

Jati K. Sengupta

New Efficiency Theory

With Applications
of Data Envelopment
Analysis



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New Efficiency Theory With Applications Of Data Envelopment Analysis

Sondra Brandler,Camille P. Roman



New Efficiency Theory With Applications Of Data Envelopment Analysis:

New Efficiency Theory Jatikumar Sengupta, University of California, Santa Barbara. Department of Economics, 1997

New Efficiency Theory Jati Sengupta, 2012-11-10 New efficiency theory refers to the various parametric and semi parametric methods of estimating production and cost frontiers which include data envelopment analysis DEA with its diverse applications in management science and operations research This monograph develops and generalizes the new efficiency theory by highlighting the interface between economic theory and operations research Some of the outstanding features of this monograph are 1 integrating the theory of firm efficiency and industry equilibrium 2 emphasizing growth efficiency in a dynamic setting 3 incorporating uncertainty of market demand and prices and 4 the implications of group efficiency by sharing investments Applications discuss in some detail the growth and decline of US computer industry and the relative performance of mutual fund portfolios

Efficiency Models in Data Envelopment Analysis J. K. Sengupta, B. Sahoo, 2006-10-06 This volume discusses the latest techniques and their economic applications for modern industries like computer pharmaceutical banking and other manufacturing Both econometric and mathematical programming techniques are analyzed so as to develop a synthetic approach

Introduction to the Theory and Application of Data Envelopment Analysis Emmanuel Thanassoulis, 2013-06-29 1 DATA ENVELOPMENT ANALYSIS Data Envelopment Analysis DEA was initially developed as a method for assessing the comparative efficiencies of organisational units such as the branches of a bank schools hospital departments or restaurants The key in each case is that they perform feature which makes the units comparable the same function in terms of the kinds of resource they use and the types of output they produce For example all bank branches to be compared would typically use staff and capital assets to effect income generating activities such as advancing loans selling financial products and carrying out banking transactions on behalf of their clients The efficiencies assessed in this context by DEA are intended to reflect the scope for resource conservation at the unit being assessed without detriment to its outputs or alternatively the scope for output augmentation without additional resources The efficiencies assessed are comparative or relative because they reflect scope for resource conservation or output augmentation at one unit relative to other comparable benchmark units rather than in some absolute sense We resort to relative rather than absolute efficiencies because in most practical contexts we lack sufficient information to derive the superior measures of absolute efficiency DEA was initiated by Charnes Cooper and Rhodes in 1978 in their seminal paper Charnes et al 1978 The paper operationalised and extended by means of linear programming production economics concepts of empirical efficiency put forth some twenty years earlier by Farrell 1957

Data Envelopment Analysis in the Financial Services Industry Joseph C. Paradi, H. David Sherman, Fai Keung Tam, 2017-11-21 This book presents the methodology and applications of Data Envelopment Analysis DEA in measuring productivity efficiency and effectiveness in Financial Services firms such as banks bank branches stock markets pension funds mutual funds insurance firms credit unions risk tolerance

and corporate failure prediction Financial service DEA research includes banking insurance businesses hedge pension and mutual funds and credit unions Significant business transactions among financial service organizations such as bank mergers and acquisitions and valuation of IPOs have also been the focus of DEA research The book looks at the range of DEA uses for financial services by presenting prior studies examining the current capabilities reflected in the most recent research and projecting future new uses of DEA in finance related applications *Advances in DEA Theory and Applications* Kaoru Tone, 2017-04-12 A key resource and framework for assessing the performance of competing entities including forecasting models *Advances in DEA Theory and Applications* provides a much needed framework for assessing the performance of competing entities with special emphasis on forecasting models It helps readers to determine the most appropriate methodology in order to make the most accurate decisions for implementation Written by a noted expert in the field this text provides a review of the latest advances in DEA theory and applications to the field of forecasting Designed for use by anyone involved in research in the field of forecasting or in another application area where forecasting drives decision making this text can be applied to a wide range of contexts including education health care banking armed forces auditing market research retail outlets organizational effectiveness transportation public housing and manufacturing This vital resource Explores the latest developments in DEA frameworks for the performance evaluation of entities such as public or private organizational branches or departments economic sectors technologies and stocks Presents a novel area of application for DEA namely the performance evaluation of forecasting models Promotes the use of DEA to assess the performance of forecasting models in a wide area of applications Provides rich detailed examples and case studies *Advances in DEA Theory and Applications* includes information on a balanced benchmarking tool that is designed to help organizations examine their assumptions about their productivity and performance Data Envelopment Analysis: Theory, Methodology, and Applications Abraham Charnes, William W. Cooper, Arie Y. Lewin, Lawrence M. Seiford, 2013-12-01 This book represents a milestone in the progression of Data Envelopment Analysis DEA It is the first reference text which includes a comprehensive review and comparative discussion of the basic DEA models The development is anchored in a unified mathematical and graphical treatment and includes the most important modeling extensions In addition this is the first book that addresses the actual process of conducting DEA analyses including combining DEA and 1 parametric techniques The book has three other distinctive features It traces the applications driven evolution and diffusion of DEA models and extensions across disciplinary boundaries It includes a comprehensive bibliography to serve as a source of references as well as a platform for further developments And finally the power of DEA analysis is demonstrated through fifteen novel applications which should serve as an inspiration for future applications and extensions of the methodology The origin of this book was a Conference on New Uses of DEA in 2 Management and Public Policy which was held at the IC Institute of the University of Texas at Austin on September 27 29 1989 The conference was made possible through NSF Grant SES 8722504 A Charnes and 2 W W Cooper co

