

# The Maryland Hospital Regulation System and Its Effect on Hospital Pricing and Costs

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**The Maryland Hospital Regulation System**  
**And Its Effect on Hospital Pricing and Costs**

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Senior Honors Economics Thesis  
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**Abstract**

This thesis examines the impact of the hospital regulatory system in the state of Maryland. The system has been highly successful in lowering the gross charge-to-cost ratios that hospitals charge to their patients. In many states, these charge markups appear to be exorbitantly high, which is a great concern since the cost of health care is becoming more and more expensive for Americans. This thesis will include a description of the regulatory agency in Maryland, an explanation of how it works, and how it affects the Maryland hospital sector. Econometric analysis will then be employed in order to determine whether or not the regulatory system successfully helps hospitals reduce costs, a high priority objective of the system. In this model, Maryland hospital costs will be compared with nearby hospitals in Virginia. The paper will conclude with an evaluation of the merits of the system, and a recommendation on whether or not it would be useful in other states.

## **Acknowledgements**

First of all, I must thank my advisor, Professor Francis McLaughlin. His constructive criticisms proved invaluable throughout the process of writing this thesis. He not only made this particular work better, but also made my overall writing skills better.

Next I would like to thank Dr. Richard Tompkins, the CEO of First Chesapeake Group. I experienced great difficulty in finding the data I needed in order to perform the econometric work of this thesis. I contacted Dr. Tompkins and he was able to amass the data that I needed. Without his help this thesis would not have been possible.

I would also like to thank the Boston College Arts and Sciences Honors Program as a whole, and specifically Professors Timothy Duket, Elizabeth Chadwick, and Alan Lawson. I learned an incredible amount from these professors, and my analytical and writing skills grew leaps and bounds as a result of their guidance.

Finally I have to thank the people around me that helped keep up my morale throughout the arduous task of completing a thesis. When I questioned whether or not I could get past data problems, my parents and sister were always there to tell me that I could. My friends and roommates were also a constant source of support. In particular I would like to thank my roommate, George Toth-Demetriade, who also wrote an A&S Honors thesis. We spent countless hours together during the writing process and thrived off each other's determination to complete the task.

## **I. Introduction:**

The development of an efficient and comprehensive health care system is near the top of the list of the nation's socioeconomic problems. There are many unique aspects of health care, and of the health care market that make the inefficiencies and limitations of the current system very difficult to correct. The urgency of finding a way to improve the health care system is underscored by the fact that there are 45.8 million Americans without health insurance, and that although countless plans have been proposed to deal with this problem, an answer has not yet been discovered.

The hospital market functions like a differentiated product oligopoly rather than a perfectly competitive market (Berry 1994). It lacks the level of price transparency necessary to reap the benefits of competition. This lack of transparency, combined with the relative price inelasticity of demand for health care, provides hospitals with a high degree of price setting power. As a consequence hospitals' gross charge list prices are generally a great deal higher than the cost of the service provided. Since the overwhelming bulk of hospital care is paid according to the fee schedules of Medicare and health insurance, gross charges directly affect only the uninsured. Nevertheless there is a strong, positive correlation between gross charges and hospital profits (Institute for Health and Socio-economic Policy 2005). As a launching point for negotiations of fee schedules, high gross charges contribute to higher reimbursements from insurance companies. High markups make health insurance more and more expensive for Americans, and high and rising health insurance prices have led many companies to cut employee health benefits or reduce coverage. In addition to these high gross charges and

the resulting high price levels, high rates of medical price inflation make it difficult for hospital managers to control cost. According to the Bureau of Labor Statistics, inflation for general medical and surgical hospitals (using the Producer Price Index) was 5.8%, 4.9%, 3.8%, and 4.2% for the years from 2003 to 2006. These rates were substantially in excess of the overall rate of inflation over these same years as measured by the Consumer Price Index. Of course, a truly useful analysis of rising health care prices must consider economic efficiency as well as distributional equity. Government intervention is one means for correcting the failure of market forces to control costs in the hospital sector. Many proposals for controlling hospital costs have been drafted, ranging from universal health care to hospital price regulation.

The state of Maryland provides an interesting case study for the effectiveness of schemes for hospital price regulation. Maryland has the most highly regulated hospital sector in the country. Since the implementation of its hospital regulation plan, Maryland's gross charges for hospital services have fallen from 25% above the national average to 6% below. This provides strong prima facie evidence for believing that the Maryland Plan has been very successful in controlling prices of hospital services, at least in relation to the rest of the country, and it may provide a model for other states to consider.

My purpose in this thesis is to analyze more closely than has yet been done, certain aspects of Maryland's hospital regulation system. I will begin by presenting a qualitative examination of the Maryland regulation system. This will include an explanation of what the Health Services Cost Review Commission (HSCRC) of Maryland does; an explanation of the objectives of the Commission; and a description of

how it accomplishes these objectives. I will then present my quantitative analysis of the likely impact of the Maryland system on total hospital operating costs. My objective has been to construct an econometric model that will explain the structure of total hospital operating costs in 2005 (the choice of total operating costs as the dependent variable will be explained below.) The cost structure of Virginia will be used as a point of comparison to identify the impact of the Maryland regulatory scheme. Virginia was chosen for two reasons. First, because of its geographical proximity to Maryland I believe it has important similarities to Maryland. Second, because it does not employ a hospital price regulation system like that of Maryland it provides an example of a state against which Maryland can be measured. The comparison will provide insight into whether or not Maryland's HSCRC succeeds in minimizing hospital costs. The comparison will provide a basis for judging whether or not the Maryland hospital regulation system is beneficial in aiding hospitals to hold down costs.

## **II. Literature Review:**

In a publication entitled "The Third Annual IHSP Hospital 200: The Nation's Most – and Least – Expensive Hospitals Fiscal Year 2003/ 2004,"<sup>1</sup> the Institute for Health and Socio-economic Policy<sup>2</sup> used a survey of over 4,222 hospitals in order to analyze pricing structure and profits in the US hospital sector. In particular, the study looks at the implication of different charge-to-cost markup ratios for hospitals and how these markups affect profits. The first of these ratios is the markup for the hospital's

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<sup>1</sup> Institute for Health and Socio-economic Policy. "The Third Annual IHSP Hospital 200: The Nation's Most – and Least – Expensive Hospitals Fiscal Year 2003/ 2004." 2005.

