

Abstract

Estimation of Efficiency and Productivity of General Hospitals of Kerman University of Medical Sciences, ۲۰۰۷-۲۰۱۱

Introduction: Hospitals are considered as one of the most expensive health care organizations, so the optimal use of resources available in these units is particularly important. The aim of this study was to estimate the efficiency and productivity of general hospitals of Kerman University of Medical Sciences, using different models; from the most common to the newest models.

Methods: This study is a descriptive - analytical and applied. In this study, the efficiency and productivity of ۱۰ hospitals of Kerman University of Medical Sciences were analyzed during the years ۲۰۰۷ to ۲۰۱۱. The models used in this study consisted of nonparametric models including DEA, FDH, order m, order alpha, and also includes a parametric model of SFA. Also to estimate changes in hospital productivity; the Malmquist index is used. In addition, for ranking the hospitals in terms of efficiency; the Bootstrap resampling technique is used. According to studies, the number of **inpatient bed count**, medical staff, nursing staff and other personnels were used as inputs and the **bed occupancy day**, average length of stay and numbers of outpatient admissions have been selected as outputs.

Results:

The average technical efficiency of hospitals in the data analysis method with the assumption of variable returns to scale is ۰.۸۳۱; On the other hand, relying on the results of the model, potential to raise efficiency in hospitals without any increase in costs and applying the same amount of inputs is about ۰.۱۶۹ percent. Based on SFA method, the average performance of hospitals was ۰.۶۴۸. Hence it can be concluded that the capacity of improve performance in these hospitals (compared to the most efficient hospitals in the study population) is increasing to ۰.۳۵۲ percentage. Efficiency estimates obtained from various nonparametric estimators, have provided different results of hospital's efficiency. Hyperbolic efficiency DEA approach is ۱.۰۹۳, which represents that hospitals simultaneously could reduce their inputs and outputs about ۹%. Based on input- oriented order-m approach, the efficiency was ۰.۹۹, which indicates that sample hospitals must be reduce their inputs about ۱% and based on output- oriented order-m approach,

the efficiency was 1; shows that sample hospitals must be using their inputs without any change in their output levels.

Other new nonparametric methods are also indicate inefficiency in the period of study . Average Malmquist productivity of hospitals was 1.008 respectively. Thus , hospitals have been accompanied by reducing in productivity and this was 0.8 percent. Average technical efficiency changes as a component of total productivity was 0.979, and technological change as an other component of productivity was 1.029.

Average of pure technical efficiency was 0.99 and , average of scale efficiency was 0.99 and 0.99 , respectively.

Conclusion: In average, the hospitals of Kerman University of Medical Sciences were inefficient and the productivity growth was negative over the half of study period. Among the components of productivity, technological change always has been a negative impact on productivity and has a major role in reducing the productivity in this period. **Elasticity of production factors** demonstrated additional factors and show that the production has been done in third area. The marginal product in this area is negative and total production have to be reduced despite the increase in inputs. This study showed that nonparametric methods for estimating efficiency, are not significantly different from each other and almost presented similar results.

Keywords:

hospital, efficiency, productivity, kerman



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A Thesis
Presented to
The Graduate Studies

By

Elham haghghat fard

A Thesis Presented
to the Degree of M.Sc in:

Health Economics

Kerman University of Medical Sciences

FEB ۱۳۹۹