Handbook On Data Envelopment Analysis International Series In Operations Research Management Science

Handbook on Data Envelopment AnalysisHandbook of Research on Strategic Performance Management and Measurement Using Data Envelopment AnalysisHandbook of International Trade and TransportationProceedings of the Eighth International Conference on Management Science and Engineering ManagementHandbook for Productivity Measurement and ImprovementHandbook of Research on Interdisciplinary Approaches to Decision Making for Sustainable Supply ChainsLocation ScienceQuantitative Methods in TransportationThe Palgrave Handbook of Economic Performance AnalysisHandbook of Research Methods in Public AdministrationIntroduction to Data Envelopment Analysis and Its UsesBenchmarking with DEA, SFA, and RHandbook of Research on Strategic Performance Management and Measurement Using Data Envelopment AnalysisAnalysis and Management of Productivity and Efficiency in Production Systems for Goods and ServicesData Envelopment AnalysisHandbook of Operations Analytics Using Data Envelopment AnalysisHandbook of Research on Engineering, Business, and Healthcare Applications of Data Science and AnalyticsData Envelopment AnalysisPerformance Measurement with Fuzzy Data Envelopment AnalysisUncertain Data Envelopment AnalysisThe Oxford Handbook of Health EconomicsDecision SciencesMeasuring EfficiencyDynamics of Data Envelopment AnalysisHandbook Of Medical StatisticsNetwork Data Envelopment AnalysisEvaluating Hedge Fund and CTA PerformanceQuantitative Models for Performance Evaluation and BenchmarkingAn Introduction to Efficiency and Productivity AnalysisData Envelopment AnalysisExtension of Data Envelopment Analysis with Preference InformationData Envelopment AnalysisEncyclopedia of Operations Research and Management ScienceHandbook of Environmental and Sustainable FinanceHandbook of Research on Emergent Applications of Optimization AlgorithmsAn Introduction to Data Envelopment AnalysisHandbook on Constructing Composite Indicators: Methodology and User GuideData Envelopment AnalysisQuantitative Methods in TourismDecision Making and Performance Evaluation Using Data Envelopment Analysis

Handbook on Data Envelopment Analysis

In companies that produce goods and services, productivity and efficiency improvements are a constant challenge. This book reviews the differences between productivity and efficiency. It proposes a new method and makes available a computational tool for implementation that contributes to facilitating the use of Data Envelopment Analysis (DEA). The book presents a discussion about productivity and efficiency, illustrating the potentials of use and conceptual differences. It covers the concepts and techniques for analysis of productivity and efficiency, analyzing critical benefits and limitations, explains in detail how to use DEA for analysis, provides innovative methods for using DEA, offers a free online computer tool with a direction guide, shows real empirical applications, and covers other techniques that can be used to complement the analysis performed. The book is for professionals, managers, consultants, students working and taking

courses in productive systems of goods and services. Ancillary materials include a free online computer tool to operationalize the concepts and methods proposed in the book, a guide on how to use the method and the software developed for the DEA application. Solutions manual, instructor's manual, PowerPoint slides, and figure slides also will be available upon qualified adoption.

Handbook of Research on Strategic Performance Management and Measurement Using Data Envelopment Analysis

Organizations can use the valuable tool of data envelopment analysis (DEA) to make informed decisions on developing successful strategies, setting specific goals, and identifying underperforming activities to improve the output or outcome of performance measurement. The Handbook of Research on Strategic Performance Management and Measurement Using Data Envelopment Analysis highlights the advantages of using DEA as a tool to improve business performance and identify sources of inefficiency in public and private organizations. These recently developed theories and applications of DEA will be useful for policymakers, managers, and practitioners in the areas of sustainable development of our society including environment, agriculture, finance, and higher education sectors.

Handbook of International Trade and Transportation

This is the Proceedings of the Eighth International Conference on Management Science and Engineering Management (ICMSEM) held from July 25 to 27, 2014 at Universidade Nova de Lisboa, Lisbon, Portugal and organized by International Society of Management Science and Engineering Management (ISMSEM), Sichuan University (Chengdu, China) and Universidade Nova de Lisboa (Lisbon, Portugal). The goals of the conference are to foster international research collaborations in Management Science and Engineering Management as well as to provide a forum to present current findings. A total number of 138 papers from 14 countries are selected for the proceedings by the conference scientific committee through rigorous referee review. The selected papers in the second volume are focused on Computing and Engineering Management covering areas of Computing Methodology, Project Management, Industrial Engineering and Information Technology.