PIs and the support of the IC Institute **Handbook on Data Envelopment Analysis** William W. Cooper, Lawrence M. Seiford, Joe Zhu, 2011-08-23 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. *Dynamic and Stochastic Efficiency Analysis* Jatikumar Sengupta, 2000 This book extends the dynamic and stochastic analysis of economic efficiency by using the recent techniques of data envelopment analysis. New results and applications of these techniques in numerous areas of economics, finance and management are provided, including treatment of private sector industries, portfolio models in finance, quality control techniques in managerial performance, the role of market competition, policy applications in investment models in finance, risk aversion and efficiency and technology and innovation. The most up-to-date tools of efficiency analysis developed here will be valuable for students and researchers in operations research, applied management science and applied microeconomics. **Advances in the Theory and Applications of Performance Measurement and Management** Ali Emrouznejad, Emmanuel Thanassoulis, Mehdi Toloo, 2024-09-02 This book presents selected proceedings of DEA45 International Conference on Data Envelopment Analysis which was held September 4-6, 2023 at Surrey Business School, University of Surrey, Guildford, UK. It contains theoretical and empirical papers on Data Envelopment Analysis, DEA and related fields with a focus on performance measurement and management. It discusses the latest research and developments and their application in various areas such as regulation, agriculture, education, financial and health services. The book is of interest to both researchers and practitioners working on or utilizing the DEA method for examining efficiencies across various organizations. **Benchmarking with DEA, SFA, and R** Peter Bogetoft, Lars Otto, 2010-11-19 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

Data Envelopment Analysis William W. Cooper, Lawrence M. Seiford, Kaoru Tone, 2007-01-10 Data Envelopment Analysis A Comprehensive Text with Models Applications References And DEA Solver Software 2nd Edition is designed to provide a systematic introduction to DEA and its uses as a multifaceted tool for evaluating problems in a variety of contexts Each chapter accompanies its developments with simple numerical examples and discussions of actual applications Emphasis is placed on the use as well as an understanding of DEA and the topics in this book have been selected and treated accordingly The first nine chapters cover the basic principles of DEA and the final seven chapters are more advanced treatment of DEA These final chapters were completely revised into new chapters reflecting recent developments that greatly extend the power and scope of DEA and lead to new directions for research and DEA uses Together with the first ten chapters of the basic principles they will provide students and researchers with a solid understanding of the methodology its uses and its potential

Performance Measurement with Fuzzy Data Envelopment Analysis Ali Emrouznejad, Madjid Tavana, 2013-11-29 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

Decision Sciences Raghu Nandan Sengupta, Aparna Gupta, Joydeep Dutta, 2016-11-30 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

