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Executive Summary

Certificate-of-Need (CON) laws require the approval of states' health planning agencies for health care providers to engage in regulated actions such as opening or expanding facilities or purchasing equipment. These actions are regulated either by name or amount, depending on the state. Such laws were seen in the U.S. as early as 1964 and historically aimed to improve health care quality and accessibility while restraining costs and wasteful redundancies. Opponents of CON laws suggest these aims have not been met and that support persists largely because of the advocacy of incumbents benefiting from the anti-competitive nature of such laws.

This study reviews the literature on CON laws, with an emphasis on how they affect hospitals. Both opponents and proponents of these laws tend to take for granted that incumbent hospitals benefit from the barriers to entry created by CON laws. All else equal, economic theory suggests that hospitals should see fewer new competitors, charge higher prices, and earn higher net revenues. However, these predictions assume otherwise perfectly competitive markets, and health care markets are heavily distorted in ways that change meaningfully over time. Further, CON laws restrain not only entry of new facilities but also expansion of existing facilities, reducing their ability to leverage any potential regulatory advantages.

Viewed in its totality, the literature suggests that CON laws benefit hospitals in some ways and hinder them in others. There is strong evidence of restricted entry and an increase in the number of procedures per hospital. However, other evidence points towards constraints on hospital expansion, while effects on prices and profitability are mixed and quality of care, if anything, appears to worsen.

Therefore, the available evidence does not support the contention that incumbent hospitals clearly and substantially benefit from CON laws. However, more studies using modern tools to identify causal effects that generalize beyond narrow settings are needed before more definitive conclusions can be reached.

Keywords: certificate of need, hospitals, health care regulation
JEL Codes: I11, I18, L25, L51

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I. Introduction

Certificate of Need (CON) regulations require the approval of states' health planning agencies for health care providers to engage in regulated actions such as equipment purchases and facility expansions. These actions can fall under CON regulation either by specific designation or, depending on the program, by the amount of the proposed expenditure (Cavanaugh et al 2020). Such regulation has an over 60-year history in the United States, as CON laws were seen as early as 1964, when New York began restricting new hospital construction (Metcalf-McCloskey Act of 1964; Battistella 1967). Though administered at the state level, federal interest in the proliferation of CON programs grew with concerns over rising health care expenditures in the 1960s and 1970s, as hospital admission and other service expenses grew between six and nine percent annually from 1965 to 1978 (Sloan 1981).

To combat rising health care costs, Congress incentivized states to adopt CON programs with an amendment to the Public Health Service Act called the National Health Planning and Resources Development Act (NHPRDA). This act, which was signed into law in 1975 (National Health Planning and Resources Development Act 1975), threatened to withhold federal funds for non-compliant states without a CON program. Within four years, only three states had not yet implemented CON programs (Sloan 1981). The NHPRDA's purported aims for CON programs were to promote health care quality and accessibility while restraining costs and wasteful redundancies (National Health Planning and Resources Development Act 1975). Federal enthusiasm for CON programs, however, wilted over the next decade, and Congress repealed the amendment in 1986 (Public Law No. 99-660, § 701, 100 Stat. 3743, 3799).

In the absence of a federal incentive, the persistence and form of states' CON programs became discretionary. Eleven states ended their CON programs by 1990, though some eventually reinstated them (Mitchell and Koopman 2016). According to the National Conference of State

Legislatures (NCSL), as of January 2024, 35 states and the District of Columbia (DC) had some level of CON regulation. Among the 15 states without formal CON programs, 12 (CA, CO, ID, KS, ND, NH, NM, PA, SD, TX, UT, WY) have no CON program whatsoever, while the other 3 (AZ, MN, WI) have certain approval processes that approximate CONs (National Conference of State Legislatures 2024). While ending CON programs entirely is rare, with New Hampshire the last to do so in 2016, modifications to state programs are more common. From 2021-2023, the National Conference of State Legislatures reports 30 modifications to CON programs across 18 states and DC. Over time, this has led to considerable variation in CON programs across states (Cavanaugh et al 2020).

A large literature examines the effects of CON laws. Studies often seek to evaluate whether programs meet the aims put forth under the NHPRDA. Namely, do states' CON programs promote health care accessibility and quality while constraining costs from excessive use or service redundancies? Providing an overall picture requires reconciling pieces of evidence across decades, during which the form of CON programs, other regulatory elements, medical practice, and empirical methods have changed considerably.

Three prior review articles evaluate this literature (Mitchell 2024a, Mitchell 2024b, Conover and Bailey 2020). Conover and Bailey (2020) focus on two key areas: the regulatory costs of CON programs and their effectiveness in meeting their aforementioned aims. They present mixed evidence that generally does not weigh in favor of CON regulations. They also conduct a cost-effectiveness analysis, suggesting that the cost of CON laws exceeds their benefits. Mitchell's reviews show that the large majority of empirical tests provide no evidence of CON programs having intended effects.

Despite such conclusions, the authors of these reviews note a need for additional high-quality research in areas where evidence is thin. The evidence on CON's effectiveness is mixed in the sense that there are some pro-CON findings; many imprecise, null findings; and plenty of anti-CON findings. Those favoring the elimination of CONs suggest that, if the combination of null and anti-CON evidence outweighs the pro-CON evidence, then CON regulation is ineffective and therefore should be repealed. Yet CON laws' prolonged existence indicates they have significant legislative inertia and have become the status quo, with repeal representing a deviation from the norm. From this perspective, one could interpret Mitchell's (2024a) tally of results as showing that repeal is nearly equally likely to fail to improve matters (49%) as it is to improve them (51%).

As a point of agreement, both proponents and opponents of CON regulations seem to start with the same assumption that these regulations are beneficial for incumbent health care providers such as hospitals. CON opponents tend to rely on economic theory about market competition to assume that incumbents benefit as oligopolists would in an otherwise unregulated market. At the same time, incumbents' persistent defense of CON laws suggests they also believe these laws benefit them directly.

Our review offers a unique contribution relative to those of Mitchell (2024a; 2024b) and Conover and Bailey (2020) by focusing on the impacts of CON laws on *hospitals*. In so doing, we ask whether the available evidence supports the conventional wisdom that incumbent hospitals benefit from the protections afforded by CON laws. We begin by discussing why standard economic models make that prediction, but also why these models might not adequately depict the heavily regulated market for hospital services. We then proceed to discuss the relevant empirical studies. The available evidence points towards CON laws reducing the number of

competing facilities and programs, increasing the number of surgeries per hospital, and lowering efficiency and quality of care. Results are more mixed for other categories of outcomes. The majority of available evidence suggests that CON laws do *not* increase hospital profitability, though additional studies are needed using comprehensive data and modern econometric techniques that aim to identify causal effects.

II. CON Application Process and Costs

The items regulated under CONs vary by state, as do the processes governing submission, review, and associated fees. In this section, we unpack some of these details, primarily based on information provided in Cavanaugh et al. (2020). While most states are CON states, some non-CON states, like Wisconsin, could be considered quasi-CON states. Such states may not have formal, mandatory programs, but have voluntary programs or moratoria on expansion for certain equipment or facilities. In the latter case, moratoria represent the more extreme side of regulation as they are bans that are more burdensome to lift or from which to be exempted. Therefore, we include moratorium states in our discussion of CON processes, as restricting expansion was among CON programs' early aims. Based on what we observe in Cavanaugh et al. (2020), we end up with 38 regulated states and the District of Columbia (DC) as a result of such inclusions.