<sup>2</sup> The IHSP is a non-profit policy and research group based in California. The group focuses on providing policy and economic analysis in health care and other industries.

operations as a whole, or the total charge to cost ratio, which is calculated by dividing “the total aggregated charges by the total aggregated costs associated with the hospital’s major financial categories/centers.”<sup>3</sup> Additional calculations are made for the markups for individual goods and services such as drugs sold to patients or operating room services. This is done by dividing the listed gross charges by the costs that can be directly expensed to individual good or service.

The average total charge-to-cost ratio for the 4,222 hospitals in the study was 244% for 2004, indicating that if total aggregated hospital services cost \$10, the average hospital charge \$24.40 for those services. This was up from the previous year’s number of 232% in 2003. The hundred most expensive hospitals in the country set aggregate gross charges at 680% of cost. Certain individual goods and services in health care had much higher markups, namely operating rooms, drugs, and medical supplies. The top forty most expensive hospitals for each charged exorbitant markups of 1,073% for operating rooms, 2,319% for drugs, and 5,090% for medical supplies, respectively. The average for all 4,200 hospitals for drug markups was 425% in 2004 versus the 398% markup from the previous year, representing a 6.77% increase. These three divisions of health care tend to be the profit centers for hospitals.

The IHSP report also shows how different types of hospitals differ with respect to charge-to-cost ratios. The most expensive hospitals are for-profit institutions with an average total charge-to-cost percentage of 366%. The least expensive are government hospitals which averaged a 181% charge-to-cost ratio. Of the hundred most expensive hospitals in the country, 64 were large, for-profit institutions, and 89 were system

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<sup>3</sup> Institute for Health and Socio-economic Policy. “The Third Annual IHSP Hospital 200: The Nation’s Most – and Least – Expensive Hospitals Fiscal Year 2003/ 2004.” 2005. p.12.



affiliated hospitals. (A system affiliated hospital is simply a hospital that is horizontally integrated with others.) The high markup ratios of for-profit hospitals could indicate that regulation might be necessary to prevent these institutions from charging exorbitant prices. Not-for-profit and government hospitals appear to behave differently in the way that they price their services. This suggests that a regulatory system such as Maryland's that closely monitors hospital pricing might be helpful in controlling exorbitant hospital charges elsewhere.

Health care pricing does not directly affect most consumers in the same way that pricing does in other industries. Though hospitals are required to charge the same price to everyone, different groups end up paying different prices for the same service. The vast majority of hospital service reimbursement comes from Medicare, Medicaid, or health insurance companies. Medicare and Medicaid reimburse hospitals based on a formula that utilizes a number of variables. This reimbursement aims to be at or around the cost of the service provided. Payments by insurance companies are based on prearranged fee schedules included in contractual agreements between insurers and hospitals. The remainder of hospital income comes either from government subsidy or the uninsured. The uninsured are the only group that is charged the aforementioned list prices.

The interesting finding from the IHSP report is not necessarily the exorbitant markups charged by some hospitals, but the fact that there is a strong, positive correlation between high charge-to-cost markups and high profits. The results from the IHSP survey indicate a general relationship that the higher the charge-to-cost ratio, the higher the net income for that hospital. The IHSP report proposes that one reason for this relationship is

that the gross charges are used as a starting point for negotiations between hospitals and insurance companies. Higher gross charges might play a role in edging up the reimbursements outlined in the fee schedules. Of course, higher prices paid by insurance companies ultimately lead to higher prices for consumers since insurers will eventually have to implement higher deductibles and/ or raise premiums.

The IHSP report also provides other support for the contention that government intervention is necessary in order to regulate hospitals. For-profit hospitals appear to act differently than government and not-for-profit hospitals. By charging what appear to be unnecessarily high prices, hospitals seem to be making health care more expensive for insurance companies and therefore consumers. In addition, the uninsured often incur huge amounts of debt as a result of health care bills. According to Access Project, a Boston based health care resource center, “half of all personal bankruptcies and one third of all credit card debt is caused by illness or medical bills.”<sup>4</sup>

An alternative analysis of hospital pricing behavior is performed in “Competition Among Hospitals” by Martin Gaynor and William B. Vogt (2003).<sup>5</sup> Gaynor and Vogt aim to examine and characterize the differences in behavior between for-profit and not-for-profit hospitals. In their study they used data from 593 California hospitals to estimate structural demand and pricing equations in order to analyze the pricing environment in the hospital sector.

The authors begin with a discussion of the nature of the hospital market and the ways in which it functions like a differentiated product oligopoly. They enumerate some of the ways in which hospital products are differentiated. One very important

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<sup>4</sup> Lalasz, Elizabeth. “The US Health Care System: Sick and Getting Sicker.” *Socialist Worker*. 2007.

<sup>5</sup> Gaynor, Martin and William B. Vogt. “Competition Among Hospitals”. *RAND Journal of Economics*. Winter 2003.

characteristic differentiating hospitals is how much consumers value proximity to the service offered. Physical location clearly carries an enormous impact on the level of demand for a hospital's services. This provides some hospitals with a certain degree of price setting power. The authors also note that hospitals are differentiated by factors like "religious affiliation... the breadth of the product line they offer, the technological sophistication of their services, the quality of the 'hotel' services they offer, their use and deployment of staffing, and their mortality rates."<sup>6</sup>

Gaynor and Vogt also discuss the high volume of mergers in the hospital sector that has led to a great deal of consolidation of the market. They cite one estimate that calculated 900 mergers of US hospitals between the years of 1994 and 2000.<sup>7</sup> As a result, many insurance companies complain about rising prices in areas where consolidations have led to the existence of only two or three hospital chains. With these issues in mind, the authors eventually simulate two hospital mergers in California and analyze the effects.

The authors treat for-profit and not-for-profit hospitals slightly differently. For-profit hospitals are thought of as operating more or less like ordinary business firms by maximizing profit. Not-for-profit hospitals are thought of as having varying missions therefore they operate differently. In their study, not-for-profit hospitals are thought of as maximizing a utility function that depends on both profit and also the level of output. This makes intuitive sense because these hospitals will obviously aim to bring in income, but they also aim to maximize the service they provide for their community. This sort of

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<sup>6</sup> Ibid. p. 2

<sup>7</sup> Jaklevic, M. "Tired Trend." *Modern Healthcare*. 2002.

theory supports indications from the IHSP report that for-profit and not-for-profit act differently when pricing services.

