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ORIGINAL ARTICLE

Can health spending be reined in through supply restraints? An evaluation of certificate-of-need laws

James Bailey[1]

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Abstract

Aims Most US states use certificate-of-need (CON) programs in an attempt to slow the growth of health care spending. The objective of this study is to evaluate how CON in fact affects health care spending.

Subjects and methods With 1980–2009 state-level data on spending from the National Health Expenditure Accounts, this article uses fixed-effects regressions to evaluate how the presence and scope of state CON laws affect these spending outcomes.

Results This article estimates that CON laws lead to a statistically significant 3.1% increase in total spending and finds that this increase is primarily driven by spending on physicians.

Conclusion Rather than decreasing health care spending as intended, it appears that CON laws actually increase it. To the extent that policy makers wish to restrain health care spending, they may wish to repeal these laws.

Keywords Health care spending · Certificate of need · Health care supply · Regulation

Introduction

Certificate-of-need laws require health providers to obtain the permission of a state board before opening, expanding into new lines of service, or making large capital expenditures. These laws were passed rapidly between 1964 and 1980 in the hope of restraining the growth of health spending; by 1980, every state but Louisiana had a CON program, and the federal government was pushing states to adopt CON. Since the Medicare payment reform and the end of the federal push for CON in the 1980s, 15 states have repealed their CON laws. This article aims to determine whether these CON-repealing states saw an increase in total spending relative to CON-maintaining states or whether instead CON fails to restrain health spending.

Using 1980–2009 National Health Expenditure Accounts data, this article shows that CON states do not experience lower spending overall or for any major type of provider (e.g., hospitals or physicians). It finds some evidence that CON backfires and leads to increased spending. The estimate is that CON leads to a statistically significant 3.1% increase in total spending. While the finding that CON does not reduce spending is quite robust, the finding that it increases spending is sensitive to the time period considered and the measure of CON used.

Compared with previous work on CON laws and health care spending, this study uses more recent data on spending from the National Health Expenditure Accounts and is the first to use an extensive index of CON scope to measure the intensity of state CON programs. These new methods show clearly that CON fails to reduce spending and provide some evidence that it actually increases spending, making an important contribution to the policy debate over CON repeal.

✉ James Bailey
jbailey6@providence.edu

[1] Providence College, Providence, RI, USA

Background and literature review

Certificate-of-need Laws: history and intentions

The first certificate-of-need law was passed by New York in 1964. Other states rapidly followed suit, and 23 states had laws in place by 1974. The rapid progress of CON laws was accelerated further when Gerald Ford signed the National Health Planning and Resources Development Act of 1974 (P.L. 93–641), which incentivized states to create CON programs.

The text of the 1974 federal law promoting CON makes clear its intention of restraining health spending: "The massive infusion of Federal funds into the existing health care system has contributed to inflationary increases in the cost of health care…Increases in the cost of health care, particularly of hospital stays, have been uncontrollable and inflationary, and there are presently inadequate incentives for the use of appropriate alternative levels of health care, and for the substitution of ambulatory and intermediate care for inpatient hospital care" (P.L. 93–641, Section 2a). The law plans to reduce spending growth through state-led planning: "In recognition of the magnitude of the problems described in subsection (a) and the urgency placed on their solution, it is the purpose of this Act to facilitate the development of recommendations for a national health planning policy, to augment areawide and State planning for health services, manpower, and facilities, and to authorize financial assistance for the development of resources to further that policy" (P.L. 93–641, Section 2b).

These planning agencies are expected to achieve spending reductions by "preventing unnecessary duplication of health resources" (P.L. 93–641, Section 1513). State CON programs are expected to "provide for review and determination of need prior to the time such services, facilities, and organizations are offered or developed or substantial expenditures are undertaken in preparation for such offering or development, and provide that only those services, facilities, and organizations found to be needed shall be offered or developed in the State" (P.L. 93–641, Section 1523).

