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Does State Community Benefits Regulation Influence Charity Care and Operational Efficiency in U.S. Non-profit Hospitals?

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Abstract

Using a comprehensive sample of U.S. non-profit hospitals from 2011 to 2015, we examine the effects of state community benefits regulation (CBR) on the amount of charity care provided by and the operational efficiency of U.S. non-profit hospitals. First, we document that, under such regulations, non-profit hospitals provide more charity care and less compensated care as a proportion of net revenue. We infer from these findings that CBR has the potential to increase both non-profit hospitals' amount of charity care and their efficiency of operations. Second, by examining variation in CBR types, we find no differences between having provision or having reporting requirements on the amount of charity care offered. Moreover, when we consider CBR with both provision and reporting requirements, the combination of these two requirements does not incrementally enhance charity care offerings, suggesting that the requirements may serve as substitutes with comparable effect. Lastly, we show that several state-level characteristics influence the relationship between CBR and charity care: CBRs in states with a higher gross domestic product and percentage of revenue received in taxes have incrementally lower associations with charity care, while hospitals in states where populations have, on average, higher household incomes have greater associations between CBR and charity care. Our findings highlight the effects that state-enacted regulation can have on socially beneficial behavior by non-profits.

Keywords

Hospitals, Non-profit, Regulation, Social benefits, Charity care

Disciplines

Accounting | Business Law, Public Responsibility, and Ethics | Finance and Financial Management | Nonprofit Administration and Management | Strategic Management Policy

Comments

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ABSTRACT: Using a comprehensive sample of U.S. non-profit hospitals from 2011 to 2015, we examine the effects of state community benefits regulation (CBR) on the amount of charity care provided by and the operational efficiency of U.S. non-profit hospitals. First, we document that, under such regulations, non-profit hospitals provide more charity care and less compensated care as a proportion of net revenue. We infer from these findings that CBR has the potential to increase both non-profit hospitals' amount of charity care and their efficiency of operations. Second, by examining variation in CBR types, we find no differences between having provision or having reporting requirements on the amount of charity care offered. Moreover, when we consider CBR with both provision and reporting requirements, the combination of these two requirements does not incrementally enhance charity care offerings, suggesting that the requirements may serve as substitutes with comparable effect. Lastly, we show that several state-level characteristics influence the relationship between CBR and charity care: CBRs in states with a higher gross domestic product and percentage of revenue received in taxes have incrementally lower associations with charity care, while hospitals in states where populations have, on average, higher household incomes have greater associations between CBR and charity care. Our findings highlight the effects that state-enacted regulation can have on socially beneficial behavior by non-profits.

Running title: State community benefits regulation and non-profit hospital charity care

Data availability: All data are publicly available as identified in the text.

Keywords: *hospitals; non-profit; regulation; social benefits; charity care.*

Does State Community Benefits Regulation Influence Charity Care and Operational Efficiency in U.S. Non-profit Hospitals?

1. Introduction

This study examines the effects of state regulation on the amount of charity care provided by and the operational efficiency of U.S. non-profit hospitals. Non-profit organizations represent a large and rapidly growing sector of the U.S. economy, with healthcare non-profits dominating other non-profits in terms of labor employment.[1] Non-profit hospitals, by their mission, also serve society by providing free or low-cost healthcare services (community benefits) to underprivileged constituents.[2] In exchange for providing community benefits, non-profit hospitals receive income, sales, and property tax exemptions.[3] Recently, non-profit hospitals have been criticized for reporting high positive earnings, without equitably contributing back to the community (e.g., Everson 2005; Phillips 2007; Gordon 2013; Rosenthal 2013; Sesana 2014; Bai and Anderson 2016; Kassab 2016; Lee 2016; Sun 2016).[4] In some cases, a non-profit hospital's tax-exempt status has been revoked by its municipality, and such revocations have been upheld in court (Gialanella 2017).

Our study is further motivated by the tightening of the state regulatory environment

[1] Specifically, over the period from 2007 through 2012, non-profit employment increased by 8.5%, from 10.5 to 11.4 million jobs in the U.S. Over that same period, the number of non-profit organizations increased by 15% (Friesenhahn 2016). The non-profit healthcare sector provides 57% of non-profit jobs (Lambert 2013).

[2] The Henry J. Kaiser Family Foundation reported that more than 72 million (~23% of the population) Americans were without health insurance coverage or federal care benefits coverage in 2013, and that these individuals incurred an average of $2,443 in annual health care costs (Coughlin et al. 2014).

[3] The U.S. Government Accountability Office (2008) describes community benefits as the provision of charity care, health education, and screening services to specific vulnerable populations within a community, as well as activities that benefit the greater public good, such as education for medical professionals and medical research. Charity care is a cost of medical services provided free of charge or at discounted prices to patients. A hospital typically reports on its earnings statement an item called "uncompensated care," which encompasses all community benefits provided. To vary the exposition, we use the terms "uncompensated care," "charity care," and "community benefits" interchangeably.

[4] Non-profit hospitals, as with all other non-profits, cannot distribute residual income to internal or external stakeholders (Eldenburg et al. 2015). Non-profits can reinvest earnings into new projects/expansions, offer more charity care, or accumulate earnings in an "unrestricted net position," an equivalent to retained earnings in a for-profit organization.

related to hospitals providing benefits to the community (Hellinger 2009). Specifically, many U.S. states have established community benefits regulation (CBR) to promote additional charitable offerings and to improve non-profit hospitals' compliance with state requirements in order to maintain tax exemption (Hellinger 2009; Hilltop Institute 2017b). Broadly stated, we are interested in testing whether state-level CBR is effective. For this purpose, using a large sample of U.S. non-profit hospitals from 2011 to 2015, we first investigate how CBR is associated with the level of charity care offered by non-profit hospitals.

If CBR increases non-profit hospitals' charity care, it would naturally put downward pressure on their profitability. However, managers are unlikely to sacrifice completely the economic surpluses of their hospitals for the sake of greater charity care offerings. Consistent with this premise, existing literature has demonstrated that non-profit hospital managers have incentives to improve operating performance, often emulating those incentive contracts found in for-profit firms (Duggan 2000; Brickley and Van Horn 2002; Eldenburg et al. 2011). Therefore, we also examine whether CBR is associated with the operational efficiency of non-profit hospitals in generating revenue through compensated care.

In order to perform our tests, we examine the costs reported by non-profit hospitals as a proportion of net revenue. Those costs representing community benefits we term *uncompensated care costs*. In contrast, *compensated care costs* are costs attributed to revenues from paying/insured patients. We measure operational efficiency by observing a decrease in compensated care costs as a proportion of net revenue. We find that, as a proportion of net revenue, CBR is associated with 20.2% higher uncompensated care costs and 5.7% lower compensated care costs. We infer that non-profit hospital managers in states with CBR have higher offerings of community benefits and more efficient operations. Furthermore, when we

examine total costs (including both expenditures related to charity care and compensated care) as a proportion of net revenue, we find that non-profit hospitals in states with CBR have 1.5% lower total costs, suggesting that the operational efficiency more than offsets additional charity care offerings.

Next, we examine the heterogeneity of the requirements in states' CBRs. Specifically, we test whether *provision* or *reporting* requirements or a combination of *both* provision and reporting are equally associated with greater charity care costs. We do not find differences in uncompensated care costs between states that require only provision of community benefits and states that require only reporting of community benefits. Further, we find that if a state requires both provision and reporting, the combination of these CBR types does not incrementally increase community benefits. Therefore, there appears to be a significant overlap in the regulatory effects of provision and reporting requirements. Although the combination of provision and reporting may not enhance charity care offerings, hospitals in states with both types of CBR still offer more uncompensated care than non-profit hospitals in states without CBR.

Having established that CBR is positively associated with the amount of charity care, in further exploratory analysis, we seek to determine which, if any, state-level characteristics influence this relationship. We find that the effectiveness of CBR diminishes relative to increases in the level of state gross domestic product (GDP) and the proportion of state revenue received in taxes, suggesting that states with fewer resources gain more from such regulation. Finally, we find a greater association between charity care and CBR in states with higher median household income. Based on these empirical results, we infer that states with higher household incomes have populations better able to cover their medical expenses, potentially allowing hospitals to be

less constrained in offering charity care to the indigent.

We make two important contributions to the literature. First, our study provides generalizable large-sample evidence for testing whether state-level regulation of community benefits is associated with non-profit hospitals' uncompensated care. Most of the existing empirical literature focuses on hospitals in one state, such as California or Texas (e.g., Vansant 2015; Eldenburg et al. 2015; Krishnan and Yetman 2011; Kennedy et al. 2010), limiting the inferences that can be drawn about the effectiveness of regulation. In contrast, we examine charity care costs and operating efficiency across many states to take advantage of heterogeneity in state-level regulation. Second, we contribute to a growing stream of health economics literature that studies charity care in hospitals (e.g., Kim et al. 2009; Bai 2013; Eldenburg et al. 2015). We provide additional evidence that state regulation targeting uncompensated care is indeed associated with higher levels of charity care provided.

The rest of the paper proceeds as follows. In section two we review existing literature and state our hypotheses. Section three describes the empirical model and variables. In section four we describe the sample. We present empirical findings in section five, and in section six we summarize and conclude.

2. Literature review and hypothesis development

Non-profit hospitals' incentives to provide charity care

Unlike managers of public corporations that have a primary goal of providing shareholders a return on their investment, best captured by reporting a steady stream of increasing earnings (Demerjian et al. 2017), governing bodies expect managers of non-profits to conform to a different mission—that of providing a public benefit. In exchange for providing public benefits,

a non-profit organization is exempt from paying taxes.[5] The non-profit ownership structure requires that the organization either retain or reinvest or else distribute profits in the form of community benefits.

Reported earnings allow the public to observe non-profit managers' trade-off between retaining and distributing profits. All else being equal, distributing profits in the form of community benefits decreases the level of reported earnings. Survey evidence shows that respondents react negatively to non-profits' tax-exempt status when their reported earnings are high, suggesting that people prefer non-profits to distribute their surpluses as uncompensated services rather than retain them (Wilkicki 2001). If a non-profit hospital's manager were to report excess earnings (choosing to retain rather than to distribute profits in the form of community benefits), the hospital would risk incurring a federal excise tax or even losing its federal or state tax-exempt status (Smith 2005).[6]

However, non-profit managers also have incentives to demonstrate that their organization is a viable going concern. Existing empirical evidence suggests that non-profit CEOs' compensation is related to financial performance (Brickley and Van Horn 2002). Eldenburg and Krishnan (2008) argue and find evidence that, in response to compensation incentives, non-profit managers demand information about cost reductions and equipment and operating expenditures. Moreover, Eldenburg et al. (2011) provide evidence that non-profit managers respond to compensation incentives by using real activities manipulations that reduce expenditures.

[5] As of 2010, non-profit hospitals also need to comply with expanded requirements, added under the Affordable Care Act, such as limitations on the charges for emergency and necessary medical care services for individuals who qualify under hospital medical assistance programs (https://www.irs.gov/Charities-&-Non-profits/Charitable-Organizations/New-Requirements-for-501(c)(3)-Hospitals-Under-the-Affordable-Care-Act).

[6] In some cases, local governments perceived the under-provision of public benefits to be sufficiently significant to revoke a hospital's non-profit status. Such revocations have been upheld in the state court system. For instance, in 2008 the Illinois Fourth District Court of Appeals ruled in *Provena Covenant Medical Center v. the Department of Revenue* (2010) that Provena Covenant Medical Center did not provide enough charity care in 2002 to merit $1.1 million in property tax exemption. The ruling by the appellate court was upheld on March 18, 2010, by the Illinois Supreme Court (http://www.illinoiscourts.gov/opinions/supremecourt/2010/march/107328.pdf).

