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Factors Affecting the Financial Performance of US Children's Hospitals:  
An Exploratory Study

by

Jimmy Mahgoub

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree

Of

Doctorate in Business Administration

In the Robinson College of Business

Of

Georgia State University

GEORGIA STATE UNIVERSITY

ROBINSON COLLEGE OF BUSINESS

2020

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## ACCEPTANCE

This dissertation was prepared under the direction of the *JIMMY MAHGOUB* Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Business Administration in the J. Mack Robinson College of Business of Georgia State University.

Richard Phillips, Dean

## DISSERTATION COMMITTEE

*Dr. Subhashish Samaddar (Chair)*

*Dr. Satish Nargundkar*

*Dr. Aaron Baird*

## DEDICATION

I dedicate this dissertation on Children's Healthcare to the people of my homeland and to the new generations of children who have been jeopardized their basic needs of healthcare and education through the past three decades.

To my mother, who has raised me to be who I am, a man of principles, dignity, and integrity. To my late wife and role model Maggie whom I promised that I will make her dream come true and become a professor to serve our own country as she did. To my son and daughter Mazin and Sarah Mahgoub who supported me during this long journey from afar in San Francisco and Paris.

My dissertation is dedicated to my new amazing family: Betty, Leah, and Abel Mahgoub who provided me with encouragement and support towards my dream of achieving this terminal degree to spread the knowledge and to participate in educating those who need it the most in my homelands. You've been there during the highs and the lows. You've always been a rock that I could lean on.

I dedicate this manuscript to all my friends and family who encouraged me to take life seriously and who allowed me to pursue this tough journey. Your dreams will always live through my future work and through those whom I positively impact. You have been critical supporters, protectors, and cheerleaders. You believed in me when I didn't believe in myself. It is now time for me to pay back your good.

To my mentor, professor, and good friend Dr. Sub who enhanced my critical thinking and reasoning and pushed me so hard to think outside the box. I thank you so much for your guidance and for allowing me to benefit from your wealth of knowledge and expertise. I look forward to making further contributions to the body of knowledge with you in my future academic research.

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When I joined this program, my intention from the beginning was how I can contribute in serving my own people in Africa and how to improve the quality of life of the impoverished and underprivileged in my homeland and particularly the children. My goal was to add to the body of knowledge in children's healthcare to serve the entire humanity. I have always believed that children are the future of any nation and the investment in their healthcare and education is what makes it a great one.

Many individuals were influential throughout the achievement of this terminal degree. Even though my name is listed as the author of this manuscript, but I must acknowledge those who have supported me along this journey.

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**LIST OF ABBREVIATIONS**

|      |  |
|------|--|
| CDC  | Center for Disease Control                                 |
| CHIP | Children's Health Insurance Program                        |
| ACA  | Affordable Care Act  |
| CMS  | Centers for Medicare & Medicaid Services                   |
| GDP  | Gross Domestic Product                                     |
| CBO  | Congressional Budget Office                                |
| IRB  | Institutional Review Board                                 |
| GSU  | Georgia State University                                   |
| DBA  | Doctor of Business Administration                          |
| RBV  | Resource Based View  |
| VRIN | Valuable, Rare, Imperfectly Imitable and Non-substitutable |
| DV   | Dependent Variable   |
| IV   | Independent Variable                                       |
| MV   | Moderator Variable   |
| CV   | Control Variable   |
| US   | United States  |
| SDG  | Sustainable Development Goals Theory                       |
| SCT  | Social Capital Theory                                      |
| SRQ  | Sub Research Question                                      |
| ASDB | Annual Survey Database                                     |
| AHA  | American Hospital Association                              |
| AMR  | Academy of Management Review                               |
| JOM  | Journal of Management                                      |
| AMJ  | Academy of Management Journal                              |
| SMJ  | Strategic Management Journal                               |
| CCC  | Complex Chronic Condition                                  |
| OPCQ | Occupancy and Patient Care Quality                         |
| SDH  | Social Determinants of Health                              |
| DSH  | Disproportionate Share Hospital                            |

**ABSTRACT**

Factors Affecting the Financial Performance of US Children's Hospitals:

An Exploratory Study

by

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Financial performance is a key indicator of success and competitive advantage for organizations. This paper presents an exploratory study of factors affecting financial performance of US children's hospitals using secondary data collected by the American Hospital Association. The dataset included all children's hospitals in the United States. Prior studies explored factors around financial performance of hospitals in general, but to date, there is no enough literature that focuses on children's hospitals to explore which factors impact financial performance independently and simultaneously. While many factors may affect financial performance, but this study found that: health care accessibility, number of services offered, organizational factors and community factors to be the most significant predictors of financial performance independently and simultaneously. This exploratory study used an empirical quantitative method to examine the characteristics of these independent variables using the resource-based view (RBV) as a theoretical framework. The study offered practical solutions for hospital managers and practitioners. It made

valuable recommendation for future research and new addition to the body of knowledge and the literature in this domain of study. Hospital leaders can use these empirical findings to develop financial strategies to increase children's hospitals overall revenue.

**INDEX WORDS:** resource-based view, hospital financial performance, health care accessibility, medical coverage, medical care resources, community factors, organizational factors.

## I INTRODUCTION

### I.1 Study Background:

The health of children differs greatly from the health of adults (Center for Disease Control [CDC], 2017). First, children are often exposed to a wider array of pollutants or hazardous material through play and time spent outdoors (Vrijheid, Casas, Gascon, Valvi & Nieuwenhuijsen, 2016). Next, the way children play and explore their environment is largely through touch and taste, resulting in higher exposure to harmful substances than adults (CDC, 2017). Additionally, children are more likely to transmit disease through unwashed hands and contact with other children than are adult counterparts (CDC, 2017).

The way in which children are exposed to harmful substances or environments can also affect their respective development (Vrijheid et al, 2016). Children develop physiologically and psychologically more quickly than do adults (CDC, 2017). As such, pollutants, disease and harmful substances can interrupt and slow development, affecting both the physical and mental health of children (Vrijheid et al, 2016). Finally, children have longer life expectancies than do adults (CDC, 2017). Thus, if disease or hazardous environments affect physical or mental development, or impede proper functioning, children must live longer with the effects of improper body functionality or mental impairment (Hanson & Gluckman, 2015).

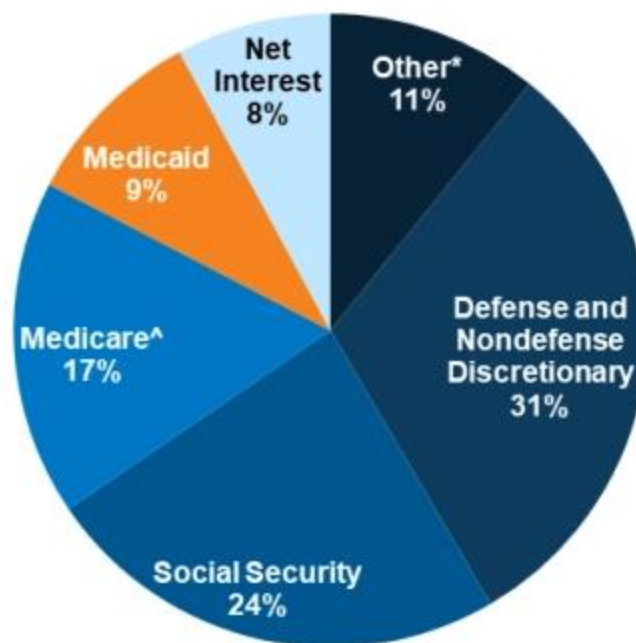
Regular access to healthcare has shown to reduce the effects of harmful environments on child development and functionality (CDC, 2017). As such, regular access to healthcare is imperative to prevent and mitigate a variety of health issues found primarily in children (Vrijheid et al, 2016). The United States government has long recognized the need to create accessible healthcare to American children. Programs such as Medicaid, the Children's Health Insurance

Program (CHIP), and the Affordable Care Act (ACA), have been developed by the federal government to aid parents in obtaining healthcare for their children.

Medicaid is a federally funded program to ensure the most impoverished U.S. families receive access to healthcare was enacted in 1965 (Centers for Medicare & Medicaid Services (CMS), 2016a). When Medicaid was implemented throughout the United States, millions of children were allowed subsidized health care for the first time (CMS, 2016a). However, Medicaid is not without shortcomings. Although effective in granting American children healthcare, Medicaid only covers children from families below the federal poverty line which is \$24,450 for a family of four (CMS, 2016b).

To ensure medical coverage to all children within the U.S., the federal government created the Children's Health Insurance Program (CHIP) in 1997 (Manriquez & Stewart, 2018). The CHIP program provides federal monies to states that insure children that are from families that make too much money to qualify for Medicaid but cannot afford private health insurance programs (Larson, Cull, Racine, & Olson, 2016). When CHIP was enacted children from 200% above the federal poverty level could receive access to healthcare, resulting in additional millions of children gaining access to medical care (Manriquez & Stewart, 2018). Figure 1 indicates that Medicaid in FY 2018 was the third largest mandatory spending program representing 9% of the federal budget as shown in Figure 1.





**Figure 1: Actual FY 2018 Total Federal Outlays: \$4.1 Trillion**  
 (Source: Kaiser Family Foundation, KFF, FYs, January 2019)

Finally, the Affordable Care Act (ACA) was enacted in 2014 (Sommers, Gunja, Finegold & Musco, 2015). The ACA grants even more coverage to American Children by ensuring that medical care coverage does not change if a household income fluctuates periodically to both over and under the federal poverty level (Frean, Gruber & Sommers, 2017). Moreover, the ACA was instrumental in setting standards within both CHIP and Medicaid to reduce ambiguity in coverage and strengthen state and federal guidelines on insurance coverage (Sommers et al., 2015). In this way, families can continue to receive access to healthcare regardless of financial situation or locality (Frean et al., 2017).

## **I.2 Significance of the Study:**

Although Medicaid, CHIP, and the ACA were created to ensure healthcare to all American children, the CDC (2017) estimated that 5.1% of children within the United States remain without

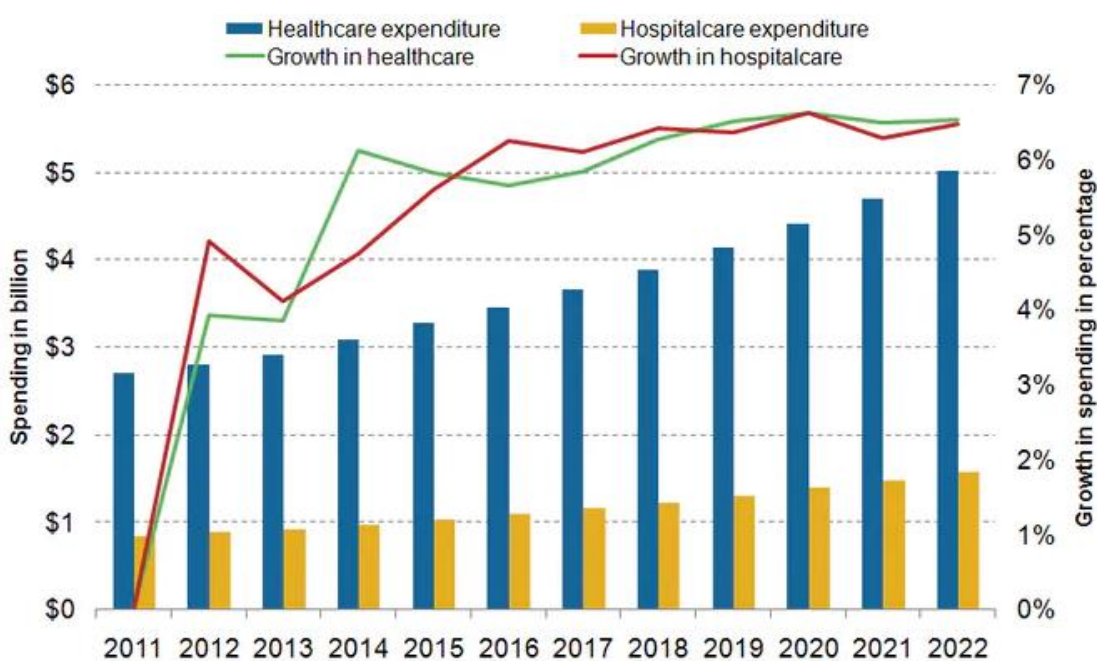
access to healthcare services. This estimate means that over 3.1 million children, defined as anyone under the age of 18, remain without healthcare. This statistic is troubling as, on average, children are more prone to both illness and bodily injury than are adults (CDC, 2017).

With the need for access to healthcare becoming so important within younger generation, in 2017 the federal government spent approximately \$3.5 trillion dollars to supplement healthcare programs, approximately 20% of the gross domestic product ([GDP]; Congressional Budget Office (CBO), 2018). The monies used by the federal government to supplement healthcare often exceeds the revenue generated from hospital organizations (CBO, 2018). As such, the amount of monies granted to respective healthcare facilities often impacts the extent and quality of health care afforded to those individuals that rely on these institutions (CDC, 2017).

Hospitals play a vital role in society as wellness and well-being are connected to the social and economic conditions of people's lives. In seeking to meet a country's health needs in an equitable, efficient, and financial manner, hospitals are challenged with maintaining sustainable financial, operational, and healthcare performance. Community and organizational factors that influence financial, operational, and healthcare performance of children's hospitals are often considered independently throughout academic literature, without much focus on how these factors influence healthcare services when considered together. Our study contribution is to determine individually and simultaneously the impact of healthcare accessibility, number of services offered, community and organizational factors on U.S. children's hospitals financial performance.

The contribution of this study to science and practice would be in: (a) the consideration of the influence of the resource-based view in organizational factors of US children's hospitals (b) evaluating the impact of health care accessibility, number of services offered, organizational

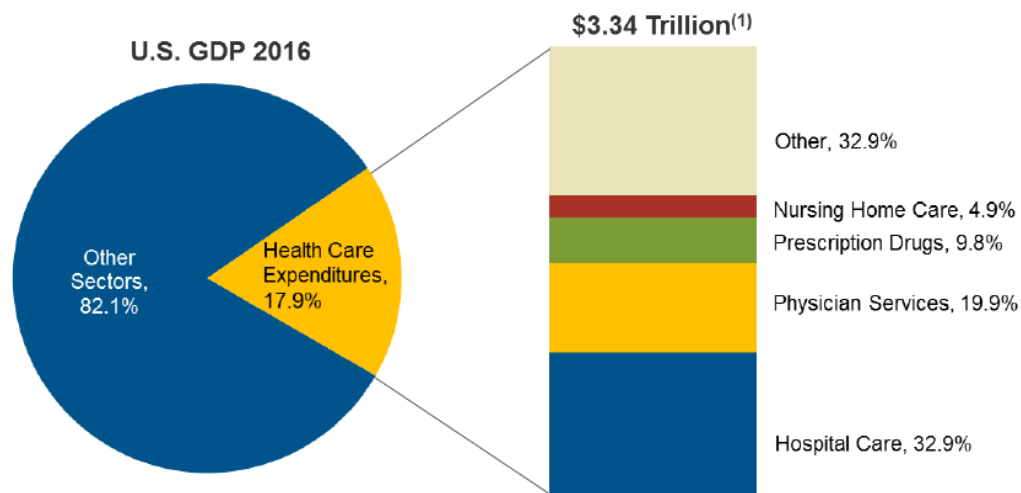
factors and community factors on US children’s hospitals financial performance independently and simultaneously to find significance, appropriateness, and weight of importance (c) distinguishing the inputs and outputs and assessing the relationships between these factors and financial, operational, and healthcare performance of US children’s hospitals. Figure 2 illustrates the growth in US national healthcare expenditures, by major spending category. Hospital care accounts for 32.9% of the estimated \$3.34 trillion healthcare budget (CMS, 2017).



**Figure 2: National Healthcare and Hospital Care Spending**  
(Source: National Health Expenditure Projections 2012-2022)

### I.3 Research Motivation:

With so many governmental initiatives including Medicaid, CHIP and the ACA approximately 3.34 trillion dollars - as illustrated by figure 3 below - invested by the US federal government in 2016 (CMS, December 2017). Recently special focus has been given to the financial performance of children’s hospitals throughout the United States (CBO, 2018).



Source: Centers for Medicare & Medicaid Services, Office of the Actuary. Data released December 6, 2017.  
<sup>(1)</sup> Percentages were rounded, so they may not sum to 100 percent.

### Figure 3: Hospital Care Expenditures

Patients in children's hospitals are often younger, and more likely to experience comorbidities, and are more seriously ill than children in general care hospitals (Gupta et al., 2016). As such, children within children's only hospitals often used more resources and were more likely to undergo more costly procedures (Peltz et al., 2016). Financial competition is exacerbated by the overreliance of reimbursement by Medicare, CHIP and the ACA programs to help subsidize children's only hospitals (CBO, 2017).

To mitigate the reliance on government funding, hospital management has been tasked with the continuous monitoring of hospital budgets to ensure proper spending and reduce costs, without reducing the quality of patient care (Grimaldi & Vernant, 2017). Although management within children's hospitals are diligent, incomplete data facilitated by human error and imperfect software could hinder hospital management from identifying key elements within an organization regarding improper spending and financial waste (Grimaldi & Vernant, 2017). The aim of this study is to look at the factors affecting the financial performance of US children's hospitals to better understand how these factors affect hospital functioning and stability.

#### **I.4 Problem Background:**

Children's hospitals comprise only a small fraction of the United States healthcare sector, however, children only hospitals are more costly to operate than healthcare institutions that serve both children and adults (Leyenaar et al., 2016). The additional costs of operation within children's hospital is based primarily on patient care, as children that utilize children's only hospitals are typically diagnosed with chronic or potentially fatal conditions, like childhood cancers, muscular dystrophy or cerebral palsy, as these conditions originate in younger persons (Peltz et al., 2016).

With diagnoses of patients being chronic or largely debilitating, often procedures, medications and the cost of patients' extended hospital stays greatly increase the cost of care per patient when compared to other hospital organizations (Peltz et al., 2016). Additionally, as many children's patients are accompanied by parents, guardians or other loved ones, most children's hospitals enable these persons to stay close to their children in subsidized housing (Pelletier & Bona, 2015). This allows for a better quality of life for the patient as they undergo testing or treatment but can add greater costs of operation to respective children's hospitals (Leyenaar et al., 2016).

Although children's hospitals comprise a small fraction of the United States healthcare sectors, with such large per patient expenditure, children's hospitals are often placed in direct competition for federal funding with other healthcare organizations which service both children and adult patients (CBO, 2017). The competition between children's hospitals and general care hospitals can be problematic as children's hospitals generally rely heavily on federal grants and other monies to continue operation (CBO, 2017). Financial competition with general care hospitals is also increasingly problematic as children's hospitals grow and expand to help more patients, as additional patient loads require extra staff and extra costs associated with patient care (CDC, 2017).

Financial burdens for children's hospitals are made greater as children's hospitals treat more children covered by Medicaid, CHIP and the ACA than do general care hospitals (CDC, 2017). Even though children's hospital delivers the same quality of care to non-Medicaid patients, often children's hospital receives less in reimbursement from federal agencies (CBO, 2017). Federal payments to close the gap between what Medicaid and private insurers pay were cut on the assumption that the Affordable Care Act would leave fewer children uninsured (CBO, 2017).

Operating costs of all hospital types are similar, outside of patient care (Leyenaar et al., 2016). The difference is their margin between the monies allotted for operational costs, patient wellbeing and the profits generated after all expenditures (Leyenaar et al., 2016). As such, hospital management often examines hospital policy and procedure to best identify cost-cutting measures and implement cheaper alternatives to hospital initiatives without compromising patient care (Grimaldi & Vernant, 2017). However, incomplete data facilitated by human error and imperfect software could hinder hospital management from identifying key elements within an organization regarding improper spending and financial waste (Grimaldi & Vernant, 2017).

## **I.5 Study Setting and Geographic Area:**

The geographic area included the entirety of the United States. A total of 230 hospitals were identified. Of those, 142 are considered a children's only hospitals as they specifically treat children 18 years and younger. Data was reviewed from urban and rural settings; however, most of the hospitals were found to be in urban areas. Table 1 below illustrates these hospitals count in FY2017.

**Table 1: Children-only Hospitals in the United States:**

| <b>COUNTS OF CHILDREN'S HOSPITALS (FY2017 Data)</b>  |                                 |                  |              |
|--|---------------------------------|------------------|--------------|
| Source: AHA ANNUAL SURVEY DATABASE, FY2017.  |                                 |                  |              |
| Copyrighted and licensed by Health Forum LLC, an American Hospital Association company, Chicago, 2018. |                                 |                  |              |
| List created by Kim Garber on 7/29/19, AHA Resource Center, (312) 422-2003, kgarber@aha.org.           |                                 |                  |              |
| <b>PRIMARY SERVICE</b>   | <b>CONTROL / OWNERSHIP TYPE</b> |                  |              |
|  | <b>Investor Owned</b>           | <b>All Other</b> | <b>Total</b> |
| <b>Puerto Rico (the only territory with children's hospitals)</b>                                      |                                 |                  |              |
| Children's general   | 1                               | 1                | 2            |
| <b>US (no territories counted below)</b>   |                                 |                  |              |
| Children's acute long-term   | 4                               | 1                | 5            |
| Children's cancer  | 0                               | 1                | 1            |
| Children's chronic disease   | 0                               | 2                | 2            |
| Children's general   | 4                               | 59               | 63           |
| Children's orthopedic  | 0                               | 13               | 13           |
| Children's other specialty   | 0                               | 7                | 7            |
| Children's psychiatric   | 14                              | 25               | 39           |
| Children's rehabilitation  | 1                               | 9                | 10           |
| Total US (no territories)  | 23                              | 117              | 140          |
| <b>GRAND TOTAL (Puerto Rico and Total US)</b>  | <b>24</b>                       | <b>118</b>       | <b>142</b>   |

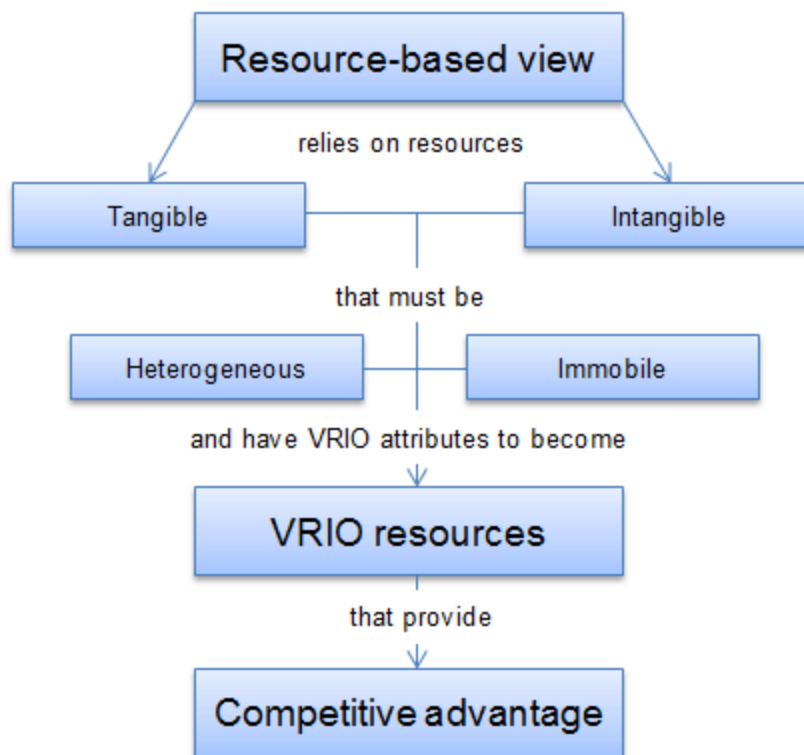
**I.6 Theoretical Background:**

The theoretical background of a research provides context for both the creation of research questions and the practical or academic nature for which findings of research can be applied. The theoretical background for this exploratory study is the Resource-Based View (RBV). The RBV is a business theory which is used by numerous corporations to determine which resources within the company can be used strategically to gain competitive advantage within their respective fields (Alvarez & Barney, 2017). The RBV, categorizes key resources into three distinct categories: tangible resources, intangible resources and capabilities (Alvarez & Barney, 2017). According to Alvarez and Barney (2017), the resources available to a company enable the organization to be competitive and increase organizational performance. These resources can be classified as either tangible or intangible in nature. Tangible resources include resources that can be seen or touched,

like money, equipment or product. Tangible assets can also be resources that are physical, such as land, buildings, and equipment (Hill et al., 2016). Although tangible assets can provide some advantage to organizations, they are largely common within a given field, meaning that this advantage is minor.

Conversely, intangible assets are abstract in nature (Hitt et al., 2016). Thus, intangible resources include knowledge, workplace culture and policy that is important for the success of an organization (Hitt et al., 2016). Intangible assets can also include intellectual property and reputation (Alvarez & Barney, 2017). Unlike tangible resources, intangible resources are able to give organizations more of a competitive edge because they are unique to a company. Through the promotion of intangible resources, organizations can gain greater competitive edge (Alvarez & Barney, 2017). Finally, capabilities refer to a resource, either tangible or intangible, that is unique to a given workplace, and to which no other entity has access (Alvarez & Barney, 2017). When considered together it is the three types of resources that create sustainable competitive advantage (SCA). According to RBV, creating SCA requires four key elements: assets, capabilities, competencies and competitive advantage (Alvarez & Barney, 2017). Figure 4 illustrates the resources that the RBV relies on to achieve competitive advantage.





**Figure 4: The Resource Based View & VRIO Resources**

Source: Strategic Management Insight - <https://strategicmanagementinsight.com/>

### I.6.1 Assets:

Assets, within this context refers to the variety of intangible and tangible company resources that benefit organizational performance (Hitt et al., 2016). Assets of an organization include all knowledge, skill, tools, reputation and policy that aid in the success of a company (Hitt et al., 2016). Company assets may also include physical features of a business including location, appearance and accessibility (Alvarez & Barney, 2017). The amalgamation of assets helps to develop capabilities that leads to customer satisfaction by deriving strength from each resource (Hitt et al., 2016). Core and unique competencies often arise through capacity building and are used as key components to formulate a strategic plan directed at company or project success (Ferlie, 2015).

### **I.6.2 Capabilities:**

Capabilities refer to a resource, either tangible or intangible, that is unique to a given workplace, and to which no other entity has access (Ferlie, 2015). Capabilities are an essential facet of creating SCA as, often capabilities of an organization are the factors within one organization out of many similar organizations that are unique (Ferlie, 2015). In this way, capabilities are able to set certain businesses apart from one another even in seemingly homogenous sectors (Hitt et al., 2016).

### **I.6.3 Competencies:**

Core competences are key internal resources, which, when effectively developed and exploited, allow organizations to create unanticipated product and gain competitive advantage over their rivals (Ferlie, 2015). Competencies allow for the development of resources that may be beneficial to organizational success, as a result of unintended consequences (Hitt et al., 2016). As competencies are often unexpected, and can happen at any time, employing persons that can recognize and properly integrate competencies are another key element in creating SCA (Alvarez & Barney, 2017).

### **I.6.4 Competitive Advantage:**

Competitive advantage is the last facet needed to create and maintain SCA (Ferlie et al., 2015). Competitive advantage refers to the way in which an organization can set themselves apart from similar enterprises based on the competencies and resources available (Alvarez & Barney, 2017). When a company reaches a competitive advantage, it is important to divert resources to maintaining and expanding this advantage to obtain SCA (Alvarez & Barney, 2017). Resource

Based View is a well vetted theory that continues to allow for a prescriptive approach for its application. This theory has specific applicability to this study as I am reviewing, comparing, and combining a multitude of factors to determine the competitive advantage to the children's hospitals' financial performance.

By gaining competitive advantage, a given organization can often maximize business performance while reducing costs and investing in future endeavors (Hitt, Xu, & Carnes, 2016). As such, management of key resources are a vital part of remaining competitive while simultaneously adapting to fluctuations in performance or within the performance of entire respective sectors (Hitt et al., 2016). Finally, it is worth mentioning that as this study is data-driven and empirically focused in order to identify antecedents, and there is little theory effect on grounding or justify the research, by uncovering the underlying facts on what factors affect the financial performance of children's hospitals, its antecedents makes a significant contribution to research and practice.

### **I.7 Research Design:**

This study followed an exploratory approach. This methodology allowed this researcher the use of correlational analysis to explain and quantify the degree of relationship between two or more variables (Cozby & Bates, 2012; Patton, 2015). Further, quantitative approaches deduce insights from numerically measured and statistically tested data in the hope of generalizing the findings to a larger population (Allwood, 2012). This study used secondary data that included measures for all variables in the research model which was further analyzed using univariate, bivariate and multivariate analysis to address the research question and hypotheses. The unit of analysis in this study was the US children's hospitals. All children's hospitals in the country were

considered in the dataset. The independent variables were: IV1: health care accessibility, IV2: medical coverage, IV3: number of services offered, IV4: community factors, and IV5: organizational factors while the dependent variable (DV) is the hospital financial performance. The moderator variable MV was the hospital ownership type while the control variables were CV1: hospital's size (indicated by the total number of beds) and CV2: teaching affiliations. The source for the secondary data was the American Hospital Association (AHA Annual Survey and Financial Data Base FY2017).

### **I.8 Research Question:**

I have conducted an exploratory study in search for an answer on the factors affecting the financial performance of US Children's Hospitals as follows: First, I conducted a thorough review of the extant literature and the theory established for this study. Second, I met with 8 practitioners to collect important feedback from the field. Third, I reviewed the available secondary dataset. This guided me to the research questions of this study shown below. Given this scope, and by using the Resource Based View (RBV) as a theoretical framework that gives context to both research question and results, the following research question and sub-questions have been developed:

***RQ: What factors affect the financial performance of U.S. children's hospitals?***

*SRQ1: To what extent, if any, does a relationship exist between health care accessibility and hospital financial performance while controlling for hospital size and teaching affiliation?*

*SRQ2: To what extent, if any, does a relationship exist between medical coverage and hospital financial performance while controlling for hospital size and teaching affiliation?*

*SRQ3: To what extent, if any, does a relationship exist between the number of services offered and hospital financial performance while controlling for hospital size and teaching affiliation?*

*SRQ4: To what extent, if any, does a relationship exist between community factors and hospital financial performance while controlling for hospital size and teaching affiliation?*

*SRQ5: To what extent, if any, does a relationship exist between organizational factors and hospital financial performance while controlling for hospital size and teaching affiliation?*

*SRQ6: To what extent, if any, does a simultaneous relationship exist between healthcare accessibility, medical coverage, number of services offered, community factors, organizational factors and hospital financial performance while controlling for hospital size and teaching affiliation and moderating for ownership type?*

In this study, we attempted to answer these research questions through subsequent statistical analysis to examine the dataset using univariate, bivariate and multivariate data analysis. In this way the behavior of individual variables, relationships between the independent variables and the dependent variables, and the simultaneous effect of all variables on the dependent variables can be better understood which can allow for a more robust answer to the research questions of this study.

## **I.9 Data Collection and Data Source:**

### **I.9.1 Data Collection:**

The unit of analysis in this study was the US Children's Hospitals. The target population is 142 children's hospitals across the United States. The dataset was acquired from AHA (FY 2017). The research setting included types and geographical areas of children's hospitals along with hospitals' characteristics. In addition, hospitals websites, conferences and other medical and financial information were used. For the research ethical considerations, we used Lincoln and

Guba (1985) and Corporate Social Responsibility of hospitals to ensure adherence to ethical standards throughout the entirety of this study.

### **I.9.2 Data Source:**

The constructs and associated measures used in the research model including hospitals' survey and financial data was developed using a secondary data acquired from the American Hospital Association (AHA). The AHA is a not-for-profit association of health care provider organizations and individuals that are committed to the health improvement of their communities. The AHA is the national advocate for nearly 5,000 hospitals, health care systems, networks, other providers of care and 43,000 individual members. Founded in 1898, the AHA also provides education for health care leaders and is a source of information on health care issues and trends. The AHA aggregates hospital data and creates trends analysis which include data on utilization, personnel, revenue, expenses, and community health indicators.

### **I.10 Method of Analysis:**

Analysis occurred first through the creation of descriptive statistics. Second, data was analyzed through the use of univariate analysis of all variables. Third, the relationships between independent and dependent variables were analyzed using bivariate analysis. Fourth, a multivariate analysis was run to assess if the four independent variables have simultaneous effect on the dependent variables. The simple regression analysis was controlled by the hospital size and teaching affiliation and the hierarchical regression analysis was moderated by the hospital's ownership type.

**I.11 Ethical Consideration:**

In any study that uses sensitive information, it is subjected to Institutional Review Board (IRB) approval. As such, this study was approved by the Georgia State University's IRB to ensure ethical standards are met throughout the study entirety. This study did not pose any harm to children's hospitals, as the nature of anonymous quantitative data collection is such that no identifying information was collected, could be traced backed to any hospital. In addition, to ensure hospital and patient confidentiality, pseudo codes were used to designate each hospital. Another ethical consideration is the necessity to protect the population within this study. The hospitals are not a vulnerable population and therefore risk of harm was minimal. To ensure that data is protected, hard copies of raw data and other documents pertinent to this study were securely kept in a locked filing cabinet inside the personal office of the researcher. This was done to ensure that all data remained confidential. Soft copies of raw data and other documents were saved in a password-protected flash drive. All data related to the study will be destroyed seven years after completion. Hard copies will be shredded while soft copies will be deleted, to ensure confidentiality in perpetuity.

**I.12 Summary:**

The aim of this study was to determine the factors affecting the financial performance of US children's hospitals. Moreover, its objective was to better understand how these factors affect hospital functioning and stability. To accomplish the goal of this study, a univariate, bivariate and multivariate statistical analysis were conducted to analyze the data acquired from the American Hospital Association.

This study aimed to contribute to academia and practice. From the academic perspective, it added to the body of knowledge in the healthcare industry and the application of the resource-

based view (RBV Theory). For medical practice, the study's findings provided valuable information to practitioners, managers and stake holders of children's hospitals.

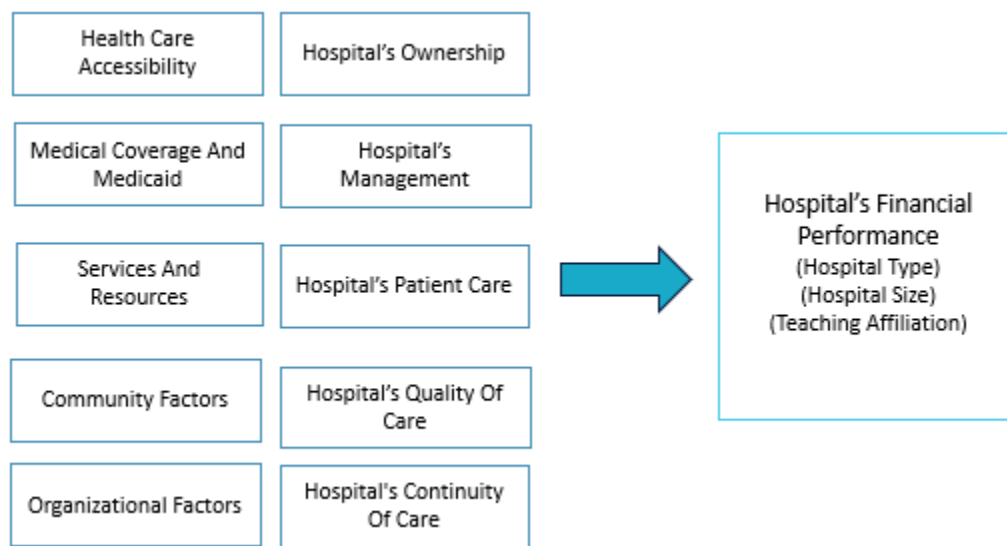
This chapter has outlined the need for this exploratory study, as well as an overview of the methodology needed to complete the goals of the research. The next chapter will include a comprehensive review of the extant literature important to the understanding of this study. Topics within the next chapter have included an elaboration on the theoretical framework and detailed explanations of the effect of independent variables such as healthcare accessibility, medical coverage, number of services offered, community and organizational factors on the financial performance of US children's hospitals, and the functionality and financial habits of such institutions. Finally, the next chapter ended with a summary of relevant points before introducing the third chapter on research design and methodology.



## II LITERATURE REVIEW

### II.1 Literature Review Approach:

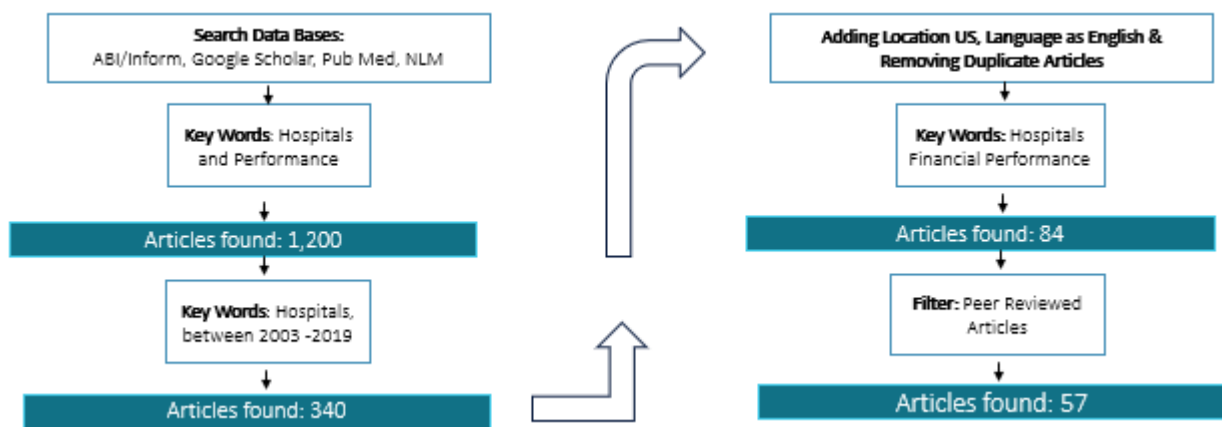
The literature search for this study started with 340 academic articles and it included a systematic search of peer-reviewed journals between 2003 and 2019. The review included some seminal works related to the topic and research question(s) as well as current works which ensured capturing a wide range of views. This timeframe was chosen to capture important statistics and the impact that legislation and regulation have on children's hospitals. Search engines used included the Georgia State University Library, ABI/Inform, Business Source Complete, Web of Science, Scholar Works @ GSU, Google Scholar, PubMed, and the US National Library of Medicine of the National Institutes of Health. Internet sites were avoided due to their lack of peer-review. Abstracts and introductions were reviewed to eliminate articles outside the study scope, then, the full text of each article was reviewed to eliminate duplicates and articles not directly relevant to the study and the research question. A summary of the most relevant literature used in this study was shown in chapter VII (Appetencies).



**Figure 5: Literature Review Focus Areas**

Keywords used included: Children’s hospital financial management; Children’s hospital financial performance; Children’s hospital resource utilization; Children’s hospital financial characteristics; Pediatric hospitals trends resource use; Non-profit children’s hospitals variations in care; Children’s hospitals quality of care; Hospital quality of service; Healthcare accessibility; Children’s medical coverage; Medical care resources; Services offered in children’s hospitals; Hospital community factors; Hospital organizational factors; Types of hospitals; Children’s hospitals comorbidities; Children’s hospitals continuity of care; Children’s hospitals lean practices.

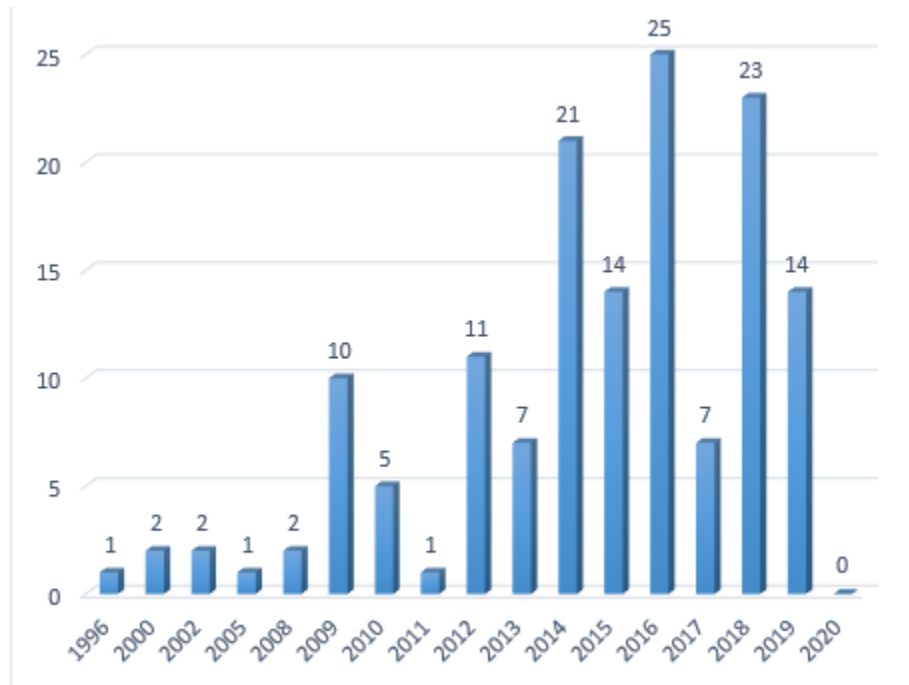
Variations of the keywords were employed, along with keyword strings suggested by the search engines. Each keyword string was pursued until the sixth screen. Boolean techniques were also used to expand the search and provide new paths to explore the extant literature.



