

Assessing Road Safety Performance using a DEA Approach

Ibtissam El Khalai, Zoubida Chorfi and Abdelaziz Berrado

Equipe de recherche AMIPS
Université Mohammed V de Rabat
Ecole Mohammadia d'ingénieurs
Rabat, Morocco

ibtissamelkhalai@research.emi.ac.ma, chorfi@emi.ac.ma
berrado@emi.ac.ma

Abstract

Road safety performance is influenced by various factors, including management strategies, infrastructure, human behaviors, regulations, and laws. Consequently, determining priority areas for intervention and selecting appropriate strategies and actions to enhance road network performance remains a complex challenge. This study adopts a performance evaluation approach to assess and compare the efficiency of different road safety systems, considering multiple factors. To achieve this, a Data Envelopment Analysis (DEA) model is applied to measure the relative efficiency of selected road safety entities based on multiple inputs and outputs. The main goals of this research are: (1) to evaluate and compare the efficiency of road safety entities, (2) to identify benchmarks based on the best-performing entities, and (3) to determine the input adjustments needed to improve the efficiency of underperforming entities.

Keywords

Road safety performance, Data Envelopment Analysis, Efficiency assessment, Benchmarking, Performance evaluation.

Biographies

Ibtissam EL KHALAI is a PhD student in EMI School of Engineering at Mohammed V University in Rabat, Morocco. She received her Dipl-Ing degree in Mechanical Engineering from EMI in 2008. She has worked three years for an industrial company, and is working now for the Ministry of Transport and Logistics. Her research focuses on road safety management, with particular interest in performance measurement and the application of data-driven decision-making methodologies.

Zoubida CHORFI is Associate professor of Industrial Engineering at EMI School of Engineering at Mohamed V University. She received her MS/BS and PhD in Industrial Engineering from the same institution. She has more than three years of industrial experience working as process engineer and quality engineer for industrial companies. Her research interests are in the areas of Industrial Statistics, Operations and Supply Chain Modelling, Planning and Control with application in different industries. Her research work is about developing frameworks, methods and tools for systems' diagnostics, optimization and control with the aim of operational excellence.

Abdelaziz BERRADO is Professor of Industrial Engineering in EMI School of Engineering at Mohammed V University in Rabat. He was previously Deputy Director of Research and Cooperation and Industrial Engineering Department Chair at the same institution. Prior to his current position, he was a faculty member of Engineering

Management at AlAkhawayn University in Ifrane. He holds a Ph.D. in Decision Systems and Industrial Engineering from Arizona State University. He researches advanced analytical methods and frameworks for knowledge generation and decision support in organizations. He focuses on data analytics for Operations and Supply Chain Modelling, Planning, Improvement and Control with applications in Healthcare, Education and other Industries. He has led several funded applied research projects with local and international impact and published research papers in renowned journals. In addition to academic work, he interacts closely with the industry through training and consulting projects. He is a fellow of IEOM Society and a member of INFORMS and IEEE. Previously, he was a senior engineer and data analytics lead at Intel.