Furthermore, Eldenburg et al. (2015) show that financial performance measures are prevalent within incentive compensation structures in large non-profit hospitals; they argue that more competitive environments and greater cost pressures have increased non-profit hospitals' reliance on profit-based compensation contracts. However, Eldenburg et al. (2015) also show that non-profit managers are not penalized through lower compensation for charity care offerings.[7]

In sum, the incentive literature suggests that constituents expect non-profit managers to run an operationally efficient entity that distributes profits in the form of uncompensated care. However, recent media reports on the profitability of non-profit hospitals have raised significant concerns that non-profit hospitals are not contributing sufficiently to society to justify their tax-exempt status (Gordon 2013; Sesana 2014; Lee 2016). In fact, a recent study in *Health Affairs* reports that seven out of the top ten most profitable hospitals in the U.S. in 2013 were non-profit, with the highest return on patient care of over $302 million (Meyer 2016).

Role of community benefits regulation

To increase non-profit hospitals' offering of and accountability for charity care, many states in the U.S. have enacted some form of CBR. As of 2009, 15 states had such regulation (Hellinger 2009). The trend continued, and by the end of 2015, 34 states had enacted community benefits provision and/or reporting requirements (Cronin 2015; Hilltop Institute 2017a). Provision requirements can take the form of a prescribed set of persons that must be offered charity care, prescribed types or amounts of uncompensated services offered, and/or charity care requirements for facility investment or expansion. Reporting requirements can range from a statement of commitment to community benefit reporting to detailed information regarding the provision of uncompensated care, often including detailed charity care costs and even patient information

[7] In fact, there is some evidence that non-profit managers' compensation can be based on measures that reduce earnings (Preyra and Pink 2001).

(Hilltop Institute 2017a).

While the definition of community benefits varies by state, the purpose of CBR is, generally, to ensure that hospitals offer public benefits and provide greater transparency about the level of charitable care offered in return for their non-profit status with state-level tax exemptions (Hellinger 2009).[8] There is some preliminary evidence that, among those few states that enacted CBR in earlier years, the level of uncompensated care offered by non-profit hospitals increased (Sutton and Stensland 2004; U.S. Congressional Budget Office 2006; Kennedy et al. 2010). We begin our study by examining whether CBR is associated with greater charity care offerings by non-profit managers, and we hypothesize a positive association:

H1: *CBR is positively associated with non-profit hospitals' uncompensated care.*

Although we hypothesize a higher level of charity care associated with CBR, we do not expect CBR to alleviate pressure on managers to maintain a hospital as a viable going concern. On the contrary, greater outlay of charity care may put added pressure on a manager to operate efficiently because the manager is still expected to maintain a certain level of positive earnings. As such, we expect that the increased pressure exerted by CBR on managers to provide charity care will have a positive second-order effect on non-profit hospitals' operating efficiency. That is, we expect managers to offset the additional cost of higher uncompensated care by improving the profit margin on compensated care through greater operational efficiency. This leads to our

[8] At the federal level, effective 2008, the Internal Revenue Service (IRS) added "Schedule H: Hospitals" to Form 990. Schedule H requires non-profit hospitals to disclose standardized information about community benefits. Its purpose was "to promote transparency and compliance… to develop risk models to assess the likelihood of noncompliance by organizations, allowing more effective use of examination resources" (IRS 2012). We expect the enhanced IRS oversight, effective 2008, to result in greater compliance (i.e., community benefit provision) across all federally tax-exempt hospitals across all states. It is possible that the enhanced oversight offered by Form 990, Schedule H would subsume any regulatory effects of state-level CBR, offering a plausible null hypothesis for our study. Further, non-profit status, although often associated with federal tax-exempt status, is a distinct state-level concept. That is, only states may revoke a hospital's non-profit status (and the accompanying state-level tax benefits), whereas the IRS can only revoke federal tax-exempt status (IRS 2017). Thus, because each level of government has its own jurisdiction, we expect that state CBR offers an incremental level of governance to that offered at the federal level.

second hypothesis:

H2: *CBR is positively associated with non-profit hospitals' operational efficiency.*

3. Measurement of variables and model specification

Hospital care costs

Our main variable of interest is a proxy for the level of community benefits provided by hospitals. Following Kennedy et al. (2010), we measure community benefits provided as the cost of health services provided during any given year for which a hospital demonstrates that the patient is unable to pay as well as its voluntary education, extension, and outreach programs (charity care provided), plus the cost of health services for which a hospital expected a patient had the financial capacity to pay but was unwilling or unable to settle the claim (bad debt expense).[9] To align our terminology with that of Medicare Cost Reports (MCRs), we refer to such costs as *uncompensated care costs*.[10] Such uncompensated care costs are net of any payments received from patients approved for charity care. We scale uncompensated care costs by net revenues to facilitate comparisons among hospitals.[11] Our main proxy for the costs of community benefits provided by the hospital, termed UCC_t, is the natural logarithm of uncompensated care costs scaled by net revenues. We purposely exclude from the cost of

[9] Bad debt expense includes only non-Medicare bad debt costs and non-reimbursable Medicare bad debt costs (MCR Worksheet S-10, line 29).

[10] In hospital accounting systems, all patient services provided are recorded at gross charges (gross patient care revenue). When a patient is approved for charity care, the hospital writes off those changes via contractual allowance. On MCR Worksheet S-10, charity care and bad debt expense are calculated by multiplying charity care and bad debt charges by the cost-to-charge ratio (CCR). To alleviate the concerns that managers over-report charity care by inflating uncompensated care charges, we control for variation in CCRs across hospitals in our empirical model.

[11] Existing literature differs in the approaches used to measure and scale charity care costs. Vansant (2015) uses gross charity care charges and scales them by total assets; Eldenburg et al. (2004) and Bai (2013) scale the metric of uncompensated care charges by gross patient revenues. Both Vansant (2015) and Eldenburg et al. (2004) rely on California's Office of Statewide Health Planning and Development for charity care data. This office does not report charity care costs separately from other expenses, but it does report charity care at gross charges as a deduction from gross revenue (also reported at charges and including charity care); therefore, in Vansant's (2015) study, the effect of charity care on net revenue is zero. We use MCRs, which allow us to obtain uncompensated care costs. However, in robustness tests we re-estimate our models using total assets as an alternative scalar of uncompensated care costs.

community benefits any unreimbursed Medicaid costs and unreimbursed costs of services provided to medically indigent patients that are covered by state and local government programs. We term such costs *unreimbursed costs*.[12]

To capture hospital operating efficiency, we first compute compensated patient care costs. MCRs do not require reporting of such costs. Thus, we compute compensated patient care costs as the difference between total patient care costs (MCR Worksheet A, lines 30 through 117), and unreimbursed (MCR Worksheet S-10, line 19) and uncompensated care costs (MCR Worksheet S-10, line 30), all scaled by net revenues.[13] To obtain our first operating efficiency variable of interest, we take a natural logarithm of compensated care costs as a proportion of net revenue and term it CCC_t. For our second measure of efficiency we use a natural logarithm of total patient care costs scaled by net revenue, termed TPC_t. For our third measure of operating efficiency we use the natural logarithm of total costs scaled by net revenues, termed TC_t.

CBR measures

We identify states' CBR using data from the Hilltop Institute (2017a). Formed in 1994 in collaboration with Maryland Medicaid, the Hilltop Institute is a non-partisan health research organization associated with the University of Maryland. The institute's Hospital Community Benefit Program "is a central resource created specifically for state and local policymakers who seek to ensure that tax-exempt hospital community benefit activities are responsive to pressing

[12] Medicaid costs, State Children's Health Insurance Program costs (focused on medically indigent children), and other state and local indigent healthcare program costs are not included in our definition of community benefit costs because these programs are intended to compensate hospitals with a program amount for providing healthcare services to program beneficiaries. In cases where the hospital does not receive reimbursement for such patients, the hospital absorbs the cost. Since some states do not include such unreimbursed costs in their definition of community benefits, for consistency we opt to exclude them from our measurement of the costs of community benefits in all states.

[13] For clarification, we note that our measure of compensated care costs not only includes costs recovered through patients and third-party payers, but it also includes care costs labeled "uncompensated" that are covered by private grants (MCR Worksheet S-10, line 17) and those covered by government appropriations (MCR Worksheet S-10, line 18).

community health needs" (Hilltop Institute 2017b). Our first test variable, *CBR*, is an indicator variable that is coded one if the hospital operates in a state with existing CBR or zero if the state has no explicit CBR. We present *CBR* variable values by state in Appendix A.

Model specification

To test our hypotheses we estimate the following ordinary least squares (OLS) regression:

$$\begin{aligned}\text{Log}(Care\ Costs_t) = {} & \beta_0 + \beta_1 CBR + \beta_2 Beds_t + \beta_3 UP_t + \beta_4 \%GRMED_t + \beta_5 Trauma_t \\ & + \beta_6 Teach_t + \beta_7 Small_t + \beta_8 Rural_t + \beta_9 ALOS_t + \beta_{10} Occupancy\ Rate_t \\ & + \beta_{11} Loss_t + \beta_{12} CCR_t + \beta_{13} \%State\ Tax\ Revenue_t + \beta_{14} \%Contributions\ and\ Donations_t \\ & + \beta_{15} \%Government\ Appropriations_t + \beta_{16} \%Government\ Hospitals_t \\ & + \beta_{17} Log\_Med\_Hshld\_Income_t + \beta_{18} LogGDP_t + \beta_{19} Blue\ State_t + \sum \beta_j\ Year_t + \varepsilon_t \qquad (1)\end{aligned}$$

The time subscript ($_t$) for *CBR* is omitted because the values of *CBR* are constant for each unique hospital observation within the sample period.[14] Log(*Care Costs*$_t$) represents one of the four dependent variables: UCC_t, CCC_t, TPC_t, or TC_t. To test H1, the estimate β_1 captures a difference in non-profit hospitals' charity care costs (UCC_t) in states with CBR, compared with those of hospitals in states without CBR. To test H2, we estimate model (1) using CCC_t, TPC_t, or TC_t as the dependent variable. A negative coefficient β_1 would imply higher operational efficiency (or lower costs as a proportion of net revenue) in non-profit hospitals operating in states with CBR.

Consistent with existing literature, we include the following control variables in our model:

$Beds_t$ is the average number of staffed beds in a hospital. We use this variable to proxy for the size of the hospital facilities, as well as the underlying physical capacity (Bai 2013; Bai et

[14] Note that no states in our sample experience enacted community benefits laws during the sample period. Therefore, we avoid transitional periods and examine all hospitals under a stable CBR regime.

al. 2014; Vansant 2015). Hospitals with more beds may be able to provide more charity care, although Bai et al. (2014) and Vansant (2015) do not find a significant association between number of beds and charity care provided by non-profit hospitals in California.

UP_t is the percentage of uninsured population in a state in a given year. We expect a greater proportion of charity care to be offered by non-profit hospitals located in states with larger uninsured populations (Norton and Staiger 1994).

