

THE PERFORMANCE AND VALUE IMPLICATIONS OF LEVERAGED BUYOUTS IN THE
HEALTHCARE INDUSTRY

by

Jake Mayock

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Project Approved:

Supervising Professor: Swaminathan Kalpathy, Ph.D.

Department of Finance

Associate Professor: William Cron, Ph.D.

Department of Marketing

ABSTRACT

Over the past few years, the healthcare industry has been facing consumer and political pressures to decrease overall healthcare system costs and to increase the quality of care provided. New reimbursement policy changes by the Centers for Medicare and Medicaid Services reward hospitals that are able to decrease costs while increasing quality, and punish those that are unable to do the same. This reimbursement change-up has led to increased M&A activity, and created a hot-spot for middle market private equity firms. The focus of this paper is to examine the role of private equity firms within the hospital industry and their ability to contribute to an increase in quality of care for specific healthcare providers. This research aims to answer the question of whether or not private equity firms can create value beyond standard financial measures, and increase value for their investors without compromising on the value for healthcare consumers.

Table of Contents

Introduction	5
Literature Review	8
Relevant Trends in the Hospital Industry.....	9
Capital Expenditures in Private Equity Sponsored Businesses	9
Debt Effects on Capital Expenditures in the Hospital Sector.....	10
Reevaluating Capital Structure for Private Equity Backed Hospitals	12
The Operational Impact of Private Equity Sponsors.....	13
The Impact of HCA’s 2006 Leveraged Buyout on Hospital Performance	14
A Brief Conclusion on Literature	16
Data Collection Process.....	17
Data Limitations	18
Results.....	20
HCAHPS Patient Survey	20
30-Day Mortality Rates	21
30-Day Readmission Measures.....	23
Discussion.....	24
Discussion on Limitations.....	25
Further Research and Studies	26
Implications to Private Equity and Healthcare	26

Introduction

Over the past four years, the global trend of consolidation through mergers and acquisitions (M&A) has led to a significant growth in the healthcare industry. For the period 2012-2015, global deal volume in the healthcare industry grew at twice the volume of the overall market with a compounded annual growth rate (CAGR) of 50% versus 24% for the overall market (Bain Report 2016). This trend of consolidation in the industry has largely been driven by the aging demographics of various countries as well as the increase in need for healthcare in developing nations. Additionally, the industry is facing significant pressure to lower overall healthcare costs. This has led to increased consolidation in the industry with an aim towards cost reductions associated with the realization of strategic synergies.

While the majority of M&A transactions in the healthcare industry have been consummated by large corporations for reasons discussed above, the industry has been a hot-spot for private equity (PE) investments. Private equity in the healthcare industry has represented an average of 10% of global buyout deal volume over the past five years (Bain Report 2016). PE has focused on the healthcare industry over the past several years given the opportunities that the industry provides PE firms to generate significant value for its investors. As large corporations in the healthcare industry have continued to consolidate operations over the past few years, the overall market has become fragmented, creating opportunities for middle-market businesses to increase growth in certain markets. Private equity shops primarily operate in the middle-market and consummate buyout transactions through leveraged buyout (LBO) models. An LBO is characterized by acquiring a significant ownership stake in a company with the use of high levels of debt. The cash flows generated after the LBO transaction are used

to repay the debt, therefore significantly increasing investment returns for the PE investors given the relative low levels of equity used to finance the LBO.

The objective of this paper is to determine the impact that leveraged buyouts have on healthcare providers in regards to the quality of care received. There is limited research on this topic as performance metrics are rarely made publicly available once a business is taken private. Even among those transactions for which financial data is available after the transaction, there are selection bias issues involved because only private firms with publicly traded bonds are required to disclose financial statements publicly (Bernstein and Sheen 2014).

