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The Relationship of Debt Ratio and Financial Performance for Large NFP Health Systems

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THE RELATIONSHIP OF DEBT RATIO AND FINANCIAL PERFORMANCE FOR LARGE NFP HEALTH SYSTEMS

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ABSTRACT

This dissertation was a quasi-experimental research study exploring the relationship between long-term to debt capitalization ratio and financial performance in an environment where interest rates remained historically low and stable, while investment returns in the U.S. equity markets increased year over year. The study reviewed 142 not for profit health systems and examined total and non-operating margins along with long-term debt to capitalization ratio to determine if margins increased as long-term debt increased. Researchers have discussed the opportunity that not for profit health systems have to utilize low cost, tax-exempt debt to maintain or grow their endowments and in turn their non-operating income. The environment during the study years of 2015, 2016, and 2017 presented a great opportunity to investigate the relationship.

The study used secondary data of 142 not for profit health systems, rated by Standard and Poor's, and utilized their audited financial statements to calculate the variables. The data were used to test the hypothesis that incurring additional debt would lead to a higher level of total margin and/or non-operating margin in an environment where equity returns were increasing as borrowing rates on debt were decreasing.

Findings of the study indicated that there was a relationship between both total and non-operating margin and long-term debt to capitalization, but that the relationship was negatively correlated. The correlation became both stronger and the differences in

margin performance were greater as equity market returns, as measured by the Standard and Poor's 500 Index, increased suggesting that not for profit hospital systems with lower debt to capitalization had higher exposure to equities as compared to those with higher debt to capitalization ratios. The study controlled for a health system's days of cash on hand and return on assets, both of which showed a significant relationship with both total and non-operating margins. The study provides findings that will assist hospital administrators as well as lending institutions and finance companies that work with health systems, to target the ideal deal capital structure for an organization.

DEDICATION

For my mother, Marie Lombardi and my Aunt Claire Weimmer, thanks for always supporting my educational efforts.

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LIST OF ABBREVIATIONS

CAAP	COVID-19 Accelerated and Advance Payment Program
CAPM	Capital Asset Pricing Model
CFO	Chief Financial Officer
DCOH	Days of Cash on Hand
EBIDA	Earnings Before Interest, Depreciation and Amortization
EMMA	Electronic Municipal Market Access System
MSRB	Municipal Securities Rulemaking Board (MSRB)
FP	For Profit
NFP	Not for Profit
ROA	Return on Assets
ROE	Return on Equity
ROI	Return on Investment
S&P	Standard and Poor's
S&P 500	Standard and Poor's 500 Index

CHAPTER 1

INTRODUCTION

Capital Structure

The capital structures (the relative use of debt and equity to support long-term assets) of leading health care systems are viewed as a strategic component of their financial plans (Wheeler et al., 2000). Given healthcare has always been a capital-intensive industry, requiring significant investments in brick and mortar, high-tech imaging machines, and other medical equipment (Schroeder, 2015), the importance of how capital is acquired and distributed is paramount to the profitable growth of a hospital system. Key components of a hospital system's capital structure include long-term debt and equity (Wiese, 2009), with for profit hospitals having the advantage of being able to issue equity to shareholders and not for profit hospitals having the benefit of being able to issue tax-exempt debt. The effective combination of using debt and equity to generate capital for both replacement and new growth assets ultimately define the ability of a hospital organization to remain viable (Cleverly, 1990).

Capital allocation for hospitals has changed over the years with outside disruptors altering the way systems craft their long-term investment strategies. Instead of focusing on heavy hospital plant investment, including new towers or beds, system Chief Financial Officers (CFOs) have shifted to investments in patient access points, technology innovation, and physician recruitment (O'Brien, 2020). As a result, the age of hospital plant has consistently ticked up over the years moving from 9.8 in 2004 to 10.9 years in

2014 (AHA, 2016). While age of plant may not have a direct correlation with system efficacy, studies have shown a negative correlation between age of plant and metrics like value-based purchasing (Beauvais et al., 2020) and likelihood of acquisition (McCue et al., 2015) highlighting the need to monitor the metric. With investment in both new areas of focus as well as existing infrastructure being important to stay competitive, large hospital systems are attempting to preserve strong balance sheets while ramping up investments in a healthcare landscape being targeted by disruptors like United Healthcare, CVS, and Walgreens. The pressure to build physician networks, increase an outpatient footprint, and invest heavily in technology favor larger hospital systems that have healthy access to the capital markets, market pricing power, and more lines of business to enhance financial performance.

Studies have shown that hospitals with low occupancy rates, low profitability, limited financial capital, and aging facilities that needed replacement were more likely to be acquired by multihospital systems (Alexander & Morrisey, 1988; Bogue et al., 1995; McCue, 1988). Capital investment for these hospitals is important to keep pace with medical technologies and maintain facilities for patient care needs (Song & Reiter, 2010). How hospitals, specifically not for profit entities, invest in financial assets has received attention, especially larger systems that maintain significant long-term balances (Song et al., 2008).

The growth in large hospital systems has accelerated since the passage of the Affordable Care Act (ACA) with 2017 setting a record for large hospital mergers and 2018 hitting a new high for average seller size of hospital (by revenue) (Singh, 2019), which many refer to as Mega Mergers. These new systems are integrating and struggling

to find the right balance of investing for the future while maintaining long-term viability. That struggle is accentuated by the historical hesitancy of NFP hospitals to take on debt when compared to their FP peers (Wheeler et al., 2000). As such, NFP hospitals have tended to choose an approach resembling pecking order theory, putting a regulator on the use of their capital structure in maximizing profitability. The behavior during this period of NFP consolidation and transition, has created a gap in our knowledge regarding industry guidelines for identifying the ideal mix of equity and debt investments and the impact on large hospital systems' operating performance.

Capital Structure Defined

The capital structure of a health system is typically defined as the debt and equity that can be found on a hospital's balance sheet. Debt and equity can be used to finance or purchase assets, which are also reported on the balance sheet. Additions to property, plant, and equipment are accounted for in the cash flow statement, under investing activities, whereas debt activity can be found under financing activities in the cash flow statement. Those capital expenditures are depreciated as an expense on the income statement and a trend where capital expenditures exceed depreciation expense is indicative of a growing asset base and business expansion.

When hospital systems are calculating the cost of capital, they should be including a cost for the use of equity as well as the cost of their debt, which is being charged by the financial institution holding the liability. The true cost of equity for a not for profit hospital is estimated by some to be equal to the cost of philanthropy (Sloan et al., 1998) with others estimating numbers as high as 18% as outlined in the interviews

completed by Wheeler et al. (2000). The cost of debt is typically lower than the cost of equity given debt is an obligation that is repaid before equity holders gain returns. The additional risk equity holders have given where they sit in the repayment priority deserves a premium, one that many calculate by using the Capital Asset Pricing Model (CAPM), which was developed by Sharpe (1963, 1964) and Treynor (1961) and extended by a number of investigators (Sloan et al., 1988). CAPM is a key metric because it estimates the true cost of equity, which should be considered when making any decision related to funding source. Calculations to estimate the cost of equity (CAPM) and the weighted cost of capital (WACC) for an entity are included below to outline how managers should measure their funding sources as they target enhanced financial performance.

Blending the cost of equity, estimated by the CAPM model, and the cost of debt, using their respected weights, calculates the average interest rate a company must pay to finance its assets, growth, and working capital. The rate is considered a firm's weighted average cost of capital, and all potential investments should be measured against this hurdle.

Weighted Average Cost of Capital Formula (WACC)

Cost of Equity * % Equity + Cost of Debt * % Debt *(1-Tax Rate) + Cost of Preferred Stock * % Preferred Stock

Health systems measure their cost of capital against the return on investment (ROI) to determine if the investment will create value for the firm and its shareholders. While some investments like replacement capital must be made, all other projects should be measured against this calculation.

When measuring the return on investment of a project against the WACC, each firm needs to consider the impact a heavy debt load can have on future costs of capital. If debt levels rise quickly, the three main rating agencies for hospital bond issues, Moody's, Fitch, and Standard & Poor's, will downgrade the bond ratings of a system, which could impact interest rates and public perception about the health of a hospital system. Not for profit health system leaders are keenly focused on bond ratings given their inability to issue equity as compared to their for-profit counterparts (Wheeler et al., 2000). There are several metrics used to measure leverage when rating bonds with one of the most important being long-term debt to capitalization percentage. The average percentages vary widely per industry, but in the not for profit hospital space the percentage ranged from 26.1% in the AA credit tier to 68.7% in the speculative grade tier (Bretz & Arrick, 2018). Managers' focus on debt ratio as opposed to the impact taking on additional debt has on financial performance may be limiting financial gains of conservative hospital systems that focus solely on leverage. The formula for long-term debt to capitalization is included below for clarification. The metric is one of the key leverage ratios examined by the three major ratings agencies and the one that will be utilized in this study.

Long-term Debt to Capitalization Formula

Long-term Liabilities / Long-term Liabilities + Shareholders Equity

Research Question and Significance

Due to the gap in our knowledge regarding industry guidelines for identifying the ideal mix of equity and debt investments and the impact on hospital systems' financial performance, the following research questions are presented: (1) Is there an association

between the capital structure of a not for profit hospital system and its overall financial performance?; (2) Is there an association between not for profit health systems that use more debt in their capital structure and higher non-operating returns?; and (3) Is there an association between credit rating and both operating and non-operating financial performance?

The study included the 142 not for profit hospital systems rated by Standard and Poor's, with adjustments being made to address changes in ownership during the study period. While every hospital system is unique in nature, beyond rating agency metrics, there is a lack of information available regarding the ideal mix of equity and debt financing as it relates to the impact on operating performance. Traditionally, not for profit hospital systems have been motivated to preserve equity (Wheeler et al., 2000) more in line with trade off theory of capital structure, with a focus on the Days of Cash on Hand metric, while for profit hospital systems have focused more on debt availability and shareholder value more in line with pecking order theory of capital structure. Since 2000, the percentage of for profit hospitals has grown from 15.2% to 24.9% (Kaiser Family Foundation, 2020), which has changed the overall mix of debt and equity used by hospitals during that span. The growth of for profit influence coupled with nontraditional disruptors with lower capital intensity entering the provider space has motivated hospital systems to invest heavily in access points and nontraditional vertical integration areas like insurance. The struggle that administrators face today is how to balance all of the needs for capital with a funding plan that can address both short-term growth and long-term viability.

As such, guided by capital structure theory, the purpose of this study is to examine the relationship between not for profit health systems that issued more debt than their peers and the financial performance of those hospital systems. The study examined both non-operating and total margin to determine if there was an impact on either or both in health systems where many not for profit managers have historically taken a conservative approach for issuing debt.

