

ECON 470: Preliminary Analysis

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What is the effect of hospital profit status on hospital prices?

I. Motivation

Healthcare costs are a significant burden on individuals and families, and hospital prices are a major contributor to these costs. Understanding the factors that influence hospital prices can help policymakers develop strategies to contain costs and improve access to care. Whether a hospital's profit status affects its prices has been researched prior, with mixed results, and further investigation into this relationship is an important topic to consider in today's healthcare landscape. Non-profit hospitals are healthcare facilities that operate under a not-for-profit or tax-exempt status. These hospitals are typically organized as charitable organizations, providing affordable and accessible healthcare services to the community. Non-profit hospital profits are reinvested into the hospital or its community benefit programs, rather than being distributed to shareholders or investors. For-profit hospitals, conversely, operate as a business with the goal of generating profits for their owners/shareholders. These hospitals are typically owned by private companies or investor groups, practice profit maximization, and use technological investments to attract patients.

Hospital pricing is a complex issue, and there is a lack of transparency in the pricing practices of many hospitals. By studying the relationship between hospital profit status and prices, we can gain a better understanding of how hospitals set prices and whether there are disparities in pricing between for-profit and non-profit hospitals. Additionally, an increasing number of hospitals have converted from non-profit to for-profit entities in the past 10 years, and it is crucial to understand the implications of this trend on healthcare prices and accessibility. Researchers found that the converted hospitals improved their financial income-revenue margins after holding the for-profit title (Joynt, et al., 2014). This follows concerns that for-profit hospitals have higher prices for services to maximize profits while not improving patient care outcomes. High hospital prices can have significant effects, such as rising healthcare spending and reduced accessibility to healthcare services.

In order to address the issue of hospital price discrepancies and simultaneously ensure that non-profit hospitals use appropriate practices, policymakers could implement increased transparency and accountability as a potential solution. Non-profit hospitals should be required to disclose more information about their operational costs, such as compensation, the cost of services, and the amount of charity care provided. This would allow the public to better evaluate whether Non-profit hospitals are fulfilling their community benefit obligations. Under audits, if non-profit hospitals fail to meet their community benefit obligations, they could lose their tax-exempt status. Moreover, increasing transparency and accountability could also help to reduce price differences between for-profit and non-profit hospitals. By making hospital prices more transparent and easily accessible to the public, it could increase competition and put pressure on hospitals to lower their prices to remain competitive. By implementing these policy solutions, policymakers and healthcare professionals can develop effective strategies to address hospital price discrepancies between hospitals of different profit statuses, and ensure equitable access to healthcare services.

II. Data

To address this question, I used data from the Healthcare Cost Report Information System (HCRIS) combined with data from the Centers for Medicare & Medicaid Services (CMS) Provider of Services (POS) files. The HCRIS is a database maintained by the CMS in the United States, and contains financial and operational information on healthcare providers who participate in Medicare, Medicaid, and other CMS programs. The information in HCRIS comes from annual cost reports submitted by healthcare providers to the CMS. In the HCRIS data, I used its information on hospital providers' total beds, total charges, total operating expenses, in-patient charges, ICU charges, and ancillary charges. The POS files contain information on healthcare providers who participate in Medicare and Medicaid programs, including hospitals, skilled nursing facilities, home health agencies, and hospices. The files also provide information on their type of ownership, including the following: Non-profit Church, Non-profit Private, Non-profit Other, Profit, and Physician Owned. In these initial data sources, I selected data from all years available.

From these raw sources, I cleaned each individual dataset of duplicate reports, blank values, and negative values, only selecting for providers classified as hospitals, and only selecting for providers with non-profit and for-profit ownership types (mentioned above). I merged the HCRIS and POS datasets by the providers' National Provider Identifier number and year to create the final dataset. I added a "price" column to this dataset, using the following equation:

$$\text{price} = ((\text{ip_charges} + \text{icu_charges} + \text{ancillary_charges}) * (1 - \text{tot_discounts}/\text{tot_charges}) - \text{tot_mcare_payment}) / (\text{tot_discharges} - \text{mcare_discharges})$$

The equation was found in the class website, M1.1: HCRIS Data under presentation slide "Estimating Hospital Prices". These steps provided me with a dataset of U.S hospitals from 1997-2018 I could group by Non-Profit (non-profit church, non-profit private, non-profit other) and For-Profit (profit, physician owned) status, and compare their average price.