Proceedings of the Eighth International Conference on Management Science and Engineering Management

This book provides an introduction to incorporating preference information in Data Envelopment Analysis (DEA) with a special emphasis in Value Efficiency Analysis. In addition to theoretical considerations, numerous illustrative examples are included. Hence, the book can be used as a teaching text as well. Only a modest mathematical background is needed to understand the main principles. The only prerequisites are a) familiarity with linear algebra, especially matrix calculus; b) knowledge of the simplex method; and c) familiarity with the use of computer software. The book is organized as follows. Chapter 1 provides motivation and introduces the basic concepts. Chapter 2 provides the basic ideas and models of

Data Envelopment Analysis. The efficient frontier and production possibility set concepts play an important role in all considerations. That's why these concepts are considered more closely in Chapter 3. Since the approaches introduced in this study are inspired by Multiple Objective Linear Programming, the basic concepts of this field are reviewed in Chapter 4. Chapter 5 also compares and contrasts Data Envelopment Analysis and Multiple Objective Linear Programming, providing some cornerstones for approaches presented later in the book. Chapter 6 discusses the traditional approaches to take into account preference information in DEA. In Chapter 7, Value Efficiency is introduced, and Chapter 8 discusses practical aspects. Some extensions are presented in Chapter 9, and in Chapter 10 Value Efficiency is extended to cover the case when a production possibility set is not convex. Three implemented applications are reviewed in Chapter 11.

Handbook for Productivity Measurement and Improvement

This book provides an engaging, comprehensive review of health economics, with a focus on policy implications in the developed and developing world. Authoritative, but non-technical, it stresses the wide reach of the discipline - across nations, health systems, and areas within health and medical care.

Handbook of Research on Interdisciplinary Approaches to Decision Making for Sustainable Supply Chains

Quantitative Methods in Transportation provides the most useful, simple, and advanced quantitative techniques for solving real-life transportation engineering problems. It aims to help transportation engineers and analysts to predict travel and freight demand, plan new transportation networks, and develop various traffic control strategies that are safer, more cost effective, and greener. Transportation networks can be exceptionally large, and this makes many transportation problems combinatorial, and the challenges are compounded by the stochastic and independent nature of trip-planners decision making. Methods outlined in this book range from linear programming, multi-attribute decision making, data envelopment analysis, probability theory, and simulation to computer techniques such as genetic algorithms, simulated annealing, tabu search, ant colony optimization, and bee colony optimization. The book is supported with problems and has a solutions manual to aid course instructors.

Location Science

Analyzing data sets has continued to be an invaluable application for numerous industries. By combining different algorithms, technologies, and systems used to extract information from data and solve complex problems, various sectors have reached new heights and have changed our world for the better. The Handbook of Research on Engineering, Business, and Healthcare Applications of Data Science and Analytics is a collection of innovative research on the methods and applications of data analytics. While highlighting topics including artificial intelligence, data security, and information systems, this book is ideally designed for researchers, data analysts, data scientists, healthcare administrators, executives, managers, engineers, IT consultants, academicians, and students

interested in the potential of data application technologies.

Quantitative Methods in Transportation

From the Foreword: 'This book is an excellent tool for practitioners who are interested in the merits and pitfalls of the technique. (The author's) research is an example of inventiveness, diligence and accuracy' - Freerk A. Lootsma, Delft Institute of Technology Data envelopment Analysis is a Mathematical Programme for measuring performance efficiency of organizational units. The organizational units, termed as decision-making units (DMU) can be of any kind: manufacturing units, a set of schools, banks, hospitals, power plants, police stations, prisons, a set of firms etc. DEA has been unsuccessfully applied to measure the performance efficiency of these different kinds of DMUs which share a common characteristic - that they are non-profit organization where measurement of performance efficiency is difficult. DEA has been employed for assessing the relative performance of a set of firms that use a variety of identical inputs-say in the case of a school: quality of students, teachers, grants etc.,-to produce a variety of identical outputs-number of students who pass the final year, average grades obtained by the students in the final year etc. DEA assumes the performance of the DMUs by using the concepts of efficiency or productivity which is measured as the ratio of total outputs to total inputs. Also, the efficiencies estimated are relative to the best performing DMU or DMUs. The best performing DMU is given a score of 100% and the performance of other DMUs vary between 0 -100%.

The Palgrave Handbook of Economic Performance Analysis

This unique volume focuses on the "tools" of medical statistics. It contains over 500 concepts or methods, all of which are explained very clearly and in detail. Each chapter focuses on a specific field and its applications. There are about 20 items in each chapter with each item independent of one another and explained within one page (plus references). The structure of the book makes it extremely handy for solving targeted problems in this area. As the goal of the book is to encourage students to learn more combinatorics, every effort has been made to provide them with a not only useful, but also enjoyable and engaging reading. This handbook plays the role of "tutor" or "advisor" for teaching and further learning. It can also be a useful source for "MOOC-style teaching".