$\%GRMED_t$ is the sum of total Medicare and Medicaid patient days in year t scaled by total patient days in the same year. Because providing services to patients insured by Medicare and Medicaid results in reimbursements that are, on average, the lowest among third-party payers (Eldenburg and Krishnan 2003), the patients who are covered only under these services may be responsible for the largest relative amounts of hospital care charges (Vansant 2015). More patients with large uncovered hospital charges may lead to more charity care cases. On the other hand, more patients covered by these low-margin government programs may impose financial pressure on hospitals that reduces the amount of charity care provided (Mann et al. 1995).

$Trauma_t$ is coded one if a hospital reports intensive care unit (ICU) costs in year t, zero otherwise. Service to trauma patients requires intensive use of hospital resources, resulting in disproportionately expensive charges, which might not be reimbursed in their entirety by the patient's health insurance. Further, trauma centers may receive a greater number of uninsured patients. Trauma centers are also more likely to be engaged in medical research and education (Bai 2013). Existing research finds a positive association between trauma units and charity care (Bai 2013; Vansant 2015).

$Teach_t$ is coded one if a hospital is affiliated with a medical school at a university in year

t, and zero otherwise. The costs of care generally are higher in teaching hospitals (Sloan et al. 1983). Prior research also shows that teaching hospitals provide more charity care (Thorpe and Phelps 1991; Vansant 2015)

$Small_t$ is an indicator variable coded one if a hospital has fewer than 50 licensed beds in year t, and zero otherwise, while $Rural_t$ is an indicator variable coded one if a hospital is classified as rural hospital on MCR Worksheet S-2, Part I (as opposed to urban classification). Smaller hospitals and hospitals in rural areas tend to treat a greater proportion of uninsured patients (Eldenburg et al. 2015; Vansant 2015)

$ALOS_t$ is the average length of stay as measured by the average number of days that a patient receiving inpatient care occupied a hospital bed within the period ending at time t (i.e., total patient days divided by total patients discharged). Length of stay is a driver of hospital patient care costs (Lynk 1995; Bai 2013; Eldenburg et al. 2015; Vansant 2015). For example, Vansant (2015) and Eldenburg et al. (2015) find that length of stay is negatively related to charity care, suggesting that charity patients may have shorter hospital stays.

$Occupancy\ Rate_t$ is the percentage of beds that were occupied during the year and is measured as the total number of patients occupying a bed on any day in year t divided by the total number of beds available for the same year. Occupancy rate is included in the model to measure variations in hospitals' capacity utilization (Eldenburg et al. 2015).

$Loss_t$ is an indicator variable for hospitals reporting negative earnings and is included in our model to control for hospitals' financial performance. Eldenburg et al. (2015) argues that higher profitability could allow managers to provide more charity care. On the other hand, hospitals that experience losses may provide less charity care.

CCR_t (cost-to-charge ratio) is the ratio of total patient care costs divided by gross patient

revenue. Recall that charity care costs are calculated by multiplying gross charity care charges by the CCR. If managers systematically inflate charity care charges, then we would observe higher levels of reported charity care costs. Because we would also simultaneously observe a systematic decline in CCR since gross patient revenue (the denominator) is artificially inflated, we include CCR_t in our model to control for potential charity care charge manipulation.

%Contributions and Donations$_t$ is the total contributions, donations, bequests, and similar gifts received by the hospital during year *t* divided by the net revenue for the same year. This variable controls for the level of additional cash flows a hospital receives from private parties that can be used to cover costs related to the provision of charity care.

%Government Appropriations$_t$ is the total government appropriations received by the hospital during year *t* divided by the net revenue for the same year. This variable controls for government funding received that a hospital can use to cover costs related to the provision of charity care.

Because we do not limit our analysis to one state, we include an additional set of time-varying state-level controls to capture state economic and demographic characteristics that may be associated with the demand for and offering of healthcare services, especially services by the hospital that will be uncompensated.

%State Tax Revenue$_t$ is the total tax revenue (income, local, property, and sales) assessed by the state during year *t* divided by the total revenue from all sources for the same year. We expect that in states with a higher percentage of revenues collected from taxes, hospital managers may perceive lower pressures to provide charity care.

%Government Hospitals$_t$ is the total number of hospitals owned or operated by federal or state government authorities relative to the total number of hospitals with all ownership types

(for-profit, non-profit, and governmental) operating in the state for the same year. Government hospitals are important providers of charity care (Mann et al. 1997); thus we expect that having a greater proportion of government hospitals in a state may reduce demand for charity care, consistent with findings by Thorpe and Phelps (1991).

Log_Med_Hshld_Income$_t$ is the natural logarithm of the median state household income for the period ending at time *t.* Household income is included to proxy for the potential demand for charity care. Populations with higher median household income may be in a better position to pay for their medical services (Paul et al. 2017), thus increasing a hospital's ability to offer charity care.

LogGDP$_t$ is the natural logarithm of the state's GDP in year *t*, in millions. We expect that states with higher revenues may have better assistance programs for uninsured/underinsured patients (i.e., uncompensated care funds), resulting in less demand for charity care from hospitals.[15]

Blue State$_t$ is an indicator variable equal to one if the majority of the state's electoral votes for the 2010, 2012, and 2014 general elections was for the Democratic candidate(s), and equal to zero otherwise. We select the same party dominance for the odd-numbered years 2011, 2013, and 2015 as the immediately preceding even-numbered year. For instance, Paul et al. (2017) finds that charity care is negatively correlated with having a Democratic governor in the state and with a number of Democratic senators.

Lastly, we include year indicator variables to control for general economic conditions in

[15] To address concerns that there is overlap between the constructs of individual household income (median household income) and state-level income (GDP), we examine bivariate correlation and test for multicollinearity in our regression analysis. We find that *Log_Med_Hshld_Income*$_t$ has a modest pairwise (Pearson) correlation of 0.22 with *LogGDP*$_t$. In the regressions, the largest variance inflation factor is 2.7. Finally, the signs and significance of those coefficients on *Log_Med_Hshld_Income*$_t$ and *LogGDP*$_t$ are unchanged when we systematically remove each variable. Thus, we conclude our variables are capturing largely different constructs.

each year. Because the *CBR* variable is defined at a state level, and does not vary by state across time, we cannot include state fixed effects in model (1). We estimate all OLS regressions using robust standard errors clustered at the hospital level to account for the correlation of the residuals across years for a given hospital (Petersen 2009).

4. Data, sample selection, and descriptive statistics

Data and sample

We obtain hospital financial data from the Healthcare Cost Report Information System of the Centers for Medicare and Medicaid Services (CMS). This database contains financial statements and operational data for most U.S. hospitals and has become the primary public source of hospital financial information for policy makers and financial analysts. CMS collects hospital financial information annually on the MCR form. Hospitals submit a cost report to a Medicare administrative contractor in order to receive updated prospective payments for the following year. Due to continuous revisions and appeals of cost reports during the reimbursement process, the database is not static and only contains the last report submitted.[16] We remove states that have minimum charity care provision requirements, as such requirements may create an unintended ceiling of charity care provision.[17] We obtain data for yearly state-level variables from other public sources, which are referenced in Appendix B. We present a simplified statement of hospital revenues and expenses in Appendix C, to ease the reader's understanding of our sourcing of the data for dependent variables.

Similar to existing studies (e.g., Eldenburg et al. 2004; Eldenburg et al. 2015; Vansant 2015), the focus of our study is on non-federal, general short-term acute hospitals, which represent 60% of all U.S. hospitals, share the same largest client (i.e., the government) and have

[16] We obtained the latest update of the data used in this study from the CMS database on December 31, 2016. MCRs are posted with a significant delay; therefore, without complete data available for 2016, we end our sample in 2015.
[17] According to the Hilltop Institute, these states are Illinois, Nevada, Pennsylvania, Texas, and Utah.

a common reimbursement methodology. MCR format changed in 2010. Prior to 2010, hospitals used the 1996 reporting format, which did not disaggregate charity care costs and bad debt expenses. We begin our sample in 2011 because the majority of the hospitals still submitted their MCRs using the 1996 format in fiscal year 2010. We eliminate for-profit and governmental hospitals from our sample, as well as hospitals located in Guam, Puerto Rico, and the Virgin Islands, as these U.S. territories do not experience the same level of state and federal regulation and enforcement as do the 50 U.S. states and the District of Columbia. After removing observations for which we cannot compute all dependent and independent variables, our final sample consists of 6,796 hospital-year observations from 1,459 unique hospitals from 2011 through 2015. We winsorize all continuous variables at 1% and 99% to control for potential outliers.

Descriptive statistics

Table 1, panel A presents the sample distribution by year. Number of observations is relatively equally distributed across years, with 2013 having a slightly lower number of observations (19.54%) than the remaining years. Mean charity care costs are 4.2% of net revenue, while mean compensated care costs and unreimbursed care costs are 43.8% and 2.5% of net revenue, respectively. Together, these three categories of costs add up to approximately 50.3% of net revenues, representing mean patient care costs. Once other indirect costs of care are accounted for (untabulated mean of 51% of net revenue), total costs of providing patient services as a percentage of net revenue are, on average, 101.5%. Thus, on average, non-profit hospitals do not earn positive surpluses on patient care, but rather they operate at 1.5% losses on patient services relative to net revenue.

[Insert Table 1 here]

We observe total costs of patient care that are higher than net revenues in all years, except 2015, where total costs are 99.8% of net revenues. Non-profit hospitals in our sample do, however, achieve an average net income of 5.3% of net revenue, due to positive other income, which has a mean of 6.4% of net revenue. Thus, we note that non-profit hospitals do not typically profit directly from patient services but rather earn their positive margins from other income sources, such as cafeterias, parking, facility rentals, meals, tuition, non-patient laundry, and other services. These statistics are consistent with Schuhmann (2008), who reports, for a sample of acute short-term hospitals from 2003 to 2007, a mean net loss from patient care of 1.4% and a mean net income from all sources of 5.4% (as a percentage of net patient revenue). Lastly, we note that mean bad debt costs represent 2.1% of net revenues, or approximately one-half of total uncompensated care costs.

In panel B we display the distribution of non-profit hospitals by state. Arkansas and Wyoming have the smallest representation in our sample with 0.15% and 0.13% of observations, respectively. Several states have a proportionally larger number of non-profit hospital-years in our sample. These are New York, California, Ohio, and Michigan with 9.24%, 9.12%, 7.02%, and 4.78% of observations, respectively. We address potential bias caused by the large representation of these states in our sample in the robustness checks.

In Table 2 we present summary statistics for the variables used in the OLS model. Recall that we take a natural logarithm of each of our four constructs of care costs to reduce the skewness of these variables. Indeed, UCC_t, CCC_t, TPC_t, and TC_t all have small differences between reported means and medians. Hospitals in states with CBR represent 76.3% of hospital-years in the sample.

[Insert Table 2 here]

The average (median) number of beds per hospital is 186 (146). In a given year, 11.9% of the state population was uninsured. On average, 51.5% of patient-days are from Medicare and Medicaid patients, 90.1% of hospitals report having ICUs for trauma patients, and 39.5% are affiliated with a medical school at a university. Small hospitals and hospitals located in rural areas represent 13.6% and 75.2% of hospital-years in our sample. Average (median) length of stay is 4.4 (4.3) days as expected in a sample of short-term hospitals. Average $Occupancy\ Rate_t$ is 66.9%, and less than a quarter of hospital-years are loss years (mean $Loss_t$ is 0.225). Cost-to-charge ratio has a mean (median) value of 0.316 (0.297). For an average hospital in our sample, contributions and donations represent only 0.2%, and government appropriations represent only 0.3% of the revenues. These proportions are consistent with Schuhmann (2008), who reports similar means of 0.3% and 0.3% of net revenue, respectively, in his sample of non-profit hospitals.