The federal push for CON was reversed in the mid-1980s (P.L. 99–660, Title VII). Most states have been slow to respond to this, but 15 have repealed their CON programs as of 2016.[1] These CON repeals offer an opportunity to study the effect of CON: what happened to health care access, outcomes, and spending in the states that dropped CON compared with those that did not?

Previous literature on CON and spending

The empirical literature on how CON laws affect spending has found mixed results (Table 1).[2] These mixed results may stem from the fact that the studies measure different types of spending.

Conover and Sloan (1998) find that CON reduces spending on acute care by 5% but does not reduce overall health expenditures. Hellinger (2009) finds that CON reduces the number of hospital beds by 10% and argues based on other literature that this should translate into a 1.8% reduction in spending. Grabowski et al. (2003) find that repealing CON for nursing homes has no effect on Medicaid nursing home spending, and Rivers et al. (2010) find no effect of CON on hospital spending per patient. Lanning et al. (1991) find that CON fails in its goal, increasing hospital spending by 18% and total health spending by 12%. This article focuses primarily on how CON affects overall spending (while also describing how it affects spending on hospitals, physicians, and nursing homes), using recent data and measures of CON that account for its differing scope across states and that allow for the possibility that CON repeals could take time to have an effect.

Estimating the effects of CON laws in practice

The key to determining the effects of CON will be to use data on spending, usage, and (to the extent possible) prices; data that report these separately by type of payer and provider; and a data set covering a sufficiently long period.

CON data

Data on the entire history of when states enacted and repealed their overall CON programs are available from the National Conference of State Legislatures. The general pattern is clear: By 1980 (when the spending data begin), every state except Louisiana had a CON program in place. The tide then reversed, and 15 states have ended their programs since 1983. Only Wisconsin has reinstated its CON program after ending it entirely, so most of the identification of the effect of CON is coming from CON repeals.

The main analyses of this article use this binary data on whether a state has CON in place as well as data on how long it has been since CON was repealed. However, not all CON programs are equally strong. Some programs can review any new spending by providers, while others review only spending over a certain threshold, such as $1 million. Some programs have the authority to review as little as a single type of spending, such as acute-care hospital beds, while others such as Vermont's review 28 separate types. Unfortunately, data on the strength and stringency of CON programs are not as easily available as data on their presence or absence. Stratmann and Russ (2014) compile data from the American Health Planning Association (AHPA) on the separate types of spending that CON programs can review. This article uses their data set for robustness checks but not for the main spending analysis, since it is available only from 1992 to 2011.

National health expenditure accounts data and methodology

Data on total annual health spending in each state are from the National Health Expenditure Accounts (NHEA). These data are available from 1980 to 2009 and are published by the US Centers for Medicare & Medicaid Services. The NHEA gives overall health spending and also breaks down spending somewhat by type of payer (Medicare, Medicaid) and type of

[1] See Koopman and Philpot (2016) for more information.
[2] This table does not represent an exhaustive search of the literature; see Mitchell (2016) for a more thorough review of the literature.

Table 1 Summary of literature on CON and spending

Study	Empirical strategy	Findings: Effect of CON
Rivers et al. (2010)	State fixed effects, hospital controls	0% Effect on hospital spending; strict CON increases hospital spending 4.9%
Conover and Sloan (1998)	State fixed effects	Decreases hospital spending 5%, overall spending 0%
Lanning et al. (1991)	Instrumental variables	Increases hospital spending 20.6%, overall spending 13.6%
Hellinger (2009)	Generalized estimating equations	Decreases hospital beds by 10%, which in turn decreases spending by 1.8%
Grabowski et al. (2003)	State fixed effects	Changes Medicaid nursing home expenditures 0%
Rahman et al. (2016)	State fixed effects	Increases spending on nursing homes, decreases spending on home health care

provider (hospitals, physicians, nursing homes, etc.).[3] This article adjusts the NHEA data for inflation using the Consumer Price Index; all dollar amounts reported are in 2014 dollars. In all spending regressions, total spending is divided by state population (annual estimates from the US Census) to give real per capita spending. Data were analyzed using Stata SE version 15.0.