CHAPTER 2

LITERATURE REVIEW

Background

Current literature on the study of capital structure, building upon Modigliani and Miller's (1958) argument that financing and investment decisions are separate processes, is quite extensive. Modigliani and Miller (1958) were the first to suggest that the value of a firm is independent of its capital structure, in the absence of taxes, bankruptcy costs, agency costs and in an efficient market, but those assumptions rarely hold, especially in the hospital sector. Jensen and Meckling (1976) made this clearer when they acknowledged the potential that investment and financing decisions could interact driving value to a firm. Value can be extracted by taking on low cost debt to finance high returning investments, which the literature shows has been a focus of for profit hospitals. Not for profits have tended to issue less debt even though many, including Wedig et al. (1988) and Gentry (2002), have correctly pointed out their unique opportunity to issue tax-exempt debt. This debt presents an arbitrage opportunity for these not for profit (NFP) hospital systems given the low rate of debt offered during the study period and the high returns realized on non-operating investments held by NFP hospital systems in their substantial endowments during the same period.

In this literature review, the researcher defines the characteristics of the U.S. debt markets while also highlighting the borrowing environment during the period of focus for the study. Additionally, the literature will address views related to the cost of equity and

compare those costs to the cost of debt issuance while also highlighting the heavier appetite that for profit (FP) hospital systems have for debt given the cost of issuing equity according to these models. Financial performance differences between NFP and FP hospital systems will also be reviewed as well as the arbitrage opportunities that exist for NFP entities and the bankruptcy risks that are realities for all entity types that rely on debt too heavily.

As highlighted in Chapter 1, the need for heavy investment in the hospital space has persisted and extended into many areas outside the walls of the facility. During periods of normal operations, much of a hospital's capital budget and investment decision-making concerns how to raise the necessary financial capital to fund the cost of replacing or upgrading aging and outdated equipment and facilities (Holcomb & Dean, 2020). All the reviewed works to follow will show FP entities, as a group, carry more debt and showed better financial performance than their NFP counterparts. While these studies found these trends, there was limited work dedicated to finding an optimal level of debt within the hospital sector and if the same trend exists regardless of entity type (FP vs. NFP). This gap presents an opportunity to investigate if not for profit hospitals systems that are more willing to borrow, and more similar to their for profit peers, experience better returns that those with more conservative debt policies.

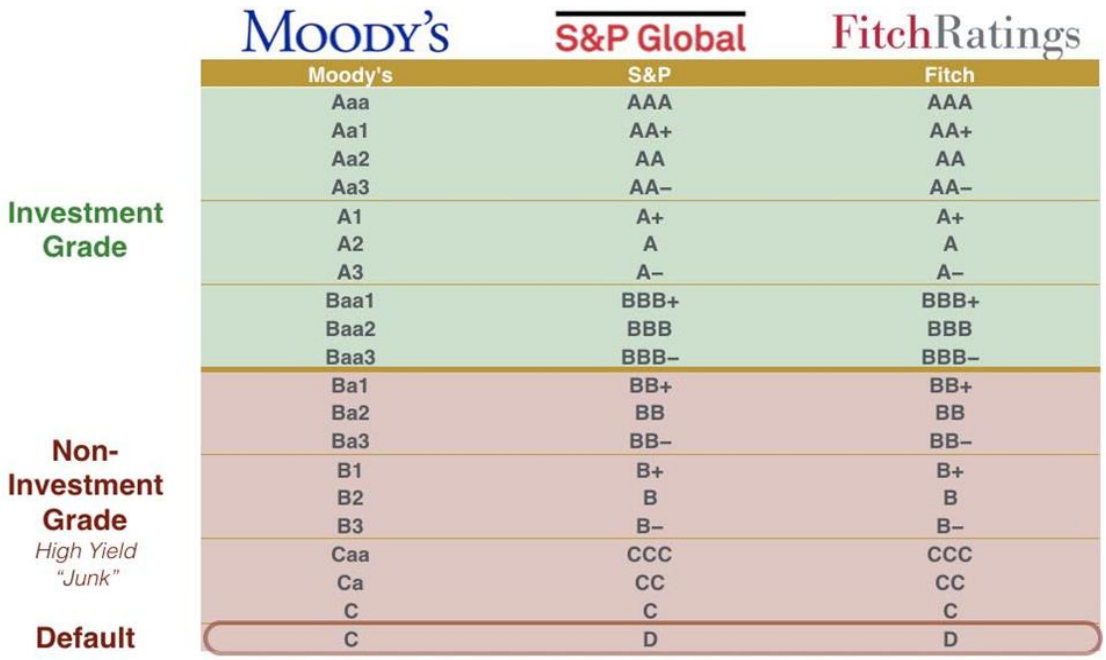
Debt Markets

In 2018, the global bond markets exceeded $102 trillion easily surpassing global equity market capitalization, which topped $74 trillion (SIFMA, 2019). The United States made up about roughly 40% of both markets and experienced $2.4 trillion of capital raised in the U.S. debt market during 2018 (SIFMA, 2019). Between 2013 and 2018,

heavy investor demand and low interest rates expanded the amount of investment grade corporate debt issued at an annual rate of 6.7% with speculative grade issuances growing by 2.8% over the same period (Vazza et al., 2019). As previously mentioned, debt ratings are issued by one of three agencies in the United States and range from AAA to C, which is highlighted in the figure below.

Figure 1

Ratings Chart Summary of the Three Major Ratings Agencies



Source: StreetFins 2020

The rating of the debt issuance has historically been a key determinant of the annual interest rate paid by the borrower. Ratings are based on the risks perceived by the agencies including the strength of a hospital's financial profile (income statement and balance sheet), low debt flow, and diversity of revenue sources (Brimmer, 2014). Once rated with one of the designations above, the free markets assign an interest rate to the

debt, based on the term, risk, and liquidity in the markets. That rate is made up of a risk-free yield and a credit spread added to that rate based on the targeted return of an investor. Credit spread is the additional yield that investors receive on top of a risk-free yield in exchange for taking on repayment risk (Bogacz, 2017).

Credit spreads for hospitals have decreased significantly for the period from 2008 to 2016 (Bogacz, 2017), as outlined in the graphic below, which measures spreads in basis points. One basis point is equal to 1/100 of a percent and 100 basis points is equal to a 1% rate. In addition to the spreads overall decreasing, the spread between credit ratings has also been compressed over that same period for hospitals, meaning the difference in rates between credit rating has become less pronounced (Bogacz, 2017). Historically, maintaining the highest credit rating available has been one of the key focus areas of NFP CFOs as they focused on ensuring access to the debt markets at aggressive rates (Wheeler et al., 2000).

Figure 2

Hospital Credit Spreads by Credit Rating

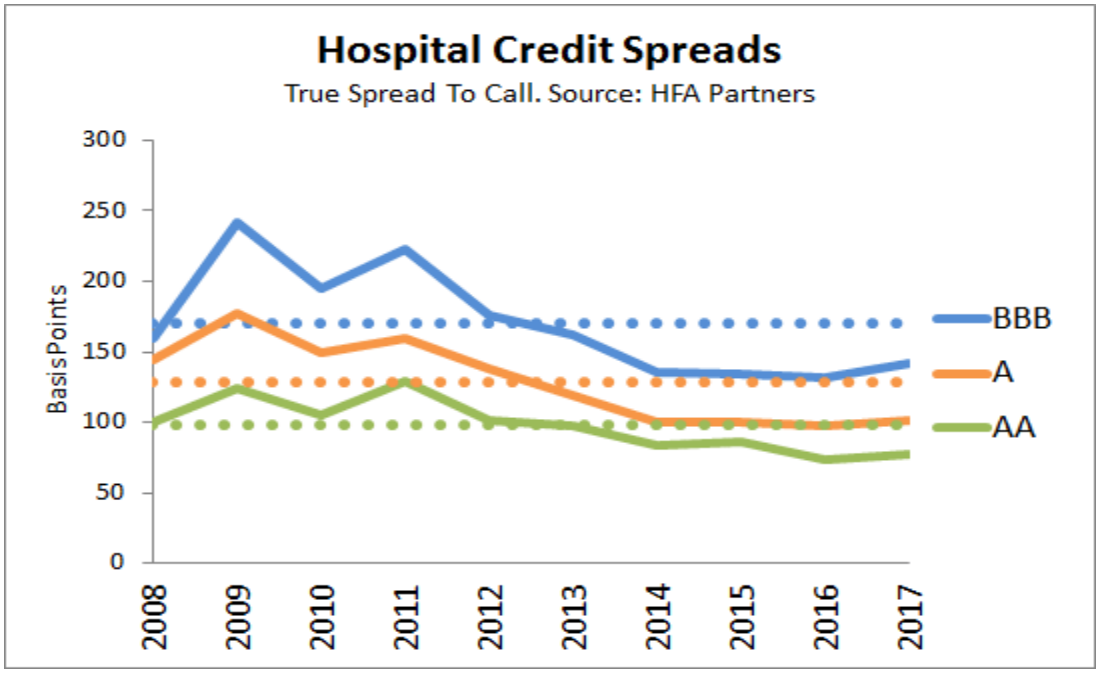


Figure 3

Hospital Average Credit Spread

Hospital Average Credit Spread*		
Rating Category	2017	10-Yr Avg
BBB	141	170
A	101	129
AA	77	98

* True Spread To Call. Source: HFA Partners

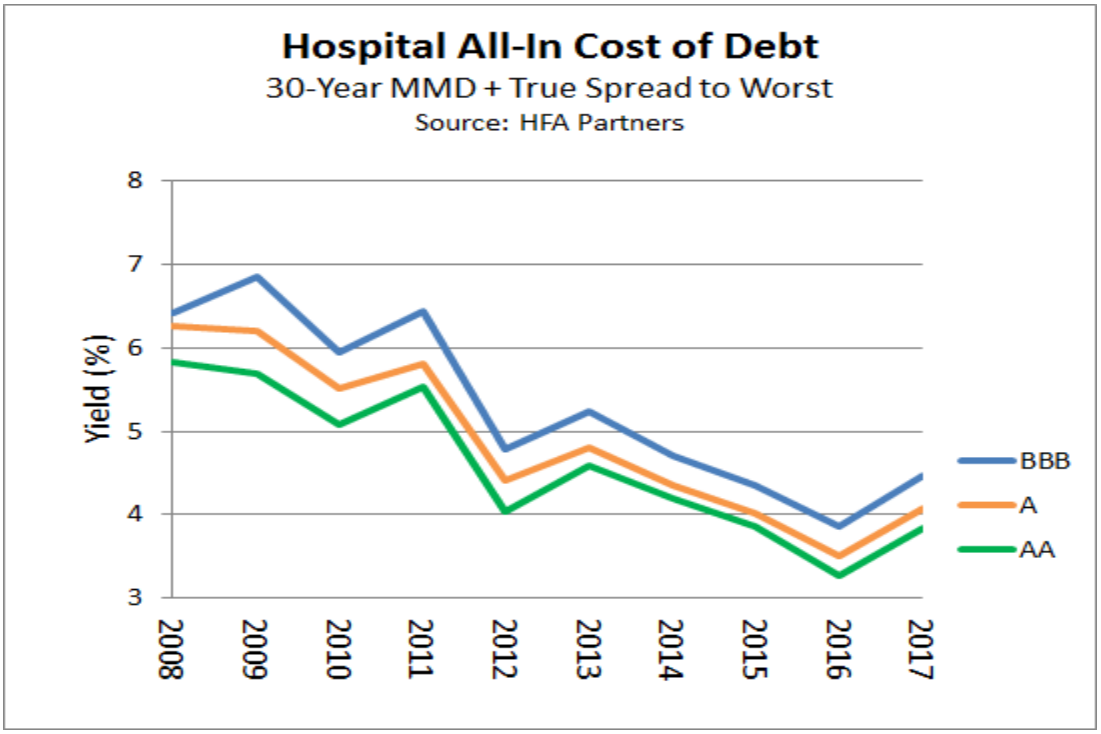
The goal of maintaining a strong balance sheet buoyed by large cash reserves for NFP hospitals (Wheeler et al., 2000) has become less important over the past 10 years due to the above highlighted spread compression and the lack of supply in the tax-exempt market (Bogacz, 2018). Tax-exempt hospital issuances did see an outsized boom in issuance at the end of 2017 when the Tax Cuts and Jobs Act of 2017 eliminated the tax

advantages of advanced refundings (Bogacz, 2018) starting January 1, 2018. In an advanced refunding, an issuer is permitted to refund or payoff a prior bond issue more than 90 days prior to its first call date, similar to a mortgage refinancing, with the intent of bringing down the overall cost of a debt issuance (MRSB, 2017).