The authors' simulation found that hospitals mergers resulted in price increases of up to 58% in highly concentrated markets. When examining the behavioral differences between for-profit and not-for-profit hospitals, the study showed similar responses to increases in market power. In anti-trust cases involving not-for-profit hospitals, the hospital managers commonly defend the mergers by claiming that they will not increase prices since their mission is to serve the community. The authors' findings contradict that. In comparing for-profit and not-for-profit hospitals, the authors found that not-for-profit hospitals have less elastic demand for their services, lower marginal costs, lower prices, and higher price markups. In other words, the study found that the degree of market concentration is what leads to higher prices, not the for-profit status. This analysis runs contrary to the data provided by the IHSP which found that for-profit hospitals charge much higher charge-to-cost ratios.

In "Factors Associated with the Increasing Cost of Hospital Care" (1972),<sup>8</sup> Andersen and May present some basic, yet useful, ideas about the causes of rising hospital costs. Their study looks at the two decades leading up to their paper in 1972, but the concepts they outline are still useful in understanding today's economic environment for hospitals. They discuss "use" and "price" as the two primary components that have caused hospital care costs to rise. Use factors deal with the cost implication of hospitals offering more services. Health care is one of the most rapidly evolving industries, and new procedures, medicine, and equipment are constantly being developed leading to

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<sup>8</sup> Andersen, Ronald and J. Joel May. "Factors Associated with the Increasing Cost of Hospital Care." *The Annals of the American Academy of Political and Social Science*, Vol. 399. 1972.

higher costs. In addition, the sheer rise in population causes increases in hospital costs. Hospitals must serve greater volumes of patients each year simply due to increases in the numbers of people served in the area. Andersen and May describe price factors as including “overall economic factors affecting the hospital, the nature of the care itself, and how efficiently or inefficiently it is given.”<sup>9</sup> They use the Consumer Price Index as a measure of inflation in the economy as a whole, and they note, as I also noted above, that medical inflation has been a little higher than overall inflation. They also note the rising wages and salaries of hospital employees as a contributing factor to rising costs. Finally, the authors take note of the increasingly larger stock of plant and equipment necessary to fulfill hospital care needs and the rising prices of that plant and equipment. The authors concluded that, overall, price factors accounted for 7/8<sup>th</sup> of the increases in costs. In the most basic economic terms, the authors describe rising hospital costs in terms of quantity and price. Their work is useful, however, when considering the structure of hospital costs.

In “The structure of hospital costs: An econometric analysis of short term general hospitals in Maryland” (1992),<sup>10</sup> Philip Kemere examines the hospital cost structure specifically in Maryland. He “examines the effect of input price, output level, hospital location, teaching status, intensity of care, indigent care, utilization rates, and racial composition on hospital costs in Maryland.”<sup>11</sup> The study uses time series data from 1981-1985 for short term general hospitals. Kemere also estimates economies of scale,

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<sup>9</sup> Ibid. p. 14.

<sup>10</sup> Kemere, Philip. “The structure of hospital costs: An econometric analysis of short term general hospitals in Maryland.” Howard University Dissertation. 1992.

<sup>11</sup> Ibid. p. v.

economies of scope,<sup>12</sup> the elasticities of demand for individual inputs, and elasticities of substitution of inputs. With these estimates Kemere is able to make assessments about the ability of hospital managers to manage costs. This can be done by either expanding or scaling down operations, or substituting towards less expensive inputs.

Kemere begins by laying down a framework with which to analyze the hospital market. He reviews the different approaches that have been taken in past literature. In this regard his work supplements the works previously mentioned in this paper. The different approaches described by Kemere provide valuable insight as to the choice of the dependent variable in my econometric model. The first approach is the profit maximization model. In this approach, it is assumed that, given some efficient level of service provided, hospitals attempt to minimize total operating cost. In addition, hospitals charge higher prices for services that are more price inelastic such as ancillary services. This model appears to be unrealistic, however, since hospitals seem to have other goals than just profits. Also, the approach does not account for the significant role that physicians play in hospital management. The next approach is the quantity maximization model which aims to maximize the level of services that hospitals provide and the amount of care that they give to their community. This theory fails in that it downplays the role of profits in hospital behavior. The third approach analyzes hospitals under the assumption that they aim to maximize a utility function that depends on both quantity and quality of service provided. Kemere notes that the “desire to increase quality leads to the over-employment of inputs beyond the profit maximization point.”<sup>13</sup>

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<sup>12</sup> Economies of scope are said to exist if it is cheaper to produce two products jointly than it is to produce them separately.

<sup>13</sup> Kemere, Philip. “The structure of hospital costs: An econometric analysis of short term general hospitals in Maryland.” Howard University Dissertation. 1992. p. 19.

Next is the physician income maximization model. Hospital management is closely tied with its physicians and aims to maximize the income of the physicians. In this model “non-physician inputs are hired up to the point where their marginal contribution to physician revenue is zero.”<sup>14</sup> Finally, the “two firms in one organization model” divides hospitals into two different firms, one being the doctor firm and the other being the administrative firm. In this model the doctor firm is concerned only with providing the services without heed to cost or price. The administrative firm makes decisions about the marginal benefits of different services. While there is no one model that is unanimously accepted or preferred, Kemere adheres most closely to the profit maximization model by assuming in his econometric model that hospitals aim to minimize operating costs.

Kemere then constructs his model using various variables. The dependent variable is total operating costs which are the summation of various hospital operations and services that are provided. The independent variables fall under three different categories. He utilizes four different variables to measure the level of output. These include outpatient visits, pediatric inpatients, adult inpatients, and geriatric inpatients. Next Kemere includes six input price variables, namely administrative, general duty nurse, ancillary, general service, drugs and medical supplies, and capital service. Finally he includes six variables to control for varying hospital characteristics. These variables include medical school affiliation, length of stay, urban/rural location, capacity utilization, CT scan, and indigent care.

Kemere’s results lead to a number of different conclusions. All output levels and input price levels have positive relationships with total operating costs, which makes intuitive sense. As output increases, total operating costs also increase. Kemere’s results

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<sup>14</sup> Ibid. p. 24.

indicate positive but almost negligible economies of scale. According to his parameter estimates and calculations, a 1% increase in the four outputs leads to 0.983% increase in total operating cost. Constant economies of scale cannot be rejected. Kemere did find more economically significant economies of scales for different sized hospitals.

