

Name:

Model-based Decision Support

Exam 6 (home assignment) Enrolment number:

Till June 6, 2019

The Management of the chain of stores Doberhams has taken the following 3 Outputs and 2 Inputs as crucial for efficiency measuring of their branches:

(O) Sales (unit sold articles)

(I) Employees (full time equivalent)

(O) Total Revenue (unit £)

(I) Sales Area (unit 100 m²)

(O) Profits (unit £)

Data collection yields the following operating figures:

Store	(I) Employee	(I) Area	(O) Sales	(O) Revenue	(O) Profits
Doberhams A	14	20	700	6000	700
Doberhams B	18	1X	1000	12000	1700
Doberhams C	20	1Y	800	11000	1900
Doberhams D	25	1Z	1200	23000	2600
Doberhams E	28	13	900	18000	4000
Doberhams F	16	21	1200	10000	3200
Doberhams G	13	32	1100	12000	3100
Doberhams H	24	9	600	18000	5000
Doberhams I	17	21	1300	13000	3400
Doberhams J	13	32	1400	13000	3100
Doberhams K	29	15	900	19000	4500
Doberhams L	16	21	900	12000	3600
Doberhams M	13	28	1500	14000	3400
Doberhams N	15	17	900	13000	3700

For X use the last digit of your student enrolment number, Y the last but one digit, and Z the last but two (If X=4, then 1X is 14).

Use Banxia Frontier Analyst demo version

<https://banxia.com/frontier/>

to compute **CCR-efficiency** for the stores A-L of Doberhams (input-oriented). Describe **verbally** (i.e. in words) which store operates efficiently and which not. If you do this, it will be sufficient to be rewarded with 5 points. Your submission should be handed in at next but one class on June 6th, 2019; on May 23rd, 2019 in-class submission is possible. Keep in mind that the Banxia's Frontier Analyst demo version is limited to 12 DMUs – otherwise the demo version does not compute any results. An easy way to provide data to Frontier Analyst is to prepare the data in a MS Excel Spreadsheet and in the opened Excel document select the data area. In Frontier Analyst start a new project (cancel loading an existing one) and choose the option “use current selection from Excel”.

Alternatively, you can model DEA CCR in MS Excel and solve the efficiency measures **for all 14 stores** by MS Excel Solver to compute **CCR-efficiency** of these branches of Doberhams (input-oriented). For one of the necessary 14 optimization runs, copy your

spreadsheet to a piece of paper. Additionally, describe **verbally** (i.e. in words) which branch operates efficiently and which not.

You find many tutorials and videos in the web that explain how to use MS Excel Solver. E.g.

<https://www.ablebits.com/office-addins-blog/2016/06/22/how-to-use-solver-in-excel-with-examples/>

Alternatively, you can model DEA CCR in GAMS and solve the efficiency measures **for all 14 stores** A-N. If you choose this option, submit your gams code and efficiency results for Doberhams stores A-N. Then I reward you with 3 extra bonus points – in total you can achieve 8 points for this home assignment, if you use GAMS. In this alternative option, you are free to give Banxia's Frontier Analyst or MS EXCEL Solver a trial, but if you use GAMS to compute the results, only, it will be sufficient to get the full 8 points.

Reserve the date for the next written exam on June 6th, 2019. There is no class on May 30th (holiday).