MaxDEA 8 Ultra Manual

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Contents

1 System Requirements

Windows System: Windows 7, 8, 8.1, 10 or 11.

Microsoft Access 2010(SP2) or higher version is required, including Office 2010(SP2), 2013, 2016, 2019, 2021, 365.

1) If Microsoft Office Professional is installed. That's perfect.
2) If Microsoft Office Standard (Word, Excel, PowerPoint only, no Access) is installed, or Microsoft Office is not installed. You must install **Access Runtime**.

   Access 2016 Runtime can be downloaded **free** at Microsoft website:

   https://www.microsoft.com/en-us/download/details.aspx?id=50040
   Access 2013 Runtime can be downloaded **free** at Microsoft website:
   http://www.microsoft.com/en-us/download/details.aspx?id=39358
   Access 2010 Runtime can be downloaded **free** at Microsoft website:
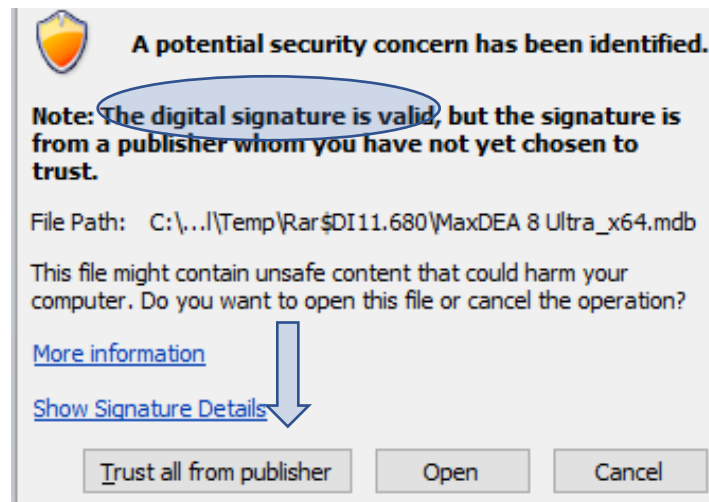   http://www.microsoft.com/en-us/download/details.aspx?id=10910

If you are using 32-bit Access, run the program file "MaxDEA 8 Ultra", no matter whether your Windows system is 32-bit or 64-bit;
If you are using 64-bit Access, run the program file "MaxDEA 8 Ultra_x64".
If you don't know what type of Access you are using, just have a try, only one of the two program files can run.

MaxDEA has valid digital signature. When open MaxDEA first time, click "Trust all from publisher".

2 Features of MaxDEA

MaxDEA Ultra is easy-to-use but powerful and professional DEA software. It has the most extensive range of the up-to-date DEA models.

- Easy to use. It needn't installation and has user-friendly interface. It is very easy to prepare the dataset. You needn't indicate what are the inputs and outputs by field (variable) names or special arrangement of your data.
- No limitation on the number of DMUs and most comprehensive DEA models.
- Easy to backup your DEA models and dataset. Everything is saved in a single file. The software, your dataset and the settings for your DEA model are all integrated into the single program file, and it is the only file needed for MaxDEA Ultra, so it is very convenient to backup. After closing and reopening MaxDEA Ultra, your database and model settings are still there unchanged.
- Most important of all, MaxDEA Ultra provides nearly all the possible combinations of up-to-date DEA models. To use a combination of multiple DEA models, just choose all the relevant options. For example, Network-Malmquist model with weakly disposable bad outputs can be achieved by choosing the settings for Network, Undesirable outputs, Weak disposability and Malmquist, at the same time.

3 A Quick Guide

Step 1:   Prepare Data

MaxDEA Ultra can import data from **Excel, Access, dBase and comma delimited** text files (.csv). Preparing your data in Excel is the most convenient way.

Data Format

The first and only the first row must contain field (column, variable) names. The field names can be anything you want.