**Figure 6: Literature Search String**

An attempt was made to locate relevant academic articles within four leading management journals: Academy of Management Review (AMR), Academy of Management Journal (AMJ), Strategic Management Journal (SMJ), and Journal of Management (JOM). The “advanced search” functions of GSU Library and Google Scholar were used for this purpose. 10 articles were located

from these journals, three of which specifically related to children's hospitals. The search was reduced from 340 to 84 articles based on their abstracts and the potential for relevance to the research question(s). The final number articles used in this study after reading was 57 articles. Figure 7 summarizes the of publications each year. The complete list of most relevant articles is reported in table 16 - Chapter VII (Appendices).



**Figure 7: Number of Articles Per Year**

## **II.2 Introduction to Financial Performance:**

Financial performance is a key indicator of success for organizations. According to King (2016), organizations with high levels of financial performance are organizations with sustainable advantages. Firms with healthy levels of financial performance are able to deliver value to its stakeholders (King, 2016). Organizations evaluate their performance through lean accounting, eliminating or reducing unnecessary operations and identifying activities that provide higher profits while decreasing costs (Amusawi, Almagtome & Shaker, 2019). This is especially

important in a healthcare setting, where lean accounting can help administrators identify non-cost-effective strategies to provide care and not compromising a patient's care. Financial performance posits is essential in all settings, including healthcare (Amusawi, Almagtome & Shaker, 2019). Chakraborty (2020) recognizes the importance of identifying factors that can influence an organization's financial performance and specifically in a healthcare setting. An organization values its ratings, both from its customers as well as its stakeholders. Additionally, Chakraborty (2020) posits that an organization will rely that quality improvement and strategic planning are essential when identifying an organizations' financial performance.

### **II.3 Children's Hospitals Financial Performance:**

The competition between children's hospitals and general hospitals is not level. The Healthcare Cost and Utilization Project's 2012 Kids' Inpatient Database showed that 71.7% of pediatric admissions were at general hospitals (Leyenaar et al., 2016). General hospitals also accounted for 63.6 % of pediatric patient days and 50.0 % of pediatric costs (Leyenaar et al., 2016). Patients in children's hospitals by contrast were younger, had greater comorbidities, and more seriously ill (Gupta et al., 2016). These patients also used more resources and were more likely to undergo complex procedures. However, ICU care in a freestanding children's hospital was associated with greater survival than treatment at other hospitals (Gupta et al., 2016). Children's hospitals not only get the sickest patients, but also the most expensive. More than half of the total pediatric inpatient costs in 2010, 56.9 percent, were incurred by the top 10 percent of children with highest annual inpatient cost (CHIC) (Peltz et al., 2016). However, most of the children with the highest one-year costs do not require hospitalization in later years (Peltz et al., 2016).

Children's hospitals play other roles than inpatient care because the home is the best place for a child to receive long-term care (Carter et al., 2016). Pediatric nurses develop the skills, knowledge, and networks essential to continuity of care and a transfer home for the patient. The nurses navigate the system and provide a bridge between the families and professionals so that home can provide a place where the family can be nurtured together (Carter et al., 2016). Hospital staff can also devise Individual Learning Plans for patients to continue their education both inside the hospital and once home (Peters, Hopkins & Barnett, 2016). Structured routines taught to parents by nurses can also help parents participate in the care of their child. Gentle hair brushing is one example, which enhances parent confidence and can be continued at home (Crawford, Lewis, Bartholomew & Joseph, 2018). Some urban children's hospitals are also looking into caregiver hospital food insecurity. Money, transportation, or knowledge were barriers to food for 32 percent of parents whose child was a patient (Makelarski, Thorngren & Lindau, 2015). Makelarski, Thorngren & Lindau (2015) found an interdependence between caregiver food insecurity and patient outcomes.

Children's hospitals also reach beyond the patient and parent into the community and those roles are most endangered by the competition with general hospitals and health systems. Freestanding children's hospitals provide clinical programs, teaching, and research, but these programs largely do not generate margin (Levine & Harris, 2017). Competition with general hospitals is exacerbated by the lowest birth rate since records were first kept in 1909, 62 births per 1,000. The pediatric market in some regions is shrinking and technology means parents are able to shop around (Levine & Harris, 2017). "For children's hospitals, developing a scale strategy requires them to identify their aspirations for the future, consider the various types of scale that could potentially allow them to achieve those aspirations, and then determine what type of scale

will add the most organizational value” (Levine & Harris, 2017, p. 3). Scale can mean many things, “in all cases, however, the type of scale should enable children’s hospitals to improve their financial efficiency (or risk mitigation) while also ensuring high-quality care” (Levine & Harris, 2017, p. 4). Levine & Harris (2017) suggest children’s hospitals can look for scale in four areas: clinical programs; population health; research; and non-clinical operations. Scale in these areas will help build or maintain the technical and infrastructure efficiencies needed to compete against the general hospitals and for-profit health systems. They can also choose to be a factor on the local or regional level. Much will depend on the hospital’s starting point and the strategic plans, resources and time required to reach adequate scale. That is the quandary faced by management.

#### **II.4 Medicaid and Children’s Hospitals:**

Freestanding Children’s hospitals serve more children through Medicaid than any other hospital type, a fact that spurs questions about care and compensation (Colvin et al., 2016). It was noted earlier that children’s hospitals treat sicker patients with higher numbers of comorbidities than other hospitals, and surgery for children with Complex Chronic Conditions (CCCs) uses a “disproportionately large” share of resources (Silber et al., 2018). Medicaid pays less for each service than private insurance, but differences in treatment between Medicaid and non-Medicaid children were small (Silber et al., 2018). Silber et al. (2018) said that in-hospital mortality rates were slightly higher for Medicaid patients and warrants further investigation. However, many of these Medicaid children are sicker at the start and Social Determinants of Health (SDH) are known to play a role in both outcomes and readmission risk (Sills et al., 2016). The 30-day readmission rate for Medicaid children is 6.3 percent and early post-discharge outpatient follow-up visits may help reduce that total (Brittan et al., 2015). The disparity between what Medicaid and private

insurers pay hospitals led to the federal Disproportionate Share Hospital (DSH) program that provides payment to close the difference. However, the Patient Protection and Affordable Care Act cut DSH payments to hospitals in the belief there would be fewer uninsured patients and uncompensated care would decline as a result (Colvin et al., 2016). “DSH payment reductions may expose extensive Medicaid financial losses for hospitals serving large absolute numbers of children,” (Colvin et al., 2016), and freestanding children’s hospitals had the largest median Medicaid losses from pediatric inpatient care. DSH payments reduced their Medicaid losses by almost half, but do not reach the levels before the Affordable Care Act (Colvin et al., 2016). Agrawal et al. (2016) examined the top five percent of Medicaid spending on children, who were also in the top five percent for all pediatric healthcare spending in the US. The highest likelihood of persistent spending occurred in children aged 13 to 18 years, versus 1 to 2 years which was likely to be transient (Agrawal et al., 2016). The average number of comorbidities in these adolescents was greater than six. “Most children with high spending in Medicaid are without persistently high spending in subsequent years. Adolescent age, multiple chronic conditions, and certain complex chronic conditions increased the likelihood of persistently high spending; hospital and ED use decreased it. These data may help inform the development of new models of care and financing to optimize health and save resources in children with high resource use” Agrawal et al. (2016).

## **II.5 Introduction to Management:**

Access to capital and constantly changing compensation plans mean fundraising is more vital to freestanding children’s hospitals than ever before (Erwin & Landry, 2015). Public support is a key fundraising indicator, while organizational characteristics are less important. A hospital’s

endowment, its value, the hospital's investment in fundraising, and location account for 46 percent of the variance between non-profit hospitals in their degree of public support (Erwin & Landry, 2015). The debate over whether hospitals should be non-profit, for-profit, or part of a health system further clouds fundraising. However, the multitude of views in the debate can be largely explained by the theoretical frameworks, assumptions, and models used by authors (Shen, Eggleston, Lau & Schmid, 2005). Meta-analysis shows little difference in operating costs across the three hospital types. For-profit hospitals did have greater revenue and profit, but the difference was "marginal" (Shen, Eggleston, Lau & Schmid, 2005). There is also a distinction between technical/cost efficiencies and a hospital's profitability (Büchner, Hinz & Schreyögg, 2016). Büchner, Hinz & Schreyögg (2016) found that the entry of an independent hospital into a health system increased technical efficiency between 0.6 and 3.4 percent. However, any increase in profitability for the hospital was transitional and only lasted one year (Büchner, Hinz & Schreyögg, 2016). Hospital management increasingly see their futures linked to lean practices, patient-centric care, continuity of care, and quality.

## **II.6 Lean Practices:**

The goal of lean practice is to increase service quality and competitive advantage. The theory is that cutting process waste will provide better service at lower cost (Patri & Suresh, 2017). Implementing lean practice, however, is not without problems. Leadership is the most important factor and clear goals must be articulated and announced (Patri & Suresh, 2017). Secondly, staff must have adequate training in the new routines and systems envisioned before their implementation (Patri & Suresh, 2017). It is essential, though, that management has valid data to begin with before choosing technologies or changing processes. Monitoring tasks and measuring



quality is difficult in a hospital because cleaning and maintenance is continual and essential, so better tracking is needed first (Feibert & Jacobsen, 2015). Electronic Health Records (EHR) is a technology that holds promise for lean practice, but managers still do not know how to get the maximum benefit. Hospitals were given incentives to adopt the technologies through the 2009 American Recovery and Reinvestment Act, but the actual value could be far greater (Thompson, Velasco, Classen & Raddemann, 2010). Hospital administrators need to determine what their EHR systems should accomplish, quantify the benefits, and create a value framework before engaging stakeholders (Thompson, Velasco, Classen & Raddemann, 2010). The same applies to all technologies considered for adoption. Technology absorption, the ability of staff to use the new systems, is a related hurdle in lean practice.

## **II.7 Patient-Centric Care:**

Value in patient-centered care is more subjective than objective and the process is less data-driven than lean practice. One example is an approach used by the Department of Cardiology at a major Danish teaching hospital based on qualitative research that places emphasis on a patient's subjective experience (Darmer et al., 2015). A Danish government innovation office worked with medical staff to create their new model which aimed all management and staff actions at creating value for the patient (Darmer et al., 2015). Equally important, though, was that the exercise fostered a belief that innovation came from people within an organization and not the organization itself (Darmer et al., 2015).

The literature provided other examples of innovation from within, but the focus of staff is its impetus. Qualitative research showed the admission process is the most traumatic for a parent and child (Macias et al., 2015). The parents' thoughts are of an uncertain situation, concern for

their child, and perceptions of staff. It was found the staff was looking at a continuous care process and how to improve the admission process (Macias et al., 2015). A need was seen to improve the process to develop patient and parent trust (Macias et al., 2015).

A patient-centered approach is seen as essential with insurance reimbursement plans increasing their emphasis on patient satisfaction (Cosgrove et al., 2013). However, greater emphasis is placed on its potential to lower costs and improve care quality rather than innovation (Youn, Heim, Kumar & Sriskandarajah, 2016). Substantial effort is placed on developing standardized treatment protocols to reduce the variability in procedures throughout a hospital. Lion et al. (2016) reported that protocols produced significant reductions in cost rise and reduced length of stay. No negative impacts were reported on patient health after discharge or any readmissions. However, the protocols themselves might add to variability and there is little evidence that they actually lead to patient-centered care improvements (Youn, Heim, Kumar & Sriskandarajah, 2016).

Youn, Heim, Kumar & Sriskandarajah (2016) created a Weighted Average Coefficient of Variation (WACV) to explore patient-centric reforms and applied it to differences in patient charges and care. A higher charge variation means lower technical efficiency of a hospital. Process quality, meaning adherence to medical guidelines, was negatively associated with WACV. Outcome quality was not associated with WACV. The result is that reforms aimed at process quality and reducing costs would be more attractive to administrators than a focus on patient outcomes and satisfaction (Youn, Heim, Kumar & Sriskandarajah, 2016).

## **II.8 Continuity of Care:**

Children's hospitals generally see the sickest patients and clinically complex cases require many follow-up visits after discharge, as discussed in section II.3. These children have a high risk of poor outcomes during transition (Sarik, Winterhalter & Calamaro, 2018). Nurses were seen as essential to navigating the process in section II.3 and creating a bridge between parents, patients, and professionals, but systematizing that aspect of care in stand-alone programs has shown benefits (Sarik, Winterhalter & Calamaro, 2018). A study of a patient navigation program at an East Coast children's hospital during 2015 showed the average child had 12 comorbidities and 15.9 percent were readmitted within 30 days. However, "no shows" at follow-up appointments for the remaining patients at home stood at 12.9 percent using the patient navigation system. By comparison, a recent study at a Texas family health clinic discovered a no-show rate of 21.8 percent (Bard et al., 2016). Technology can be used to manage these "high-risk interorganizational collaborations" between agencies and providers (Lim, Jarvenpaa & Lanham, 2015). The greatest barrier to knowledge transfers is time as the sharing of data is often multilateral. The fluctuating capacity of providers to see patients and resolving goal conflicts among them are also leading hurdles that can also be aided by planning software so that continuity of care brings value to the patient (Lim, Jarvenpaa & Lanham, 2015).

## **II.9 Quality of Care:**

Competition and patient satisfaction now mean quality can take amorphous forms. Patients and their parents are consumers, can often shop around, and certain elements affect perceptions of quality so that children's hospitals consider elements from the hotel industry in their planning (Wu, Robson & Hollis, 2013). Evidence does support the view that hospitality elements drive both

healing and perceptions, but these changes must be balanced with cost-effectiveness and excellence in clinical care (Wu, Robson & Hollis, 2013). The move towards private rooms in children's hospitals provides a lesson. Studies on Occupancy and Patient Care Quality (OPCQ) show that private rooms for pediatric patients promote healing, but nurses find it counterproductive in many cases (Smith, 2015). Multi-bed designs are still optimal in critical care wards, the ICUs, medical/surgical, and coronary care (Smith, 2015). It illustrates how decisions on quality, efficiency, and nursing care often occur independent of one another when they instead need to be "harmonized" (Needleman & Hassmiller, 2009).

The quality of care can also be enhanced through more attention to nursing staff. Psychological empowerment of nurses matters in a children's hospital because of the dynamic environment, but it depends first on unit empowerment granted by the administration (D'Innocenzo et al., 2016). Research has shown that unit empowerment results to a collaborative interaction with nurses' individual psychological empowerment (D'Innocenzo et al., 2016). That is, the individual empowerment of nurses was greatest when the levels of empowerment of their unit as a whole was highest (D'Innocenzo et al., 2016). This underscores the need to empower hospital units as a whole, which results to individual empowerment of nurses, as well as improvement of hospital individuals' performance (D'Innocenzo et al., 2016). This is significant because human capital flows degrade unit performance (Reilly, Nyberg, Maltarich & Weller, 2014). There is always a degree of voluntary turnover, but hiring rates and transfers are distinct components of the system. Human capital flows within a nursing unit have a direct effect on patient satisfaction and there is a mutual causality (Reilly, Nyberg, Maltarich & Weller, 2014).

Many US hospitals are also pursuing an integration model and hiring their own physicians (Scott, Orav, Cutler, & Jha, 2017). A study compared 803 hospitals that hired physicians with

2085 others as a control to determine the impact on mortality, 30-day readmission rates, length of stay, and patient satisfaction. About 29 percent of US hospitals hired their own physicians in 2003 and that number rose to 42 percent by 2012, with the majority either large non-profits or teaching hospitals (Scott, Orav, Cutler, & Jha, 2017). There was no connection between the four-quality metrics and the hiring of staff physicians up to two years after the change (Scott, Orav, Cutler, & Jha, 2017), which suggests the main benefit to hospitals is cost savings.

Managers of children's hospitals are essentially in uncharted waters as little evidence exists on how they might otherwise promote quality (Parand, Dopson, Renz & Vincent, 2014). Managers spend most of their time on strategy, organizational culture, and data-centric roles. There is a lack of objective measures and empirical studies on how or whether managers might otherwise affect quality (Parand et al., 2014). Managers also need to be wary of learning from failures, as organizations and business units may have similar experiences and entirely different reactions (Desai, 2015). They may absorb the wrong lessons. Organizations also learn less effectively when failures are concentrated, either in an individual or a unit, and a hospital's size and aspirations can also color how information is assessed (Desai, 2015). Empowering the hospital's units, discussed earlier in this section, may let quality emanate from below. The interaction between the units and management then becomes an issue because context and social position affect an individual's "sensemaking" (Lockett et al., 2014). The units and management may be committed to the same goals on quality of care, but their "sensemaking" determines how each will react to organizational change (Lockett et al., 2014).

## **II.10 Management Capacity to Enact Change:**

Inadequate attention is given to management in high-performing health systems (Bradley, Taylor & Cuellar, 2015) and most of the literature is focused on particular aspects such as human, financial, or technical resources. “Management occurs at various levels of systems including top management and policy levels, middle management, and operational front-line levels. Although closely related, we distinguish management from leadership, which we view as a process of engaging with others to achieve group objectives. The roles of management and leadership are distinct; however, in practice a single individual or group may play both management and leadership roles from within the same position” (Bradley, Taylor, & Cuellar, 2015, p. 411).

Most studies instead conflate management and leadership, as was shown in past sections and will be again in this one. The result is that an incomplete picture exists of what a manager of a children’s hospital can actually accomplish.

“More generally, investments in management capacity may be viewed as a key leverage point in grand strategy, as strong management enables the achievement of large ends with limited means. The currently limited focus on management is problematic given the substantial financial resources that flow through health systems, the complexity of hospital and health center daily operations, and strategic focus needed to maximize community and patient benefits given scarce resources. Furthermore, ample evidence exists that health worker motivation and retention is highly influenced by the quality of management in their work setting” (Bradley et al., 2015, p. 412).

The competition and changes in remuneration faced by children’s hospitals instead means a large amount of a manager’s time is spent on risk management and avoiding crises. A good reputation has burdens if a crisis hits and little is known on how reputation affects a hospital manager’s daily decisions (Parker, Krause, & Devers, 2019). There are two types of reputation,

the result of behaviors or the result of outcomes. A manager then has two types of discretion, a perceived latitude of actions and a perceived latitude of objectives (Parker et al., 2019). Management must answer to a board, so the perceptions of latitude may be inaccurate, but there are other stakeholders. A hospital's reputation can attract employees, patients, and resources, but another burden is that a good reputation raises expectations (Parker et al., 2019).

### **II.11 Reforms:**

Bradley, Taylor, & Cuellar (2015) said that management and leadership are distinct, and the literature is divided on the matter. The literature also tends to focus on particular aspects of management rather than a holistic approach and rhetoric is one of those aspects. "One key responsibility of leaders involves crafting and communicating two types of messages—visions and values—that help followers understand the ultimate purpose of their work" (Carton, Murphy, & Clark, 2014, p. 1544). Carton et al. (2014) wrote that a leader's role in creating a shared sense of purpose is underrated and that rhetoric should be examined in terms of shared cognition. Communicating vision without imagery or an emphasis on values is "dysfunctional." The authors used a study of 151 hospitals to determine that managers need to focus their rhetoric on vision imagery and not values in order to increase performance because it shares a sense of the hospital's goals. That shared sense of a goal in turn enhances coordination (Carton, Murphy, & Clark, 2014).

Coordination is essential to implementing any reform, and while reforms were discussed elsewhere in this chapter, it was addressed more in terms of resistance to change. Gupta, Hoopes, & Knott (2015) wrote that routines are discovered over time, though episodes of innovation from the literature were also mentioned in this chapter. For many organizations, neither evolution of an existing program or copying is entirely appropriate. Success in replicating a routine depends on

what gets replicated (Gupta et al., 2015). Managers then need to redesign reforms with their organization's input and help before inserting them into a new context. This is where the manager's vision imagery helps. Bradley, Taylor, & Cuellar (2015) wrote that "management capacity efforts, as a key ingredient of effective systems change, take time to embed, as new protocols and ways of working become habitual and integrated as standard operating procedures" (p. 413). The vision imagery can get the coordination needed to both launch a project and "stay the course."

## **II.12 Manager Backgrounds:**

Management at children's hospitals has traditionally come from business fields and the literature shows it is uncertain how a clinical background helps managers (Sarto & Veronesi, 2016). Sarto & Veronesi (2016) identified three sub-themes related to the concerns over clinicians in management, management of financial resources, quality of care, and the social performance of service providers. The authors found in their survey that clinicians did well on quality of care and related issues, but less well on financial management and social performance.

De Harlez & Malagueno (2016) took a different approach to evaluate how well clinicians and those with administrative backgrounds fared in hospital management. The authors explored the formal control mechanisms of a hospital, the performance measurement systems, to see how well they aligned with strategic goals. They found that "when the emphasis on partnership or governance strategic priority is high, the effect of the interactive use of PMS on hospital performance is more positive for top-level managers with a clinical background than for those with an administrative background" (p. 14). Bradley, Taylor & Cuellar (2015) add to the debate over clinicians or administrators in top roles by producing a list of core competencies for hospital administrators:



“The competencies are: (1) strategic thinking and problem solving, (2) human resource management, (3) financial management, (4) operations management, (5) performance management and accountability, (6) governance and leadership, (7) political analysis and dialogue, and (8) community and customer assessment and engagement” (p. 413). The core competencies would seem to give an edge to administrators over clinicians. However, these competencies also describe the typical administrator of a freestanding children’s hospital. A compromise is unlikely because “empowering middle managers to think strategically and problem solve can upset traditional hierarchies and power structures in the name of efficiency and performance. Hence, while external technical inputs are helpful, internal political leadership is essential to address and manage friction that is inevitable with transformational change” (Bradley, Taylor & Cuellar, 2015, p. 413).

### **II.13 Theoretical Background:**

A sustainable competitive advantage is the goal of Resource-based view, one that enables a firm to deliver superior performance over others for long-term success. It differs from the comparative advantage of classical economics where a trading nation is initially at the mercy of geography because firms engineer their advantage and assemble resources that are essentially non-substitutable. These resources take a variety of forms, but include people, leadership, capabilities, and processes (Porter, 1980). Freestanding children’s hospitals had been largely insulated from market forces because pediatric spending was always a small part of overall health spending in the US, but general hospitals and health systems are now seeking to claim part of that market share with their own specialized capabilities (Levine & Harris, 2017). Children’s hospitals are also facing uncertainty over their ability to access resources and funding. Changes in compensation

limit reimbursements to a narrow range for procedures over a set time period and all hospitals are now subject to penalties for potentially preventable readmissions and customer satisfaction. Resource-based view may enable children's hospitals to both remain independent and grow. Research has shown that firm is more competitive when its resources are valuable (V), rare (R), imperfectly imitable (I), and non-substitutable (N) (Adnan, Abdulhamid, & Sohail, 2018). Ashour (2018) outlined that a firm's competitive advantage can only be sustainable when its foundation is drawn from these VRIN resources. These VRIN resources can also be referred to as resources that allow the firm to develop and implement strategies that aim to increase firm effectiveness and efficiency (Rose et al., 2010). As such, the more VRIN resources a firm has, the greater likelihood the firm has in attaining and maintaining sustainable competitive advantage.

Hospitals are either non-profit, for profit, or government owned, and most children's hospitals are non-profit institutions. However, it is not insurmountable for a non-profit to apply resource-based view. Hospitals are more complex than most firms because of the communications required for service delivery and private hospitals depend on patient perceptions, and the quality of their products and services to survive (Priya & Jabarethina, 2016). Priya & Jabarethina (2016) used Porter's model of cost, technology, people, capability, and resources in their study of private hospitals and the SERVQUAL dimensions (reliability, assurance, responsiveness, tangibles, and empathy) to show resource-based view can be applied to the healthcare industry. The improvements in service quality and operational efficiencies enable creating a sustainable competitive advantage.

“Sustainable competitive advantage allows the maintenance and enhancement of markets and maintains the competitive position of an organization. It ensures the long-term growth of the organization and results in stronger brand, greater pricing power and operational efficiencies,

increases customer loyalty and enhances the ability to attract, retain, and motivate employees” (Priya & Jabarethina, 2016, p. 36). Arbab Kash et al. (2014) used a comparative case study of a children’s hospital and a multi-hospital health system in competitive markets to explore strategic change reforms and found their approaches similar. Both used resource dependency theory initially to understand their positions and develop their strategies. Both health systems then used a resource-based view to implement those reforms. The authors concluded resource-based view can be a valid part of strategic management in hospitals and is compatible with other planning methods. The result will be a hospital’s identification of its competitive advantages and effective management of the plans to achieve them. Resource-based view could give freestanding children’s hospitals the means to increase efficiency and performance to provide better care to more and remain viable.

#### **II.14 Feedback from the Field:**

Feedback from the field was conducted to gain more clarity and understanding to what was found in the extant literature. During this study, I was able to short list 25 hospitals from the 142 total children’s hospitals listed in the US. I was able to speak to 8 practitioners including pediatricians, directors and hospital managers. The feedback was based on their views about the hospital’s financial performance and what factors they believe could have direct impact on financial performance. The feedback collected was very instrumental in guiding this study and confirming the findings from the systematic literature review and in developing the research model. During these meetings, the following two questions were asked to the participants (Ps): (a) *“Based on your experience working in a children’s hospital setting, which factor(s) do you think has (have) the biggest influence on financial performance and why?”* (2) *“Do you think*

*financial performance is important?”*. The complete text of the meetings scripts of this feedback is included in Table 23 - chapter VII (Appendices). Table 2 below summarizes the feedback collected from the field.

**Table 2: Summary of feedback from the field:**

| <b>Independent Variables</b>   | <b>P1</b> | <b>P2</b> | <b>P3</b> | <b>P4</b> | <b>P5</b> | <b>P6</b> | <b>P7</b> | <b>P8</b> | <b>Action taken</b> |
|--------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---------------------|
| IV1 – Healthcare accessibility |           |           | X         | X         | X         |           |           | X         | Included            |
| IV2 – Medical coverage         | X         |           |           |           |           | X         | X         | X         | Included            |
| IV3 – Medical care resources   | X         | X         | X         |           |           |           | X         |           | Included            |
| IV4 – Community factors        | X         |           |           | X         | X         |           |           | X         | Included            |
| IV5 – Organizational factors   | X         |           |           |           | X         |           | X         |           | Included            |
| <b>Dependent Variable</b>      | <b>P1</b> | <b>P2</b> | <b>P3</b> | <b>P4</b> | <b>P5</b> | <b>P6</b> | <b>P7</b> | <b>P8</b> | <b>Action taken</b> |
| DV – Financial performance     | X         | X         | X         | X         | X         | X         | X         | X         | Included            |

## II.15 Development of the Research Model:

This section introduces the dependent variable and independent variables developed as a result of information captured in the literature review, theoretical background and the feedback collected from the field.

### *DV: Financial Performance:*

Financial Performance as found in the literature is how the hospital generates revenues and manages its assets, liabilities, and the financial interests of its stakeholders. We measured this variable with overall revenues and total operating expenses.

### *IV1: Healthcare Accessibility*

Accessibility as captured in the literature review and in the field was defined as the availability of good health services within reasonable reach of those who need them and of opening

hours, appointment systems, emergency room, length of stay and other aspects of service organization and delivery that allow people to obtain the services when they need them.

***IV2: Medical Coverage:***

Medical Coverage as captured in the extant literature review and feedback from the field is defined as whether the hospital accepts Medicaid and CHIP coverage or not. It was found that most children's hospitals accept Medicaid and the Children's Health Insurance Program (CHIP) which are both considered as a joint state-federal programs.

***IV3: Number of Services Offered***

Number of Services Offered refer to the medical care resources and the number of services that children's hospitals offer to patients such as birthing rooms, organs transplants, NICU, ambulance, oncology and neurological services.

***IV4: Community Factors:***

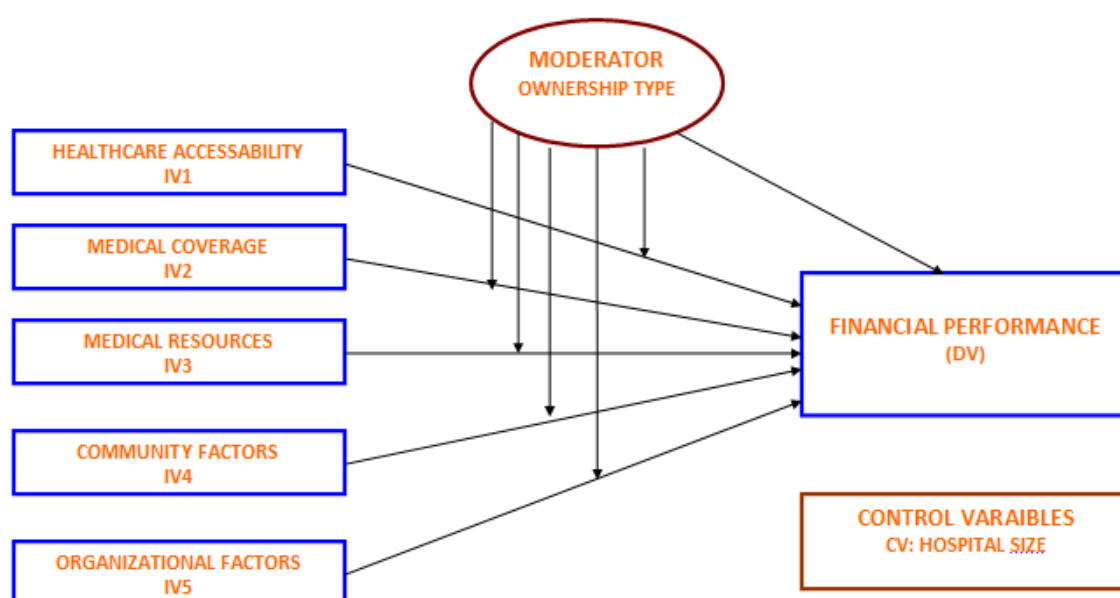
Community Factors as found in the literature included the language, ethnicity, race, health education and planning for improving community health.

***IV5: Organizational Factors:***

Organizational Factors are defined by the characteristics of the hospitals such as teaching affiliation status, organizational structure, public or private, catholic, for profit or non-for-profit organizations and the degree of centralization of health system.

## II.16 Conceptual Framework:

The extant literature review, theory used to inform this study, and the feedback received from the field, guided me in developing my preliminary research model which consisted of five independent variables, one dependent variable, one moderator variable and one control variable as shown in the figure below. This research model was used in the research design and to develop the hypotheses to answer the research question(s) as explained in the next chapter: “Research Design and Methodology”.



**Figure 8: Preliminary Research Model:**

## II.17 Summary:

A decline in birth rates, changes to insurance plans that stress quality and patient satisfaction, and the ability of most consumers to shop for service have put freestanding children’s hospitals in direct competition with all other healthcare institutions. Children’s hospitals were essentially shielded previously and took the sickest children with greater comorbidities. These patients also used more resources and were more likely to undergo complex procedures.

Freestanding children's hospitals treat more children covered by Medicaid and deliver the same quality of care as non-Medicaid patients, yet receive less in reimbursement. Federal payments to close the gap between what Medicaid and private insurers pay were cut on the assumption that the Affordable Care Act (ACA) would leave fewer children uninsured.

Children's hospitals look increasingly toward fundraising to adapt, but not all of these institutions have the same potential to attract donors. The issue is also clouded by debate on whether to stay independent and non-profit. However, the operating costs of all hospital types are similar. The difference is their margin. Independent hospitals that joined a health system did show savings during their transition due to increased technical efficiency, but any gain in profit vanished after the first year. Children's hospitals can use scale to remain independent, but that requires stakeholder decisions on future direction and the planning, resources, and time required to meet those goals.

Management in the short term looks to lean practices, patient-centric care, and continuity of care to reduce costs and increase quality. Incomplete data and imperfect tracking systems can be a hurdle in those efforts, as is organizational friction while change is introduced. Innovation has been successful, but mostly when innovation came from people within an organization and not the organization itself. Management must also address human capital flows that degrade unit performance while juggling these other issues.

There is also the question whether management has the potential to enact change. A children's hospital is a highly complex organization and much of the manager's focus is on risk management to please the hospital's board. Substantial debate exists on whether management and leadership are distinct, but change requires the manager to lead. Another question is for the



hospital's board to answer, whether an administrative or clinical background would be best for whoever is charged to lead the way.

### **III RESEARCH DESIGN & METHODOLOGY**

#### **III.1 Research Design:**

The research design of this study focused on determining the relationships between numerically measured variables (Curtis, Comiskey, & Dempsey, 2016; Goodwin & Goodwin, 2013). The use of exploratory research design provided this researcher the opportunity to evaluate both the magnitude and behavior of the relationships between variables (Babbie, 2013; Whitley, Kite, & Adams, 2013). Table 3 was used to develop the research design for this exploratory study on the factors affecting the US children's hospitals financial performance. In the next chapter IV "Data Analysis and Results", we measured the independent and dependent variables numerically by analyzing secondary data using statistical analysis to address the research question and hypotheses.

**Table 3: Summary of Research Design (adopted from Mathiassen 2017)**

|                                 |   |
|---------------------------------|---|
| <b>P</b> (Problem Setting)      | Healthcare costs continue to increase while quality remains unchanged.  |
| <b>A</b> (Area of Concern)      | Healthcare Industry - US children hospitals.  |
| <b>F</b> (Conceptual Framework) | Resource Based View (RBV).  |
| <b>M</b> (Research Method)      | Quantitative exploratory study.   |
| <b>RQ</b> (Research Question)   | What factors affect US Children's Hospitals Financial Performance?  |
| <b>C</b> (Contribution)         | From the academic perspective, this study adds to the body of knowledge in the healthcare industry and the application of resource-based view. For practitioners, the study findings provide practical information to managers and stake holders of children's hospitals. |
| Study Population                | 230 children's hospitals registered in the US as of FY2017.   |
| Data Source                     | Secondary data acquired from the American Hospital Association.   |
| Participants                    | 124 US children's hospitals who treat children under the age of 18.   |
| Unit of analysis                | US Children's Hospitals.  |
| Exclusion of Sampling           | Sampling was excluded due to the exploratory nature of this study.  |
| Variable and measures           | After cleaning and building constructs, the measures were selected for each variable to develop the research model.   |
| Threats to Validity             | Data had a high degree of validity as it consisted raw data from a reliable source which is the American Hospital Association (AHA).  |

Our study initially used a bivariate model to examine the impact of the independent variables: health care accessibility, medical coverage, medical care resources, community factors, and organizational factors on the dependent variable "US children's hospitals' financial performance" while controlling for hospital's size (total number of beds), and teaching affiliation. Then, we used a multivariate model to examine the simultaneous effect of all independent variables on the dependent variables. The unit of analysis in this study was the US children's hospitals. All

142 US children's hospitals were included in the dataset. The source of the data was the American Hospital Association (AHA). Univariate analysis (including descriptive statistics), bivariate analysis and multivariate analysis were conducted to determine: (a) the behavior of each independent variable (IV); (b) the relationship between each IV and the dependent variable (DV), and (c) the simultaneous effect of the independent variables on the dependent variable, respectively.

### **III.2 Research Question and Hypotheses:**

Based on the research design, the following were the research question (RQ), sub-research questions (SRQs), and the hypotheses explored in this study:

**“RQ: What factors affect the financial performance of US children's hospitals?”**

***SRQ1: To what extent, if any, does a relationship exist between Healthcare Accessibility and Financial performance while controlling for Hospital Size and/or Teaching Affiliation?***

***H<sub>1a</sub>: There is a significant relationship between Healthcare Accessibility and Financial Performance while controlling for Hospital Size and/or Teaching Affiliation.***

***H<sub>1b</sub>: Healthcare Accessibility, along with other independent variables, has simultaneous effect on Financial Performance in the presence of “Ownership Type” as a moderator variable.***

***SRQ2: To what extent, if any, does a relationship exist between Medical Coverage and Financial performance while controlling for Hospital Size and/or Teaching Affiliation?***

***H<sub>2a</sub>: There is a significant relationship between Medical Coverage and Financial Performance while controlling for Hospital Size and/or Teaching Affiliation***

*H<sub>2b</sub>: Medical Coverage, along with other independent variables, has simultaneous effect on Financial Performance in the presence of “Ownership Type” as a moderator variable.*

***SRQ3: To what extent, if any, does a relationship exist between Number of Services Offered and Financial performance while controlling for Hospital Size and/or Teaching Affiliation?***

*H<sub>3a</sub>: There is a significant relationship between Number of Services Offered and Financial Performance while controlling for Hospital Size and/or Teaching Affiliation.*

*H<sub>3b</sub>: Number of Services Offered, along with other independent variables, has simultaneous effect on Financial Performance in the presence of “Ownership Type” as a moderator variable.*

***SRQ4: To what extent, if any, does a relationship exist between Organizational Factors and Financial Performance while controlling for Hospital Size and/or Teaching Affiliation?***

*H<sub>4a</sub>: There is a significant relationship between Organizational Factors and Financial Performance while controlling for Hospital Size and/or Teaching Affiliation.*

*H<sub>4b</sub>: Organizational Factors, along with other independent variables, has simultaneous effect on Financial Performance in the presence of “Ownership Type” as a moderator variable.*

***SRQ5: To what extent, if any, does a relationship exist between Community Factors and Financial Performance while controlling for Hospital Size and/or Teaching Affiliation?***

*H<sub>5a</sub>: There is a significant relationship between Community Factors and Financial Performance while controlling for hospital size and/or Teaching Affiliation.*

*H<sub>5b</sub>: Community Factors, along with other independent variables, has simultaneous effect on Financial Performance in the presence of “Ownership Type” as a moderator variable.*

### **III.3 Study Population and Data Sources:**

#### **III.3.1 Study Population:**

The target population for this study was all US children’s hospitals. In 2017, there was about 230 children’s hospitals registered across the United States. Out of those, 142 hospitals involved in the medical treatment of children only. In this study we defined them as “children-only hospitals”. The research setting included types and geographical areas of children’s hospitals along with hospitals characteristics. The intended statistical technique to address the research questions consisted of descriptive statistics, univariate method, bivariate method, and multivariate method analysis including simple regression and hierarchical multiple regression with one dependent variable, five independent variables, one moderator variable, and two control variables. As being an exploratory study, any type of sampling had been excluded in the selection of participants. Hence, the data set of this study included the entire children’s hospitals in the United States.

#### **III.3.2 Data Sources:**

The constructs used in the research model included hospitals’ financials and survey data and they were developed from a secondary dataset acquired from the American Hospital Association’s Annual Survey Database (AHA ASDB data set FY 2017). The AHA is a not-for-profit association of health care provider organizations and individuals that are committed to the health improvement of their communities. The AHA is the national advocate for nearly 5,000

hospitals, health care systems, networks, other providers of care and 43,000 individual members. Founded in 1898, the AHA also provides education for health care leaders and is a source of information on health care issues and trends. The AHA aggregates hospital data and creates trend analysis which includes data on utilization, personnel, revenue, expenses, and community health indicators.

#### **III.4 Operationalization of Measures:**

For this study, and as illustrated by Figure 8 – Chapter II, there was initially one dependent variable, five independent variables, one moderator variable, and one control variable. The definition and operationalization of each variable were discussed below:

The dependent variable *hospital financial performance* was defined in this study as the indicator that identifies how well a company generates revenues and manages its assets, liabilities, and the financial interests of its stakeholders. Financial performance was computed by dividing the net profit by net assets (total assets minus total liabilities), multiplied by 100 to compute the return on assets (ROA). The higher the ratio, the more efficiently the company was generating profits from its resources. ROA is an indicator of how profitable a company is relative to its total assets and it gives a manager, investor, or analyst an idea as to how efficient a company's management is at using its assets to generate earnings.

The independent variable *health care accessibility* was defined in this study as the availability of good health services within reasonable reach of those who need them and of opening hours, appointment systems, and other aspects of service organization and delivery that allow people to obtain the services when they need them. This independent variable was measured through its operation hours and distance from city center. The data was in nominal form.