Control variables come from the Integrated Public Use Microdata Series compilation of the Current Population Survey. They include state-level measures of age, gender, race (black, Asian, Hispanic; white omitted), income, poverty, education, and health insurance (private, Medicare, Medicaid). The summary statistics for the NHEA data and the control variables are provided in tabular form (Table 2). The baseline regression is as follows:

$$lnPerCapitaSpending_{st} = \beta_0 + \beta_1{}^{*}\, CON_{st} + \boldsymbol{Controls_{st}}{}^{*}\, \boldsymbol{\beta_2} + \gamma_t + \theta_s + \epsilon_{st} \quad (1)$$

where γ_t represents year fixed effects and θ_s represents state fixed effects.

Results

Effect of CON on total spending

The effect of CON laws on various types of health expenditures is provided in tabular form (Table 3). It shows that CON laws have the opposite of their intended effect, actually increasing spending rather than decreasing it. CON increases total health spending by a statistically significant 3.1%. Increases are especially high for spending on physician care—a statistically significant 5.0%.

[3] Some of these distinctions are difficult to make; in particular, many physicians work inside hospitals. In this case, spending is counted under physician services if the physicians bill independently from the hospital but under hospital spending if not.

Robustness

Long-run effect of CON repeals

Hospitals cannot be built overnight; even if CON is the binding constraint keeping a hospital from opening or expanding, it could take several years for the full effects of CON repeal to be felt. Previous studies of cardiac CON have found that new surgery centers opened at a higher rate for 5 to 10 years after CON repeal before the new equilibrium was reached (Ho 2006; Cutler et al. 2010).

This article therefore considers the delayed effects of CON repeal by using a new independent variable that measures the number of years since a state CON program was repealed, up to a maximum of 5 (and thereafter taking the value of 5). Equation 2 gives the new regression:

$$Y_{st} = \beta_0 + \beta_1{}^{*}\, YearsCONrepealed_{st} + Controls_{st}{}^{*}\, \beta_2 + \gamma_t + \theta_s + \epsilon_{st} \quad (2)$$

Table 2 State-level summary statistics for NHEA and current population survey data

Variable	Mean 1980	Mean 2009
% CON	98.0	72.5
Total health expenditure per capita	2656	7736
Hospital expenditure per capita	1235	2977
Physician expenditure per capita	580	1765
Nursing home expenditure per capita	189	510
Age	32.7	34.7
% Male	48.4	48.5
% Black	9.9	11.6
% Hispanic	6.3	12.3
% College	4.3	18.9
% Poor	12.0	12.8
Income per capita	25,765	37,028
% Employer insurance	28.8	29.6
% Medicaid	7.7	14.7
% Medicare	10.8	12.0

Note: All expenditure figures are in inflation-adjusted 2014 dollars

Table 3 Effect of certificate-of-need laws on overall per capita spending by type of provider

	Total	Hospital	Physician	Nursing home
CON	0.031**	0.014	0.050**	0.043
	(0.014)	(0.024)	(0.023)	(0.043)
State fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Overall R^2	0.69	0.30	0.69	0.46
Observations	1530	1530	1530	1530

Note: *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$. Robust standard errors clustered by state in parentheses. Control variables included in the regression but omitted from the table include age, gender, race (black, Asian, Hispanic; white omitted), income, poverty, education, and health insurance (private, Medicare, Medicaid). Spending is measured using the 1980–2009 NHEA

Each year of CON repeal reduces total expenditures by a statistically significant 0.8%, so that after 5 years, total spending has fallen by 4% (Table 4). This result is driven by the fall in physician spending, which drops a statistically significant 1.4% per year, while hospital spending drops only a statistically insignificant 0.3%.

CON scope: do broader CON programs have bigger effects?