Table 1 (A) An example of correct data format

Company	Capital	Labor	Product
A	4323	875	93608
B	2295	469	225559
C	379	1286	327068
D	6644	1339	201354
E	1436	297	188926
F	6281	1266	413738
G	7459	1502	114022

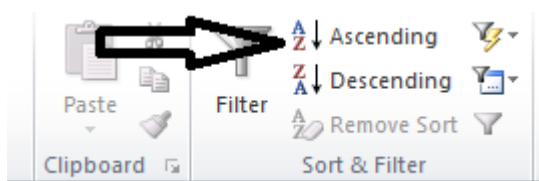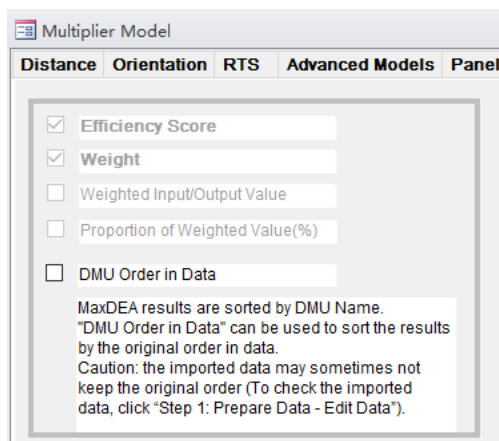Table 1 (B) An example of wrong data format

DMU	Input		Output
Company	Capital	Labor	Product
A	4323	875	93608
B	2295	469	225559
C	6 9	1286	327068
D	6644	1339	201354
E	1436	297	188926
F	6281	1266	413738
G	7459	1502	114022

DMU Name

DMU Name is the identifier for each DMU, so it must be **unique**. The DMU name can be anything, such as letters, characters, numbers or mixture of them.

Note that the DEA results are sorted by DMU name, so if you expect the results to be displayed in the order as that in the dataset, your dataset should be sorted by DMU name. For example, use "DMU001, DMU002, …DMU100" instead of DMU1, DMU2, …DMU100". If you use numbers as DMU name, such as 1,2,…,100, MaxDEA will automatically format the numbers by adding leading zeros, like 001, 002,…,100, so that the results are displayed in numerical order. The number of leading zeros added depends on the length of the maximum number.

Since MaxDEA version 6.9, a new field "DMU Order in Data" is added to the results. It is the original order of each DMU in the data. If you want the results to keep the original order, you can sort the results by "DMU Order in Data". But the imported data may sometimes not keep the original order. To check the imported data, click "Step 1: Prepare Data - Edit Data".

Panel Data

For **panel data**, there must be an additional column indicating the time of the data. DMU Name must be **unique** within each period. Panel data are prepared for Malmquist, Window, and Dynamic models. If you try to run a cross-sectional DEA model using panel data, there will be an error message indicating that the DMU names are not unique. Panel data can be sorted by DMU name or by period, but not necessary.

Panel data for Malmquist model and Window model are not necessary to be balanced, i.e., missing values at some periods are permitted. But panel data for Dynamic model must be balanced.

Table 2 (A) An example of correct panel data format (balanced)

Period	Company	Capital	Labor	Product
1	A	4323	875	93608
1	B	2295	469	225559
1	C	6379	1286	327068
2	A	6644	1339	201354
2	B	1436	297	188926
2	C	6281	1266	413738
3	A	7459	1502	114022
3	B	4464	903	212444
3	C	4524	915	462677

Table 2 (B) A second example of correct panel data format (balanced)

Period	Company	Capital	Labor	Product
1	A	4323	875	93608
2	B	1436	297	188926
1	B	2295	469	225559
3	A	7459	1502	114022
3	B	4464	903	212444
1	C	6379	1286	327068
2	A	6644	1339	201354
2	C	6281	1266	413738
3	C	4524	915	462677

Table 2 (C) An example of correct panel data format (unbalanced)

Period	Company	Capital	Labor	Product
1	A	4323	875	93608
1	B	2295	469	225559
1	C	6379	1286	327068
2	A	6644	1339	201354
2	B	1436	297	188926
3	A	7459	1502	114022
3	B	4464	903	212444
3	C	4524	915	462677