The independent variable *medical coverage* was defined in this study as whether the hospital accepts Medicaid coverage. This was a categorical variable. The options can be either with Medicaid coverage or without Medicaid coverage.

The independent variable *medical resources* were defined as any needed equipment, facility, or people to deliver hospital care to patients. In this study it was measured using the number of beds (neonatal and pediatric) and number of staff (physicians, nurses, and dentists).

The independent variable *community factors* were defined by measures such as language, ethnicity, race, and health education.

The independent variable *organizational factors* were defined as any extraneous characteristics of the hospitals. Specifically, organizational factors that were considered for this study were teaching affiliation status (with teaching affiliation or without teaching affiliation) and organizational structure (rural or urban). All organizational factors were measured in categorical form.

The moderator variable *hospital type* refers to the hospital ownership. A hospital can either be public, private, or non-for-profit hospital. This variable was measured in categorical form.

Finally, the control variable *hospital's size* (refers to the number of beds), was measured in continuous form.

### **III.5 Threats to Validity:**

Ensuring the validity of the data collected and analyzed was an important goal of this study. Creswell (2012) asserted that validity is the development of sound evidence to demonstrate that the test interpretation of scores about the concept or construct that the test is



assumed to measure, matches its proposed use. In this study, the secondary data had a high degree of validity because it consisted raw dataset from a reliable source in the United States.

### **III.6 Ethical Considerations:**

This study began with the approval from the Georgia State University's Institutional Review Board (IRB) to ensure ethical standards were met. This research did not pose any harm to hospitals for several reasons. Firstly, the nature of anonymous quantitative data collection was such that no identifying information collected can be linked back to the hospitals. Pseudo codes were used to designate each hospital, i.e. H01 for hospital number one and so on. Secondly, the hospitals were not a vulnerable population. The data collected in this study was not in any way confidential, meaning that where anonymity could somehow be compromised, the risk of harm remained minimal. Hard copies of raw data and other documents pertinent to this study were securely kept in a locked filing cabinet inside the personal office of the researcher. Soft copies of raw data and other documents were saved in a password-protected flash drive. All data and documents related to the study will be destroyed seven years after completion. Hard copies will be shredded while soft copies will be deleted.

### **III.7 Feedback from The Field:**

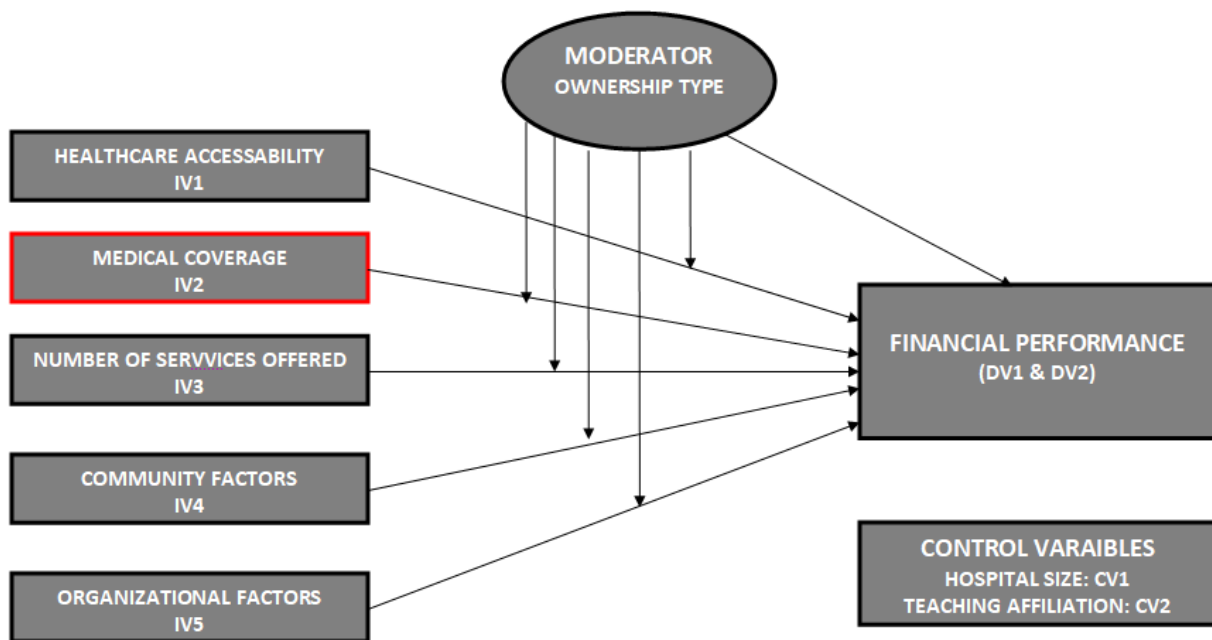
By recalling what we explained in chapter II section 14, the methodology used to collect feedback from the field was based on two questions asked to the practitioners about their views on (1) the importance of the dependent variable "Financial Performance", and (2) which factors they believe have impact on financial performance. The feedback was summarized in chapter II table

2. This process guided this researcher to confirm what was found in the literature, and hence in developing the supported research model as shown in figure 9.

### **III.8 Development of the Research Model:**

In order to explore and examine the impact of factors affecting the financial performance of US Children's Hospitals, I first investigated the extant literature related to US children's healthcare to explore variables that may have impact on the financial performance. I found nine variables including the five proposed in the research model in addition to four other variables and these were: "Hospital's Environment, Care Quality, Organizational Leadership, and Patient Experience". Then, I investigated some theories to guide and support my research question(s) including the Resource Based View (RBV), Sustainable Development Goals Theory (SDGs), Institutional Theory, Stakeholder theory, and Social Capital Theory. I found the RBV to be the most suitable as it has been explained in the introduction chapter of this study. This guided me to collapse my selected independent variable from nine to seven variables including the five proposed in the research model in addition to: "Care Quality and Organizational Leadership". Then, I collected additional information from the field by speaking to 8 practitioners including pediatricians and hospitals' managers which guided me to collapse my variables to the five proposed in the research model plus the "Care Quality factor". After investigating and looking deeply into the dataset to be tested, the independent variable: IV2: "Medical Coverage" was dropped from the research model due to lack of reported Medicaid coverage acceptance by hospitals listed in the data set. After cleaning and building the constructs, the DV was split in 2 parts DV1 and DV2. The control variables were set as CV1: Hospital Size and CV2: Teaching Affiliation. Hence, I concluded the development of the research model with four independent

variables and two dependent variables which constituted the conceptual framework shown in Figure 9. This research model was used to address the research question. Finally, I conducted further steps into the data analysis exploration as described in Chapter VI (Data Analysis and Results).



**Figure 9: The Supported Research Model (Conceptual Framework)**

### III.9 Layout of Constructs and Measures:

Based on the supported research model, the following measures were developed for each construct:

**Table 4: Final Layout of Constructs and Measures****DV1 and DV2: Financial Performance:**

| No | Measure                  | Code in data | Value |
|----|--------------------------|--------------|-------|
| 1  | Hospital revenue         | hosprev      | \$    |
| 2  | Total income             | totinc       | \$    |
| 3  | Total assets             | totasset     | \$    |
| 4  | Total operating expenses | totopexp     | \$    |
| 5  | Inventory                | inven        | \$    |
| 6  | Cash on hand             | cashonhand   | \$    |

**IV1: Health Care Accessibility:**

| No | Measure               | Code in data | Value  |
|----|-----------------------|--------------|--------|
| 1  | Total Admissions      | admtot       | Number |
| 2  | Outpatient Visits     | vtot         | Number |
| 3  | Inpatient Visits      | ipdtot       | Number |
| 4  | Length of Stay        | los          | Number |
| 5  | Emergency room visits | vem          | Number |

**IV3: Number Of Services Offered:**

| No | Measure                            | Code in data | Value      |
|----|------------------------------------|--------------|------------|
| 1  | Pediatric Emergency Department     | pemerhos     | Yes / No - |
| 2  | Neonatal intensive care            | ftenic       | Yes / No   |
| 3  | Pediatric intensive care           | ftepic       | Yes / No   |
| 4  | Ambulance services                 | ambhos       | Yes / No   |
| 5  | Children's wellness program        | cwellhos     | Yes / No   |
| 6  | Health screenings                  | hlthshos     | Yes / No   |
| 7  | Oncology services                  | oncolhos     | Yes / No   |
| 8  | Orthopedic services                | ortohos      | Yes / No   |
| 9  | Neurological services              | nerohos      | Yes / No   |
| 10 | Computed tomography (CT) scanner   | ctscnhos     | Yes / No   |
| 11 | Magnetic resonance imaging (MRI)   | mrihos       | Yes / No   |
| 12 | Ultrasound                         | ultsnhos     | Yes / No   |
| 13 | Heart transplant                   | harthos      | Yes / No   |
| 14 | Kidney transplant                  | kdnyhos      | Yes / No   |
| 15 | Liver transplant                   | livrhos      | Yes / No   |
| 16 | Lung transplant                    | lunghos      | Yes / No   |
| 17 | Open 24 hours a day, 7 days a week | acuhos       | Yes / No   |
| 18 | Birthing room/LDR room/LDRP room   | broomsys     | Yes / No   |

**IV4: Community Factors:**

| No | Measure                                       | Code in data | Value    |
|----|---|--------------|----------|
| 1  | Community Health Education                    | hlthchos     | Yes / No |
| 2  | Collects patient's primary language           | linghos      | Yes / No |
| 3  | Offers community health & wellness activities | fitchos      | Yes / No |
| 4  | Plan for improving community's health         | coutrhos     | Yes / No |

**IV5: Organizational Factors:**

| No | Measure                                   | Code in data | Value  |
|----|---|--------------|--------|
| 1  | Degree of centralization of health system | cluster      | Number |

**MV (Moderator) Ownership Type:**

| No | Measure                        | Code in data | Value    |
|----|--------------------------------|--------------|----------|
| 1  | Government federal             | cntrl        | Yes / No |
| 2  | Government non-federal         | cntrl        | Yes / No |
| 3  | Nongovernmental non-for-profit | cntrl        | Yes / No |

**CV (Control Variables) Hospital Size & Teaching Affiliation:**

| No | Measure                        | Code in data | Value    |
|----|--------------------------------|--------------|----------|
| 1  | Hospital size (Number of beds) | hospbd       | Number   |
| 2  | Teaching Affiliation           | mapp5        | Yes / No |

**III.10 Data Analysis Plan:**

The data analysis for this study was performed using the Statistical Package for the Social Sciences (SPSS) for Windows, to provide a range of descriptive as well as inferential statistics including Descriptive Statistics, Univariate, Bivariate, and Multivariate statistical analysis. SPSS software is used extensively by researchers in the educational as well as social and behavioral sciences (Hinton, McMurray, & Brownlow, 2014). The advantage of using SPSS was that it was user friendly and enabled this researcher to export data from Microsoft Excel easily.

First, descriptive statistics was conducted to assess the behavior of each construct individually, and to further characterize the demographics of the hospitals as well as their responses to the survey conducted by the AHA. Descriptive statistics such as frequency, percentage, mean, standard deviation was computed. Histogram and scatterplots were generated to accompany this analysis. Second, the data analysis included inferential statistical analyses including bivariate simple regression analysis to examine the relationship between each independent variable and the dependent variable while controlling for hospital's size and teaching affiliation. Third, hierarchical multiple regression was conducted to test the simultaneous effect of the independent variables on the dependent variable while using the same control variables and moderating for hospital ownership type.

Regression analysis serves three purposes: description, control, and prediction (Nimon & Reio, 2011). Along with correlation analysis, the simple regression and hierarchical multiple regression were used to answer the research question(s) and sub-question(s). Hierarchical multiple regression enabled the entering of independent variables into the regression equation which allowed to control the effects of covariates on the results. There are four assumptions of hierarchical regression analysis and these include: (a) normality, (b) homogeneity of variance, (c) linearity, and (d) independence (Sedgwick, 2015). In data analysis, first, a Kolmogorov-Smirnov test was performed in order to detect if all study variables comply with the normality assumption (Siddiqi, 2014). Second, a test for homogeneity of variance was conducted using Levine's test that investigates for a constant variance of error for the independent variable, by plotting residuals versus predicted values, and residuals versus independent variables (Parra-Frutos, 2013). The scatterplots of the variables were pattern-less, which suggests that the errors were consistent across the range of predicted values hence and hence the assumption was met. Third, linearity test was

conducted to test for a linear relationship between the two variables (Sedgwick, 2015). The linearity test involved producing scatterplots in order to make sure the mean of the outcome variable for each increment fall on a straight line. Lastly, a test for outliers was conducted through visual inspection of histograms and boxplots to meet the assumption of independence (Huber & Melly, 2015). Hypothesis testing was done on all analyses with a 0.05 level of significance (Weakliem, 2016). This means that all p-value output of the simple and hierarchical multiple regressions was assessed using a 0.05 level of significance. A p-value of less than 0.05 dictates that there was a statistically significant relationship between the variables and that the null hypothesis can be rejected, whereas a value of greater than 0.05 dictates that there was a statistically non-significant relationship between variables.

### **III.11 Data Collection, Cleaning and Preparation:**

#### **III.11.1 *Data Collection:***

The data for this study was acquired from the American Hospital Association (AHA) and the study was approved by the Georgia State University IRB Department. Before deciding on the research model and what constructs and measures to use from the data, I first analyzed the themes of the extant literature to guide the selection of the most suitable variables. Then, I collected critical and valuable feedback from the field by meeting and speaking to practitioners including children's hospitals pediatricians and managers who have uncovered important information leading to the selection of the variables and measures from the data set. Based on such feedback and the extant literature review, I was able to arrive to certain important variables, but since I was still exploring, I was not sure whether they have impact on financial performance or not. Then I reviewed additional literature related to the theoretical framework RVB to support the selected

model. Finally, I carefully investigated the available dataset acquired from the American Hospital Association (AHA ASDB data set FY 2017).

This data was delivered in an ascii and Microsoft Access format. I first converted the data into Microsoft Excel. Then, I inspected the data from both file formats to make sure that no data was lost during the conversion process. Then I started the process of merging the survey data and financial data in one Microsoft Excel sheet. Then, I translated the data into SPSS for analysis. After the data was loaded into SPSS, I ensured that it is properly organized, structured, and all of the composite variables have been created for the analyses that has been specified. Finally, I ran the data analysis as described in chapter IV of this study: “Data Analysis and Results”.

### **III.11.2      *Data Cleaning and Preparation:***

The original 2017 dataset included all 6,146 hospitals in the United States. The children’s hospitals were first filtered out to include the total of 230 listed children’s hospitals. Then the children-only hospitals were filtered out and there was a total of 142 cases as shown in (chapter I - Table 1). These 142 children’s hospitals that do not report to any other parent organization, constituted the scope of this study. The data set was further inspected for missing fields and 68 cases were dropped and excluded from further analysis. The outcome of this data cleaning process was 74 cases with clean and rich data to be analyzed. In preparing the dataset, the financial and survey data were merged and linked in one Microsoft Excel sheet by using the AHA hospital’s ID number. All data were pre-processed using Microsoft Excel. Pre-processing aimed to ensure a clean data set by excluding data outliers and missing data. Measures not included in the research model were removed and missing fields were updated by using the substitution and averaging methods for values of similar size hospitals. This process was used for fields with one to three



missing values. For fields with more than three missing values, they were dropped, and the entire case was removed from the analysis (listwise deletion). In listwise deletion, a case is dropped from an analysis because it has a missing value in at least one or more of the specified variables. Once a complete, clean dataset has been achieved, it was then exported to SPSS for data analysis. Only those hospitals who have complete information on all the variables were included in the data analysis. Finally, the data was organized based on continuous versus categorical variables.

### **III.12 Summary:**

This chapter presented the research method and the appropriate research design used for this study. The research question and hypotheses were presented in this chapter. A detailed discussion of the target population strategies used as well as details about data collection, data analyses procedures and the operationalization of constructs and measures were addressed. Threats to validity and ethical considerations were explained. The feedback collected from practitioners in the field was summarized to inform how it was an instrumental measure along with the literature review and the theoretical framework to support the development of the research model and the final layout of constructs and measures. Finally, the methods used to collect, clean and prepare the data for analysis were explained in details and a summary of the key points of the proposed methodology concluded this chapter. The next chapter of this study will address the data analysis and results before moving to chapter V (Discussions).

## IV DATA ANALYSIS & RESULTS

### IV.1 Introduction

After the data was collected, cleaned and prepared, the first step in this exploratory study was to understand the behavior of the eight variables in the research model using descriptive statistics and univariate analysis. Next, I moved to the second level and conducted bivariate analysis which aimed to assess the relationships and the effect of each independent variable on the dependent variables. Finally, I moved to the third level and conducted the multivariate analysis which aimed to assess the simultaneous effect of the four independent variables on the dependent variables.

To achieve this goal, I first utilized the extant literature summary and the theoretical framework as shown in the previous chapter to assess the factors that could have the highest impact on financial performance. Then I analyzed the feedback from the field provided by eight children's hospitals practitioners including pediatricians and hospital managers. Second, I conducted a thorough evaluation of the measures included in each construct through four consecutive stages of rigorous evaluations and selections which started with 170 measures. After carefully defining the role of each measure in relation to the variable, I excluded the ones that are non-relevant to the study and hence the number was collapsed down from 170 to 136 measures. Then after applying what was found in the literature and feedback from the field, the measures were trimmed down to 56. Finally, after checking the availability of the 56 measures in the data to be analyzed, I collapsed them down to 39 relevant measures across all 7 constructs as shown in chapter III – Table 8.

At this point, I decided to split the DV into two dependent variables, DV1 which represented the (Total Operating Expenses), and DV2 which included the remaining 5 measures (Hospital revenue, Total income, Total assets, Inventory and Cash on hand). Furthermore, and as reported in the previous chapter, it is worth mentioning again, that upon checking the final dataset,

the independent variable IV2: “Medical Coverage” was removed from the model and excluded from further analysis due to non-sufficient data in this construct to explain whether the hospital participates in Medicaid coverage or not. This specific limitation was addressed in the next chapter (Discussion).

The univariate analysis and descriptive statistics indicated that all eight variables were ready for further analysis. The results of the bivariate and multivariate analysis are presented in this chapter and were discussed in depth in chapter V (Discussion)

#### **IV.2 Definition of Dataset:**

It is worth mentioning in the beginning of this chapter that the total number of children’s hospital registered in the United States were found to be 230 hospitals. 142 of these hospitals are children-only hospitals as reported by the American Hospital Association in Puerto Rico and US (Table 1, chapter I). After cleaning and preparing the data set for analysis, only 74 cases were used for the data analysis due to the missing of important measures proposed in the research model. The data analysis performed in this chapter is based on the final layout of constructs and measures in Table 8 in the previous chapter.

#### **IV.3 Descriptive Statistics & Univariate Analysis:**

Table 5 and figures from 10 to 18 summarize the behavior of the 2 dependent variables (DV1 and DV2), the 4 independent variables (IV1, IV3, IV4 and IV5), the moderator variable (MV), and the 2 control variables (CV1 and CV2).

**Table 5: Descriptive Statistics**

|          | Financial Performance 1 (\$10.000) | Financial Performance 2 (\$10.000) | Health Care Accessibility | Number of Services Offered | Community Factors | Organizational Factors | Hospital Size |
|----------|------------------------------------|------------------------------------|---------------------------|----------------------------|-------------------|------------------------|---------------|
| N        | 74                                 | 74                                 | 74                        | 74                         | 73                | 74                     | 74            |
| M        | \$36,464.67                        | \$100,307.71                       | 69,412.69                 | 6.09                       | 2.04              | 1.58                   | 185.78        |
| SD       | \$47,481.68                        | \$148,300.36                       | 80,444.40                 | 5.13                       | 1.07              | 2.14                   | 167.70        |
| Skewness | \$1.80                             | \$2.18                             | 1.58                      | 0.06                       | 0.12              | 0.83                   | 1.17          |
| Kurtosis | \$3.66                             | \$4.85                             | 2.52                      | -1.58                      | -0.71             | -1.14                  | 1.02          |
| Minimum  | \$0.00                             | -\$13,396.78                       | 1,081.60                  | 0.00                       | 0.00              | 0.00                   | 10.00         |
| Maximum  | \$225,993.00                       | \$663,037.02                       | 353,029.00                | 14.00                      | 4.00              | 6.00                   | 743.00        |

Financial Performance 1 = (Total Operating Expenses)

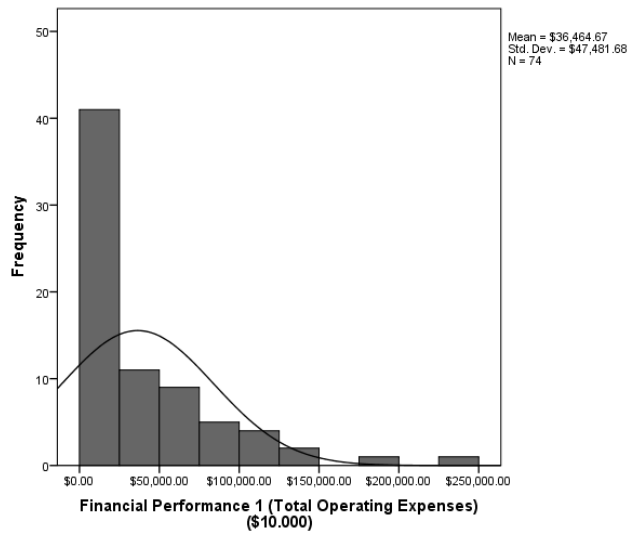
Financial Performance 2 = (Hospital revenue, Total income, Total assets, Inventory, Cash on hand)

### ***DV: Financial Performance:***

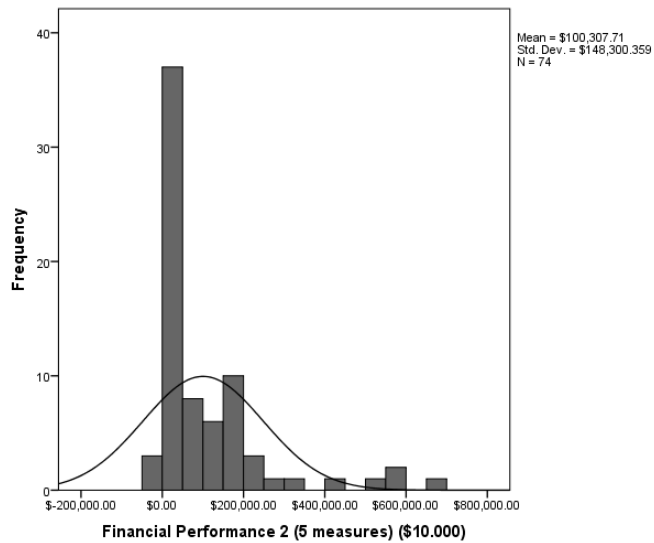
Financial Performance is the dependent variable in this study which was split in two parts and included the measures: DV1 (Total operating expenses) and DV2 (Hospital revenue; Total income; Total assets; Inventory; Operational margin; Cash on hand). First, we tested the dependent variable DV1. The average financial performance was \$36464.67 (in \$10.000) (M=36464.67; SD=47481.68), minimum is \$0.00, and maximum is \$225993.00. Skewness was positive and higher than 1, so the data are positively and highly skewed. Kurtosis was positive and higher than 3. The distribution is leptokurtic - longer, tails are fatter. The results of the univariate analysis for this construct showed that it behaves normally, and the associated measure is consistent and represent the construct.

Second, we tested the dependent variable DV2. The average financial performance was \$100,307.71 (in \$10.000) (M = 100,307.71; SD = 148300.36), minimum is -13,396.78, and maximum is 663,037.02. Skewness was positive and higher than 1, so the data are positively and highly skewed. Kurtosis was higher than 3 (4.85). The distribution is leptokurtic - longer, tails

are fatter. The results of the univariate analysis for this construct showed that it behaves normally, and the associated measures are consistent and represent the construct. Figures 10 and 11 show the data distribution for the dependent variables DV1 and DV2.



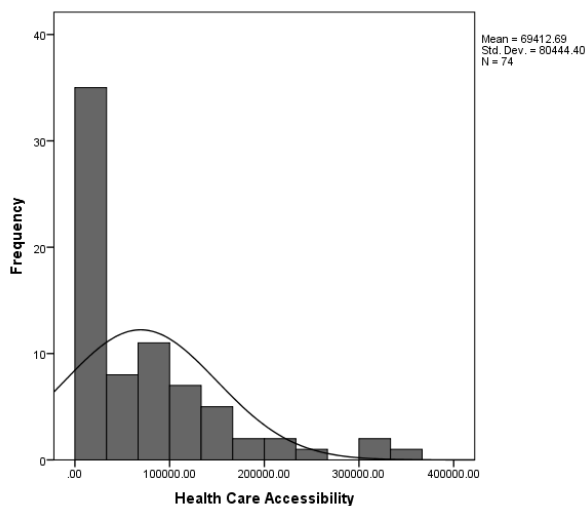
**Figure 10: Financial performance (DV 1)**



**Figure 11: Financial performance (DV2)**

### ***IV1: Health Care Accessibility:***

Health Care Accessibility is the independent variable that included the measures: (Total admissions; Outpatient visits; Inpatient visits, Length of stay, and Emergency room visits). The average health care accessibility is 69412.69, ( $M=69412.69$ ;  $SD=80444.40$ ), minimum is 1081.60, and maximum is 353029.00. Skewness was positive and higher than 1 (1.58), so the data are positively highly skewed. Kurtosis was lower than 3 (2.52). The distribution is platykurtic - distribution is shorter, tails are thinner than the normal distribution. The results of the univariate analysis for this construct showed that it behaves normally, and the associated measures are consistent and represent the construct. Figure 12 shows the data distribution for the independent variable “Health Care Accessibility”.

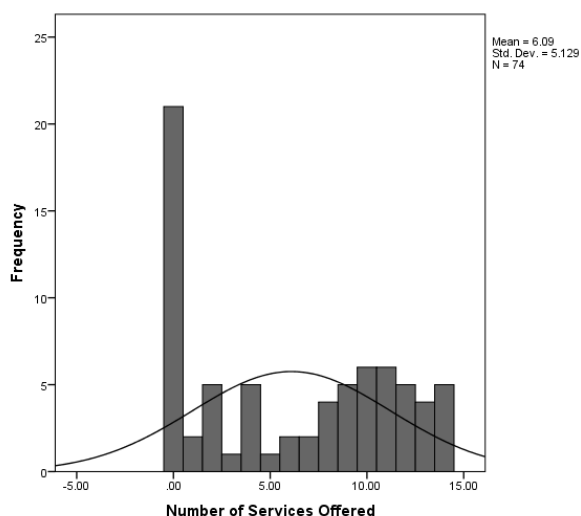


**Figure 12: Health Care Accessibility**

### ***IV3: Number of Services Offered:***

Number of services offered is the independent variable that included 18 type of services offered by the hospital as shown in table 8. All 74 cases were valid for this construct. The average number of services offered is 6.09 ( $M=6.09$ ;  $SD=5.13$ ), minimum is 0.00, and maximum is 14.00.

Skewness was 0.06 that is lower than 1, so the data distribution is negatively and highly skewed. Kurtosis was -1.58 that is lower than 3. The distribution is platykurtic - distribution is shorter, tails are thinner than the normal distribution. The results of the univariate analysis for this construct showed that it behaves normally, and the associated measures are consistent and represent the construct. Figure 13 shows the data distribution for the independent variable “Number of Services Offered”.

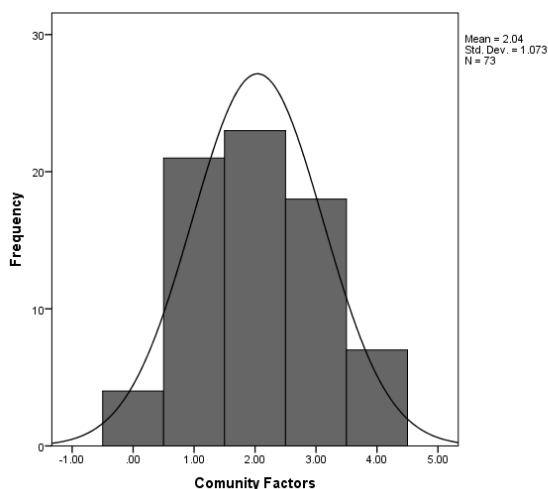


**Figure 13: Number of services offered**

#### ***IV4: Community Factors:***

Community Factors is the independent variable that included the measures: (community health education, collects patient’s primary language, offers community health and wellness activities, and plan for improving community health). All 74 cases were valid for this construct. The average community factors is 2.04 (M=2.04; SD=1.07), minimum is 0.00, and maximum is 4.00. Skewness was 0.12 which is lower than 1, so the distribution is negatively and highly skewed. Kurtosis was -0.71 that is lower than 3, so the distribution is platykurtic - distribution is shorter, tails are thinner than the normal distribution. The results of the univariate analysis for this

construct showed that it behaves normally, and the associated measures are consistent and represent the construct. Figure 14 shows the data distribution for the independent variable “Community Factors”.

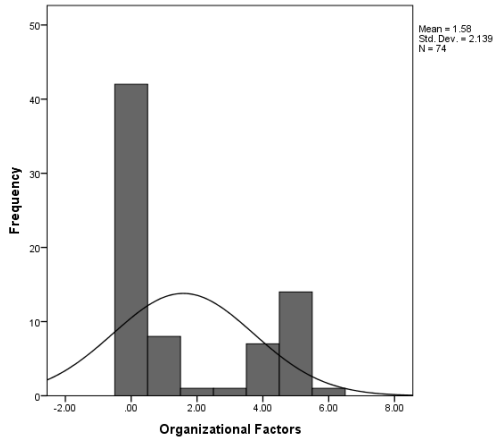


**Figure 14: Community Factors**

***IV5: Organizational Factors:***

Organizational Factors is the independent variable that included the measures: (degree of centralization of healthcare system). 73 cases out of 74 were valid for this construct. The average organizational factors is 1.58 (M=1.58, SD=2.14), minimum is 0.00, and maximum is 6.00. Skewness was 0.83 which is lower than 1, so the distribution is highly skewed. Kurtosis was -1.14 that is lower than 3, so the distribution is platykurtic - distribution is shorter, tails are thinner than the normal distribution. The results of the univariate analysis for this construct showed that it behaves normally, and the associated measures are consistent and represent the construct. Figure 15 shows the data distribution for the variable “Organizational Factors”.

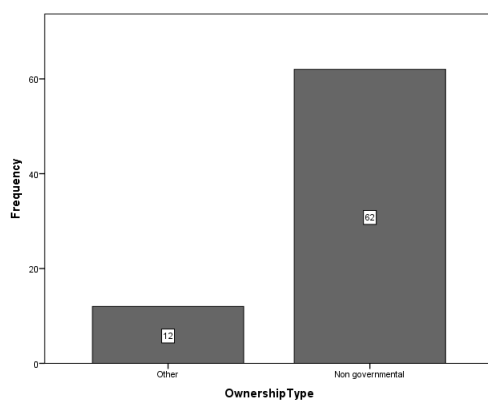




**Figure 15: Organizational Factors**

***MV: Moderator Variable:***

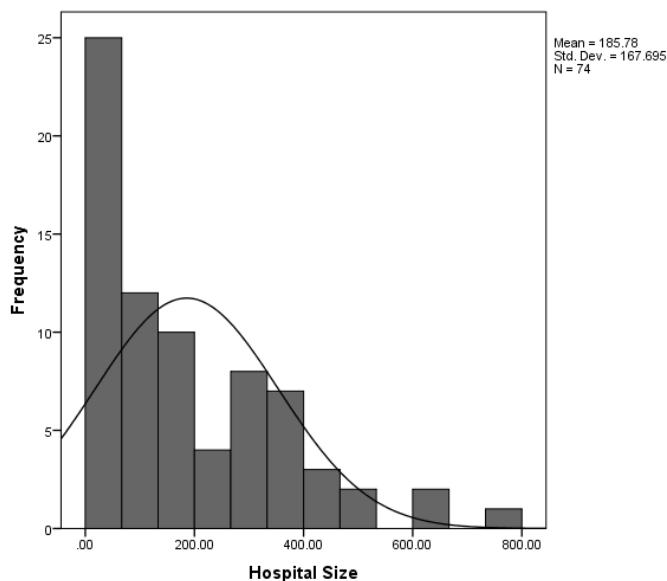
The moderating variable in this analysis is the Hospital's Ownership Type, which included the measures: (Government federal, Government non-federal, Nongovernmental non-for-profit). The most dominant measure in this variable according to the dataset is: (Nongovernmental, not for profit), which represented 62 cases from 74 while the other 12 cases represented the other hospital's ownership types. The results of the univariate analysis for this construct showed that it behaves normally and the associated measures are consistent and represent the construct. Figure 16 shows the data distribution of the moderator variable "Hospital's Ownership Type".



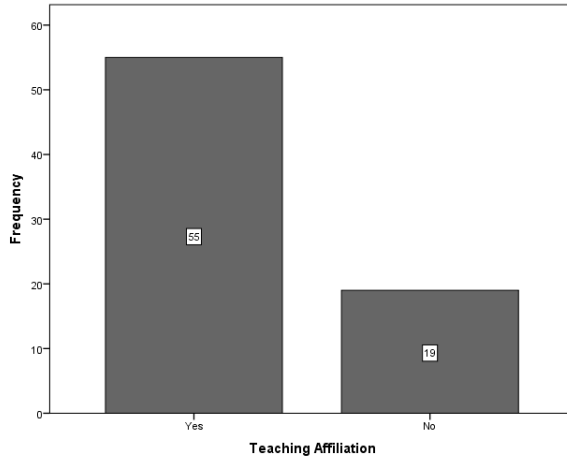
**Figure 16: Ownership Type**

***CV: Control Variables:***

Hospital size was the first control variables used in this study which represented the measure (number of beds). All 74 cases were valid for this construct. The average hospital size is 185.78 (M=185.78, SD=167.70), minimum is 10.00, maximum is 743.00. Skewness was positive and higher than 1 (1.17), so the data are positively skewed. Kurtosis was lower than 3 (1.02), so the distribution is platykurtic - distribution is shorter, tails are thinner than the normal distribution. The second control variable in this analysis was the Hospital's Teaching Affiliation denoted by the values 1=Yes, 2=No. All 74 cases were valid for this construct. There were 55 hospitals with Teaching affiliation (74.30%) and 19 hospitals without Teaching affiliation (25.70%). The results of the univariate analysis for both constructs showed that they behave normally and the associated measures are consistent and represent the constructs. Figures 17 and 18 show the data distribution for the control variables "Hospital Size" and "Teaching Affiliation".



**Figure 17: Hospital Size**



**Figure 18: Teaching Affiliation**

#### **IV.4 Bivariate Analysis and Results:**

After completing the univariate analysis, I conducted the bivariate analysis. This analysis was intended to test the relationship between each individual independent variable (IV1, IV3, IV4, IV5) and the dependent variables (DV1 and DV2) using Pearson correlation coefficient. The bivariate analysis was conducted in two steps. The first analysis was conducted with the DV1 and the second test was conducted with DV2. Tables 6, 7, 8 and 9 shows the correlation, simple regression results and relationships between the dependent variables and each independent variable as follows: DV1 and DV2: Financial Performance, IV1: Health Care Accessibility, IV3: Number of Services Offered, IV4: Community Factors, IV5: Organizational Factors.

#### IV.4.1 Bivariate Analysis with DV1:

**Table 6: Correlations Between (IV1, IV3, IV4, IV5) and DV1**

|                            |   | Financial Performance | Health Care Accessibility | Number of services offered | Community Factors | Organizational Factors |
|----------------------------|---|-----------------------|---------------------------|----------------------------|-------------------|------------------------|
| Financial Performance      | r | 1                     |                           |                            |                   |                        |
|                            | P |                       |                           |                            |                   |                        |
|                            | N | 74                    |                           |                            |                   |                        |
| Health Care Accessibility  | r | .898**                | 1                         |                            |                   |                        |
|                            | P | .000                  |                           |                            |                   |                        |
|                            | N | 74                    | 74                        |                            |                   |                        |
| Number of services offered | r | .718**                | .693**                    | 1                          |                   |                        |
|                            | P | .000                  | .000                      |                            |                   |                        |
|                            | N | 74                    | 74                        | 74                         |                   |                        |
| Community Factors          | r | .402**                | .406**                    | .766**                     | 1                 |                        |
|                            | P | .000                  | .000                      | .000                       |                   |                        |
|                            | N | 73                    | 73                        | 73                         | 73                |                        |
| Organizational Factors     | r | -.342**               | -.371**                   | -.291*                     | -.198             | 1                      |
|                            | P | .003                  | .001                      | .012                       | .093              |                        |
|                            | N | 74                    | 74                        | 74                         | 73                | 74                     |

\*\***. Correlation is significant at the 0.01 level (2-tailed).**

\***. Correlation is significant at the 0.05 level (2-tailed).**

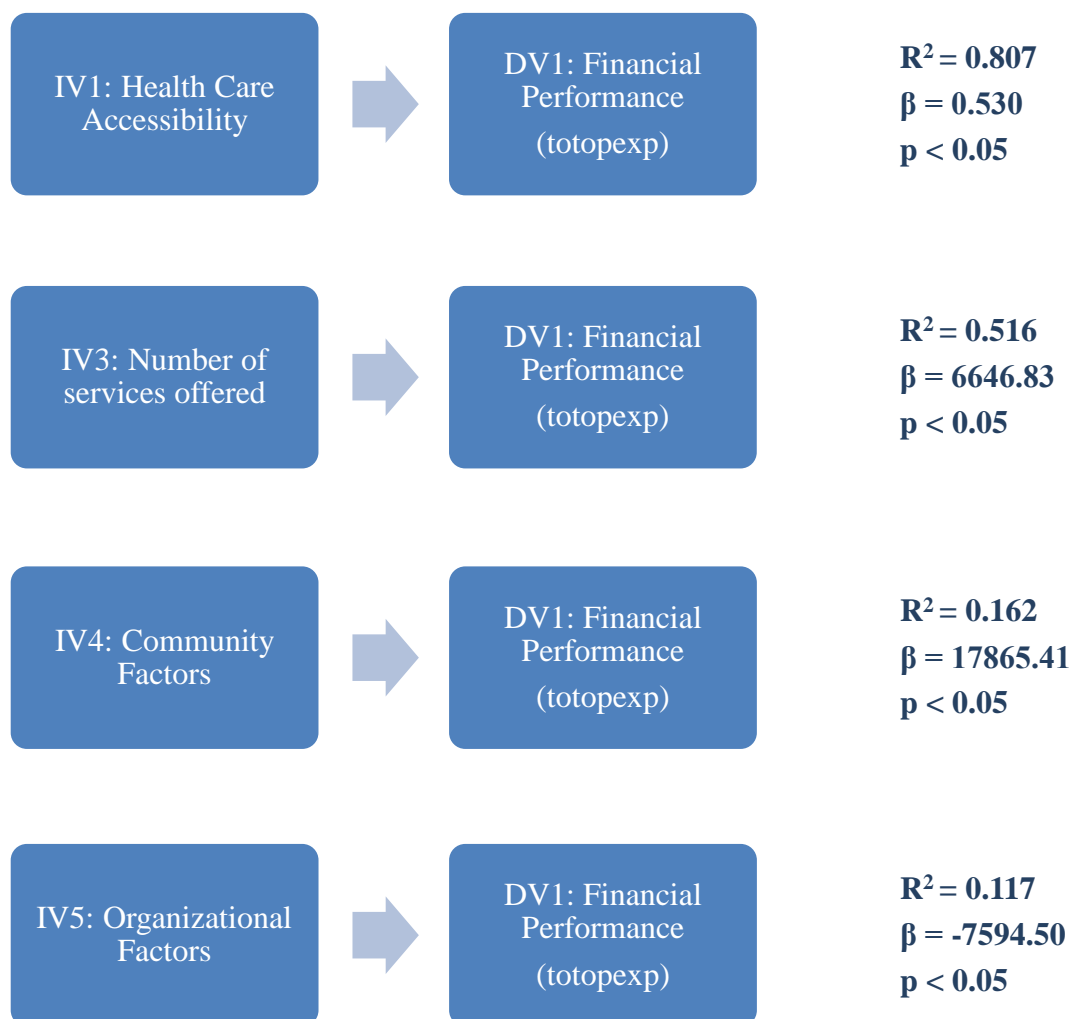
The results showed positive and statistically significant relationship between health care accessibility and financial performance, [ $r(74) = 0.898$ ,  $p < 0.05$ ]. This is an indication that as health care accessibility increases, financial performance increases.

The results showed positive and statistically significant relationship between the number of services offered and financial performance, [ $r(74) = 0.718$ ,  $p < 0.05$ ]. This is an indication that as the number of services offered increases, financial performance increases.