Cavanaugh et al. categorize CON regulations into six general categories. These are hospital beds, non-hospital beds, equipment, facilities/buildings, services, and emergency medical transportation. They note that eight states maintain CON laws in all categories, with seventeen states and DC having CON laws in at least five.

States also vary in terms of application timing. Roughly two-thirds (29) of the 38 states accept CON applications at any point throughout the year (Cavanaugh et al. 2020). The

remainder and DC either accept applications based on their scheduled review cycles or when they call for applications based on expected needs.

In almost all CON states, there is a fee to submit an application. These fees often have upper and lower bounds, with intermediate values scaling up with the cost of the proposed project until it reaches the fee cap. Among those states charging a fee, the lowest minimum is $100 (Arizona and Delaware), while the highest minimum is $10,000 (Florida).[1,2] Nine states charge a flat fee, and two do not charge a fee, leaving their maximums and minimums equal.[3] The lowest, capped maximum among states charging differential fees is $3,000 (New York), while the highest maximums are theoretically infinite for states that use uncapped scaling fees.[4] Application fees are not only quite sizeable in some states but are inherently nonrefundable, as they are supposed to cover the cost of evaluating the application. This proposes a stark efficiency difference between the ability to evaluate an application with a proposed cost of a billion dollars in Connecticut (Fee = $500) versus that in Massachusetts (Fee = The greater of $500 or 0.2% of the total value of the proposed project).[5]

Figure 1 categorizes states by their maximum fees based on information in Cavanaugh et al. (2020). While the large majority of CON states cap application fees under $100,000—just

[1] Arizona is considered a non-CON state, but Cavanaugh et al indicate that it requires a certificate of necessity for ground ambulances. The application fee mentioned is related to this certification.
[2] In Cavanaugh et al, this was Tennessee at $15,000. However, Tennessee listed a minimum of $3,000 as of their revised statute in July 2022.
[3] It's unclear if a third state, Virginia, charges a fee or not.
[4] For example, Hawaii uses the following application fee schedule: $200 + 0.001 × (First Million Dollars) + 0.0005 × (Total Capital Costs – First Million Dollars) (Hawaii State Health Planning and Development Agency, 2025). If the total capital costs were one billion dollars, the fee would be $200 + 0.001 × ($1,000,000) + 0.0005 × ($999,000,000) = $200 + $1,000 + $499,500 = $500,700.
[5] With that said, Connecticut recently modified its evaluation process. CON applicants submitting applications in Connecticut since October 1, 2023, may be billed for consulting services used by the state. For such submissions, the statute states that if the reviewing unit cannot reasonably conduct the review independently without outside expertise, it may retain an independent consultant with expertise specific to the application's area of health care. The cost of this consultation is transferred to the applicant and must be paid within 30 days (Connecticut General Statutes § 19a-639a (g)). This seems to equate to a nonrefundable, unforeseeable, incremental, and retroactive increase in the application fee for more complex applications.

four states have hard caps above this in Cavanaugh et al.—only about a quarter do so under $10,000. These fees are inescapable as they must be paid for an application to be deemed complete and are nearly always nonrefundable. In Kentucky, for example, the application fee is only refundable if an application is withdrawn within five business days of submission (900 KAR 6:020 § 2(3)).

Submission fees may not be the earliest monetary costs incurred by applicants. To increase the probability of approval, applicants may hire consulting firms to assist them in the preparation and review process. A 2011 article focusing on North Carolina uses information from a single consulting firm to explore these costs. It suggests that, at a minimum, an applicant hospital would have to pay $27,000 in consulting fees for help with application preparation and a public hearing (Conley and Valone 2011). However, this was a proposed floor, and the ceiling could reach into the hundreds of thousands of dollars for non-expedited reviews, with consulting fees capping out at $300,000 for appeals alone.

While consultants can assist in creating an application, the application itself and accompanying fees are not always sufficient for it to be considered complete. To illustrate, we turn to Connecticut's CON application process described in Connecticut General Statutes § 19a-639a. In Connecticut, there are preconditions to submitting an application. The statute states that at least 20 days before submitting an application, a notice must be published in a well-circulated newspaper in the area where a proposed project is to be undertaken. The notice must include details about the scope and nature, location, and total capital expenditure for the proposed project. The application must then be filed within 90 days, but no sooner than 20 days, after posting the notice (Connecticut Department of Public Health, 2015).

Once an application has been submitted, it is subject to a 30-day completeness review. If the state decides additional information or items must be added to the application, the applicant has 60 days to update the application and resubmit it. If this is not done, the application is considered withdrawn. Once received, an updated application re-enters the completeness review, and the state has another 30 days to evaluate the application's completeness. This cycle continues indefinitely until the application is deemed complete (Connecticut Department of Public Health, 2015).

Once an application is deemed complete and notice of the complete application is posted to the government's website, a 90-day review period begins.[6] Nearly all CON states take 60 or more days for formal reviews, with many taking over 100 (Cavanaugh et al. 2020). In Connecticut, a decision will be made by the end of this period, unless one of two things occurs: the reviewing unit finds good cause to extend the period by 60 days, or a public hearing is called. If a public hearing is called, a decision will be made no later than 60 days after the reviewing unit closes the public hearing record for the application (Connecticut General Statutes § 19a-639a (d)(3)). While good cause is not explicitly defined in subsequent subsections, the conditions to trigger a public hearing are made clear. The reviewing unit "shall hold a public hearing … if three or more individuals or an individual representing an entity with five or more people submits a request, in writing, that a public hearing be held on the application" (Connecticut General Statutes § 19a-639a(e)).[7] Public hearings also occur when the application involves the transfer of a hospital's ownership or at the reviewing unit's discretion. For the latter, the

[6] Except in the case of a voluntary offer of sale for a large practice, which has a 60-day review period (Connecticut General Statutes § 19a-639a (d)(3))

[7] For sales of large practices, this gets bumped up to 25 or more people, or an individual representing 25 or more people.

applicant and public must be given two weeks' notice about an upcoming hearing (Connecticut General Statutes § 19a-639a (f)(2)).

A public hearing allows for the exercise of what is sometimes referred to as the competitor's veto. States that hold public hearings on applications often allow other interested parties to present evidence on why the application should be denied. Figure 2 displays which states allow or disallow others to intervene in the CON application process. Only six of the 38 states we consider disallow any form of intervention in the CON process. In Oklahoma, interested parties can ask for reconsideration of a denial or approval, and if sufficient cause is found for reconsideration, then a public hearing is held. This suggests that in some states, competitors with sufficient interest may still impose further costs on the applicant even after approval (Oklahoma Administrative Code § 310:4-1-8).

