



Special issue on:

## Recent Advances in Inverse Data Envelopment Analysis

Guest editors:

**Ali Emrouznejad,**  
Aston Business School, Aston University, UK, [A.Emrouznejad@aston.ac.uk](mailto:A.Emrouznejad@aston.ac.uk)

**Gholam R Amin**  
Faculty of Business, University of New Brunswick at Saint John, Canada, [gamin@unb.ca](mailto:gamin@unb.ca)

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**Data Envelopment Analysis (DEA)** as developed by Charles Coopers, Rhodes (1978) is an optimization method of mathematical programming to generalize the Farrell (1957) single-input/ single-output technical efficiency measure to the multiple-input/ multiple-output case by constructing a relative efficiency score as the ratio of a single virtual output to a single virtual input. The standard DEA models measure the relative efficiency of decision-making units (DMUs). They do not reveal the level of inputs and outputs that would allow a business firm to realize a given efficiency target. This requires solving an inverse problem which is beyond the scope of DEA models and requires appropriate mathematical models relate to inverse optimisation to be developed.

Recent years have seen the potential of **inverse DEA (InvDEA)** in solving different decision-making problems in the areas such as environmental efficiency, greenhouse gas emissions optimization, resource allocation, firms restructuring, and mergers' gains estimation. Despite the wide range applicability of DEA, there are few applications of InvDEA in the literature.

In this issue, we consider state-of-the-art papers spanning all areas of analytical and empirical research related to new developments in InvDEA models and applications of performance and efficiency analysis in the real world as long as the article provides significant new insights to advance the practices of InvDEA. Specifically, this special issue aims to invite scholars and practitioners to develop theory and application of InvDEA in the areas such as climate change, environmental efficiency, pollution minimization, carbon tax policy, firms restructuring, resource allocation, as well as potential merger and acquisition application of InvDEA for the post-Coronavirus market.

### Important Dates

31 December 2020	Submission deadline ( <b><u>Early submission recommended, referee process starts once the paper received, accepted papers will be published individually online as they are accepted</u></b> )
31 April 2021	Notification of status & acceptance of paper
31 August 2021	Revised manuscripts
31 December 2021	Final submissions

### List of Editors' related paper on "Inverse DEA":

- Amin, G.R., and Ibn Boamah, M. (2020). A new inverse DEA cost efficiency model for estimating potential merger gains: A case of Canadian banks, *Annals of Operations Research*, 1-16, in press.
- Wegener, M., and Amin, G.R. (2019). Minimizing Greenhouse Gas Emissions using Inverse DEA with an Application in Oil and Gas, *Expert Systems with Applications*, 122, 369–375.
- Emrouznejad, A., Yang, G., and Amin, G.R. (2019). A novel inverse DEA model with application to allocate the CO<sub>2</sub> emissions quota to different regions in Chinese manufacturing industries. *Journal of the Operational Research Society*, 70(7), 1079-1090.
- Amin, G.R., Al-Muharrami, S., and Toloo, M. (2019). A combined goal programming and inverse DEA method for target setting in mergers, *Expert Systems with Applications*, 115, 412-417.
- Amin, G.R., and Oukil, A. (2019). Flexible target setting in mergers using inverse data envelopment analysis, *International Journal of Operational Research*, 35(3), 301-317.
- Amin, G.R., and Saeed Al-Muharrami (2018). A new inverse DEA model for mergers with negative data, *IMA Journal of Management Mathematics*, 29(2), 137-149.
- Amin, G.R., Emrouznejad, A., and Gattoufi, S. (2017). Modelling Generalized Firms' Restructuring using Inverse DEA, *Journal of Productivity Analysis*, 48(1), 51-61.
- Amin, G.R., Emrouznejad, A., and Gattoufi, S. (2017). Minor and Major Consolidations in Inverse DEA: Definition and Determination, *Computers and Industrial Engineering*, 103(1), 193-200.
- Gattoufi, S., Amin, G.R., and Emrouznejad, A. (2014). A new inverse DEA method for merging banks, *IMA Journal of Management Mathematics*, 25(1): 73-87.
- Amin, G.R., and Emrouznejad, A. (2007). Inverse forecasting: A new approach for predictive modeling. *Computers & Industrial Engineering*, 53(3):491-498.
- Amin, G.R., and Emrouznejad, A. (2007). Inverse linear programming in DEA. *International Journal of Operations Research*, 4(2):105-109.