Handbook of Research Methods in Public Administration

This book offers new transparent views and step-by-step methods for performance evaluation of a set of units using Data Envelopment Analysis (DEA). The book has twelve practical chapters. Elementary concepts and definitions are gradually built in Chapters 1-6 based upon four examples of one input and one output factors, two input factors, two output factors, and four input and three output factors. Simultaneously, the mathematical foundations using linear programming are also introduced without any prerequisites. A reader with basic knowledge of mathematics and computers is able to understand the contents of the book. In addition, to prevent pre-judgment about the available concepts and definitions in the DEA literature, some new phrases are introduced and, after elucidating each

phrase in detail in Chapters 1-6, they are reintroduced for industry-wide accuracy in Chapter 7. After that, some of the more advanced DEA topics are illustrated in Chapters 8-12, such as: production-planning problems, output-input ratio analysis, efficiency over different time periods, Malmquist efficiency indexes, and a delta neighborhood model. A clear overview of many of the elementary and advanced concepts of DEA is provided, including Technical Efficiency, Relative Efficiency, Cost/Revenue/Profit Efficiency, Price/Overall Efficiency, the DEA axioms, the mathematical background to measure technical efficiency and overall efficiency, the multiplier/envelopment form of basic DEA models in input/output-orientation, the multiplier/envelopment of Additive DEA model, the multiplier/envelopment of slacks-based models, and others. The book also covers a variety of DEA techniques, input-output ratio analysis, the natural relationships between DEA frontier and the ratio of output to input factors, production-planning problems, planning ideas with a centralized decision-making unit, context-dependent DEA, Malmquist efficiency index, efficiency over different time periods, and others. End-of-chapter exercises are provided for each chapter.

Introduction to Data Envelopment Analysis and Its Uses

The use of financial concepts and tools to shape development is hardly new, but their recent adoption by advocates of sustainable environmental management has created opportunities for innovation in business and regulatory groups. The Handbook of Environmental and Sustainable Finance summarizes the latest trends and attitudes in environmental finance, balancing empirical research with theory and applications. It captures the evolution of environmental finance from a niche scholarly field to a mainstream subdiscipline, and it provides glimpses of future directions for research. Covering implications from the Kyoto and Paris Protocols, it presents an intellectually cohesive examination of problems, opportunities, and metrics worldwide. Introduces the latest developments in environmental economics, sustainable accounting work, and environmental/sustainable finance Explores the effects of environmental regulation on the economy and businesses Emphasizes research about the trade-environmental regulation nexus, relevant for economics and business students

Benchmarking with DEA, SFA, and R

Describing new techniques and novel applications, Handbook of Research Methods in Public Administration, Second Edition demonstrates the use of tools designed to meet the increased complexity of problems in government and non-profit organizations with ever-more rigorous and systematic research. It presents detailed information on conceptualizing, planning, and implementing research projects involving a wide variety of available methodologies. Providing a reference of systematic research methods, this second edition explains how these techniques aid in understanding traditional issues, and reveals how they might be applied to answer emerging theoretical and practical questions. Following a linear, logical organization, this handbook meets systematic goals and objectives through eight groups of chapters. The first group explains the logic of inquiry and the practical problems of locating existing research. The second group deals with research design and the third examines pitfalls in measurement and data collection. The authors give practical, considered advice in the fourth section to anticipate and

solve data management problems. They include numerous illustrations to supplement two separate sections devoted to basic and advanced quantitative analysis. The seventh section covers unique analytical techniques used to gain insight specific to the non-market sector's knotty problems. The final section addresses the impact of research and describes how to overcome illusive, tricky, and sizeable barriers to influence other researchers, decision makers, foundations, and grant making institutions. With a comprehensive survey of research methods and an examination of their practical and theoretical application in the past, present, and future, Handbook of Research Methods in Public Administration, Second Edition gives you the tools to make informed decisions.

Handbook of Research on Strategic Performance Management and Measurement Using Data Envelopment Analysis

This comprehensive and clearly structured book presents essential information on modern Location Science. The book is divided into three parts: basic concepts, advanced concepts and applications. Written by the most respected specialists in the field and thoroughly reviewed by the editors, it first lays out the fundamental problems in Location Science and provides the reader with basic background information on location theory. Part II covers advanced models and concepts, broadening and expanding on the content presented in Part I. It provides the reader with important tools to help them understand and solve real-world location problems. Part III is dedicated to linking Location Science with other areas like GIS, telecommunications, healthcare, rapid transit networks, districting problems and disaster events, presenting a wide range of applications. This part enables the reader to understand the role of facility location in such areas, as well as to learn how to handle realistic location problems. The book is intended for researchers working on theory and applications involving location problems and models. It is also suitable as a textbook for graduate courses on facility location.