Prior to the enactment of the Tax Cuts and Jobs Act, a bond could be refunded twice instead of only once after passage, limiting flexibility for borrowers. The boom in 2017 led to a bond issuance dip in 2018, the first since 2013 for tax-exempt fixed rate revenue bonds (Bogacz, 2018). After a dip in 2018, demand for hospital debt came back into favor in 2019. This strength of demand for debt was observed by both for profit and not for profit hospitals. In that same year, for example, HCA Healthcare and CommonSpirit Health both issued debt in total of $5 billion (Hartnett & De Lombaerde, 2019, Webster, 2019). The strength of the debt markets, coupled with historically low rates, provided health services firms with an opportunity to easily finance their expansion projects with debt during a period of heavy investment.

Figure 4

Hospital All-In Cost of Debt



Access to the debt markets in 2019 differed greatly from what was experienced by hospitals 10 years earlier. The financial crisis of 2008-2009 had a significant impact on raising capital for hospitals, most notably in the municipal Auction Rate Securities (ARS) Market where a collapse in February 2008 significantly hindered access to debt for health systems (Stewart & Smith, 2011). Auction Rate Securities (ARS) and Variable Rate Demand Obligations (VRDO) are debt financing instruments that behave as a long-term bond for the issuer but a short-term security for the investor (D'Silvia et al., 2008). In the case of ARS, the security first developed in 1984 carries a longer finance term (20 to 30 years) with an interest rate that is reset through a modified Dutch auction at predetermined short-term intervals (7, 28, or 35 days). The lowest bid rate at which all shares can be sold at par is the clearing rate, but an auction can fail if demand is weak and

no clearing rate is received (Stewart & Smith, 2011). The instruments were used by many hospitals in 2007 and 2008 and perhaps most famously by The University of Pittsburgh Medical Center which held approximately $464 million of ARS bonds out of $2.43 billion of total long-term debt as of December 31, 2007 (Stewart & Smith, 2011). The collapse of this market was a contributing factor in placing nearly half of all non-federal hospitals' capital projects on hold or stopping projects in progress (Pizzi, 2009).

The Great Recession brought significant increases in the spread between corporate bonds and U.S. treasury bonds as well as credit flows that decreased more than any time in recent history (Amaral, 2011). The slowdown in credit had a significant impact on not for profit hospital liquidity in a study that reviewed California-based hospitals, which, in turn, slowed capital investment (Choi, 2017). Since the end of the crisis, credit spreads have continued to fall but stabilized after 2011 (Board of Governors of The Federal Reserve System, 2019) with credit flows being strong during the same period (Bogacz, 2018). The low cost of debt presents an opportunity for NFP entities to consider increasing issuance to fund their capital spending plan as opposed to using equity, which could be held in higher returning assets like endowment investments.

Cost of Equity

Tax deductibility of debt lowers the overall cost of capital for FP firms, encouraging companies to take on more debt (Sloan et al., 1988). While tax deductibility is not a factor for NFP firms, Wedig et al. (1996) pointed out that the use of tax-exempt debt is analogous to the income tax deductibility of interest expense for investor owned firms. The cost of debt is easily calculated and defined in the audited financial statements

of both NFP and FP firms while the cost of equity is vaguer. As previously highlighted, the Capital Asset Pricing Model (CAPM) is one way of calculating the cost of equity.

The CAPM was developed in the early 1960s by Sharpe (1964), Treynor (1962), Lintner (1965a, 1965b), and Mossen (1966) (Perold, 2004). The CAPM provides insights about what kind of systematic risk is related to return (Perold, 2004), particularly stocks. While NFP hospitals do not issue equity, Sloan et al. (1988) pointed out that systematic risk of NFP firms should be equal to their FP counterparts given they operate in the same product markets and in the same regulatory environment. NFP hospitals must also pay a return on equity, albeit in a different form (Sloan et al., 1988). Given debt holders are paid before equity holders in the event of a bankruptcy, equity holders typically require a higher return, making that capital more valuable than debt, especially in imperfect markets (Modigliani & Miller, 1958).

As previously mentioned, FP entities have been far more willing to use debt even with the ability to issue true equity in the capital markets. The difference in debt usage is interesting given both entity types serve the same group of consumers and maintain very similar organizational structures.

Hospital Type, Investment, and Capital Structure

Unlike other sectors of the economy where not for profit (NFP) and for profit (FP) firms occupy different market niches, NFP and FP hospital companies compete directly for patients, providers, and revenue to preserve margins and profitability (Turner et al., 2015). Differences between the capital structures of each of these entities has been studied extensively with a focus on the debt load carried by each hospital type. Not for

profit firms do not have the ability to raise funds through the sale of stock to the public, but instead maintain equity through retained earnings, income on investments, and donations (Wheeler et al., 2000). NFP hospitals' use of debt has been shown to be lower than their FP peers through multiple business cycles (Cleverley & Baserman, 2005; Turner et al., 2015) with many NFP CFOs targeting low debt levels to maintain strong bond ratings (Wheeler et al., 2000) issued by Standard & Poor's, Moody's, and Fitch. Maintaining closely related financial ratios has been another reason NFP CFOs have taken on less debt with the industry focusing on three specific ratios, including Cash to Debt Ratio, Days Cash on Hand, and Debt Service Coverage (Wheeler et al., 2000).

Another metric that is widely tracked for hospitals is average age of plant, which has ticked up significantly since 1994 (AHA, 2016). The age of plant ratio measures how well a hospital is keeping its facilities up to date and is calculated by dividing accumulated depreciation by depreciation expense. The ratio has moved up nearly two years since it was first tracked in 1994 reaching a range of 10.78 years to 11.48 years, depending on publishing source (King et al., 2018). While heavy capital investment has not always shown improved performance (Cleverley, 1990), capital investments in the latest medical equipment and replacement of aging facilities are important hospital decisions that may improve operating efficiencies, raise the quality of care, and attract physicians and patients (McCue & Kim, 2008). This relationship is consistent with Cleverley's (1990) findings which showed hospitals that performed better financially had newer plants than their lower performing peers.

In recent years, the hospital industry has faced mandates to increase investment in a variety of costly projects including new health information technology, integration

strategies that may including acquiring physician practices, and construction of new outpatient and ambulatory care facilities (Huang et al., 2018). These pressures coupled with favorable debt markets present an opportunity for NFP hospital systems to access inexpensive debt with the goal of increasing returns through investments. While FP hospital systems have consistently been heavier users of debt, NFP hospital systems have used larger amounts of debt as their revenues and asset bases grow (Turner et al., 2015) presenting an opportunity to find an optimal capital structure for large NFP systems that positively impacts financial performance.

Financial Performance

The study of the relationship between capital structure and financial performance has historically been centered on the comparison between NFP and FP hospital systems. Since the first signs of growth in the FP space in the 1980s, researchers have found that FP or Investor Owned companies have been more willing to take on additional debt when compared to their NFP counterparts (Sloan et al., 1987; Valvona & Sloan, 1988). The willingness to take on additional debt and the ability to realize returns on that debt on both a Return on Equity (ROE) and ROI basis in the hospital space has been studied extensively.

Four studies specifically assessing the ROE in the hospital space and ranging from 1987 to 2015 all found that FP hospitals measured significantly better than their NFP counterparts on the metric (Cleverley, 1990, 2005; Sloan et al., 1988; Valvona & Sloan, 1988). Return on equity can be calculated by dividing net profits by the average equity of a hospital. The use of debt does magnify ROE both positively and negatively

depending on the returns a hospital is realizing compared to the rate at which the debt has been issued (Turner et al., 2015). High ROE firms can increase their total pool of available funds for new investment for two reasons. First, the firms with higher ROE performance are generating greater growth in equity capital that can be attributed to investment. Second, higher ROE firms are able to use their profitability to attract more debt financing when needed (Cleverley, 1990).

These studies noted that excessive borrowing to invest in plant was not accretive to ROE (Cleverley, 1990) and that while there has been convergence between FP and NFP hospital systems since the 1980s, significant differences still existed in performance based on ROE (Turner et al., 2015). When comparing two studies separated by 25 years, one key difference was the impact system affiliation had on ROE. Cleverley's (1990) study showed system affiliation had limited impact on ROE while Turner and colleagues' study (2015) demonstrated a positive relationship between system affiliation and ROE performance. While this was an inconsistent finding between the studies, both studies showed statistically significant differences in performance based on market share, which health systems have been more successful in growing (Cleverley, 1990; Turner et al., 2015).

The focus on market share was also consistent when the focus shifted from ROE to ROI as a key financial metric of comparison in the hospital sector. One key study calculated ROI by adding back interest expense to net income before dividing by total assets to neutralize the effect of financing (Cleverley, 1992). There was no direct comparison between FP and NFP hospitals included in the study, but the approach examined capital structure closely given the ROI calculation used measured hospitals

with the same operating and non-operating income at the same level of performance even if they had different proportions of debt. Study findings were consistent with earlier work that determined cost containment was the single most important strategy that could be deployed to increase ROI and that the use of debt, while not on its own a negative driver of performance, should be focused on projects with returns higher than the cost of capital (Cleverley, 1990).

The literature related to the comparison between FP and NFP hospital systems provides consistent evidence that FP hospital systems are more willing to utilize debt and to do so in an efficient manner. The financial performance ratios examined are extensive but not exhaustive, and limited work has been done in recent years to examine the impact of liquid markets with all-time low borrowing rates.