Fortunately, within the healthcare industry, Medicare and Medicaid require various hospital level data to be publicly reported. The Centers for Medicare & Medicaid Services provide various data metrics that allow for the comparison of the quality of care for over 4,000 Medicare-certified hospitals globally. Therefore, this research focuses specifically on the hospital segment of the healthcare industry and analyzes the various quality of care metrics provided by Medicare to determine the value implications on hospitals after the LBO transactions. In collecting this data, the first step is to identify a list of hospitals that have undergone an LBO. Medicare data, pre-LBO and post-LBO, is then collected from public records in order to compare the reported metrics before and after the transaction. The quality of care data analyzed includes:

- Patient Survey (HCAHPS): A list of hospital ratings from the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS). HCAHPS is a national, standardized survey of hospital patients about their experiences during a recent inpatient hospital stay. For the purpose of this research, we focus specifically on the

“Overall Hospital Rating – Star Rating” measurement. From this data, we are able to determine the percentages of people that rated the hospital either zero through six, seven through eight, and nine through ten to assess how overall hospital quality is perceived by patients prior to and after an LBO.

- 30-Day Readmission Rates: A measure that tracks the percentage of patients that are readmitted to the hospital within 30-days of discharge. These patients have undergone an episode of heart attack, pneumonia, or heart failure. This measure provides insights on the hospital’s ability to increase quality. We hypothesize that an increase in the quality of care will result in lower readmission rates. In addition to quality of care, this measure provides evidence of a provider’s ability to decrease costs, as readmission rates are a direct cost driver.
- 30-Day Death Rates: A measure that tracks the percentage of patients who die within 30-days of experiencing an episode of heart attack, pneumonia, or heart failure. Similar to the readmission measure, this data is used to determine quality of care improvements prior to and after a leveraged buyout.

The primary goal of an LBO is to increase investment returns for the purchasing company through the use of financial leverage as well as operational improvements. But the concern is whether the LBO induces myopia. Actions that are undertaken for short-term benefits could be associated with adverse consequences in the long-term. Hospitals are in the business of improving people’s health and saving lives which goes presumably at odds with the short-term focus associated with LBO transactions. Therefore, the goal of this paper is to

determine whether an LBO strategy can provide positive value beyond a financial standpoint, and create value for patients via an increase in the standard of care as well as by delivering care at lower costs.

Literature Review

This section of my paper will include a review of literature with a focus on:

- The current trends within the hospital industry
- The financial constraints that leveraged buyouts impose on hospitals
- The operational impact private equity firms have on their portfolio companies
- Various operational analyses gathered from the HCA hospital systems LBO in 2006

The goal of this literature review is first to gain an understanding of how various industry trends are changing the operational focus of individual hospitals and overall healthcare systems. The second focus is on the financial implications of leveraged buyouts, to determine how capital structure decisions could play a role in a hospital's quality of care. Beyond the financial impact, it is important to assess the managerial and operational impact private equity sponsors have on value and quality. Lastly, this review will look at various conclusions that were drawn from Hospital Corporations of America's leveraged buyout in 2006.

Relevant Trends in the Hospital Industry

In 2013, the Centers for Medicare and Medicaid Services implemented a new reimbursement system for hospitals. While hospitals had previously been incentivized to provide more services for patients, new CMS research suggests that increased service offerings led to higher costs with no guarantee of improved patient outcomes. This led to the new hospital reimbursement system, known as the Hospital Value Based Purchasing Program (VBP). The VBP program primarily rewards hospital for the quality of care they provide to patients, rather than for the quantity of services. Additionally, it rewards hospitals that most closely follow the defined best clinical practices, and those that are able to best enhance the experience for patients that are admitted to hospitals. Each individual hospital is given an outcome score that affects the rate of reimbursement. Effective starting in 2017, a weight of 25% will be placed on “Efficiency and Cost Reduction,” based off of a measure of each hospital’s Medicare Spending per Beneficiary (MSPB, or simply, cost per patient) (CMS.gov).

Hospitals that are able to reduce healthcare costs per patient are rewarded twofold: through increased profit due to the cost and profit relationship, and through increased reimbursement rates, resulting in increased revenue per patient. Moreover, hospitals are equally rewarded through their ability to increase their quality of care provided.