The incentive to impose added costs on an applicant may or may not be sufficient to induce challenges from the applicant's competitors. A challenge to an application likely depends on 1) how damaging the application's approval would be for the competitor and 2) how great of a cost can be imposed relative to the expense of imposing it. Naturally, the greatest cost that can be imposed would be added time and monetary costs spent defending against a competitor's attacks, followed by a denial of the application. If competitors' efforts have little impact on the outcome, then few attempts would be made to defeat or defend applications.

While there is relatively little information on the rates of denial based on competitors' interventions, a case study from Kentucky provides some insight. Cavanaugh and Mitchell (2023) examined CON applications submitted in Kentucky from January 2019 to May 2023. Of the 262 examined applications, incumbent providers in Kentucky submitted 76 percent. Of note, however, is that over 60 percent of the applications by incumbents qualified for non-substantive

review. In Kentucky, non-substantive review has the advantage of no competitor intervention, no burden to show need, and a faster review time. An example of an application that would likely qualify for non-substantive review in Kentucky would be the relocation of a health care facility within the same county (Kentucky Revised Statutes § 216B.095). Of the applications in the non-substantive category, only about four percent were denied. Among those requiring a formal review, 16 percent of unopposed applications were denied. In contrast, 57 percent of opposed applications were denied. These statistics provide a possible indication of the impact of competitors' intervention; however, they also leave rather significant questions unanswered.

In Kentucky, any affected person can request a public hearing within 15 days of the start of the review process (Kentucky Revised Statutes 216B.085). Affected persons can only be Kentucky residents, and if one acts as a surrogate, they can only do so on behalf of an affected person. For example, a Kentuckian cannot act on behalf of a non-Kentucky resident, as non-residents would be deemed unaffected. Applicants can challenge the right of a person to call for or attend a public hearing in opposition to the application (Title 900 Kentucky Administrative Regulations 6:090 § 3(4)(a)-(b)). This results in an evidentiary hearing where sworn statements are taken and the applicant can cross-examine the opposing party. This process suggests that opposition cannot be arbitrarily offered by relatively uninvolved parties. In conjunction, as not all applications are opposed and entities are strategic decision makers, opposition almost certainly occurs non-randomly. Therefore, it is unclear how much of the difference in the approval rates is due to opposition as opposed to other factors.

Cavanaugh and Mitchell (2023) leave unclear how many of the opposed or unopposed applications come from would-be new entrants or specific types of proposals. Knowing the breakdown within these categories would give some insight as to whether opposition is focused

on particular applications and or applicants. Nevertheless, in the absence of better information, opposition may well be a fruitful endeavor for incumbents when they elect to implement it. Opposition, at least naively, appears to add additional time costs for applicants. Cavanaugh and Mitchell state that the average length of time for an unopposed application decision was 5.4 months, while an opposed decision took an average of 10.2. They do note, however, that decision times were trending downward over time. In addition, given the limited information, we cannot rule out that the review process for applications that happened to be opposed may take longer for non-opposition reasons.

Kimbrell and Schmidt (2024) review heterogeneous CON application data across seven states (GA, IA, MI, NC, SC, VA, and WV) for at least three years per state. They find overall application approval rates between 78% (WV) and 94% (SC). However, while West Virginia has a low denial rate (4%), the authors indicate that 17% of applications were withdrawn due to competitors' opposition. Kimbrell and Schmidt indicate that between 2017 and 2021, withdrawn projects in West Virginia had a proposed value of over $53 million. In North Carolina, from 2012 to 2022, the proposed value of denied applications was about $1.48 billion. It is unclear to what degree opposition played a role in North Carolina.

Generally, it seems the application process can take several months or more from preparation to decision, occupying applicants' financial and administrative resources for the duration. Additional time and monetary costs can be imposed through opposition and may increase the probability that an application is rejected. Further, pursuing large projects relative to provider size may add significant time if government grants or partnerships that have their own review times and costs must be sought. Even when a provider finances a project itself, funds

must be set aside to ensure a project can move forward in the event of approval, preventing them from being used for other purposes.

The burden of application preparation, submission, and defense; and the heterogeneity of regulations and procedures among CON states; likely influence the number, nature, and size of health care projects. Regulations may incentivize the diversion of resources to unregulated areas or less-regulated areas, where regulatory costs and competitor interference are minimal. The widespread ability for competitor opposition could restrict optimal capacity expansions in meaningful ways. Obstacles to output optimization via restraints on expansion may also avert optimal capacity contractions, as regaining output capacity in the future may be perceived as too costly or too improbable. As a result, incumbent health care providers may maintain sub-optimal levels of output – involuntarily in the case of expansion, and voluntarily in the case of contraction. Such quantity constraints in the long run could harm efficiency and profitability. We next turn to a more detailed discussion of what economic theory has to say about the effects of CON laws.

III. Theoretical Foundations

According to conventional economic theory, an increase in a market's barriers to entry enhances the position of market incumbents. All else equal, with fewer entrants, any quantity demanded in the market will be distributed across fewer firms, and firm-level demand curves will be relatively less elastic as there are fewer suppliers between which demanders can choose. All else equal, this should lead to an equilibrium with higher prices and lower market-wide quantities. When market demand is inelastic, the increase in market price will be more pronounced than the drop in quantity, and vice versa. Profitability rises for incumbent producers,

and consumer surplus falls, as do overall gains from trade. Aggregate spending can either rise or fall depending on the relative magnitudes of the decrease in quantity and increase in price.

Therefore, if CON laws function mainly as a barrier to entry in an otherwise competitive market, then we would expect lower market quantities, greater concentration of patients across hospitals, higher market prices, and higher per-hospital net revenues. Per-hospital gross revenues do not necessarily increase, as profit-maximizing quantities are not inherently revenue-maximizing. Overall spending on hospital services across all hospitals could either rise or fall. In terms of efficiency, oligopolistic profit maximization does not necessitate that firms operate at their minimum efficient scale. Efficiency would decrease if firms move away from their minimum efficient scale, which could reduce quality of care. Additionally, if the reduction in market-wide quantity reflects services that would have been beneficial for patient health, then population health could worsen.

However, *the above conclusions hinge on the assumption that the market for hospital services is perfectly competitive aside from the CON laws*. In other words, all parties have perfect information, there are many buyers and sellers, and there are no other barriers to entry, externalities (spillover effects on others), or differentiation of products or services across providers. Dating back to seminal work by Arrow (1963), health economists have long understood that health care markets tend to look nothing like these idealized markets found in economics textbooks. *Asymmetric information* is inherent with health care, as knowledge of one's health status and treatment options depends on information provided by suppliers with a vested interest in treatment decisions. *Asymmetric information* is also present in the market for health insurance, as consumers know more about their health risks than insurance providers. While certainly many patients and health care providers exist, insurance networks can restrict the

number of providers so that there are functionally very few. *Barriers to entry* are inherent to any market with large entry costs. Health care services that slow the spread of communicable diseases have *positive externalities*. However, insured medical expenses have *negative externalities* on others in the insurance pool. This leads to the phenomenon of *moral hazard*, where individuals make decisions based on the out-of-pocket cost rather than the full cost of medical care, leading to consumption beyond the socially optimal level. Additionally, variation in service offerings and the quality of these offerings can further distort market outcomes by creating a form of market power.