Analysis and Management of Productivity and Efficiency in Production Systems for Goods and Services

This handbook covers DEA topics that are extensively used and solidly based. The purpose of the handbook is to (1) describe and elucidate the state of the field and (2), where appropriate, extend the frontier of DEA research. It defines the state-of-the-art of DEA methodology and its uses. This handbook is intended to represent a milestone in the progression of DEA. Written by experts, who are generally major contributors to the topics to be covered, it includes a comprehensive review and discussion of basic DEA models, which, in the present issue extensions to the basic DEA methods, and a collection of DEA applications in the areas of banking, engineering, health care, and services. The handbook's chapters are organized into two categories: (i) basic DEA models, concepts, and their extensions, and (ii) DEA applications. First edition contributors have returned to update their work. The second edition includes updated versions of selected first edition chapters. New chapters have been added on: different approaches with no need for a priori choices of weights (called "multipliers) that reflect meaningful trade-offs, construction of static and dynamic DEA technologies, slacks-based model and its extensions, DEA models for DMUs that have internal structures network DEA that

can be used for measuring supply chain operations, Selection of DEA applications in the service sector with a focus on building a conceptual framework, research design and interpreting results.

Data Envelopment Analysis

A guide for constructing and using composite indicators for policy makers, academics, the media and other interested parties. In particular, this handbook is concerned with indicators which compare and rank country performance.

Handbook of Operations Analytics Using Data Envelopment Analysis

International trade has grown rapidly over the past half century, accommodated by the transportation industry through concomitant growth and technological change. But while the connection between transport and trade flows is clear, the academic literature often looks at these two issues separately. This Handbook is unique in pulling together the key insights of each field while highlighting what we know about their intersection and ideas for future research in this relatively unexamined but growing area of study.

Handbook of Research on Engineering, Business, and Healthcare Applications of Data Science and Analytics

This volume systematically details both the basic principles and new developments in Data Envelopment Analysis (DEA), offering a solid understanding of the methodology, its uses, and its potential. New material in this edition includes coverage of recent developments that have greatly extended the power and scope of DEA and have lead to new directions for research and DEA uses. Each chapter accompanies its developments with simple numerical examples and discussions of actual applications. The first nine chapters cover the basic principles of DEA, while the final seven chapters provide a more advanced treatment.

Data Envelopment Analysis

The intensity of global competition and ever-increasing economic uncertainties has led organizations to search for more efficient and effective ways to manage their business operations. Data envelopment analysis (DEA) has been widely used as a conceptually simple yet powerful tool for evaluating organizational productivity and performance. Fuzzy DEA (FDEA) is a promising extension of the conventional DEA proposed for dealing with imprecise and ambiguous data in performance measurement problems. This book is the first volume in the literature to present the state-of-the-art developments and applications of FDEA. It is designed for students, educators, researchers, consultants and practicing managers in business, industry, and government with a basic understanding of the DEA and fuzzy logic concepts.

Performance Measurement with Fuzzy Data Envelopment Analysis

Audience: Anyone concerned with the science, techniques and ideas of how decisions are made."--BOOK JACKET.

Uncertain Data Envelopment Analysis

Organizations can use the valuable tool of data envelopment analysis (DEA) to make informed decisions on developing successful strategies, setting specific goals, and identifying underperforming activities to improve the output or outcome of performance measurement. The Handbook of Research on Strategic Performance Management and Measurement Using Data Envelopment Analysis highlights the advantages of using DEA as a tool to improve business performance and identify sources of inefficiency in public and private organizations. These recently developed theories and applications of DEA will be useful for policymakers, managers, and practitioners in the areas of sustainable development of our society including environment, agriculture, finance, and higher education sectors.

The Oxford Handbook of Health Economics

This book covers recent advances in efficiency evaluations, most notably Data Envelopment Analysis (DEA) and Stochastic Frontier Analysis (SFA) methods. It introduces the underlying theories, shows how to make the relevant calculations and discusses applications. The aim is to make the reader aware of the pros and cons of the different methods and to show how to use these methods in both standard and non-standard cases. Several software packages have been developed to solve some of the most common DEA and SFA models. This book relies on R, a free, open source software environment for statistical computing and graphics. This enables the reader to solve not only standard problems, but also many other problem variants. Using R, one can focus on understanding the context and developing a good model. One is not restricted to predefined model variants and to a one-size-fits-all approach. To facilitate the use of R, the authors have developed an R package called Benchmarking, which implements the main methods within both DEA and SFA. The book uses mathematical formulations of models and assumptions, but it de-emphasizes the formal proofs - in part by placing them in appendices -- or by referring to the original sources. Moreover, the book emphasizes the usage of the theories and the interpretations of the mathematical formulations. It includes a series of small examples, graphical illustrations, simple extensions and questions to think about. Also, it combines the formal models with less formal economic and organizational thinking. Last but not least it discusses some larger applications with significant practical impacts, including the design of benchmarking-based regulations of energy companies in different European countries, and the development of merger control programs for competition authorities.