Capital Expenditures in Private Equity Sponsored Businesses

I identify two separate types of capital expenditures: growth expenditures and maintenance expenditures. Growth expenditures are defined as capital expenditures which are used for the purpose of growing a company’s sales and operational capabilities. Maintenance expenditures are capital expenditures which are required on a timely basis in order to maintain

current levels of operations or services. If we look at a manufacturing firm, expenditures on new machines for the purpose of increasing capacity would be considered as growth expenditures. If a machine has a useful life of ten years and then needs replacement, the replacement of that machine after ten years would be considered a maintenance capital expenditure.

Private equity sponsors typically view companies that have high maintenance capital expenditure requirements unfavorably, as they restrict free cash flows, and decrease the value of a business. Private equity firms are more likely to invest in growth capital expenditures to accelerate the sales growth of a business. This is supported by a study of twenty manufacturing businesses and thirty three non-manufacturing firms, all financed with private equity. The study concluded that capital spending grew by an average of 14.6% per-year, compared to 3.5% for non-private-equity backed firms. Consistent with an increased level of capital spending, was an increase in sales growth of 10.8% for the sample companies compared to a national average of 6.1% (Shapiro & Pham 2008). Thus, I infer that these private equity-backed firms had significantly increased their investments in growth capital spending for the purpose of accelerating sales growth.

Debt Effects on Capital Expenditures in the Hospital Sector

The large amounts of debt taken on during leveraged buyouts result in debt-service payments which restrict free cash flows and a company's ability to invest in capital expenditures. A study by the Healthcare Financial Management Associates in 2009 found that hospitals spend, on average, 63.4% of their free cash flows on capital expenditures (HFMA

2009). A survey by Health Capital Consultants found that 52% of hospital's capital allocation goes toward improving the quality of care, with another 34% going towards equipment replacement necessities (Burt & Voss 2012). Given the necessity of free cash flows for the purpose of quality of care improvements, the reduction of free cash flows could result in a negative impact on a hospital's quality of care.

This data has several negative implications for private equity-backed hospitals. With current hospital trends favoring providers who can simultaneously decrease costs while increasing quality of care, private equity sponsors and hospital management face a tradeoff between leverage and quality of care improvement. The higher the leverage in a buyout scenario, the greater the returns for the sponsor. But leverage inherently increases the risk-profile of a business through the limitations it places on free cash flows. In a hospital setting, where more than half of a hospital's free cash flow is used to increase the quality of care, there is very little cash flow left to service debt payments. Therefore the result of high leverage is a decrease in free cash flows that could be spent on fixed assets, which I hypothesize will lead to a decrease in the quality of care. Additionally, many lenders restrict capital expenditures of the borrower through financial covenants as a method of reducing investment risk, which could further impact a hospital's ability to increase its quality of care. Given these arguments, it is important to test whether leveraged buyouts lead to a reduction in value for healthcare consumers. The next section will focus on the implications that the debt-free cash flow relationship has on capital spending strategies, given the new Value Based Purchasing Program.

Reevaluating Capital Structure for Private Equity Backed Hospitals

While private equity sponsorship, in most cases, leads to increased capital expenditures, I do not hypothesize that these findings are transmittable to private equity backed hospitals. As discussed earlier, hospitals spend on average 34% of their free cash flows on equipment replacement. For the purposes of this research, I classify this as maintenance capital spending as equipment replacement, while it may increase quality of care, does not increase hospital capacity or their ability to incrementally increase sales. Because of this relationship, private equity sponsors are adversely incentivized to replace equipment as it decreases firm value. Equipment replacement lowers free cash flow, and does not increase revenue capacity nor accelerate revenue generation, therefore resulting in the loss of value, and a further restriction of free cash flows to meet debt service payments. HCA's significantly lower expenditures in fixed assets throughout their leveraged buyout period supports the notion that private equity firms in the hospital sector are dissuaded from investing in fixed assets, although private equity firms on average do increase capital spending.