Hospitals with less than 250 beds appear to experience economies of scale and beds with more than 500 beds appear to experience diseconomies of scale. Small hospitals earned a scale coefficient of 1.21 while large hospitals received a scale coefficient of .86. The model found the existence of economies of scope between outpatient visits and pediatric inpatients, as well as between adult inpatients and geriatric patients.<sup>15</sup> Kemere also finds degrees of substitutability between certain inputs: administrative and nursing service, general service and materials, and general and capital services. He also finds complementarity between nursing and general services, nursing and medical supplies, administrative and ancillary labor, and administrative and general service labor.<sup>16</sup>

### **III Results:**

#### **III.i Qualitative:**

Maryland's system provides an interesting case study for government hospital regulation. Evaluating this system is useful in determining the merits of hospital

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<sup>15</sup> Kemere employs a multiproduct cost function for his econometric model. Kemere explains the calculation of economies of scope for this type of model. It is done by taking the second derivative of total cost with respect to the two quantities of outputs in question and compares that value to zero. If the value is less than zero, then economies of scope exist. In chapter three of his dissertation, Kemere shows that this condition will hold if the coefficients of the two output variables in question and the coefficient of their cross-product sum to a negative value.

<sup>16</sup> Kemere arrives at these conclusions about substitutability by calculating elasticities of substitution. These values come from the second derivative of the natural logarithm of cost with respect to the natural logarithm of the two price variables in question. If the value is greater than 1 then the inputs are said to be substitutes. If the value is less than zero then the inputs are said to be complements. If the value is infinity then the inputs are perfect substitutes. If the value equals zero then the inputs are perfect complements and must be used in fixed proportion.



regulation and in making informed judgments about whether it should be extended to other states. Among other states, Oregon has expressed interest in applying a similar system.

As a group, Maryland's hospitals have the lowest charge-to-cost markup ratio among the hospital population of the 50 US states, according to the previously noted IHSP report.<sup>17</sup> As mentioned above, the national average charge-to-cost ratio in 2004 for the 4,222 hospitals in the IHSP report was 244%. Maryland compares with a much lower markup ratio of 123% for the same year. Since the implementation of its hospital regulation plan in 1974, Maryland's hospital gross charges have gone from 25% above the US national average to 6% below. Despite the high level of price regulation, 73.2% of Maryland hospitals reported positive net income, which is on par with the national average.

The agency that monitors and regulates the Maryland hospital market is the Health Services Cost Review Commission (HSCRC). This government agency works alongside hospitals in the state to set the rates that they can charge. The agency was established in 1971 when it underwent a three year "phase in period." It then began enforcing price regulation in 1974 by setting individual rate schedules for each hospital. Originally, the HSCRC's jurisdiction only applied to non-federal payers of health care, meaning they did not set prices for Medicare or Medicaid. However, in 1977 the state of Maryland was granted a waiver, the only one of its kind, which allowed the HSCRC to set the rate schedules for federal payers as well. This is known as the "all payer system" and provides greater power to the HSCRC in its effort to ensure consistency and stability.

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<sup>17</sup> Institute for Health and Socio-economic Policy. "The Third Annual IHSP Hospital 200: The Nation's Most – and Least – Expensive Hospitals Fiscal Year 2003/ 2004." 2005.

Unlike any other state, each payer in Maryland pays the same price whether it be Medicare, Medicaid, uncompensated care provision, private insurance, or a health maintenance organization (HMO). According to Robert Murray, the Executive Director of the HSCRC, the system focuses on controlling costs, not necessarily limiting profit. Since the focus of this study is analyzing the minimization of total operating costs, Maryland's system can be evaluated directly with the econometric model that is the product of my study. Since 1976 Maryland has enjoyed the lowest rate of increase in costs, and as mentioned continues to produce profitable hospitals.

The HSCRC has six main objectives: control cost growth, improve access to care, improve equity in payment and care, improve quality, provide financial stability, and increase transparency and accountability. Murray does not believe that the health care market has the "characteristics of functional competition,"<sup>18</sup> and thus the HSCRC aims to correct these failures with the aforementioned objectives in mind.

The maintenance of hospital pricing is reviewed by analyzing the HSCRC's Reasonableness of Charges report, or ROC. Hospitals are placed in peer groups of similarly structured institutions in the state. According to the HSCRC, "the purpose of these peer groups is to capture differences in rate structures across hospitals that cannot be accounted for directly by various adjustments to charges."<sup>19</sup> Hospitals are held accountable for what they can control, but it is recognized by the HSCRC that there are certain factors that are beyond their control. For this reason before it compares hospitals within peer groups, the HSCRC makes adjustments to standardize the costs faced by

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<sup>18</sup> Murray, Robert. "The Maryland All-Payor Hospital Rate Setting System." Presentation for the Brazilian National Supplementary Health Agency. 2006. p. 13.

<sup>19</sup> Health Services Cost Review Commission, "About the HSCRC." Published on the Maryland state website. 2007.

individual hospitals. These factors include adjustments for the differences in the labor market, direct medical education costs, trauma costs, case mix, disproportionate share, and partial differences in capital costs. The labor market adjustor is included to control for differences in labor costs that are outside of the hospital's control. Factors like location might yield such differences in the labor market. Parts of residents' salaries are removed to standardize direct medical education costs. There are incremental costs associated with operating trauma centers, thus an adjustment is made to standardize these differences. The case mix adjustment is a key standardizing factor. This takes into account the "average patient acuity across hospitals."<sup>20</sup> In other words, different hospitals, due to either location or other factors, will end up providing care for different types of patients with varying levels of health problems. The HSCRC accounts for this by making an adjustment for average acuity. This disproportionate share adjustment takes this concept one step further by accounting for hospitals that care for relatively higher levels of poor patients. Poor patients may incur higher costs for things like getting them qualified for Medicaid or finding a place for them to go upon discharge. The capital costs adjustment smoothes out differences among capital costs by taking half of the individual hospital's capital costs and then half of the average capital costs within the peer group. Once all of these adjustments have been made, the HSCRC continues with its analysis of the ROC and compare hospitals within their peer groups.