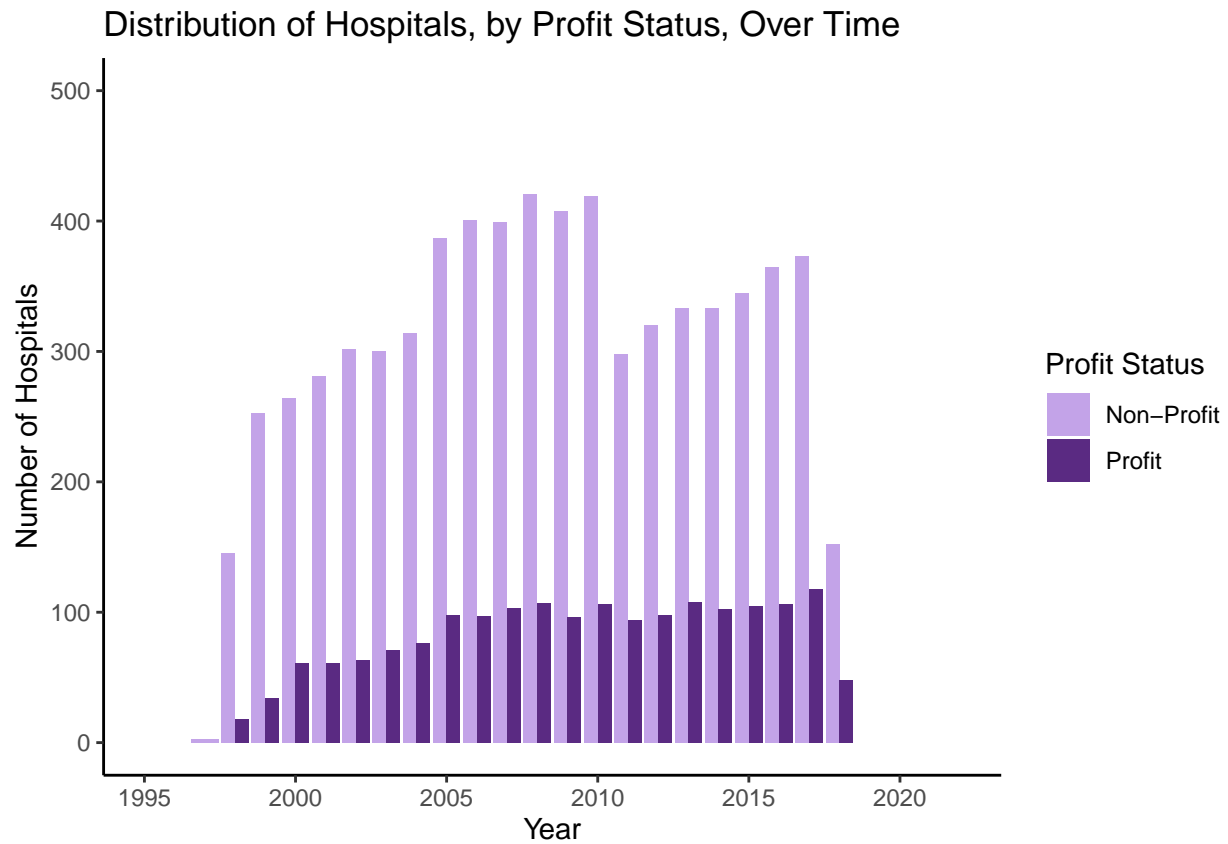


Figure 1: Distribution of Hospitals, by Profit Status, Over Time

Figure 1 demonstrates the increasing trend of hospitals being classified as for-profit entities. This trend has been observed over the past few decades, with more and more hospitals converting from non-profit to for-profit status. This is relevant as literature explains for-profit titles are increasingly popular as these hospitals tend to charge higher prices for their services.



Figure 2: Hospital Prices by Profit Status

Figure 2 compares the distribution of hospital prices between for-profit and non-profit hospitals. This can provide a clearer picture of the differences in price distribution between the two groups, as the mean price seems similar yet the non-profit hospitals appear to have a greater price range, with outliers approaching 80,000 USD for an average hospital price.

Table 1. Average Price, Beds, and Operating Expenses by Hospital Profit Status

Profit Status	Price	Beds	Operating Expense
Non-Profit	8458	264	211007365
Profit	9812	218	124796095

Table 1 compares average hospital price, number of beds, and total operating expense between hospitals of different profit statuses. This comparison was intended to help identify other factors that may be driving the price differences between for-profit and non-profit hospitals. While it appears that non-profit hospitals have, on average, 1.69x higher total operating expenses, their average prices are lower than those of for-profit hospitals.

Table 2. Average Hospital Price by Ownership Type

	Hospital Type	Price
Non-Profit Church	01	8427.87
Non-Profit Private	02	8620.66
Non-Profit Other	03	8176.40
For-Profit	04	9813.19
For-Profit Physician-Owned	09	9463.48

Table 2 compares the average hospital price by the ungrouped Non-Profit and For-Profit hospitals investigated. It demonstrates if different types of hospital ownerships were more of the driving force of price differences among the grouped price averages. The highest price discrepancy found was between the Non-Profit Other and For-Profit Physician-Owned hospitals.