Not all CON programs are created equal; some are charged with much broader mandates than others. Broad CON programs that regulate many different types of providers may have stronger effects than narrow programs that only regulate a few. In this section, therefore, instead of measuring CON with a binary variable indicating whether a state has CON or not, the scope of each state's CON program—how many separate types of hospital care it restricts—is measured based on AHPA data. These data count 28 separate CON restrictions. Most of these restrictions apply to hospitals—for example, providers must get a certificate before opening or expanding a psychiatric service center or a neonatal intensive care unit. However, it is estimated that eight of these CON restrictions do not apply to hospitals (see Table 8 for a complete list). The variable $CONindex_{st}$ is formed by adding up the number of separate CON restrictions each state has for hospitals in each year. The number ranges from 0 in states with no CON program to 20 in the states with the strictest programs (Vermont and Washington, DC); the average state with a CON program has 10.3 separate restrictions on hospitals (see Table 9 for more summary statistics of this index).

The CON index affects total spending from 1992 (when the CON index data begin) to 2009 (when the NHEA spending data end) (see Table 5). States with broader CON programs are estimated to have higher total spending, but these estimates are not statistically significant.

Table 4 Long-run effects of certificate-of-need repeals on overall per capita spending by type of provider

	Total	Hospital	Physician	Nursing home
Years CON repealed	−0.008**	−0.003	−0.014**	−0.011
	(0.004)	(0.006)	(0.006)	(0.012)
State fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Overall R^2	0.69	0.30	0.69	0.46
Observations	1530	1530	1530	1530

Note: *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$. Robust standard errors clustered by state in parentheses. Control variables included in the regression but omitted from the table include age, gender, race (black, Asian, Hispanic; white omitted), income, poverty, education, and health insurance (private, Medicare, Medicaid). Years since CON was repealed is measured up to a maximum of 5; states that repealed CON more than 5 years ago maintain a value of 5. Spending is measured using the 1980–2009 NHEA

Endogeneity

One natural concern with the regressions of this article is that they ignore the potential endogeneity of CON laws. Perhaps CON appears to increase spending because the states that passed CON earlier and kept it in place longer were different from the others; in particular, they may have been experiencing more rapid spending growth and turned to CON to fight it. This concern led Lanning et al. (1991) to use instruments for CON, though the difficulty of finding instruments for CON that truly satisfy the exclusion restriction for spending is great.[4] The 1980 demographics of states that eventually repealed CON differ from those of states that have maintained it (Table 6). With the exception of the size of minority populations, though, the states do not appear to be substantially different, suggesting endogeneity may not be a major issue.

As a way to partially address the potential endogeneity problem, the main regressions are rerun while adding controls for state-specific linear time trends. The results (Table 7) are similar to the results without state-specific time trends in Table 3. As before, it is estimated that CON laws lead to a statistically significant increase in overall spending and spending on physicians (though now slightly smaller than the increase shown in Table 3) while having no statistically significant effect on spending in hospitals and nursing homes.

[4] For instance, the instruments used by Lanning et al. (1991) are state-level measures of Medicaid expenditures per capita, budget revenues per capita, percent of insurance premiums that are commercial, hospital beds per capita, percentage of beds in for-profit hospitals, ideology, and the party of the state government. These variables could all affect total spending in ways other than by affecting CON laws, violating the exclusion restriction; this is especially clear in the case of Medicaid spending, which adds directly into total spending.