With standardized peer groups, the HSCRC makes evaluations on which hospitals need to adjust their pricing rates. If hospitals charge a price markup that is more than 3% above the average for the peer group, then the HSCRC will enter into discussions with that hospital. This hospital will then usually target the peer group average as a goal on a

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<sup>20</sup> Ibid. p. 5.

case by case basis. The system keeps hospitals in check and promotes beneficial competition among them. The HSCRC also pays attention to certain benchmarks, one of which is operating margin. Though a specific operating margin is not mandated, they do use a benchmark operating margin of 2.75%.<sup>21</sup> (Publicly traded, for-profit hospitals can provide some contrast since these firms are generally the system affiliated type of hospital as described in the IHSP report, and financial information is easily accessible since they must file their income statements. According to Yahoo! Finance, the average operating margin for the industry is 7.00%, well above the 2.75% set by Maryland.) However, in an interview with Mr. Murray, he stressed the fact that this is only a benchmark and is not aimed to reduce profits. Traditionally, the average profit margins for Maryland hospitals have been about .5%-1.5% lower than the US national average across all hospitals,<sup>22</sup> but higher profit rates are not prohibited. According to Mr. Murray, “profits are a reward for being efficient under our system just as they are in a competitive market.”<sup>23</sup>

The transparency and accountability aims of the HSCRC also promote beneficial competition. The Maryland Health Care Commission works in partnership with the HSCRC and releases a hospital pricing guide periodically. The guide lists prices at individual hospitals for common health care needs like newborn delivery, pneumonia, chest pain, and heart failure. One of the major factors that causes problems in the hospital care market is the lack of price transparency. It seems that physical proximity to a hospital is often more important than the prices of the services (Gaynor and Vogt

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<sup>21</sup> Phone interview with Robert Murray of the HSCRC. March 15, 2008.

<sup>22</sup> Ibid.

<sup>23</sup> Ibid.

2003).<sup>24</sup> Since the majority of consumers of hospital care pay only a fraction of the price charged by hospitals, not much attention is paid to hospital pricing. This can be detrimental to price competition. If promoted and then utilized by consumers, programs like Maryland's hospital pricing guide can encourage more price transparency in a sector that appears to be lacking it.

As mentioned above,<sup>25</sup> price markup restrictions have led to the lowest markup ratio in the country, and Maryland has had the lowest rate of increase in hospital costs since 1976. The HSCRC has achieved other beneficial results as well. Because cost and pricing structures are evaluated on a case by case basis, the Maryland system eliminates the ability to shift costs. In other words, hospitals in other states might shift the burdens of the cost of expensive and unprofitable services like emergency care into other areas of operation, usually ancillary services. In effect they attempt to make up what they lose in one service by charging more for another. The HSCRC eliminates this problem.

Maryland's health care sector also enjoys the greatest level of stability in the country. Though stability is not a readily quantifiable objective, hospital bond ratings provide an effective approximation. With the highest rated bonds in the country, it can be said that the Maryland health care sector is the most stable by state in the US. In addition, the payment structure is the most equitable in the country. In Maryland, the uninsured pay the same price as the insurance companies that cover the insured which makes sense in an economic as well as ethical framework. They have also achieved a system that does not allow for patient dumping. Oftentimes hospitals will attempt to transfer costly patients with low revenues to other hospitals, usually a non-profit institution. This practice is not

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<sup>24</sup> Gaynor, Martin and William B. Vogt. "Competition Among Hospitals". *RAND Journal of Economics*. Winter 2003. p. 2.

<sup>25</sup> p. 12.

allowed in Maryland. Finally, Maryland hospitals have a reputation for clinical excellence, but this is also where problems with the Maryland plan seep in.

The greatest weakness with a hospital regulation system like Maryland's is that there is little incentive for quality improvement. Hospitals must operate in such a way that they are always searching for cost cutting opportunities. This creates an environment in which there is little incentive to actively seek ways to offer higher quality care which might be more costly. In most industries, sacrificing a certain amount of quality in order to cut costs is not much of an issue, but in the case of health care the implications of lower quality care are much greater since they affect the health of the patients. In addition, hospital profits are extremely important for the progression of health care. For a non-profit hospital, all profits that are generated get poured back into the health care services. In many cases this reinvestment will be in the form of research and development. Maryland hospitals might be more reluctant to engage in research and development since they seek to keep costs down.

The HSCRC recognizes this potential problem, and it seeks to correct it. Quality based reimbursement, or pay for performance (P4P), has gained steam nationally, and Maryland is undergoing its own Quality Initiative that would provide financial incentives for high quality care. The program focuses on quality measurement and appropriate incentives to follow. An Evaluation Work Group exists that conducts periodic assessments of the effectiveness of the system and whether quality targets are being met. The HSCRC claims that the Quality Initiative "will represent one of the broadest quality-based reimbursement systems in the nation."<sup>26</sup> As a side note, for similar reasons that

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<sup>26</sup> Health Services Cost Review Commission, "About the HSCRC." Published on the Maryland state website. 2007.

preventive care reduces long term costs of healthcare, higher quality care does the same by reducing costs of error corrections and other complications, thus higher quality care can in fact reduce hospital costs.

### III.ii Quantitative:

My econometric model used data from 110 hospitals: 45 hospitals from Maryland and 55 hospitals from Virginia. The selection of hospitals will be described in further detail below in the description of the data.

The dependent variable used in the econometric model is total operating costs per hospital bed. This was chosen as the dependent variable for two reasons. First, minimizing hospital cost is one of the foremost goals of the HSCRC. The goal of the model is to determine whether or not the HSCRC has an effect on minimizing hospital costs. Second, the profit maximizing model for hospitals, while not comprehensive in describing hospital behavior, is probably the most applicable. This approach will help in determining whether or not the less regulated hospitals in Virginia behave in the same way as the highly regulated hospitals in Maryland. The dependent variable was originally just total operating costs, but because of problems with heteroskedasticity<sup>27</sup> I divided operating costs by number of hospital beds in order to transform the variable into a ratio.<sup>28</sup> Once this transformation was made, the model was indeed homoskedastic. The dependent variable was also logged due to the high magnitude and wide range of its values. The logged values provide for a more convenient interpretation of the parameter estimates.

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<sup>27</sup> Heteroskedasticity occurs when the variance alters across different segments of the sample population. Since the standard error is used to calculate t-statistics, it makes the values of the t-statistics inaccurate.

<sup>28</sup> Using ratios rather than a unit based dependent variable such as dollars is a technique commonly used in order to combat heteroskedasticity.