Additional distortions arise from the extensive government intervention into health care markets. For instance, public health insurance and government subsidies for private insurance are common, which impacts demand for both insurance and medical care. Medical care prices in the U.S. tend to be set through a process of negotiation between insurers and providers, making them reflective of these companies' levels of market power rather than the underlying forces of supply and demand. In the case of public insurance, the government sets prices, making them susceptible to political and budgetary considerations. Hospitals cannot simply raise and lower prices as market conditions warrant, which could limit their ability to take advantage of CON laws. In an environment of fee negotiations with intermediaries, CON laws can only affect prices indirectly by limiting competition and therefore increasing incumbent hospitals' bargaining power. Additionally, CON laws themselves can limit hospitals' ability to respond on the quantity dimension by imposing regulations on capital investments. Furthermore, regulations prevent hospitals from turning away those with emergency medical conditions irrespective of their ability to pay.

These are only a few of numerous examples of how both inherent features of health care markets and government interventions into these markets can influence outcomes. Given the large number of distortions that can point in different directions, it is impossible to determine with confidence whether their net effect is to increase or decrease prices and quantities relative to the social-welfare-maximizing levels. A clearer conclusion is simply that there are far too many important deviations from the assumptions of perfect competition for it to be safe to assume that CON laws will have the effects predicted by basic economic theory.

A good illustration of this conclusion is the theory of the "medical arms race" (MAR), which suggests that competition could actually *worsen* efficiency in the market for hospital services. This theory arose because of the presence of multiple distortions. First, at the time the theory was introduced, payment from private and government insurers was generally cost-based, meaning that hospitals had little incentive to keep costs down. Although this is no longer the case, hospitals still are limited in their ability to compete along the price dimension because of the important roles of third parties in setting fees. Next, the prevalence of third-party payers and the apparent necessity of many medical services likely leads to relatively low demand elasticities that limit the effectiveness of price competition. Additionally, most hospitals are not-for-profit or public, which suggests that they are not only motivated by profits but also less measurable outcomes such as prestige.[8]

Putting these factors together, the MAR hypothesis asserts that hospitals respond to increased competition along the dimensions of technology and amenities. This might entail investing in excess capacity, creating a need for more patients or more extensive treatments. In turn, this can trigger *supplier-induced demand*, which arises from the combination of asymmetric

[8] For a discussion of MAR, see Frakt (2011) and the studies cited therein.

information in favor of medical providers and moral hazard from third-party payers that limits patients' incentive to question treatment recommendations. In the end, costs rise and efficiency is reduced. The empirical literature generally supported the existence of a MAR prior to the mid-1980s. This changed after the rise of managed care in the 1980s and 1990s and the implementation of the Medicare prospective payment system – which replaced cost-based reimbursement – in 2003, with evidence now pointing to efficiency gains from competition. Nonetheless, the MAR theory illustrates how the standard conclusion from economic theory that CON laws stifle competition and therefore lower prices might not apply because of all the other distortions already present in the market for hospital services.

Ultimately, the desirability of CON laws depends on the reality of how things are rather than an idealized abstraction. Some of the distortions to the market for hospital services, such as moral hazard from insurance-induced inflated demand for health care, may work in hospitals' favor. Others, such as the requirement to treat emergency room patients regardless of ability to pay, appear to work against them. If the net effect of the other distortions is to hurt rather than help hospitals, then CON laws could conceivably serve as a countervailing force that pushes price and quantity outcomes closer to their efficient levels, even if these laws would be detrimental to efficiency in isolation.

IV. Evidence

Given this theoretical ambiguity, we next examine the empirical evidence on the effects of CON laws, with a particular emphasis on hospitals. CON regulations' long history has resulted in considerable research spanning the past 50 years. The standards for published empirical work have risen dramatically during the past half-century, so later work is generally more credible than early work in terms of identifying causal effects. More recent evidence is also typically more

relevant for current policy decisions. With that said, each paper has its own strengths and weaknesses. Therefore, we end this section by emphasizing the studies that use the most convincing research designs and that, in our judgment, should be given priority when assessing policy implications. A tally of positive and negative results is useful, but the information from one well-designed study can be more valuable than the information from numerous less rigorous studies.

Our focus on the entities that are arguably most likely to benefit from CON laws is intentional. If even incumbent hospitals are not made better off by CON laws, then removing them is likely to be Pareto improving. In contrast, if they *are* made better off by CON laws, then the policy implications are less clear. If repealing CON laws would hurt hospitals – many of which are already struggling financially – then other compensatory interventions might be necessary to avoid jeopardizing access to health care services in underserved communities.

With that said, it is not always straightforward to classify particular outcomes as beneficial or harmful to incumbent hospitals. This is especially true for measures of quantity of services, such as hospital beds, inpatient days, and volume of various kinds of procedures. For these outcomes, the implications for incumbent hospitals differ depending on whether the analysis is done at the aggregate level (e.g. all hospitals in a state or market) versus the hospital level. In the latter case, estimates reflect changes in average quantities across hospitals, so presumably more is better from the perspective of a given hospital. In contrast, an increase in market-wide quantities could simply reflect an increase in the number of facilities, making it uninformative about changes at a given incumbent hospital.

Different-signed effects on aggregate and per-hospital measures of quantity are possible if not probable. If a state repeals its CON law, standard economic theory predicts a rise in

aggregate quantity, as the removal of barriers to entry leads to more competitors. However, any given hospital's quantity could drop or stay the same. Importantly, though, CON laws not only inhibit new entrants – they also constrain expansion by incumbents. This means aggregate quantity could rise even without new entry – and in this case per-hospital quantity would unambiguously rise. Given these theoretical differences, we will discuss results from aggregate- and hospital-level analyses separately when we examine these volume-related outcomes.

Competing Facilities

We begin by discussing an outcome for which the implication for incumbent hospitals is clearer: the number of competing facilities. Theoretically, the benefit to hospitals from CON laws arises primarily through reduced competition. Indeed, evidence shows that CON laws reduce the number of hospitals (Custer et al. 2006; Ho et al. 2007; Short et al. 2008; Hellinger 2009; Eichmann and Santerre 2011; Stratmann and Koopman 2016).[9] With the repeal of CON laws, new entrants may attempt to lure away incumbents' patients. Li and Dor (2014) found this for hospitals newly entering the market for coronary artery bypass grafts (CABG) and percutaneous coronary interventions (PCI) in Pennsylvania, particularly for PCI, which can be either an inpatient or outpatient procedure.

However, the reduction in competition could also arise from fewer specialized facilities that compete with hospitals for certain service lines. A prominent example is ambulatory surgery centers (ASCs), which are typically physician-owned and specialize in highly profitable outpatient procedures such as orthopedics. Research shows that CON regulations are associated with fewer ASCs (Stratmann and Koopman 2016; Stratmann et al. 2024).

[9] In the case of Custer et al. (2006), this is based on our calculations of the state-level hospital information in their Figure 9. We compute an average reduction in the number of hospitals between 1985 and 2006 of 24% in their eight CON law states and 12% in their three non-CON law states.

