

\$online

/*

*GAMS program used to estimate technical efficiency for
200 New England Otter Trawl Vessels.*

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*This version will estimate technical efficiency for
each vessel, based on an output oriented DEA model.*

*/

/* The following line turns off listing of
some elements in the GAMS listing file*/

\$OFFSYMLIST OFFSYMXREF OFFUELLIST OFFUELXREF

/*NEXT DEFINE INPUTS AND OUTPUTS*/

SET INOUT /y1*y3, x1*x5/
OUTPUT(INOUT) /y1*y3/
INPUT(INOUT) /x1*x5/

OBS /1*200/
SUBOBS(OBS) /1*50/
ACTOBS(OBS)

*/*We have allocated enough memory for 200 observations, but our
data set only contains 50 observations (subobs)*/*

/*Next, define an alias for the set SUBOBS */

alias (subobs, subobs1)

/ The include statement below reads in an external data
file which contains a table of observations, inputs
and outputs.*

*The offlisting command means that the data won't
be included in the listing file.*

*/

\$OFFLISTING

TABLE ACT(OBS,INOUT) INPUT OUTPUT TABLE
\$ondelim
\$INCLUDE "data_test.csv"

\$offdelim

\$ONLISTING

VARIABLES

theta efficiency score
weight(obs) weights;

POSITIVE Variable weight;

EQUATIONS

CONSTR1(OUTPUT, OBS) DEA constraint for each output
CONSTR2(INPUT, OBS) DEA constraint for each input;

CONSTR1(OUTPUT, ACTOBS).. SUM(SUBOBS, WEIGHT(SUBOBS)*ACT(SUBOBS,OUTPUT)) =G=
THETA*ACT(ACTOBS, OUTPUT);

CONSTR2(INPUT, ACTOBS).. SUM(SUBOBS, WEIGHT(SUBOBS)*ACT(SUBOBS,INPUT)) =L=
ACT(ACTOBS, INPUT);

*/*Define a parameter to hold results for each pass through
the loop*/*

PARAMETER

score1(obs) efficiency scores
;

*/*Define an external file to hold results which tell whether model solved
at each iteration*/*

file primal /teout_res.txt/;

*/*The model defined below consists of two equations.
CONSTR1, CONSTR2 */*

MODEL TEDEA /CONSTR1, CONSTR2/;

tedea.solprint=2; */*Turn off writing results to solution file*/*
tedea.solvelink=2; */*Keep model in memory. Improves solution time*/*

LOOP(SUBOBS1,

ACTOBS(OBS)=NO;
ACTOBS(SUBOBS1)=YES;

SOLVE TEDEA maximizing THETA USING LP;

score1(SUBOBS1) = theta.1;

put primal;

```
if ((tedea.modelstat eq 1 and tedea.solvestat eq 1),  
    put @1, subobs1.tl, @10, "optimal", @20, "normal completion" /  
else  
    put @1, subobs1.tl, @10, tedea.modelstat:>2:0,  
        @20, tedea.solvestat:>2:0/  
);  
);
```

*/*The next file is to output results to a file to be imported
into a spreadsheet program. Results could also be printed to
the listing file with the use of the display command*/*

```
file res /teoutput.csv/ ;  
res.pc=5;  
put res;  
loop (subobs1,  
    put subobs1.tl, score1(subobs1)/  
);  
putclose;
```