Table 5 Effects of certificate-of-need intensity on overall per capita spending by type of provider

	Total	Hospital	Physician	Nursing Home
CON Index	0.002	0.003	0.002	−0.002
	(0.001)	(0.002)	(0.001)	(0.002)
State fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Overall R^2	0.37	0.07	0.23	0.11
Observations	918	918	918	918

Note: *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$. Robust standard errors clustered by state in parentheses. Control variables included in the regression but omitted from the table include age, gender, race (black, Asian, Hispanic; white omitted), income, poverty, education, and health insurance (private, Medicare, Medicaid). Spending is measured using the 1992–2009 NHEA

Discussion

CON laws do not appear to have achieved their goal of reducing health care spending. Despite using a wide variety of empirical specifications, this article finds no statistically significant estimate in which CON reduces spending. In fact, CON laws have the unintended but foreseeable consequence of increasing such spending by 3–4% overall. This is consistent with models in which CON restricts the supply of medical care; medical care being a generally inelastic good, this leads to price increases that exceed cuts to quantities (Ford and Kaserman 1993). The spending increases are most apparent in the case of physicians, who may benefit from CON raising the cost of a substitute. That CON increases spending provides some evidence against theories of supplier-induced demand, though it cannot rule them out (Auster and Oaxaca 1981).

Table 6 Endogenous CON repeal? 1980 demographics of CON-maintaining and CON-repealing states

Variable	Maintained	Repealed
Total health expenditure per capita	2691	2561
Hospital expenditure per capita	1272	1135
Physician expenditure per capita	578	584
Nursing home expenditure per capita	189	189
Age	33.1	31.6
% Male	48.2	49.0
% Black	12.3	3.4
% Hispanic	3.6	13.6
% College	4.4	4.1
Income per capita	25,708	25,915
% Poor	12.3	11.2
% Employer insurance	29.3	27.5
% Medicaid	8.3	6.1
% Medicare	11.1	10.1
Population	4,154,753	5,201,425

Note: All expenditure figures are in inflation-adjusted 2014 dollars. Repeal states are those that had repealed their CON program as of 2011

Table 7 Effect of certificate-of-need laws on overall per capita spending by type of provider, with state-specific time trends

	Total	Hospital	Physician	Nursing home
CON	0.028***	0.025	0.044**	0.007
	(0.009)	(0.018)	(0.017)	(0.035)
State fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
State-specific time trends	Yes	Yes	Yes	Yes
Overall R^2	0.68	0.35	0.65	0.34
Observations	1530	1530	1530	1530

Note: *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$. Robust standard errors clustered by state in parentheses. Control variables included in the regression but omitted from the table include age, gender, race (black, Asian, Hispanic; white omitted), income, poverty, education, and health insurance (private, Medicare, Medicaid). Spending is measured using the 1980–2009 NHEA

Limitations

The NHEA data only include total spending; future work should attempt to disambiguate how much of the spending increase is driven by increasing prices and how much by increasing usage or intensity. This will be challenging as data on actual prices paid for care (as opposed to charges) are just beginning to become widely available (Bailey et al. 2017).

This study uses two measures of CON: a binary measure of whether a state has any CON program and an index that sums the total number of hospital-related CON restrictions. However, it is possible that the magnitude and indeed the direction of the effect on spending could be different for different types of CON restrictions. Future work should endeavor to measure the effects of specific types of CON restrictions (e.g., MRI, substance abuse, neonatal) on spending in that specific category.

Conclusion

Certificate-of-need laws aim to bend the health care cost curve downward by slowing the entry of new providers and the adoption of new technology. The estimates in this article show that CON does not reduce any type of spending and may actually increase spending on hospitals and physicians. To the extent that spending reductions are the primary goal of CON programs, they should be reconsidered. However, CON has sometimes been put forward as a way to improve health care quality (Bailey 2018; Shortell and Hughes 1988)

or access (DeLia et al. 2009) or as a way to protect safety net hospitals (Reinhardt et al. 1987). To the extent that these are in fact the primary goals, researchers should continue to investigate whether CON achieves them.

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Compliance with ethical standards

Conflicts of interest The authors have no conflicts of interest to declare.