Arbitrage Opportunities

Historically, low interest rates and liquid debt markets coupled with a multi-year bull run in the equity markets present an opportunity for arbitrage in the NFP sector of hospitals, unlike anything in recent history. NFP hospitals seem, at first glance, to be an unlikely laboratory for the study of capital structure given their exemption from corporate income tax (Wedig et al., 1996). Debt issuance provides FP entities income tax abatement at the corporate level, but NFP hospital systems' ability to issue tax-exempt debt, in the municipal market, provides tax abatement at the direct personal level of the organization through the issuance of tax-exempt debt (Wedig et al., 1996). The ability to issue tax-exempt debt in lieu of using cash reserves is unique to NFP hospital systems and has been

the topic of several studies that found evidence that NFPs use the arbitrage opportunity to maintain higher endowment balances and increase investment returns (Gentry, 2002).

The benefits of this strategy were evident in 2017 when credit spreads for hospital bonds were at 10-year lows while returns realized by hospitals in their endowments averaged 13.2%, according to one study that analyzed 56 different entities (McElhaney, 2018). While A Rated NFP hospitals delivered strong operating margins in 2017 (4.5%), fund balances drove total margin substantially higher to 8.3% (Vazza et al., 2019). These gains were even more pronounced on a percentage basis as the credit rating of hospitals declined, illustrating the importance of investment gains to every NFP hospital regardless of size or strength. The opportunity to utilize tax-exempt debt for arbitrage was more pronounced in the larger hospitals that issued tax-exempt debt given the size of their endowments as compared to smaller organizations that tended to carry lower credit ratings (Gentry, 2002).

The approach of carrying lower debt levels, even with the opportunity to benefit from the arbitrage between low debt rates and higher equity or endowment returns, has historically been an approach taken by CFOs of NFP hospital systems that focus on maintaining access to debt markets in all environments (Wheeler et al., 2000). The risk of bankruptcy and the focus on credit rating has kept NFP balance sheets heavily capitalized with equity as compared to their FP counterparts, limiting upside margin opportunities for many NFPs. This conservative approach has limited bankruptcies in the industry, but also potentially limited upside in total margin performance driven by non-operating gains.

Bankruptcy Risk

The optimal capital structure is the leverage choice at which the marginal benefit of debt is completely offset by the marginal cost of financial distress (Huang et al., 2018). Increasing leverage is a sign of financial stress that could lead to bankruptcy, but other factors may have a more pronounced impact than deteriorating debt ratios. A few additional non-financial factors of bankruptcy are the size of the organization, increased competition, reimbursement changes, and mismanagement (Yarbrough & Landry, 2009). While hospital bankruptcies have been very contained historically, an uptick has been seen in the period from 2010 to 2016 (Minemyer, 2018). Seventy-five percent of the hospitals that filed during this period were located in rural areas (Minemyer, 2018) and the majority of the filings that occurred in 2019 and 2020 were for profit entities (Ellison, 2020).

The concentration in bankruptcies among smaller hospitals is consistent with the literature, which has also highlighted the ability for hospitals to survive for several years even with deteriorating financial metrics (Bazzoli & Andes, 1995). Bankruptcies in all reviewed studies appeared to be far less likely to occur in hospital systems, while limited correlation was found between rural and urban facilities (Yarbrough & Landry, 2009). NFP hospital borrowing did not seem to slow even as the prospects of bankruptcy increased, potentially due to their limited access to capital outside of debt or due to their comparable increased potential to raise funds through philanthropy or local governments (Huang et al., 2018). All of these factors pointed to NFP hospital systems' limited risk of increasing debt to fund projects that would better help them compete against their FP peers that tend to have stronger margins. While very high debt levels could become a

bankruptcy concern, management's investment strategy and the returns of projects would be a far better measurement of bankruptcy risk.

Theoretical Framework

When considering how to fund projects within a hospital setting it is helpful to evaluate the decisions made by financial leaders in the context of Capital Structure. Early work in this area was guided by Modigliani and Miller's 1958 argument that financing and investment decisions are separate processes, and the value of the firm is independent of its capital structure, given certain simplifying assumptions. Their now famous Proposition I, which essentially claims that a company's capital structure does not impact its value, violated prevailing wisdom at the time and generated a significant amount of controversy (O'Brien, 2003). The argument, that under certain assumptions the total costs of company capital and therefore the market value of the company is independent of capital structure, was updated in 1963 when the most important assumption regarding taxes was challenged.

The condition of a tax-free environment was investigated in 1963 by Modigliani and Miller and their understanding that the value of the firm can be increased through debt due to the tax deductibility of interest payments. FP hospital systems have consistently maintained higher levels of debt than their NFP counterparts, and while NFP hospital systems do not receive tax benefits through the deductibility of interest, their ability to issue tax-exempt debt provides similar advantages. NFP hospital systems have relied on tax exempt financing less extensively (Sloan et al., 1987), which presents an

opportunity to reconsider their capital structure in an environment where they compete with debt-friendly FP hospital systems.

The incentive to use debt to increase the value of the firm given the tax advantages is understood by bondholders that demand protection from the agency concerns raised by Jensen and Meckling (1976) where management has an incentive to take additional risks with debt to increase equity returns. Potential agency and tax benefits of debt has led to researchers investigating if there is an optimal capital structure that balances the costs and benefits of debt (Jalilvand & Harris, 1984). Researchers have argued on both sides using trade off and pecking order as sub-theories under the larger heading of Capital Structure Theory, which many academics agree involves balancing the tax advantages of debt against the present value of bankruptcy costs (Bradley et al., 1984).

This study relied on both trade off theory and pecking order theory of capital structure to explain the behavior of large health systems that experience the best financial performance. While not for profit hospital systems do not pay taxes, the direct benefit received through the ability to issue tax-exempt debt, directly to the market, provides these systems with the same benefits realized by their for profit peers. The Trade-Off between taking on this additional debt and the benefit received is one that is examined in the not for profit hospital system space where debt issuance has been well received by the market even at systems with non-investment grade credit ratings.

Trade Off Theory

Modigliani and Miller's (1963) irrelevance theorem in a tax free and frictionless world indicated that if there is an optimal capital structure it should reflect taxes or some specifically identified market imperfections (Myers, 1993). In turn, managers are placed in a position of identifying the tradeoff between the tax advantages of debt and the costs of financial stress caused by debt. As more debt is issued, the firm moves closer to a target set where managers feel comfortable with the tradeoff between the use and the costs of debt. The theory assumes that managers have a target and are reassessing this target regularly, adjusting their balance sheet accordingly. Healthy debate exists regarding the speed at which firms move back to a target, with some research estimating substantial changes in a defined time frame (Flannery & Rangan, 2006) while others have concluded that change occurs in a slow manner (Fama & French, 2002).

Pecking Order Theory

Pecking Order Theory is an alternative to Trade Off Theory, which highlights the preference of a firm to internally finance before seeking external sources. In the Pecking Order Theory, no well-defined target debt ratio exists. The attraction of interest tax shields and the threat of financial distress are assumed to be second-order (Myers, 1993). The four tenants of Pecking Order Theory, described by Myers (1984), include:

1. Dividend Policy is "sticky".
2. Firms prefer internal to external financing. However, they seek external financing if necessary to finance real investments with a positive net present value (NPV).

3. If firms do require external financing, they will issue the safest security first; that is, they will choose debt before equity financing.
4. As the firm seeks more external financing, it will work down the pecking order of securities, from safe to risky debt, perhaps to convertibles and other quasi-equity instruments, and finally to equity as a last resort.

The Pecking Order Theory explains several business practices, including why highly profitable firms with limited investment opportunities work down to a low debt ratio while firms whose investment opportunities outrun internally generated funds are driven to borrow more and more (Myers, 1993). Additionally, the Pecking Order Theory explains why stock prices fall when equity is issued (Myers & Majluf, 1984) while also differentiating internal (retained earnings) and external equity (stock issues), unlike Trade Off Theory, which generalizes equity (Myers, 1993).

Work focused on both Trade Off and Pecking Order Theories has shown that they are not necessarily mutually exclusive (Cotei & Farhat, 2009) and that there is no consensus around one of the two being superior to the other. While not for profit hospital systems value their bond ratings and may target a level of debt, they do not have the ability to issue equity. For profit hospitals that can issue equity prefer to use debt first and repurchase shares as opposed to issuing them. The heavy investment required in the hospital space, coupled with thin operating margins, requires these firms to carry higher levels of debt to capital as compared to other industries (Damodaran, 2018).

Conceptual Framework

Pecking Order Theory has received substantial support since Myers' (1983) initial work and even more attention since a follow up study by Shyam-Sunder (1999) in which strong statistical evidence indicated Pecking Order Theory was likely used more than Trade Off Theory by the large industrial firms studied. This work inspired Frank and Goyal (2003) to look deeper into smaller firms where they found greater support for Trade Off Theory.

The strength and size of hospitals differs greatly in the United States with the percentage of hospitals affiliated with a system growing to over 67% as of 2018 (AHA, 2020). Larger hospitals and system affiliated hospitals would in turn be more likely to utilize Pecking Order Theory, and all 142 reviewed hospital systems would fit this characterization. Furthermore, the inability of not for profit hospital systems to issue equity shares may also contribute to a greater reliance on debt as a funding mechanism, even if administrators tracked a target goal ratio as outlined by Trade Off Theory.