As for the state-level variables, the government runs 13.3% of all hospitals, on average, in any given state. Average median household income is $53,050 ($Log_Med_Hshld_Income_t$ mean is 10.879), and average state GDP is $387.3 billion (mean $LogGDP_t$ is 12.867). Finally, the average annual unemployment rate across states is 4.3%, and 51.8% of observations are associated with hospitals in states where the Democratic Party won most general elections in the sample period.

Untabulated correlations among the control variables reveal several coefficients of higher magnitude; specifically, the correlation coefficient between $Blue\ State_t$ and $Log\_Med\_Hshld\_Income_t$ is 0.62, and between $Teach_t$ and $Occupancy\ Rate_t$ is 0.45. To test for potential multicollinearity among control variables, we estimate variance inflation factors for model (1) and note that none are above three.

5. Empirical analysis

Tests of H1 and H2

In Table 3 we present the OLS regression results for model (1). The estimated coefficient for *CBR* is 0.202 (p-value < 0.01) in column (1) for the uncompensated care costs, indicating that non-profit hospitals in states with CBR report 20.2% more uncompensated care costs as a proportion of net revenue than non-profits in states without CBR. The *CBR* coefficient is –0.057 (p-value < 0.01) in column (2) for compensated care costs as a proportion of net revenue, indicating 5.7% lower costs of compensated care per dollar of revenue. The lower cost of revenue (e.g., higher margin) suggests higher operational efficiency. In columns (3) and (4) we observe *CBR* coefficients of –0.044 (p-value < 0.01) and –0.015 (p-value < 0.05), suggesting that CBR is associated with 4.4% lower total patient care costs and 1.5% lower total costs as proportions of net revenue. Both of these results further suggest higher operational efficiency associated with CBR.

Overall, results in Table 3 support H1 and H2 and suggest that non-profit hospital managers in states with CBR provide substantially more charity care, which is more than offset by greater operational efficiency, and that increases in operational efficiency are driven by lower direct patient service costs.

[Insert Table 3 here]

We note that the hospital-level control variables reported in column (1) of Table 3 indicate that hospitals with more beds ($Beds_t$) and those located in rural areas ($Rural_t$) report lower uncompensated care costs.[18] In contrast, non-profit hospitals with a greater proportion of Medicare and Medicaid patients ($\%GRMED_t$), a higher percentage of government appropriations

[18] In untabulated analysis, we substitute the logarithmic transformation of total assets instead of $Beds_t$. The positive association between *CBR* and charity care remains robust.

in their net revenue (*%Government Appropriations*$_t$), and those reporting losses (*Loss*$_t$) tend to report, on average, higher uncompensated care costs.

Turning to state-level control variables, we find that the percentage of the uninsured population in the state (*UP*$_t$) is a significant factor in explaining higher charity care. There is also greater uncompensated care when the state has higher median household income (*Log_Med_Hshld_Income*$_t$). In contrast, hospitals in states with a higher proportion of revenue composed of state taxes (*%State Tax Revenue*$_t$) and with higher GDP (*LogGDP*$_t$) report lower uncompensated care.[19] We interpret these results to suggest that states with greater resources have more programs to help uninsured or underprivileged citizens and/or have less fiscal concern about offering tax exemptions to hospitals in exchange for charity care.

Lastly, we observe lower uncompensated care costs in states where the Democratic Party wins most general elections. Taken another way, a negative coefficient on *Blue State*$_t$ implies greater uncompensated care costs in the states where the Republican Party wins the general elections. One interpretation for lower charity care in Democratic states may be the existence of alternative means for underprivileged constituents to obtain healthcare, such as expanded state-level social programs. Conversely, there may be a greater need for charity care in Republican states, which have been generally associated with fewer government-sponsored alternative sources for healthcare (Blais et al. 1993).

Regarding control variables in columns (2) through (4) of Table 3, we find that compensated care costs are negatively related to the percentage of state population that is uninsured. In addition, total costs with respect to net revenue are negatively associated with the

[19] As an untabulated robustness test, we adjust *Log_Med_Hshld_Income*$_t$ and *LogGDP*$_t$ for inflation, using 2011 as our base year and the Consumer Price Index reported by U.S. Bureau of Labor Statistics (https://www.bls.gov/cpi/data.htm). The results are materially indistinguishable from those reported in the primary results.

proportion of government-run hospitals in the state. We also find positive associations between $\%GRMED_t$ and $\%State\ Tax\ Revenue_t$ and find that care costs decline as we shift our point of analysis from compensated care costs to total costs. We observe that CCC_t, TPC_t, and TC_t are all higher in predominantly Democratic Party states; they are higher, too, when a hospital reports a loss, reports higher cost-to-charge ratios, and receives more contributions and donations. Compensated care costs, total patient costs, and total costs are all lower in states with greater median household income, potentially because such populations are healthier. Total costs are positively associated with length of stay but are lower if a hospital is located in a rural area, likely because rural hospitals may lack the advanced facilities to manage the more complex and therefore more expensive medical cases. Further, both compensated care and total costs are positively associated with the number of beds, and compensated care and total patient care costs are lower as a proportion of net revenue for small hospitals. Total costs as a proportion of net revenue are also higher when hospitals receive more government appropriations and are located in states with higher GDP.

Additional Analysis

Variations in CBR

Thus far, we have treated the presence of CBR as a homogeneous indicator of a state's regulatory environment, reflective of a greater demand for charity care from non-profit hospitals. However, the type of CBR enacted by states may include different regulatory components. Specifically, CBR can have a provision and/or a reporting requirement. In the next set of analyses, we discuss variations in CBR requirements, focusing our attention on provision and reporting requirements.

Provision requirement

States can institute a CBR provision requirement using several terms that are not mutually exclusive, such as categories of persons that must be served, categories or amounts of uncompensated services that must be offered, or a certification of charity care provision or planned provision that is required for facility investment or expansion. To illustrate a charity care provision requirement stated in terms of categories of persons, Maine and Maryland require provision of free medical services to residents whose income is no more than 150% of the federal poverty level. Maryland adds a CBR requirement to provide charity care to individuals whose medical debt exceeds 25% of family income. Mississippi law requires non-profit hospitals to dedicate one or more wards to charity patients.

Reporting requirement

States can establish a CBR reporting requirement using several different conditions, such as requiring a report of community benefit plans and policies, detailed information regarding the provision of uncompensated care (often including detailed charity care costs and sometimes including patient information), a statement of financial resources and their allocation to hospital activities, or a stated commitment to community benefit reporting as a condition for facility investment, among others.

To illustrate several of the reporting regulations, New York requires non-profit hospitals to publish a summary of their financial resources and allocation to healthcare activities, while Mississippi requires non-profit hospitals to commit to reporting charity care and South Carolina requires a report of historical charity care as a prerequisite for facilities investment, expansion, or financing.

To further understand how CBR affects the level of uncompensated care, we examine associations between combinations of CBR regulation types and uncompensated care costs as a

proportion of net revenue. We create three indicator variables, *Provision*, *Reporting*, and *Provision*×*Reporting*, to reflect variations in state CBR regulation. *Provision* is coded one if the state requires provision of community benefits, and zero otherwise. *Reporting* is coded one if the state requires reporting of community benefits, and zero otherwise. *Provision*×*Reporting* is coded one if the state requires both provision and reporting of community benefits, and zero otherwise. We report combinations of regulation types by state in Appendix A and report our regression results in Table 4. Although we include all control variables and fixed effects in the OLS model, for parsimony we only report the parameter estimates for our CBR type indicator variables.

In Panel A of Table 4, we report descriptive statistics for our three indicator variables. Specifically, 53.7% of hospital-year observations are from states that have a provision requirement, 68.7% from states that require reporting, and 46.1% are from states that have both provision and reporting requirements. Note that these variables are not mutually exclusive because those observations coded as requiring both provision and reporting are separately coded as requiring provision and as requiring reporting.

[Insert Table 4 here]

In Panel B of Table 4, we present the incremental effect of combining provision and reporting requirements on non-profit hospitals' uncompensated care costs. We observe that the simple effects of states' provision and reporting requirements are 30.0% and 16.4% higher in uncompensated care costs as a proportion of net revenue (p-values < 0.01) compared to states with no CBR. However, the significant negative coefficient on the interaction term *Provision*×*Reporting* (coef. = –0.253, p-value < 0.01) implies that combining CBR types may not be incrementally beneficial over either *Provision* or *Reporting* alone. Said another way, there

appears to be significant overlap in the regulatory effectiveness of *Provision* and *Reporting*. We statistically support this inference by comparing and finding no differences between the sum of *Provision*, *Reporting*, and *Provision*×*Reporting* parameter estimates and the simple effects of *Provision* and *Reporting* (*F*-statistics = 1.48, 2.03; *p*-values = 0.224, 0.155). Although combining *Provision* and *Reporting* may not incrementally enhance charity care offerings, hospitals in states with both types of CBR, represented by the sum of the estimated coefficients of *Provision*, *Reporting*, and *Provision*×*Reporting*, still offer more uncompensated care than non-profit hospitals in states without CBR (*F*-statistic = 32.80, *p*-value < 0.001).

In Panel C, we make a direct comparison of provision or reporting CBR effectiveness against no CBR by eliminating from the sample those states that require both provision and reporting. We note that while *Provision* and *Reporting* both have positive and statistically significant associations with uncompensated care costs (coefs. = 0.190, 0.079; *p*-values < 0.05 and 0.10) when compared with uncompensated care offered in states with no CBR, the *Provision* and *Reporting* parameter estimates are not statistically different from one another (*F*-statistic = 2.06, *p*-value = 0.152). These analyses reinforce that, although both provision and reporting appear to be effective regulatory tools in motivating uncompensated care offering, they appear to be substitute forms of CBR.

Factors that influence the effectiveness of CBR

Next, we perform exploratory analysis designed to identify factors that influence the association between CBR and the amount of uncompensated care provided. Specifically, we identify four state characteristics and one firm characteristic that may either increase or decrease the positive association between CBR and charity care: GDP ($LogGDP_t$), proportion of state revenue in taxes ($\%State\ Tax\ Revenue_t$), dominant political party ($Blue\ State_t$), median household income

(*Log_Med_Hshld_Income*$_t$), and the proportion of contributions, donations, bequests, and other gifts in non-profit hospital revenue (*%Contributions and Donations*$_t$).

[Insert Table 5 here]

Gross domestic product. In column (1) of Table 5, we include an interaction between *CBR* and *LogGDP*$_t$. The parameter estimate on the interaction is negative and significant (coef. = –0.162, *p*-value < 0.05), indicating that CBR is less positively associated with the amount of charity care offered by non-profit hospitals when GDP is higher. Stated differently, charity care regulation has a greater impact on the provision of community benefits in states with fewer economic resources. Interestingly, there is no significant direct association between *LogGDP*$_t$ and charity care, suggesting that a state's level of revenues has no effect (beyond that associated with year fixed effects) on the proportion of charity care offered by non-profit hospitals in states with no regulation of community benefits.

In untabulated analysis, the negative parameter estimate on the interaction between *CBR* and *LogGDP*$_t$ is attributable to the bad debt expense associated with non-Medicare and non-reimbursable Medicare patients. That is, CBR appears to be effective in motivating non-profit managers to forgive patient debt in states with fewer economic resources.

