HEALTH AND HUMAN SCIENCES

Quality-Adjusted Efficiency Analysis of U.S. Hospitals

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More than half a trillion dollars are spent each year in the U.S. hospital industry, which alone would rank as the 20th largest economy in the world. Despite widespread recognition that inefficiencies exist, there is little recent evidence from an industry-wide perspective to speak to the amounts and trends in inefficiency, or the associations of endogenous or exogenous hospital contextual factors, such as quality. In this study, we constructed a crosswalk between the Agency for Healthcare Research and Quality's (AHRQ) Healthcare Cost and Utilization Project (HCUP) Nationwide Inpatient Sample (NIS) and the Centers for Medicare and Medicaid Services' (CMS) Healthcare Cost Report Information System (HCRIS) for the years 2002–2009, consisting of approximately 600 hospitals per year, which represent more than 10% of the firms in the industry. Our model captures inputs (labor, beds, and other direct medical costs), outputs (inpatient days and number of procedures), patient severity, and

quality to measure the efficiency of hospitals, and we utilized a variety of methods, including parametric (stochastic frontier analysis) and nonparametric (data envelopment analysis) estimators. Our results showed that the mean efficiency score of the U.S. hospital industry is in an inclusive range of 0.63 to 0.72, which implies the existence of 28% to 37% inefficiency in the industry. As for the contextual factors, we found that ownership structure, location, and qualified organ transplant center status are significantly related to the efficiency of the hospital. Our results can be used to construct strategies and policies at the firm and industry level to promote efficiency while adjusting for the context and quality of hospital production.

Research advisor Brandon Pope writes, "Xin's project studying hospital services production is important because U.S. hospitals have historically operated under weak incentives for efficiency, and current measures of efficiency do not account for quality. Her findings speak to the extent of quality-adjusted inefficiency and hint at its sources from uncertain demand, policies, operational practices, and environment."

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