Decision Sciences

Introducing Data Envelopment Analysis (DEA) -- a quantitativeapproach to assess the performance of hedge funds, funds of hedgefunds, and commmodity trading advisors. Steep yourself inthis approach with this important new book by Greg

Gregoriou andJoe Zhu. "This book steps beyond the traditional trade-off betweensingle variables for risk and return in the determination ofinvestment portfolios. For the first time, a comprehensiveprocedure is presented to compose portfolios using multiplemeasures of risk and return simultaneously. This approachrepresents a watershed in portfolio construction techniques and isespecially useful for hedge fund and CTA offerings." -- Richard E. Oberuc, CEO, Burlington Hall Asset Management, Inc.Chairman, Foundation for Managed Derivatives Research Order your copy today!

Measuring Efficiency

Modern optimization approaches have attracted an increasing number of scientists, decision makers, and researchers. As new issues in this field emerge, different optimization methodologies must be developed and implemented. The Handbook of Research on Emergent Applications of Optimization Algorithms is an authoritative reference source for the latest scholarly research on modern optimization techniques for solving complex problems of global optimization and their applications in economics and engineering. Featuring coverage on a broad range of topics and perspectives such as hybrid systems, non-cooperative games, and cryptography, this publication is ideally designed for students, researchers, and engineers interested in emerging developments in optimization algorithms.

Dynamics of Data Envelopment Analysis

The author is one of the prominent researchers in the field of Data Envelopment Analysis (DEA), a powerful data analysis tool that can be used in performance evaluation and benchmarking. This book is based upon the author's years of research and teaching experiences. It is difficult to evaluate an organization's performance when multiple performance metrics are present. The difficulties are further enhanced when the relationships among the performance metrics are complex and involve unknown tradeoffs. This book introduces Data Envelopment Analysis (DEA) as a multiple-measure performance evaluation and benchmarking tool. The focus of performance evaluation and benchmarking is shifted from characterizing performance in terms of single measures to evaluating performance as a multidimensional systems perspective. Conventional and new DEA approaches are presented and discussed using Excel spreadsheets — one of the most effective ways to analyze and evaluate decision alternatives. The user can easily develop and customize new DEA models based upon these spreadsheets. DEA models and approaches are presented to deal with performance evaluation problems in a variety of contexts. For example, a context-dependent DEA measures the relative attractiveness of similar operations/processes/products. Sensitivity analysis techniques can be easily applied, and used to identify critical performance measures. Two-stage network efficiency models can be utilized to study performance of supply chain. DEA benchmarking models extend DEA's ability in performance evaluation. Various cross efficiency approaches are presented to provide peer evaluation scores. This book also provides an easy-to-use DEA software — DEAFrontier. This DEAFrontier is an Add-In for Microsoft® Excel and provides a custom menu of DEA approaches. This version of DEAFrontier is for use with Excel 97-2013 under Windows and can solve up to 50 DMUs, subject to the capacity of Excel Solver. It is an extremely powerful tool that can assist decision-

makers in benchmarking and analyzing complex operational performance issues in manufacturing organizations as well as evaluating processes in banking, retail, franchising, health care, public services and many other industries.

Handbook Of Medical Statistics

With its comprehensive scope and easy-to-read format, this compendium belongs in every company and academic institution concerned with business and industrial viability. Featuring scores of contributions covering the most advanced methods for the measurement and improvement of quality and productivity, no other reference can compete. Throughout 100 chapters, front-runners in the quality movement reveal the evolving theory and specific practices of world-class organizations. Spanning a wide variety of industries and business sectors, this handbook includes insightful discussions on quality and productivity in manufacturing, service industries, profit centers, administration, nonprofit and government institutions, health care and education. Topics include—Benchmarking The best way to implement an activity-based cost-management system Ten rules for building a measurement system Process simplification through cycle-time reduction Strategies for measuring and improving white-collar productivity Sharing the productivity payoff—gain sharing primer

Network Data Envelopment Analysis

This book goes beyond the methods usually covered in introductory textbooks on quantitative methods in tourism. It considers key issues in data selection, approaches to factor and cluster analysis and regression before covering advanced topics including structural equation modelling, maximum likelihood estimation, simulation and agent-based modelling. The result is a guide to quantitative methods in tourism that de-mystifies both simple and apparently complex techniques and makes them more accessible to tourism researchers.

