more information on the GUSS solver see the GAMS web site [www.gams.com](http://www.gams.com)\*/

\$OFFSYMLIST OFFSYMXREF OFFUELLIST OFFUELXREF

OPTION SOLPRINT=OFF, SYSOUT=OFF, LIMROW=0, LIMCOL=0;

/\*NEXT DEFINE INPUTS AND OUTPUTS. There are 6 inputs x1,x2,x3, x4,x5 and x6; there are 3 outputs y1,y2,y3. The data has 201 observations\*/

SET INOUT /x1\*x6, y1\*y3/

OUTPUT(INOUT) /y1\*y3/

INPUT(INOUT) /x1\*x6/

OBS /1\*201/

SUBOBS(OBS) /1\*201/

;

/\*Next, define an alias for the set SUBOBS, and read in the data\*/

alias (subobs, subobs1);

\$OFFLISTING

TABLE ACT(OBS,INOUT) INPUT OUTPUT TABLE

\$ondelim

\$INCLUDE "data2.csv"

\$offdelim

\$ONLISTING

parameter slice(inout) slice of input output data  
eff\_k(obs) efficiency report;

VARIABLES

theta efficiency score

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weight(obs) weights;

POSITIVE Variable weight;

EQUATIONS

CONSTR1(output) DEA constraint for each output
CONSTR2(input) DEA constraint for each input
;

CONSTR1(output).. sum(subobs, weight(subobs)*ACT(subobs,output)) =G= Theta*slice(output);

CONSTR2(input).. sum(subobs, weight(subobs)*ACT(subobs,input)) =L= slice(input);

MODEL TE /all/;

set h headers /modelstat, solvestat, objval/;
parameter scenrep(obs,h) solution report summary
         sconfig /SkipBaseCase 1/;

set dict /subobs. scenario.'
         sconfig. opt. scenrep
         slice. param. ACT
         theta. level. eff_k/;

slice(inout)=0;

option lp=cbc;

solve te maximizing theta using lp scenario dict;

display scenrep, eff_k;

/*results are printed out to the file 'results_test.csv'*/

file sr /results_test.csv/;

sr.pc=5;
put sr;

put 'obs', 'theta';
put /;
loop(subobs, put subobs.tl, scenrep(subobs,'objval'):4;
      put /;

);
putclose;

```