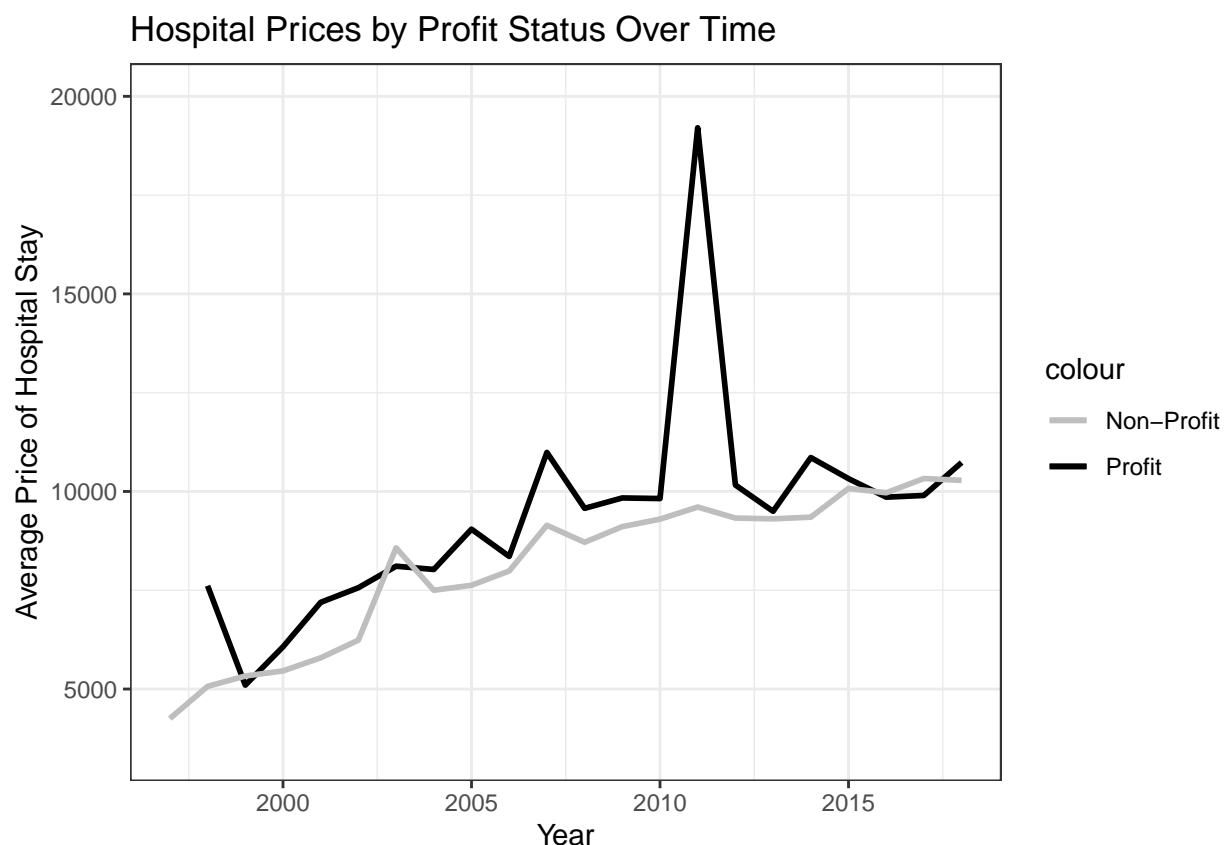


Figure 3: Hospital Prices by Profit Status, Over Time

Figure 3, as a time series line chart, shows the trends in hospital prices between 1997-2018, with separate lines for for-profit and non-profit hospitals. This can help identify if the price differences between the two groups are increasing, decreasing, or staying constant over time. While both Non-Profit and Profit prices increased over time, there was a spike in the profit hospital groups' average price in 2011.

Table 3. Proportion of Service Charges and Operating Expenses Relative to Total Charges

Profit Status	In Patient	ICU	Ancillary	Operating Expenses
Non-Profit	0.12	0.05	0.37	0.33
Profit	0.09	0.04	0.47	0.22

Table 3 shows the breakdown of hospital charges by type of service (inpatient, ICU, ancillary) and operating expenses, relative to total charges. These proportions can help provide some insight into the nature of a hospital's patient population and the complexity of the care provided. Non-Profit hospitals seem to have a greater emphasis on operating expenses, while for-profit hospitals have a higher percent of their total charges come from ancillary care.