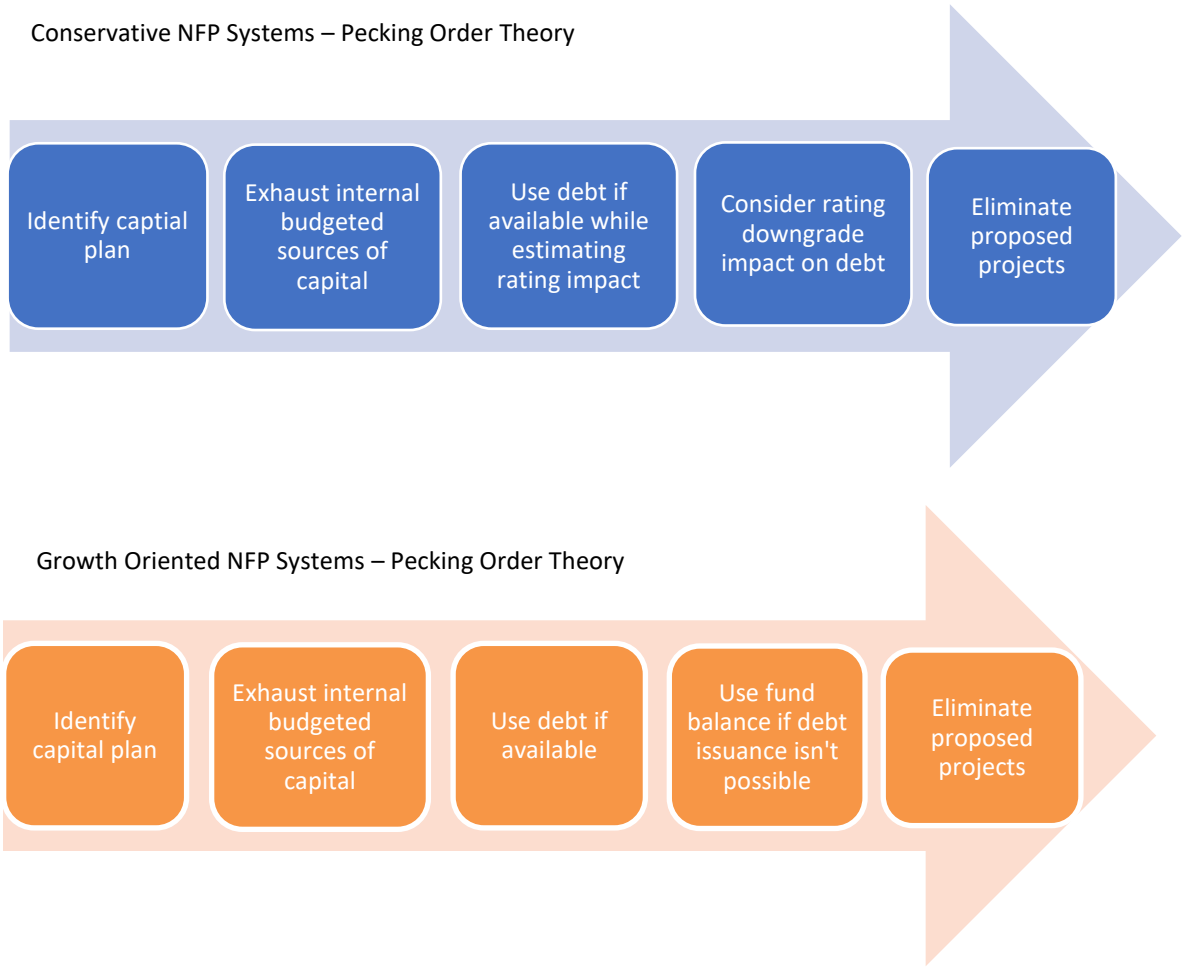
Wheeler et al. (2000) highlighted this struggle in their work which indicated that over half of hospital CFOs surveyed had difficulty achieving their capital structure targets. Three CFOs in their study stated they were as much as 10 points above their debt to capitalization targets, which supports Wedig's (1990) work that indicated not for profit hospitals will preserve equity capital given their inability to issue equity freely. The goal of maintaining cash to enhance bond ratings presents an interesting blend of these approaches within the hospital space.

Building upon this work, this study assessed the willingness of large, not for profit hospital systems to adapt either one or a blend of these theoretical approaches. The

growth of for profit systems and nontraditional competitors may be influencing more not for profit hospital systems to adopt Pecking Order Theory as the primary approach to growth financing as opposed to Trade Off Theory. This study focused on the behavior of not for profit hospital systems that have historically tried to balance the use of debt and the importance of credit ratings in their long-term planning in a shifting market that has demanded greater investment. Few studies have closely examined this relationship within the not for profit space, especially during the time period reviewed by this study, which offered narrow credit spreads and healthy equity market gains.

Figure 5

Conceptual Framework for Hospital Debt Use Decision



The blended model for not for profit hospital systems could be limiting margin expansion due to the focus on maintaining healthier leverage ratios in a debt market that is not rewarding the more conservative Trade Off approach. While overloading the business with debt could lead to bankruptcy risk, not for profits with strong access to debt markets should be willing to take on more debt even if their credit rating is impacted. Doing so would enable these firms to invest more freely in high returning projects while maintaining their assets in well performing equity markets.

Hypotheses

Capital Structure Theory asserts that a firm will try to optimize their mix of debt and equity by balancing the tax advantages of debt with the various leverage related costs (Bradley et al., 1984). Capital Structure Theory explains how some hospital companies have created value for shareholders through the expanded use of debt in an environment where both the flow of debt and the cost of debt favored borrowers since the stabilization of markets after the U.S. financial crisis.

Numerous reviewed studies (Cleverley & Baserman, 2005; Turner et al., 2015) have shown that for profit healthcare companies have, for many decades, been willing to take on additional leverage when compared to their not for profit counterparts. These same studies have shown that for profit firms have had higher levels of return on investment and equity (Cleverley, 1990, 2005; Sloan et al., 1988; Valvona & Sloan, 1988) as compared to the same segment of not for profit competitors. The correlation between the profitability of a hospital firm and its willingness to take on more debt has been discussed, but rarely tested by researchers.

The environment for doing so has been volatile given the impact of legislation, including but not limited to the Balanced Budget Act of 1997 and the passage of the Patient Protection and Affordable Care Act in 2010. Legislation coupled with financial instability including the recessions experienced in 2001 and The Great Recession from December 2007 to June 2009 have made studying the impact in a stable environment challenging.

Since 2010, the U.S. economy has been expanding and unemployment has been decreasing with rates falling from 9.8% on January 1, 2010 to 3.6% on January 1, 2020 (U.S. Bureau of Statistics, 2020). Increased employment and stable debt markets have

allowed hospitals to invest in their operations while realizing strong total margins, even as operating margins struggled to expand (White, 2018). Equity market appreciation has aided hospitals that maintain large fund balances with the S&P 500 realizing strong gains increasing by nearly 290% from 2010 to 2019 (Butler, 2020). These returns led to significant increases in total margin for hospitals even with operating margins falling from 2015 through 2017 (Paavola, 2019).

While rural hospitals with limited fund balances have not realized the same benefit, large, not for profit hospital systems should have capitalized on this opportunity with the S&P 500 returning 9.54% in 2016 and 19.42% in 2017 (Butler, 2020). While the S&P 500 returns in 2015 were flat, that year was the strongest for not for profit hospital systems in terms of operating margin for the period including 2015, 2016, and 2017. With interest rates being at stable and all-time low levels, using the target Federal Funds Rate as a proxy, the opportunity to use capital structure theory to enhance overall returns within an organization was ideal.

Therefore, equity market returns, falling unemployment, and low and stable interest rates may contribute to increasing total margin and non-operating margins while EBIDA margins would not be impacted to the same extent, such that:

H1: Hospital systems that had higher long-term debt to capitalization ratios for each year including 2015, 2016 and 2017, reported higher total margins as compared to those that used more equity in their capital expenditure funding model.

H2: Hospital systems that used higher levels of long-term debt to capitalization ratios for each year including 2015, 2016 and 2017, reported higher non-operating margins as compared to those that used more equity in their capital expenditure funding model.

CHAPTER 3

METHODS

Overview

The purpose of this section is to examine the relationship between the expansion of debt and the impact on both total and non-operating margin among large not for profit health systems. This chapter outlines the approach and analyses used to assess the relationship between debt usage and income. The intent of this study was to test two hypotheses that examine the relationship between higher debt levels and not for profit hospital system margins. One of these hypotheses examined the relationship between debt and total profitability measured through total margin while the other focused on the relationship between debt and non-operating income. The study also tested the relationship between hospital margins, and both return on assets and days of cash on hand (DCOH).

Research Context

An ideal study on the impact capital structure has on both non-operating and total margin performance would investigate all hospital systems serving the same market with the same payor mix and same capital expenditure investment plan and compare the impact capital structure has on both non-operating and total margin. Given each hospital system operates differently, invests differently in property plant and equipment, and very few maintain the same share in a specified market, a wider view of health systems should

be considered. Previous studies have focused on for profit vs. not for profit status of hospitals when reviewing performance, but very few have examined the impact that capital structure has on hospitals using audited financial statements within the not for profit segment. Additionally, a limited number of studies have examined the performance within specific credit ratings assigned by Moody's, Standard and Poor's (S&P) or Fitch.

An alternative approach to a study is to utilize a segment of hospital systems that are examined by one of these agencies over multiple years. The disadvantage of only using a segment is that it cannot provide a full picture of the entire hospital market. The advantage of using this approach is that one can focus on a specific segment of hospital systems and obtain system-specific financial information that provides a more precise measurement of the relationship. This study examined 142 not for profit hospital systems that were rated by S&P in 2015, 2016, and 2017 and provided financial information, available to investors, through audited financial statements over that time.

Study Participants

The study examined the consolidated financial statements, at the highest level, for 142 not for profit hospital systems rated by S&P. Total margin, EBIDA margin, operating margin, and non-operating margin were calculated and included in the study to review financial performance at each entity. Long-term debt to capitalization was calculated and included in the study as well as return on assets, days of cash on hand and capital expenditures. Each of these ratios was calculated using the audited financial statements of the entity obtained through the Electronic Municipal Market Access (EMMA) system, operated by the Municipal Securities Rulemaking Board (MSRB), which serves as the

official source for municipal securities disclosures and related market data in the United States. The not for profit hospitals included are listed in Table 1 (see Appendix A).

IRB Approval

The Institutional Review Board (IRB) of the University of Alabama at Birmingham reviewed and approved the research. The study included the analysis of publicly available information at the health system level, allowing for the Institutional Review Board to deem the study exempt from human subjects research review (see Appendix B).

Data Sources and Sample

After receiving IRB approval, the financial data for each of the 142 not for profit hospital systems were identified and entered into Excel using 2015, 2016, and 2017 audited financial statements. The numbers were then used to calculate each of the ratios identified below. For each of the years there were some data gaps, which reduced the full number of observations over the three-year review period. In some cases, reorganization was the cause of these data limitations. In other cases, limitations were due to the lack of reporting of days of cash on hand and capital expenditure metrics.

Observations were taken from the final audit posted by each organization through EMMA. For consistency, all government health systems were excluded as well as any specialty hospital systems where margins may be influenced heavily by the procedures being completed. Private hospital companies were excluded if their financial information was not readily available, and any mergers that impacted more than one year of financial

data were also excluded from the study. The data were reviewed at the consolidated parent level for each firm. The numbers required to calculate operating, non-operating, and total margin were obtained from the income statement of each hospital system with the debt and equity numbers being pulled from the balance sheet of each entity. Capital expenditures were included from the cash flow statement of the hospital systems, and both days of cash on hand and return on assets were calculated by using information from income and balance sheet statements.

Data Analysis

The analysis included two dependent variables, one independent variable, and two control variables, all of which are included in Table 2.

Dependent Variable – Total Margin

Total margin, or total margin, is a measurement of an organization's financial health. It is calculated using the financial information from a hospital's income statement and by subtracting expenses from revenues and then calculating a percentage based on the total revenue of the hospital. Revenues and expenses for inpatient, outpatient, and non-patient care activities are included in the calculation, which totals all margin dollars and then divides those by total revenues.

Each of the values used in the study were derived from the audited financial statement from each hospital included in the study. These values were calculated in Excel over the three-year period including 2015, 2016, and 2017.