On the right side of the equation the independent variables begin with pediatric discharges. This is defined as the volume of discharges for patients age 15 and younger. Next is adult discharges which is defined as the volume of discharges for patients between the ages of 15 and 65. Next is geriatric discharges which is defined as the volume of discharges for patients age 65 and older. Geriatric discharges was followed with the inclusion of outpatient visits. The next variable included is emergency room admissions. ER admissions is followed by a proxy variable for time spent in open heart surgery. This is calculated by summing the volume of discharges from four different Medicare Diagnosis Related Groups (DRG). This includes DRGs 104-107, namely cardiac valve and other major cardiothoracic procedures with cardiac catheterization, cardiac valve and other major cardiothoracic procedures without cardiac catheterization, coronary bypass with percutaneous transluminal coronary angioplasty, and coronary bypass with cardiac catheterization. Pediatric, adult, and geriatric discharges, outpatient visits, ER admissions, and time spent in open heart surgery parallel the output variables included in Kemere's model and provide a rough approximation for the level of output of the hospitals.

The average hourly wages for administrative and general employees as well as average hourly wages for nursing administration workers were included next. These variables were incorporated into the model in order gauge differences in labor costs across the states.<sup>29</sup> The values were transformed into logarithms so that they could be interpreted as elasticities.

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<sup>29</sup> A number of input price variables were not included because of insufficient data. Drug and medical supplies costs were included in the HCRIS report, but there were minimal observations. Nursing administration salaries were used instead of general duty nurse salaries due to problems in locating data on those salaries.



Seven variables were included as control variables. First was a variable for capacity utilization. This was calculated by dividing total inpatient days by total bed days available in the hospital. Total bed days available was calculated by multiplying the number of beds in the hospital by 365 days. The second variable included was average length of stay. This value was calculated by dividing total inpatient days by total inpatient discharges. This variable was included in order to account for differences in costs that would result from shorter or longer hospital stays. Next was a dummy variable for location. This was included to catch differences in costs that might result from being located in an urban or rural area. Observations received a zero-value if located in a rural area and a one-value if located in an urban area. The third control variable was a dummy variable for type of hospital. For-profit (investor owned) hospitals received a one-value. Not-for-profit and government hospitals received a zero-value. This variable was included for two reasons. One was to control for differences in how different hospitals might behave. Second was to observe *if* different types of hospitals do in fact behave differently as suggested by Newhouse (1970) and others. Two additional variables were included for magnetic resonance imaging (MRI) machines and computed tomography scanners (CT scan). Hospitals received one-values if they operate MRIs or CT scans and zero-values if they do not. These variables were included because the equipment is costly to operate, and its presence would be expected to have a substantial impact on the dependent variable. In addition they act as proxy variables for overall level of technology at the hospital. The log of total hospital beds was included as the seventh control variable. This means that the log of total hospital beds appears on both sides of the equation: a scale factor as part of the dependent variable and also as an explanatory

factor. This should not make the econometric invalid, however. The independent variable includes total operating costs which are related to both short run expenses and capital stock. Hospital beds is essentially a measure of capital stock which cannot be altered in the short run. This makes hospital beds an effective scale factor.

My hope in constructing my regression was that the aforementioned independent variables would sufficiently capture the structure of total operating costs. I then added a dummy variable for state. This was introduced in order to determine whether differences exist between states that are not captured by the other variables included. Hospitals receive a zero-value if they are located in Maryland and a one-value if they are located in Virginia. Assuming that the other variables sufficiently control for other factors that affect total operating cost, then a positive, significant parameter estimate would indicate that the Maryland regulation system makes a beneficial difference.

Data was compiled from three different sources. I began with a dataset 163 hospitals from Maryland and Virginia from the 2005 Healthcare Cost Report Information System (HCRIS). State Level Patient Data was then added to the dataset. Forty-two observations were dropped from the original HCRIS dataset since data on these hospitals was not available in the second dataset. I then added data from the 2005 American Hospital Association (AHA) guide. This led to an additional 11 hospitals being dropped from the dataset since data was not available for these hospitals in the AHA guide. This limited the dataset to a final number of 110 hospitals of which 55 are located in Virginia and 45 are located in Maryland. Total operating costs, administrative and general salaries, nursing administrative salaries, capacity utilization, length of stay, total hospital beds, and urban dummy were taken from the HCRIS dataset. Pediatric discharges, adult

discharges, geriatric discharges, ER admissions, and time spent in open heart surgery were taken from State Level Patient Data. Outpatient visits, for-profit dummy, MRI dummy, CT scan dummy, and state dummy were taken from the AHA guide.

The table below provides the results from the regression that was run. The last two columns represent the confidence levels for the different variables. A check in the 5% column indicates that a variable is significant on a 95% confidence level. A check in the 10% column indicates that the variable is significant on a 90% confidence level. The parameter estimates are discussed in further detail below.

**Table of results:**

| <b>Variable</b>                | <b>Coefficient</b> | <b>Standard error</b> | <b>t-stat</b> | <b>&lt;5%</b> | <b>&lt;10%</b> |
|--------------------------------|--------------------|-----------------------|---------------|---------------|----------------|
| Pediatric discharges           | 0.0000289          | 0.0001205             | 0.24          |               |                |
| Adult discharges               | 0.0000782          | 0.0000221             | 3.54          | x             |                |
| Geriatric discharges           | 0.0000332          | 0.0000333             | 1.00          |               |                |
| ER admissions                  | 0.0000259          | 0.0000286             | 0.91          |               |                |
| Outpatient visits              | 0.00000065         | 0.00000031            | 2.07          | x             |                |
| Heart surgery                  | 0.0001516          | 0.0003124             | 0.49          |               |                |
| Log Administrator wage         | 0.464293           | 0.1365512             | 3.4           | x             |                |
| Log Nursing administrator wage | 0.0537828          | 0.1627619             | 0.33          |               |                |
| Urban dummy                    | 0.1055244          | 0.0892099             | 1.18          |               |                |
| Capacity utilization           | 1.001368           | 0.2460917             | 4.07          | x             |                |
| Length of stay                 | -0.0111654         | 0.0314404             | -0.36         |               |                |
| For profit dummy               | -0.2780159         | 0.1026161             | -2.71         | x             |                |
| CT scan dummy                  | -0.0292982         | 0.2421292             | -0.12         |               |                |
| MRI dummy                      | 0.1537607          | 0.0869766             | 1.77          |               | x              |
| Log beds                       | -0.8805097         | 0.0361762             | -24.34        | x             |                |
| State dummy                    | 0.1239822          | 0.0875153             | 1.42          |               |                |
| Constant                       | 14.58412           | 0.6729549             | 21.67         | x             |                |
| <b>Adjusted R-squared</b>      | 0.8942             |                       |               |               |                |