Evaluating Hedge Fund and CTA Performance

This handbook serves as a complement to the Handbook on Data Envelopment Analysis (eds, W.W. Cooper, L.M. Seiford and J, Zhu, 2011, Springer) in an effort to extend the frontier of DEA research. It provides a comprehensive source for the state-of-the art DEA modeling on internal structures and network DEA. Chapter 1 provides a survey on two-stage network performance decomposition and modeling techniques. Chapter 2 discusses the pitfalls in network DEA modeling. Chapter 3 discusses efficiency decompositions in network DEA under three types of structures, namely series, parallel and dynamic. Chapter 4 studies the determination of the network DEA frontier. In chapter 5 additive efficiency decomposition in network DEA is discussed. An approach in scale efficiency measurement in two-stage networks is presented in chapter 6. Chapter 7 further discusses the scale efficiency decosition in two stage networks. Chapter 8 offers a bargaining game approach to modeling two-stage networks. Chapter 9 studies shared resources and efficiency decomposition in two-stage networks. Chapter 10 introduces an approach to computing the technical efficiency scores for a dynamic production network and its sub-processes. Chapter 11 presents a slacks-

based network DEA. Chapter 12 discusses a DEA modeling technique for a two-stage network process where the inputs of the second stage include both the outputs from the first stage and additional inputs to the second stage. Chapter 13 presents an efficiency measurement methodology for multi-stage production systems. Chapter 14 discusses network DEA models, both static and dynamic. The discussion also explores various useful objective functions that can be applied to the models to find the optimal allocation of resources for processes within the black box, that are normally invisible to DEA. Chapter 15 provides a comprehensive review of various type network DEA modeling techniques. Chapter 16 presents shared resources models for deriving aggregate measures of bank-branch performance, with accompanying component measures that make up that aggregate value. Chapter 17 examines a set of manufacturing plants operating under a single umbrella, with the objective being to use the component or function measures to decide what might be considered as each plant's core business. Chapter 18 considers problem settings where there may be clusters or groups of DMUs that form a hierarchy. The specific case of a set off electric power plants is examined in this context. Chapter 19 models bad outputs in two-stage network DEA. Chapter 20 presents an application of network DEA to performance measurement of Major League Baseball (MLB) teams. Chapter 21 presents an application of a two-stage network DEA model for examining the performance of 30 U.S. airline companies. Chapter 22 then presents two distinct network efficiency models that are applied to engineering systems.

Quantitative Models for Performance Evaluation and Benchmarking

An Introduction to Efficiency and Productivity Analysis

This book is intended to present the milestones in the progression of uncertain Data envelopment analysis (DEA). Chapter 1 gives some basic introduction to uncertain theories, including probability theory, credibility theory, uncertainty theory and chance theory. Chapter 2 presents a comprehensive review and discussion of basic DEA models. The stochastic DEA is introduced in Chapter 3, in which the inputs and outputs are assumed to be random variables. To obtain the probability distribution of a random variable, a lot of samples are needed to apply the statistics inference approach. Chapter 4 and 5 provide two uncertain DEA methods to evaluate the DMUs with limited or insufficient statistical data, named fuzzy DEA and uncertain DEA. In order to evaluate the DMUs in which uncertainty and randomness appear simultaneously, the hybrid DEA based on chance theory is presented in Chapter 6.

Data Envelopment Analysis

This volume systematically details both the basic principles and new developments in Data Envelopment Analysis (DEA), offering a solid understanding of the methodology, its uses, and its potential. New material in this edition includes coverage of recent developments that have greatly extended the power and scope of DEA and have lead to new directions for research and DEA uses. Each chapter

accompanies its developments with simple numerical examples and discussions of actual applications. The first nine chapters cover the basic principles of DEA, while the final seven chapters provide a more advanced treatment.

Extension of Data Envelopment Analysis with Preference Information

This handbook focuses on Data Envelopment Analysis (DEA) applications in operations analytics which are fundamental tools and techniques for improving operation functions and attaining long-term competitiveness. In fact, the handbook demonstrates that DEA can be viewed as Data Envelopment Analytics. Chapters include a review of cross-efficiency evaluation; a case study on measuring the environmental performance of OECS countries; how to select a set of performance metrics in DEA with an application to American banks; a relational network model to take the operations of individual periods into account in measuring efficiencies; how the efficient frontier methods DEA and stochastic frontier analysis (SFA) can be used synergistically; and how to integrate DEA and multidimensional scaling. In other chapters, authors construct a dynamic three-stage network DEA model; a bootstrapping based methodology to evaluate returns to scale and convexity assumptions in DEA; hybridizing DEA and cooperative games; using DEA to represent the production technology and directional distance functions to measure band performance; an input-specific Luenberger energy and environmental productivity indicator; and the issue of reference set by differentiating between the uniquely found reference set and the unary and maximal types of the reference set. Finally, additional chapters evaluate and compare the technological advancement observed in different hybrid electric vehicles (HEV) market segments over the past 15 years; radial measurement of efficiency for the production process possessing multi-components under different production technologies; issues around the use of accounting information in DEA; how to use DEA environmental assessment to establish corporate sustainability; a summary of research efforts on DEA environmental assessment applied to energy in the last 30 years; and an overview of DEA and how it can be utilized alone and with other techniques to investigate corporate environmental sustainability questions.