Dependent Variable – Non-Operating Margin

Non-operating margin in the not for profit hospital segment are concentrated in financial investments (Singh & Song, 2013). Investment income for NFP hospitals is a key driver of total margin given the significant reserves these hospitals maintain in marketable securities. In addition to investments, non-operating income includes charitable giving, which can be a driver of profitability for not for profit hospitals. The values were calculated in Excel and were placed into Excel as a percentage for the three-year period including 2015, 2016, and 2017.

Independent Variable – Long-term Debt to Capitalization

Long-term debt to capitalization ratio was the independent variable of the study. Long-term debt to capitalization ratio is a financial leverage metric that measures the degree to which a company is financing its operation through debt versus wholly owned funds considered equity. The calculation divides total liabilities by net assets, with some modifying this approach to review only long-term liabilities. Analysts and creditors use the metric widely when reviewing the performance and viability of health systems.

While lenders and analysts may consider lower long-term debt to capitalization ratios as better metrics, the capital markets have placed less value on the calculation over time when lending to hospitals in the not for profit segment. In this study, long term debt to capitalization ratio was calculated by dividing long term debt by net assets without donor restrictions plus total long term debt.

Control Variables – Return on Assets and Days of Cash on Hand

The study controlled for variables including the cash balances of an organization during the review period, measured through days of cash on hand as well as the efficiency in which hospitals utilize their assets, measured through return on assets.

Days of cash on hand measures the amount of unrestricted cash a not for profit hospital system has available to pay daily expenses. When determining the amount of operating expenses, one must use the operating expenses subtotal in the income statement and subtract all non-cash expenses (usually depreciation and amortization). That number is then divided by 365 to determine the amount of cash outflow per day, and then the per day is divided into the total amount of cash on hand. Days of cash on hand was selected as a control variable to limit the impact higher cash balances could have on non-operating gains and in turn overall financial performance.

Return on assets is calculated by dividing the net income of a firm by total assets. The higher the ROA, the better the company is at using assets efficiently. ROA was selected as a control variable in an attempt to isolate the non-operating gains that could be realized through the use of capital structure as opposed to operating gains that would be a result of a NFP system using their assets more efficiently to increase returns.

Table 2

Summary Table of Measures

Measure	Type	Description	Format
Non-Operating Margin	Dependent Variable	Margin realized on non-operating activities	Continuous
Total Margin	Dependent Variable	Total Margin realized by a firm including non-operating income	Continuous
LT Debt to Cap Ratio	Independent Variable	A measurement of a firm's financial leverage. Calculated by dividing long term debt by net assets, without donor restrictions, plus total long term debt	Continuous
Return on Assets	Control Variable	Total margin divided by the average of assets over the 3 study years	Continuous
Days of Cash on Hand	Control Variable	Dividing unrestricted cash and cash equivalents by the system's average daily cost of operations, excluding depreciation	Continuous

Statistical Analysis Strategy

STATA 17 was used to analyze the data. Descriptive statistics (univariate) were used to review the distribution of each variable to look for errors, outliers, or missing values in the data. The data were analyzed in STATA to determine if there were any single observations that were unusual or had an overly influential impact. Outliers of more than three standard deviations in the areas of total margin and non-operating margin were excluded from the study as well as any hospital data in which values being reviewed were missing. Ordinary least squares regression analysis was then administered with both total margin and non-operating margin representing the outcome, in hypothesis one and hypothesis two, with long-term debt to equity ratio being the independent predictor. Each of the regression analyses controlled for days of cash on hand and return on assets.

The estimated regression model was:

$$Y = b_0 + b_1X_1 + b_2X_2 + \cdots + b_kX_k$$

The model expressed with variable names was:

Total Margin = $b_0 + b_1(Long\ Term\ Debt\ to\ Capitalization) +$

$b_2\ (Retun\ on\ Assets) +\ b_3(Days\ of\ Cash\ on\ Hand)$.

Non-Operating Margin = $b_0 + b_1(Long\ Term\ Debt\ to\ Capitalization) +$

$b_2\ (Retun\ on\ Assets) +\ b_3(Days\ of\ Cash\ on\ Hand)$.

In addition to the two regression analyses, two independent samples t-tests were run for each of the three years reviewed after separating the hospital groups into two credit rating classifications. The t-tests compared the means of non-operating income and capital expenditures for each of the two groups. The first classification of hospitals included all those that had a S&P credit rating lower than AA-, whereas the second classification of hospitals included all facilities with an AA- rating or higher. Outliers that exceeded three standard deviations of non-operating margin returns were excluded, consistent with the approach taken in the regression analysis.

CHAPTER 4

RESULTS

The purpose of this chapter is to present the findings from the data analysis used to examine the relationship between margins (total and non-operating) and long-term debt to capitalization. More specifically, this section provides the detailed actions taken and the results realized from each of the ordinary least square linear regressions and t-tests run in STATA 17. A description of the data, unusual and influential observations, and an explanation of the exclusion of outliers is also detailed in this chapter.

Sample Characteristics

Each year of the study (2015, 2016, 2017) included the same 142 not for profit hospitals rated by S&P. In 2015, 17 observations were missing days of cash on hand information and four observations were missing long-term debt to capitalization, total margin, non-operating margin data, as well as the information needed to calculate return on assets. For 2016, nine health systems observed were missing days of cash on hand information with the remaining data being intact. In 2017, 11 days of cash on hand calculations were missing along with the margin and return on assets information for one health system. Capital expenditure expense was included for the independent samples t-test for 2016 and 2017 but was excluded in 2015. In 2017, there was one capital expenditure value missing from the data set, and in 2016 capital expenditure expense was included for all 142 observations.

Descriptive Statistics

Focusing on total margin, non-operating margin, and long-term debt to capitalization, there were a total of 138 observations with complete data in 2015, 141 observations in 2016, and 142 observations in 2017. The mean for non-operating margin was -1.26% in 2015, 1.15% in 2016, and 4.52% in 2017. Total margin over the same period was 4.79% in 2015, 4.73% in 2016, and 7.59% in 2017. Long-term debt to capitalization had less variability and was 37.7% in 2015, 37.5% in 2016, and 35.5% in 2017.

When reviewing Days of Cash on Hand for the same three-year period, there were 125 observations in 2015 with an average of 233 days, 133 observations in 2016 with an average of 227 days, and 131 observations in 2017 with an average of 236 days of cash on hand. The mean for Return on Assets over the same period was 4.1% in 2015 for 138 observations, 1.8% in 2016 for 142 observations, and 1.0% in 2017 for 141 observations.

Table 3

Descriptive Statistics

Year	Total Margin	Non-Operating Margin	LT Debt / Capitalization	Days of Cash on Hand	Return on Assets
2015	4.79	-1.26	37.7	233	4.1
2016	4.73	1.15	37.5	227	1.8
2017	7.59	4.52	35.5	236	1.0

Test of Assumptions of Ordinary Least Squares Linear Regression

Review of the data using graphing in STATA displayed outliers for both total and non-operating margin. Outliers of greater than three standard deviations in either direction from the mean, for both margin variables, were excluded resulting in one less observation in 2015, three fewer observations in 2016, and three fewer observations in

2017. Once these observations were removed, six separate regression analyses were conducted to examine the relationship between both margin variables (total margin, non-operating margin), long-term debt to capitalization, return on assets, and days of cash on hand for each year (2015, 2016, 2017). The results of each of the analyses are presented in Tables 4-9.

The results of the regression analysis in 2015 showed no significance between total margin and long-term debt to capitalization, but a significant and positive relationship did exist between total margin and for both days of cash on hand and return on assets. While significance between total margin and long-term debt to capitalization was not present, there was a positive relationship between the two variables in 2015, which is different from the findings in 2016 and 2017.

Table 4

Total Margin 2015

TotalMargin	Coefficient	Std. err.	t	P > | t |	[95% conf.	interval]
Longtermdebtcapitalization	.0098032	.0269172	0.36	0.716	-.0434911	.630975
Dayscashonhand_int	.000222	.0000517	4.30	0.000	.0001198	.0003243
ROA	.5426925	.1576495	3.44	0.001	.2305574	.8548276
_cons	-.0254566	.0194665	-1.31	0.193	-.0639989	.0130856

F(3,120) = 12.28 *R=Squared = 0.2348* *Adjusted R-Squared = 0.2157*

In 2016, total margin and long-term debt to capitalization were significantly associated, but the relationship did not support H1 as the relationship between the two were negatively correlated. For each percentage point increase in long-term debt to capitalization, total margin decreased by 0.0317 percentage points. Like in 2015, days of cash on hand was positively correlated with total margin and return on assets showed a

strong relationship with a one unit increase in return on assets resulting in a 1.3528 percentage point increase in total margin.

Table 5

Total Margin 2016

TotalMargin	Coefficient	Std. err.	t	P > | t |	[95% conf.	interval]
Longtermdebtcapitalization	-.0317369	.0143521	-2.21	-0.029	-.0601394	-.0033344
Dayscashonhand_int	.0001487	.0000308	4.82	0.000	.0000877	.0002098
ROA	1.352833	.1349687	10.02	0.000	1.085734	1.619932
_cons	-.0003621	.0106523	-0.03	0.973	-.0214427	.0207184

F(3,126) = 57.63 *R=Squared = 0.5785* *Adjusted R-Squared = 0.5684*

The results for 2017 showed an even stronger significant relationship between total margin and long-term debt to capitalization, but as reviewed in 2016, the relationship was negatively correlated and did not support H1. For each percentage point increase in long-term debt to capitalization, total margin decreased by 0.03443 percentage points while a one unit increase in days of cash on hand resulted in an increase in total margin by 0.00024 percentage points. Return on assets was once again strongly and positively correlated with a one percentage point increase in the measurement resulting in 2.6780 percentage points increase in total margin.

Table 6

Total Margin 2017

TotalMargin	Coefficient	Std. err.	t	P > | t |	[95% conf.	interval]
Longtermdebtcapitalization	-.0344384	.0131033	-2.63	0.010	-.0603735	-.0085032
Dayscashonhand_int	.0002464	.0000286	8.62	0.000	.0001898	.0003029
ROA	2.678011	.246937	10.84	0.000	2.189253	3.166768
_cons	.0017042	.0099458	0.17	0.864	-.0179813	0.213897

F(3,124) = 97.98 *R=Squared = 0.7033* *Adjusted R-Squared = 0.6961*

When replacing total margin with non-operating margin the results of the regression analysis for 2015 showed no significant relationship between non-operating margin and long-term debt to capitalization. The relationship between total margin and long-term debt to capitalization did move in tandem but not with statistical significance. Days of cash on hand had a positive and significant relationship with a one unit increase resulting in non-operating margin moving 0.00012 percentage points. A significant relationship also existed between non-operating income and return on assets with a one percentage point movement in return on assets resulting in -0.75398 percentage points movement in non-operating margin.