Appendix

Table 8 Components of CON Index

Hospital		Nonhospital
PET scanners	Lithotripsy	Home health
Gamma knives	Organ transplant	Rehabilitation
Swing beds	Ultrasound	Intermediate care facility w/ mental
Radiation therapy	CT scanners	Residential care/assisted living
Burn care	Open-heart surgery	Substance abuse
MRI scanners	Cardiac catheterization	Ambulatory surgery center
Long-term acute care	Obstetric services	Medical office buildings
Acute-care hospital beds	Air ambulance	Renal dialysis
Mobile high tech	Neonatal intensive care unit	
Sub-acute services	Psychiatric services	

Table 9 Summary Statistics for CON Index

Variable	Mean 1997	Mean 2011
CON Index (all states)	11.2	9.5
CON Index (CON states)	15.0	13.5
CON Hospital Index (all states)	8.1	7.0
CON Hospital Index (CON states)	10.9	9.9

Note: Index is based on data from the American Health Planning Association and author calculations

References

Auster R, Oaxaca R (1981) Identification of supplier induced demand in the health care sector. J Hum Resour 16:327–342

Bailey J (2018) The effect of certificate-of-need laws on all-cause mortality. Health Serv Res 53:49–62

Bailey J, Hamami T, McCorry D (2017) Certificate of need laws and health care prices. J Health Care Finance 43(4):1–7

Conover C, Sloan F (1998) Does removing certificate-of-need regulations lead to a surge in health care spending? J Health Polit Policy Law 23: 455–481

Cutler D, Huckman RS, Kolstad JT (2010) Input constraints and the efficiency of entry: lessons from cardiac surgery. Am Econ J: Econ Policy 2:51–76. https://doi.org/10.1257/pol.2.1.51

DeLia D, Cantor JC, Tiedemann A, Huang CS (2009) Effects of regulation and competition on health care disparities: the case of cardiac angiography in New Jersey. J Health Polit Policy Law 34:63–91

Ford JM, Kaserman DL (1993) Certificate-of-need regulation and entry: evidence from the dialysis industry. South Econ J 59:783–791

Grabowski DC, Ohsfeldt RL, Morrisey MA (2003) The effects of CON repeal on Medicaid nursing home and long-term care expenditures. Inquiry 40:146–157

Hellinger F (2009) The effect of certificate-of-need laws on hospital beds and health-care expenditures: an empirical analysis. Am J Managed Care 15:737–744

Ho V (2006) Does certificate of need affect cardiac outcomes and costs? Int J Health Care Finance Econ 6:300–324. https://doi.org/10.1007/s10754-007-9008-9

Koopman C, Philpot A (2016) The state of certificate-of-need laws in 2016. Mercatus Center at George Mason University, Arlington, VA. https://www.mercatus.org/publications/state-certificate-need-laws-2016. Accessed 10/17/18

Lanning J, Morrisey M, Ohsfeldt R (1991) Endogenous hospital regulation and its effects on hospital and non-hospital expenditures. J Regul Econ 3:137–154

Mitchell M (2016) Do certificate-of-need laws limit spending? Mercatus Working Paper, Mercatus Center at George Mason University, Arlington, VA. https://www.mercatus.org/publication/do-certificate-need-laws-limit-spending. Accessed 10/17/18

Rahman M, Galarraga O, Zinn JS, Grabowski DC, Mor V (2016) The impact of certificate-of-need laws on nursing home and home health care expenditures. Med Care Res Review 73:85–105. https://doi.org/10.1177/1077558715597161

Reinhardt HL, Reinhardt HN, Reinhardt UE (1987) Lessons for hospital payment from ornithology. J Policy Anal Manage 6:449–450

Rivers PA, Fottler MD, Frimpong JA (2010) The effects of certificate-of-need regulation on hospital costs. J Health Care Finance 36:1–16

Shortell SM, Hughes EFX (1988) The effects of regulation, competition, and ownership on mortality rates among hospital inpatients. N Engl J Med 318:1100–1107

Stratmann T, Russ J (2014) Do certificate-of-need laws increase indigent care? Mercatus working paper. Mercatus Center at George Mason University, Arlington