A Software Framework for Measuring Efficiency

Veska Noncheva [1,2,*] , Armando Mendes [1] , Emiliana da Silva [3]

1. CEEAplA, Azores University, 9501-801 Ponta Delgada, Portugal
2. Faculty of Mathematics and Informatics, University of Plovdiv "Paisii Hilendarski", Plovdiv, Bulgaria
3. CEEAplA, Azores University, 9700-851 Angra do Heroísmo, Portugal

* Contact author: veska@uac.pt

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The producers always aim at increasing the efficiency of their production process. However, the producers do not always succeed in optimizing their production. In the last years, the interest on Data Envelopment Analysis (DEA) as a powerful tool for measuring efficiency has increased. This is due to the large amount of data-sets available for description of the phenomena under study, and at the same time, to the need of timely and not costly information.

The "Productivity Analysis with R" (PAR) framework establishes a user-friendly data envelopment analysis environment with special emphasis on variable selection and aggregation, and summarization and interpretation of the results. The starting point is the following R packages: DEA [Diaz-Martinez and Fernandez-Menendez, 2008] and FEAR [Wilson, 2007]. The DEA package performs some models of Data Envelopment Analysis presented in [Cooper et al., 2007]. FEAR is a software package for computing nonparametric efficiency estimates and testing hypotheses in frontier models. FEAR implements the bootstrap methods described in [Simar and Wilson, 2000].

PAR is a software framework using a variety of models estimating efficiency and providing results explanation functionality. PAR framework has been developed to distinguish between efficient and inefficient observations of performances and to advise explicitly for producers' possibilities to optimize their production. PER framework offers several R functions for a reasonable interpretation of the data analysis results and text presentation of the information obtained. The output of the efficiency study with PAR software is self explanatory.

We are applying PAR framework to estimate the efficiency of the agricultural system in Azores [Mendes et al., 2009]. All Azorean farms will be clustered into homogeneous groups according to their efficiency measurements to define clusters of "good" practices and cluster of "less good" practices. This makes PAR appropriate to support public policies in agriculture sector in Azores.

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