

CONVEGNO

TUTTO SOTTO CONTROLLO? Stato dell'arte e prospettive del controllo di gestione nel SSSR

Gli strumenti del Controllo di Gestione regionale: La Data Envelopment Analysis

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LA DATA ENVELOPMENT ANALYSIS

Strumento metodologico di misura dell'efficienza a supporto delle
decisioni aziendali



DEA Analysis: Caratteristiche Principali

- ❑ Non solo fornisce score di efficienza ma permette anche di capire quali sono le aree che generano il più alto livello di inefficienza
- ❑ Flessibilità (analisi su molteplici input e output; no assunzioni a priori tra la relazione input/output)
- ❑ Possibilità di analisi intertemporale: potere informativo sul trend di efficienza nel tempo (Malmquist Index)



L'implementazione della Data Envelopment Analysis nel SSR Veneto

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Public vs. Private in Hospital Efficiency: Exploring Determinants in a Competitive Environment

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ABSTRACT

This study investigates the determinants of efficiency in an Italian regional health system and estimates the effect exerted by ownership on hospitals' performance. To achieve this aim, the Veneto region was considered as a case study and a full dataset (2011–2012) containing nonpublicly available technical data and cost and income items was analyzed. Efficiencies are measured applying a three-stage data envelopment analysis (DEA). Our results suggest that private hospitals perform better than public hospitals in productivity and cost saving, not considering the effect of other environmental and operational variables such as length of stay and beds per capita.

KEYWORDS

Costs and income; efficiency; hospital; private ownership; three-stage DEA

Introduction

The global economic crisis has affected the budgets of public organizations. This issue has driven the research of new forms of monitoring and controlling focused on efficiency and effectiveness in the use of public resources (Rondeau & Wagar, 2003). As a result, recent years have seen growing attention paid to the financial equilibrium of the Italian National Health System (NHS) and the reduction of the average annual growth rate of total health expenditure per capita. Meanwhile, the sustainability of the Italian NHS over time depends primarily on how this containment of spending has been attained. This necessitates investigation of whether the attention of health policy and management decisions were focused primarily on the linear reduction of the consumption of the individual "input" of the health system (e.g., cost of personnel, procurement of goods and services) or on the efficiency and effectiveness of the system, encouraging the optimal use of "inputs" in relation to the outputs and outcomes of health services. The performance evaluation of hospitals is an extremely complex task because the analysis of efficiency is only one of the dimensions to be considered for a complete performance evaluation of hospitals (Eddy, 1998; McIntyre, Rogers, & Heier, 2001).

In the past four decades, the Italian NHS has undergone many reforms (Cellini, Pignataro, & Rizzo, 2000). Today, it is facing increasing problems of sustainability due to a reduction of funding sources, the persistent period of economic crisis, an increased demand for care, and a growth in life expectancy. Consequently, regional

planning shows the need for instruments of government spending that focus on the economic sustainability of the system through the appropriate use of available resources (Veneto Region, 2012). Assessing efficiency is increasingly a fundamental step in assessing the proper functioning of hospitals.

The Italian NHS involved three decision makers: the central government, the regional governments, and the local health units (De Nicola, Gitto, & Mancuso, 2011). Regional governments are responsible for and make autonomous decisions in relation to legislative and administrative health functions, planning health-care activities, organizing supply according to population needs, and monitoring the quality, appropriateness, and efficiency of health services. Accordingly, regional governments have the authority to increase taxes to provide additional health services defined as essential health care services—referred to in Italian as *Livelli Essenziali di Assistenza* (LEA)—and can modify national tariffs because of each regional health context (De Nicola et al., 2011). Consequently, the Italian NHS is characterized by a number of health-care systems that differ from region to region. Therefore, the technical efficiency of Italian hospitals seems to be related to differences in regional characteristics (Schiavone, 2008). In Italy, the law established that health-care services could be supplied by public, private for-profit, and private not-for-profit organizations to enhance competition and improve efficiency in the provision of services (Barbetta, Turati, & Zago, 2007; Cellini et al., 2000). Despite the numerous studies on

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RESEARCH

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Inefficiency of public hospitals: a multistage data envelopment analysis in an Italian region

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Abstract

Background: The objective of this study was to assess public hospital efficiency, including quality outputs, inefficiency determinants, and changes to efficiency over time, in an Italian region. To achieve this aim, the study used secondary data from the Veneto region for the years 2018 and 2019.

Methods: A nonparametric approach—that is, multistage data envelopment analysis (DEA)—was applied to a sample of 43 hospitals. We identified three categories of input: capital investments (Beds), labor (FTE), operating expenses. We selected five efficiency outputs (outpatient visits, inpatients, outpatient visit revenue, inpatient revenue, bed occupancy rate) and two quality outputs (mortality rate and inappropriate admission rate). Efficiency scores were estimated and decomposed into two components. Slack analysis was then conducted. Further, DEA efficiency scores were regressed on internal and external variables using a Tobit model. Finally, the Malmquist Productivity Index was applied.

Results: On average, the hospitals in the Veneto region operated at more than 95% efficiency. Technical and scale inefficiencies often occurred jointly, with 77% of inefficient hospitals needing a downsizing strategy to gain efficiency. The inputs identified as needing significant reductions were full-time employee (FTE) administrative staff and technicians. The size of the hospital in relation to the size of the population served and the length of patient stay were important factors for the efficiency score. The major cause of decreased efficiency over time was technical change (0.908) rather than efficiency change (0.974).

Conclusions: The study reveals improvements that should be made from both the policy and managerial perspectives. Hospital size is an important feature of inefficiency. On average, the results show that it is advisable for hospitals to reorganize nonmedical staff to enhance efficiency. Further, increasing technology investment could enable higher efficiency levels.