Data Envelopment Analysis

This handbook represents a milestone in the progression of Data Envelopment Analysis (DEA). Written by experts who are often major contributors to DEA theory, it includes a collection of chapters that represent the current state-of-the-art in DEA research. Topics include distance functions and their value duals, cross-efficiency measures in DEA, integer DEA, weight restrictions and production trade-offs, facet analysis in DEA, scale elasticity, benchmarking and context-dependent DEA, fuzzy DEA, non-homogenous units, partial input-output relations, super efficiency, treatment of undesirable measures, translation invariance, stochastic nonparametric envelopment of data, and global frontier index. Focusing only on new models/approaches of DEA, the book includes contributions from Juan Aparicio, Mette Asmild, Yao Chen, Wade D. Cook, Juan Du, Rolf Färe, Julie Harrison, Raha Imanirad, Andrew Johnson, Chiang Kao, Abolfazl Keshvari, Timo Kuosmanen, Sungmook Lim, Wenbin Liu, Dimitri Margaritis, Reza Kazemi Matin, Ole B. Olesen,

Jesus T. Pastor, Niels Chr. Petersen, Victor V. Podinovski, Paul Rouse, Antti Saastamoinen, Biresh K. Sahoo, Kaoru Tone, and Zhongbao Zhou.

Encyclopedia of Operations Research and Management Science

Data envelopment analysis develops a set of nonparametric and semiparametric techniques for measuring economic efficiency among firms and nonprofit organizations. Over the past decade this technique has found most widespread applications in public sector organizations. However these applications have been mostly static. This monograph extends this static framework of efficiency analysis in several new directions. These include but are not limited to the following: (1) a dynamic view of the production and cost frontier, where capital inputs are treated differently from the current inputs, (2) a direct role of the technological progress and regress, which is so often stressed in total factor productivity discussion in modem growth theory in economics, (3) stochastic efficiency in a dynamic setting, where reliability improvement competes with technical efficiency, (4) flexible manufacturing systems, where flexibility of the production process and the economies of scope play an important role in efficiency analysis and (5) the role of economic factors such as externalities and input interdependences. Efficiency is viewed here in the framework of a general systems theory model. Such a view is intended to broaden the scope of applications of this promising new technique of data envelopment analysis. The monograph stresses the various applied aspects of the dynamic theory, so that it can be empirically implemented in different situations. As far as possible abstract mathematical treatments are avoided and emphasis placed on the statistical examples and empirical illustrations.

Handbook of Environmental and Sustainable Finance

Softcover version of the second edition Hardcover. Incorporates a new author, Dr. Chris O'Donnell, who brings considerable expertise to the project in the area of performance measurement. Numerous topics are being added and more applications using real data, as well as exercises at the end of the chapters. Data sets, computer codes and software will be available for download from the web to accompany the volume.

Handbook of Research on Emergent Applications of Optimization Algorithms

Businesses must create initiatives and adopt eco-friendly practices in order to adhere to the sustainability goals of a globalized world. Recycling, product service systems, and green manufacturing are just a few methods businesses use within a sustainable supply chain. However, these tools and techniques must also ensure business growth in order to remain relevant in an environmentally-conscious world. The Handbook of Research on Interdisciplinary Approaches to Decision Making for Sustainable Supply Chains provides interdisciplinary approaches to sustainable supply chain management through the optimization of system performance and development of new policies, design networks, and effective reverse logistics practices. Featuring research on topics such as industrial symbiosis, green collaboration, and clean transportation, this book is ideally designed for

policymakers, business executives, warehouse managers, operations managers, suppliers, industry professionals, sustainability developers, decision makers, students, academicians, practitioners, and researchers seeking current research on reducing the environmental impacts of businesses via sustainable supply chain planning.

An Introduction to Data Envelopment Analysis

This book presents the underlying theory, model development, and applications of network Data Envelopment Analysis (DEA) in a systematic way. The field of network DEA extends and complements conventional DEA by considering not only inputs and outputs when measuring system efficiency, but also the internal structure of the system being analyzed. By analyzing the efficiency of individual internal components, and more particularly by studying the effects of relationships among components which are modeled and implemented by means of various network structures, the "network DEA" approach is able to help identify and manage the specific components that contribute inefficiencies into the overall systems. This relatively new approach comprises an important analytical tool based on mathematical programming techniques, with valuable implications to production and operations management. The existing models for measuring the efficiency of systems of specific network structures are also discussed, and the relationships between the system and component efficiencies are explored. This book should be able to inspire new research and new applications based on the current state of the art. Performance evaluation is an important task in management, and is needed to (i) better understand the past accomplishments of an organization and (ii) plan for its future development. However, this task becomes rather challenging when multiple performance metrics are involved. DEA is a powerful tool to cope with such issues. For systems or operations composed of interrelated processes, managers need to know how the performances of the various processes evaluated and how they are aggregated to form the overall performance of the system. This book provides an advanced exposition on performance evaluation of systems with network structures. It explores the network nature of most production and operation systems, and explains why network analyses are necessary.

