If you apply the additive DEA model, you can use this report

Help: Replace the yellow highlighted areas with the output values obtained from the software

Data envelopment analysis (DEA) can be utilized a linear programming based technique and optimization for measuring the efficiency of each unit. With the aim of improving the efficiency of each unit, a set reference for an inefficient unit is determined and the efficiency of various units can be compared to the efficiency boundary.

In an input-oriented DEA model, a given amount of inputs should be appropriately decreased as much as possible while keeping the outputs at the same levels, and vice versa, an output-oriented DEA model can be expected to increase the outputs by maintaining a given amount of inputs. "Additive model" is a model that simultaneously reduces the inputs and increases the outputs. The primary and secondary problems of the additive model can be considered as follows:

 **The primary model:**

$$Min Z\_{0}=-\sum\_{r=1}^{s}s\_{r}^{+}-\sum\_{i=1}^{m}s\_{i}^{-}$$

*St:*

$\sum\_{j=1}^{n}λ\_{j}x\_{rj}-s\_{r}^{+}=y\_{r0}$ *(r=1,2,…,s)*

$\sum\_{j=1}^{n}λ\_{j}x\_{ij}+s\_{i}^{-}=x\_{i0}$ *(i=1,2,…,m)*

$\sum\_{j=1}^{n}λ\_{j}=1$  *(j=1,2,…,n)*

$λ\_{j},s\_{r}^{+},s\_{i}^{-}\geq 0$

 **The secondary model:**

$$Max Y\_{0}=\sum\_{r=1}^{s}y\_{r0}u\_{r}-\sum\_{i=1}^{m}x\_{i0}v\_{i}+w$$

*St:*

$\sum\_{r=1}^{s}y\_{rj}u\_{r}-\sum\_{i=1}^{m}x\_{ij}v\_{i}+w$ *(j=1,2,…,n)*

$\sum\_{r=1}^{s}u\_{r}\geq 1$

$\sum\_{i=1}^{m}v\_{i}\geq 1$

$u\_{r},v\_{i}\geq 0$

The primary model can be called the envelopment model, and the secondary model is called the multiplier model.

In the primary model, the auxiliary variable $s\_{r}^{+}$ is related to the limitation for the output *rth* and the auxiliary variable $s\_{i}^{-}$ can be related to the limitation for the input *ith*. The unit under investigation is efficient if $Z\_{0}^{\*}=0$, in other words, all auxiliary variables have an optimal solution with value zero. One unit is inefficient, whenever the auxiliary variables associated with it are not zero. Auxiliary variables represent the sources and amounts of inefficiency in each input and output corresponding to their limitations.

**Project Specifications**

In this study, A as decision making unit (DMU) was investigated with respect to B input and C output using a additive DEA model. The model used in this study is D.

A: the number of decision making units (DMUs)

B: the number of inputs

C: the number of outputs

D: the model

**Objective Values**

The values of the function obtained by the defined model are given in Table 1. It is important to note that zero values indicate the units that are efficient.

**Table 1.**

**Reference Set**

 A peer group is the efficient units that can be considered as the model of some other units. Table 2 shows the peers.

**Table 2.**

Table 3 also shows the number of the repeated peer units.

**Table 3.**

$λ$ **(Weights for Peer Units)**

Whenever the amount of each input and output is changed in such a way that the unit under consideration can be located on the efficiency boundary (i.e. its efficiency is equal to 1), then the hypothetical unit located on the efficiency boundary can be viewed as the virtual unit. λ represents the combination of the peer units used to construct each virtual unit. The values of λ are presented in Table 4.

**Table 4.**

**Input and Output slacks**

Input and Output slacks related to related to each unit are presented in Tables 5 and 6, respectively.

**Table 5. Input Slacks**

**Table 6. Output Slacks**

**Target Values**

Tables 7 present the actual and target values of each input.

**Table 7. Inputs & Target inputs**

Tables 8 present the actual and target values of each output.

**Table 8. Outputs & Target outputs**