Keywords: Data envelopment analysis, Efficiency, Quality, Public hospitals, Tobit, Malmquist productivity index

Background

The recent global economic crisis has influenced the budgets of public organizations, including those of public hospitals and national health systems in general. According to the World Health Organization, for high-income and upper-middle-income countries, such as Italy, the main challenge relating to the provision of health services

is to continue improving efficiency, quality, and equity [1]. Moreover, within the evolving social and economic environment, budget constraints have prompted a search for new ways of monitoring and controlling organizational finances that focus on the efficient and effective use of public resources [2]. Monitoring the performance of healthcare providers is a relevant issue worldwide, particularly in contexts such as hospitals given their significant effect on population health and the economy. The main problem facing hospitals has been inefficient use of existing resources rather than a lack of resources

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ANALISI DELL'EFFICIENZA TECNICA DEI LABORATORI CLINICI NELLA REGIONE VENETO MEDIANTE DATA ENVELOPMENT ANALYSIS

Luca Piubello Orsini, Gianluca Maistri

Costi di Presidio

Modello ministeriale CP

anno 2019



UOC Controllo di gestione
ed adempimenti LEA

Efficienza dei Laboratori Clinici Pubblici in Veneto



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**ANALISI DELL'EFFICIENZA TECNICA DEI LABORATORI
CLINICI NELLA REGIONE VENETO MEDIANTE DATA
ENVELOPMENT ANALYSIS**

Luca Piubello Orsini, Gianluca Maistri

- ❑ Obiettivo: indagare **l'efficienza tecnica** dei laboratori clinici in Veneto e l'andamento dal 2017 al 2021 (analisi impatto Covid)
- ❑ 42 laboratori clinici negli ospedali pubblici in Veneto
- ❑ Metodologia: Data Envelopment Analysis e Malmquist Index



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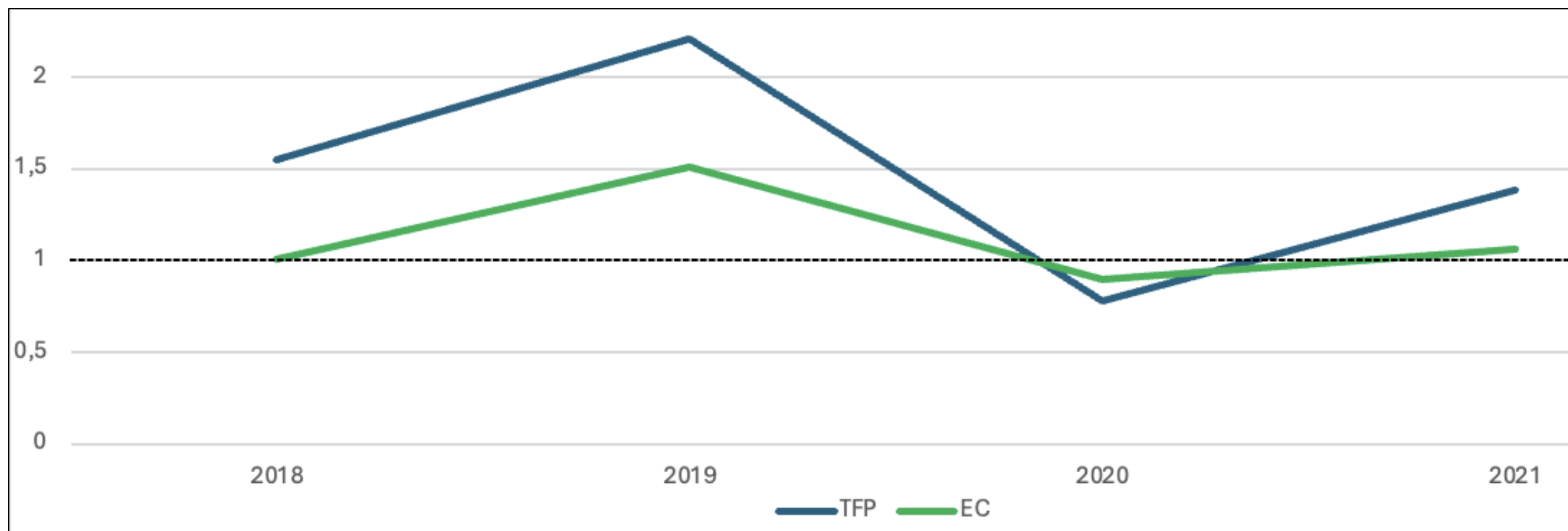
Efficienza tecnica: L'individuazione degli input e degli output

INPUT	OUTPUT
COSTI OPERATIVI	NUMERO PRESTAZIONI ESTERNE
AMMORTAMENTI E CANONI	RICAVI PRESTAZIONI ESTERNE
FTE MEDICI	NUMERO PRESTAZIONI INTERNE
FTE INFERMIERI E OSS	RICAVI PRESTAZIONI INTERNE
FTE TECNICI	NUMERO PRESTAZIONI PRONTO SOCCORSO
FTE AMMINISTRATIVI	RICAVI PRESTAZIONI PRONTO SOCCORSO



Trend di efficienza tecnica a livello regionale (2017-2021)

Malmquist Index based on DEA Regione Veneto



Ulteriori sviluppi



Sistemi sanitari generano circa il 5% delle emissioni di gas serra (HCWH, 2021):

- ❑ Antinomia del settore sanitario: perseguimento della tutela della salute VS
impatto negativo sull'ambiente
- ❑ DEA: Possibilità di valutare l'efficienza considerando anche output relativi
all'impatto ambientale (ad esempio Co2e, kg rifiuti generati ...)



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A cura di

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