State tax revenue. The coefficient on the interaction between *CBR* and *%State Tax Revenue*$_t$ is reported in column (2). The parameter estimate is negative and significant (coef. = –3.431, *p*-value < 0.01). We offer two potential explanations for this association. First, CBR may have a greater impact in states that rely more on non-profit hospitals to provide charity care than it does in states that offer healthcare programs funded by tax revenue. Second, states that are well funded by tax revenue might be more willing to grant tax-exempt status to hospitals, resulting in a greater number of non-profit hospitals to share the burden of providing charity care. As a

result, CBR would have a smaller marginal effect on the level of charity care offered by those hospitals. There is no simple effect of the proportion of state revenue funded by state taxes on the charity care offered by non-profit hospitals, suggesting that any influence of taxation on managers' provision of uncompensated care comes through the effectiveness of CBR.

Political party. We interact *Blue State*$_t$ with *CBR* to determine whether state party politics influences the effectiveness of CBR in increasing charity care. In column (3), we observe an insignificant parameter estimate on the interaction (coef. = –0.053, p-value > 0.10), suggesting that CBR is no more or less effective in states dominated by the Democratic Party. There is, however, a significant simple effect of the dominant political party on the proportion of charity care offered by non-profit hospitals (coef. *Blue State*$_t$ = –0.146, p-value < 0.05), suggesting that the observed negative relation between Democratic Party dominance and provision of charity care by non-profit hospitals is unaffected by the presence of CBR.

Household income. In column (4), we observe that the interaction between *Log_Med_Hshld_Income*$_t$ and *CBR* is positive and significant (coef. = 0.782, p-value < 0.01), suggesting that CBR is more effective in increasing uncompensated care in states where constituents have greater income. It is plausible that in states where the population has higher incomes, self-sufficient people are more able to cover the costs of their medical expenses, allowing hospitals to be less constrained in offering charity care to those in need. It is also possible that states with higher median household incomes have higher costs of living, and that CBR is more effective in these states.

Contributions and donations. In column (5), we include an interaction between *CBR* and *%Contributions and Donations*$_t$. The parameter estimate on the interaction is not significantly different from zero (coef. = 4.061, p-value > 0.10), suggesting that donor oversight

does not significantly augment the effectiveness of charity care regulation. Note that there is also no significant association between *%Contributions and Donations*$_t$ and uncompensated care costs, suggesting that the level of contributions has no direct effect on the proportion of charity care offered by non-profit hospitals. We infer from this finding that donors do not directly monitor non-profit hospitals' provision of charity care.

In column (6) we report all interactions simultaneously and note that such OLS specification does not alter our findings.

Robustness checks

Unobserved state characteristics

We recognize that given the time invariance of our test variable, *CBR*, our empirical results may manifest themselves due to an unobserved state-level factor that is correlated with both *CBR* and the dependent variables. Such endogeneity would likely result in error terms that are correlated with the independent variable, *CBR* (Wooldridge 2013, p. 83).

To mitigate endogeneity concerns, we create a two-stage least squares model that uses the percentage of for-profit hospitals in each state to form an instrumental variable for CBR. We anticipate a negative association between the proportion of for-profit hospitals and CBR because we expect that states that rely more on for-profit hospitals will have less need to regulate non-profit hospitals' charity care offerings. We observe that the correlation between the percentage of for-profit hospitals and *CBR* is –0.20 (*p*-value = 0.000).

The empirical result of the two-stage least squares model is consistent with the primary results reported in Table 3. Specifically, the parameter estimate associated with the instrumented *CBR* is 0.46 (*z*-statistic = 2.10, *p*-value = 0.036). Further, the first-stage regression shows a relatively high statistical fit, with an adjusted R^2 of 0.22. Finally, a Wooldridge (1995) test

supports the conjecture that the variables in the primary model are exogenous (robust regression F-stat = 1.405, p-value = 0.236, indicating that we fail to reject the null hypothesis of exogeneity), and an eigenvalue test for instrument's strength is above the minimum threshold for confidence (minimum eigenvalue statistic = 194.553, 10% minimum eigenvalue threshold = 16.38).[20] In summary, further analysis including an exogenously determined instrumental variable model alleviates concern that our primary analysis suffers from endogeneity.

Other robustness checks

In our final set of analyses, we perform a series of additional robustness tests. We present these tests in Table 6.[21] First, we re-estimate model (1) using a random effects model, similar to Kennedy et al. (2010). Hospital-level individual random effects allow for a varying constant term for each hospital. Unlike a model with fixed effects, a random effects model does not require an assumption that a fixed effect is time-invariant, but it assumes that omitted variables are statistically independent of observed variables (Wooldridge 2013, pp. 477–478). This estimation produces a slightly lower but statistically significant estimated coefficient for *CBR* (coef. = 0.176, p-value < 0.01). Second, we re-estimate model (1), including in our sample hospitals from states that have requirements to provide a certain minimal amount of charity care. Our inferences also remain unchanged.

[Insert Table 6 here]

In the next set of robustness tests, we focus on the bad debt expense component of

[20] We recognize that our setting does not allow for a model with state-level fixed effects. However, in further untabulated analysis, we employ a Hausman-Taylor (1981) two-stage least squares model to mitigate concerns about time-invariant state-level omitted correlated variables. We calculate and use as an exogenous time-invariant instrument the mean proportion of for-profit hospitals by state and across sampled years. The results of the Hausman-Taylor approach are consistent with our primary results, offering further confidence that our primary results are not biased by endogeneity. We thank an anonymous reviewer for this suggestion.

[21] In Table 6, our dependent variable is UCC_t. We perform all applicable robustness tests using CCC_t as a dependent variable as well, but we do not report them for parsimony. Our inferences remain unchanged with respect to the association of CBR with compensated care costs as a proportion of net revenue.

uncompensated care costs.[22] First, we remove bad debt expense from total uncompensated care costs. Recall that bad debt expense represents approximately one-half of total uncompensated care as a proportion of net revenue (mean = 0.021). We note a significant increase in the *CBR* coefficient: from 0.202 reported in Table 3, column (1) to 0.475 (p-value < 0.01). Next, we re-estimate model (1) using a natural logarithm of bad debt expense scaled by net revenue as a dependent variable. We observe an insignificant coefficient on *CBR* (coef. = 0.064, p-value > 0.10). Taken together, these results provide evidence that managers in states with CBR do not offer more charity care simply by reporting a higher allowance for uncollectible patient accounts.

Recall from our discussion of dependent variables that charity care costs exclude unreimbursed Medicaid costs and costs from services provided to medically indigent patients that are covered by state and local government programs. Many states' CBR does not classify such costs as charity care, and therefore we do not expect that CBR will have an effect on unreimbursed care costs. In our next test, we report a significant negative relationship between *CBR* and unreimbursed costs (coef. = –0.005, p-value < 0.01). Therefore, hospitals in states with CBR report 0.5% less unreimbursed care as a proportion of net revenue. These findings suggest that managers who are incentivized to provide more charity care in CBR states are also incentivized to extract more reimbursements from patients covered by reimbursable programs, such as the State Children's Health Insurance Program, indigent care programs, and Medicaid.

Next, we use an alternative approach to address influential observations. While we winsorize all continuous variables at 1% and 99%, there is a possibility that outliers still remain and may influence our OLS estimations. We re-estimate model (1) after removing observations with studentized residuals below –3 and above 3. These additional tests do not alter our findings.

[22] Not all hospitals in our sample report bad debt expense. Although, for our main tests, we assume bad debt expense is equal to zero if unreported, for robustness tests we eliminate hospital-years where bad debt expense is missing, resulting in a maximum sample size of 6,616 hospital-years.

Four states, California, Michigan, New York, and Ohio, provide 30.16% of hospital-year observations in our sample. In order to rule out the possibility that our results could be driven by these states, we re-estimate model (1) while excluding them from the sample. Again, our inferences remain unchanged.

In our final two robustness tests, we re-estimate model (1) using total assets as a scalar for uncompensated care costs and including a control variable for the quality of care provided, respectively. First, scaling uncompensated care costs by total assets does not change our findings (coef. = 0.204, p-value < 0.01). Second, we compute an index for hospital care quality for three core medical conditions: acute myocardial infarction, heart failure, and pneumonia (Dlugacz 2017). We obtain quality rankings for hospitals for each of these conditions from CMS.[23] We compute our metric of hospital quality of care for these three conditions as the average of scores for each of the conditions and term the variable *AMI_HF_PN*.[24] Not all of the hospitals in our sample have data for care quality metrics, so our sample is reduced to 5,060 observations. Our inferences remain unchanged, and we also note that quality of care is unrelated to the relative amount of charity care offered by a hospital. In an untabulated test, we interact the hospital care quality metric (*AMI_HF_PN*) with the *CBR* variable and find that the interaction term is statistically insignificant, suggesting that provision of charity care is unassociated with quality of care in states with and without CBRs. Perhaps more importantly, our results suggest that managers are not sacrificing service quality as they offer more charity care.

Lastly, we perform two untabulated tests to further address unobserved heterogeneity and a potential serial correlation of residuals. First, we include lagged care costs as a right-hand-side variable in our OLS models. In this analysis, the estimated coefficients for *CBR* are relatively

[23] Extracted from https://data.medicare.gov/data/archives/hospital-compare.
[24] *AMI_HF_PN* has a mean of 96.23, median of 97.38, and a standard deviation of 4.12.

statistically weaker than those reported in our primary analysis. For example, we observe a smaller but statistically significant estimated coefficient on UCC_t (coef. = 0.068, p-value < 0.01). However, we have no inherent reason to believe that CBR will result in continuous growth in the provision of charity care (i.e., a positive association between *CBR* and *change* in charity care). Second, we estimate the relationship between CBR and uncompensated care costs by year, and we find that the *CBR* estimated coefficient is statistically significant in all years in our sample, although only at a one-tailed level in 2014 (t-stat = 1.45). We believe that OLS estimation by year alleviates any concerns of serial correlation.

6. Summary and Conclusions

Discussion

The purpose of our study is to examine whether non-profit hospitals in states with enacted CBRs provide more charity care and whether operational efficiency is higher in such hospitals. Empirical tests using data from a large sample of U.S. non-profit hospitals support our hypotheses.

Our study is motivated, in part, by concerns that many non-profit hospitals are, in fact, profitable and may not be contributing equitably to society in return for their tax-exempt status. A recent study in *Health Affairs* points out that seven out of the top ten most profitable hospitals in the U.S. in 2013 were non-profit (Meyer 2016). We note that while some hospitals in states that have enacted CBR (such as Illinois or New Jersey) have had their tax-exempt status revoked (Japsen 2011; Gialanella 2017), our study does not attempt to determine whether higher uncompensated care costs reported by hospitals in CBR states represent optimal or even minimally acceptable levels of charity care. However, we would argue that the existence of a positive association between CBR and uncompensated care suggests that CBR offers a means for

municipalities to incentivize non-profit hospitals to increase their charity care offerings.

Our study is not without limitations. We construct our *CBR* variable based on the existence of provision and/or reporting requirements by state, assumed to be stable across time. We do not account for any variations in enforcement strengths or penalties for non-compliance. For instance, Flasher and Lamboy-Ruiz (2017) find that the amount of resources dedicated to Medicaid Fraud Control Units is positively associated with the number of healthcare providers that were excluded from doing business with federal and state governments. Future research may examine how the amount of resources that states and/or localities expend toward enforcement of CBR influences the provision of community benefits by non-profit hospitals.