The results showed positive and statistically significant relationship between community factors and financial performance, [ $r(74) = 0.402$ ,  $p < 0.05$ ]. This is an indication that as community factors increase, financial performance increases.

The results showed negative and statistically significant relationship between organizational factors and financial performance, [ $r(74) = -0.342, p < 0.05$ ]. This is an indication that as organizational factors (the degree of centralization) increase, financial performance decreases.

Since the results of correlation analysis showed that there is statistically significant relationship between all four independent variables and the dependent variables, a simple regression was conducted to further assess the relationships between each one of the 4 independent variables and financial performance (DV1). Figure 19 shows all bivariate models that were analyzed.



**Figure 19: Bivariate model (DV1)**

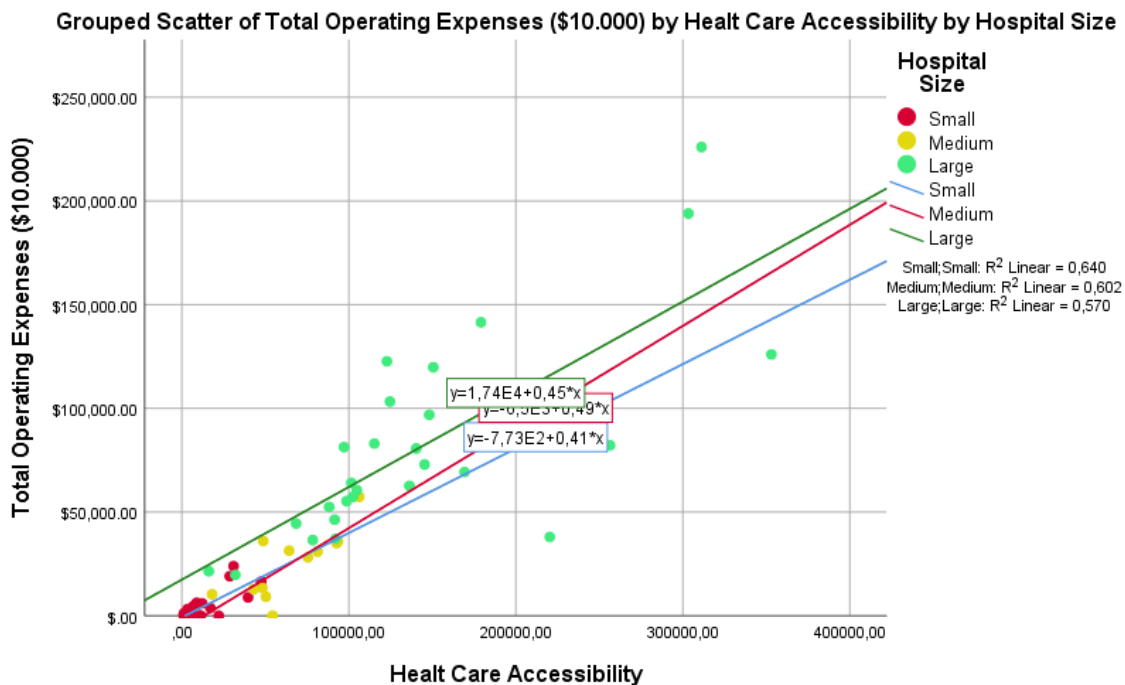
**Table 7: Simple Regression results between all 4 IVs and Financial Performance DV1**

| Simple regression | Independent variable       | $R^2$ | $\beta$  | F      | p        |
|-------------------|----------------------------|-------|----------|--------|----------|
| 1                 | Health Care Accessibility  | 0.807 | 0.530    | 301.02 | 0.000*** |
| 2                 | Number of services offered | 0.516 | 6646.83  | 76.61  | 0.000*** |
| 3                 | Community Factors          | 0.162 | 17865.41 | 13.72  | 0.000*** |
| 4                 | Organizational Factors     | 0.117 | -7594.50 | 9.55   | 0.003**  |

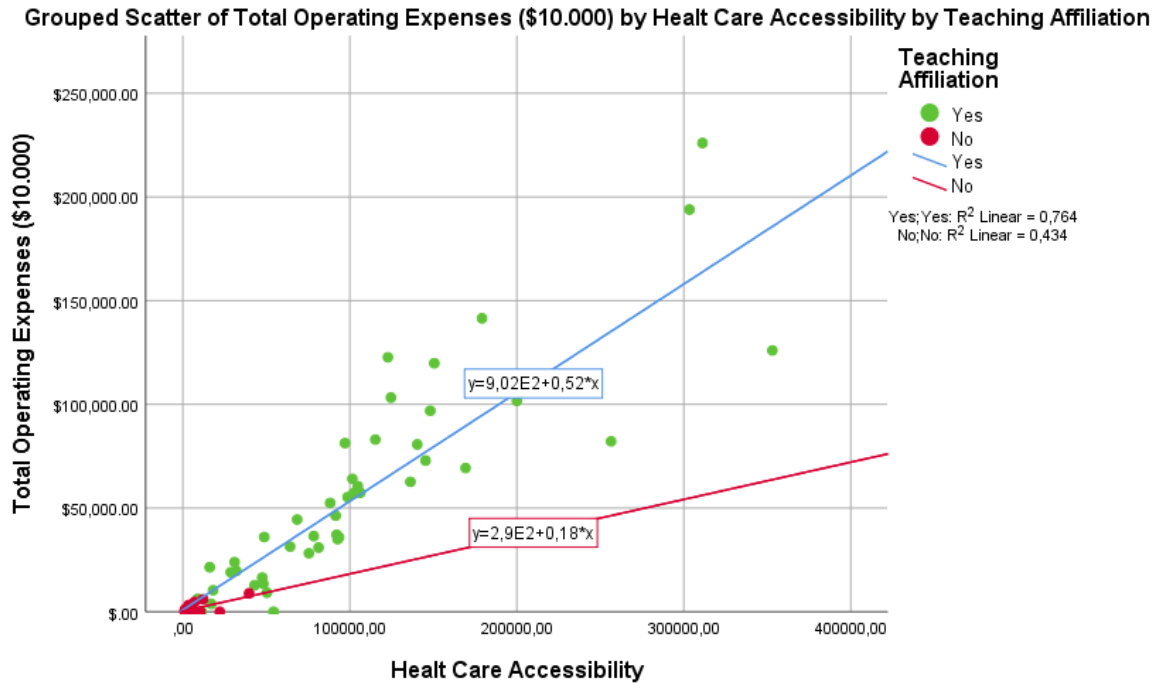
Dependent variable: Financial Performance DV1, Significance Levels: \*  $\leq 10\%$  \*\*  $\leq 5\%$  \*\*\*  $\leq 1\%$

### *Simple Regression for IV1: Health Care Accessibility:*

A regression analysis was computed to determine the effect of health care accessibility on financial performance. The equation for the regression line is financial performance = 339.81+ 0.530\*health care accessibility.  $R^2 = 0.807$ , indicating that 80.70% of the variance in financial performance was explained by health care accessibility. The results were significant,  $F(1, 72) = 301.02$ ,  $p < 0.05$ . Therefore, I could reject the null hypothesis since the slope of regression line is 0 and I concluded that ‘Health Care Accessibility’ has significant and positive effect on ‘Financial Performance’. ( $\beta = 0.530$ ).



**Figure 20: Scatterplot (IV1 – DV1) – Control Variable Hospital Size**



**Figure 21: Scatterplot (IV1 – DV1) – Control Variable Teaching Affiliation**

***Simple Regression for IV3: Number of services offered:***

A regression analysis was computed to determine whether the number of services offered impacts the financial performance. The equation for the regression line is financial performance =  $-4045.03 + 6646.83 * \text{number of services offered}$ .  $R^2 = 0.516$ , indicating that 51.60% of the variance in financial performance is explained by number of services offered. The results were significant,  $F(1, 72) = 76.61$ ,  $p < 0.05$ . Therefore, I could reject the null hypothesis since the slope of regression line is 0 and I conclude that the “Number of Services Offered” have significant and positive effect on “Financial Performance” ( $\beta = 6646.83$ ).



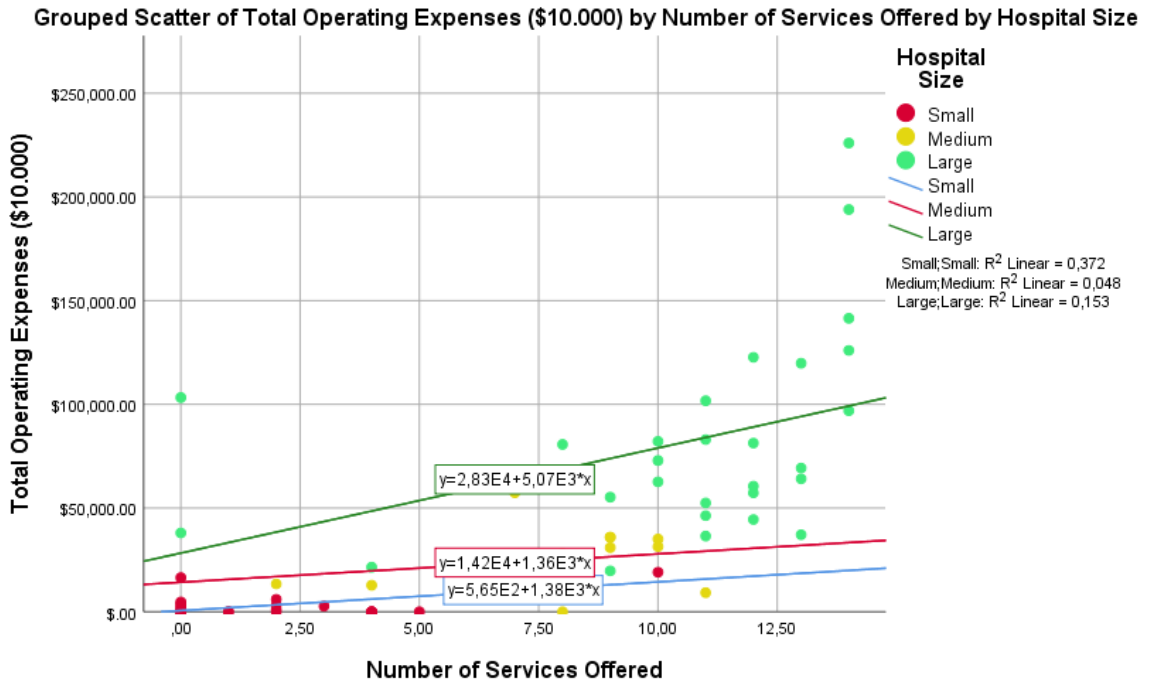


Figure 22: Scatterplot (IV3 – DV1) – Control Variable Hospital Size

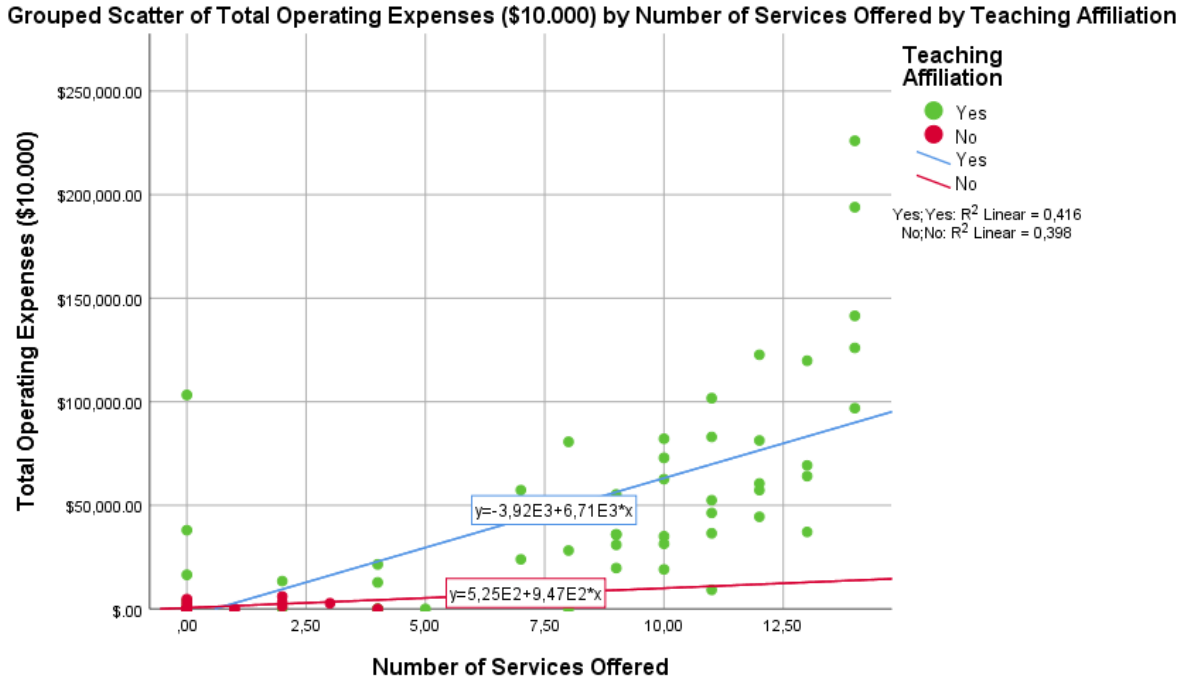


Figure 23: Scatterplot (IV3 – DV1) – Control Variable Teaching Affiliation

***Simple Regression for IV4: Community Factors:***

A regression analysis was computed to determine whether community factors impacts the financial performance. The equation for the regression line is financial performance = 478.27 + 17865.41\*community factors.  $R^2 = 0.162$ , indicating that 16.20% of the variance in financial performance is explained by community factors. The results were significant,  $F(1, 71) = 13.72$ ,  $p < 0.05$ . Therefore, I could reject the null hypothesis since the slope of regression line is 0 and I concluded that “Community Factors” has positive and significant effect on “Financial Performance” ( $\beta=17865.41$ ).

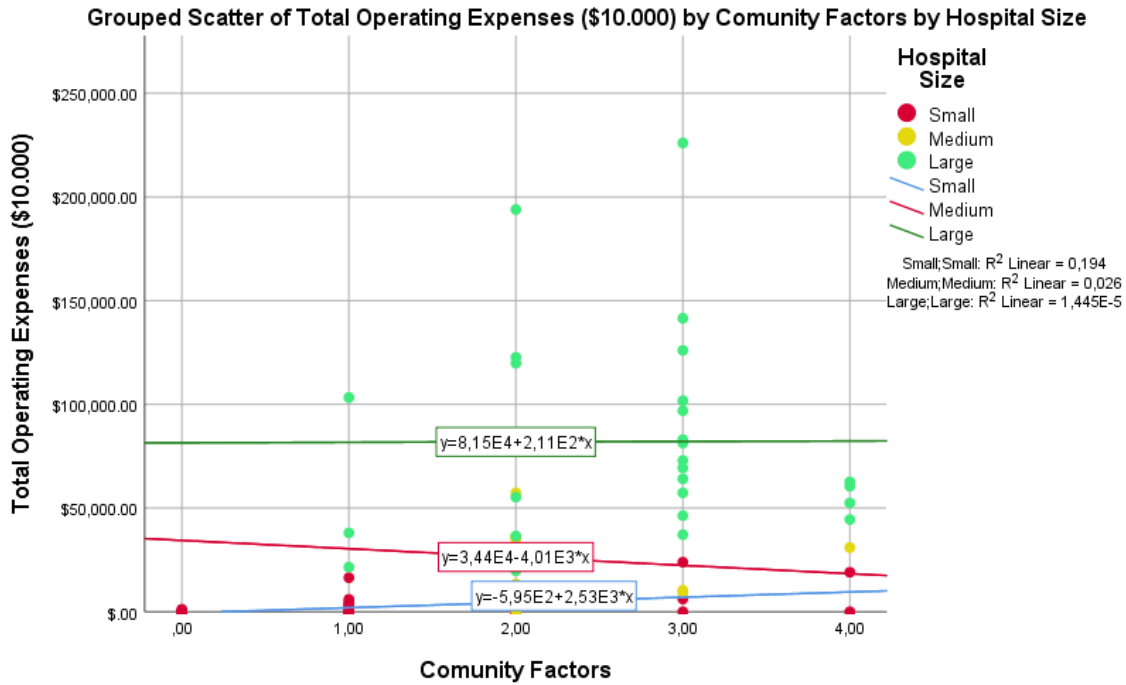


Figure 24: Scatterplot (IV4 – DV1) – Control Variable Hospital Size

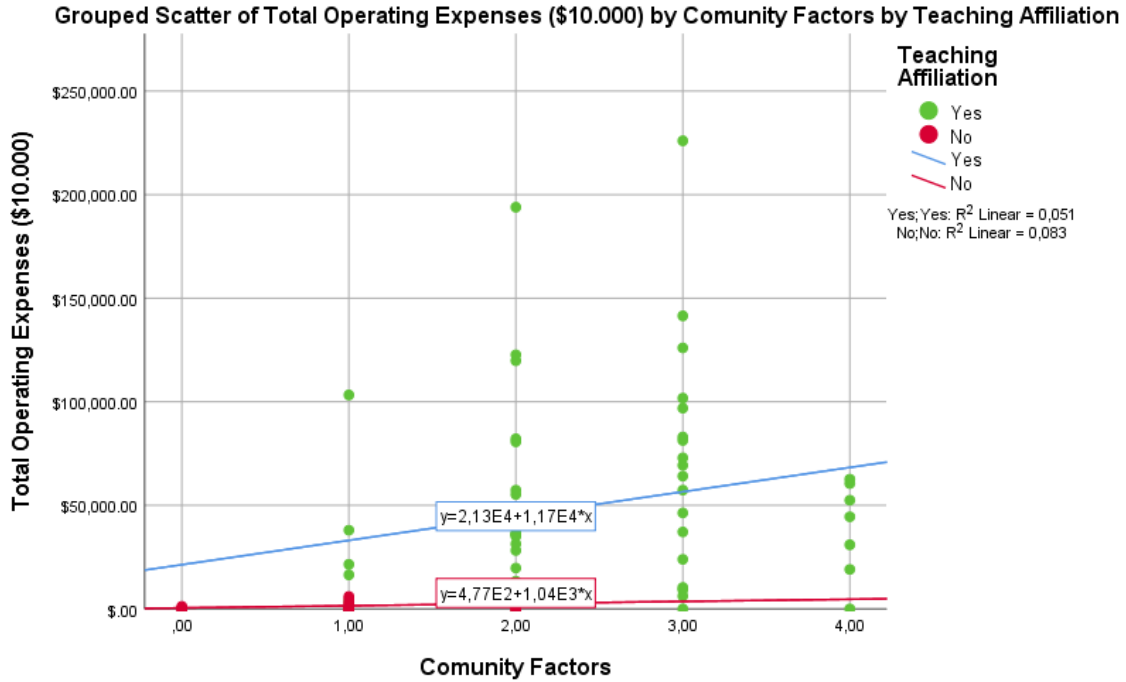


Figure 25: Scatterplot (IV4 – DV1) – Control Variable Teaching Affiliation

### Simple Regression for IV5: Organizational Factors:

A regression analysis was computed to determine whether “Organizational Factors” have effect on “Financial Performance”. The equation for the regression line is financial performance =  $48472.18 - 7594.50 \times \text{organizational factors}$ .  $R^2 = 0.117$ , indicating that 11.70% of the variance in financial performance is explained by organizational factors. The results were significant,  $F(1, 72) = 9.55$ ,  $p < 0.05$ . Therefore, I could reject the null hypothesis since the slope of regression line is 0 and I concluded that “Organizational Factors” have significant and negative effect on “Financial performance” ( $\beta = -7594.50$ ).

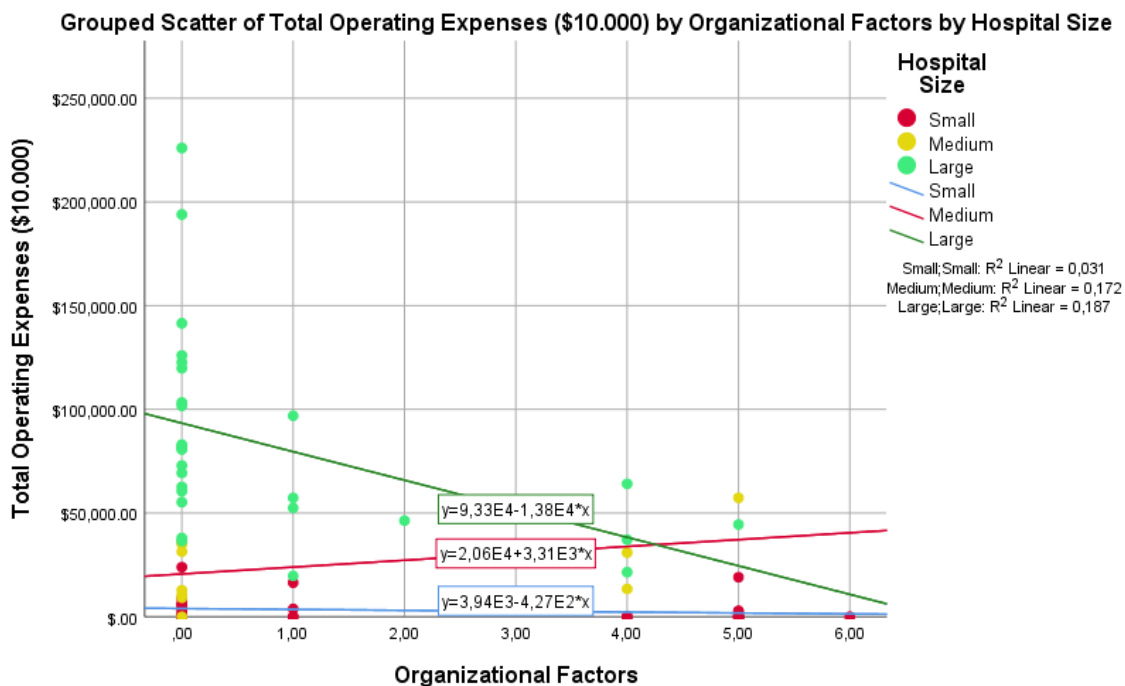
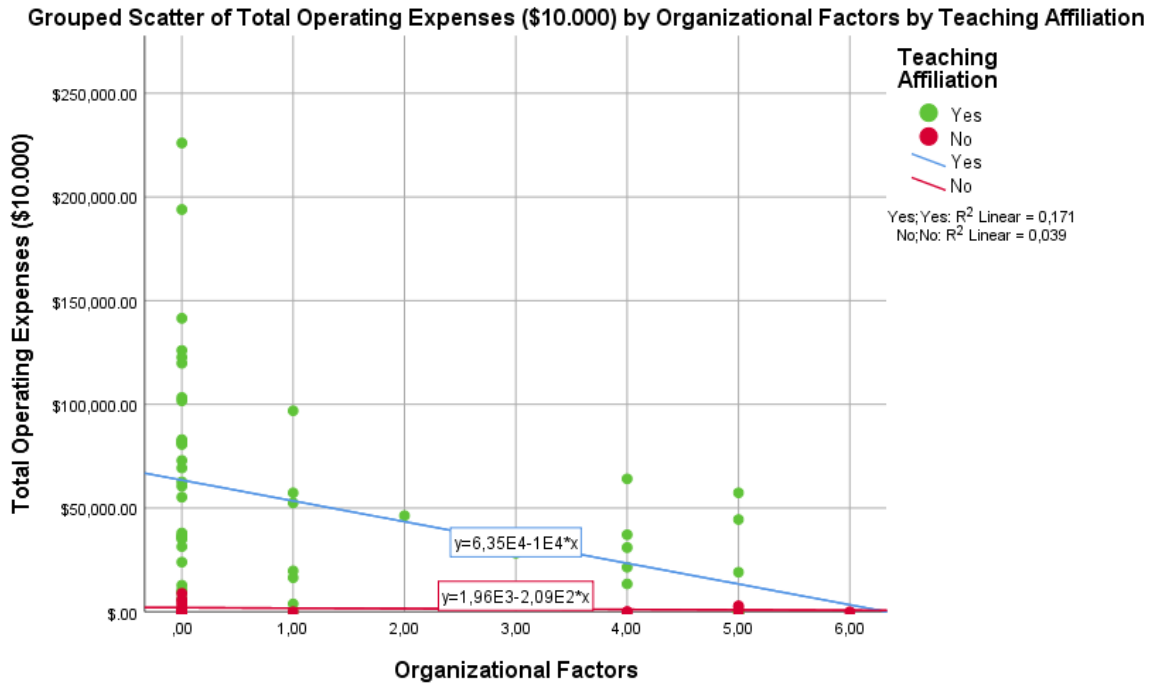


Figure 26: Scatterplot (IV5 – DV1) – Control Variable Hospital Size



**Figure 27: Scatterplot (IV5 – DV1) – Control Variable Teaching Affiliation**

#### IV.4.2 Bivariate Analysis with DV2:

**Table 8: Correlations Between (IV1, IV3, IV4, IV5) and DV2**

|                            |   | Financial Performance | Health Care Accessibility | Number of services offered | Community Factors | Organizational Factors |
|----------------------------|---|-----------------------|---------------------------|----------------------------|-------------------|------------------------|
| Financial Performance 2    | r | 1                     |                           |                            |                   |                        |
|                            | p |                       |                           |                            |                   |                        |
|                            | N | 74                    |                           |                            |                   |                        |
| Health Care Accessibility  | r | .887**                | 1                         |                            |                   |                        |
|                            | p | .000                  |                           |                            |                   |                        |
|                            | N | 74                    | 74                        |                            |                   |                        |
| Number of services offered | r | .573**                | .693**                    | 1                          |                   |                        |
|                            | p | .000                  | .000                      |                            |                   |                        |
|                            | N | 74                    | 74                        | 74                         |                   |                        |
| Community Factors          | r | .297*                 | .406**                    | .766**                     | 1                 |                        |
|                            | p | .011                  | .000                      | .000                       |                   |                        |
|                            | N | 73                    | 73                        | 73                         | 73                |                        |
| Organizational Factors     | r | -.309**               | -.371**                   | -.291*                     | -.198             | 1                      |
|                            | p | .007                  | .001                      | .012                       | .093              |                        |
|                            | N | 74                    | 74                        | 74                         | 73                | 74                     |

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

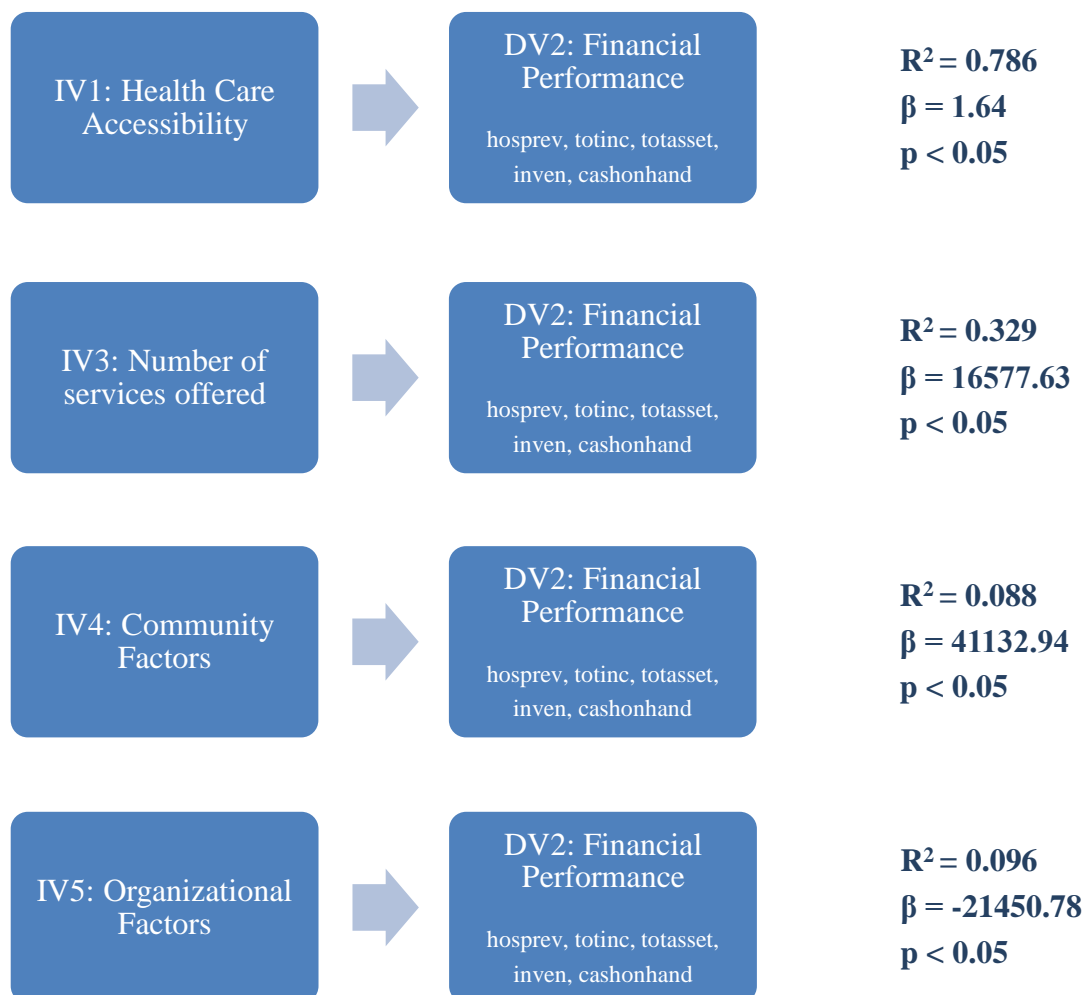
The results showed positive and statistically significant relationship between health care accessibility and financial performance, [ $r(74) = 0.887, p < 0.05$ ]. This is an indication that as health care accessibility increases, financial performance increases.

The results show positive and statistically significant relationship between the number of services offered and financial performance, [ $r(74) = 0.573, p < 0.05$ ]. This is an indication that as the number of services offered increases, financial performance increases.

The results show positive and statistically non-significant relationship between community factors and financial performance, [ $r(73) = 0.297, p = 0.011$ ]. This is an indication that as community factors increase, financial performance increases.

The results show negative and statistically significant relationship between organizational factors and financial performance, [ $r(74) = -0.309, p = 0.007$ ]. This is an indication that as organizational factors (the degree of centralization) increase, financial performance decreases.

Next, a simple regression was conducted to further assess the relationships between all 4 independent variables and financial performance DV2. Figure 20 shows the bivariate models that were analyzed with the remaining 5 measures in the dependent variable (DV2).



**Figure 28: Bivariate model (DV2)**

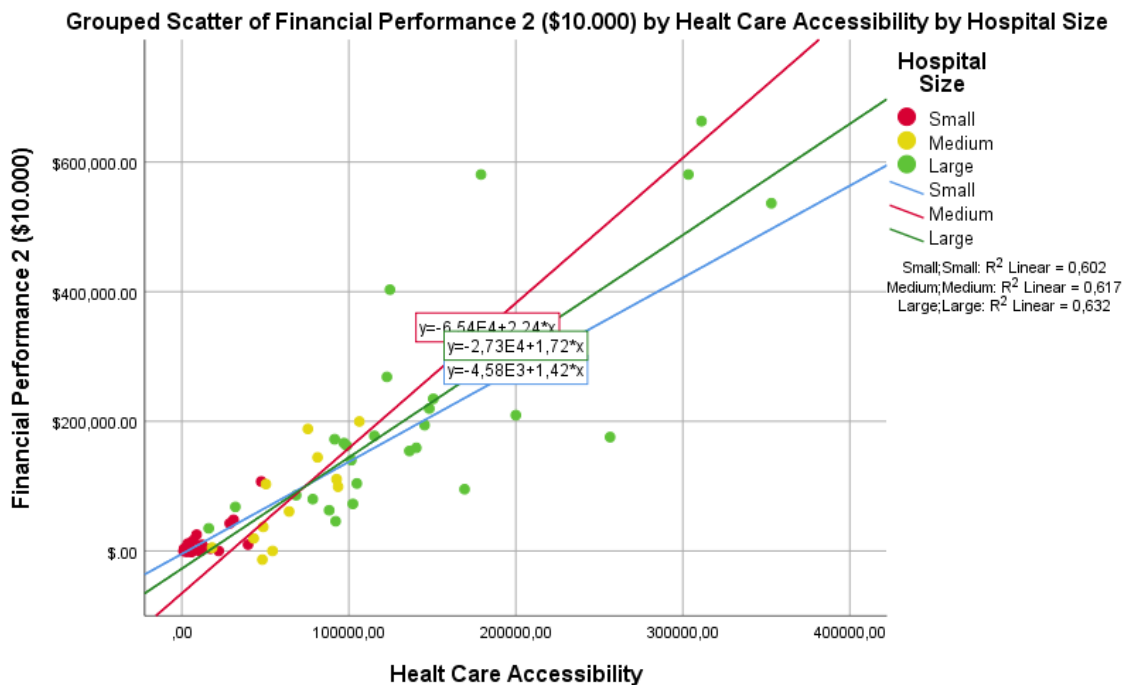
**Table 9: Simple Regression results between all IVs and Financial Performance DV2:**

| Simple regression | Independent variable       | $R^2$ | $\beta$   | F      | p        |
|-------------------|----------------------------|-------|-----------|--------|----------|
| 1                 | Health Care Accessibility  | 0.786 | 1.64      | 265.17 | 0.000*** |
| 2                 | Number of services offered | 0.329 | 16577.63  | 35.26  | 0.000*** |
| 3                 | Community Factors          | 0.088 | 41132.94  | 6.84   | 0.011**  |
| 4                 | Organizational Factors     | 0.096 | -21450.78 | 7.62   | 0.007*   |

**Dependent variable: Financial Performance DV2, Significance Levels: \*  $\leq 10\%$  \*\*  $\leq 5\%$  \*\*\* $\leq 1\%$**

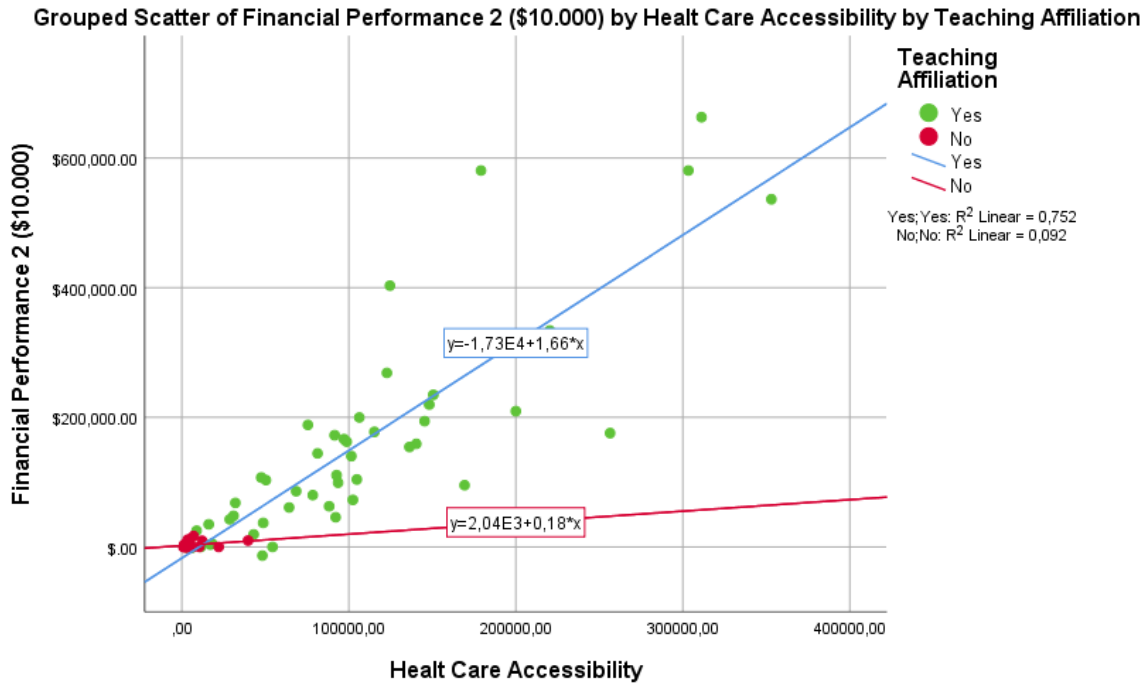
### *Simple Regression for IV1: Health Care Accessibility:*

A regression analysis was computed to determine whether health care accessibility has effect on financial performance. The equation for the regression line is financial performance = -13173.22 + 1.64\*health care accessibility.  $R^2 = 0.786$ , indicating that 78.60% of the variance in financial performance was explained by health care accessibility. The results were significant,  $F(1, 72) = 265.17, p < 0.05$ . Therefore, I could reject the null hypothesis since the slope of regression line is 0 and I concluded that ‘Health Care Accessibility’ has significant and positive effect on ‘Financial Performance’. ( $\beta = 1.64$ ).



**Figure 29: Scatterplot (IV1 – DV2) – Control Variable Hospital Size**

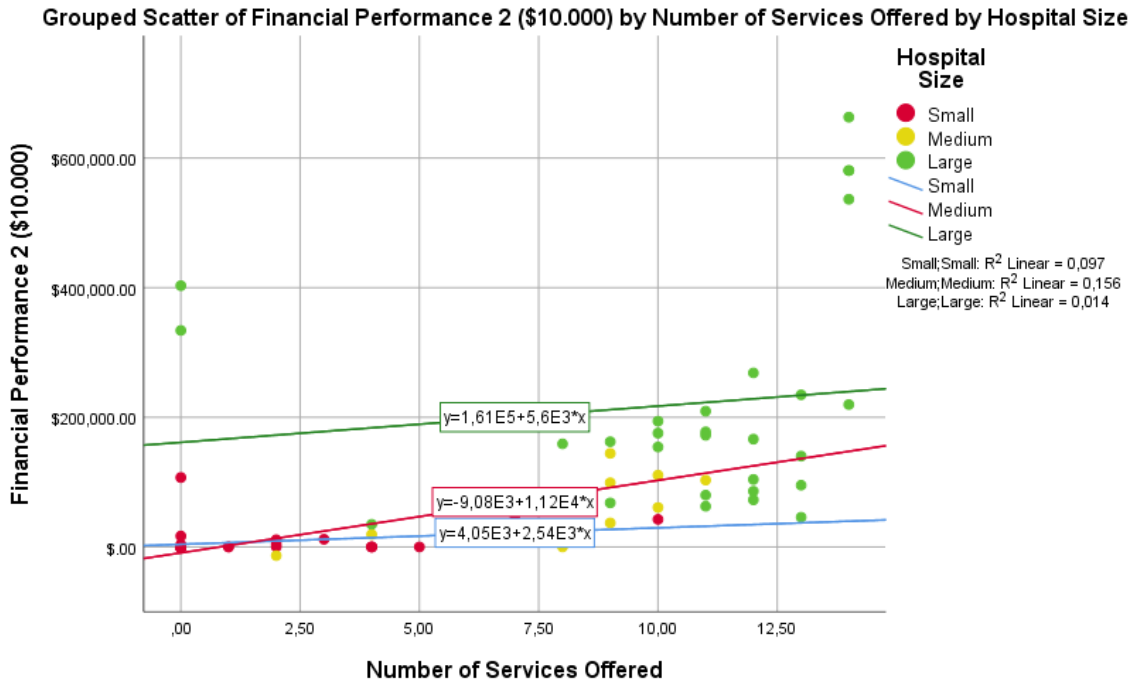




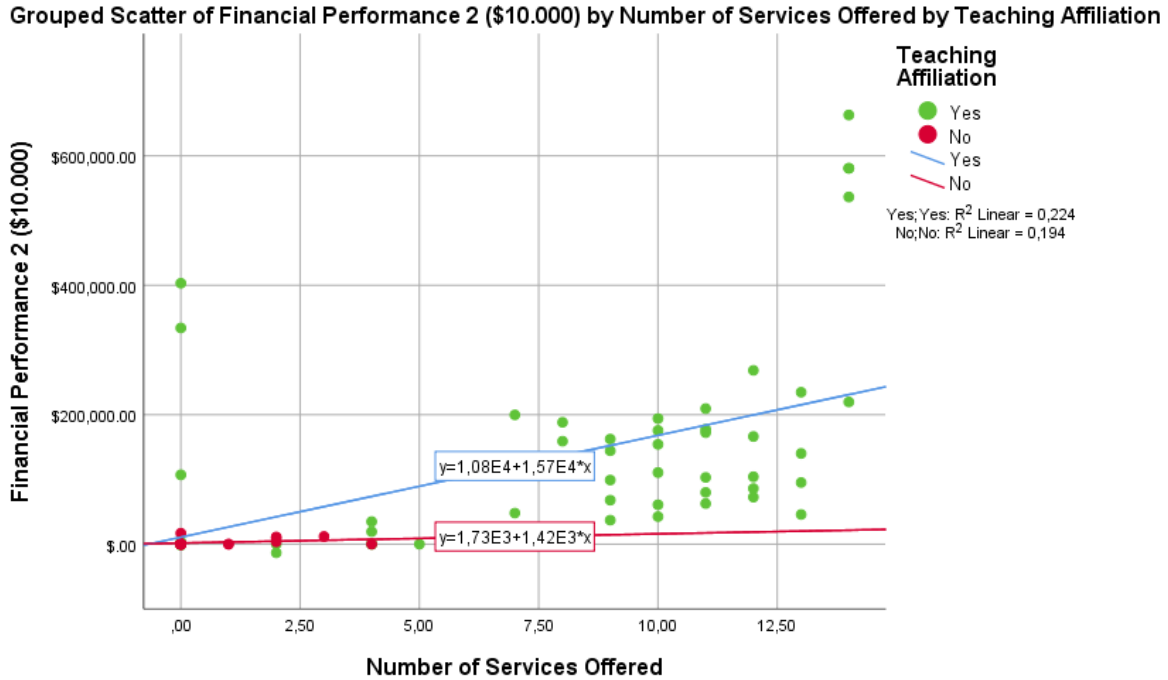
**Figure 30: Scatterplot (IV1 – DV2) – Control Variable Teaching Affiliation**

***Simple Regression for IV3: Number of services offered:***

A regression analysis was computed to determine whether the number of services offered impacts the financial performance. The equation for the regression line is financial performance =  $-726.23 + 16577.63 * \text{number of services offered}$ .  $R^2 = 0.329$ , indicating that 32.90% of the variance in financial performance is explained by number of services offered. The results were significant,  $F(1, 72) = 35.26$ ,  $p < 0.05$ . Therefore, I could reject the null hypothesis since the slope of regression line is 0 and I concluded that the “Number of Services Offered” have significant and positive effect on “Financial Performance” ( $\beta = 16577.63$ ).