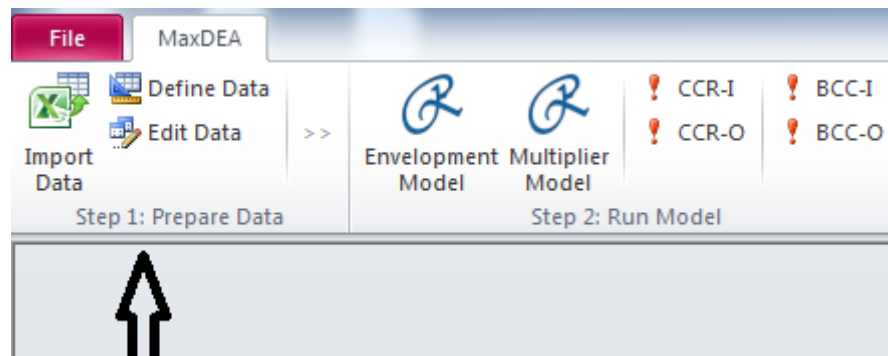The **period field** must be integer numbers, such as

1, 2, 3……

2001, 2002, 2003……

But they needn't to be continuous. The following time series are permitted:

1, 2, 5, 8……

2001, 2005, 2009……

200101, 200102, 200302……

Import and Define Data

After the data are imported, the "Data Define" window will open automatically. Defining data is to tell MaxDEA Ultra which column is the DMU name, which columns are inputs, and which columns are outputs. At least the fields for **DMU Name**, **Inputs** and **Outputs** must be defined.

Missing values are not permitted. If a record in the data has missing values, you must either delete this record, or replace the missing values.
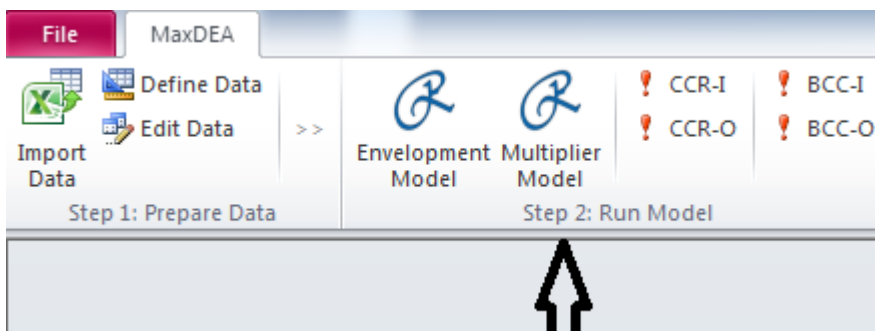
Table 3 Missing values not permitted

DMU	Input1	Input2	Output
A	4323	875	93608
B	2295	469	225559
C	6379	✖	327068
D	6644	1339	201354
E	1436	297	188926
F	6281	1266	413738
G	7459	1502	114022

If you want to eliminate some inputs or outputs from the model, you can set these fields "Not defined".