Additional studies focus on particular lines of service that are typically provided at hospitals. If CON laws inhibit the establishment of these lines of service, this would be beneficial to incumbent hospitals that already provide them but detrimental to other hospitals who would like to add them. CON laws are associated with fewer neonatal intensive care units (Lorch et al. 2012). Additionally, the elimination of a trauma center CON requirement in Florida is associated with more trauma centers opening (Broecker et al. 2024). Several papers indicate that CON laws reduced the number of programs providing heart surgeries or related diagnostics, or that repeal increased them (Robinson et al. 2001; Conover and Sloan 2003; Popescu et al. 2006[10]; Cantor et al. 2009; DeLia et al. 2009; Ho et al. 2007; Ho et al. 2009; Cutler et al. 2010; Vaughn-Sarrazin et al. 2010; Li and Dor 2014). However, Conover and Sloan (1998) find no effect of CON laws on open heart, organ transplant, or ambulatory surgical units per million for hospitals or for a broader variable including free-standing units. Conover and Sloan (2003) find no lasting effect of lifting CON laws on technology diffusion (trauma centers, open heart surgery, computed tomography scanners, magnetic resonance imaging scanners, and cardiac catheterization laboratories).

In short, a substantial body of evidence from various settings shows that CON laws reduce the number of service providers. As discussed previously, in an otherwise perfectly competitive market, this would lead to lower market-wide quantities, higher prices, and higher net revenues for incumbent hospitals. However, the substantial distortions in the market for hospital services means that these results cannot be taken for granted. A large body of empirical studies examine whether CON laws have these (or other) effects.

[10] Popescu et al. (2006) find that Medicare beneficiaries with acute myocardial infarction were less likely to be admitted to hospitals with revascularization services in CON states or undergo such surgeries, implying fewer such programs, all else equal.

Market Concentration

If CON laws reduce the number of competing facilities, we would expect them to also increase market concentration. Only a few studies have examined direct measures of concentration such as the Herfindahl-Hirschman Index (HHI), finding mixed results.[11] Custer et al. (2006) construct an HHI for hospital beds and observe that states with more expansive CON laws have more concentrated markets. However, Paul et al. (2019a) find that CON laws are associated with *decreased* inpatient service concentrations in hospital referral regions. Yuce et al. (2020) examine median market shares for ten surgical procedures and suggest they find no statistically significant difference between concentrations in CON and non-CON jurisdictions. However, the median market share for hospitals for each procedure is always higher in CON states. Half of these procedures have at least marginally significant differences before a multiple hypotheses correction is applied, and the result for their overall measure indicating this difference is very close to marginal significance ($p=0.11$).[12] Therefore, the preponderance of Yuce et al.'s evidence points to higher concentration in CON states.

Hospital Beds

A number of studies examine whether CON laws influence the number of hospital beds – a readily available measure of capacity. Consistent with the MAR, early advocates suggested that hospitals over-invested in beds, which, if unused, increased hospital costs and the incentive to fill them with patients via induced demand, leading to excessive increases in medical expenditures. Therefore, an initial goal of CON regulations was to curtail hospitals' investment in hospital

[11] Other studies have drawn conclusions about concentration based on average or median procedures per hospital. However, this only captures concentration is there is no change in market-wide quantity, which seems unlikely given the aforementioned theoretical predictions.

[12] The median market share for total knee arthroplasty, total hip arthroplasty, coronary artery bypass graft, lower extremity bypass, and lung resection all have p-values < 0.1.

beds. Some of the studies on hospital beds use total number of beds across all hospitals in a given state or market, while others conduct hospital-level analyses and estimate the effect on the average number of beds per hospital. We discuss the results from these two types of analyses separately for the reasons discussed earlier in this section.

Evidence on the effect of CON laws on aggregate hospital beds is somewhat mixed, though the majority points to a reduction. Early studies finding fewer beds include Salkever and Bice (1976; 1979) and Conover and Sloan (1998). However, Eastaugh (1982) find no impact, while Salkever and Bice (1976; 1979) and Eastaugh (1982) find evidence of increases in other investments or anticipatory investments before CON implementation (Salkever and Bice 1976; Salkever and Bice 1979; Eastaugh 1982). Several more recent studies examine data from after the expansion of managed care and implementation of the Medicare Prospective Payment System. Most again find decreases in the aggregate number of beds from CON laws (Hellinger 2009; Lorch et al. 2012[13]; Stratmann and Russ 2014; Mitchell and Stratmann 2022[14]). One exception is Conover and Sloan's (2003) finding that the most stringent CON laws increased beds per 1,000 state population. Another is Custer et al. (2006), who found an overall decrease in the number of beds but no evidence that this decrease correlated with state CON laws.

At the hospital level, the majority of evidence again points to decreases in beds. This includes early work by Joskow (1980) and Mayo and MacFarland (1989) as well as later analyses by Eichmann and Santerre (2011) and Paul et al. (2019b). One study, however, finds an increase in beds based on the interaction between the square root of hospitals' average daily census and the length of time a CON law has been in place (Anderson 1991).

[13] Lorch et al. (2012) look at neonatal intensive care unit beds.
[14] Mitchell and Stratmann (2022) indicate that during the COVID-19 pandemic, CON state hospitals were more likely to have a high percentage of their beds in use. We infer a supply constraint in the face of a demand increase, all else equal.

In short, the preponderance of evidence suggests that CON laws had the intended effect of curtailing expansions in the number of hospital beds. Since aggregate and hospital-level measures both suggest reductions in facilities and beds, the results are inconsistent with new entrants reducing the number of beds at the average hospital but keeping overall supply the same. This in turn implies that the effect comes – at least in part – from CON laws inhibiting incumbent expansion. Accordingly, Mayo and MacFarland (1989) restrict their Tennessee sample to hospitals observed continuously from 1980-1984, thus isolating effects on hospitals that entered before the sample period, and still find a decrease.

It is important to note that, while bed reductions may have been social-welfare-improving in the 1970s and early 1980s when cost-based reimbursement incentivized overinvestment, it is unclear whether this is still the case. As discussed previously, normally barriers to entry would worsen economic efficiency and social welfare. However, given the numerous distortions still present in the market for hospital services, some of which push towards excessive service provision (e.g. asymmetric information and moral hazard), it is difficult to ascertain the welfare effects of curtailing hospital expansion or entry.

Patient Days and Length of Stay

If reduced capacity in the form of hospital beds correlates with a lower quantity of services, this should show up in the form of number of patient days. Mechanically, patient days equals the number of patients times the average length of stay per patient. From the hospital's perspective, more patients are presumably better, but length of stay is less clear. Prior to the early 1980s, longer stays meant more revenue. However, the implementation of the Medicare Prospective Payment System in 1983 aimed to incentivize shorter stays by providing a flat amount per diagnosis code. The rise in managed care in the 1980s and 1990s changed the

incentives for privately insured patients. Therefore, longer patient stays – and therefore also total number of patient days – can only be seen as unambiguously positive for hospital revenue in earlier studies.

