Foreword

The book is an excellent exposition of the use of Data Envelopment Analysis (DEA) to generate data analytic insights to make evidence-based decisions, to improve productivity, and to manage cost-risk and benefit-opportunity in public and private sectors.

The design and the content of the book make it an up-to-date and timely reference for professionals, academics, students, and employees, in particular those involved in strategic and operational decision-making processes to evaluate and prioritize alternatives to boost productivity growth, to optimize the efficiency of resource utilization, and to maximize the effectiveness of outputs and impacts to stakeholders. It is concerned with the alleviation of world changes, including changing demographics, accelerating globalization, rising environmental concerns, evolving societal relationships, growing ethical and governance concern, expanding the impact of technology; some of these changes have impacted negatively the economic growth of private firms, governments, communities, and the whole society.

Recently, low performance growth, large income disparity, large unemployment rates among young generations with calls for more job creations, with a lot of shortage in skilled talents require new ways of innovation and thinking that can be smartly inspired from the cognition and excellent synergies that are found in nature. In parallel to the above changes, the world has witnessed evolution of independent new discoveries and advances in data science and technology ranging from descriptive, predictive, prescriptive analytics that are based on statistical, informational, decision making, technological, and managerial intelligent capitals. These independent and dis-integrated findings are rooted in basic engineering, humanity, management, medical, social sciences, and information and communication technologies; they need to be integrated within a cognitive analytical and management framework to generate insights and values in order to suggest new innovative improvements from best practices for a sustained productivity growth in shared values and an increased welfare of humanity in future.

The present book on strategic performance measurement and management using data envelopment provides an implementation roadmap with practical illustrations on how to integrate the dis-integrated findings in the literature into a unique SAMAS five-component framework: Shared values of stakeholders; cognitive Analytics; Mission; Activities; and Structures. SAMAS is a mission-driven framework to generate insights using the logic of data envelopment/frontier analysis and the recent advances in business and big data analytics. It can manage the performance of people, processes, and systems, and set targets, prioritize actions, and recommend development plans from the best practices that are captured and identified from internal/external benchmarks. It brings the scientific rigor and practical relevance in one manuscript to help organizations think smart and act fast for a greater success in the 21st century. It can help organizations uncover valuable insights into lifestyle choices, social determinants, and clinical factors, enabling holistic and individualized products and services while optimizing the outcome eftec-
tiveness and the input efficiency to improve the productivity efficiency of the transformation processes in government agencies, non-government agencies, and private organizations and firms. It is highly recommended for the development of cognitive managerial skills and future critical talent. Cognitive analytics success stories have already delivered effective increases in benefits and efficient reductions in costs to governments and firms. The main contribution of the book is to clarify the difference between the use of optimization for resource allocation, the use of efficient utilization of input resources, the effective valuation of the generated outputs, and impacts for a strategic planning and prioritization of initiatives. The book also covers approaches to the facilitation of the negotiation process involving multiple stakeholders, setting target improvements for the budget allocation of scarce resources and the development of corporate strategic plan.

The book includes six chapters on cognitive analytics and leadership by covering the foundations of the new cognitive concept, cognitive analytics; DEA valuation models and software; a DEA tutorial illustration of three strategic real-life cases; and coverage of the new advances in big data and business analytics; two chapters on negotiation and prioritization through DEA frontier analysis; six chapters on public sector applications; four on performance in the private sector; and a further four in the financial sector.

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Robert G. Dyson was initially a research mathematician and senior systems technologist at Pilkington Plc (1964-70). He joined the University of Warwick School of Industrial and Business Studies (now Warwick Business School) in 1970 as a lecturer. He served as Chairman of WBS from 1978 to 1981 and Dean from 1998 to 2000. He was a Visiting Fellow at Technische Hogeschool Twente, Enschede, in 1977, and Visiting Professor at the University of Texas, Austin, in 1982. He served as Pro-Vice Chancellor of the University from 1989 to 1995 and from 1999 to 2005. He was Chair of the Committee of Professors of Operational Research from 1995 to 1997 and President of the Operational Research Society in 1998 and 1999. He was elected a Companion of Operational Research in 2007 and served as Board Member of the Coventry Partnership from 1998 to 2005. He was Governor of Kenilworth School from 1989 to 1998, Chair of Governors from 1993 to 1997, and Chair of Trust from 2008 to 2012. He has been an Editor of the European Journal of Operational Research since 2006.