The model created was highly descriptive of total operating costs per bed with an adjusted R-squared of .8793. Since the dependent variable was logged, independent variable parameter estimates will be interpreted as approximate percentage changes in total operating costs per bed. The first variable was total pediatric discharges. Its

coefficient was .0000289 indicating that an increase of 1,000 pediatric discharges would lead to a 2.89% increase in total operating costs per bed. It had a t-statistic of 0.24, making it statistically insignificant on its own on a 95% confidence level. Total adult discharges had a coefficient of .0000782 meaning that an increase of 1,000 adult discharges would lead to a 7.82% increase in total operating costs per bed. This variable had a t-statistic of 3.54, making it statistically significant on a 95% confidence level. Total geriatric charges had a coefficient of .0000332 which signifies that an increase of 1,000 geriatric discharges would lead to a 3.32% increase in total operating costs per bed. This variable proved statistically insignificant on its own with a t-statistic of 1.00. Emergency room admissions had a coefficient of .0000259 indicating that an increase of 1,000 ER admissions would result in a 2.59% increase in total operating costs per bed. This variable was statistically insignificant on its own with a t-statistic of 0.91. Next was the proxy variable for time spent in open heart surgery. This variable had a parameter estimate of .0001516, meaning that an increase of 1,000 heart surgery discharges would result in a 15.2% increase in total operating costs per bed. This variable had a t-statistic of only 0.49 making it statistically insignificant on its own. Outpatient visits was the final output level variable included in the model. This variable had a coefficient of .000000647, signifying that a 1,000 value increase in outpatient visits would lead to .0647% increase in total operating costs per bed. This variable had a t-statistic of 2.07, also making it statistically significant on a 95% confidence level.

Of these six output level variables, only adult discharges and outpatient visits were statistically significant on their own on a 95% confidence level. These six variables were an important part of the model, however, so I examined them further. I performed

an f-test to test their joint significance. These variables were in fact found to be jointly significant, even though four of them were singularly insignificant.

The next variables included were the input price variables for administrative and general wages and nursing administrative wages. Since both the dependent and independent variables are in logarithmic form, these estimates are interpreted as elasticities. The log of administrative and general wages had a coefficient of .4643 indicating that a 10% increase in administrative salaries would lead to a 4.64% increase in total operating costs per bed. This variable had a t-statistic of 3.40 making it statistically significant. The log of nursing administration wages had a parameter estimate of .0538, meaning that a 10% increase in nursing administration wages would lead to a 0.54% increase in total operating costs per bed. This variable had a t-statistic of only 0.33, making it statistically insignificant.

As mentioned, various control variables were included next. The first is capacity utilization which had a parameter estimate of 1.001. Since this variable is a percentage it has a slightly different interpretation. According to the parameter estimate given, a 1 percentage point increase in capacity utilization (i.e. from 50% utilization to 51% utilization) results in a 1.001% increase in total operating costs per bed. This variable had a t-statistic of 4.07, making it statistically significant. This was followed by the dummy variable for location. The coefficient for this variable was .1055 indicating that, all else equal, urban hospitals incurred total operating costs per bed that were about 10.55% higher than hospitals located in rural areas. The t-statistic of 1.18 made this variable statistically insignificant. Next was the for-profit dummy variable. The parameter estimate for this variable was -.2780 meaning that, all else equal, for-profit

hospitals' total operating costs per bed were about 28% lower than those of not-for-profit or government hospitals. This dummy variable had a t-statistic of -2.71 making it statistically significant. The next control variable included was the average length of stay. This variable had a parameter estimate of -.0112 indicating that a ten day increase in the average length of stay reduces total operating costs per bed by .11%. Next, dummy variables were included for whether or not the hospitals operate CT scans and/or MRI's. The dummy variable for CT scan had a parameter estimate of -.0293 which means that, all else equal, total operating costs per bed were about 3% less for hospitals that operate CT scans. This variable had a t-statistic of -0.12 making it statistically insignificant. The MRI dummy variable had a coefficient of 0.1538 indicating that total operating costs per bed were about 15.4% higher for hospitals that operate MRI's, all else equal. This variable was statistically significant on a 90% confidence level with a t-statistic of 1.77.

Next, the log of hospital beds was included. This variable had a coefficient of -0.8805. Since hospital beds appears both on the left hand side of the equation as a scale factor and as an explanatory variable on the right hand side, some simple algebra is necessary in order to calculate the appropriate coefficient. I added the log of hospital beds to both sides which eliminates it from the left hand side. Combining the two coefficients on log of hospital beds on the right hand side, those values being 1 and -0.8805, the parameter estimate becomes .1195. Once again since both the dependent and independent variables are logs, this value is interpreted as an elasticity. Thus a 10% increase in the number of hospital beds leads to a 1.2% increase in total operating costs. This variable was statistically significant.

Finally, the dummy variable for state was included. State had a coefficient of .0971, indicating that, all else equal, hospitals in Virginia incurred total operating costs per bed that were about 9.7% higher than the total operating costs per bed for hospitals in Maryland. This variable had a t-statistic of 1.18, making it statistically insignificant on a 95% confidence level. This variable was kept in the model in the interest of examination and discussion moving forward.

#### **IV. Conclusions:**

With an adjusted R-squared of .8492, the econometric model created appears to be highly descriptive of the structure of total operating costs. Within this model, the purpose of this study was to determine whether or not the Maryland regulation system has an impact on reducing hospital operating costs since this is one of its main objectives. This is approximated in the model by interpreting the estimates on the dummy variable for state, be it Maryland or Virginia. This main objective of this thesis will be addressed in detail momentarily, but first will be analysis of other pertinent conclusions from the data.

Four of the six output variables (pediatric, adult, geriatric, time spent in open heart surgery, ER admissions, and outpatient visits) were statistically insignificant on their own. Only adult discharges and outpatient visits were statistically significant on their own on the 95% confidence level. The six variables were, however, proven jointly significant. Some of these variables had negative parameter estimates in earlier regressions that I ran during this study which did not make economic sense. Other studies such as “Hospital Efficiency and Indigent Care” (Campbell 1990) ran into similar

problems. In the final regression I settled on for this study, all output variables behaved according to my a priori hypotheses, i.e. that as each output variable increases, total operating costs also increases. Hopefully this is an indication that the final model is an effective one.