**Figure 31: Scatterplot (IV3 – DV2) – Control Variable Hospital Size**



**Figure 32: Scatterplot (IV3 – DV2) – Control Variable Teaching Affiliation**

### Simple Regression for IV4: Community Factors:

A regression analysis was computed to determine whether community factors impacts the financial performance. The equation for the regression line is financial performance = 17746.41 + 41132.94\*community factors.  $R^2 = 0.088$ , indicating that 8.80% of the variance in financial performance is explained by community factors. The results were significant,  $F(1, 71) = 6.84$ ,  $p = 0.011$ . Therefore, I could reject the null hypothesis while the slope of regression line is 0 and I concluded that “Community Factors” does have significant effect on “Financial Performance” ( $\beta=41132.94$ ).

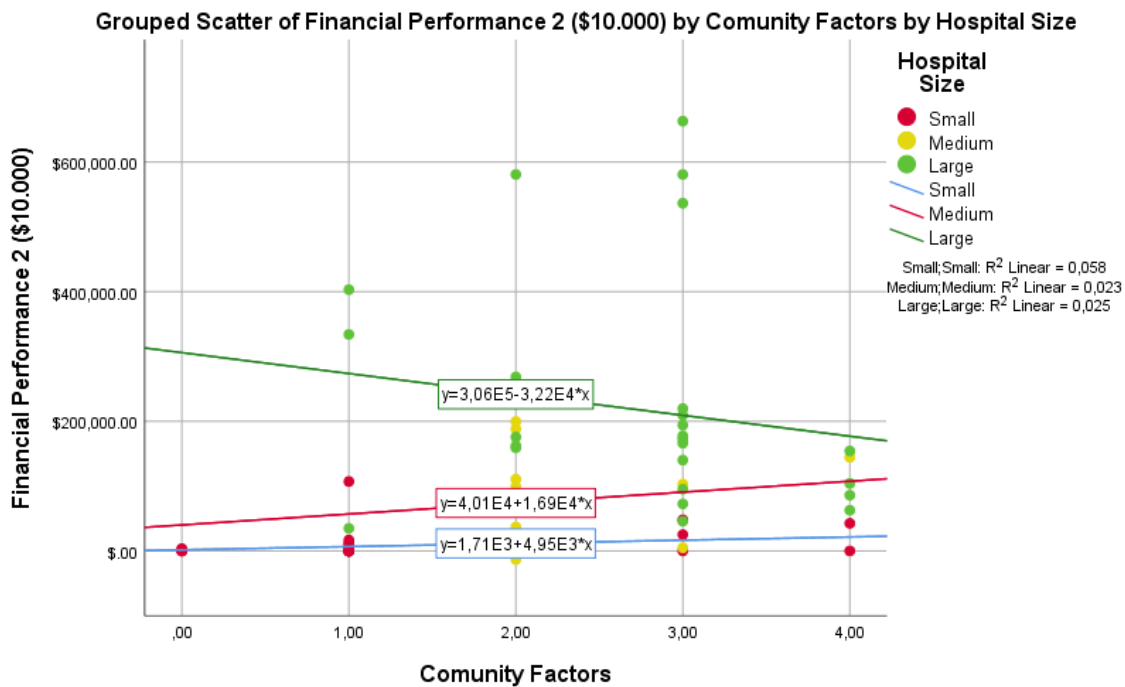
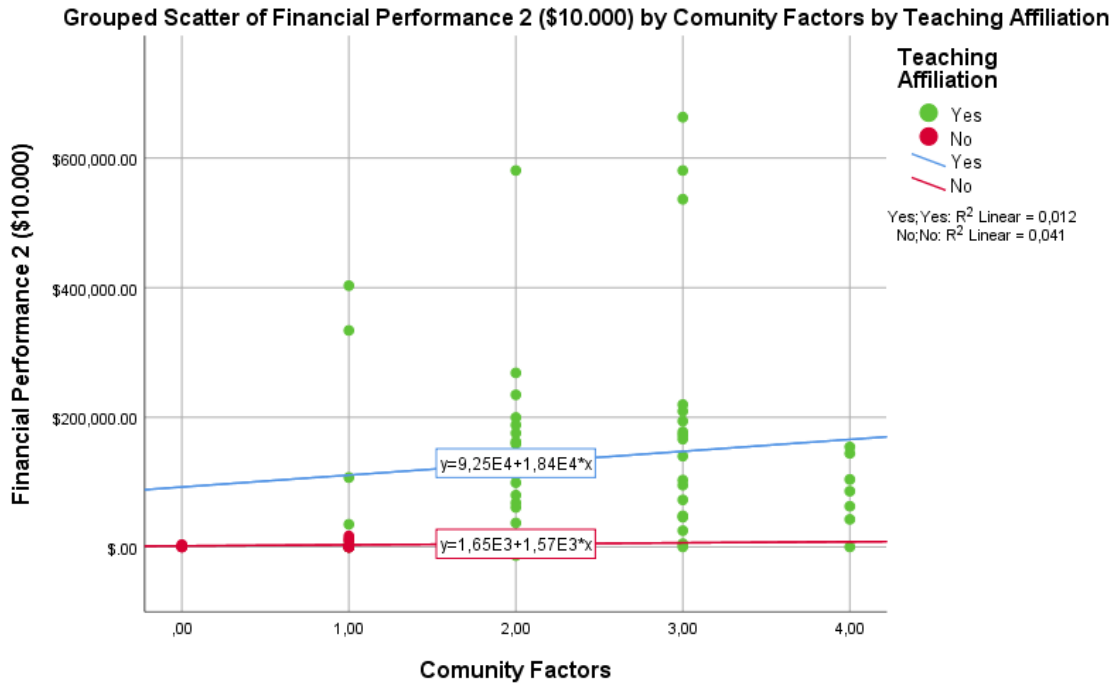


Figure 33: Scatterplot (IV4 – DV2) – Control Variable Hospital Size



**Figure 34: Scatterplot (IV4 – DV2) – Control Variable Teaching Affiliation**

***Simple Regression for IV5: Organizational Factors:***

A regression analysis was computed to determine whether “Organizational Factors” have effect on “Financial Performance”. The equation for the regression line is financial performance =  $134223.14 - 21450.78 * \text{organizational factors}$ .  $R^2 = 0.096$ , indicating that 9.60% of the variance in financial performance is explained by organizational factors. The results were significant,  $F(1,72) = 7.62$ ,  $p = 0.007$ . Therefore, I could reject the null hypothesis while the slope of regression line is 0 and I concluded that “Organizational Factors” does have significant and effect on “Financial performance” ( $\beta = -21450.78$ ).

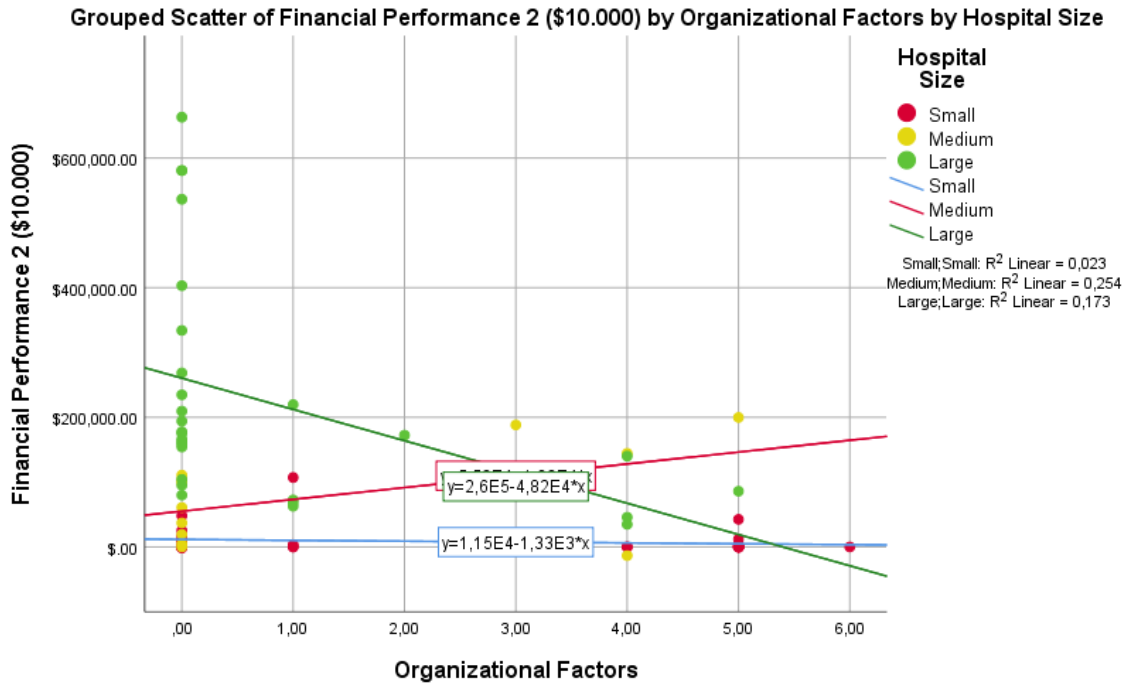


Figure 35: Scatterplot (IV5 – DV2) – Control Variable Hospital Size

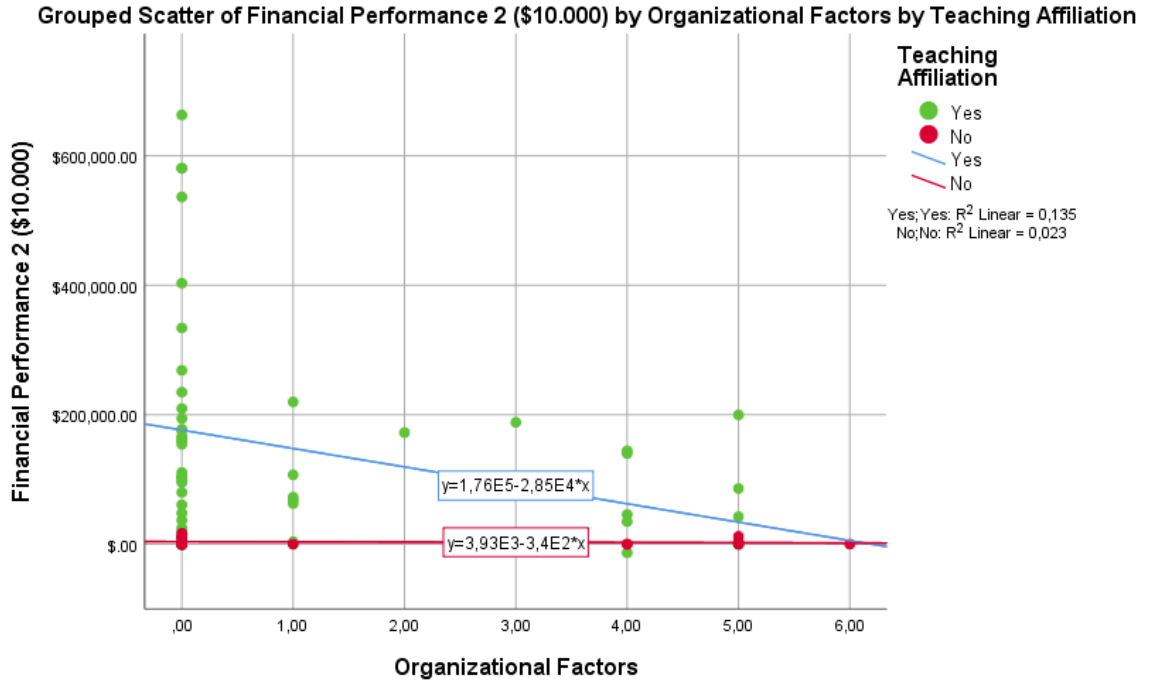


Figure 36: Scatterplot (IV5 – DV2) – Control Variable Teaching Affiliation

**Table 10: Summary of Bivariate Analysis:**

| <b>DV:<br/>Financial<br/>Performance</b> | <b>Independent<br/>Variable Used in the<br/>Model</b> | <b>IV/DV<br/>Relationship</b> | <b>Statistical<br/>Significance</b> | <b>IV Effect on<br/>DV<br/>(Financial<br/>Performance)</b> |
|--|---|-------------------------------|-------------------------------------|--|
| DV1:<br>Operating Expenses               | IV1:<br>Healthcare<br>Accessibility                   | <b>Yes</b>                    | <b>Yes</b>                          | <b>Positive</b>  |
| DV1:<br>Operating Expenses               | IV3: Number of<br>Services Offered                    | <b>Yes</b>                    | <b>Yes</b>                          | <b>Positive</b>  |
| DV1:<br>Operating Expenses               | IV4:<br>Community Factors                             | <b>Yes</b>                    | <b>Yes</b>                          | <b>Positive</b>  |
| DV1:<br>Operating Expenses               | IV5:<br>Organizational<br>Factors                     | <b>Yes</b>                    | <b>Yes</b>                          | <b>Negative</b>  |
| DV2:<br>Revenue Measures                 | IV1:<br>Healthcare<br>Accessibility                   | <b>Yes</b>                    | <b>Yes</b>                          | <b>Positive</b>  |
| DV2:<br>Revenue Measures                 | IV3: Number of<br>Services Offered                    | <b>Yes</b>                    | <b>Yes</b>                          | <b>Positive</b>  |
| DV2:<br>Revenue Measures                 | IV4:<br>Community Factors                             | <b>Yes</b>                    | <b>Yes</b>                          | <b>Positive</b>  |
| DV2:<br>Revenue Measures                 | IV5:<br>Organizational<br>Factors                     | <b>Yes</b>                    | <b>Yes</b>                          | <b>Negative</b>  |

**Control Variables Used: Hospital Size and Teaching Affiliation**

**Analysis method used: Correlation and Simple Regression**

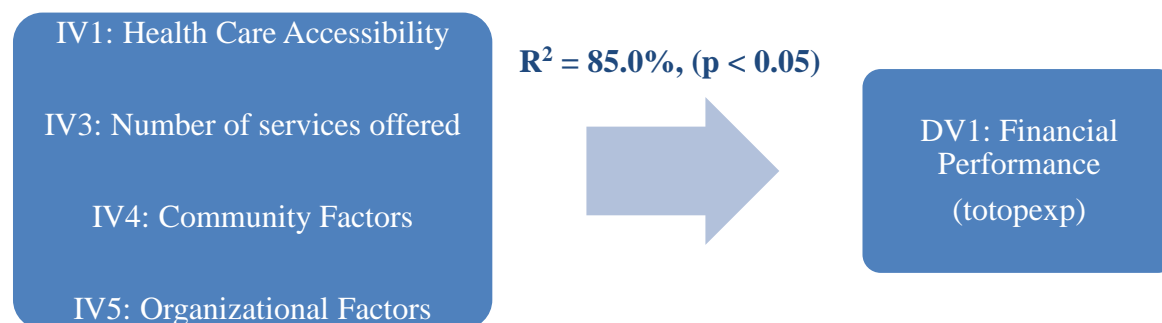
#### **IV.5 Multivariate Analysis & Results:**

After conducting the bivariate analysis in two steps with DV1 and DV2, a multivariate analysis was conducted as well with the two dependent variables to assess the simultaneous effect of the 4 independent variables on financial performance of US children's hospitals.

##### **IV.5.1 Multivariate Analysis with DV1:**

Figure 37 shows the multivariate model that was analyzed using the dependent variable (DV1) represented by the total operating expenses. Table 11 summarizes the results of the multi-

variate multiple regression analysis as follows: **Model 1**: included the constant plus the two control variables; **Model 2**: included the constant plus the two control variables plus the four independent variables; **Model 3**: included the constant plus the two control variables plus the four independent variables plus the moderator interactions with the four independent variables.



**Figure 37: Multivariate model (DV1)**

**Table 11: Hierarchical Regression for DV1 (Total operating expenses)**

|                                  | Model 1          | Model 2         | Model 3           |
|----------------------------------|------------------|-----------------|-------------------|
| Constant                         | 0 (-8470.32)     | 0 (-11212.795)  | 0 (-13092.381)    |
| Hospital Size                    | 0.887 (251.896)* | .355            | .352 (100.005)**  |
| Teaching Affiliation             |                  | (100.687)**     |                   |
| Yes                              | -0.014 (-        |                 | .047 (5059.143)   |
| Health Care Accessibility        | 1541.635)        | .034 (3633.917) | -.284 (-0.168)    |
| Number of Services Offered       |                  | .455 (0.268)*   | .426 (3967.313)   |
| Community Factors                |                  | .250            | -.027 (-1193.320) |
| Organizational Factors           |                  | (2326.728)**    | -.073 (-1627.599) |
| Health Care                      |                  | -.099 (-        | .744 (0.434)      |
| Accessibility*Ownership Type     |                  | 4378.142)       | -.133 (-1219.167) |
| Number of services               |                  | .010 (212.347)  | -.113 (-4465.836) |
| offered*Ownership Type           |                  |                 | .105 (2466.991)   |
| Community factors*Ownership      |                  |                 |                   |
| type                             |                  |                 | 0.850             |
| Organizational factors*Ownership | 0.800            |                 | 0.004             |
| Type                             | -                |                 | 35.070*           |
|                                  | 139.682*         | 0.846           | 0.410             |
| R <sup>2</sup>                   | -                | 0.046           |                   |
| ΔR <sup>2</sup>                  |                  | 60.335*         |                   |
| F                                |                  | 4.939*          |                   |
| ΔF                               |                  |                 |                   |
| N                                | 74               | 74              | 74                |

Dependent variable: Financial performance (DV1), N = Number of cases (hospitals)

\* statistically significant at 1% level, \*\* statistically significant at 5% level

**(a) Regression Analysis Model (1):**

The regression analysis was computed to determine whether the two control variables have any simultaneous effect on the dependent variable “DV1”. The equation for the regression line is “financial performance = -8470.32 + 251.896\*hospital size – 1541.635\*teaching affiliation.  $R^2 = 0.800$ , indicating that 80.00% of the variance in financial performance is explained by the two control variables. The results were significant,  $F(2, 70) = 139.682$ ,  $p < 0.001$ . Therefore, I could reject the null hypothesis that the slope of regression line is 0 and I concluded that two control variables have simultaneous and statistically significant effect on the dependent variable “Financial Performance”.

**(b) Regression Analysis Model (2):**

A regression analysis was computed to determine whether all the independent variables have simultaneous effect on the dependent variable “DV1” in the presence of Hospital Size and Teaching affiliation as control variable. The equation for the regression line is financial performance = -11212.795 + 100.687\*hospital size + 3633.917\*teaching affiliation + 0.268\*health care accessibility + 2326.728\*number of services offered – 4378.142\*community factors + 212.347\*organizational factors.  $R^2 = 0.846$ , indicating that 84.60% of the variance in financial performance is explained by the 4 independent variables and 2 control variables. The results were significant,  $F(6, 66) = 60.335$ ,  $p < 0.001$ . Therefore, I could reject the null hypothesis that the slope of regression line is 0 and I concluded that all independent variables (IVs) have simultaneous effect on the dependent variable Financial Performance when Hospital Size and Teaching Affiliation are used as control variables.



**(c) Regression Analysis Model (3):**

A regression analysis was computed to determine whether all the independent variables have simultaneous effect on the dependent variable “DV1” in the presence of Hospital size and Teaching Affiliation as control variable and moderator variable “Ownership type” interactions with 4 dependent variables. The equation for the regression line is financial performance is = - 13092.381 + 100.005\*hospital size + 5059.143\*teaching affiliation - 0.168\*health care accessibility -3967.313\*number of services offered - 1193.320\*community factors - 1627.599\*organizational factors + 0.434\* Health Care Accessibility\*Ownership Type -1219.167\* Number of services offered\*Ownership Type - 4465.836\* Community factors\*Ownership type + 2466.991\* Organizational factors\*Ownership Type.  $R^2 = 0.850$ , indicating that 85.00% of the variance in financial performance is explained by the independent variables, control variables and interactions between moderator and 4 independent variables. The results were significant,  $F(10, 62) = 35.070$ ,  $p < 0.001$ . Therefore, I could reject the null hypothesis that the slope of regression line is 0 and I concluded that all independent variables (IVs) have simultaneous effect on the dependent variable Financial Performance when Teaching affiliation and Hospital size are used as control variable, and interactions between moderator and 4 independent variables are included.

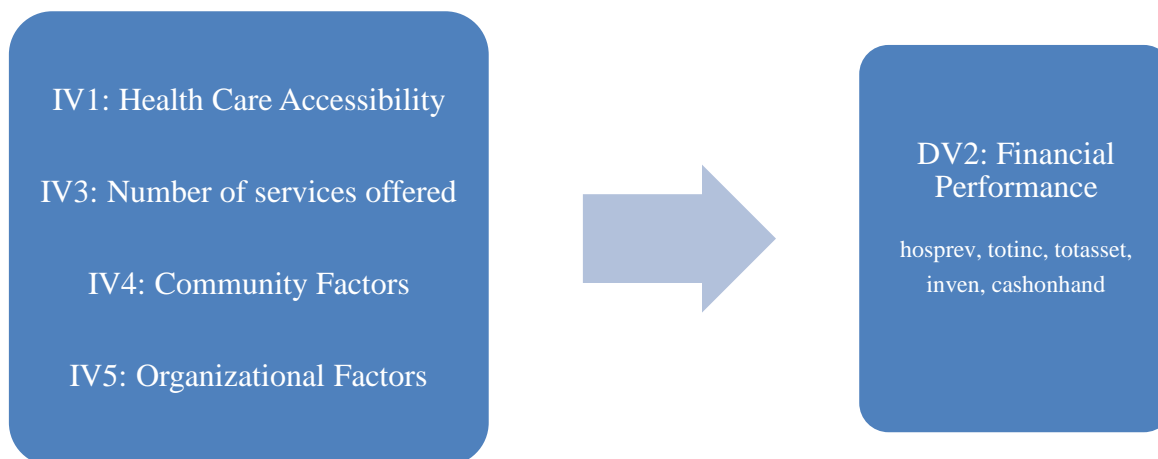
**Table 12: Multivariate Hierarchical Regression DVI:**

| Variable                             | $\beta$ | p value |
|--------------------------------------|---------|---------|
| Hospital Size                        | .352    | * 0.000 |
| Teaching Affiliation                 |         |         |
| Yes                                  | .047    | 0.520   |
| Health Care Accessibility            | -.284   | 0.849   |
| Number of Services Offered           | .426    | 0.500   |
| Community Factors                    | -.027   | 0.896   |
| Organizational Factors               | -.073   | 0.622   |
| Health Care Accessibility*Ownership  | .744    | 0.622   |
| Type                                 | -.133   | 0.837   |
| Number of services offered*Ownership | -.113   | 0.624   |
| Type                                 | .105    | 0.396   |
| Community factors*Ownership type     |         |         |
| Organizational factors*Ownership     |         |         |
| Type                                 |         |         |
| $R^2 = 0.850$                        |         | *0.000  |

\* $\leq 0.05$ , \*\* $0.05 < p \leq 0.10$ , \*\*\* $0.10 < p \leq 0.15$

#### IV.5.2 Multivariate Analysis with DV2:

Figure 30 shows the multivariate model that was analyzed using the dependent variable (DV2) represented by the revenue measures. Tables 13, summarizes the results of the multivariate multiple regression analysis as follows: **(a) Model 1:** included the constant plus the two control variables; **(b) Model 2:** included the constant plus the two control variables plus the four independent variables; **(c) Model 3:** included the constant plus the two control variables plus the four independent variables plus the moderator interactions with the four independent variables.



**Figure 38: Multivariate model (DV2)**

**Table 13: Hierarchical Regression DV2**

|   | Model 1         | Model 2         | Model 3           |
|---|-----------------|-----------------|-------------------|
| Constant                                  | 0 (-52590.298)  | 0 (-12780.969)  | 0 (14375.019)     |
| Hospital Size                             | .865 (767.389)* | .263 (233.293)  | .251 (222.880)    |
| Teaching Affiliation                      |                 |                 |                   |
| Yes                                       | .024 (7953.756) | .000 (139.802)  | .005 (1774.036)   |
| Health Care Accessibility                 |                 | .715 (1.320)*   | -.299 (-0.551)    |
| Number of Services Offered                |                 | -.067 (-        | .167 (4862.988)   |
| Community Factors                         |                 | 1960.703)       | .004 (570.706)    |
| Organizational Factors                    |                 | -.045 (-        | -.015 (-1015.842) |
| Health Care                               |                 | 6279.864)       | 1.026 (1.869)     |
| Accessibility*Ownership Type              |                 | .024 (1631.709) | -.195 (-5559.520) |
| Number of services offered*Ownership Type |                 |                 | -.081 (-9962.017) |
| Community factors*Ownership type          | 0.729           |                 | 0.804             |
| Organizational factors*Ownership Type     | -               |                 | 0.005             |
|   | 94.127*         | 0.799           | 25.360*           |
|   | -               | 0.070           | 0.386             |
| R <sup>2</sup>                            |                 | 43.633*         |                   |
| ΔR <sup>2</sup>                           |                 | 5.713*          |                   |
| F   |                 |                 |                   |
| ΔF  |                 |                 |                   |
| N   | 74              | 74              | 74                |

Dependent variable: Financial performance (DV2), N = Number of cases (hospitals)

\* statistically significant at 1% level, \*\* statistically significant at 5% level

***(a) Regression Analysis Model (1):***

The regression analysis was computed to determine whether the two control variables have any simultaneous effect on the dependent variable “DV1”. The equation for the regression line is “financial performance = -52590.298 + 767.389\*hospital size + 7953.756\*teaching affiliation.  $R^2 = 0.729$ , indicating that 72.90% of the variance in financial performance is explained by the two control variables. The results were significant,  $F(2, 70) = 94.127$ ,  $p < 0.001$ . Therefore, I could reject the null hypothesis that the slope of regression line is 0 and I concluded that two control variables have simultaneous and statistically significant effect on the dependent variable “Financial Performance”.

***(b) Regression Analysis Model (2):***

A regression analysis was computed to determine whether all the independent variables have simultaneous effect on the dependent variable “DV1” in the presence of Hospital Size and Teaching affiliation as control variable. The equation for the regression line is financial performance = -12780.969 + 233.293\*hospital size + 139.802\*teaching affiliation + 1.320\*health care accessibility – 1960.703\*number of services offered – 6279.864\*community factors + 1631.709\*organizational factors.  $R^2 = 0.799$ , indicating that 79.90% of the variance in financial performance is explained by the 4 independent variables and 2 control variables. The results were significant,  $F(6, 66) = 43.633$ ,  $p < 0.001$ . Therefore, I could reject the null hypothesis that the slope of regression line is 0 and I concluded that all independent variables (IVs) have simultaneous effect on the dependent variable Financial Performance when Hospital Size and Teaching Affiliation are used as a control variable.

***(c) Regression Analysis Model (3):***

A regression analysis was computed to determine whether all the independent variables have simultaneous effect on the dependent variable “DV1” in the presence of Hospital size and Teaching Affiliation as control variable and moderator variable “Ownership type” interactions with 4 dependent variables. The equation for the regression line is financial performance is = - 14375.019 + 222.880\*hospital size + 1774.036\*teaching affiliation – 0.551\*health care accessibility –4862.988\*number of services offered + 570.706\*community factors – 1015.842\*organizational factors + 1.869\* Health Care Accessibility\*Ownership Type - 5559.520\*Number of services offered\*Ownership Type – 9962.017\*Community factors\*Ownership type + 3944.529\*Organizational factors\*Ownership Type.  $R^2 = 0.804$ , indicating that 80.40% of the variance in financial performance is explained by the independent variables, control variables and interactions between moderator and 4 independent variables. The results were significant,  $F(10, 62) = 25.360$ ,  $p < 0.001$ . Therefore, I could reject the null hypothesis that the slope of regression line is 0 and I concluded that all independent variables (IVs) have simultaneous effect on the dependent variable Financial Performance when Teaching affiliation and Hospital size are used as a control variable, and interactions between moderator and 4 independent variables are included.

**Table 14: Multivariate Hierarchical Regression DV2**

|                                      | $\beta$ | p value |
|--------------------------------------|---------|---------|
| Hospital Size                        | .251    | 0.950   |
| Teaching Affiliation                 |         | 0.129   |
| Yes                                  | .005    | 0.861   |
| Health Care Accessibility            | -.299   | 0.817   |
| Number of Services Offered           | .167    | 0.986   |
| Community Factors                    | .004    | 0.915   |
| Organizational Factors               | -.015   | 0.553   |
| Health Care Accessibility*Ownership  | 1.026   | 0.793   |
| Type                                 | -.195   | 0.759   |
| Number of services offered*Ownership | -.081   | 0.704   |
| Type                                 | .054    |         |
| Community factors*Ownership type     |         |         |
| Organizational factors*Ownership     |         |         |
| Type                                 |         |         |
| $R^2 = 80.4\%$                       |         | *0.000  |

\* $\leq 0.05$ , \*\* $0.05 < p \leq 0.10$ , \*\*\* $0.10 < p \leq 0.15$

#### IV.6 Summary of Multivariate Analysis:

##### IV.6.1 Multivariate Hierarchical Regression: Financial Performance DV1:

Recall from tables: 11 and 12, each of the 4 IVs, [IV1: Healthcare Accessibility, IV3: Number of Services Offered, IV4: Community Factors, IV5: Organizational Factors], were entered manually and in sequential order. The variance explained by the final model (3) was  $R^2 = 85.00\%$ ,  $F(10, 62) = 35.1$ , \*  $p < 0.001$ . Number of Services Offered recorded the strongest  $\beta$  value of .426 &  $B = 3967$ , followed by Healthcare Accessibility ( $\beta = -.284$  &  $B = -0.168$ ), then organizational factors ( $\beta = -.073$  &  $B = -1627.6$ ), and finally Community Factors: ( $\beta = .027$  &  $B = -1193$ )

##### IV.6.2 Multivariate Hierarchical Regression: Financial Performance DV2:

Recall from tables 13 and 14, each of the 4 IVs, [IV1: Healthcare Accessibility, IV3: Number of Services Offered, IV4: Community Factors, IV5: Organizational Factors], were entered manually and in sequential order. The variance explained by the final model (3) was  $R^2 = 80.40\%$ ,  $F(10, 62) = 25.4$ , \*  $p < 0.001$ . Healthcare Accessibility recorded the strongest  $\beta$  value of 2.9 and

B = -0.551, followed by number of services offered ( $\beta = .167$  & B = 4862.988), then organizational factors ( $\beta = -.015$  & B = -1015.842), and finally Community Factors: ( $\beta = .004$  & B = 570.706).

## V DISCUSSION

This chapter is organized in seven sections as follows:

- V.1 Discussion of univariate analysis and results
- V.2 Discussion of bivariate analysis and results
- V.3 Discussion of multivariate analysis and results
- V.4 Summary of key findings
- V.5 Contribution to literature and practice
- V.6 Study limitations
- V.7 Implications for future research

### **V.1 Discussion of Univariate Analysis and Results:**

This section discusses the purpose, behavior and individual characteristics of the dependent, independent, control and moderator variables of this study. Explained herein, are the measures associated with these variables, and the sequence of developments which resulted in the selection and validation of these variables and measures before moving into the bivariate and multivariate analysis to test the independent and simultaneous relationships between the IVs and the DVs to answer the research question.

Before running the univariate analysis and descriptive statistics to understand the behavior of each variable used in this study, rigorous steps were performed to prepare the final model to be tested. This began with an extensive review of the extant literature and theoretical framework followed by an analysis of the feedback received from practitioners who work at children's hospitals to support what was found in the literature. Then, an evaluation of the measures was performed by defining each measure and how it relates to the construct and to the research question.



In order to produce results that can be utilized by the various stakeholders of this study, and thus furthering knowledge and awareness of this domain, a rigorous selection of variables and measures was necessary. As mentioned in the methods chapter, this began with 170 measures, then collapsed to 136 measures, then to 56 measures and finally to the 39 measures across all 6 constructs of the research model. The descriptive statistics conducted in chapter (IV) showed acceptable data distribution for all these variables. We also explained how the independent variable IV2 “Medical Coverage” was removed from the model due to lack of data reported on Medicaid coverage by the hospitals listed in the dataset.

#### **V.1.1 DV: *Financial Performance:***

This dependent variable consisted of 6 measures and was split into two parts, DV1 including (total operating expenses) and DV2 including (Hospital revenue; Total income; Total assets; Inventory; Cash on hand). As indicated in chapter VII (appendices), this variable was supported by eight practitioners who participated in the feedback received from the field. As shown in table 5.3 (feedback summary), all practitioners (Ps), to whom this researcher spoke to, agreed with the importance of studying financial performance. Financial performance is an important indicator of any hospital’s organizational wellbeing and may have a positive relationship with patient quality of care. Deep financial problems that go beyond the patient care may also affect quality problems (Bazzioli et al., 2007). Furthermore, by logical conclusion, financial performance is an important variable for the surrounding community to have access to this essential resource, where government funding of these institutions is not necessarily guaranteed due to possible changes in policy. Although medical research may be funded by governmental, external or private sources, this leaves no profit to hospitals, only compensation for expenses, so the general capacity of the US medical community to further research and knowledge is related to financial

performance. (Dean D. Akinyele, PLoS One, 2019) . Children's hospitals make up less than 3% of hospitals in the US according to the American Hospital Association. In collaboration with pediatric departments of university medical centers, they make up for 35% of NIH funded pediatric research (The National Association of Children’s Hospitals and Related Institutions). As reported in chapter VII (appendices), practitioner (P2) stated that: “Research hospitals are funded and that is good but there is no profit to hospital rather expenses going towards compensation for medical research and researchers from the NIH funding”. This is significant as Children’s hospitals specialize in rare and complex conditions which constitute the majority of their revenue and costs, whereas the majority of other non-children hospitals focus research on more common conditions which appear later in life. The univariate analysis and descriptive statistics showed acceptable behavior and data distribution. Accordingly, I concluded that all the 6 measures were consistent and represent the construct and ready for bivariate analysis.

### **V.1.2 IV1: *Healthcare Accessibility:***

This independent variable included the measures: (total admissions, outpatient visits, inpatient visits, length of stay, emergency room visits). These measures were among the highest reported important factors affecting financial performance by practitioners in the field as explained in chapter VII (appendices). P4 stated that: “hospital accessibility is the most important factor that affects financial performance. We are working on expanding our hospital’s inpatient and outpatient admissions rate, the length of stay, as well as the capacity of the emergency room”. This feedback from the field illuminated that children’s hospitals deal largely with complex, chronic and life-long conditions, requiring more patients to remain in the hospital for extended durations. Furthermore, practitioner (P7) as reported in chapter VII (appendices), emphasized that: “the

specialized trauma hospital that I worked for, allowed patients to stay for longer periods to ensure that the medical condition has been controlled and/or mitigated”. Based upon this, I deduced that such finding related to the relationship between IV1 and financial performance, may be useful for healthcare professionals. With over 4 million uninsured children in the United States, access to health care becomes more critical for the overall physical, social and mental health and quality of life for US children. The obstacles that face low income families are high cost of care and insurance coverage. Some top-rated hospitals in the US such as Boston Children Hospital (BCH) and the Children’s Hospitals of Philadelphia (CHOP), strive to have additional numbers of beds to accommodate the growing needs of their children patients. The relationship between IV1 and financial performance may illuminate possible solutions to these challenges as healthcare leaders strategize to ensure that children in the United States have the care they need, and that hospitals can succeed in their financial goals in doing so. The univariate analysis and descriptive statistics showed acceptable behavior and data distribution. Accordingly, I concluded that all the 5 measures were consistent and represent the construct and ready for bivariate analysis.

### **V.1.3 IV2: *Healthcare Coverage:***

Given the exploratory nature of this study to examine the effect of the independent variables on financial performance, IV2 (healthcare coverage) is a logical variable to explore among others in how it might affect the number of children who have the necessary coverage to receive the medical services they need. According to Georgetown University’s Health Policy Institute, Medicaid alone covers 45% of children under the age of 6, and 35% of those aged between six and 18. (Center for children and families, Georgetown University, HPI, December 2016). Today, millions of children in the US do not have health coverage, and to mitigate this

problem, the federal government stepped up to close the gap and enacted the Medicaid, CHIP and ACA programs. Simultaneously, the overall cost of healthcare continues to rise, raising concerns about the possible ramifications of increasing spending deficits and national debt. With the potential changes in policy and the effects this will have on coverage for children in the US, this variable may have an impact on financial performance (Channick, 2012). Unfortunately, due to limitation of data reported on these three federal health coverage programs, this important variable was dropped from the model and this limitation is addressed in section (V.6) of this chapter.

#### **V.1.4 IV3: *Number of Services Offered:***

This independent variable included 18 measures which are: (pediatric emergency department, neonatal intensive care, pediatric intensive care, ambulance services, children's wellness program, health screenings, oncology services, orthopedic services, neurological services, computed tomography (CT) scanner, magnetic resonance imaging (MRI), ultrasound, heart transplant, kidney transplant, liver transplant, lung transplant, open 24 hours a day 7 days a week, birthing room/LDR room/LDRP room). Many children hospitals in the United States strive to become full-service hospitals that offer critically needed medical services to its patients by providing a wide range of acute care and diagnostic services to offer health and wellbeing for the community where they operate. According to the Children's Hospital Association, children with chronic and complex medical conditions, who require intensive care management, make up only 6 percent of the Medicaid population and represent 40% of Medicaid expenditure for children. This indicates that having the capacity to service complex medical conditions may have an effect on financial performance. Furthermore, this variable was supported by the feedback received from the field and especially from a practitioner as reported in chapter VII (appendices). Practitioner

(P7) stated that: “As a pediatrician who worked in different children's teaching and trauma centers, I believe that neonatal and pediatric intensive care units are very vital. Having a NICU and birthing rooms are critical. Also other diagnostic services such as CT scan and MRI are very important to diagnose medical conditions. It is important to have access for complex procedures such as organ transplants”. (P7) added that: “many of these hospitals used to open 24X7”. The univariate analysis and descriptive statistics showed acceptable behavior and data distribution. Accordingly, I concluded that all 18 measures were consistent and represent the construct and ready for bivariate analysis.

#### **V.1.5 IV4: *Community Factors:***

This independent variable included the measures: (community health education, collects patient's primary language, offers community health & wellness activities, Plan for improving community's health). For any community where hospitals operate, the determinants for better healthcare include social, economic, physical and environmental characteristics and behaviors of the members of the community. Little support was found for the effect of this variable on DV1 and DV2 from prior literature. Practitioner (P8) as reported in chapter VII (appendices) stated that: “Another area of the hospital focus is in its community programs and initiatives which focus on the treatment of common children's conditions such as obesity, asthma, mental and behavioral health. The community aspects we focus on are the community size, geography, environment, health knowledge, health education, social work services, outreach, behaviors, influence of culture, media, technology, communication and health advocacy, this in addition to other factors such as race, ethnicity and language”. The univariate analysis and descriptive statistics showed acceptable

behavior and data distribution. Accordingly, I concluded that all the 5 measures were consistent and represent the construct and ready for bivariate analysis.