Further, we select our sample period, 2011 through 2015, to avoid potentially confounding changes to the reporting environment. First, we begin sampling in 2011, given that the MCR changed its reporting treatment for charity care and bad debt expense in 2010 (MedPAC 2009), and most of our sampled hospitals did not adopt the new reporting format until 2011. However, all those states that have CBR during our sample period adopted the regulatory legislation prior to 2011. An absence of CBR enactments after 2011 prevents us from engaging in a difference-in-difference methodology that would examine hospitals' provision of charity care and operational efficiency before and after the adoption year. Although we include an extensive set of hospital and state determinants of CBR, and in additional analysis we estimate two types of two-stage least squares models, it is possible that our observed associations between CBR and charity care and operational efficiency are attributable to an unobserved state-level characteristic.

We do not examine how competitive forces shape hospitals' provision of community benefits, especially in states with CBR. Non-profit hospitals compete for managerial talent and

market share with other types of hospitals, including for-profits. We leave it to future research to investigate the impacts of competition on the association between CBR and both the amount of non-profit hospitals' charity care and their operating efficiency. We also do not distinguish among categories of non-profit hospitals. For instance, future research can examine whether governmental hospitals or religiously affiliated hospitals differ in their charity care offerings, and what factors may drive such differences.

Next, we assume that by reporting higher uncompensated care costs, managers of non-profit hospitals are responding to the state regulatory pressure created by CBRs. However, existing literature provides evidence that hospitals manage reported earnings (e.g., Eldenburg et al. 2011; Leone and Van Horn 2005). Further, when a manager perceives that his hospital's reported charity care is higher (lower) than societal expectations, he will report higher (lower) earnings using discretionary accruals (Vansant 2015). Most of these studies, however, were limited to California hospitals. More research is necessary to examine how managers of non-profit hospitals interpret societal expectations for charity care given the heterogeneity of the regulatory (i.e., CBR) and enforcement environments they operate in. Further, research can provide an important contribution by testing whether non-profit hospitals respond to regulatory pressures, such as CBRs, by manipulating reported earnings downward, either via discretionary accruals or real earnings manipulations, to avoid the scrutiny that attends a perceived under-provision of charity care.

Lastly, we focus on the benefits of regulation to society, namely whether CBRs are associated with higher charity care. However, we do not consider other possible consequences of CBRs. It is plausible that, although hospitals in CBR states offer more community benefits and are more operationally efficient, they do so at the expense of healthcare quality. For instance, a

hospital may achieve higher operational efficiency through labor cost savings (e.g., fewer or cheaper, less qualified nurses as noted by Kane et al. 2007). Future research can examine to what extent pressures to provide more charity care influence hospital care quality, particularly if such pressures are driven by CBRs.

Conclusions

We examine the effect of state-level CBR on the provision of charity care and on the operating efficiency of U.S. non-profit hospitals. We document that state CBR is associated with higher levels of uncompensated care costs and with lower levels of compensated care and total care costs with respect to net revenue. Therefore, while providing higher charity care, non-profit hospital managers operating under CBR have more efficient compensated care operations. Decomposing CBR into different types, we do not find significant differences between states that require only provision of charity care and states that require only reporting of charity care. Further, we find that if a state requires both provision and reporting of community benefits, the combination of these CBR types is not associated with incrementally higher uncompensated care costs than those associated with the provision or requiring type alone.

Lastly, we show that CBRs are more negatively associated with charity care in states that have higher overall revenues and a higher proportion of taxes in their state revenues. We also show that CBRs are positively associated with charity care in states where populations have higher household income. Finally, we fail to identify any impacts of state-level political party regime and the magnitude of private donations and contributions on the association between CBR and charity care.

The results provide valuable insights for policy makers. We encourage regulators in those states that do not have existing CBRs to pay closer attention to non-profit hospitals' offerings of

community benefits and to consider some form of CBR to incentivize managers to increase charity care.

As a final observation, this study contributes to a wider stream of literature that examines the consequences of regulations, such as the Sarbanes-Oxley Act of 2002. For instance, Cohen et al. (2008) document a trade-off between higher-quality financial reporting and suboptimal increases in operating expenses, while Ahluwalia et al. (2016) find an increase in the integrity of financial reporting following the adoption of the Sarbanes-Oxley Act. The provision in the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 that awards a bounty to whistle-blowers seems to lead to a potential increase in firm employees' willingness to report questionable acts by their peers or superiors (Pope and Lee 2012). Further, research shows an increase in the cost of equity capital for firms after the adoption of Regulation Fair Disclosure (Gomes et al. 2007; Duarte et al. 2008). Similar to the way that we examine state-enacted CBRs, there is an opportunity to offer an assessment of recent federal healthcare policy changes by investigating the benefits and the costs of the Affordable Care Act.

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Appendix A. CBR Variables' Values by State

State	CBR	Provision	Reporting	Both	State	CBR	Provision	Reporting	Both
AK	0	0	0	0	**MT**	1	1	1	1
AL	0	0	0	0	**NC**	1	1	1	1
AR	0	0	0	0	**ND**	0	0	0	0
AZ	0	0	0	0	**NE**	0	0	0	0
CA	1	1	1	1	**NH**	1	1	1	1
CO	0	0	0	0	**NJ**	1	0	1	0
CT	1	0	1	0	**NM**	1	1	1	1
DE	1	1	0	0	**NV**	1	1	1	1
FL	1	1	0	0	**NY**	1	1	1	1
GA	1	0	1	0	**OH**	1	1	1	1
HI	0	0	0	0	**OK**	0	0	0	0
IA	0	0	0	0	**OR**	1	0	1	0
ID	1	0	1	0	**PA**	1	1	1	1
IL	1	1	1	1	**RI**	1	1	1	1
IN	1	1	1	1	**SC**	1	1	1	1
KS	0	0	0	0	**SD**	0	0	0	0
KY	0	0	0	0	**TN**	1	0	1	0
LA	0	0	0	0	**TX**	1	1	1	1
MA	1	1	0	0	**UT**	1	1	1	1
MD	1	1	1	1	**VA**	1	1	1	1
ME	1	1	1	1	**VT**	1	0	1	0
MI	0	0	0	0	**WA**	1	1	1	1
MN	1	0	1	0	**WI**	1	0	1	0
MO	1	0	1	0	**WV**	1	1	1	1
MS	1	1	1	1	**WY**	0	0	0	0

Notes: Coding of CBR variables by state, where *Both* indicates *Provision*×*Reporting*. All variables are defined in Appendix B.

Appendix B. Variable Definitions

Variable Name	Definition	Source
	Dependent Variables	
Uncompensated Care Cost$_t$ / Net Revenue$_t$	Total reported uncompensated medical care (charity care) cost scaled by net revenues in year *t*. Uncompensated care equals care costs for patients that qualify under charity care provisions less payments by such patients plus non-Medicare-related bad debt expense.	MCR S10, L30, C1; G3, L3, C1
Compensated Care Cost$_t$ / Net Revenue$_t$	Compensated care cost scaled by net revenues in year *t*. Compensated care cost includes costs of providing patient services that are reimbursed or partially reimbursed (e.g., by payments from Medicaid programs). Compensated care cost is determined as total patient care costs minus uncompensated care costs and unreimbursed costs.	MCR A L30–L117, C5; S10 L30, C1; S10, L19, C1; G3, L3, C1
Total Patient Care Cost$_t$ / Net Revenue$_t$	Total patient care cost scaled by net revenue in year *t*. Patient care cost is costs for inpatient routine services, ancillary services, ambulatory services, and outpatient services.	MCR A L34–L130, C3; G3, L3, C1
Total Costs$_t$ / Net Revenue$_t$	Total patient care costs plus other indirect patient care costs scaled by net revenue in year *t*.	G2, L43
UCC$_t$	Natural logarithm of uncompensated care costs scaled by net revenues in year *t*.	Not directly reported
CCC$_t$	Natural logarithm of compensated care costs scaled by net revenues in year *t*.	Not directly reported
TPC$_t$	Natural logarithm of the sum of compensated care costs and uncompensated care costs scaled by net revenues in year *t*.	Not directly reported
TC$_t$	Natural logarithm of total operating expenses scaled by net revenue in year *t*.	Not directly reported
	Explanatory Variables	
CBR	A dichotomous variable coded 1 if a hospital is located in a state that requires provision or reporting (or both) of community benefits, 0 otherwise.	The Hilltop Institute
Provision	A dichotomous variable coded 1 if a hospital is located in a state that requires provision of community benefits, 0 otherwise.	The Hilltop Institute

Reporting	A dichotomous variable coded 1 if a hospital is located in a state that requires reporting of community benefits, 0 otherwise.	The Hilltop Institute
Provision×Reporting	A dichotomous variable coded 1 if a hospital is located in a state that requires both provision and reporting of community benefits, 0 otherwise.	The Hilltop Institute
$Beds_t$	Number of staffed beds in the hospital in year *t*. Computed as the sum of staffed and available beds during year *t* divided by 365.	MCR S3I, L14, C3
UP_t	Percentage of uninsured population in a state in year *t*.	U.S. Census Bureau
$\%GRMED_t$	Sum of the total Medicare and Medicaid patient days in year *t* scaled by total patient days in the same year.	MCR S3I, L14, C6; S3I, L14, C7; S3I, L14, C8
$Trauma_t$	Coded 1 if a hospital reports ICU costs in year *t*, 0 otherwise.	MCR A, L31, C3
$Teach_t$	Coded 1 if a hospital is affiliated with a medical school at a university in year *t*, 0 otherwise.	MCR S2I, L56, C1
$Small_t$	Coded 1 if a hospital has fewer than 50 licensed beds in year *t*, 0 otherwise.	MCR S3I, L14, C2
$Rural_t$	Coded 1 if a hospital is located in a rural area, 0 otherwise.	MCR S2I, L26, C1
$ALOS_t$	Average length of stay is the average number of days that a patient receiving inpatient care occupied a bed in hospital in year *t*; average length of stay is total patient days divided by total patients discharged.	MCR S3I, L14, C8; S3I, L14, C15
$Occupancy\ Rate_t$	Total number of patients occupying beds on any day in year *t* divided by the total number of beds available for the same year.	MCR S3I, L14, C8; S3I, L14, C3
$Loss_t$	Indicator variable equal to 1 if the net income is negative, otherwise equal to 0.	MCR G3, L29, C1
CCR_t	Ratio of total patient care costs to gross patient revenue (cost-to-charge ratio).	MCR S10, L7, C1
$\%Contributions\ and\ Donations_t$	The sum of total contributions, donations, bequests, etc. received by the hospital during year *t* divided by the total net revenue for the same year.	MCR G3, L6, C1
$\%Government\ Appropriations_t$	The sum of total government appropriations received by the hospital during year *t* divided by the total net revenue for the same year.	MCR G3, L23, C1
$\%State\ Tax\ Revenue_t$	Total tax revenue earned by the state during year *t* divided by the total revenue from taxes and non-tax sources earned for the same year.	Urban Institute & Brookings Institution

%Government Hospitals$_t$	Total number of hospitals owned or operated by federal or state government authorities operating in the state during year *t* divided by the total number of hospitals with all ownership types operating in the state for the same year.	MCR S2I, L21, C1
Log_Med_Hshld_Income$_t$	Natural logarithm of the median state household income in year *t*.	U.S. Census Bureau
LogGDP$_t$	Natural logarithm of the state GDP in year *t*.	U.S. Department of Commerce
Blue State$_t$	Indicator variable equal to 1 if the majority of the state's electoral votes for the 2010, 2012, and 2014 general elections was for the Democratic Party, 0 otherwise. We select the same party dominance for the odd-numbered years 2011, 2013, and 2015 as the immediately preceding even-numbered year.	The Green Papers

Notes: MCR data are from the 2010 format of the MCR Form CMS-2552-10 available from the CMS (https://www.cms.gov/Research-Statistics-Data-and-Systems/Downloadable-Public-Use-Files/Cost-Reports/); A = Worksheet A "Reclassification And Adjustment Of Trial Balance Of Expenses"; G = Worksheet G "Balance Sheet"; G2 = Worksheet G-2 "Statement of Patient Revenues And Operating Expenses"; G3 = Worksheet G-3 "Statement of Revenues And Expenses"; S2I = Worksheet S-2 Part I "Hospital And Hospital Health Care Complex Identification Data"; S3I = Worksheet S-3 Part I "Hospital And Hospital Health Care Complex Statistical Data"; S10 = Worksheet S-10 "Hospital Uncompensated And Indigent Care Data"; L# = line number on the related worksheet; C# = column number on the respective worksheet. *Not directly reported* = amounts were calculated using the reported amounts from the MCR.