The location variable for urban versus rural yielded some interesting results. Urban hospitals were found to be 10.6% more costly than rural hospitals, all else equal. The exact reason for this result is unclear, but it could possibly result from the populations that surround these hospitals. For instance, urban environments probably have higher rates of violence which leads to a greater volume of complex hospital care. In addition, disease might spread faster in a highly populated, urban area. Another possibility is that the wages of employees that were not included in this model might be higher in urban areas. The availability and use of more expansive datasets could potentially shed more light on this issue.

One parameter estimate that did not seem to make much economic sense was the dummy variable for CT scan. The interpretation of this variable said that on average, hospitals with CT scans incurred 3% lower operating costs than those without, all else equal. CT scans are costly to operate, thus it would seem that operating CT scans should have a positive effect on operating costs, not a negative one. Perhaps operating CT scans is indicative of more sophisticated hospitals that operate more efficiently. In any case, the variable was highly insignificant with a t-statistic of only -0.12. The MRI variable behaved more according to my intuition. The variable had a positive impact on total operating costs per bed.



The behavior of for-profit versus not-for-profit hospitals was of particular interest of this study. The regression found that on average, for-profit hospitals incurred total operating costs that were about 28% less than that of not-for-profit hospitals, all else equal. My initial hypothesis was that the two types of hospitals would either be about equivalent in behavior, or that for-profit hospitals would incur lower costs. The logic is as follows. A sensible explanation arises from examining hospital behavior with the assumption of profit maximization. Under this assumption both for-profit and not-for-profit hospitals aim to minimize costs and then charge a price that is higher than that cost. In this instance, both types of hospitals would behave in essentially the same way. However, not-for-profit hospitals might have alternative objectives as well, as noted in Kemere and others. This might include maximizing the quantity of care provided to the community. This might lead to providing a higher level of uncompensated care. It could also result in the overutilization of inputs beyond the point of efficiency as mentioned by Kemere and others.

A main objective of the Health Services Cost Review Commission of Maryland is to reduce hospital costs. According to the regression, the total operating costs per bed for hospitals in Maryland were approximately 10% less than that for Virginia hospitals. This would be a strong indicator that the HSCRC has a positive impact on reducing hospital costs as long as there are not other factors that make Maryland and Virginia hospitals different. With a t-statistic of only 1.18, however, the null hypothesis that the coefficient is equal to zero cannot be rejected on a 95% confidence level. This means that, according to the regression that was run, it is possible that the Maryland regulation system has no impact on reducing hospital costs, but it is still more likely that it does.

Having no impact on reducing costs could be easily explained. First of all, if the assumption is made that hospitals in Maryland and Virginia are both profit maximizing institutions, then hospitals in both states would aim to minimize their costs and then charge a price higher than that minimized cost in order to attain a profit. This follows the same logic as was presented for for-profit and not-for-profit hospitals. In this case, hospitals in both states take the necessary steps in order to minimize cost. Hospitals would not need a regulatory agency to encourage the minimization of costs because that is already the objective of the institutions. An efficient, properly functioning hospital would be able to make sound economic decisions about the cost structure of their services. Especially once for-profit versus not-for-profit has been controlled for, the profit maximization assumption would lead one to believe that hospitals in Maryland and Virginia would behave in the exact same way with respect to cost.

Another factor that would encourage similar behavior in both states is the Medicare Prospective Payment System (PPS). Implemented in 1983, this system sets the reimbursement schedules for hospitals for patients that qualify for Medicare. Each Medicare patient is classified in a Diagnosis Related Group (DRG) based on clinical information. Medicare calculates the average cost for providing each service. Hospitals are then reimbursed the mean cost of each DRG by Medicare. Hospitals that are able to provide the service below the average cost of the DRG are able to earn a profit. Those that cannot provide the service at mean cost are forced to absorb the loss. Hospitals therefore seek to provide each hospital service at or below the DRG average cost. This system is beneficial, first of all, because it encourages competition among hospitals.

Hospitals that operate efficiently are rewarded with profits. Hospitals that do not operate efficiently are penalized and forced to find ways to work more properly.

This system is also important in the context of this analysis. The Medicare PPS encourages, or one could even say forces, hospitals to minimize costs for Medicare services if they are to be successful. If hospitals are able to provide a service at a lower cost for Medicare patients, then clearly they will follow the same steps to minimize costs in providing the same services to other patients since it will increase their profits. Even though Virginia lacks an agency like the HSCRC of Maryland, the Medicare Prospective Payment System acts in a similar way to make sure that hospitals minimize costs. If this is indeed the case, then one would expect that the state variable in the regression would be insignificant. The regression that was run for this study was inconclusive. The coefficient indicated that the HSCRC has a positive impact on minimizing costs, but the null hypothesis that the system does not affect hospital cost structure could not be rejected.

While the HSCRC states that the regulation system is about minimizing costs, not necessarily limiting profits, there are merits to the system with respect to reducing prices. Maryland does have the lowest price markup on hospital services in the country. It would be difficult to argue that the HSCRC does not have a substantial impact on that fact. Judging by the information provided in the qualitative results section of this study, the Maryland regulation system succeeds in making health care more affordable and accessible to its citizens. Maryland has the most equitable system in the country since all payers, Medicare and privately insured patients included, are charged the same price for the same service. In addition, the fact that Maryland has the most stable hospital sector in

the country, judging by hospital bond ratings, should not be overlooked. Whether or not this results directly from the regulation system is debatable, however it would seem likely that the HSCRC has at least some positive effect on hospital market stability in Maryland. Even if one rejects that Maryland's system aids in reducing hospitals' costs, it is difficult to refute that the system does not yield substantial benefits for patients.

With so many issues affecting the US health care system, it seems that government regulation is necessary in order to make the hospital market operate more efficiently and equitably. Perhaps a similar system could benefit other states like New Jersey, Pennsylvania, and California that have the highest charge-to-cost markups in the country. An agency like the HSCRC could help make health care more affordable and accessible in these and other states. Under Governor Mitt Romney, Massachusetts recently passed legislation that effectively forces all of its citizens to insure themselves. Those who do not purchase health insurance must pay penalties. One of the criticisms of the legislation is that there is no regulation in place to control health care costs. Citizens are forced to purchase health insurance, but insurance may become more and more costly without any controls in place. A system like Maryland's could provide a solution for Massachusetts as well.

The Maryland system certainly does not solve all of the problems that plague the US health care system; however, in my opinion, the benefits of the system are many. Implementing the system in other states could be the first step towards making the US health care system operate more effectively and equitably.

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