#### **V.1.6 IV5: *Organizational Factors:***

This independent variable included the measure: (degree of centralization of health system). From the literature we found that children's hospitals can use scale to remain independent, but that requires stakeholder decisions on future direction and planning of resources and time required to meet these goals. The effect of this variable was also supported by the theoretical framework established for this study. According to the RBV, an organization contains the different types of organizational resources such as, assets, capabilities, processes, management, competencies, technology and knowledge resources (Barney,1991). The univariate analysis and descriptive statistics showed acceptable behavior and data distribution. Accordingly, I concluded that this measure is consistent and represent the construct and ready for bi-variate analysis.

#### **V.1.7 CV1: *Control Variable (Hospital Size):***

This control variable included one measure which represents the number of beds. Generally, the greater number of beds in a hospital, the more revenue it could generate. This variable was supported by some prior literature. An increase in the supply of beds will help meet the demand for hospital services. Whether it results in more efficient use of hospital services will depend upon how well the expansion achieves a more efficient distribution of hospital facilities (Wandel 1960). In his paper published in 2016, Seth Freedman concluded that hospitals with smaller NICUs may respond more strongly to the number of beds, since one empty bed likely represents a larger share of revenue than it would in hospitals with larger NICUs. Additionally,

smaller NICUs are likely to face more financial stress. Because geographic variation in medical care utilization is jointly determined by both supply and demand, it is difficult to empirically estimate whether capacity itself has a causal impact on utilization in health care (Freedman, *American Economic Journal*, 2016). The univariate analysis and descriptive statistics showed acceptable behavior and data distribution. Accordingly, I concluded that this measure was consistent and represented the construct and ready for bivariate analysis.

#### **V.1.8 CV2: Control Variable (Teaching Affiliation):**

This control variable included the measure teaching affiliation. Hospital affiliation affects the quality of care and provides new cures and treatment therapies. It adds to the hospital state-of-the-art technologies, shorter length of stay for major illnesses, and better survival rates. It means more specialized surgeries and experimental medical procedures. This variable was supported by literature and feedback from the field. Prior studies associated teaching hospitals status with lower financial performance, considering they often support more labor-intensive staff and offer a wide array of costly medical services (Dean D. Akinleye, *PLoS One*, 2019). Practitioner (P1) stated that: “Researchers should consider teaching versus research hospitals. Teaching hospitals could be big for research”. He added: “also consider the effect of university relations with hospitals, for example Stanford Hospital and UCSF”. Practitioner (P2) stated that: “Research hospitals are funded and that is good but there is no profit to the hospital rather expenses going towards compensation for medical research and researchers from the NIH funding”. The univariate analysis and descriptive statistics showed acceptable behavior and data distribution. Accordingly, I concluded that this measure is consistent and represent the construct and ready for bivariate analysis.

**V.1.9 *MV: Moderator Variable (Ownership Type):***

This moderator variable included the measures: (Government federal, Government non-federal, Nongovernmental non-for-profit). The ownership type of any hospital is an indicator for its financial performance. For example, medical centers as opposed to public hospitals offer wider range of services than public hospitals. (Horwitz, 2005) found that public hospitals offered the largest number of these services, not-for-profit hospitals (NFP), offered several of them, and for-profit hospitals (FP) offered the least. Prior studies have found that NFPs with better financial performance provide higher quality of care (Encinosa and Bernard 2005; Bazzoli et al. 2008). Understanding the effects of hospital ownership on cost and pricing policies is becoming increasingly relevant. Not-for-profit hospitals had the highest profit margins for daily hospital services, (Robin Eskoz, and K. Michael Peddecord, HCFR, Spring 1985). The univariate analysis and descriptive statistics showed acceptable behavior and data distribution. Accordingly, I concluded that all the 3 measures of this construct were consistent and represent the construct and ready for bi-variate analysis.

**V.1.10 : *Summary of Univariate Analysis:***

As explained in the beginning of this chapter, all variables in the model were consistent by their definitions and relevance to the study. They were supported by the literature, feedback from the field, and they were present in the dataset. However, since we have a small number of cases in our data set (74 hospitals), some of the histograms in the descriptive statistics showed abnormal data distribution. Hence, I decided to perform extra investigation to test normality. I used the “Anderson-Darling” normality test as shown in table 25 in chapter VII “Appendices”. The results showed that the p values for all variables were lower than 0.05 where we can reject the hypothesis



of normality and able to assume that no significant departure from normality was found. Since our sample size is larger than 30 ( $n = 74 > 30$ ), therefore, we kept these variables to conduct further analysis as performed in this study using bivariate and multivariate analysis.

## **V.2 Discussion of Bivariate Analysis and Results:**

In this section, we discuss the relationship of each independent variable with the dependent variables DV1 and DV2 to assess the effect on children's hospitals financial performance. We explain how these relationships supported what was found in the extant literature, the feedback collected from the field, and how the analysis results relate and fit within the theoretical framework used in this study. Finally, we discuss how the bivariate analyses guided this researcher in answering the research question and hypotheses. (Table 10 - Chapter IV) summarized these results and guided this discussion. The bivariate analysis was performed in two steps by splitting the dependent variable into 2 parts which are (a) DV1 representing the measure (total operating expenses), and (b) DV2 representing the measures (Hospital revenue, Total income, Total assets, Inventory and Cash on hand). Finally, the discussion concludes on how the bivariate analysis helped the researcher to arrive at the factors that have the most significant impact on financial performance and how the research question was answered.

### **V.2.1 Financial Performance (DV1 & DV2):**

Financial performance is an important predictor of the stability and financial health of any hospital. It is defined in this study as the indicator that identifies how well a company generates revenues and manages its assets, liabilities, and the financial interests of its stakeholders. As reported in chapter VII (appendices), practitioner (P4) mentioned that: "based on my long years in

hospital administration, I came to find out that while some hospitals may have the required medical resources and services, but still they could suffer from adverse financial performance”. This construct represents the core of this exploratory study as the dependent variables used to answer the research question. The six measures used in this construct were validated through rigorous evaluation and selection that started with 30 possible measures that represent financial performance. After defining the role of each measure, looking into the literature summary, applying the feedback from the field, evaluating the relevance to the study and ensuring availability in the dataset, the measures of this construct were reduced to the 6 elements listed in table 4 in chapter (IV).

As per the literature, children’s hospitals look increasingly towards fundraising to adapt, but not all these institutions have the same potential to attract donors. It has been debatable whether these hospitals can stay independent and non-profit. While the hospitals’ operating cost is somewhat similar in nature, the difference has always been in the hospital’s operating margin. Furthermore, independent hospitals that joined a healthcare system did show savings during their transition due to increased technical efficiency, but any gain in profit vanished after the first year.

This study utilized the RVB theory as a baseline for understanding the factors that impact financial performance and the competitive advantage of children’s hospitals. The Resource Based View (RBV), as a business management tool, was used in this research to guide the understanding of how the internal features of the organization and the healthcare system may increase its financial performance. Therefore, the aim of using the RBV was to understand the Sustainable Competitive Advantage (SCA) for children’s hospitals within the healthcare industry. The importance of financial performance of children hospitals as a dependent variable was confirmed by 8 practitioners working in the field as summarized in table 2. While there is very little prior research

covering the domain of this study, by doing so, this paper hopes to contribute to the body of literature, research and practice.

### **V.2.2 IV1: *Healthcare Accessibility:***

This independent variable is defined as the availability of good health services within reasonable reach of children who need them including opening hours, appointment systems, and other aspects of service organization and delivery that allow children to obtain the services when they need them. According to the RBV, organizational assets range from intangible to tangible elements such as physical resources including location. Tangible resources of a hospital include land, buildings, equipment and capital. They can easily be bought in the market so they grant little sustainable advantage in the long run because the competition can soon acquire the identical assets. Intangible resources include assets that have no physical presence and stay within the organization and are built over a long time and hence cannot be bought from the market and they are the main source of sustainable competitive advantage. The hospital's location is a critical measure for healthcare accessibility in providing critical medical services to children who live within proximity to the hospital for access to admissions, inpatient and outpatient visits, emergency room and adequate length of stay in case of critical conditions. Practitioner (P4) as reported in chapter VII (appendices) focused her feedback on hospital accessibility and location as being the most important factor that affect financial performance. She indicated that their main problem is that they are not able to keep up with the patient's demands and accessibility due to the large population around the hospital. According to the RBV model, the organization's tangible resources such as land and buildings play a role in helping the firm to achieve higher organizational performance.

### ***V.2.2.1 The Effect of IV1 on DV1 (Total Operating Expenses):***

The results of the analysis showed that IV1 has a statistically significant and positive effect on DV1. The total operating expenses in a hospital setting is defined as all the expenses associated with the operation of the hospital, such as salaries, employee benefits, purchased services, supplies, professional fees, and insurance. Although better healthcare accessibility is always a goal for any children's hospital that is keen to provide access to beds and services to those children who need them, it comes with additional expenditure since the hospital will need to staff more employees and cover other daily operating expenses. The location of the hospital is an important factor for health care accessibility. Practitioner (P5) as reported in chapter VII (appendices), mentioned that: "the location of the hospital in the center of Philadelphia plays a big role where many patients come from other states". Any business is always seeking to increase its revenue more than they are increasing their costs, yet completely predicting the future outcome of these changes is impossible. The findings from this study may support hospital managers to make strategic and informed decisions as to which costs they incur are more or less likely to have a positive effect on the hospital revenue.

### ***V.2.2.2 The effect of IV1 on DV2 (Revenue Measures):***

The results of the analysis showed that IV1 has a statistically significant and positive effect on DV2. A children hospital's revenue is mainly generated from its billing for patient care services through contracts with healthcare plans. A small but growing population of children with medical complexity accounts for a high proportion of pediatric health care spending. Many of them are covered by Medicaid (Barry et al., Health Affairs Journal, 2014). The 4 measures of DV2 represent the sum of all money received, tangible or intangible resources owned by the hospital, inventory

including medicines and surgical equipment and any other liquid assets. The results of this analysis have been supported by the feedback from the field. Practitioner (P4), as reported in chapter VII (appendices) mentioned that “hospital accessibility and location are the most important factor that affect financial performance”. As part of the hospital board she said that: “they are working to expand the number of beds in the hospital to accommodate the growing need”. This finding shows that hospitals with higher IV1 factors had a positive effect on revenue measures (DV2). As per the literature, patients with high level of “children with medical complexity” known as CMCs, account for a large portion of pediatric health care spending. As long as CMCs are covered by Medicaid (the major provider of this revenue), hospitals with a high IV1 factor (particularly length of stay), are well positioned to service this group. CMCs accounts for 40% of Medicaid expenditure on children. CMCs are an emerging population, as medical advancements have made it possible for children to survive with conditions that would not have been possible to live with previously (Eyal Cohen et al, Pediatrics, March 2011). CMCs often require intensive and diverse treatments. This would incentivize parents to select hospitals which can service all of their needs and have the capacity to service them for the full duration of their medical requirements. (Eyal Cohen et al, Pediatrics, March 2011)

**Summary: (The Effect of Healthcare Accessibility on Financial Performance)**

By revisiting the research question of this study, we see that (IV1) is a significant predictor of financial performance (DV1 and DV2). Furthermore, the results of both correlation and regression analysis confirmed this statistically significant relationship. Hence, we concluded that healthcare accessibly, independently, has a significant and positive impact on DV2 and significant and negative impact on DV1 and therefore we were able to answer the research question and reject

the null hypothesis. Accordingly, this variable was kept and used in the multivariate analysis to see if it simultaneously has impact with other independent variables.

### **V.2.3 IV2: *Medical Coverage:***

This independent variable was dropped as explained in this chapter in section V.1.3.

### **V.2.4 IV3: *Number of Services Offered:***

Any hospital in the United States and specially children hospitals, strive to provide critical and most needed medical services to its patients. Based on prior literature, children patients use more medical services as they are more likely to undergo complex procedures. This justifies the selection of the 18 services shown in table 4 in the previous chapter as being the most needed type of medical services for children healthcare. Practitioner (P7) as reported in chapter VII (appendices) stated that “as a pediatrician who worked in different children's teaching and trauma center, I believe that neonatal and pediatric intensive care units are very vital”. She added: “Having a NICU and birthing rooms are critical. Also, other diagnostic services such as CT scan and MRI are very important to diagnose medical conditions. It is important to have access for complex procedures such as organ transplants”. She finally added that “many of these hospitals used to open 24X7”. According to the Resource Based View (RBV), internal resources are important (in this case services offered) which possesses the fundamentals of the theory as being valuable, non-imitable and void of easy substitution; all of which leads to a sustainable competitive advantage (Barney, 1991).

#### ***V.2.4.1 The Effect of IV3 on DV1 (Total Operating Expenses):***

The results of the analysis showed that IV3 has a statistically significant and positive effect on DV1. This independent variable is defined as any needed services, equipment, facility, or people to deliver hospital care to patients. As per the literature, reducing health care costs through improved care management for children with medical complexity is not easy. It will not be possible to easily reduce all of the children's future expenditures while maintaining high-quality care. It remains unclear which care management methods for reducing cost work best (Barry et al., Health Affairs, 2014). Therefore, the success of any care management program is contingent upon identifying children with medical complexity who have such health problems and engaging them and their families in a timely manner to reduce health care expenditures before they occur (Barry et al., Health Affairs, 2014). In this study, 18 types of medical services were identified by the AHA hospitals survey data as being much needed for children's healthcare. According to the results, the more services offered, the more operating expenses are incurred by the hospital. Hospital managers can use this knowledge to focus on how to reduce the operating expenses of adding additional medical services and procedures. One way to do that, is to identify a health problem experienced by a child with medical complexity over the phone, in an outpatient clinic, or in the child's home, thereby avoiding an emergency department visit or a hospitalization (Barry et al., Health Affairs, 2014). Based on these interesting findings, I decided to keep this variable and move it to the multivariate analysis to see if it simultaneously has impact with other independent variables.

#### ***V.2.4.2 The effect of IV3 on DV2 (Revenue Measures):***

The results of the analysis showed that IV3 has a statistically significant and positive effects on DV2. According to these results, the more services offered, the better revenue and financial performance the hospital can achieve. Recent surveys have revealed that self-pay receivables have been increasing and smaller hospitals are seeing the greatest increases (Healthcare Financial Management, 2014). RBV supports hospital services and resources in the area of tangible assets such as medical equipment used for these services. According to the RBV, the organization's tangible resources such as birthing rooms, CT scanner, MRI, Ultrasound and other medical equipment play a role in helping the hospital to achieve better organizational and financial performance. When asked about what medical services she believes are important for children, practitioner (P8) as reported in chapter VII (appendices) stated that "Boston Children Hospital is distinguished by its technical resources as a teaching hospital". For healthcare providers, this finding is important to consider these services as very essential not only for children's healthcare, but also for improving financial performance of the hospital. Hospital managers and stakeholders can use this knowledge to consider adding other important medical services and procedures.

#### **Summary (The Effect of Number of Services Offered on Financial Performance):**

The results of both correlation and regression analysis showed a statistically significant and positive relationship between IV3 and both DV1 and DV2. Therefore, we concluded that this independent variable has a significant effect on financial performance and were able to answer the research question and reject the null hypothesis. Hence, this variable was kept and used it in the multivariate analysis to assess if it simultaneously has effect on financial performance with other independent variables.



### **V.2.5 IV4: Community Factors:**

During this exploratory study, there was not enough prior research to support or inform on the effect of community factors on US children's hospitals financial performance. The measures of this variable were chosen mainly based on the feedback reported from practitioners in the field. Practitioner (P8) stated that: "Another area of the hospital focus is in its community programs and initiatives which focus on the treatment of common children's conditions such as obesity, asthma, mental and behavioral health". "We have a big focus on affordable housing and food access through our neighborhood partnerships programs to address many community behavioral health issues". During the meeting with this practitioner, the factors mentioned were community size, geography, environment, health knowledge, health education, social work services, outreach, behaviors, influence of culture, media, & technology, communication and health advocacy, in addition to other factors such as race, ethnicity and language. Based on these findings, future studies can consider the effect of these community factors on financial performance.

#### **V.2.5.1 The Effect of IV4 on DV1 (Total Operating Expenses):**

The results of the analysis showed that IV4 has statistically significant and positive effect on DV1. The more community factors present in the model, the more operating expenses are incurred. These findings trigger a need for future research. According to the RBV, intangible resources including brand equity and reputation may prove to influence operating expenses, particularly those spent on marketing costs. This is because some community factors, such as community education, may take multiple years to take effect, as members of the community change behavior, and subsequent social, cultural and even political impacts occur as a result of these changes. Practitioners and hospital managers may want to conduct more surveys in the

community around the hospital to gain more clarity on the effect on total operating expenses. Based on these interesting findings, this variable was kept and used for further testing in the multivariate analysis to see if it has simultaneous effect with other independent variables.

#### ***V.2.5.2 The effect of IV4 on DV2 (Revenue Measures):***

The results of the analysis showed that IV4 has a statistically significant and positive effect on DV2. The more community factors present in the model, the better financial performance the hospital can achieve. Hospital managers, practitioners and researchers may use this finding to better understand the effect of community factors on financial performance through surveys and interviews among the communities around the hospital. As reported in chapter VII, practitioner (P9) stated that: “Our hospital has big focus on affordable housing, food access through our neighborhood partnerships programs to addresses many community behavioral health issues”. Shed added: “In my view, community factors play a vital role in the hospital's quality of service and financial performance”. Based on these findings, I decided to keep this variable and consider it for further testing in the multivariate analysis to see if it has simultaneous effect with other independent variables.

#### **Summary: (The effect of Community Factor on Financial Performance):**

The bivariate analysis showed a statistical significance and positive effect of IV4 on both DV1 and DV2. The feedback from the field, though it was informative, but it was only reported by one out of eight practitioners. Therefore, this study suggests more feedback is needed to better evaluate the effect of community factors on the financial performance of children’s hospitals.

### **V.2.6 IV5: Organizational Factors:**

This variable is defined as any extraneous characteristics of the hospital such as teaching affiliation, organizational structure (rural or urban) and degree of centralization. Due to the limitation in the dataset, this variable was represented by the degree of centralization of healthcare system. Centralization refers to whether decision-making and service delivery originate from the system level or from the individual hospitals. The robustness of a health system in achieving desirable outcomes is contingent upon the decision space at the local level. Different approaches have been used to examine decentralization and its effect on health system functioning (Panda, B., & Thakur, H. P., BMC, Health Services Research, 2016). The degree of centralization of healthcare system is categorized in 5-degree levels of healthcare system delivery: (1) centralized, (2) centralized physician and insurance, (3) moderately centralized, (4) decentralized and (5) Independent hospital.

#### **V.2.6.1 The Effect of IV5 on DV1 (Total Operating Expenses):**

The results of the analysis showed that IV5 has statistically significant and negative effect on DV1. The more the decision making is made by the hospital system, the less the total operating expenses. This result indicates that the centralized system of hospitals can have better control on operating expenses since all support services for the organization is centralized which means less spending on employees' salaries, benefits, purchased services and supplies. When asked about the effect of organizational factors, practitioner (P6) as reported in chapter VII (appendices), mentioned that "hospitals who are not part of a system are able to quickly and freely make financial decisions and tend to have better overall financial performance". The RBV theory supported this finding as it explains how organizational factors affect competitive advantage found within the

organization. Managers and stakeholders can use these findings to improve financial performance. Researchers can build upon this knowledge to find other organizational variables to consider in future research models.

#### ***V.2.6.2 The effect of IV5 on DV2 (Revenue Measures):***

The results of the analysis showed that IV5 has a statistically significant and negative effect On DV2. The less is the degree of centralization (which means the more independent the hospital), the better financial performance is achieved. As mentioned in V.2.6.1, this finding was supported by the feedback from the field and the theoretical framework established for this study as a tool to analyze the effect of IV5 and its relationship with DV2 as we found the RBV very helpful in how to understand and predict organizational relationships.

#### **Summary: (The Effect of Organizational Factors on Financial Performance):**

The bivariate analysis showed that this variable has a statistically significant impact on financial performance (DV1 and DV2). The less the degree of centralization (independent hospital system), the better financial performance is achieved. Therefore, we were able to answer the research question and reject the null hypothesis. Accordingly, this variable kept and used in the multivariate analysis to assess if it simultaneously has effect with other independent variables.

### **V.3 Discussion of Multivariate Analysis and Results:**

After discussing the results of the bivariate analysis which revealed a statistically significant effect in the relationship between each of the independent variable (IV1, IV3, IV4, IV5) with the dependent variables (DV1 and DV2), we now discuss the multivariate results which aim

to understand the relationship and simultaneous effect of the 4 IVs on DV1 and DV2. We discuss these results in relation to what was found in the extant literature and the feedback collected from the field and whether they confirm or contradict with our findings. We further explain these results in relation to the practical problem, the theoretical framework, implications for future research and practice and how these findings can guide hospital's managers and stakeholders in addressing issues related to the financial performance of children's hospitals. We finally conclude this section by explaining how the research question and hypotheses were addressed. (Tables 11 and 13 - Chapter IV) summarized the results of the multivariate analysis performed in this study.

#### **V.4 Summary of Multivariate Analysis and Results:**

Recall from chapter IV (sections 5.1 and 5.2), that the multivariate analysis was performed using three models. The first model included the two control variables. The second model included the two control variables and the four independent variables. The third model included the two control variables, the four independent variables and the interactions between the moderator and the four independent variables. The results of the multivariate analysis using these three models were as follows:

##### **Model (1) Results:**

The two control variables Hospital Size (CV1) and Teaching Affiliation (CV2) had simultaneous and statistically significant effect on the dependent variables DV1 ( $R^2 = 0.800$ ,  $p < 0.001$ ) and DV2 ( $R^2 = 0.729$ ,  $p < 0.001$ ).

**Model (2) Results:**

In the presence of Hospital Size (CV1) and Teaching Affiliation (CV2) as control variables, the independent variables (IV1, IV3, IV4, IV5) had simultaneous and statistically significant effect on the dependent variables DV1 ( $R^2 = 0.846$ ,  $p < 0.001$ ) and DV2 ( $R^2 = 0.799$  and  $p < 0.001$ ).

**Model (3) Results:**

In the presence of Hospital Size (CV1) and Teaching Affiliation (CV2) as control variables, and when the interactions between the moderator (MV) and the four independent variables were present, the independent variables (IV1, IV3, IV4, IV5) had simultaneous and statistically significant effect on the dependent variables DV1 ( $R^2 = 0.850$ ,  $p < 0.001$ ) and DV2 ( $R^2 = 0.804$ ,  $p < 0.001$ ).

Recall from chapter IV (Table 12, Table14 and Figures 37, Figure 38) that the summary of multivariate model for DV1 indicated that  $R^2 = 85.5\%$  and  $p < 0.001$ , and for DV2,  $R^2 = 80.4\%$  and  $p < 0.001$ . Hence, the multivariate results revealed that the 4 independent variables: IV1: healthcare accessibility, IV3: number of services offered, IV4: community factors, and IV5: Organizational factors had statistically significant and simultaneous effect on financial performance (DV1 and DV2).

Furthermore, from the summary of bivariate analysis (table 10, chapter IV) we see that all bivariate relationships between each independent variable (IV1, IV3, V4, IV5) with the dependent variables (DV1, DV2) were statistically significant. It was not surprising that the combined effect of these independent variables was also statistically significant when performing multivariate analysis. Therefore, we were able to answer the research question and reject the null hypotheses.

However, as shown in tables 12 and 14 in chapter IV, and while the simultaneous effect of the independent variables was statistically significant ( $p < 0.05$ ), but the p-values reported for each independent variable in the two models ranged between 0.520 and 0.896. While these p-values were not expected to be far above the significance level, this result required more investigation to assess the root cause for such unexpected high p values. Therefore, I decided to investigate further into this issue to further understand the effect of correlation between the variables in the multivariate model which showed that all IVs are non-significant predictors while they simultaneously have significant effect on the dependent variables. I looked deeper into the correlation analysis in tables 6 and 8 in chapter IV of this study. The correlation between the variables revealed that as one variable changes in value, the other variable tends to change in a specific direction. My investigation revealed that there is some correlation between most variables in the model without any other variable interfering. Hence, I was able to assume that they may interfere in the multiple regression and explain the likelihood of what happened in the multivariate analysis which spoke for the data that was used in this exploratory study.

In my investigation, and as shown in tables 26 through 28, I first ran the regression for all 4 IVs against DV1 (step1). I found (IV5) non-significant predictor of (DV1), I then dropped this variable from the model and ran the regression analysis again (step 2). I found (IV4) non-significant predictor of (DV1), I then dropped this variable from the model and ran the regression analysis again (step 3). The final result included only two independent variables, (IV1) and (IV3) as predictors of (DV1). The equation for the regression line is financial performance =  $-5505.632 + 0.455 \cdot \text{health care accessibility} + 1705.115 \cdot \text{number of services offered}$ .  $R^2 = 0.825$ , indicating that 82.50% of the variance in financial performance is explained by the two independent variables. The results were significant,  $F(2, 71) = 166.933$ ,  $p < 0.001$ . Therefore, I concluded that Health

Care Accessibility and Number of Services Offered are positive and collectively significant predictors of Financial performance (DV1).

Next, and as shown in tables 29 through 34, I first ran the regression for all 4 IVs against DV2 (step 1). I found that (IV3) was non-significant predictor of (DV2), so I dropped this variable and ran the regression analysis again (step 2). I found that (IV5) was non-significant predictor of (DV2), so I dropped this variable and ran the regression analysis again (step3). I found that (IV4) non-significant predictor of (DV2), so I dropped this variable and ran the regression analysis again (step 4). My final result included only one independent variable Health Care Accessibility (IV1) as a significant predictor of Financial performance (DV2). The equation for the regression line is financial performance =  $-13173.222 + 1.635 * \text{health care accessibility}$ .  $R^2 = 0.786$ , indicating that 78.60% of the variance in financial performance is explained by this independent variable. The results were significant,  $F(1, 72) = 265.170$ ,  $p < 0.001$ . Therefore, I concluded that Health Care Accessibility is positive and significant predictors of Financial performance (DV2).

I further conducted more investigation and ran a multicollinearity analysis using Variance Inflation Factor (VIF) as shown in tables 33 and 34. According to (Miles and Shevlin, 2001) on explaining regression and correlation, they indicated that co-linearity causes the standard errors to increase in size, however they acknowledged that: “larger samples have smaller standard errors and dataset will make up for some of the effects of co-linearity”. I realized that this could have been the cause of the problem since my dataset was limited to 74 hospitals. (Miles & Shevlin, 2001) added: “If the variables are highly correlated this implies that they are measuring similar constructs and that the information in one of those variables may be redundant”. They suggested that one solution is to remove one of the variables or to combine the variables. While many researchers and statisticians, consider any value of VIF over 10 to be a high multicollinearity and



in weaker models values above 2.5 may be a cause for concern, however by adopting Miles and Shevlin findings, a VIF greater than 2 would alert to the possibility of co-linearity and more data collection is needed. From this investigation, I concluded that multicollinearity was present among the IVs except IV5. This could have attributed to the correlation between the variables, the data limitation and the dominant presence of the moderator variable “ownership type” as measured by “non-government, nonprofit”.

These results illuminate an area for future investigation regarding the influence of the control variables and moderator variable used in this model and to the dominant presence of hospitals that are non-for-profit in the dataset. Therefore, it would have been interesting to consider different control variables and other types of ownerships such as (government owned, investor-owned and for-profit) in the multivariate models. Therefore, future studies may expand by analyzing other variables and a wider range of hospitals survey data and using different control and moderator variables.

After arriving to these results, I went back and reviewed the extant literature to determine whether other studies have supported these finding, I did not find any studies that either supported or rejected these results. I spoke again to three of the practitioners about these results and they have all agreed with these results. These findings make a significant contribution to future research as it sheds new light on which factors impact children’s hospitals’ financial performance.

These findings were consistent with the theoretical framework established for this study. They confirmed the established literature knowledge on sustainable competitive advantage. The resource-based view (RBV) ascribes better financial performance to the firm resources and capabilities (Bharadwaj, 2000; Wernerfelt, 1984). A firm possess different types of resource and capabilities, among them, several will be strongly associated with better performance (Song et al.,

2007). Per the literature, very few prior researchers have examined financial performance for general hospitals. To my knowledge, this is the first study to investigate the effect of these variables on financial performance for US children's hospitals.

The bivariate and multivariate results extended the prior research on hospital stability and functionality in relation to financial performance (literature review summary - table 16) and provided new insights on the factors that have the most impact on financial performance. These results provided positive proof and made significant practical implications on the effect of these variables on financial performance and provided new insights and knowledge to healthcare practitioners, managers and stakeholder. Had this study used primary data instead of secondary data, it might have been interesting to survey hospital managers and directors on their views on what factors they believe would affect financial performance. This is one of the limitations of this study and could be an area for future research.

## **V.5 Summary and Discussion of Key Findings:**

(1) The data analysis in this study revealed that all variables used in the research model were relevant and the associated measures were consistent within the constructs. They showed normal behavior and data distribution was acceptable and justifiable. These variables and measures were supported by the extant literature and the feedback from the field. While three independent variables had a positive effect, however organizational factors had a negative effect on financial performance. This is due to the degree of centralization which dictates that the less the hospital's delivery system is centralized, the more likely it will achieve better financial performance. This finding would be worthy of attention from hospital managers and stakeholders. Such insights could help practitioners delineate when and how to recommend additional services

and medical resources. For future researchers, these findings may trigger the need for additional studies to evaluate how these relationships manifest. (2) The bivariate analysis of this study revealed that IV1 has a statistically significant and positive effect on DV1 (as health care accessibility increases, total operating expenses increase). IV1 has a statistically significant and positive effect on DV2 (as health care accessibility increases, hospital net revenues increase). IV3 has a statistically significant and positive effect on DV1 (as number of services increases, total operating expenses increase). IV3 has a statistically significant and positive effect on DV2 (as the number of services increases, hospital net revenues increase). IV4 has a statistically significant and positive effect on DV1 (as community factors increase; total operating expenses increase). IV4 has a statistically significant and positive effect on DV2 (as community factors increase, hospital net revenues increase). IV5 has a statistically significant and negative effect on DV1 (as organizational factors increase; total operating expenses decrease). IV5 has a statistically significant and negative effect on DV2 (as organizational factors increase; hospital net revenues decrease). The bivariate analysis concluded that all 4 variables (IV1, IV3, IV4 and IV5) are significant predictors for children's hospitals financial performance. The results of this analysis answered the research question and hence the null hypotheses were rejected. (3) The multivariate results revealed that the independent variables: IV1: healthcare accessibility, IV3: number of services offered, IV4: community factors and IV5: Organizational factors had statistically significant and simultaneous effect on financial performance (DV1 and DV2). Hence, we were able to answer the research question and reject the null hypotheses.

These key findings revealed that children's hospitals should focus on factors associated with accessibility such as pediatric ICU, admissions, length of stay for complex conditions and inpatient/outpatient management systems. Hospital managers must consider the role of medical

services to enhance financial performance. They also confirmed that organizational and community factors are predictors for financial performance. Organizational and community factors are not identified as resources in hospitals, but rather, characteristics related to organizational culture (Ghiasi, Davlyatov, Lord, & Weech-Maldonado, 2019). The findings added to the body of knowledge by expanding the current literature related to the theoretical framework (RBV) within the context of hospital organizations. They highlight the effect of hospital size, ownership type and teaching affiliation and how they may impact other variables that are relevant to hospital financial performance. Therefore, they were consistent with the literature on RBV when indicating that valuable (V), rare (R), imperfectly imitable (I), and non-substitutable (N) resources contribute to a firm's competitive advantage and thus financial performance (King, 2016).

The bivariate results showed that in the presence of the control variables (hospital size and teaching affiliation) all four independent variables were predictors for financial performance. The multivariate results showed that when introducing the moderator variable "ownership type" to the same model, the simultaneous effect of the four variables was also a predictor for financial performance. This empirical knowledge is valuable for practitioners, researchers, hospital managers and stakeholders, which could be used as a reference guide for the development of effective strategies to enhance financial performance and sustainable competitive advantage. It should be noted, however, that these key findings are dependent on the hospital size, teaching affiliation and ownership type. These findings could be used by future researchers examining this field of study, exploring varying ranges of hospital ownership types and hospital sizes and determining the extent to which the size of the hospital alters the relevant resources that should be focused on by hospital organizations. This is vital to explore further in order to determine how to gain competitive advantage and enhance financial performance among hospitals.

As indicated in section (IV.1) of this study, it is worth mentioning that “not-for-profit” hospitals accounted for 62 cases in the dataset that included 74 children’s hospitals. This dominance of hospital’s ownership type was supported by the extant literature along with the location of children hospitals. Non-profit hospitals provide the community with service expected of them by locating in more needy areas due to the current tax-exempt status (Norton & Staiger, *The RAND Journal of Economics*, 1994). In return, while for-profit ownership is related to the volume of uninsured patients at a hospital, but they provide service to the communities they choose to serve and hence they avoid areas with large numbers of uninsured (Norton & Staiger, 1994). The hospital industry continues its dominance of non-profit ownership due to the policies designed to increase its role in the market force, which results in the limitation of future growth of for-profit hospitals and their importance in the hospital industry. (Norton & Staiger, 1994). In their very interesting study of hospital ownership, service, and location in 1994, Norton & Staiger found that when for-profit and non-profit hospitals are located in the same area, they serve an equivalent number of uninsured patients, but for-profit hospitals indirectly avoid the uninsured by locating more often in better-insured areas.

Children’s hospitals as complex institutions with multiple variables to consider, should seek to prioritize which of their many challenges to focus their energy on. The key finding of this study may justify that hospital management should focus on these four variables with a higher level of priority among many other factors. Furthermore, those in healthcare policy may draw from this study in the creation of laws for healthcare coverage, as they consider which variables will incur the most costs on the federal healthcare budget, by seeing the effect of these variables on total operating cost.

Finally, these key findings are invaluable and useful for hospitals that aim to increase their financial performance considering the significance of healthcare accessibility, the number of services offered, organizational and community factors in driving these financial performance indicators. This study could act as an empirical guidance in the development of financial strategies which could yield an increase in hospital overall revenues and minimize the hospital operating expenses to achieve better financial performance.

#### **V.6 Contribution to Literature and Practice:**

This study adds a contribution to literature, practice and the body of knowledge in this specific domain of US children's healthcare. This study is important as it addresses an important gap in the area of concern. First, it helped in guiding the evaluation for the significance of proposed factors and their effect on operational, quality of service and financial performance of US children's hospitals. These factors included: healthcare accessibility, healthcare coverage, number of services offered, community and organizational factors. Second, it helped in identifying the factors that affect financial performance of children's hospitals independently and simultaneously. Third, it helped to identify the inputs, outputs and relationships associated with these independent variables in relation to the financial performance of children's hospitals. Fourth, it helped in assessing the influence of the Resource Based View (RBV) in the organizational structure and sustainable competitive advantage of children's hospitals. This study has provided significant insights into the key drivers of financial performance within the context of children's hospitals in the United States, and it confirmed the established literature by supporting that key resources that are valuable, rare, imperfectly imitable, and non-substitutable as being crucial in driving competitive advantage as well as financial performance. The study contributed to the literature

and practice by revealing that healthcare accessibility, number of services offered, community factors and organizational factors as significant predictors associated with children's hospitals financial performance, which corroborates past studies that hospitals are highly dependent on the quality of their products and services to survive and grow (Priya & Jabarethina, 2016). The findings extended the existing literature by showing that utilizing the resource-based view as a theoretical framework could increase the overall efficiency and financial performance of children's hospitals (Arbab Kash et al., 2014; Priya & Jabarethina, 2016). Furthermore, this study added to the existing literature by exploring control variables such as hospital size, teaching affiliation, as well as moderator variables such as ownership type. These are significant findings for practitioners and researchers, which could aid in the development of sustainable and effective strategies that help ensure long-term growth of children's hospitals.

In addition, the key findings of this study could significantly contribute to the literature and practice by enhancing overall healthcare quality and stability of children's hospitals by determining and understanding the factors that affect their financial performance. It provided insights for more effective strategies that could be developed and implemented by hospital leaders and administrators, yielding in increased value for both hospitals and the stakeholders (Sarto & Veronesi, 2016). Increased financial performance of children's hospitals could also result in improvement in the areas of people, leadership, capabilities, and processes, which could yield better outcomes in terms of providing hospital care services to its patients. The findings of this study could help children's hospitals grow and maintain competitive advantage, by drawing from key variables in this study that are significant in impacting financial performance given the crucial view of VRIN resources.

## V.7 Limitations:

While this study focused on measuring and examining the impact of health care accessibility, medical coverage, number of services offered, community factors, and organizational factors on children's hospitals' financial performance, there was no prior research or data regarding this specific domain of study except for few studies for reference on non-children hospitals. Moreover, this study was limited to hospitals financials and survey data. Because this study used secondary data, there were no additional methods available to verify and validate the dataset. In addition, some of the important measures affecting financial performance were not available in the such as "Medicaid Managed-Care Hospital" and "Operating Margin". The variable IV1: Healthcare Accessibility correlated with the control variable CV1: Hospital Size (number of beds) as opposed to the second control variable CV2: Teaching Affiliation. Future studies may consider removing Hospital Size as a control variable. In addition, the categorical nature of the moderator variable (MV) denoted by (Y/N), may have affected the significance (p-value) of the IV-DV individual relationships nevertheless the combined effect of all variables was significant. This limitation could have been due to the limited number of cases (N=74 hospitals) and the dominance of the measure (nongovernmental non-for-profit) in the moderator construct.

This study was limited to children's hospitals registered across the United States for FY 2017. So, the findings were limited to this time frame. Furthermore, these findings are not generalizable to children's hospitals in other countries outside of the United States. There are 124 children-only hospitals registered across the US that are varied in size, therefore, the findings may not be generalizable to small, medium, or large-sized children's hospitals and may vary according to the size of the hospital. Further researchers could expand on this knowledge by focusing on more time span for the dataset and ranges of small, medium, or large-sized children's hospitals with respect to the number of hospital beds. Other limitations of this study is (a) the lack of prior



literature and research about the effect of community factors on children hospital's financial performance (b) the exploratory nature of this study in validating empirical results. (c) one of the most important variables in the research model "Medical Coverage" was excluded due to lack of reported data on government's subsidized healthcare scheme widely known as "Medicaid". (e) due to confidentiality of internal financial resources, some hospitals may have not reported accurate financial data and others did not report any financial data when surveyed by the American Hospital Association.

### **V.8 Implications for Future Research:**

While conducting this exploratory study, this researcher uncovered some important findings that healthcare professionals and researchers may take into consideration in future studies. These key findings are summarized as follows: (a) The percentage of children hospitals in the United States is 2% (which 230 with 124 hospitals serving children only) compared to the overall number of hospitals which is 6,146. Children make up 22.6 percent of the US population (figure 42, chapter VII Appendices). Children's hospitals can specialize in the treatment and prevention of health conditions that the next generation will face. (b) Over 80% of the children hospitals listed in the dataset were non-governmental and non-for-profit. Healthcare policy professionals may benefit from data that reveals the effect of ownership type on financial performance, and this study outcome may also be valuable for groups seeking to open new children's hospitals and considering which ownership type will yield the best results for their purpose. The hospital market is served by firms that are private for-profit, private not-for-profit, and government-owned and operated. The critical difference between the three types of hospitals is caused by the soft budget constraint of government-owned institutions (Duggan, *The Quarterly Journal of Economic*, 2000).

Public hospitals were unresponsive to financial incentives because any increases in their revenues were taken by the local governments that own them and none of the billions of dollars received by public hospitals resulted in improved medical care quality for the poor (Duggan, 2000). (c) Children's hospitals in tandem with pediatric departments of universities are the leading centers for treating children with medical complexity, which account for almost half of Medicaid expenditure on children. If it is possible that these institutions with better financial performance can make significant improvements through research on the treatment, diagnosis and potential cures for some of these conditions, this can have a major impact on national healthcare costs and would warrant further research. (d) Children born after 1997 (known as generation Z), made up the largest generation in the United States as of 2018 with about 90.55 million individuals. Future research that could shed more light on the extent to which children's hospitals are better or lesser equipped than other hospitals to serve children's health needs, and what variables determine if this is true, could support all hospitals to understand how to best service this growing demographic. (e) The number of uninsured children in the United States increased by more than 400,000 between 2016 and 2018 bringing the total to over 4 million uninsured children in the nation. This study showed the need for further research to show how medical coverage affects children's ability to access the services of these hospitals, particularly children with medical complexity. Medicaid is, the biggest health coverage insurance for children in the United States. Newborn infants are, by a significant margin, the most common type of Medicaid-insured hospital patient, with births accounting for more than 60 percent of all Medicaid discharges. These key findings indicate the need for additional research in children's healthcare, medical research and the financial performance of children's hospitals.