Given the new VBP Program, hospitals have been forced to reconsider their capital allocation strategies. According to Warren Forgey, the CFO of Schneck Medical Center, many hospital systems are backing away from growth capital spending on more patient beds, and instead investing their capital in data analytics and "the basics" of providing quality care (Banham 2014). The new reimbursement program has forced hospitals to focus on quality of care and cost of care improvements, rather than growth strategies.

I identify two strategies for increasing returns in the hospital industry: use of debt, and spending on capital equipment. Through reduced debt and increased capital spending, hospitals

are able to obtain greater financial metrics, as they receive increased Medicare reimbursement. But, it is unclear whether the short-term nature of private equity sponsorship leads to the use of more leverage or higher capital spending strategy.

The Operational Impact of Private Equity Sponsors

While leveraged buyouts result in capital structure adjustments that impact the financial performance of a business, arguably one of the most beneficial assets gained for the business itself is the managerial and operational experience from the private equity sponsor. Bernstein and Sheen (2014) analyzed data from PE buyouts in the restaurant industry to examine whether or not private equity firms go beyond finance engineering and utilize operational engineering to directly increase value for their portfolio companies. Bernstein and Sheen (2014) identify two hypotheses that are applicable for the healthcare industry setting analyzed in this thesis: (1) that private equity firms have no operational impact on their target firms, and (2) that private equity partner experience (in the respective industry) is positively correlated with operational performance.

Bernstein and Sheen's research relies primarily on two data measures: (1) health inspection records, and (2) Yelp.com consumer reviews. In addition to these two measures, their research concludes that there is positive correlation between the size of the restaurant and the number of health inspections received, and health inspections received to store closure.

Post-leveraged buyout, critical health inspection violations decreased at a statistically significant level compared to non-LBO restaurants. These results were achieved through

improvements in food handling and employee training, which is evidence regarding the operational impact of PE firms, given that the restructuring of a restaurant's capital structure is unlikely to cause these results (Bernstein and Sheen 2014). To dismiss a possible alternative explanation, Bernstein and Sheen conducted the same analysis for restaurants that had undergone a change in ownership (non-PE related) and determined that critical violations had not decreased – providing further evidence that private equity firms generate operation value within a business. This suggests that the first hypothesis regarding the lack of any operational impact of PE firms on target firms can be rejected.

In testing the second hypothesis, Bernstein and Sheen gathered data on PE firms' employee backgrounds and prior industry experience. They concluded (1) that private equity firms whose employees have operational backgrounds are able to generate greater improvements compared to firms whose employees have financial background, and (2) that firms that had previous experience in the restaurant industry also led to higher operational performance. Bernstein and Sheen's research emphasizes the impact that prior operational experience has on future firm performance.

[The Impact of HCA's 2006 Leveraged Buyout on Hospital Performance](#)

As mentioned prior, an LBO is a financial strategy that aims to create value through complex financial structuring. Given that this strategy relies in large part on the use of financial leverage, it is important to look at its impact on hospital performance along other dimensions as well. High amounts of leverage result in large debt service payments, and effectively reduce the free-cash-flow a business has available to invest in assets or other business areas. It is

important to take a deeper look at the financial restraints caused by LBOs in order to determine whether they have a significant effect on a hospital's ability to improve its quality of care and cost of care.

In 2006, Hospital Corporation of America (HCA) utilized a reverse leveraged buyout strategy, in which it utilized three private equity firms as well as management equity to take their public company private, and then initiated an initial public offering (IPO) four years later. As HCA is an operator of over 150 hospitals, one can review their decision to utilize an LBO strategy and look at the impact it had on overall hospital performance.

Clement and McCue (2012) found that HCA had failed to increase revenues, decrease operating expenses, and enhance profitability post-LBO. Due to the significant differences in the macro economy and global financial markets as well as with Medicare reimbursement, it is important to reassess the financial and operational performance viability of the strategy.