The early evidence related to patient days is mixed. Several studies suggest little effect of CON laws on patient days per capita, along with possible increases in administrative services but not clinical services (Salkever and Bice 1976; Salkever and Bice 1979; Cromwell and Canak 1982). One study, Sloan (1983), indicates CON laws were associated with reduced lengths of stay. This would be consistent with these laws inhibiting facility expansion, leading to earlier discharges to avoid overcrowding. This would mean a loss of revenue for the hospital, though the effect on social welfare could be positive if the additional days were medically unnecessary. With that said, Ashby (1984) finds no association between CON laws and the percent change in total admissions per capita or average length of stay.

Other studies are from a more recent time period when the implications for hospital revenue are unclear. Kahn et al. (2012) find CON laws reduced the likelihood of a stay in a long-term acute care hospital after a stay in an intensive care unit, implying a reduction in the total number of days spent in the hospital. Ho and Ku-Guto (2013) find no evidence that CON law repeal influences length of stay. Paul et al. (2019b) show that CON laws reduced hospital bed occupancy rates, implying fewer total patient days unless CON laws increased the number of beds. On the other hand, Mitchell and Stratmann (2022) find hospitals in CON states to be more likely to have had high or full occupancy during the COVID-19 pandemic.

Surgeries

New points of focus emerged in the literature on the effect of CON laws on quantity with the growth in heart and orthopedic surgeries. Several studies examine CABG and PCI. CABG is

an invasive surgery wherein blood vessels are taken from elsewhere to reroute blood flow around a blocked artery. PCI is less invasive and uses a stent to expand a narrowing or blocked artery and reestablish blood flow. The appropriateness of each is based on the complexity and severity of a patient's condition.

There is little direct evidence that total state- or market-wide cardiac procedures changed in response to CON laws (Conover and Sloan 1998; Robinson et al. 2001; Ho et al. 2009; Cutler et al. 2010). One exception is Fric-Shamji and Shamji (2010), who find CON states to have higher rates of CABG but lower rates of cardiac transplant. Some indirect evidence may imply procedure reductions. Two studies associate CON laws with reduced likelihoods of receiving heart surgery (Popescu et al. 2006; Li and Dor 2014). Also, Vaughn-Sarrazin et al. (2010) suggest that CON reduction states saw increased CABG utilization relative to PCI. This may indicate that CON laws reduced CABG provision, particularly given the opposite trends in overall utilization (more PCI, less CABG) (Vaugn-Sarrazin et al. 2010). In contrast, Custer et al. (2006) found that the most rigorous CON programs were associated with greater inpatient utilization and higher per capita admission rates for CABG.

If CON regulations do induce a supply contraction for heart surgeries, changes in quantities may be difficult to detect if demand is highly inelastic. Given CABG's invasiveness and relation to case complexity and severity, it would be unsurprising if the quantity demanded was insensitive to price changes. Waterworth et al. (2008) find that 87 percent of patients referred for cardiac surgery underwent surgery and only 0.8 percent of those referred actually refused surgery. The vast majority of those not undergoing surgery ultimately were considered too high risk, were not suitable for surgery, or another procedure was deemed more appropriate. Heidenreich et al. (2002) examine Medicare beneficiaries with acute myocardial infarction,

finding a refusal rate of 2.8 percent for coronary angiography, an imaging procedure. In contrast, Rothman et al. (2007) find a refusal rate for surgery more generally of 11-13 percent. This evidence shows that heart procedures are rarely refused, even relative to other medical procedures, suggesting inelastic demand.

Three recent studies on back surgeries together imply that CON laws induce substitution from more to less serious procedures, similarly to substitution from CABG to PCI. Malik et al. (2019) and Sridharan et al. (2020) find that CON states had lower utilization of elective 1-to-3-level posterior lumbar fusions per capita relative to non-CON states. At the same time, Ziino et al. (2021) found utilization and growth of lumbar micro decompressions to be higher in CON states. Lumbar micro decompression is a minimally invasive surgery that alleviates bone or disk pressure on nerves.

Several papers examine impacts on total knee, hip, and shoulder arthroplasty (TKA, THA, TSA), commonly referred to as knee, hip, and shoulder replacements. A majority of studies find that CON regulations were associated with lower levels of TKA, THA, TSA, and simple knee arthroscopy, but with higher growth rates for TKA and THA (Browne et al. 2018; Casp et al. 2019; Cancienne et al. 2020; Schultz et al. 2021). Contrarily, Fric-Shamji and Shamji (2010) find no detectable difference in the rates of THA and TKA.

Effects of CON laws on other surgical procedures have also been examined. Short et al. (2008) show no difference in procedures per cancer incident in CON and non-CON states. Cosby (2011) finds no detectable difference in heart and kidney transplant facilities or procedures per 100,000 population. Liang and Lindsey (2024) show that the frequency of cataract surgery was lower in CON states than non-CON states and declined more rapidly from 2017-2021.

In short, in most cases, CON laws were found to have either no detectable effect or a quantity-reducing effect on aggregate (state- or market-wide) surgical procedures. These findings appear to be grouped by the relative seriousness of the condition. Heart surgeries, organ transplants, and cancer-related surgeries showed little response to CON regulation, which seems plausible for potentially life-threatening conditions. Quantities of less life-threatening conditions, such as joint replacements, back surgery, and cataract surgery were generally sensitive to CON regulations.

In contrast to the murkier results from the literature on market-wide quantity of services, studies on per-hospital quantity generally find CON laws increase volume. This is most widely seen for heart procedures (Robinson et al. 2001[15]; Vaughn-Sarrazin et al. 2002; Ho 2004; DiSesa et al. 2006; Dobson et al. 2007; Ho 2007; Ho et al. 2009; Cutler et al. 2010; Vaughn-Sarrazin et al. 2010; Li and Dor 2014). A handful of other studies suggest increased per-hospital volume for joint procedures, procedures for cancer patients, non-heart surgical procedures, lumbar fusions, and imaging services (Short et al. 2008; Fric-Shamji and Shamji 2010[16]; Casp et al. 2019; Malik et al. 2019; Sridharan et al. 2020; Myers and Sheehan 2020[17]; Cancienne et al. 2020; Baker and Stratmann 2021).

Also, combining results from multiple studies implies that CON laws that restrict ASC entry preserve per-hospital outpatient surgical volume. Stratmann et al. (2024) show that CON repeal significantly increases the number of ASCs by around 45 percent, with nearly double that

[15] Specifically, they find CON repeal increased open heart surgery programs but did not change the number of CABGs occurring. This implies that repeal led to less concentration within incumbents, which in turn implies that CON laws increase per-hospital volume.
[16] They suggest CON laws may have moved some surgical procedures typically performed in private settings to teaching hospital settings.
[17] They find CON intensity increased emergency department wait times for examinations by medical professionals, pain medication for fractures, hospital admittance, and hospital discharge. We take this to suggest there are more patients per medical professional in CON states and not lower medical professional competence.

increase in rural areas. Courtemanche and Plotzke's (2010) finding that the entry of a nearby ASCs reduces a hospital's outpatient procedures implies an increase in outpatient volume from CON laws. Accordingly, Lynk and Longley (2002) find at least a temporary decline in outpatient procedures at a Louisiana hospital when physicians opened a nearby ASC. Yee (2011) shows that physicians who become directors at ASCs increase their procedure load, and part of the increase is from patients who would have been referred to other facilities. This change, however, declines when the physician is no longer a director at an ASC. Bian and Morrisey (2007) find that ASCs reduce hospital outpatient surgical volume by 4.3 percent. Combined, these results suggest that CON laws restricting ASC entry concentrate outpatient surgeries in hospitals.

