THE UNIVERSITY OF TENNESSEE
CHATTANOOGA

DEPARTMENT OF MATHEMATICS AND SIMCENTER

present

"Benchmarking with DEA Introduction to Data Envelopment Analysis"

by

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September 12th, 3 p.m., UTC SimCenter Auditorium*

Networking | Light Refreshments | Seminar | Q & A

Public Invited

Data Envelopment Analysis, in the following DEA, is a methodology introduced by Charnes, Cooper and Rodes in 1978 to compare the efficiencies of a set of homogeneous units that produce several outputs from the same set of inputs. This methodology has become very popular in many different topics and it has been combined with many optimization techniques. For each Decision Making Unit, DMU, not only does the DEA analysis provide an efficiency score, but it also provides a peer set. The peer set can be used to guide the managers making decisions leading the DMU's to an optimal performance.

The DEA methodology is a non parametric method that estimates the frontier of technology given by the efficiency units. For each DMU, DEA considers two sets of weights, one set for inputs and one set for outputs, setting up what are called virtual input and virtual output, and it measures the efficiency through the ratio between virtual output and virtual input for each unit. The weights are selected in the most favourable way to the unit that has been evaluated.

The first part of the talk is devoted to introduce the DEA methodology, showing how it can be used to benchmark the DMU's.

Usually, the selection of the variables to be included in the analysis are made by the managers, so one can assume a correct selection. But a bad selection of the variables to include in the model could bias the results. So, the task of selecting the set of variables becomes an important task. To this topic and how one can handle that problem, is devoted the second part.

In the next section, a case study with a classical set of data is showed.

The talks ends with a section devoted to conclusions and future research.

Graduated in Mathematics for the specialty of Statistics and Operational Research in 1991 at the University of Seville, where he began to work under the department of the same name in October of that year. In March of 1995 he obtained the title of doctor with the doctoral thesis entitled "El problema de Weber Regional" directed by professors Emilio Carrizosa Priego and Justo Puerto Albandoz.

In November 1995 he joined the then Department of Mathematics of the University of Cádiz where he obtained the position of holder of a university in June 1997. He is currently attached to the Department of Statistics and Operational Research split from the previous one. In the university, he holds the position of head of the Teaching Technologies Secretariat.

Since 1999, he is responsible for the TeLoYDisRen Research Group. One of the main lines of work is the theory of localization, and in general optimization, where he has published works in international journals of recognized international prestige, such as, for example, Management Science or Mathematical Programming. At present, other lines of work are being developed, such as data analysis, the development of statistical software and gender studies in the university sphere.

Since 2007 he shares the direction of the R-UCA project. He has taught numerous courses in Statistics and R, and has been invited several times in scientific meetings where he has presented papers related to R. In the scope of the project, three books with free license have been published and multiple versions of the R-package have been published.

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