Mathematical Optimization and Economic Analysis Mikuláš Luptáčík, 2009-10-03 Mathematical Optimization and Economic Analysis is a self contained introduction to various optimization techniques used in economic modeling and analysis such as geometric linear and convex programming and data envelopment analysis Through a systematic approach this book demonstrates the usefulness of these mathematical tools in quantitative and qualitative economic analysis The book presents specific examples to demonstrate each technique s advantages and applicability as well as numerous applications of these techniques to industrial economics regulatory economics trade policy economic sustainability production planning and environmental policy Key Features include A detailed presentation of both single objective and multiobjective optimization An in depth exposition of various applied optimization problems Implementation of optimization tools to improve the accuracy of various economic models Extensive resources suggested for further reading This book is intended for graduate and postgraduate students studying quantitative economics as well as economics researchers and applied mathematicians Requirements include a basic knowledge of calculus and linear algebra and a familiarity with economic modeling *Keio Economic Studies* ,2002 *Advances in Efficiency and Productivity II* Juan Aparicio, C. A. Knox Lovell, Jesus T. Pastor, Joe Zhu, 2020-07-20 This book surveys the state of the art in efficiency and productivity analysis examining advances in the analytical foundations and empirical applications The analytical techniques developed in this book for efficiency provide alternative ways of defining optimum outcome sets typically as a technical production frontier or as an economic cost revenue or profit frontier and alternative ways of measuring efficiency relative to an appropriate frontier Simultaneously the analytical techniques developed for efficiency analysis extend directly to productivity analysis thereby providing alternative methods for estimating productivity levels and productivity change through time or productivity variation across producers This book includes chapters using data envelopment analysis DEA or stochastic frontier analysis SFA as quantitative

techniques capable of measuring efficiency and productivity Across the book s 15 chapters it broadly extends into popular application areas including agriculture banking and finance and municipal performance and relatively new application areas including corporate social responsibility the value of intangible assets land consolidation and the measurement of economic well being The chapters also cover topics such as permutation tests for production frontier shifts new indices of total factor productivity and also randomized controlled trials and production frontiers

Data Envelopment Analysis: Theory, Methodology, and Applications Abraham Charnes, William W. Cooper, Arie Y. Lewin, Lawrence M. Seiford, 1995-07-31 This book represents a milestone in the progression of Data Envelopment Analysis DEA It is the first reference text which includes a comprehensive review and comparative discussion of the basic DEA models The development is anchored in a unified mathematical and graphical treatment and includes the most important modeling extensions In addition this is the first book that addresses the actual process of conducting DEA analyses including combining DEA and 1 parametric techniques The book has three other distinctive features It traces the applications driven evolution and diffusion of DEA models and extensions across disciplinary boundaries It includes a comprehensive bibliography to serve as a source of references as well as a platform for further developments And finally the power of DEA analysis is demonstrated through fifteen novel applications which should serve as an inspiration for future applications and extensions of the methodology The origin of this book was a Conference on New Uses of DEA in 2 Management and Public Policy which was held at the IC Institute of the University of Texas at Austin on September 27 29 1989 The conference was made possible through NSF Grant SES 8722504 A Charnes and 2 W W Cooper co PIs and the support of the IC Institute

Handbook of Research Methods and Applications in Empirical Microeconomics Hashimzade, Nigar, Thornton, Michael A., 2021-11-18 Written in a comprehensive yet accessible style this Handbook introduces readers to a range of modern empirical methods with applications in microeconomics illustrating how to use two of the most popular software packages Stata and R in microeconomic applications

Data Envelopment Analysis Joe Zhu, 2015-03-18 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 F re Julie Harrison Raha Imanirad Andrew Johnson Chiang Kao Abolfazl Keshvari Timo Kuosmanen Sungmook Lim Wenbin Liu Dimitri Margaritis Reza Kazemi Martin Ole B Olesen Jesus T Pastor Niels Chr Petersen Victor V Podinovski Paul Rouse Antti Saastamoinen Bireesh K Sahoo

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The Enigmatic Realm of **New Efficiency Theory With Applications Of Data Envelopment Analysis**: Unleashing the Language is Inner Magic

In a fast-paced digital era where connections and knowledge intertwine, the enigmatic realm of language reveals its inherent magic. Its capacity to stir emotions, ignite contemplation, and catalyze profound transformations is nothing short of extraordinary. Within the captivating pages of **New Efficiency Theory With Applications Of Data Envelopment Analysis** a literary masterpiece penned by a renowned author, readers attempt a transformative journey, unlocking the secrets and untapped potential embedded within each word. In this evaluation, we shall explore the book's core themes, assess its distinct writing style, and delve into its lasting effect on the hearts and minds of those who partake in its reading experience.

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