Table 7

Non-Operating Margin 2015

no_op_margin	Coefficient	Std. err.	t	P > | t |	[95% conf.	interval]
Longtermdebtcapitalization	.0067224	.0263286	0.26	0.799	-.0454064	.0588512
Dayscashonhand_int	.0001284	.0000505	2.54	0.012	.0000284	.0002284
ROA	-.7539883	.1542019	-4.89	0.000	-1.059297	-.4486793
_cons	-.0047417	.0190408	-0.25	0.804	-.0424411	.0329577

F(3,120) = 9.49 *R=Squared = 0.1918* *Adjusted R-Squared = 0.1716*

In 2016, non-operating margin and long-term debt had a weak but statistically significant relationship with a one percentage point increase in long-term debt to capitalization resulting in a -0.02820 percentage point movement in non-operating margin, which did not support H2. Days of cash on hand and return on assets had a significant relationship with non-operating margin with a one unit increase in days of cash on hand moving non-operating margin in a slightly positive direction (0.00010 percentage points) and a one percentage point increase in return on assets resulting in a -0.51265 percentage point move non-operating income.

Table 8

Non-Operating Margin 2016

no_op_margin	Coefficient	Std. err.	t	P > | t |	[95% conf.	interval]
Longtermdebtcapitalization	-.0282037	.0137896	-2.05	0.043	-0.554929	-.0009145
Dayscashonhand_int	.0001003	.0000296	3.39	0.001	.0000417	.0001589
ROA	-.5126506	.1296785	-3.95	0.000	-.7692805	-.2560207
_cons	.0080267	.0102347	0.78	0.434	-.0122276	.0282809

F(3,126) = 12.78 *R=Squared = 0.2333* *Adjusted R-Squared = 0.2150*

The results for 2017 showed a strong and statistically significant relationship between non-operating margin and long-term debt to capitalization. For every percentage point increase in long-term debt to capitalization, non-operating margin moved down by 0.03316 percentage points, which did not support H2. Days of cash on hand also showed a significant relationship, with a one unit move in the metric increasing non-operating margin by 0.00019 percentage points, while return on assets was negatively correlated with a relationship that was not significant.

Table 9

Non-Operating Margin 2017

no_op_margin	Coefficient	Std. err.	t	P > | t |	[95% conf.	interval]
Longtermdebtcapitalization	-.0331602	.012655	-2.62	0.010	-.058208	-.0081123
Dayscashonhand_int	.0001924	.0000276	6.97	0.000	.0001378	.000247
ROA	-.0748875	.2384889	-0.31	0.754	-.5469238	.3971489
_cons	.0111042	.0096055	1.16	0.250	-.0079078	.0301162

F(3,124) = 31.72 *R=Squared = 0.4342* *Adjusted R-Squared = 0.4206*

Independent Samples T-Test

To evaluate the differences in non-operating margin within the 142 selected hospital systems, an independent samples t-test was performed between two groups. All hospital systems within the 142 selected were separated by S&P credit rating with the systems rated in the top 1/3 of ratings (AA- or better) being assigned to one group and all

those with a lower rating (AA- or lower) assigned to a second group. To remain consistent with the regression analyses, returns of three standard deviations or more were considered outliers and removed from the data set. The results from each test are included in Tables 10-12.

Table 10

Non-Operating Margin 2015

Group	Observations	Mean	Std. err.	Std. dev.
Rated lower than AA-	74	.000428	.0051561	.0443548
Rated AA- or Better	63	.0032519	.0074148	.058853
Pr (T > t) = 0.7497				

Table 11

Non-Operating Margin 2016

Group	Observations	Mean	Std. err.	Std. dev.
Rated lower than AA-	77	.0042053	.0031301	.0274663
Rated AA- or Better	62	.0169111	.0043616	.0343432
Pr (T > t) = 0.0167				

Table 12

Non-Operating Margin 2017

Group	Observations	Mean	Std. err.	Std. dev.
Rated lower than AA-	76	.0287277	.0033727	.0294024
Rated AA- or Better	62	.0584146	.0038248	.0301165
Pr (T > t) = 0.0000				

In each of the three independent sample t-tests, homogeneity of variances was assumed, a random sample was selected, and no relationship existed between the two groups. The results indicated that health systems with an AA- or better credit rating

realized higher returns than those with a rating of AA- or lower. While the results for 2016 and 2017 were statistically significant, the results for 2015 did not show a significant result. The results from 2016 and 2017 indicated that health systems rated AA- or better realize higher non-operating returns of 1.27% in 2016 and 2.97% in 2017, on average.

Independent sample t-tests on the same hospital systems were also run on capital expenditures for 2016 and 2017, separating the hospital systems into two groups by credit rating. The results are included in Tables 13 and 14 below. In each of the independent sample t-tests, homogeneity of variances was assumed, a random sample was selected, and no relationship existed between the two groups. All hospital systems that held a credit rating of AA- or higher were included in one group while those with a rating lower than AA- were separated into a second group. Both t-tests showed a significant result with those in the AA- or better classification investing more than 111.62 units more than the health systems with a rating lower than AA-. In 2017, the difference was even greater with health systems rated AA- or higher investing 248.23 units more on average than hospital systems rated lower than AA-.

Independent samples t-Tests were also run to determine if there was a relationship between hospital size and non-operating margin, by splitting the 142 hospital systems into two groups by size. The first group included of hospitals included all systems that have more than ten (10) hospitals within their network while the second included all systems with less than ten (10) hospitals. The split placed nearly 40 percent of the hospital systems in the category with ten (10) or more facilities and no relationship was found using this differentiator.

Table 13

Capital Expenditures 2016

Group	Observations	Mean	Std. err.	Std. dev.
Rated lower than AA-	77	234.2532	29.19298	256.1674
Rated AA- or better	62	345.8706	50.92948	401.0192
Pr (T > t) = 0.0485				

Table 14

Capital Expenditures 2017

Group	Observations	Mean	Std. err.	Std. dev.
Rated lower than AA-	78	230.8323	29.01863	256.285
Rated AA- or better	64	479.0667	130.7693	1046.154
Pr (T > t) = 0.0448				

Summary

This chapter presented results from analyses that did not support the two hypotheses of the study.

H1: Hospital systems that had higher long-term debt to capitalization ratios for each year including 2015, 2016 and 2017, reported higher total margins as compared to those that used more equity in their capital expenditure funding model.

Results indicated that in 2016 and 2017 hospital systems that had lower long-term debt to capitalization realized higher total margins. Given these results for each year, hypothesis 1 is not supported.

H2: Hospital systems that used higher levels of long-term debt to capitalization ratios for each year including 2015, 2016 and 2017, reported higher non-operating margins as compared to those that used more equity in their capital expenditure funding model.

Once again results indicated that in 2016 and 2017 hospital systems that had lower long-term debt to capitalization realized higher non-operating margins. Given these results for each year, hypothesis 2 is not supported.

Additionally, t-tests indicated that there was a statistical difference between the means of non-operating income realized by not for profit hospital systems. Hospital systems rated AA- or higher produced higher non-operating margins and spent more on capital expenditures as compared to the group of hospital systems with a rating lower than AA-.

CHAPTER 5

DISCUSSION AND CONCLUSION

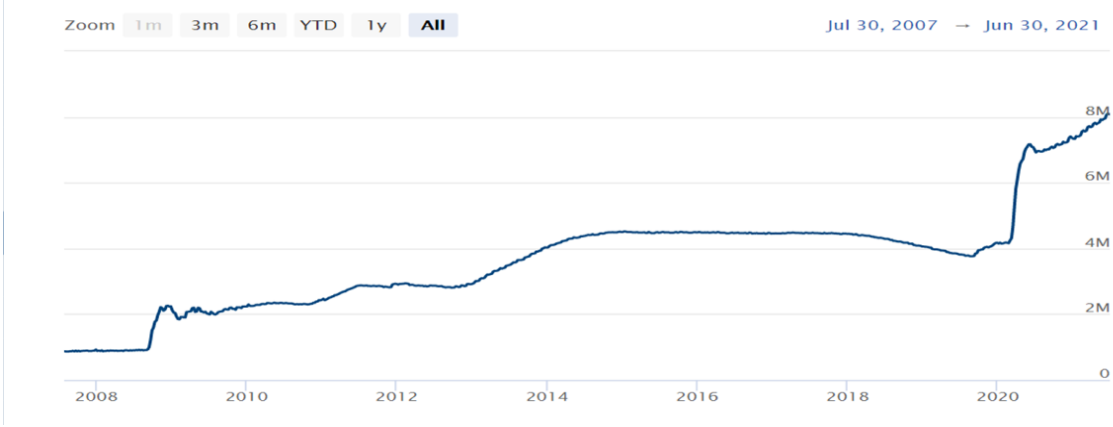
Introduction

Since the financial crisis of 2008, the Federal Reserve Board of the United States has maintained a policy of low interest rates and higher money supply, leading to an expansion of the Federal Reserve Balance Sheet, through asset purchases, highlighted in Figure 6. These purchases have been a factor in holding borrowing rates at historically low levels while equity markets, as measured by the S&P 500 index, have consistently risen since this *easy monetary policy* has been adopted. Since 2009, the S&P 500 index has only experienced an annual decrease of more than 1% one time. Strong equity performance coupled with historically low interest rates has presented not for profit hospital systems with an opportunity to realize arbitrage between their investments and the rate at which they borrow. Not for profit hospital systems typically maintain sizeable investment portfolios and have the ability to borrow at low tax-exempt rates, but their historically conservative nature is limiting their ability to capitalize during a time when both interest rates and interest spreads have continued to decrease. Researchers have identified this opportunity and advantage of not for profits over the years (Wedig et al., 1996), but very few have found a direct correlation between the ability to lever up and the willingness to do so by hospital administrators.

Equity markets can decrease in value, negatively impacting non-operating and total margins, but the S&P 500 index has increased more than 400% since 2008 with only three years of break even or worse performance from 2009 to 2020. Healthy market returns and very low historical hospital margins led to 38 hospital systems in the study showing higher non-operating margins than margins from operations in 2017 alone. While the opportunity exists to take advantage of the arbitrage gap by borrowing tax-exempt dollars to the fullest extent of the project financing rule (Wedig et al., 1996) and investing those dollars in equity markets, this study indicated that hospital administrators have been reluctant to utilize their capital structure to the fullest extent.

Figure 6

Federal Reserve Balance Sheet Balance



Source: Federal Reserve

Summary of Findings

The aim of this study was to show that not for profit hospital systems that increased their use of low cost debt, to maintain strong endowments invested in high

returning equity markets, would have higher total and non-operating margins than their peers. Surprisingly, the opposite relationship was found in this study. In both 2016 and 2017, health systems that maintained lower long-term debt to capitalization ratios showed a statistically significant relationship with higher total and non-operating margin performance. The result was surprising given the S&P 500 had outsized returns by increasing 9.54% in 2016 and 19.42% in 2017. As outlined in Figure 2 this increase in the equity market returns occurred as debt rates hit an eight-year low in 2016 and a similar, albeit slightly higher, level in 2017. The ability to lever up using low cost debt and invest in higher returning equity markets was ignored, even after an exceptional string of strong returns in the market. Markets can decrease and this risk may have impacted the willingness of hospital administrators to take advantage of these conditions, even with the S&P index showing positive gains every year since 2008 when dividends are taken into consideration.

