

# Market restructuring and pricing in the hospital industry

Ranjani Krishnan\*

*Eli Broad School of Business, Michigan State University,  
N251 North Business Complex, East Lansing, MI 48824, USA*

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## Abstract

This paper examines the diagnosis related group-level (DRG) price effects of recent hospital mergers and acquisitions that occurred in Ohio and California. Empirical results indicate that hospital mergers and acquisitions increase prices at the DRG level. Further, price increases are greater in DRGs where the merging hospitals gained substantial market share compared to DRGs where the merging hospitals did not gain significant market share. These results suggest that DRG specific market share plays an important role in a hospital's post-merger pricing strategy. © 2001 Elsevier Science B.V. All rights reserved.

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## 1. Introduction

Regulators are often concerned that merger related increases in market power can adversely affect consumers through higher prices, while merging firms usually claim that efficiency gains and cost reductions from the merger will lead to lower prices. The price effects of mergers are of great current relevance in the US hospital industry. In response to changes in the Medicare reimbursement system, the rise of managed care, and declining patient reimbursements, the hospital industry has undergone significant restructuring in recent years. Over 45% of the US hospitals have been involved in mergers, acquisitions, and joint ventures since 1990 (Jaspens, 1998).

Many of the recent horizontal within-market hospital mergers and acquisitions have caused large increases in the market share of the merging hospitals. For example, two merg-

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\* Tel.: +1-517-353-4687; fax: +1-517-432-1101.  
*E-mail address:* krishn15@pilot.msu.edu (R. Krishnan).

ers in Cincinnati in 1994 caused the Herfindahl–Hirschman index<sup>1</sup> (HHI) in the Cincinnati market to increase from 1238 in 1993 to 2102 in 1995. Similarly, mergers and acquisitions in the Pittsburgh market caused the Pittsburgh HHI to increase from 763 in 1990 to 3506 in 1998. As per the 1992 Horizontal Merger Guidelines issued by the Department of Justice (DOJ) and the Federal Trade Commission (FTC), the above examples represent large increases in market concentration (Bazzoli et al., 1995). This study examines the price effects of recent hospital mergers and acquisitions.

In addition to local within-market mergers, several across-market acquisitions have also occurred. Across-market integration is the merger of two or more firms producing the same product in different markets, as in the case of regional or national hospital chains and networks<sup>2</sup> (Snail and Robinson, 1998). Prior studies have not examined the price effects of across-market acquisitions separately from within-market mergers.

This study examines price effects of hospital mergers and acquisitions at the level of the individual diagnosis related group (DRG).<sup>3</sup> Data from mergers and acquisitions that occurred in the states of Ohio and California during the period 1994–1995 are used to analyze the post-merger price changes for individual DRGs within hospitals. For the Ohio within-market mergers, three different types of analyses are conducted. First, the change in prices for DRGs where the merging hospitals gained substantial market share from the merger is compared to the change in prices for DRGs where the merging hospitals did not gain substantial market share.<sup>4</sup> Second, the change in prices for merging hospitals in DRGs where they gained substantial market share from the merger is compared to the change in prices for an identical set of matched DRGs from a non-merging hospital located in the same hospital market. Third, the change in prices for merging hospitals for high-volume DRGs is compared to the change in prices for all non-merging hospitals for the same DRGs. For the California across-market acquisitions, the changes in prices of high-volume DRGs for acquired hospitals are compared with the changes in prices for hospitals which were not acquired.

The general finding from this study is that hospital mergers and acquisitions result in increased prices at the DRG level. These results were found at all the levels of analyses and indicate that merging and acquired hospitals increased prices for all DRGs to a greater extent than non-merging hospitals. The results also indicate that price increases were greater in DRGs where the hospital gained substantial market share suggesting that DRG-specific market-share has an important role in a hospital's post-merger pricing strategy.

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<sup>1</sup> The Herfindahl–Hirschman index (HHI) is frequently used to measure market concentration and is defined as the sum of squares of the market shares (measured as percentages) of all the firms operating in the market (Martin, 1994). Higher HHI implies lower competition.

<sup>2</sup> Examples of such acquisitions include the 1994 Columbia–HCA acquisition of Memorial Medical Center of Jacksonville, Tenet acquisition of the 357 bed North Shore Medical Center in Miami (1995), and the 1996 Columbia–HCA acquisition of the Good Samaritan Health system (four hospitals with a total of 815 beds) in San Jose. None of these across-market acquisitions altered local market concentration ratios.

<sup>3</sup> DRGs are a set of case types established under the Medicare Prospective Payment System (PPS) identifying patients with similar conditions and processes of care. There are currently 495 DRGs in Medicare's PPS (Folland et al., 1997).

<sup>4</sup> California hospitals are not used in the within-market analysis because the consolidation activity was primarily in the form of across-market acquisitions, which do not affect *local* market concentration ratios.

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