The Hilltop Institute data are from the Hospital Community Benefit Program, Community Benefit State Law Profiles Comparison (http://www.hilltopinstitute.org/HCBP_CBL_state_table.cfm). *U.S. Census Bureau* data for uninsured population and household median income are from the Current Population Survey, Annual Social and Economic Supplement (https://www.census.gov). *Urban Institute & Brookings Institution* data for state tax revenue are from the State and Local Finance Initiative, Data Query System (http://slfdqs.taxpolicycenter.org/pages.cfm), which draws on U.S. Census data (http://www.census.gov/govs/financegen/index.html). *U.S. Department of Commerce* data for state GDP are from the Bureau of Economic Analysis, Regional Data (https://www.bea.gov/index.htm). *The Green Papers* data are from the Comparative Political Party Predominance (http://www.thegreenpapers.com).

Appendix C. Hospital Statement of Revenues and Expenses

Statement of Revenues and Expenses		MCR Worksheet
Gross Patient Revenue	$XXX,XXX	G3
Less: contractual allowances and discounts on patient accounts	(XXX,XXX)	G3
Net revenue	XXX,XXX	G3
Total patient care costs*	(XXX,XXX)	A
Other indirect patient care expenses**	(XXX,XXX)	A, G2
Total Costs		G3
Net Income from service to patients	(XX,XXX)	G3
Add: Other income		
Contributions, donations, bequests	X,XXX	G3
Government appropriations	X,XXX	G3
Income from other sources***	X,XXX	G3
Total other income	X,XXX	G3
Net Income (Loss)	$XXX	G3

Notes: Presented here is a simplified statement of hospital revenues and expenses, with references to the MCR, where data are presented. G2 = Worksheet G-2 "Statement Of Patient Revenues And Operating Expenses"; G3 = Worksheet G-3 "Statement Of Revenues And Expenses"; A = Worksheet A "Reclassification And Adjustment Of Trial Balance Of Expenses."
* Total Patient Care Costs are the sum of Uncompensated Care Costs and Compensated Care Costs. They include direct care costs such as inpatient services (e.g., ICU, nursery, adults and pediatrics, coronary care unit), ancillary services (e.g., labor and delivery, anesthesiology, radiology, laboratory, MRI, electrocardiology, etc.), outpatient services (e.g., emergency, observation beds, clinic, rural health clinic, etc.), other reimbursable services (e.g., ambulance, medical equipment, home program dialysis, etc.), and special purpose costs (e.g., kidney, heart, liver acquisition, hospice, etc.).
** Other expenses include from Worksheet A "general service cost centers" (i.e., administrative and general expenses, employee benefits, pharmacy, maintenance and repairs, nursing administration, medical records and medical records library, among others), "nonreimbursable cost centers" (gift, flower, coffee shop and canteen, research, physicians' private offices, and nonpaid workers); and from Worksheet G2 Operating Expenses Additions (line 36) less Operating Expenses Deductions.
*** Income from other sources includes items such as "parking lot receipts," "revenue from meals sold to employees and guests," "tuition (fees, sale of textbooks, uniforms, etc.)," "revenue from laundry and linen service," etc., and net of other non-patient related expenses.

Table 1
Descriptive Statistics

Panel A: Frequency of observations, hospital costs, and income by year

Fiscal Year	*N*	%	Mean Uncompensated Care Cost / Net Revenue	Mean Compensated Care Cost / Net Revenue	Mean Unreimbursed Care Cost / Net Revenue	Mean Total Patient Care Cost / Net Revenue
2011	1,363	20.06%	0.044	0.430	0.023	0.493
2012	1,382	20.34%	0.046	0.439	0.024	0.507
2013	1,328	19.54%	0.048	0.439	0.025	0.508
2014	1,364	20.07%	0.042	0.441	0.027	0.507
2015	1,359	20.00%	0.032	0.442	0.029	0.500
Total / *Average*	6,796	100.00%	*0.042*	*0.438*	*0.025*	*0.503*

Fiscal Year	*N*	%	Mean Total Cost / Net Revenue	Mean Other Income / Net Revenue	Mean NI / Net Revenue	Mean Bad Debt Cost / Net Revenue
2011	1,363	20.06%	1.006	0.056	0.048	0.020
2012	1,382	20.34%	1.039	0.066	0.050	0.023
2013	1,328	19.54%	1.022	0.079	0.057	0.023
2014	1,364	20.07%	1.011	0.070	0.059	0.022
2015	1,359	20.00%	0.998	0.049	0.050	0.017
Total / *Average*	6,796	100.00%	*1.015*	*0.064*	*0.053*	*0.021*

Table 1 (Continued)

Panel B: Sample distribution by state

State	*N*	%	State	*N*	%
AK	10	0.15%	**MS**	88	1.29%
AL	68	1.00%	**MT**	49	0.72%
AR	111	1.63%	**NC**	167	2.46%
AZ	146	2.15%	**ND**	22	0.32%
CA	620	9.12%	**NE**	64	0.94%
CO	154	2.27%	**NH**	53	0.78%
CT	127	1.87%	**NJ**	232	3.41%
DE	29	0.43%	**NM**	38	0.56%
FL	278	4.09%	**NY**	628	9.24%
GA	180	2.65%	**OH**	477	7.02%
HI	34	0.50%	**OK**	98	1.44%
IA	134	1.97%	**OR**	120	1.77%
ID	19	0.28%	**RI**	34	0.50%
IN	208	3.06%	**SC**	93	1.37%
KS	95	1.40%	**SD**	52	0.77%
KY	202	2.97%	**TN**	157	2.31%
LA	88	1.29%	**VA**	225	3.31%
MA	208	3.06%	**VT**	29	0.43%
MD	179	2.63%	**WA**	122	1.80%
ME	77	1.13%	**WI**	275	4.05%
MI	325	4.78%	**WV**	78	1.15%
MN	201	2.96%	**WY**	9	0.13%
MO	193	2.84%	**Total**	6,796	100%

Notes: *Panel A* presents overall and annual means of hospital care costs. ***Uncompensated Care Cost / Net Revenue*** is total reported uncompensated care costs scaled by net revenue. ***Compensated Care Cost / Net Revenue*** is compensated care costs scaled by net revenue. Compensated care cost includes costs of providing patient services that are reimbursed or partially reimbursed (e.g., by payments from Medicaid programs). Compensated care costs are determined as total patient service costs minus uncompensated care costs and unreimbursed costs. ***Unreimbursed Care Cost / Net Revenue*** is the unreimbursed Medicaid costs and unreimbursed costs of services provided to medically indigent patients covered by state and local government programs scaled by net revenue. ***Total Patient Care Cost / Net Revenue*** is total patient service costs scaled by net revenue. Patient service costs include inpatient routine services, ancillary services, ambulatory services, and outpatient services. ***Total Cost / Net Revenue*** is total operating expenses scaled by net revenue. ***Other Income / Net Revenue*** is income from non-patient services scaled by net revenue. ***NI / Net Revenue*** is net income (loss) scaled by net revenue. ***Bad Debt Cost / Net Revenue*** is non-Medicare and unreimbursed Medicare bad debt expenses scaled by net revenue. *Panel B* presents sample composition by state. Five states (IL, NV, PA, TX, and UT) were removed from the sample because they have minimum charity care provision requirements (according to the Hilltop Institute), and such requirements may create an unintended ceiling of charity care provision.

Table 2
Descriptive Statistics

Variable	Mean	Median	STD	25%	75%
UCC_t	–3.501	–3.431	0.786	–3.957	–2.977
CCC_t	–0.858	–0.836	0.264	–0.970	–0.710
TPC_t	–0.712	–0.699	0.224	–0.810	–0.594
TC_t	–0.005	0.001	0.165	–0.061	0.055
CBR	0.763	1.000	0.425	1.000	1.000
$Beds_t$	186	146	145	78	256
UP_t	0.119	0.119	0.041	0.087	0.143
$\%GRMED_t$	0.515	0.514	0.125	0.429	0.598
$Trauma_t$	0.901	1.000	0.299	1.000	1.000
$Teach_t$	0.395	0.000	0.489	0.000	1.000
$Small_t$	0.136	0.000	0.343	0.000	0.000
$Rural_t$	0.752	1.000	0.432	1.000	1.000
$ALOS_t$	4.4	4.3	0.9	3.8	4.9
$Occupancy\ Rate_t$	0.669	0.678	0.239	0.501	0.828
CCR_t	0.316	0.297	0.121	0.230	0.374
$Loss_t$	0.225	0.000	0.417	0.000	0.000
$\%Contribution\ and\ Donations_t$	0.002	0.000	0.012	0.000	0.001
$\%Government\ Appropriations_t$	0.003	0.000	0.017	0.000	0.000
$\%State\ Tax\ Revenue_t$	0.480	0.473	0.062	0.435	0.515
$\%Government\ Hospitals_t$	0.133	0.106	0.106	0.059	0.187
$Log\_Med\_Hshld\_Income_t$	10.879	10.860	0.158	10.760	11.014
$LogGDP_t$	12.867	12.903	0.951	12.398	13.286
$Blue\ State_t$	0.518	1.000	0.500	0.000	1.000
$\%Unemployment_t$	0.043	0.045	0.010	0.035	0.051

Notes: Summary statistics of variables used in the OLS regressions. All variables are defined in Appendix B.