Imaging

Another point of focus for recent CON literature has been medical imaging, particularly Magnetic Resonance Imaging (MRI). Conover and Sloan (2003) find that CON laws reduce the number of MRI machines per capita. Stratmann and Russ (2014) show that these laws also reduce the number of hospitals that report providing different types of imaging services. Horwitz and Polsky (2015) provide evidence that freestanding MRI providers in states without a CON law tend to locate close to the border of states with a CON law.

Together, these studies imply that CON laws impose binding constraints on the number of imaging machines. However, whether this is a positive or negative from the perspective of an incumbent hospital is less clear. If the effect comes from would-be competitors being unable to enter the market, this would benefit incumbents. In contrast, if the effect comes from existing hospitals being unable to invest in new machines despite abundant demand, that would hurt incumbents. The available evidence suggests that both of these phenomena occur to at least some extent. Perry (2017) documents reliance on unregulated mobile scanners that goes away once

state restrictions are loosened and existing facilities can purchase a new scanner. At the same time, Baker and Stratmann (2021) show that CON law states have lower entry of new MRI providers. Consistent with that finding, Horwitz et al. (2024) provide evidence that CON laws increase the probability that an MRI is conducted at a hospital rather than a freestanding facility.

Access in Rural Communities

Some evidence suggests that CON laws could uniquely affect access to medical care in rural areas. Herb et al. (2020) found CONs *reduced* travel time for rural radiation oncology services but varied in significance and direction by census region. One might expect that a supply reduction from CON regulation should only result in increased travel times. However, an explicit aim for some CON programs is geographic redistribution of services to sparsely populated areas. Additionally, a common advantage for CON state incumbents is the ability to oppose localized entry. In the absence of CON regulations, initial competition may be focused in heavily populated areas, with providers entering less populated areas only once more populated areas are saturated. If CON programs restrict expansion and entry to areas that have little territorial overlap with incumbents, then this could result in reduced travel times in less population-dense areas. Cavanaugh et al. (2020) note that Alabama, Florida, Kentucky, Oregon, and Washington exempt rural areas from CONs, providing an incentive for rural expansion. On the other hand, Nevada requires a CON for rural hospitals to open but not for urban hospitals. How feasible and focused expansions in rural areas are may correlate with states' focus and population distributions.

According to the Census Bureau's American Community Survey from 2011-2015, 64.4% of the total rural population in the United States (US) resides east of the Mississippi River (Census Bureau n.d.). Data from the 2020 Census indicates that 46% of the US' rural population

lives in the South census region, under 27% live in the Midwest, and the Northeast and West contain under 15% each. Herb et al. (2020) found that CON laws significantly reduced rural travel time for radiation oncology in the South, increased it in the Northeast and Midwest, and had no detectable effect in the West. Given the sizeable rural population, the South may be conducive to aligning CON intent and financial feasibility. The opposite may be true if other regions' populations are insufficiently rural. CON programs in such cases may not have a rural focus or investments may not be financially feasible, resulting in fewer urban investments being redirected to rural areas and thus longer relative travel times.

CON programs may also improve access to medical care in rural communities by preventing struggling rural hospitals from closing or reducing lines of service. Indeed, D'Aunno et al. (2000) find that rural hospitals in CON states were less likely to convert to non-hospital health care providers than those in non-CON states. However, Stratmann et al. (2024) find no evidence that CON repeal led to rural hospital closures or service reductions.

Prices

We next turn to the expectation that CON-law-induced barriers to entry should result in higher prices, all else equal. Pricing data are notoriously hard to obtain in health care research, and the evidence is sparse here. Noether (1988) finds CON laws associated with higher prices for certain conditions and treatments such as diabetes, cataract surgery, acute myocardial infarction, and congestive heart failure.

Custer et al. (2006) find CON regulations are associated with increased inpatient stay payments per episode for private payers, though not by as much in rural areas. Casp et al. (2019) find that average per-patient charges for THA are lower in CON states. Cancienne et al. (2020) obtain similar findings for simple knee arthroscopies, as do Wu et al. (2025) for TSA. However,

Schultz et al. (2021) find that costs for TKA and TSA were higher in CON states. Given these findings, the association with CON regulation on price for joint procedures is unclear. Both Casp et al. and Cancienne et al. examine Medicare data. Schultz examines Humana data for patients diagnosed with arthritis in a relevant joint. Wu et al. use 2024 data from the Centers for Medicare and Medicaid Services mandated disclosure of hospital pricing for TSA. However, the required disclosure covers prices for a variety of payors, and it is unclear how a final price was constructed.

Wu et al. also find that Medicaid expansion is associated with increased TSA prices. The finding of an increased price associated with expansion suggests a potential demand increase. Based on information from the Kaiser Family Foundation (KFF) and the NCSL, as of 2024, 40 states have expanded Medicaid, and 31 of these have CON programs (Kaiser Family Foundation 2025; National Conference of State Legislatures 2024). Given the correlation between CON programs and Medicaid expansion, this may suggest the price difference between CON and non-CON states is less likely explained by a demand decrease. It could be that public payers in CON states have less generous reimbursements for joint procedures, resulting in a lower average price across payers. In contrast, lower public reimbursements might lead providers to charge privately insured patients more. If so, this might explain the difference in the findings of Casp et al, Cancienne et al, and Wu et al. compared to that of Schultz et al.

In short, evidence on the effect of CON laws on prices is limited and somewhat mixed. Section III provided a possible explanation for prices not increasing as much as standard economic theory might suggest. Market distortions from public insurance price setting and commercial insurance bargaining limit the price-setting power hospitals would otherwise garner

from restricted competition. This limits hospitals' ability to affect prices in a profit-maximizing way.

Hospital Efficiency

In this subsection, we turn to evidence of CON laws' influence on hospital efficiency, or cost per unit.[18] Whether or not CON laws should be expected to improve efficiency depends on where hospitals are producing along their average total cost curve. If they are overproducing relative to their minimum efficient scale (perhaps due to the MAR), CONs that decrease output would improve efficiency. However, if as oligopolists, hospitals were producing below their minimum efficient scale as a means to maximize profits, then further reductions would only increase inefficiency. As a consequence, CON laws' effects likely vary with the state of the pre-CON market and shifts in health care demand over time. This also means that it is difficult to connect changes in efficiency – as measured by average costs – to incumbent hospitals being better or worse off. By creating market power, CON laws could induce production below the minimum efficient scale but still increase incumbent's profits.

A number of papers study effects on the average cost per unit of output, service, or patient, finding mixed results. Salkever and Bice's (1976; 1979) evidence varied, depending on whether they allowed for state-specific intercepts in their regressions or not. Doing so leads to findings of significant reductions in total costs per capita and inpatient costs per inpatient day but no discernable effect on patient days per capita. Starting in the 1980s, Sloan and Steinwald (1980) find CONs had either no detectable effect on efficiency or increased total costs per adjusted patient day or per admission. Coelen and Sullivan (1981) include CON dummies for specific states and find mixed signs and significance for several outcomes related to hospital

[18] This is a distinct concept from overall economic efficiency, which was emphasized in Section III.

expenditures per adjusted admission, per capita, and per adjusted patient day. Sloan (1981; 1983) finds a reduction in expenses per admission but not per adjusted admission nor expense per adjusted patient day. Ashby (1984) and Noether (1988) find CONs increased the percent change in total costs per capita and expenses per admission respectively.