HCA's asset turnover was higher than comparison hospitals and days receivables outstanding was lower, implying an increase in operational efficiency with respect to receiving and better utilizing cash (McCue 2012). The greater efficiency achieved could possibly be attributed to HCA's need to meet debt service payments. Further from a financial standpoint, HCA had increased net revenue per patient, and increased profits although at a rate no higher than comparison hospitals (McCue 2012). Throughout the analyzed period, HCA had reduced its occupancy of Medicare patients, and increased their occupancy of privately insured patients, which is a possible explanation for the improved financial performance as private insurance reimburses at a higher rate than does Medicare.

From a quality and operational standpoint, HCA encapsulates the concerns of leveraged buyouts in the hospital sector. HCA did not decrease staffing levels over the period of the LBO, but levels were significantly lower than other comparison hospitals. HCA hospitals increased their fixed-assets-per-bed at a rate of 6%, which is significantly less than comparison hospitals at 20% (McCue 2012). In addition to this, HCA's asset base was aging at an increasing rate, which, along with the previous finding, suggest that HCA invested significantly less in fixed assets over the period of the LBO (McCue 2012). Capital expenditures and investments in fixed assets are positively correlated to a hospital's quality of care. Therefore, I conjecture that the financial limitations put on hospitals that have undergone a leveraged buyout negatively impacts their quality of care. In the case of HCA, there is significant evidence that suggests that the leveraged buyout provided little financial value to HCA's hospital system, and that the improved financial performance was a result of operational changes made by management.

[A Brief Conclusion on Literature](#)

The earliest data provided by Medicare is from 2007, with some of the newer measures being implemented as recently as 2014 – the information has largely been ignored in the literature. Because of this, little research and analysis has been conducted within the hospital industry in regards to evaluating quality of care and cost of care. While the healthcare sector has been a hotspot for private equity investing, the hospital specific sector has received less attention, likely due to various unfavorable aspects discussed earlier. In the context of private equity, there is a degree of conflict between the PE firms and hospitals, as PE firms are focused on enhancing investment returns, while hospitals are focused on improving health standards,

and providing consumers with necessary care. This conflict is realized when we look at the tradeoff between leverage and capital spending. Leverage increases private equity returns, but reduces free cash flows, while capital spending increases quality of care, but decreases returns and value. In looking at Bernstein and Sheen's research, private equity firms do increase performance and value within a firm beyond simply financial restructuring. My research will examine whether the same conclusion can be reached for the healthcare industry. With that being said, the goal of this paper is to provide a starting point for further research that can answer one specific question:

1. Does private equity sponsorship create value for healthcare consumers through an increase in the quality of care received?

Data Collection Process

All hospitals that accept Medicare & Medicaid payments are required by the Centers for Medicare & Medicaid Services to report various operational, cost of care, and quality of care metrics. Because of this, we have a unique opportunity to analyze hospital performance beyond a strictly financial standpoint, and can draw conclusions regarding the effectiveness of management and various financial strategies on value creation for patients and healthcare consumers. To begin my data analysis, I started with a list of all hospital holding companies that had undergone leveraged buyouts, with information on their acquirers/private equity sponsors, and the date of the acquisition. One of the drawbacks of this method is that I only had information on the holding company that was acquired and not a list of the specific hospitals that were acquired in the transaction. The Medicare data that is reported is reported on the

hospital level, meaning each individual hospital reports data, rather than the hospital's holding corporation. Therefore, to cross reference pre-and-post LBO data, I had to identify each individual hospital that the holding corporation owned, and obtain their Medicare PIN (Payer Identification Number).

There is no documentation online that matches hospital holding corporations with the specific hospitals that they own, therefore my hospital list for which my analysis was based on was limited to holding corporations that had websites that listed all their specific hospitals. From here, I pulled a list of all hospitals I could find on the holding corporations website, and then referenced it with the National Plan and Provider Enumeration System (NPPES) which provided me with the specific hospitals PIN and their enumeration date. I referenced the hospitals enumeration date against the leveraged buyout acquisition date, to determine which hospitals were owned prior to the LBO, while eliminating the ones which were acquired after the acquisition.