## VI CONCLUSION

Healthcare is one of the most important drivers for the US economy posing a major impact on the country's national GDP. No wonder it was estimated to be 93% higher than the spending on national defense and 59% on education. Based on recent studies, the US GDP showed that healthcare expenditure is around 18% of the US economy. It accounts for \$3.34 Trillion out of which 32.9% is spent in hospital care. Furthermore, US healthcare is the most expensive in the world, and hospitals are the largest portion of the healthcare sector. As one of the top sources of private sector's jobs, hospitals employ more than 5.7 million people and purchases nearly \$852 billion in goods and services. The total costs for all pediatric readmissions were \$1.7 billion in 2011, with 27.3 percent of those readmissions considered preventable (Gay et al., 2015). Children's hospitals often see the sickest patients and the total number of readmitted children can be substantial. Because of the concentration of expertise and technology in children's hospitals, the US health care system depends on them to treat children with the most severe and complex conditions. (Children's Hospital Association, [childrenshospitals.org](http://childrenshospitals.org)). Prior research has shown that certain hospital characteristics can positively or negatively influence the operations and organizational structure of the hospital warranting the focus on this factor (Armansingham et al, 2008). More than 15 percent of US hospitals have weak financial metrics or are at risk of potential closure (Ellison, 2018).

This study provided valuable insights into factors affecting the financial performance of US children's hospitals and confirmed the established literature in this domain. The findings of this study supported the theoretical framework established for this research (the resource-based view theory). Additionally, the exploratory nature of the data analysis in this study proved to be important for this kind of research. The results of this study were significant findings for healthcare practitioners, analysts, and researchers as it complements the emerging research on

children's healthcare. The strategic design and implementation of this study could provide healthcare executives, reform and policymakers, and hospital administrators with new leads of research areas aimed at decreasing the problem of rising healthcare expenditures and improving the financial performance of US children's hospitals.

The goal of this study was to examine the factors affecting the financial performance of US children's hospitals independently and/or simultaneously. Also, this research aimed to better understand the role of the Resource-Based View (RBV) as a theoretical framework that can guide future researchers to assess the competitive advantage and organizational effectiveness of these hospitals. The resource-based view was positioned in this study as a determinant of the hospital's performance. The performance of any organization in the marketplace depends critically on the characteristics of the industry in which it operates and competes. The RBV states that organizational resources are described as assets, capabilities, organizational processes, resources, information, and knowledge among other attributes. When the RBV is applied, it expresses the importance of internal resources possessing the fundamentals of being valuable, imitable, and void of easy substitution; all of which lead to sustainable competitive advantage. (Barney, 1991). The resource-based view (RBV) ascribes better financial performance to the firm resources and capabilities (Bharadwaj, 2000; Wernerfelt, 1984). Firms possess different types of resources and capabilities; among them several will be strongly associated with better performance (Song et al., 2007).

The importance of this study stems from the fact that there is growing attention and rising demands for better children's healthcare in the United States to meet the daily needs of families. Hence, the financial performance of any children's hospital is a very critical element to be considered given the small number of hospitals, which constitute only 3.5% of the total hospitals

while the number of children in the US is around 75 million with over 4 million children who have no access to health coverage. Currently, there are 6,146 hospitals in the United States, out of which there are 230 children hospitals. Those hospitals that serve children under the age of 18 are only 124 hospitals which are 2% of the total hospitals in the United States. This study focused primarily on this specific category of children's hospitals.

The goal of this study was successfully achieved by answering the research question developed from a research model that consisted of four independent variables representing health care accessibility, number of services offered, community factors, and organizational factors. The model included two dependent variables representing financial performance (operating cost and overall revenues). The research question was:

***“What factors affect the financial performance of U.S. children's hospitals?”***

To address the research question and hypotheses, this study utilized secondary data. The unit of analysis used in this study was the children's hospitals. These variables were analyzed using statistical methods which included univariate, bivariate, and multivariate analysis to address the research question and respective hypotheses.

This study has shown evidence for the relationships and disparities of financial performance in children's hospitals. With very few prior research and literature in this specific domain, it expanded the dimension of previous literature by comparing information of organizational structures to identify progress, inefficiencies, inequality, and deficiencies that impact financial performance. Research has shown that to improve hospital performance and control healthcare costs, hospital leaders and managers need to focus on prevalent and increasing beliefs related to medical and social areas (Bush, 2007). Hospital growth and financial

performance are dependent on aspects of compassion and community, as well as clinical capabilities and consumerism (Bush, 2007). Managing and controlling financial performance and cultural transformation is complex and a long-term endeavor. This study intended to highlight specific organizational, community, healthcare accessibility, and services offered by children's hospitals and how these factors influence their financial performance. The data analysis showed that efforts to improve performance must be multifaceted and should occur at multiple types of hospitals. Additionally, these factors collectively provided additional evidence of their influence on children's hospital financial performance.

The bivariate and multi-variate analysis results of this study answered the research question and the proposed hypotheses and showed that healthcare accessibility, the number of medical services offered, community factors, and organizational factors have a significant effect on financial performance independently and simultaneously. This conclusion adds an important element of contribution to the body of research and practice to guide researchers, health practitioners and stakeholders in focusing their efforts in these factors to achieve better financial performance and mitigate practical problems that face the organizational structure, accessibility, community, medical resources and services offered by US children's hospitals.

This study also suggested more in-depth research on community factors and organizational structure of children hospitals and the impact of such factors on financial performance and how the Resource-Based View theory can be utilized as a theoretical framework to address these challenges and areas of concern. Due to the limitation of data, this study leaves us with some open issues. First, the impact of medical coverage on the financial performance of children's hospitals and the role of Medicaid as a joint federal-state program that evolved over time to cover a broad range of health and long-term care services and affects the healthcare of millions of children in the

United States and families with low income. Second, although there are many services offered by children hospitals categorized as ancillary services such as laboratory, radiology, pharmacy, dialysis, ventilator, mobile diagnostic, skilled nursing and many more, however the ones analyzed in this study are the ones that are limited by the dataset availability. It may be useful to examine these open issues through the lens of other theories such as the Structural Contingency Theory, Sustainable Development Goals Theory (SDGs), Institutional Theory, Stakeholder Theory, and Social Capital Theory.

Finally, the study analysis showed that there is a need for future research to close the current gaps in the literature regarding the effect of community and organizational factors on children's hospitals' financial performance. While this study was conducted with very little and sometimes lack of prior research in this domain, however, this study has uncovered the important need to close the gaps in studying the effect of these factors on children's hospitals' financial performance.

## VII APPENDICES

### Appendix A: Literature Review Summary

Table 16: Literature Review Summary

| 1. Financial Performance |      |   |                  |  |
|--------------------------|------|---|------------------|--|
| #                        | Year | Journal                                     | Author or Source | Title  |
| 1                        | 2012 | Journal of Organizational Behaviour         | Young et al.     | Financial Incentives And Performance: A Study Of Pay-for-performance In A Professional Organization  |
| 2                        | 2009 | Atlantic Economic Journal                   | Bazzoli et al.   | Hospital Financial Conditions and the Provision of Unprofitable Services   |
| 3                        | 2016 | American Economic Journal                   | Seth Freedman    | Capacity and Utilization in Health Care: The Effect of Empty Beds on Neonatal Intensive Care Admission   |
| 4                        | 2014 | Health Affairs                              | Barry et al.     | Medically Complex Children: Children With Medical Complexity And Medicaid: Spending And Cost Savings   |
| 5                        | 2014 | Health Care Management                      | HFM              | Achieving an Integrated Revenue Cycle  |
| 6                        | 2018 | PLoS ONE 13                                 | Chen et al.      | Does providing more services increase the primary hospitals' revenue? An assessment of national essential medicine policy based on 2,675 counties in China |
| 7                        | 2019 | Journal of Engineering and Applied Sciences | Almusawi et al.  | Impact of Lean Accounting Information on the Financial performance of the Healthcare Institutions: A Case Study  |

| 2. All Hospitals Financial Performance |      |                              |                  |   |
|--|------|------------------------------|------------------|---|
| #                                      | Year | Journal                      | Author or Source | Title   |
| 1                                      | 2014 | Article                      | Behra et al.     | Framing and reframing critical incidents in hospitals   |
| 2                                      | 2015 | BMC Health Services Research | Taylor et al.    | High performing hospitals: a qualitative systematic review of associated factors and practical strategies for improvement |



|    |      |                                  |                                  |   |
|----|------|----------------------------------|----------------------------------|---|
| 3  | 2019 | Computers & Chemical Engineering | Lee & He                         | Understanding the effect of specialization on hospital performance through knowledge-guided machine learning  |
| 4  | 2008 | Article                          | Health Care Financial Management | Data Trends - trends in hospital uncollectible revenues   |
| 5  | 2013 | Journal of Healthcare Management | Wu et al.                        | The Application of Hospitality Elements in Hospitals  |
| 6  | 2013 | Costs, Insurance & Quality       | Cosgrove et al.                  | Ten Strategies To Lower Costs, Improve Quality, And Engage Patients: The View From Leading Health System CEOs |
| 7  | 2013 | Healthcare Financial Management  | Thompson et al.                  | Reducing clinical costs with an EHR   |
| 8  | 2016 | Revenue Cycle                    | Andrew Ray                       | Improvement Over Disruption   |
| 9  | 2002 | Business Insurance               | Prince et al.                    | Hospital costs are key driver of medical care inflation: Blues  |
| 10 | 2014 | Health Care Manag Sci.           | Büchner et al.                   | Health systems: changes in hospital efficiency and profitability  |
| 11 | 2015 | Journal of Healthcare Management | Erwin et al.                     | Organizational Characteristics Associated With Fundraising Performance of Nonprofit Hospitals                 |
| 12 | 2009 | Atlantic Economic Journal        | Bazzoli et al.                   | Hospital Financial Conditions and the Provision of Unprofitable Services                                      |
| 13 | 2014 | Health Care Management           | HFM                              | Achieving an Integrated Revenue Cycle   |
| 14 | 1960 | The Journal of Insurance         | William H. Wandel                | Rising Medical Care Costs with Special Reference to Hospital Expenses   |

| <b>3. US Children's Hospitals Financial Performance</b> |      |  |                   |  |
|---|------|--|-------------------|--|
| #   | Year | Journal  | Author or Source  | Title  |
| 1   | 2015 | American Journal of Public Health                        | Makelarski et al. | Feed First, Ask Questions Later: Alleviating and Understanding Caregiver Food Insecurity in an Urban Children's Hospital |
| 2   | 2002 | Hospital Topics: Research and Perspectives on Healthcare | Michael J. McCue  | The Impact of the Balanced Budget Act on the Utilization and Financial Condition of Children's Services                  |
| 3   | 2012 | Child: care, health and development                      | Lambert et al.    | Social spaces for young children in hospital   |

|    |      |  |                     |  |
|----|------|--|---------------------|--|
| 4  | 2014 | Issues in Comprehensive Pediatric Nursing            | Alan Glasper        | Children's Hospital Charters Revisited   |
| 5  | 2018 | Anthropology & Education Quarterly                   | Christian Ehret     | Moments of Teaching and Learning in a Children's Hospital: Affects, Textures, and Temporalities  |
| 6  | 2018 | Office Journal of the American Academy of Pediatrics | Trowbridge et al.   | Modes of Death Within a Children's Hospital  |
| 7  | 1996 | Journal of health care marketing                     | K Douglass Hoffman  | Rude awakening. One marketer faces reality as daughters experience their first service encounter                                       |
| 8  | 2017 | J Community Health                                   | Lichtenstein et al. | Is There a Return on a Children's Hospital's Investment in a Pediatric Residency's Community Health Track? A Cost Analysis             |
| 9  | 2009 | Global Business and Organizational Excellence        | Roger Noble         | How Shriners Hospitals for Children Found the Formula for Performance Excellence   |
| 10 | 2014 | Smart Business Orange County                         | Kimberly C. Cripe   | Follow my lead: Why strong customer experiences begin with intentional behaviors   |
| 11 | 2016 | Pediatric Nursing/March-April                        | Kompany et al.      | Children's Specialized Hospital and GetWellNetwork™ Collaborate to Improve Patient Education and Outcomes Using an Innovative Approach |
| 12 | 2015 | American Journal of Public Health                    | Makelarski et al.   | Feed First, Ask Questions Later: Alleviating and Understanding Caregiver Food Insecurity in an Urban Children's Hospital               |
| 13 | 2011 | Lean Construction Journal                            | Kim & Dossick       | What makes the delivery of a project integrated? A case study of Children's Hospitals, Bellevue, WA                                    |
| 14 | 2019 | U.S. News & World Report's                           | Olmsted et al.      | Methodology: U.S. News & World Report Best Children's Hospitals 2019-20  |
| 15 | 2014 | Health Affairs                                       | Barry et al.        | Medically Complex Children: Children With Medical Complexity And Medicaid: Spending And Cost Savings                                   |
| 16 | 2018 | Health Affairs                                       | Colvin et al.       | Hypothetical Network Adequacy Schemes For Children Fail To Ensure Patients' Access To In-Network Children's Hospital                   |
| 17 | 2016 | Journal of Hospital Medicine                         | Leyenaar et al.     | Epidemiology of pediatric hospitalizations at general hospitals  |

|    |      |                                      |                 |  |
|----|------|--------------------------------------|-----------------|--|
|    |      |                                      |                 | and freestanding children's hospitals in the United States   |
| 18 | 2016 | Critical Care Medicine               | Gupta et al.    | Association of Freestanding Children's Hospitals With Outcomes in Children With Critical Illness                             |
| 19 | 2016 | Pediatrics                           | Peltz et al.    | Hospital Utilization Among Children With the Highest Annual Inpatient Cost   |
| 20 | 2016 | British Journal of Special Education | Peters et al.   | Education for children with a chronic health condition: an evidence-informed approach to policy and practice decision making |
| 21 | 2018 | Pediatrics Nursing                   | Crawford et al. | Enhancing Parent Participation with Hospitalized Children Using the Gentle Hair Brushing Routine                             |
| 22 | 2017 | McKinsey & Company                   | Levine & Harris | The new scale imperative for children's hospitals  |

| <b>4. Health Care Accessibility</b> |      |   |                        |  |
|-------------------------------------|------|---|------------------------|--|
| #                                   | Year | Journal                                       | Author or Source       | Title  |
| 1                                   | 2015 | Pediatrics Nursing                            | Macías et al.          | Impact of Hospital Admission Care At a Pediatric Unit: A Qualitative Study   |
| 2                                   | 2012 | Work 41                                       | Thomas J. Smith        | A comparative study of occupancy and patient care quality in four different types of intensive care units in a children's hospital |
| 3                                   | 2019 | University of the Sunshine Coast              | Lee-anne Bye           | The Impact Of Social Capital (Relationships) on Mature-aged Nurses' Retention in Hospital Settings                                 |
| 4                                   | 2012 | 21 Annals Health L. 63                        | Susan A. Channick      | Taming the Beast of Health Care Costs: Why Medicare Reform Alone is Not Enough   |
| 5                                   | 2009 | Annals of internal medicine. 152. 114-7       | Bhalla & Kalkut        | Could Medicare Readmission Policy Exacerbate Health Care System Inequity?  |
| 6                                   | 2016 | Communities of Health Care Justice (pp. 7-22) | Galarneau, Charlene A. | Health Care as a Community Good  |
| 7                                   | 2014 | Health Affairs                                | Barry et al.           | Medically Complex Children: Children With Medical Complexity And Medicaid: Spending And Cost Savings                               |
| 8                                   | 2018 | Health Affairs                                | Colvin et al.          | Hypothetical Network Adequacy Schemes For Children Fail To Ensure Patients' Access To In-Network Children's Hospital               |

| <b>5. Medical Coverage</b> |      |  |                                |  |
|----------------------------|------|--|--------------------------------|--|
| #                          | Year | Journal                                | Author or Source               | Title  |
| 1                          | 2019 | Number of Uninsured Children Increases | Joan Alker & Lauren Roygardner | The Number of Uninsured Children Is On the Rise  |
| 2                          | 2012 | 21 Annals Health L. 63                 | Susan A. Channick              | Taming the Beast of Health Care Costs: Why Medicare Reform Alone is Not Enough                                       |
| 3                          | 2014 | Health Affairs                         | Barry et al.                   | Medically Complex Children: Children With Medical Complexity And Medicaid: Spending And Cost Savings                 |
| 4                          | 2014 | Health Affairs                         | Barry et al.                   | Medically Complex Children: Children With Medical Complexity And Medicaid: Spending And Cost Savings                 |
| 5                          | 2000 | The Quarterly Journal of Economics     | Mark G. Duggan                 | Hospital Ownership and Public Medical Spending   |
| 6                          | 1994 | The RAND Journal of Economics          | Norton & Staiger               | How Hospital Ownership Affects Access to Care for the Uninsured  |
| 7                          | 2018 | Health Affairs                         | Colvin et al.                  | Hypothetical Network Adequacy Schemes For Children Fail To Ensure Patients' Access To In-Network Children's Hospital |

| <b>6. Medical Resources and Services Offered</b> |      |   |                   |   |
|--|------|---|-------------------|---|
| #  | Year | Journal   | Author or Source  | Title   |
| 1  | 2018 | Journal of the American Art Therapy Association | Kaley Wajcman     | Developing an Art Therapy Program in a Children's Hospital  |
| 2  | 2018 | American Journal of Audiology                   | Steuerwald et al. | Stories From the Webcams: Cincinnati Children's Hospital Medical Center Audiology Telehealth and Pediatric Auditory Device Services |
| 3  | 2018 | Journal of the American Art Therapy Association | Kaley Wajcman     | Developing an Art Therapy Program in a Children's Hospital  |
| 4  | 2014 | American Journal of Public Health               | Cunningham et al. | The Texas Children's Hospital Immunization Forecaster: Conceptualization to Implementation  |
| 5  | 2019 | Pediatrics Volume 141                           | Kane et al.       | Opioid-Related Critical Care Resource Use in US Children's Hospitals  |

| 7. Community Factors |      |   |  |   |
|----------------------|------|---|--|---|
| #                    | Year | Journal                                       | Author or Source   | Title   |
| 1                    | 2018 | Vaccine 36                                    | Jiang et al.   | A quality improvement initiative to increase Tdap (tetanus, diphtheria, acellular pertussis) vaccination coverage among direct health care providers at a children's hospital |
| 2                    | 2018 | Pediatrics Volume 142                         | Wolf et al.  | Gaps in Well-Child Care Attendance Among Primary Care Clinics Serving Low-Income Families   |
| 3                    | 2018 | Pediatric Nursing                             | Crawford et al.  | Enhancing Parent Participation with Hospitalized Children Using the Gentle Hair Brushing Routine  |
| 4                    | 2018 | Journal of Child and Family Studies           | Sandra Lookabaugh & Sharon M. Ballard  | The Scope and Future Direction of Child Life  |
| 5                    | 2012 | Midlothian Area Air Quality Petition Response | Office of the Director, Division of Community Health Investigations Agency for Toxic Substances and Disease Registry | Evaluation of Health Outcome Data   |
| 6                    | 2016 | British Journal of Special Education          | Peters et al.  | Education for children with a chronic health condition: an evidence-informed approach to policy and practice decision making  |
| 7                    | 2018 | J Appl Res Intellect Disabil.                 | Oulton et al.  | "LEARN"ing what is important to children and young people with intellectual disabilities when they are in hospital  |
| 8                    | 2009 | Annals of internal medicine. 152. 114-7       | Bhalla & Kalkut  | Could Medicare Readmission Policy Exacerbate Health Care System Inequity?   |
| 9                    | 2016 | Communities of Health Care Justice (pp. 7-22) | Galarneau, Charlene A.   | Health Care as a Community Good   |
| 10                   | 2018 | Health Affairs                                | Colvin et al.  | Hypothetical Network Adequacy Schemes For Children Fail To Ensure Patients' Access To In-Network Children's Hospital  |
| 11                   | 1960 | The Journal of Insurance                      | William H. Wandel  | Rising Medical Care Costs with Special Reference to Hospital Expenses   |

| <b>8. Organizational Factors</b> |      |  |                               |  |
|----------------------------------|------|--|-------------------------------|--|
| #                                | Year | Journal  | Author or Source              | Title  |
| 1                                | 2017 | American Hospital Association                  | American Hospital Association | Hospitals are Economic Anchors in their Communities  |
| 2                                | 2019 | American Journal of Emergency Medicine         | Alghanem & Clements           | Narrowing performance gap between rural and urban hospitals for acute myocardial infarction care   |
| 3                                | 2012 | Manufacturing & Service Operations Management  | Linda V. Green                | OM Forum—The Vital Role of Operations Analysis in Improving Healthcare Delivery                    |
| 4                                | 2012 | NAHQ Presentation                              | Patrick A Palmieri            | Organizational Disruptions Caused By Technological Failures In Healthcare Delivery Systems         |
| 5                                | 2010 | U. of Texas, Austin, The Academy of Management | J. L. Ray et al.              | Participation In Decision Making One More Time: A Look At Hospital Decision Making And Performance |

| <b>9. Ownership Type</b> |      |                                      |                           |  |
|--------------------------|------|--------------------------------------|---------------------------|--|
| #                        | Year | Journal                              | Author or Source          | Title  |
| 1                        | 2005 | National Bureau of Economic Research | Shen et al.               | Hospital Ownership And Financial Performance: A Quantitative Research Review   |
| 2                        | 1985 | Health Care Financing Review         | Eskoz & Michael Peddecord | The relationship of hospital ownership and service composition to hospital charges                                       |
| 3                        | 2009 | Atlantic Economic Journal            | Chen et al.               | Hospital Financial Conditions and the Provision of Unprofitable Services   |
| 4                        | 2000 | The Quarterly Journal of Economics   | Mark G. Duggan            | Hospital Ownership and Public Medical Spending   |
| 5                        | 1994 | The RAND Journal of Economics        | Norton & Staiger          | How Hospital Ownership Affects Access to Care for the Uninsured  |
| 6                        | 2016 | BMC Health Serv Res 16               | Panda et al.              | Decentralization and health system performance – a focused review of dimensions, difficulties, and derivatives in India. |

| <b>10. Hospitals Size and Teaching Affiliation</b> |      |                           |                  |  |
|--|------|---------------------------|------------------|--|
| #  | Year | Journal                   | Author or Source | Title  |
| 1  | 2016 | American Economic Journal | Seth Freedman    | Capacity and Utilization in Health Care: The Effect of Empty Beds on Neonatal Intensive Care Admission |

| <b>11. Medicaid and Children Hospitals</b> |      |  |                  |  |
|--|------|--|------------------|--|
| #  | Year | Journal  | Author or Source | Title  |
| 1  | 2016 | American Economic Journal                            | Seth Freedman    | Capacity and Utilization in Health Care: The Effect of Empty Beds on Neonatal Intensive Care Admission               |
| 2  | 2014 | Health Affairs                                       | Barry et al.     | Medically Complex Children: Children With Medical Complexity And Medicaid: Spending And Cost Savings                 |
| 3  | 2019 | Medical Care 57                                      | Silber et al.    | Comparing Resource Use in Medical Admissions of Children With Complex Chronic Conditions                             |
| 4  | 2016 | JAMA Pediatrics                                      | Sills et al.     | Association of Social Determinants With Children's Hospitals' Preventable Readmissions Performance                   |
| 5  | 2015 | JAMA Pediatrics                                      | Brittan et al.   | Outpatient follow-up visits and readmission in medically complex children enrolled in Medicaid                       |
| 6  | 2016 | Office Journal of the American Academy of Pediatrics | Agrawal et al.   | Trends in Health Care Spending for Children in Medicaid With High Resource Use                                       |
| 7  | 2018 | Health Affairs                                       | Colvin et al.    | Hypothetical Network Adequacy Schemes For Children Fail To Ensure Patients' Access To In-Network Children's Hospital |

| <b>12. Hospital Management</b> |      |  |                        |   |
|--------------------------------|------|--|------------------------|---|
| #                              | Year | Journal  | Author or Source       | Title   |
| 1                              | 2016 | BMC Health Services Research                     | F. Sarto & G. Veronesi | Clinical leadership and hospital performance: assessing the evidence base                     |
| 2                              | 2014 | BMJ Open   | Parand et al.          | The role of hospital managers in quality and patient safety: a systematic review              |
| 3                              | 2013 | 73rd Annual Meeting of the Academy of Management | Mascia et al.          | Understanding Hospital Performance: The Role Of Network Ties And Patterns Of Competition      |
| 4                              | 2015 | Journal of Healthcare Management                 | Erwin & Landry         | Organizational Characteristics Associated With Fundraising Performance of Nonprofit Hospitals |
| 5                              | 2016 | Health Care Management Science                   | Büchner et al.         | Health systems: changes in hospital efficiency and profitability                              |

|   |      |   |                       |   |
|---|------|---|-----------------------|---|
| 6 | 2016 | BMC Health Services Research                          | Sarto & Veronesi      | Clinical leadership and hospital performance: assessing the evidence base   |
| 7 | 2016 | Management Accounting Research                        | De Harlez & Malagueño | Examining the joint effects of strategic priorities, use of management control systems, and personal background on hospital performance |
| 8 | 2015 | International Journal of Health Policy and Management | Bradley et al.        | Management Matters: A Leverage Point for Health Systems Strengthening in Global Health  |
| 9 | 2019 | The Academy of Management Review                      | Parker et al.         | How Firm Reputation Shapes Managerial Discretion  |

| <b>13. Lean Practices</b> |      |  |                    |  |
|---------------------------|------|--|--------------------|--|
| #                         | Year | Journal  | Author or Source   | Title  |
| 1                         | 2018 | International Journal of Healthcare Management | Patri & Suresh     | Factors influencing lean implementation in healthcare organizations: An ISM approach                                   |
| 2                         | 2015 | Academy of Strategic Management Journal        | Feibert & Jacobsen | Measuring process performance within healthcare logistics - a decision tool for selecting track and trace technologies |
| 3                         | 2010 | Healthc Financ Manage                          | Thompson et al.    | Reducing clinical costs with an EHR  |
| 4                         | 2008 | Health Econ                                    | Shen et al.        | Hospital ownership and quality of care: what explains the different results in the literature?                         |

| <b>14. Patient Care</b> |      |   |                     |   |
|-------------------------|------|---|---------------------|---|
| #                       | Year | Journal   | Author or Source    | Title   |
| 1                       | 2019 | Pediatric Nursing                               | Johnson & Rodriguez | Children with Autism Spectrum Disorder At a Pediatric Hospital: A Systematic Review of the Literature                   |
| 2                       | 2016 | Mays Business School Research Paper No. 2876358 | Youn et al.         | Hospital Quality, Medical Charge Variation, and Patient Care Efficiency: Implications for Bundled Payment Reform Models |
| 3                       | 2018 | Pediatric Nursing                               | Sarik et al.        | Improving the Transition from Hospital to Home for Clinically Complex Children  |



|   |      |   |                     |   |
|---|------|---|---------------------|---|
| 4 | 2015 | Work 54 - School of Kinesiology, University of Minnesota, Minneapolis | Thomas J. Smith     | Occupancy and patient care quality benefits of private room relative to multi-bed patient room designs for five different children's hospital intensive and intermediate care units |
| 5 | 2019 | Pediatric Nursing   | Chadwick and Miller | The Impact of Patient and Family Advisors in One Hospital System  |
| 6 | 2015 | Pediatr Nurs.   | Macias et al.       | Impact of Hospital Admission Care At a Pediatric Unit: A Qualitative Study  |
| 7 | 2016 | Mays Business School Research Paper No. 2876358                       | Youn et al.         | Hospital Quality, Medical Charge Variation, and Patient Care Efficiency: Implications for Bundled Payment Reform Models   |
| 8 | 2013 | Health Aff (Millwood).  | Cosgrove et al.     | Ten strategies to lower costs, improve quality, and engage patients: the view from leading health system CEOs   |

| <b>15. Continuity of Care</b> |      |  |                  |  |
|-------------------------------|------|--|------------------|--|
| #                             | Year | Journal                                    | Author or Source | Title  |
| 1                             | 2010 | The Milbank Quarterly                      | Kaplan et al.    | The Influence of Context on Quality Improvement Success in Health Care: A Systematic Review of the Literature                                |
| 2                             | 2016 | Comprehensive Child And Adolescent Nursing | Carter et al.    | "Knowing the Places of Care": How Nurses Facilitate Transition of Children with Complex Health Care Needs from Hospital to Home              |
| 3                             | 2012 | Health Policy Brief                        | Health Affairs   | Health Policy Brief: Pay-for-Performance   |
| 4                             | 2018 | Pediatric Nursing                          | Sarik et al.     | Improving the Transition from Hospital to Home for Clinically Complex Children   |
| 5                             | 2015 | Journal of Management Information Systems  | Lim et al.       | Barriers to Interorganizational Knowledge Transfer in Post-Hospital Care Transitions: Review and Directions for Information Systems Research |
| 6                             | 2014 | Health Care Management Science             | Bard et al.      | Improving patient flow at a family health clinic   |

| 16 Quality of Care |      |  |                         |  |
|--------------------|------|--|-------------------------|--|
| #                  | Year | Journal  | Author or Source        | Title  |
| 1                  | 2014 | Article  | Behra et al.            | Framing and reframing critical incidents in hospitals  |
| 2                  | 2009 | BuR - Business Research                                  | Tiemann & Schreyögg     | Investigating The Effects Of Hospital Privatization On Efficiency And Quality Of Care  |
| 3                  | 2012 | Work 41 - School of Kinesiology, University of Minnesota | Thomas J. Smith         | A comparative study of occupancy and patient care quality in four different types of intensive care units in a children's hospital |
| 4                  | 2017 | Comprehensive Child and Adolescent Nursing               | Dr. Edward Alan Glasper | Does a Shortage of Specially Trained Nurses Pose a Threat to the Provision of Optimum Care for Sick Children in Hospital?          |
| 5                  | 2016 | Mays Business School Research Paper No. 2876358          | Youn et al.             | Hospital Quality, Medical Charge Variation, and Patient Care Efficiency: Implications for Bundled Payment Reform Models            |
| 6                  | 2018 | Health & Social Work                                     | Hickam et al.           | Implementing a Nationally Recognized Pediatric-to-Adult Transitional Care Approach in a Major Children's Hospital                  |
| 7                  | 2017 | Comprehensive Child and Adolescent Nursing               | Dr. Edward Alan Glasper | Optimizing the Care of Children with Intellectual Disabilities in Hospital   |
| 8                  | 2018 | American Academy of Pediatrics                           | El Feghaly et al.       | A Quality Improvement Initiative: Reducing Blood Culture Contamination in a Children's Hospital                                    |
| 9                  | 2019 | Health Affairs   | Needleman & Hassmiller  | The Role Of Nurses In Improving Hospital Quality And Efficiency: Real-World Results  |
| 10                 | 2019 | American Academy of Pediatrics                           | Robinette et al.        | Use of a Clinical Care Algorithm to Improve Care for Children With Hematogenous Osteomyelitis                                      |
| 11                 | 2010 | Academy of Management Annual Meeting Proceedings         | McAlearney et al.       | Supporting Those Who Dare To Care: 5 Case Studies Of High-performance Work Practices In Healthcare                                 |
| 12                 | 2009 | Atlantic economic journal                                | Bazzoli et al.          | Hospital Financial Conditions and the Provision of Unprofitable Services   |
| 13                 | 2012 | 21 Annals Health L. 63                                   | Susan A. Channick       | Taming the Beast of Health Care Costs: Why Medicare Reform Alone is Not Enough   |
| 14                 | 2009 | Atlantic Economic Journal                                | Chen et al.             | Hospital Financial Conditions and the Provision of Unprofitable Services   |

|    |      |                                   |                    |  |
|----|------|-----------------------------------|--------------------|--|
| 15 | 2014 | Health Care Management            | HFM                | Achieving an Integrated Revenue Cycle  |
| 16 | 2013 | J Healthc Manag                   | Wu et al.          | The application of hospitality elements in hospitals   |
| 17 | 2009 | Health Affairs 28                 | Needleman et al.   | The Role Of Nurses In Improving Hospital Quality And Efficiency: Real-World Results  |
| 18 | 2015 | Academy of Management Journal     | D’Innocenzo et al. | Empowered to Perform: A Multilevel Investigation of the Influence of Empowerment on Performance in Hospital Units  |
| 19 | 2014 | Academy of Management Journal     | Reilly et al.      | Human Capital Flows: Using Context-emergent Turnover (Cet) Theory To Explore The Process By Which Turnover, Hiring, And Job Demands Affect Patient Satisfaction                      |
| 20 | 2017 | Ann Intern Med.                   | Scott et al.       | Changes in Hospital-Physician Affiliations in U.S. Hospitals and Their Effect on Quality of Care   |
| 21 | 2014 | BMJ Open                          | Parand et al.      | The role of hospital managers in quality and patient safety: a systematic review   |
| 22 | 2016 | Work                              | Smith TJ.          | Occupancy and patient care quality benefits of private room relative to multi-bed patient room designs for five different children's hospital intensive and intermediate care units. |
| 23 | 2013 | The Academy of Management Journal | Locket et al.      | The Influence of Social Position on Sensemaking About Organizational Change  |

| 17 Reforms |      |   |                  |  |
|------------|------|---|------------------|--|
| #          | Year | Journal   | Author or Source | Title  |
| 1          | 2015 | International Journal of Health Policy and Management | Bradley et al.   | Management Matters: A Leverage Point for Health Systems Strengthening in Global Health           |
| 2          | 2014 | Academy of Management Journal                         | Carton et al.    | A (Blurry) Vision of the Future: How Leader Rhetoric about Ultimate Goals Influences Performance |
| 3          | 2016 | Critical Care Medicine                                | Gupta et al.     | Association of Freestanding Children's Hospitals with Outcomes in Children With Critical Illness |

|                                      |
|--------------------------------------|
| <b>18. Resource Based View (RBV)</b> |
|--------------------------------------|

| # | Year | Journal                                      | Author or Source | Title  |
|---|------|--|------------------|--|
| 1 | 2017 | McKinsey & Company                           | Levine & Harris  | The new scale imperative for children's hospitals  |
| 2 | 2018 | European Journal of Business and Management  | Adnan et al.     | Predicting Firm Performance through Resource Based Framework   |
| 3 | 2010 | The Journal of International Social Research | Rose et al.      | A Review on the Relationship between Organizational Resources, Competitive Advantage and Performance |
| 4 | 2014 | Journal of Strategy and Management           | Kash et al.      | Healthcare strategic management and the resource-based view  |

## Appendix B: Hierarchical regression – DV1 Financial performance - Model summary

**Table 17 : Hierarchical regression – DV1 Financial performance - Model summary**

| Model Summary <sup>d</sup>   |                   |          |                   |                            |                   |          |     |     |               |               |
|--|-------------------|----------|-------------------|----------------------------|-------------------|----------|-----|-----|---------------|---------------|
| Model  | R                 | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics |          |     |     |               | Durbin-Watson |
|  |                   |          |                   |                            | R Square Change   | F Change | df1 | df2 | Sig. F Change |               |
| 1  | .894 <sup>a</sup> | .800     | .794              | \$21,622.659               | .800              | 139.682  | 2   | 70  | .000          |               |
| 2  | .920 <sup>b</sup> | .846     | .832              | \$19,535.373               | .046              | 4.939    | 4   | 66  | .002          |               |
| 3  | .922 <sup>c</sup> | .850     | .826              | \$19,894.341               | .004              | .410     | 4   | 62  | .801          | 2.222         |
| a. Predictors: (Constant), Teaching Affiliation, Hospital Size   |                   |          |                   |                            |                   |          |     |     |               |               |
| b. Predictors: (Constant), Teaching Affiliation, Hospital Size, Organizational Factors, Community Factors, Number of Services Offered, Health Care Accessibility   |                   |          |                   |                            |                   |          |     |     |               |               |
| c. Predictors: (Constant), Teaching Affiliation, Hospital Size, Organizational Factors, Community Factors, Number of Services Offered, Health Care Accessibility, Interaction 1, Interaction 2, Interaction 2, Interaction 4 |                   |          |                   |                            |                   |          |     |     |               |               |
| d. Dependent Variable: Total Operating Expenses (\$10.000)   |                   |          |                   |                            |                   |          |     |     |               |               |

## Appendix C: Hierarchical regression – DV1 Financial performance, ANOVA

**Table 18: Hierarchical regression – DV1 Financial performance, ANOVA**

| ANOVA <sup>a</sup> |            |                 |    |                 |         |                   |
|--------------------|------------|-----------------|----|-----------------|---------|-------------------|
| Model              |            | Sum of Squares  | df | Mean Square     | F       | Sig.              |
| 1                  | Regression | 130613988265.30 | 2  | 65306994132.650 | 139.682 | .000 <sup>b</sup> |
|                    | Residual   | 32727759490.23  | 70 | 467539421.289   |         |                   |
|                    | Total      | 163341747755.53 | 72 |                 |         |                   |
| 2                  | Regression | 138154113263.28 | 6  | 23025685543.880 | 60.335  | .000 <sup>c</sup> |
|                    | Residual   | 25187634492.26  | 66 | 381630825.640   |         |                   |
|                    | Total      | 163341747755.53 | 72 |                 |         |                   |
| 3                  | Regression | 138803089719.09 | 10 | 13880308971.909 | 35.070  | .000 <sup>d</sup> |
|                    | Residual   | 24538658036.44  | 62 | 395784807.039   |         |                   |

|  |                 |    |  |  |  |
|--|-----------------|----|--|--|--|
| Total  | 163341747755.53 | 72 |  |  |  |
| a. Dependent Variable: Total Operating Expenses (\$10.000)   |                 |    |  |  |  |
| b. Predictors: (Constant), Teaching Affiliation, Hospital Size   |                 |    |  |  |  |
| c. Predictors: (Constant), Teaching Affiliation, Hospital Size, Organizational Factors, Community Factors, Number of Services Offered, Health Care Accessibility                         |                 |    |  |  |  |
| d. Predictors: (Constant), Teaching Affiliation, Hospital Size, Organizational Factors, Community Factors, Number of Services Offered, Health Care Accessibility, Int4, Int3, Int2, Int1 |                 |    |  |  |  |

## Appendix D: Hierarchical regression – DV1 Financial performance, Coefficients

**Table 19: Hierarchical regression – DV1 Financial performance, Coefficients**

| Coefficients  |                            |                             |            |                           |        |       |              |         |       |                         |         |
|---------------|----------------------------|-----------------------------|------------|---------------------------|--------|-------|--------------|---------|-------|-------------------------|---------|
| Model         |                            | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig.  | Correlations |         |       | Collinearity Statistics |         |
|               |                            | B                           | Std. Error | Beta                      |        |       | Zero-order   | Partial | Part  | Tolerance               | VIF     |
| 1             | (Constant)                 | -8470.317                   | 10595.267  |                           | -.799  | .427  |              |         |       |                         |         |
|               | Hospital Size              | 251.896                     | 17.356     | .887                      | 14.513 | .000  | .894         | .866    | .776  | .766                    | 1.306   |
|               | Teaching Affiliation       | -1541.635                   | 6590.322   | -.014                     | -.234  | .816  | -.444        | -.028   | -.013 | .766                    | 1.306   |
| 2             | (Constant)                 | -11212.795                  | 13842.019  |                           | -.810  | .421  |              |         |       |                         |         |
|               | Hospital Size              | 100.687                     | 39.359     | .355                      | 2.558  | .013  | .894         | .300    | .124  | .122                    | 8.226   |
|               | Teaching Affiliation       | 3633.917                    | 6818.353   | .034                      | .533   | .596  | -.444        | .065    | .026  | .584                    | 1.712   |
|               | Health Care Accessibility  | .268                        | .079       | .455                      | 3.390  | .001  | .898         | .385    | .164  | .130                    | 7.695   |
|               | Number of Services Offered | 2326.728                    | 956.879    | .250                      | 2.432  | .018  | .716         | .287    | .118  | .221                    | 4.517   |
|               | Community Factors          | -4378.142                   | 3586.178   | -.099                     | -1.221 | .226  | .402         | -.149   | -.059 | .358                    | 2.793   |
|               | Organizational Factors     | 212.347                     | 1186.936   | .010                      | .179   | .859  | -.352        | .022    | .009  | .817                    | 1.224   |
| 3             | (Constant)                 | -13092.381                  | 14829.765  |                           | -.883  | .381  |              |         |       |                         |         |
|               | Hospital Size              | 100.005                     | 40.525     | .352                      | 2.468  | .016  | .894         | .299    | .121  | .119                    | 8.408   |
|               | Teaching Affiliation       | 5059.143                    | 7810.081   | .047                      | .648   | .520  | -.444        | .082    | .032  | .462                    | 2.166   |
|               | Health Care Accessibility  | -.168                       | .879       | -.284                     | -.191  | .849  | .898         | -.024   | -.009 | .001                    | 913.463 |
|               | Number of Services Offered | 3967.313                    | 5841.123   | .426                      | .679   | .500  | .716         | .086    | .033  | .006                    | 162.297 |
|               | Community Factors          | -1193.320                   | 9098.837   | -.027                     | -.131  | .896  | .402         | -.017   | -.006 | .058                    | 17.336  |
|               | Organizational Factors     | -1627.599                   | 2653.458   | -.073                     | -.613  | .542  | -.352        | -.078   | -.030 | .170                    | 5.897   |
|               | Interaction 1              | .434                        | .876       | .744                      | .495   | .622  | .890         | .063    | .024  | .001                    | 931.557 |
|               | Interaction 2              | -1219.167                   | 5914.855   | -.133                     | -.206  | .837  | .715         | -.026   | -.010 | .006                    | 172.717 |
|               | Interaction 3              | -4465.836                   | 9061.875   | -.113                     | -.493  | .624  | .410         | -.062   | -.024 | .046                    | 21.811  |
| Interaction 4 | 2466.991                   | 2888.156                    | .105       | .854                      | .396   | -.280 | .108         | .042    | .160  | 6.267                   |         |

a. Dependent Variable: Total Operating Expenses (\$10.000)