Handbook on Constructing Composite Indicators: Methodology and User Guide

This Handbook takes an econometric approach to the foundations of economic performance analysis. The focus is on the measurement of efficiency, productivity, growth and performance. These concepts are commonly measured residually and difficult to quantify in practice. In real-life applications, efficiency and productivity estimates are often quite sensitive to the models used in the performance assessment and the methodological approaches adopted by the analysis. The Palgrave Handbook of Performance Analysis discusses the two basic techniques of performance measurement – deterministic benchmarking and stochastic benchmarking – in detail, and addresses the statistical techniques that connect them. All chapters include applications and explore topics ranging from the output/input ratio to productivity indexes and national statistics.

Data Envelopment Analysis

This handbook compiles state-of-the-art empirical studies and applications using Data Envelopment Analysis (DEA). It includes a collection of 18 chapters written by DEA experts. Chapter 1 examines the performance of CEOs of U.S. banks and thrifts. Chapter 2 describes the network operational structure of transportation organizations and the relative network data envelopment analysis model. Chapter 3 demonstrates how to use different types of DEA models to compute total-factor energy efficiency scores with an application to energy efficiency. In chapter 4, the authors explore the impact of incorporating customers' willingness to pay for service quality in benchmarking models on cost efficiency of distribution networks, and chapter 5 provides a brief review of previous applications of DEA to the professional baseball industry, followed by two detailed applications to Major League Baseball. Chapter 6 examines efficiency and productivity of U.S. property-liability (P-L) insurers using DEA, while chapter 7 presents a two-stage network DEA model that decomposes the overall efficiency of a decision-making unit into two components. Chapter 8 presents a review of the literature of DEA models for the perfoemance assessment of mutual funds, and chapter 9 discusses the management strategies formulation of the international tourist hotel industry in Taiwan. Chapter 10 presents a novel use of the two-stage network DEA to evaluate sustainable product design performances. In chapter 11 authors highlight limitations of some DEA environmental efficiency models, and chapter 12 reviews applications of DEA in secondary and tertiary education. Chapter 13 measures the relative performance of New York State school districts in the 2011-2012 academic year. Chapter 14 provides an introductory prelude to chapters 15 and 16, which both provide detailed applications of DEA in marketing. Chapter 17 then shows how to decompose a new total factor productivity index that satisfies all economically-relevant axioms from index theory with an application to U.S. agriculture. Finally, chapter 18 presents a unique study that conducts a DEA research front analysis, applying a network clustering method to group the DEA literature over the period 2000 to 2014.

Quantitative Methods in Tourism

Introduction to Data Envelopment Analysis and Its Uses: With DEA-Solver Software and References has been carefully designed by the authors to provide a systematic introduction to DEA and its uses as a multifaceted tool for evaluating problems in a variety of contexts. The authors have been involved in DEA's development from the beginning. William Cooper (with Abraham Charnes and Edwardo Rhodes) is a founder of DEA. Lawrence Seiford and Kaoru Tone have been actively involved as researchers and practitioners from its earliest beginnings. All have been deeply involved in uses of DEA in practical applications as well as in the development of its basic theory and methodologies. The result is a textbook grounded in authority, experience and substance.

Decision Making and Performance Evaluation Using Data Envelopment Analysis

This handbook is an endeavour to cover many current, relevant, and essential

topics related to decision sciences in a scientific manner. Using this handbook, graduate students, researchers, as well as practitioners from engineering, statistics, sociology, economics, etc. will find a new and refreshing paradigm shift as to how these topics can be put to use beneficially. Starting from the basics to advanced concepts, authors hope to make the readers well aware of the different theoretical and practical ideas, which are the focus of study in decision sciences nowadays. It includes an excellent bibliography/reference/journal list, information about a variety of datasets, illustrated pseudo-codes, and discussion of future trends in research. Covering topics ranging from optimization, networks and games, multi-objective optimization, inventory theory, statistical methods, artificial neural networks, times series analysis, simulation modeling, decision support system, data envelopment analysis, queueing theory, etc., this reference book is an attempt to make this area more meaningful for varied readers. Noteworthy features of this handbook are in-depth coverage of different topics, solved practical examples, unique datasets for a variety of examples in the areas of decision sciences, in-depth analysis of problems through colored charts, 3D diagrams, and discussions about software.

ROMANCE ACTION & ADVENTURE MYSTERY & THRILLER BIOGRAPHIES & HISTORY CHILDREN'S YOUNG ADULT FANTASY HISTORICAL FICTION HORROR LITERARY FICTION NON-FICTION SCIENCE FICTION