At this point, I had a list of specific hospital providers and their PIN numbers to reference against the Medicare provided data. Through the CMS Hospital Data Compare website, I was able to download data for my three quality of care measurements from 2007-2015. In analyzing the data, I compiled an average score for each of my three measurements for each specific provider, pre- and post-LBO to determine the change over the course of private equity sponsorship.

Data Limitations

Due to several data limitations, I am left with a relatively small sample to analyze. First, after I restrict my analysis to pure LBO deals, I am left with less than twenty-five pure hospital

deals. From this list of hospital deals, I was further limited by my ability to determine the specific hospital providers that were owned prior to the company's acquisition. There were only a number of hospital holding companies which had websites that listed the names and locations of the hospitals their portfolio owned.

The second major limitation in my data can be attributed to the reporting periods of the provided Medicare data. The cost of care metrics reported by Medicare were only available for the years 2013-2015, which did not leave me with enough data to perform analysis before and after an LBO transaction. For the quality of care metrics, I had data from 2007-2015. Because of this, any LBO deals prior to 2007, or after 2015 were removed from my sample. In summary, my sample size was narrowed down to eight individual hospital providers, all of which were operated under the same holding corporation, and acquired by the same private equity sponsor, Cerberus Capital Management.

Results

HCAHPS Patient Survey

The HCAHPS measure is based on patient survey data, in regards to quality of care provided during the hospital stay. These results are given a weight of 25% for the VBP Program – solidifying its relevance towards quality of care, and quality of overall experience. The given data reported the percentage of surveys that rated the hospital either 0-6, 7-8, or 9-10 on overall quality and experience.

Provider		Pre-LBO Avg.	Post-LBO Avg.	% Change
220017	Rating of 0-6	9.3	13.0	40.5%
	Rating of 7-8	27.0	28.4	5.2%
	Rating of 9-10	63.8	58.6	-8.1%
220111	Rating of 0-6	11.5	13.4	16.5%
	Rating of 7-8	28.5	28.6	0.4%
	Rating of 9-10	60.0	58.0	-3.3%
220073	Rating of 0-6	14.8	16.4	11.2%
	Rating of 7-8	30.8	31.4	2.1%
	Rating of 9-10	54.5	52.2	-4.2%
220098	Rating of 0-6	9.6	10.5	9.4%
	Rating of 7-8	29.2	29.0	-0.7%
	Rating of 9-10	61.2	60.5	-1.1%
220126	Rating of 0-6	9.4	13.0	38.3%
	Rating of 7-8	30.0	30.5	1.7%
	Rating of 9-10	60.6	56.5	-6.8%
220020	Rating of 0-6	9.8	9.2	-5.6%
	Rating of 7-8	23.8	22.0	-7.4%
	Rating of 9-10	66.5	68.8	3.5%
220036	Rating of 0-6	8.3	10.4	26.1%
	Rating of 7-8	22.8	24.6	8.1%
	Rating of 9-10	69.0	65.0	-5.8%
220080	Rating of 0-6	10.8	11.0	2.3%
	Rating of 7-8	28.5	26.6	-6.7%
	Rating of 9-10	60.8	62.4	2.7%
Overall Avg.	Rating of 0-6	10.4	12.1	16.4%
	Rating of 7-8	27.6	27.6	0.3%
	Rating of 9-10	62.0	60.3	-2.9%

Based on my sample size of eight individual hospitals, the results show that, on average, the hospitals received 16.4% more score ratings of 0-6 subsequent to the leveraged buyout. Ratings of 7-8 remained relatively constant, while the highest ratings of 9-10 fell by nearly 3%. Given these preliminary findings, in the case of this specific private equity sponsor, the leveraged buyout model resulted in a decrease of perceived quality by the hospital patients. I am unable to assess the statistical significance of these results given the small sample size and the lack of power in rejecting the null hypothesis that the LBO deal is not associated with any differences in quality of care.

