Oral, M.

**E-DEA: Enhanced data envelopment analysis**  

**DOI:** 10.1016/j.ejor.2010.05.035

University of the Thai Chamber of Commerce, Bangkok, Thailand

**Abstract**
Data envelopment analysis (DEA) has enjoyed a wide range of acceptance by researchers and practitioners alike as an instrument of performance analysis and management since its introduction in 1978. Many formulations and thousands of applications of DEA have been reported in a considerable variety of academic and professional journals all around the world. Almost all of the formulations and applications have basically centered at the concept of “relative self-evaluation”, whether they are single or multi-stage applications. This paper suggests a framework for enhancing the theory of DEA through employing the concept of “relative cross-evaluation” in a multi-stage application context. Managerial situations are described where such enhanced-DEA (E-DEA) formulations had actually been used and could also be potentially most meaningful and useful. © 2010 Elsevier B.V. All rights reserved.

**Author Keywords**
Consensus formation; Data envelopment analysis; Enhanced data envelopment analysis; Mathematical programming; Project selection; Relative performance

**References**

- **Adler, N., Friedman, L., Sinuany-Stern, S.**  
  *Review of ranking methods in the data development analysis context*  

- **Brewer, T., Rivoli, P.**  
  *Politics and perceived country credit-worthiness in international banking*  

- **Charnes, A., Cooper, W.W., Rhodes, E.L.**  
  *Measuring the efficiency of decision making units*  

- **Charnes, A., Cooper, W.W., Rhodes, E.L.**  
  *Evaluating program and managerial efficiency: An application of data envelopment analysis to program follow through*  

- **Cosset, J.-C., Daouas, M., Kettani, O., Oral, M.**  
  *Replicating country risk ratings*  

- **Despotis, D.K.**  
  *Improving the discriminating power of DEA: Focus on globally efficient units*  

- **Doyle, J., Green, R.**  
  *Efficiency and cross efficiency in DEA: Derivations, meanings, and uses*  

- **Dyson, R.G., Allen, R., Camanho, A.S., Podinovski, V.V., Sarrico, C.S., Shale, E.A.**  
  *Pitfalls and protocols in DEA*  
• Eilat, H., Golany, B., Shtub, A.
  R&D project evaluation: An integrated DEA and balanced scorecard approach

• Feder, R.L., Raiffa, H.
  The determinants of international credit-worthiness and their policy implications

• Friedman, T.L.

• Green, R.H., Doyle, J.R., Cook, W.D.
  Preference voting and project ranking using DEA and cross-evaluation

• Kettani, O., Aouni, B., Martel, J.M.
  The double role of the weight factor in the goal programming model

• Lee, H., Park, Y., Choi, H.
  Comparative evaluation of performance of national R&D programs with heterogeneous
  objectives: A DEA approach

• Liang, L., Cook, W.D., Zhu, J.
  The DEA game cross-efficiency model and its Nash equilibrium

• Liang, L., Wu, J., Cook, W.D., Zhu, J.
  Alternative secondary goals in DEA cross-efficiency evaluation

  Olympic ranking based on a zero sum gains DEA model

• Oral, M., Kettani, O., Inar, Ü.
  Project evaluation and selection in a network of collaboration: A consensual
  disaggregation multi-criterion approach

• Oral, M., Chabchoub, H.
  On the methodology of the world competitiveness report

• Oral, M., Chabchoub, H.
  An estimation model for replicating the rankings of the world competitiveness report

• Oral, M., Kettani, O., Lang, P.
  A methodology for collective evaluation and selection of industrial R&D projects

• Oral, M., Kettani, O.
  A linearization procedure for quadratic and cubic mixed-integer problems

• Oral, M., Yolalan, R.
  An empirical study on measuring operating efficiency and profitability of bank branches
- Oral, M., Kettani, O., Yolalan, R.  
  **An empirical study on analyzing the productivity of bank branches**  

- Oral, M., Kettani, O., Cosset, J.-C., Daouas, M.  
  **An estimation model for country risk rating**  

- Porter, M.E.  
  (1990) *Competitive Advantage of Nations*,  
  Free Press New York, NY

- Roy, B., Vincke, P.  
  **Multicriteria analysis: Survey and new directions**  

  **Data envelopment analysis: Critique and extensions**  

- Wu, J., Liang, L., Yang, F., Yan, H.  
  **Bargaining game model in the evaluation of decision making units**  

- Wu, J., Liang, L., Ying-Chun, Z.  
  **Determination of weights of ultimate cross efficiency based on the solution of nucleolus in cooperative game**  