Using linear regression, this study showed that that the relationship between total margin and long-term debt to capitalization strengthened as the index performed better. This same relationship was found when examining the relationship between non-operating margin and long-term debt to capitalization ratio suggesting healthier hospital systems invested more effectively even without taking on additional debt. While most large hospital systems maintain significant portions of their endowments in the equity markets, this study may also suggest that hospital systems that perform better on an operating basis may also be willing to take on a heavier mix of stocks vs. bonds in their portfolios.

To further investigate the relationship between hospital systems with lower debt to capitalization ratio and non-operating margins, independent samples t-tests were run between two groups of hospital systems. Hospital systems rated in the top one-third of ratings displayed a significant relationship between non-operating and total margin realization, which increased as the performance of the equity markets improved. Hospital systems with higher ratings did not show this same significance when the markets performed poorly, pointing back to the possibility that their investment mix was heaver weighted to the equity markets as opposed to more conservative bond markets.

In an environment where publicly traded companies like Microstrategy and Tesla are now investing their cash reserves in Bitcoin (Phillips & Graves, 2021), to hedge against inflation and realize increases in asset valuations, the opportunity exists for not for profit hospital systems to take a similar path. Concurrently, junk bond returns have fallen below inflation for the first time on record (Verlaine, 2021) showing the strong market demand for debt even at the riskiest levels. Not for profit hospital systems are missing an opportunity to expand their balance sheets and reap the returns that have existed for the last 13 years.

In addition to non-operating margin, the same relationship was found when examining the capital expenditure investments between credit tiers with the health systems in the higher one-third of credit ratings investing more than those in the lower credit tier, suggesting that stronger hospitals both invested more and realized higher non-operating gains than their lower rated peers.

The increase in capital expenditures as non-operating margin increases has been investigated by previous researchers (Adelino et al., 2015) as has the importance of non-

operating revenues to not for profit hospital systems (Singh & Song 2013). This study found that both metrics were stronger when the credit rating of a system was higher, providing larger and stronger hospital systems with more resources than their lower rated peers. The purpose of this study was to evaluate the relationship between total and non-operating margin and long-term debt to capitalization ratio and to determine if not for profit hospital systems were taking advantage of their ability to borrow at a low cost and earn higher returns through financial investments. While all hospitals in the study benefited when market returns increased, those with lower debt to capitalization ratios benefited more.

One additional interesting finding was that return on assets maintained a positive relationship with total margin, but a negative relationship with non-operating margin in the study when significance was identified. This was different than days of cash on hand, which remained a positive relationship with both margin measures, which increased as margins increased.

Significance of Findings

Results from this study may help hospital administrators, financial advisory firms, and lending companies in many ways. Understanding the current market dynamics and the importance of non-operating margin for not for profit hospital systems will contribute to the long-term strategic planning for these systems. While many health systems maintain large endowments, some take a very conservative approach to investments by holding large sums of cash and low risk assets like bonds. Study results may support

hospital administrators and advisory firms that would consider holding more equities than their historical approach.

The study will contribute to the literature to help hospital administrators and lending institutions understand the risks associated with taking on more debt and the potential impact an increase in non-operating income could have on both investment and overall profitability. Understanding the risks of additional debt balanced with the importance of non-operating income could impact the time spent by health system leaders targeting an ideal capital structure.

Limitations

There are several limitations that should be considered when interpreting the study findings. First, there are issues that may limit the ability to generalize the results given that the number of hospital systems chosen only represent a fraction of the hospitals in the United States. Additionally, only hospital systems were reviewed in this study as compared to all hospitals, including independent facilities, providing an opportunity for future studies to include these entities.

Furthermore, the hospital systems in the study were selected based on the availability of their financial information and not by credit tier or the market they serve (urban vs. rural), which presents an opportunity for future studies. Finally, the difficulty in obtaining accurate and standardized payor mix information limited the ability to control for this factor, which could have a large impact on total margin and long-term debt to capitalization ratio.

Conclusion

This study found that health systems with less debt realized higher total and non-operating margin returns even in an environment where debt is inexpensive, credit spreads are very tight, and returns in the equity markets are high. While there is always a risk that equity markets can decrease and be a drag on the overall performance of a health system, there is also an opportunity for health systems to use their balance sheets to take advantage of the arbitrage opportunity that could exist by borrowing at low tax-exempt rates and realizing higher equity market returns through their financial investment portfolios.

Future studies may investigate the impact the COVID-19 Accelerated and Advance Payments Program (CAAP) had on the non-operating income of not for profit health systems that received these funds and in turn maintained higher than typical balances in their endowments. The program, which provided Medicare Part A participants with $100B of accelerated and advance payments, with the bulk going to hospitals, did not require payback of these funds for twelve months. The program was authorized on March 28, 2020 and since that date the S&P 500 Index increased over 70% through year end 2020. Not for profit hospital systems that stabilized their operations and took advantage of the performance in the equity markets should have realized significant non-operating gains in a year of crisis.

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APPENDIX A

TABLE 1 NOT FOR PROFIT HEALTH SYSTEMS INCLUDED IN THE STUDY

Table 1

Not for Profit Health Systems Included in the Study

Obligor	State
AdventHealth	FL
Adventist Health System/West	CA
AHS Hospital Corporation	NJ
Allegheny Health Network	PA
Allina Health	MN
Ascension Health Alliance	MO
Aspirus	WI
Atrium Health	NC
Avera Health	SD
Banner Health	AZ
Baptist Health	AR
Baptist Health South Florida	FL
Baptist Health System	FL
Baptist Memorial Health Care Corporation	TN
Baylor Scott & White Health	TX
Baystate Medical Center	MA
Beaumont Health	MI
BJC HealthCare	MO
Carilion Clinic	VA
Carle Foundation	IL
Catholic Health Services of Long Island	NY
Catholic Health System	NY
Centra Health	VA
Christiana Care Health System	DE
CHRISTUS Health	TX
Cleveland Clinic Health System	OH
Community Health Network	IN
Cone Health	NC
Covenant Health	TN
Dartmouth-Hitchcock	NH
Duke University Health System	NC
Essentia Health Obligated Group	MN
Fairview Health Services	MN
Franciscan Missionaries of Our Lady Health System	LA
Froedtert Health	WI
Geisinger Health	PA
Gundersen Lutheran	WI
Guthrie Clinic	PA
Hackensack Meridian Health	NJ
Hartford HealthCare	CT
Health First	FL
Henry Ford Health System	MI
Hospital Sisters Services	IL

Houston Methodist Hospital	TX
Indiana University Health	IN
Inova Health System Foundation	VA
INTEGRIS Health	OK
Intermountain Health Care	UT
Johns Hopkins Health System	MD
Kaiser Foundation Hospitals (Kaiser Permanente)	CA
Kettering Health Network	OH
Legacy Health	OR
Lehigh Valley Health Network	PA
LifeBridge Health	MD
Lifespan	RI
Loma Linda University Medical Center	CA
Louisiana Children's Medical Center	LA
Main Line Health System	PA
MaineHealth	ME
Marshfield Clinic	WI
Mayo Clinic	MN
MedStar Health	MD
Memorial Health Services	CA
Memorial Health System	IL
Memorial Hermann Healthcare System	TX
Mercy Health	MO
Methodist Hospitals of Dallas	TX
Methodist Le Bonheur Healthcare	TN
MidMichigan Health	MI
Montefiore Health System	NY
Mount Sinai Hospital Obligated Group	NY
MultiCare Health System	WA
Nebraska Methodist Health System	NE
North Broward Hospital District	FL
North Mississippi Health Services	MS
Northeast Georgia Health System	GA
Northern Light Health	ME
NorthShore University Health System	IL
Northwell Health	NY
Northwestern Memorial HealthCare	IL
Norton Healthcare	KY
Novant Health	NC
NYU Langone Hospitals	NY
Ochsner Health	LA
OhioHealth	OH
Orlando Health	FL
OSF Healthcare System	IL
Parkview Health System	IN
Partners Healthcare System	MA
PeaceHealth	WA
Piedmont Healthcare	GA
Presbyterian Healthcare Services	NM
ProMedica Health System	OH
Providence St. Joseph Health	WA

Rochester General Hospital	NY
Rush University System for Health	IL
RWJ Barnabas Health	NJ
Saint Luke's Health System	MO
Samaritan Health Services	OR
Sanford Health	SD
Scripps Health	CA
Sentara Healthcare	VA
Sharp Healthcare	CA
Sisters of Charity of Leavenworth Health System	CO
South Broward Hospital District	FL
Southcoast Health System	MA
Sparrow Health System	MI
Spartanburg Regional Health Services District	SC
Spectrum Health System	MI
SSM Health Care System	MO
St. Elizabeth Medical Center	KY
St. Francis Health System	OK
St. Luke's Health System	ID
St. Lukes University Health Network	PA
Sutter Health	CA
SwedishAmerican Hospital	IL
Texas Children's Hospital	TX
Texas Health Resources	TX
Thomas Jefferson University	PA
Tower Health	PA
TriHealth	OH
Trinity Health Credit Group	MI
UMass Memorial Health Care	MA
University Hospitals	OH
University of Colorado Health	CO
University of Kansas Health System	KS
University of Maryland Medical System	MD
University of North Carolina Hospitals	NC
University of North Carolina Rex Healthcare	NC
University of Pennsylvania Health System	PA
University of Pittsburgh Medical Center	PA
University of Vermont Medical Center	VT
Valley Health System Obligated Group	VA
Vidant Health	NC
Virtua Health	NJ
Wake Forest Baptist Medical Center	NC
Wellforce	MA
WellStar Health System	GA
West Virginia University Health System	WV
Westchester County Health Care Corporation	NY
Willis-Knighton Health System	LA
Yale New Haven Health	CT

APPENDIX B

UNIVERSITY OF ALABAMA AT BIRMINGHAM INSTITUTIONAL REVIEW BOARD APPROVAL

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM
Office of the Institutional Review Board for Human Use

470 Administration Building
701 20th Street South
Birmingham, AL 35294-0104
205.934.3789 | Fax 205.934.1301 | irb@uab.edu

NHSR DETERMINATION

TO: Lombardi, Mark G

FROM: University of Alabama at Birmingham Institutional Review Board
Federalwide Assurance Number FWA00005960
IORG Registration # IRB00000196 (IRB 01)
IORG Registration # IRB00000726 (IRB 02)

DATE: 18-Aug-2020

RE: IRB-300005847
The Relationship of Debt Ratio and Financial Performance for Large Health Systems

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The Office of the IRB has reviewed your Application for Not Human Subjects Research Designation for the above referenced project.

The reviewer has determined this project is not subject to FDA regulations and is not Human Subjects Research. Note that any changes to the project should be resubmitted to the Office of the IRB for determination.

if you have questions or concerns, please contact the Office of the IRB at 205-934-3789.