30-Day Mortality Rates

The 30-day mortality rate data focuses on the percentage of patients who died within 30-days of an episode of either heart attack, heart failure, or pneumonia. This measure is significant because it assesses each hospital's ability to provide sufficient care to patients with severe diagnoses.

The results were mixed, with a decrease in the death rate of heart attack patients by 8%, but accompanied by an increase of 9%, and 15.5% for heart failure and pneumonia, respectively. In this scenario, quality of care seems to have decreased for heart failure and pneumonia episodes. While the heart failure and pneumonia related evidence is economically significant, I am unable to determine whether the results are statistically significant given the small sample size.

30-Day Mortality Rates				
Provider	Measure	Pre-LBO Avg.	Post-LBO Avg.	% Change
220017	Heart Attack	13.9	14.9	7.6%
	Heart Failure	9.4	9.8	5.0%
	Pneumonia	9.8	11.6	18.3%
220111	Heart Attack	16.1	13.8	-14.5%
	Heart Failure	10.3	10.5	2.1%
	Pneumonia	10.4	11.1	6.3%
220073	Heart Attack	14.4	14.2	-1.3%
	Heart Failure	10.9	12.4	13.9%
	Pneumonia	12.4	13.4	7.9%
220098	Heart Attack	16.4	14.8	-9.9%
	Heart Failure	10.0	12.1	21.0%
	Pneumonia	10.1	11.7	16.1%
220126	Heart Attack	14.6	15.1	3.0%
	Heart Failure	10.3	11.6	13.1%
	Pneumonia	8.3	11.9	43.0%
220020	Heart Attack	16.6	13.8	-17.1%
	Heart Failure	8.7	10.2	17.5%
	Pneumonia	9.2	11.6	25.7%
220036	Heart Attack	14.6	13.2	-9.1%
	Heart Failure	8.9	8.5	-4.0%
	Pneumonia	10.0	10.9	9.3%
220080	Heart Attack	17.1	14.1	-17.9%
	Heart Failure	9.8	10.0	2.6%
	Pneumonia	10.6	11.2	5.8%
Overall Avg.	Heart Attack	15.5	14.2	-8.0%
	Heart Failure	9.8	10.6	9.0%
	Pneumonia	10.1	11.7	15.5%

30-Day Readmission Measures

The 30-day readmission data measure the percentage of patients that have to be readmitted to the hospital within 30-days of discharge after they experience an episode of either heart attack, heart failure, or pneumonia. One caveat to this data is that, as far as my research has discovered, this measure does not have the ability to track whether or not a specific patient had to be readmitted, but decided to be readmitted to a different hospital.

30-Day Readmission Rates				
Provider	Measure	Pre-LBO Avg.	Post-LBO Avg.	% Change
220017	Heart Attack	NA	NA	NA
	Heart Failure	21.9	16.4	-24.8%
	Pneumonia	16.7	15.0	-10.4%
220111	Heart Attack	20.5	19.0	-7.2%
	Heart Failure	21.3	16.7	-21.6%
	Pneumonia	17.1	14.8	-13.7%
220073	Heart Attack	19.3	18.2	-5.6%
	Heart Failure	21.8	18.1	-16.9%
	Pneumonia	17.5	15.9	-8.8%
220098	Heart Attack	NA	NA	NA
	Heart Failure	22.6	15.1	-33.2%
	Pneumonia	18.0	13.6	-24.3%
220126	Heart Attack	19.6	18.4	-6.2%
	Heart Failure	23.4	14.9	-36.5%
	Pneumonia	17.4	13.7	-21.2%
220020	Heart Attack	20.1	18.3	-8.9%
	Heart Failure	20.5	15.6	-23.8%
	Pneumonia	16.1	16.1	0.1%
220036	Heart Attack	21.2	20.3	-4.2%
	Heart Failure	23.3	15.7	-32.6%
	Pneumonia	19.2	15.3	-20.3%
220080	Heart Attack	19.7	18.6	-5.4%
	Heart Failure	21.9	16.3	-25.8%
	Pneumonia	17.0	15.0	-11.6%
Overall Avg.	Heart Attack	20.1	18.8	-6.2%
	Heart Failure	22.1	16.1	-27.1%
	Pneumonia	17.4	14.9	-14.1%