The imported data and their definitions are permanently saved, so after MaxDEA Ultra is closed, they will not be lost.
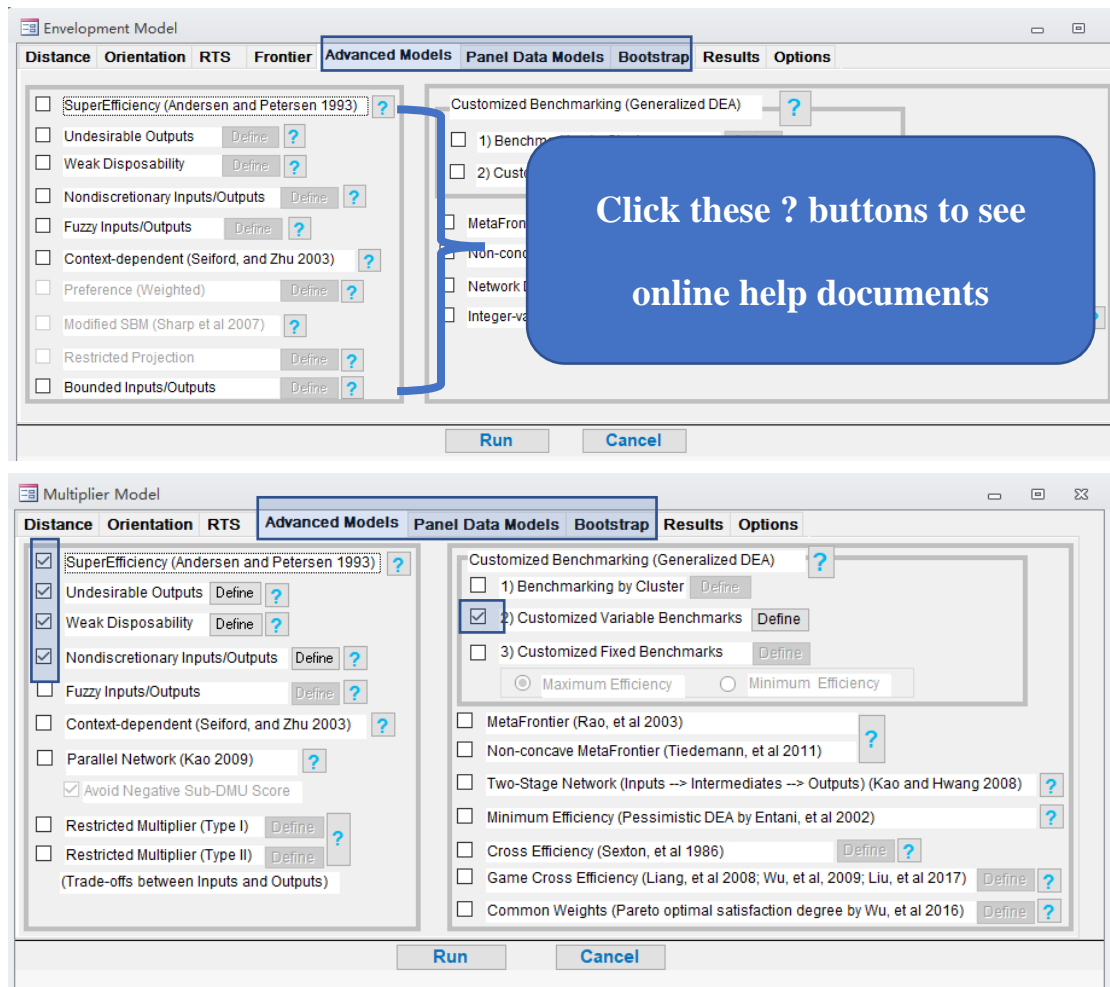
Step 2: Run Model

There are two types of DEA models. One is called multiplier model, i.e., the primal model, and the other is called envelopment model, i.e., the dual model. The menu "Run Envelopment Model" is for envelopment models, "Run Multiplier Model" is for multiplier models, and "Express to Basic Models" is an

express way to basic models (CCR and BCC), which is easy to use for new DEA leaners.

The settings (options) for the DEA model are permanently saved, so after MaxDEA Ultra is closed, they will not be lost. If you want to save a backup of your DEA model, just copy the "MaxDEA 8 Ultra" file and rename it as you want, such as CCR, BCC, etc.

4 Advanced Models

In addition to the basic DEA settings (Distance, Orientation, RTS and Frontier), you can specify other advanced options. These options are in the tabs of "Advanced Models", "Panel Data Models" and "Bootstrap". **Click the "?" button beside these options, you can see the online help text.**

If the help webpage (or pdf) cannot open after you click the ? button, please use your web browser to open or download the help webpage (or pdf). The http address is shown in the error message.

To combine two or more of these advanced options, just choose them at the same time (see the above snapshot).