## Appendix E: Hierarchical regression – DV2 Financial performance, Model summary

**Table 20: Hierarchical regression – DV2 Financial performance, Model summary**

| Model Summary <sup>d</sup>  |                   |          |                   |                            |                   |          |     |     |               |               |
|---|-------------------|----------|-------------------|----------------------------|-------------------|----------|-----|-----|---------------|---------------|
| Model   | R                 | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics |          |     |     |               | Durbin-Watson |
|   |                   |          |                   |                            | R Square Change   | F Change | df1 | df2 | Sig. F Change |               |
| 1   | .854 <sup>a</sup> | .729     | .721              | \$78,587.529               | .729              | 94.127   | 2   | 70  | .000          |               |
| 2   | .894 <sup>b</sup> | .799     | .780              | \$69,754.731               | .070              | 5.713    | 4   | 66  | .001          |               |
| 3   | .896 <sup>c</sup> | .804     | .772              | \$71,090.023               | .005              | .386     | 4   | 62  | .818          | 2.380         |
| a. Predictors: (Constant), Teaching Affiliation, Hospital Size  |                   |          |                   |                            |                   |          |     |     |               |               |
| b. Predictors: (Constant), Teaching Affiliation, Hospital Size, Organizational Factors, Community Factors, Number of Services Offered, Health Care Accessibility  |                   |          |                   |                            |                   |          |     |     |               |               |
| c. Predictors: (Constant), Teaching Affiliation, Hospital Size, Organizational Factors, Community Factors, Number of Services Offered, Health Care Accessibility, Interaction 1, Interaction 2, Interaction 4 |                   |          |                   |                            |                   |          |     |     |               |               |
| d. Dependent Variable: Financial Performance 2 (\$10.000)   |                   |          |                   |                            |                   |          |     |     |               |               |

## Appendix F: Hierarchical regression – DV2 Financial performance, ANOVA

**Table 21: Hierarchical regression – DV2 Financial performance, ANOVA**

| ANOVA <sup>a</sup>   |            |                   |    |                  |        |                   |
|--|------------|-------------------|----|------------------|--------|-------------------|
| Model  |            | Sum of Squares    | df | Mean Square      | F      | Sig.              |
| 1  | Regression | 1162656732297.628 | 2  | 581328366148.814 | 94.127 | .000 <sup>b</sup> |
|  | Residual   | 432319983999.365  | 70 | 6175999771.419   |        |                   |
|  | Total      | 1594976716296.993 | 72 |                  |        |                   |
| 2  | Regression | 1273839030941.827 | 6  | 212306505156.971 | 43.633 | .000 <sup>c</sup> |
|  | Residual   | 321137685355.165  | 66 | 4865722505.381   |        |                   |
|  | Total      | 1594976716296.993 | 72 |                  |        |                   |
| 3  | Regression | 1281641647870.710 | 10 | 128164164787.071 | 25.360 | .000 <sup>d</sup> |
|  | Residual   | 313335068426.283  | 62 | 5053791426.230   |        |                   |
|  | Total      | 1594976716296.993 | 72 |                  |        |                   |
| a. Dependent Variable: Financial Performance 2 (\$10.000)  |            |                   |    |                  |        |                   |
| b. Predictors: (Constant), Teaching Affiliation, Hospital Size   |            |                   |    |                  |        |                   |
| c. Predictors: (Constant), Teaching Affiliation, Hospital Size, Organizational Factors, Community Factors, Number of Services Offered, Health Care Accessibility                         |            |                   |    |                  |        |                   |
| d. Predictors: (Constant), Teaching Affiliation, Hospital Size, Organizational Factors, Community Factors, Number of Services Offered, Health Care Accessibility, Int4, Int3, Int2, Int1 |            |                   |    |                  |        |                   |

## Appendix G: Hierarchical regression – DV2 Financial performance, Coefficients

**Table 22: Hierarchical regression – DV2 Financial performance, Coefficients**

| Coefficients <sup>a</sup> |                            |                             |            |                           |        |       |              |         |       |                         |         |
|---------------------------|----------------------------|-----------------------------|------------|---------------------------|--------|-------|--------------|---------|-------|-------------------------|---------|
| Model                     |                            | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig.  | Correlations |         |       | Collinearity Statistics |         |
|                           |                            | B                           | Std. Error | Beta                      |        |       | Zero-order   | Partial | Part  | Tolerance               | VIF     |
| 1                         | (Constant)                 | -52590.298                  | 38508.486  |                           | -1.366 | .176  |              |         |       |                         |         |
|                           | Hospital Size              | 767.389                     | 63.082     | .865                      | 12.165 | .000  | .854         | .824    | .757  | .766                    | 1.306   |
|                           | Teaching Affiliation       | 7953.756                    | 23952.517  | .024                      | .332   | .741  | -.395        | .040    | .021  | .766                    | 1.306   |
| 2                         | (Constant)                 | -12780.969                  | 49425.534  |                           | -.259  | .797  |              |         |       |                         |         |
|                           | Hospital Size              | 233.293                     | 140.540    | .263                      | 1.660  | .102  | .854         | .200    | .092  | .122                    | 8.226   |
|                           | Teaching Affiliation       | 139.802                     | 24346.213  | .000                      | .006   | .995  | -.395        | .001    | .000  | .584                    | 1.712   |
|                           | Health Care Accessibility  | 1.320                       | .283       | .715                      | 4.668  | .000  | .886         | .498    | .258  | .130                    | 7.695   |
|                           | Number of Services Offered | -1960.703                   | 3416.717   | -.067                     | -.574  | .568  | .569         | -.070   | -.032 | .221                    | 4.517   |
|                           | Community Factors          | -6279.864                   | 12805.125  | -.045                     | -.490  | .625  | .297         | -.060   | -.027 | .358                    | 2.793   |
|                           | Organizational Factors     | 1631.709                    | 4238.177   | .024                      | .385   | .701  | -.319        | .047    | .021  | .817                    | 1.224   |
| 3                         | (Constant)                 | -14375.019                  | 52992.372  |                           | -.271  | .787  |              |         |       |                         |         |
|                           | Hospital Size              | 222.880                     | 144.812    | .251                      | 1.539  | .129  | .854         | .192    | .087  | .119                    | 8.408   |
|                           | Teaching Affiliation       | 1774.036                    | 27908.380  | .005                      | .064   | .950  | -.395        | .008    | .004  | .462                    | 2.166   |
|                           | Health Care Accessibility  | -.551                       | 3.140      | -.299                     | -.175  | .861  | .886         | -.022   | -.010 | .001                    | 913.463 |
|                           | Number of Services Offered | 4862.988                    | 20872.547  | .167                      | .233   | .817  | .569         | .030    | .013  | .006                    | 162.297 |
|                           | Community Factors          | 570.706                     | 32513.594  | .004                      | .018   | .986  | .297         | .002    | .001  | .058                    | 17.336  |
|                           | Organizational Factors     | -1015.842                   | 9481.811   | -.015                     | -.107  | .915  | -.319        | -.014   | -.006 | .170                    | 5.897   |
|                           | Interaction 1              | 1.869                       | 3.129      | 1.026                     | .597   | .553  | .887         | .076    | .034  | .001                    | 931.557 |
|                           | Interaction 2              | -5559.520                   | 21136.019  | -.195                     | -.263  | .793  | .593         | -.033   | -.015 | .006                    | 172.717 |
|                           | Interaction 3              | -9962.017                   | 32381.515  | -.081                     | -.308  | .759  | .332         | -.039   | -.017 | .046                    | 21.811  |
| Interaction 4             | 3944.529                   | 10320.477                   | .054       | .382                      | .704   | -.246 | .048         | .022    | .160  | 6.267                   |         |

a. Dependent Variable: Financial Performance 2 (\$10.000)

## Appendix H: Meetings Summary with Practitioners - Feedback from the field

**Table 23: Meetings Summary with Practitioners - Feedback from the field**

|  |
|--|
| <p><b>Questions asked during the meetings:</b></p> <p>(1) Based on your experience working in a Children’s Hospital setting, which one of the following factors (variables) do you think has the biggest influence on Hospital’s Financial Performance? (2) In addition, do you agree it is important to study children’s hospitals financial performance?</p>   |
| <p><b><u>(P1) Dr. S. A., MD, Pediatrician - Children Hospital, Michigan:</u></b></p> <p>During the meeting with Dr. S. A. he stated that first it is very important to consider competition between hospitals and that hospital’s money is mainly coming in from Medicaid and Medicare programs. He agreed on the importance of studying and measuring financial performance. He stated that most of the time hospitals are non-for-profit and that is due to their intention to keep money within and avoid paying high taxes. Dr. S. A. further stated that researchers should consider political effect in health care. For example, poor states have poor hospitals and emphasized on the need for considering funding to high risk and high poverty hospitals from the Intergovernmental Transfer Funds IGT which is used to save hospitals from going out of business. So it is important to consider interaction between Federal, State and City funding programs. He finally stated that researchers should consider teaching versus research hospitals. Teaching hospitals could be big for research. Also consider university relationships with hospitals, example Stanford Hospital and UCSF, etc.</p> |
| <p><b><u>(P2) Dr. C. X., Senior Research Director - Emory Children’s Center, Georgia:</u></b></p> <p>During the meeting with Dr. C. X. PhD, she agreed with the importance of expanding the research on US children’s hospitals performance. She mentioned that focus should go to funding from the National Institute of Health (NIH) which is provided for research to some hospitals. She mentioned that: “Research hospitals are funded and that is good but there is no profit to hospital rather expenses going towards compensation for medical research and researchers from the NIH funding”. She added: “Patient care is where hospitals make money and asked me to consider this important factor”. She also mentioned that researcher should focus on clinical (business) operation as a performance factor and consider the effect on public versus private hospitals.</p>  |
| <p><b><u>(P3) Clinical Directors and Managers at CHOA: Georgia:</u></b></p> <p>The feedback from some of the clinical directors and managers at CHOA, indicated some insights and comments regarding the impacting factors on hospital performance as follows: (1) The need for establishing consistency of purpose toward service such as meaningful visions, missions and reachable goals. (2) Supply chain management. (4) Physician specialty, whether they have all specialties in each medical area. (4) In-patient and Out-patient facilities. (5) Capability of adopting new technology such EPIC updates, AI, etc. (6) Efficient patient check-in and check-out flow and patient retention. (7) Insurance handling especially for Medicare and Medicaid. (8) Big data and data analytics: this apparently is a new area with the massive informative growth, hospital has so much data now and it is expensive to keep and store these data, how much data the hospital should keep or store. What the data means to the hospital is still an on-going discussion.</p>  |
| <p><b><u>(P4) Dr. A. S., MD, Director, Children Hospital – Philadelphia:</u></b></p> <p>During the meeting with Dr. A.S, she focused her feedback on hospital accessibility and location as being the most important factor that affect financial performance. She indicated that their</p>  |



main problem is that they are not able to keep up with the patient's demands and accessibility due to the large population around the hospital. Many families end up driving for many hours to seek medical treatment and admissions in neighboring hospitals in the state. She said that they are working on expanding our hospital's inpatient and outpatient admissions rates and the length of stay in the hospital and the capacity of their emergency room. She concluded that: based on my long years in hospital administration, I came to find out that while some hospitals may have the required medical resources and services, but still they could suffer from adverse financial performance, therefore, it is important to study the hospital's financial stability and what factors affect it.

**(P5) Mrs. O.M., Hospital Administration – International Medicine - CHOP: Philly Pennsylvania:**

During the meeting with Mrs. O.M, she mentioned that from her own experience working for over 5 years at CHOP's international medicine department, she noticed that the hospital accepts children patients from all other states and from overseas and accommodates patients with different cultures, religions, ethnicities and treat their customers very well and listen to their concerns and do the best to comfort families with children patients diagnosed with cancer in the oncology department (over 75% of all international patients). She mentioned that the hospital accepts all patients who come to the ER and specially cancer patients. She believes that accessibility is an evident factor that affects quality of service, financial performance and ranking of this hospital. When asked about the reason for CHOP to be ranked number 2 for so many years, she said it is due to its highly skilled physicians and nurses and specially surgeons, in addition to the high level of diagnosis of medical conditions. She added: they do not give up easily on cancer patients and support their families to the end. She said that the hospital accepts children covered by Medicaid and other charity care programs. She mentioned that the location of the hospital in the center of Philadelphia plays a big role where many patients come from other states. Regarding areas for improvement for financial performance and quality of service, she mentioned the environmental and cleaning aspect of the hospital to attract more patients and business. She also mentioned that the hospital has affiliation with top universities where doctors and nurses are being trained and that the hospital is advancing in research of critical illnesses such as cancer.

**(P6) Dr. A. A., MD, Director, Children Hospital – Jacksonville, Florida:**

Dr. A.A, indicated that he manages and runs seven children outpatient facilities in Jacksonville, Florida. His was able to reduce the population health (per member / per month) cost down to 29%. He said that the spending in health care is about 3.5 Trillion per year. About 1.6 trillion are from Medicare and Medicaid. The rest is private insurance. There are programs in between to cover and fill the gaps. He mentioned that about 1 Trillion is being wasted since health care is not sustainable. About 250 billion goes into over testing and about 50 billion on redundancy. He has been part of the CMS innovation center program: <https://innovation.cms.gov/>. He mentioned that the direction of health care is from fee for service to pay for performance. He said that 25% of the US will go towards health care by 20256. Many hospitals started to close down. Future of health care will be in ACOs: Accountable Care Organizations. Dr. A.A. agreed with the importance of financial performance as an important indicator and when asked about the effect of organizational factors, he mentioned that hospitals who are not part of a system are able to quickly and freely make financial decisions and tend to have better overall financial performance.

**(P7) Dr. F. M. S., MD, Oakland Children Hospital, Kaiser Permanente, California:**

During the meeting with Dr. F.M.S, a pediatrician who worked for Oakland children hospital ((now UCSF Benioff Children's Hospital) from 2004 to 2007 and now works at Kiser Permanente, she indicated that in her view the most important factors that affects financial performance and quality of services are: (1) Specialization such as telemedicine, secure messaging system and communication technology within the group of hospitals. (2) The competitive advantage of her current hospital as being a closed system with very efficient Electronic Health Record system (EHR) which makes communication between the pediatrics physicians and specialists very fluid and transparent which improves the quality of clinical care and internal communication (3) The location factor as the hospitals in the group are spread which positively affect accessibility. (4) Competition among children hospitals and pediatrics centers is growing especially in areas with small patient population which prompts the importance of hospital location to achieve competitive advantage. (5) Technology adopted in the hospital is very important especially for a closed system groups such as Keiser Permanente which is very big in internal systems such as EPIC, Dragon 1 and text messaging between the clinical staff. She mentioned that the group also strives for adequate number of delivery rooms however some of the group buildings are outdated due to budget constraints. She mentioned that the group of hospitals accept the state funded Medi-Cal insurance, however one of the draw backs in her view are the new tier plans with high deductibles which made many families unhappy with these new plans. Finally, she mentioned that physicians and specially pediatricians are well compensated and there is high degree of staff retention but that will also affect the overall cost of operation and should be taken into consideration. When asked about what medical services she believes they are important for children, Dr. F.M.S said: As a pediatrician who worked in different children's teaching and trauma centers, I believe that neonatal and pediatric intensive care units are very vital. Having a NICU and birthing rooms are critical. Also, other diagnostic services such as CT scan and MRI are very important to diagnose medical conditions. It is important to have access for complex procedures such as organ transplants. Dr. F.M.S. emphasized that the specialized hospital that she worked for (Oakland Children Trauma Center), which used to deal with complex medical conditions, allows patients to stay for longer periods to ensure that the medical condition has been controlled and/or mitigated. She finally added that many of these hospitals used to open 24X7.

**(P8) Dr. B. H. A., MD, Boston Children's Hospital, Massachusetts**

Dr. B. H. A., a pediatrician at Boston Children's Hospital agreed with the importance of researching financial performance. She added: BCH is a children's medical and surgical facility. We value the wide range of medical services and procedures that we offer to our patients. In addition, BCH It is distinguished by its technical resources as a teaching hospital. It is one of the largest medical and research centers dedicated to pediatric medicine in the country. Also, another area of the hospital focus is in its community programs and initiatives which focus on the treatment of common children's conditions such as obesity, asthma, mental and behavioral health. The community aspects we focus on are the community size, geography, environment, health knowledge, health education, social work services, outreach, behaviors, influence of culture, media, & technology, communication and health advocacy, this in addition to other factors such as race, ethnicity and language. We also have big focus on affordable housing; food access through our neighborhood partnerships programs to addresses many community behavioral health issues. In my view both community factors and medical health resources play a vital role in the hospital's quality of service and financial performance.

**Appendix I: Research model variables and measures layout – Round (2 from 4)**

**Table 24: Research model variables and measures layout – Round (2 from 4):**

**DV: Financial Performance:**

| No | Items  | Value |
|----|--|-------|
| 1  | Hospital revenue                             | \$    |
| 2  | Total income                                 | \$    |
| 3  | Net income (or loss) for the period          | \$    |
| 4  | Cash on hand and in banks                    | \$    |
| 5  | Net revenue from Medicaid                    | \$    |
| 6  | Net patient revenues                         | \$    |
| 7  | Net income (or loss) for the period          | \$    |
| 8  | Income from investments                      | \$    |
| 9  | Total assets                                 | \$    |
| 10 | Total liabilities and fund balances          | \$    |
| 11 | Total operating expenses                     | \$    |
| 12 | Investments                                  | \$    |
| 13 | Inventory                                    | \$    |
| 14 | Operating margin                             | \$    |
| 15 | Accounts payable                             | \$    |
| 16 | Accounts receivable                          | \$    |
| 17 | Hospital total expenses (excluding bad debt) | \$    |
| 18 | Makes financial contributions                | \$    |
| 19 | Intensive care unit revenue                  | \$    |
| 20 | Ambulance revenue                            | \$    |
| 21 | Rental of hospital space                     | \$    |
| 22 | Total gross Medicaid charges                 | \$    |
| 23 | Land   | \$    |
| 24 | Buildings                                    | \$    |
| 25 | Salaries wages and fees payable              | \$    |
| 26 | Total Capital Expenditures                   | \$    |
| 27 | Hospital unit employee benefits              | \$    |
| 28 | Hospital unit payroll expenses               | \$    |
| 29 | IT operating expense                         | \$    |

**IV1: Health Care Accessibility (HCA):**

| No | Items                              | Value    |
|----|------------------------------------|----------|
| 30 | Open 24 hours a day, 7 days a week | Yes / No |
| 31 | Neonatal intensive care            | Yes / No |
| 32 | Pediatric intensive care           | Yes / No |
| 33 | Birthing room/LDR room/LDRP room   | Yes / No |
| 34 | Total Admissions                   | Number   |

|    |  |          |
|----|--|----------|
| 35 | Outpatient Visits                      | Number   |
| 36 | Inpatient Visits                       | Number   |
| 37 | Length of Stay                         | Number   |
| 38 | Emergency room visits                  | Number   |
| 39 | Health screenings                      | Yes / No |
| 40 | Chemotherapy                           | Yes / No |
| 41 | Oncology services                      | Yes / No |
| 42 | Orthopedic services                    | Yes / No |
| 43 | Complementary and alternative medicine | Yes / No |
| 44 | Dental services                        | Yes / No |
| 45 | Neurological services                  | Yes / No |
| 46 | Pain Management Program                | Yes / No |
| 47 | Computed-tomography (CT) scanner       | Yes / No |
| 48 | Magnetic resonance imaging (MRI)       | Yes / No |
| 49 | Ultrasound                             | Yes / No |
| 50 | Heart transplant                       | Yes / No |
| 51 | Kidney transplant                      | Yes / No |
| 52 | Liver transplant                       | Yes / No |
| 53 | Lung transplant                        | Yes / No |

#### **IV2: Medical Coverage:**

| <b>No</b> | <b>Items</b>                            | <b>Value</b> |
|-----------|---|--------------|
| 54        | Medicaid managed care - hospital        | Yes / No     |
| 55        | HMO                                     | Yes / No     |
| 56        | PPO                                     | Yes / No     |
| 57        | Blue Cross participant                  | Yes / No     |
| 58        | Number of HMO contracts                 | Number       |
| 59        | Number of PPO Contracts                 | Number       |
| 60        | Health insurance marketplace (exchange) | Yes / No     |
| 61        | Hospital unit Medicaid days             | Number       |
| 62        | Hospital unit Medicaid discharges       | Number       |
| 63        | Total Medicaid days                     | Number       |
| 64        | Total Medicaid discharges               | Number       |

#### **IV3: Medical Care Resources:**

| <b>No</b> | <b>Items</b>                          | <b>Value</b> |
|-----------|---------------------------------------|--------------|
| 65        | Pediatric Emergency Department        | Yes / No     |
| 66        | Neonatal intensive care               | Yes / No     |
| 67        | Pediatric intensive care              | Yes / No     |
| 68        | Neonatal intensive care beds          | Number       |
| 69        | Pediatric intensive care beds         | Number       |
| 70        | Total births (excluding fetal deaths) | Number       |

|     |  |          |
|-----|--|----------|
| 71  | Ambulance services                               | Yes / No |
| 72  | Children's wellness program                      | Yes / No |
| 73  | Immunization program                             | Yes / No |
| 74  | Nutrition program                                | Yes / No |
| 75  | Satellite facilities                             | Yes / No |
| 76  | Gen. medical/surgical pediatric care             | Yes / No |
| 77  | Neonatal care (FT)                               | Number   |
| 78  | Pediatric intensive care (FT)                    | Number   |
| 79  | Physicians and dentists (FT)                     | Number   |
| 80  | Registered nurses (FT)                           | Number   |
| 81  | Total hospital unit personnel (FT)               | Number   |
| 82  | Emergency Department                             | Yes / No |
| 83  | Total fulltime employees                         | Number   |
| 84  | Pediatric intensive care (PT)                    | Number   |
| 85  | Acute long term care beds                        | Number   |
| 86  | Gen. medical/surgical pediatric beds             | Number   |
| 87  | Total hospital beds                              | Number   |
| 89  | Number of Operating Rooms                        | Number   |
| 90  | % Teaching Beds                                  | Number   |
| 91  | Transportation to health services                | Yes / No |
| 92  | Telehealth consultation and office visits        | Yes / No |
| 93  | Approved cancer program                          | Yes / No |
| 94  | Laboratory technicians (FT)                      | Number   |
| 95  | Pharmacy technicians (FT)                        | Number   |
| 96  | Radiology technicians (FT)                       | Number   |
| 97  | Respiratory therapists (FT)                      | Number   |
| 98  | Neonatal care (PT)                               | Number   |
| 99  | Ambulatory surgery - number of facilities        | Number   |
| 100 | Diagnostic imaging center - number of facilities | Number   |
| 101 | Laboratory - number of facilities                | Number   |
| 102 | Net property, plant and equipment                | Yes / No |
| 103 | CIHQ Accreditation                               | Yes / No |
| 104 | ACO Medicaid Population                          | Yes / No |
| 105 | ACO Privately Insured Population                 | Yes / No |
| 106 | AMA medical school affiliation                   | Yes / No |
| 107 | Diversity strategy/plan                          | Yes / No |
| 108 | Evaluate a leadership program                    | Yes / No |
| 109 | Leadership succession planning                   | Yes / No |
| 110 | Energy Star rating                               | Yes / No |
| 111 | Used assessment to identify unmet health needs   | Yes / No |
| 112 | Diversity orientation for clinical staff         | Yes / No |
| 113 | Diversity training for all employees is required | Yes / No |
| 114 | Evaluate a leadership program                    | Yes / No |

**IV4: Community Factors:**

| No  | Items   | Value    |
|-----|---|----------|
| 115 | Community Health Education                    | Yes / No |
| 116 | Collects patient's primary language           | Yes / No |
| 117 | Collects patient's race/ethnicity             | Yes / No |
| 118 | Offers community health & wellness activities | Yes / No |
| 119 | Plan for improving community's health         | Yes / No |
| 120 | Social work services                          | Yes / No |
| 121 | Community outreach                            | Yes / No |
| 122 | Community hospital designation                | Yes / No |

**IV5: Organizational Factors:**

| No  | Items                                     | Value         |
|-----|---|---------------|
| 123 | Teaching Affiliation                      | Yes / No      |
| 124 | Hospital size                             | No of beds    |
| 125 | Critical Access Hospital                  | Yes / No      |
| 126 | Health research                           | Yes / No      |
| 127 | Degree of centralization of health system | Number        |
| 128 | Closed physician-hospital organization    | Yes / No      |
| 129 | Open physician-hospital organization      | Yes / No      |
| 130 | Location                                  | Rural / Urban |
| 131 | Catholic                                  | Yes / No      |
|     | Admission restricted to children          | Yes / No      |

**MF (Moderator) Hospital Type:**

| No  | Items                          | Value    |
|-----|--------------------------------|----------|
| 132 | Government federal             | Yes / No |
| 133 | Government non-federal         | Yes / No |
| 134 | Nongovernmental non-for-profit | Yes / No |
| 135 | Investor-owned for-profit      | Yes / No |
| 136 | Teaching                       | Yes / No |

## Appendix J: Anderson-Darling Normality Test Results

**Table 25: Anderson-Darling Normality Test Results:**

| Variable                            | AD     | AD*    | p    |
|-------------------------------------|--------|--------|------|
| Total Operating Expenses (\$10.000) | 5.068  | 5.121  | .000 |
| Financial Performance 2 (\$10.000)  | 6.846  | 6.919  | .000 |
| Health Care Accessibility           | 4.213  | 4.257  | .000 |
| Number of Services Offered          | 3.412  | 3.448  | .000 |
| Community Factors                   | 2.695  | 2.723  | .000 |
| Organizational Factors              | 10.513 | 10.624 | .000 |
| Hospital Size                       | 2.928  | 2.959  | .000 |
| Teaching Affiliation                | 17.374 | 17.557 | .000 |
| Ownership Type                      | 21.269 | 21.493 | .000 |

## Appendix K: Step 1: Keeping all variables (DV1):

**Table 26: Step 1: Keeping all variables (DV1):**

| Variables                      | All IVs present    |
|--------------------------------|--------------------|
| Constant                       | 0 (732.104)        |
| IV1 Health Care Accessibility  | 0.738 (0.436)*     |
| IV3 Number of Services Offered | 0.308 (2870.382)*  |
| IV4 Community Factors          | -0.134 (-5928.690) |
| IV5 Organizational Factors     | -0.002 (-46.758)   |
| Yes                            |                    |
| R <sup>2</sup>                 | 0.830              |
| ΔR <sup>2</sup>                | -                  |
| F                              | 83.177*            |
| ΔF                             | -                  |
| N                              | 74                 |

| Variable (step 1)              | p    | Decision |
|--------------------------------|------|----------|
| IV1 Health Care Accessibility  | .000 | Keep     |
| IV3 Number of Services Offered | .003 | Keep     |
| IV4 Community Factors          | .102 | Keep     |
| IV5 Organizational Factors     | .969 | Remove   |

Dependent variable: Financial performance (DV1), N = Number of cases (hospitals)

\* statistically significant at 1% level, \*\* statistically significant at 5% level

Note: unstandardized coefficients in parenthesis ()

**Appendix L: Step 2: After dropping IV5:****Table 27: Step 2: After dropping IV5:**

| Variables                      | IV5 Dropped        |
|--------------------------------|--------------------|
| Constant                       | 0 (618.107)        |
| IV1 Health Care Accessibility  | 0.739 (0.437)*     |
| IV3 Number of Services Offered | 0.308 (2871.936)*  |
| IV4 Community Factors          | -0.134 (-5928.181) |
| R <sup>2</sup>                 | 0.830              |
| $\Delta R^2$                   | -                  |
| F                              | 125.531*           |
| $\Delta F$                     | -                  |
| N                              | 74                 |

| Variable (step 1)              | p    | Decision |
|--------------------------------|------|----------|
| IV1 Health Care Accessibility  | .000 | Keep     |
| IV3 Number of Services Offered | .003 | Keep     |
| IV4 Community Factors          | .099 | Remove   |

Dependent variable: Financial performance (DV1), N = Number of cases (hospitals)

\* statistically significant at 1% level, \*\* statistically significant at 5% level

Note: unstandardized coefficients in parenthesis ()

**Appendix M: Step 3: After dropping IV4 and IV5:****Table 28: Step 3: After dropping IV4 and IV5:**

| Variables                      | IV4 & IV5 Dropped |
|--------------------------------|-------------------|
| Constant                       | 0 (-5505.632)     |
| IV1 Health Care Accessibility  | 0.771 (0.455)**   |
| IV3 Number of Services Offered | 0.184 (1705.115)* |
| R <sup>2</sup>                 | 0.825             |
| $\Delta R^2$                   | -                 |
| F                              | 166.933*          |
| $\Delta F$                     | -                 |
| N                              | 74                |

| Variable (step 1)              | p    | Decision |
|--------------------------------|------|----------|
| IV1 Health Care Accessibility  | .000 | Keep     |
| IV3 Number of Services Offered | .009 | Keep     |

Dependent variable: Financial performance (DV1), N = Number of cases (hospitals)

\* statistically significant at 1% level, \*\* statistically significant at 5% level

Note: unstandardized coefficients in parenthesis ()



**Appendix N: Step 1: Keeping all variables (DV2):****Table 29: Step 1: Keeping all variables (DV2):**

| Variables                      | present    | All IVs     |          |
|--------------------------------|------------|-------------|----------|
| Constant                       |            | 0 (130.668) |          |
| IV1 Health Care Accessibility  |            | 0.931       |          |
| IV3 Number of Services Offered | (1.719)*   |             |          |
| IV4 Community Factors          |            | -0.018 (-   |          |
| IV5 Organizational Factors     | 513.606)   |             |          |
| Yes                            |            | -0.064 (-   |          |
| R <sup>2</sup>                 | 8892.755)  |             |          |
| ΔR <sup>2</sup>                |            | 0.019       |          |
| F                              | (1302.571) |             |          |
| ΔF                             |            |             |          |
| N                              |            | 0.790       |          |
|                                |            | -           |          |
|                                |            | 64.023*     |          |
|                                |            | -           |          |
|                                |            | 74          |          |
| Variable (step 1)              |            | p           | Decision |
| IV1 Health Care Accessibility  |            | .000        | Keep     |
| IV3 Number of Services Offered |            | .876        | Remove   |
| IV4 Community Factors          |            | .476        | Keep     |
| IV5 Organizational Factors     |            | .756        | Keep     |

Dependent variable: Financial performance (DV1), N = Number of cases (hospitals)

\* statistically significant at 1% level, \*\* statistically significant at 5% level

Note: unstandardized coefficients in parenthesis ()

**Appendix O: Step 2: After dropping IV3:****Table 30: Step 2: After dropping IV3:**

| Variables                     | IV3 Dropped         |          |
|-------------------------------|---------------------|----------|
| Constant                      | 0 (833.636)         |          |
| IV1 Health Care A             | 0.924 (1.704)*      |          |
| IV4 Community Factors         | 0.019 (1330.1270)   |          |
| IV5 Organization Factors      | -0.074 (-10314.278) |          |
| R <sup>2</sup>                | 0.790               |          |
| $\Delta R^2$                  | -                   |          |
| F                             | 86.580              |          |
| $\Delta F$                    | -                   |          |
| N                             | 74                  |          |
| Variable (step 1)             | p                   | Decision |
| IV1 Health Care Accessibility | .000                | Keep     |
| IV4 Community Factors         | .223                | Keep     |
| IV5 Organizational Factors    | .749                | Remove   |

Dependent variable: Financial performance (DV1), N = Number of cases (hospitals)

\* statistically significant at 1% level, \*\* statistically significant at 5% level

Note: unstandardized coefficients in parenthesis ()

**Appendix P: Step 3: After dropping IV3 and IV5:****Table 31: Step 3: After dropping IV3 and IV5:**

| Variables                     | IV3 and IV5 dropped  |          |
|-------------------------------|----------------------|----------|
| Constant                      | 0 (4142.935)         |          |
| IV1 Health Care Accessibility | 0.917 (1.692)*       |          |
| IV4 Community Factors         | -0.075 (-10.451.379) |          |
| R <sup>2</sup>                | 0.790                |          |
| $\Delta R^2$                  | -                    |          |
| F                             | 131.504              |          |
| $\Delta F$                    | -                    |          |
| N                             | 74                   |          |
| Variable (step 1)             | p                    | Decision |
| IV1 Health Care Accessibility | .000                 | Keep     |
| IV4 Community Factors         | .213                 | Remove   |

Dependent variable: Financial performance (DV1), N = Number of cases (hospitals)

\* statistically significant at 1% level, \*\* statistically significant at 5% level

Note: unstandardized coefficients in parenthesis ()

**Appendix Q: Step 4: After dropping IV3, IV4 and IV5:****Table 32: Step 4: After dropping IV3, IV4 and IV5:**

| Variables                        | IV3, IV4, IV5<br>dropped |          |
|----------------------------------|--------------------------|----------|
| Constant                         | 0 (-13173.222)           |          |
| IV1 Health Care<br>Accessibility | 0.887 (1.635)*           |          |
| R <sup>2</sup>                   | 0.786                    |          |
| $\Delta R^2$                     | -                        |          |
| F                                | 265.170                  |          |
| $\Delta F$                       | -                        |          |
| N                                | 74                       |          |
| Variable (step 1)                | p                        | Decision |
| IV1 Health Care Accessibility    | .000                     | Keep     |

Dependent variable: Financial performance (DV1), N = Number of cases (hospitals)

\* statistically significant at 1% level, \*\* statistically significant at 5% level

**Appendix R: Multicollinearity analysis results (VIF) for DV1:****Table 33: Multicollinearity analysis results (VIF) for DV1:**

| Variables                      | VIF   |
|--------------------------------|-------|
| IV1 Health Care Accessibility  | 2.170 |
| IV3 Number of Services Offered | 4.139 |
| IV4 Community Factors          | 2.596 |
| IV5 Organizational Factors     | 1.176 |

**Appendix S: Multicollinearity analysis results (VIF) for DV2:****Table 34: Multicollinearity analysis results (VIF) for DV2:**

| Variable                       | VIF   |
|--------------------------------|-------|
| IV1 Health Care Accessibility  | 2.170 |
| IV3 Number of Services Offered | 4.139 |
| IV4 Community Factors          | 2.596 |
| IV5 Organizational Factors     | 1.176 |

*Appendix T: IRB Approval Letter*

**Figure 39: IRB Approval Letter**

INSTITUTIONAL REVIEW BOARD

Mail: P.O. Box 3999  
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In Person: 3rd Floor  
58 Edgewood  
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November 18, 2019

Principal Investigator: Subhashish Samaddar

Key Personnel: Mahgoub, Jimmy; Samaddar, Subhashish

Study Department: J. Mack Robinson-College of Business

Study Title: Factors Affecting the Financial Performance of US Children's Hospitals. An Exploratory Study.

Submission Type: Application for Designation of Not Human Subjects Research

IRB Number: H20308

Reference Number: 357858

Thank you for your Application for Designation of Not Human Subjects Research. Based on the information provided, this submission has been determined to be not human subjects research. This correspondence should be maintained with your records.

Please do not hesitate to contact the Office of Research Integrity at 404-413-3500 if you have any questions or concerns.

Sincerely,

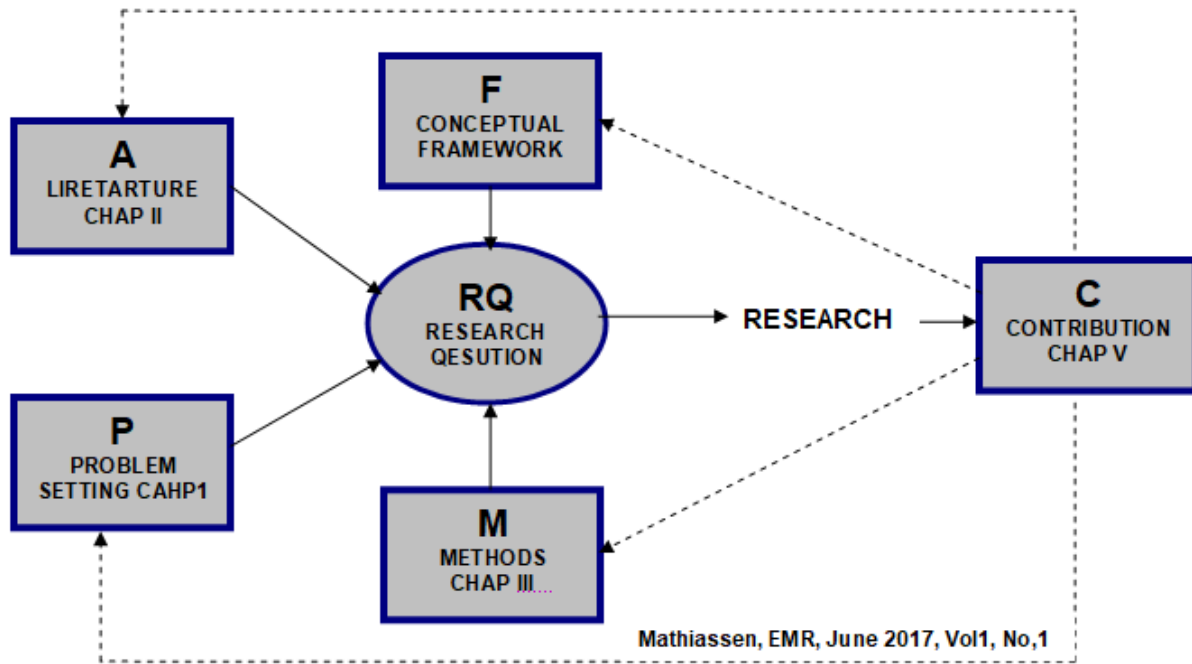
A handwritten signature in black ink, appearing to read "Kiki Sindad".

Kiki Sindad, IRB Member

## Appendix U: Structure of Engaged Scholarship Study

**Figure 40: Structure of Engaged Scholarship Study:**

**A:** Area of concern, **P:** Real-world problem, **F:** Framing, **M:** Method, **C:** Contributions



Generic Structure of Engaged Scholarship Study. Source: Mathiassen 2017, Designing Engaged Scholarship: From Real-World Problems to Research Publications

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## VITA

Jimmy Mahgoub is a business professional, trainer, community leader, and educator with over 20 years' professional experience. Dr. Mahgoub worked in corporate America for over 15 years including Hewlett Packard Company in California and INSEAD, a world's top schools based in France, Singapore, and the Middle East.

Dr. Mahgoub was born in the Blue Nile State of Sudan in a small city located at the boarder of Ethiopia. In addition to his Doctorate in Business Administration from the Robinson College of Business at Georgia State University, Dr. Mahgoub attended the graduate school of Engineering Management at Stanford University in Palo Alto, California. In addition, he earned a graduate degree in Renewable Energy Technologies and a bachelor's degree in Mechanical Engineering from the University of Khartoum, Sudan.

Dr. Mahgoub is passionate about driving measurable results and has married his strong work ethics with a passion for continuing education. His data-driven approach to continuous personal growth was instilled at an early age in North Africa which has been critical to his success in the United States. He has expertise in teaching, training, coaching, and managing businesses.

Dr. Mahgoub is a distinguished entrepreneur who established and managed a successful firm in the USA, United Arab Emirates and Ethiopia: Frontiers International Group LLC. He has developed a wealth of expertise in managing, directing, training, and coaching individuals to be successful and productive at all levels.