The results for this measure indicate that readmission rates for all three variables had decreased by a significant amount which suggests that the hospitals were able to improve their quality of care, and therefore reduce the number of patients that needed to be readmitted. An additional benefit to reduced readmission rates, is reduced costs per patient. Medicare is a heavily subsidized healthcare program of the government – therefore the majority of healthcare costs at the patient level are covered by the Medicare program, and taxpayer money. As a hospital is able to reduce readmission by providing better quality of care, patients require less healthcare consumption, which helps reduce costs of the overall healthcare system.

Discussion

This data analysis is limited in addressing the research questions that my thesis poses. That being said, I propose some possible explanation for the results. The HCAHPS data indicates that hospital quality of care has decreased post leveraged buyout, and the increase in death rates coincides with this statement. On the other hand, the readmission data suggests otherwise, that the hospital was able to reduce readmission, or increase its quality of care. There are a few possible explanations for this. First, it is possible that increased death rates partially resulted in lower readmission rates due to patient deaths. Second, the readmission data has no way of tracking whether or not the patient was readmitted at a different hospital provider. Therefore, the hospitals readmissions could have fallen as more patients chose to be readmitted at different hospitals. This scenario is more likely, when we take the 30-Day Death and HCAHPS data in account. It is possible that the decreased quality of care that those two

measure suggest has resulted in a greater number of patients choosing readmission at a different hospital.

Discussion on Limitations

This research set out to determine the effects of private equity sponsorship on hospitals' quality of care. I would like to discuss the various limitations of this study.

First, the various data limitations resulted in a small sample size making it difficult to assess statistical significance of results.

Second, the eight individual providers that make up my sample size were all part of the same hospital system, and were acquired solely by Cerberus Capital Management. Because of this, the analysis is likely driven by the specific management style of Cerberus rather than the private equity sector as a whole.

Third, the Medicare data is limited in that we are unable to determine the reason for decreasing readmission rates. Whether a quality of care increase led to decreased readmission, or patients switching providers caused the data to appear positively is difficult to ascertain.

While a preliminary conclusion can be reached on overall quality of care, my methodology does not incorporate free cash flow restrictions, or capital spending figures. Whether or not a decrease in quality of care is caused by restricted capital spending is difficult to say.

In summary, the biggest limitation to my analysis is the lack of publicly available information. Private companies don't typically disclose performance metrics, and while Medicare provides various operation and performance measures, key metrics are missing that

are necessary to determine whether or not capital expenditure restrictions are a limitation of private equity sponsorship in the hospital industry. Given the availability of data, we can only determine the effects private equity sponsorship, in general, has on costs and quality – we cannot further determine whether it is the management style or capital restrictions that drive the results.

Further Research and Studies

In the end, this paper provides a preliminary methodology and framework for looking at private equity sponsorship in the hospital industry. Once more data becomes publicly available and there is enough of a time-series on many of the important healthcare metrics, researchers can arrive at sharper inferences on whether there are significant changes in healthcare outcomes after an LBO and also whether there is a causal connection between LBOs, and patient experience and healthcare outcomes. This is an important issue that has not been addressed in the literature, and the framework developed in my thesis can help address this void in the existing literature.

Implications to Private Equity and Healthcare

Ideally, the goal of further research would be to determine the viability of private equity investment, or the replication of private equity models, in the hospital industry, as a strategy to further benefit the trends of cost reduction and quality improvement. Private equity is playing a large role in the current healthcare trends, but not so much at the hospital level. There is a lot of focus on data analytics and various other avenues of decreasing the cost to the system and

to the patient, but not as much is being done in the specific hospital systems. Many hospital systems are consolidating into massive systems, and are ending up bottlenecked by the lack of innovation that many large corporations face. A targeted strategy could benefit both the overall health system and private equity firms by spurring innovation and accelerating the rate of the trends in the industry.

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