Table 3
OLS Regression: CBR and Hospital Care Costs

Dep. Var.	UCC_t	CCC_t	TPC_t	TC_t
	(1)	(2)	(3)	(4)
CBR	0.202***	–0.057***	–0.044***	–0.015**
	[5.75]	[–4.18]	[–3.87]	[–2.13]
$Beds_t$	–0.000*	0.000*	0.000	0.000**
	[–1.79]	[1.65]	[0.09]	[2.09]
UP_t	6.731***	–0.580***	0.170	–0.086
	[13.55]	[–2.70]	[0.99]	[–0.84]
$\%GRMED_t$	0.514***	0.180***	0.167***	0.088***
	[3.12]	[3.16]	[3.49]	[3.10]
$Trauma_t$	0.068	0.029	0.021	0.014
	[1.09]	[1.16]	[1.02]	[1.04]
$Teach_t$	0.004	–0.004	–0.001	0.010
	[0.12]	[–0.26]	[–0.11]	[1.41]
$Small_t$	–0.048	–0.045**	–0.033*	0.008
	[–0.99]	[–2.12]	[–1.85]	[0.94]
$Rural_t$	–0.068*	0.002	0.002	–0.023***
	[–1.70]	[0.14]	[0.14]	[–3.14]
$ALOS_t$	–0.040	0.009	0.006	0.012***
	[–1.54]	[0.99]	[0.75]	[3.08]
$Occupancy\ Rate_t$	0.095	–0.007	–0.015	–0.015
	[1.08]	[–0.18]	[–0.51]	[–0.92]
$Loss_t$	0.192***	0.058***	0.088***	0.132***
	[6.71]	[4.73]	[9.54]	[23.30]
CCR_t	0.214	0.250***	0.234***	0.140***
	[1.06]	[3.84]	[4.31]	[4.27]
$\%State\ Tax\ Revenue_t$	–3.106***	0.312***	0.175*	–0.005
	[–10.36]	[2.75]	[1.85]	[–0.09]
$\%Contributions\ and\ Donations_t$	0.130	0.862**	0.930***	1.161***
	[0.10]	[2.34]	[2.94]	[7.29]
$\%Government\ Appropriations_t$	3.219*	–0.001	0.440	1.359***
	[1.93]	[–0.00]	[1.41]	[6.46]
$\%Government\ Hospitals_t$	–0.046	0.062	0.003	–0.066**
	[–0.29]	[1.01]	[0.06]	[–2.24]
$Log\_Med\_Hshld\_Income_t$	0.386***	–0.198***	–0.162***	–0.085***
	[3.03]	[–3.88]	[–3.79]	[–3.66]
$LogGDP_t$	–0.047**	–0.012	–0.002	0.011***
	[–2.45]	[–1.59]	[–0.35]	[3.17]
$Blue\ State_t$	–0.186***	0.055***	0.039***	0.028***
	[–5.42]	[3.56]	[3.10]	[4.01]
Constant	–6.865***	1.096**	0.735	0.611**
	[–5.25]	[1.96]	[1.57]	[2.43]

Observations	6,796	6,796	6,796	6,796
Adjusted R^2	0.265	0.065	0.081	0.230
Year Fixed Effects	Yes	Yes	Yes	Yes
Cluster by hospital	Yes	Yes	Yes	Yes

Notes: ***, **, and * denote significance at the 1%, 5%, and 10% levels (two-tail), respectively. *P*-values are based on robust standard errors clustered at the hospital level. All models include year fixed effects. *T*-statistics are reported in the square brackets. $\boldsymbol{UCC_t}$ is the natural logarithm of uncompensated care (charity care) costs scaled by net revenues. $\boldsymbol{CCC_t}$ is the natural logarithm of compensated care costs scaled by net revenues. $\boldsymbol{TPC_t}$ is the natural logarithm of total patient care costs scaled by net revenues. $\boldsymbol{TC_t}$ is the natural logarithm of total costs scaled by net revenues. ***CBR*** is a dichotomous variable, coded 1 if a hospital is located in state with explicit community benefit regulations, 0 otherwise. All other variables are defined in Appendix B.

Table 4
OLS Regression: Variation in CBR Requirements and Uncompensated Care Costs

Panel A: Descriptive statistics

Variable	Mean	Median	STD	25%	75%
Provision	0.537	1.000	0.499	0.000	1.000
Reporting	0.687	1.000	0.464	0.000	1.000
Provision×*Reporting*	0.461	0.000	0.499	0.000	1.000

Panel B: Incremental effect of combining CBR types on Uncompensated Care Costs (UCC_t)

CBR	***UCC*$_t$**	**[*t*-stat]**
Provision	0.300***	[4.82]
Reporting	0.164***	[3.64]
Provision×*Reporting*	–0.253***	[3.36]
Comparisons of effectiveness between CBR types	***F*-stat (*p*-value)**	
Provision + *Reporting* + *Provision*×*Reporting* = *Reporting*	1.36 (0.224)	
Provision + *Reporting* + *Provision*×*Reporting* = *Provision*	2.32 (0.155)	
Provision + *Reporting* + *Provision*×*Reporting* = 0	31.91 (0.000)	
Observations	6,796	
R^2	0.270	
Controls and fixed effects included	Yes	

Panel C: *Provision*-only versus *Reporting*-only CBR and Uncompensated Care Costs (UCC_t)

CBR	***UCC*$_t$**	**[*t*-stat]**
Provision	0.180**	[2.48]
Reporting	0.079*	[1.73]
Comparison of *Provision*-only and *Reporting*-only CBR	***F*-stat (*p*-value)**	
Provision = *Reporting*	2.06 (0.152)	
Observations	3,660	
R^2	0.310	
Controls and fixed effects included	Yes	

Notes: ***, **, and * denote significance at the 1%, 5%, and 10% levels (two-tail), respectively. *P*-values are based on robust standard errors clustered at the hospital level. *T*-statistics are reported in square brackets. ***UCC*$_t$** is the natural logarithm of uncompensated care (charity care) costs scaled by net revenues. ***CBR*** is a dichotomous variable, coded 1 if a hospital is located in state with explicit community benefit regulations, 0 otherwise. In *Panels A* and *B*, ***Provision*** is coded 1 if the state requires provision of community benefits, 0 otherwise. ***Reporting*** is coded 1 if the state requires reporting of community benefits, 0 otherwise. ***Provision*×*Reporting*** is coded

1 if the state requires both provision and reporting of community benefits, 0 otherwise. In *Panel C*, we retain the same *Provision* and *Reporting* variables but eliminate hospital-year observations from the states that require both provision and reporting of community benefits from the sample. In *Panel A*, we report descriptive statistics. In *Panels B* and *C*, we report OLS regressions with all controls and fixed effects included but omitted from the table for brevity.

Table 5
OLS Regression: Interaction Effects Analysis

Dep. Var.	***UCC_t***					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
CBR	2.192**	1.746***	0.221***	–8.266***	0.191***	–13.389***
	[2.57]	[5.40]	[5.11]	[–3.42]	[5.52]	[–4.47]
$LogGDP_t$	0.095	–0.028	–0.049**	–0.048**	–0.048**	0.129
	[1.47]	[–1.43]	[–2.50]	[–2.56]	[–2.52]	[1.61]
$CBR \times LogGDP_t$	–0.162**					–0.175**
	[–2.34]					[–2.13]
$\%State\ Tax\ Revenue_t$	–2.876***	–0.306	–3.063***	–3.282***	–3.088***	1.347*
	[–8.80]	[–0.48]	[–9.89]	[–10.71]	[–10.34]	[1.94]
$CBR \times \%State\ Tax\ Revenue_t$		–3.431***				–5.517***
		[–4.81]				[–7.19]
$Blue\ State_t$	–0.223***	–0.185***	–0.146**	–0.187***	–0.186***	–0.173*
	[–5.77]	[–5.40]	[–2.17]	[–5.48]	[–5.45]	[–1.81]
$CBR \times Blue\ State_t$			–0.053			–0.074
			[–0.70]			[–0.74]
$Log\_Med\_Hshld\_Income_t$	0.457***	0.468***	0.391***	–0.177	0.388***	–0.610***
	[3.50]	[3.68]	[3.05]	[–0.87]	[3.03]	[–2.63]
$CBR \times Log\_Med\_Hshld\_Income_t$				0.782***		1.684***
				[3.50]		[6.44]
$\%Contributions\ and\ Donations_t$	0.213	–0.066	0.125	0.124	–3.11	–3.749
	[0.17]	[–0.05]	[0.10]	[0.10]	[–0.77]	[–0.95]
$CBR \times \%Contributions\ and\ Donations_t$					4.061	4.552

					[0.97]	[1.12]
Observations	6,796	6,796	6,796	6,796	6,796	6,796
Adj. R^2	0.267	0.271	0.265	0.268	0.265	0.286
Controls included	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Cluster by hospital	Yes	Yes	Yes	Yes	Yes	Yes

Notes: ***, **, and * denote significance at the 1%, 5%, and 10% levels (two-tail), respectively. *P*-values are based on robust standard errors clustered at the hospital level. *T*-statistics are reported in square brackets. $\boldsymbol{UCC_t}$ is the natural logarithm of uncompensated care (charity care) costs scaled by net revenues. ***CBR*** is a dichotomous variable, coded 1 if a hospital is located in state with explicit community benefit regulations, 0 otherwise. $\boldsymbol{LogGDP_t}$ is the natural logarithm of the state GDP in year *t*. ***%State Tax Revenue***$_t$ is the state total tax revenue divided by the state total revenue. ***Blue State***$_t$ is a dichotomous variable, coded 1 if the hospital is located in a state in which a majority of electoral votes is for the Democratic Party, 0 otherwise. ***Log_Med_Hshld_Income***$_t$ is the natural logarithm of the state median household income. ***%Contributions and Donations***$_t$ is contributions, donations, bequests, etc. (from MCR Worksheet G-3) divided by net revenues. OLS regressions include all controls and fixed effects, whose parameter estimates are unreported for brevity.

Table 6
Robustness Tests

Dep. Var.	***UCC$_t$***			
	Coef.	***z*-stat / *t*-stat**	***R*^{2}**	***N***
1) Random effects model estimation				
CBR	0.176***	4.89	0.25	6,796
2) Include states with Minimum CBR requirements				
CBR	0.191***	5.49	0.28	8,359
Min_CBR	0.009	0.22		
3) Replace uncompensated care costs with charity care costs (excluding bad debt expense)				
CBR	0.390***	7.12	0.21	6,682
4) Y = *Log (Bad Debt Cost / Net Revenue)*				
CBR	0.064	1.50	0.27	6,562
5) Y = *Log (Unreimbursed Care Cost / Net Revenue)*				
CBR	–0.005***	–3.27	0.11	6,796
6) Y = Studentized Residuals between −3 and 3				
CBR	0.179***	5.61	0.31	6,716
7) Y = Remove states with most observations (CA, MI, NY, OH)				
CBR	0.162***	3.73	0.29	4,746
8) Y = *Log (Uncompensated Care Cost / Total Assets)*				
CBR	0.204***	3.57	0.18	6,796
9) Controlling for hospital care quality				
CBR	0.143***	4.19	0.24	5,060
AMI_HF_PN (acute myocardial infarction, heart failure, pneumonia)	0.003	0.89		

Notes: ***, **, and * denote significance at the 1%, 5%, and 10% levels (two-tail), respectively. *P*-values are based on robust

standard errors clustered at the hospital level. *T*-statistics (*z*-statistic for random effects model) are reported next to the estimated coefficients. ***UCC$_t$*** is the natural logarithm of uncompensated care (charity care) costs scaled by net revenues. ***CBR*** is a dichotomous variable, coded 1 if a hospital is located in state with explicit community benefit regulations, 0 otherwise. ***Min_CBR*** is a dichotomous variable, coded 1 if a hospital is located in state with minimal provision requirements of charity care, 0 otherwise. ***AMI_HF_PN*** is an average of scores for hospital care quality for the care of patients admitted with acute myocardial infarction, heart failure, or pneumonia. ***Log (Bad Debt Cost / Net Revenue)*** is a natural logarithm of non-Medicare and unreimbursable Medicare bad debt expenses scaled by net revenues. ***Log (Unreimbursed Care Cost / Net Revenue)*** is the natural logarithm of unreimbursed care costs scaled by net revenue, where unreimbursed care costs represent unreimbursed Medicaid costs and unreimbursed costs of services provided to medically indigent patients covered by state and local government programs. ***Log (Uncompensated Care Cost / Total Assets)*** is the natural logarithm of uncompensated care costs scaled by total assets. OLS regressions include all controls and fixed effects, omitted for brevity.