Several more studies emerged in the 1990s. Eakin (1991) finds that CON laws increase deviations from minimum cost production. Anderson (1991) finds CON stringency associated with increased variable costs and an increased probability that hospitals have less than 100 beds, which he argues is below optimal size. Mayo and MacFarland (1991) find mixed evidence supporting higher costs in their full sample but lower costs in the most recent year of their sample. Antel et al. (1995) find CON programs to increase hospital costs per admission and per patient day but no evidence of an effect on per capita costs. Finally, Conover and Sloan (1998) find mature CON programs to be associated with increased hospital expenses per adjusted patient day and per admission.

Turning to the 2000s, Bates et al. (2006) find no evidence that CONs worsened the input-per-output efficiency of hospitals. Rivers et al. (2007; 2010) find CON hospitals associated with higher costs per adjusted admission. Ferrier et al. (2010) show that CON laws reduce aggregate technical (output per input) and structural (mix and scale) inefficiency. However, in the decomposition of structural inefficiency, CON laws decrease mix inefficiency but increase scale inefficiency. Granderson (2011) finds that CON repeal improved cost efficiency. Ho and Ko-Guto (2013) find that CON repeal improved costs per CABG but not per PCI.

In short, the available evidence points towards CON laws reducing efficiency or having no effect, depending on the context. This is consistent with market power leading hospitals to deviate from producing at the minimum of the average total cost curve, at least in some cases.

Aggregate Hospital Expenditures

The effect of CON laws on aggregate expenditures on hospital services is ambiguous according to standard economic theory, which predicts that prices increase but quantities decrease. Lanning et al. (1991) find that CON regulations increase total hospital expenditures using an instrumental variables strategy.[19] Conover and Sloan (1998) find mixed evidence as both mature CON programs and CON repeal were associated with increases in Medicare spending, particularly for Part B. Conover and Sloan (2003) find reduced hospital spending per state resident and Medicare spending per eligible state resident. Polsky et al. (2014) find no evidence that CON laws affect overall Medicare expenditures. Averett et al. (2019) show no evidence of changes in hospital total charges after CON removal. Malik et al. (2019) and Sridharan et al. (2020) find that average Medicare reimbursements were slightly higher in CON states by the end of their sample period. Bailey and Hamami (2023) find increased expenditures for those in CON states who had poor or good self-reported health compared to those with excellent health. Liang and Lindsey (2024) show that inflation-adjusted expenditures increased more in CON states.

In short, the available evidence regarding aggregate expenditures is mixed but mostly points towards an increase or no effect. An increase would be consistent with reduced supply decrease combined with relatively inelastic demand. Proportionally, if price increases by more than quantity decreases, then the product of price and quantity increases.

Hospital-Related Quality

[19] Their instruments are prior period health expenditures per capita, state Medicaid expenditures per capita, state budget revenues per capita, American Democratic Action rating, commercial hospital insurance premiums as a percent of total premiums, hospital beds per capita, percent of beds in investor-owned hospitals, and an indicator for a party split between states' governor's office and the legislative bodies as instruments.

There are reasons to suspect that CON laws might lower quality of care. Reduced competition is generally thought to weaken the incentive to provide high quality service. Moreover, it could lead to capacity shortages that worsen care. However, quality of care is notoriously difficult to measure, as documentable adverse outcomes are relatively rare and could be influenced by numerous factors besides the care given.

A number of studies use mortality as a proxy for quality. Shortell and Hughes (1988) find CON regulations to be associated with increased mortality. Vaughn-Sarrazin et al. (2002) suggest CABG mortality is higher in non-CON states. DiSesa et al. (2006) and Popescu et al. (2006) find no relationship between CON laws and CABG mortality. Other studies document that CON repeal decreased mortality for CABG (Ho et al. 2009; Kolstad 2009; Cutler et al. 2010). Ho et al. claim the effect dissipates as the statistical significance fades after about 5 years, though this is mostly because of larger standard errors rather than decreased point estimates. Cosby (2011) finds no detectable difference in transplant failures or deaths between CON and non-CON states. Lorch et al. (2012) find no association between CON and neonatal mortality. Cancienne et al. (2020) document no effect on the odds of in-hospital death within a year of simple knee arthroscopy. Averett et al. (2019) find that ending CON regulation in Pennsylvania reduced the probability of dying after TKA and THA. Chiu (2021) finds that CON regulations increased heart attack deaths by as much as ten percent. Choudhury et al. (2022) suggest that CON relaxation in the early months of the COVID-19 pandemic reduced mortality related to COVID-19, septicemia, diabetes, chronic lower respiratory disease, influenza/pneumonia, and Alzheimer's disease. Stratmann (2022) finds that CON hospitals performed worse in mortality for surgical inpatients with serious but treatable complications, pneumonia, and heart failure.

Other proxies for quality have also been used. Cromwell and Kanak (1982) find no effect of CON on changes in total, quality, complex, community, supportive, or competitive services offered. Custer et al. (2006) provide no evidence of differential acute care quality between CON and non-CON markets as measured by indicator variables developed by the Agency for Healthcare Research and Quality. Cutler et al. (2010) show that CON repeal redistributed CABG procedures to higher quality surgeons. Ho and Ko-Guto (2013) find that repeal reduced complications from stroke. Li and Dor (2014) find that repeal increased the sorting of patients into CABG and PCI by condition severity. Polsky et al. (2014) find no evidence that CON laws influence rehospitalization rates. Casp et al. (2019) document that CON laws were associated with higher odds of TKA patients being readmitted after 30 days but with lower odds of infections and revisions.[20] Studies examining lumbar fusions suggest CON states had lower odds of 90-day pain-related complications and readmissions but higher odds of deep venous thrombosis, infectious complications, and renal complications (Malik et al. 2019; Sridharan 2020). Cancienne et al. (2020) find CON regulation associated with lower odds of ER visits within 30-days of simple knee arthroscopy, lower odds of infection within 6 months, and no detectable effect on hospital admission within 30 days. Stratmann and Baker (2020) show that CON laws were associated with increased ER visits per 1,000 Medicare beneficiaries and increased readmission rates for rural Medicare beneficiaries. Horwitz et al. (2024) find that CON reduced the likelihood of receiving low-value imaging with negligible effects on high-value imaging.

[20] Also, they suggest there was no difference in the odds of dying within one year of surgery or visiting the emergency room. However, the p-value for death was P=0.003 and the odds ratio was above one, indicating that CONs increased the odds of death. The p-value for emergency room visits was P=0.071 with odds less than one, indicating that CONs reduced the odds of such visits with marginal significance.

In short, the hospital-related evidence leans toward no change or decreased quality from CON regulation. The estimated effects vary across types of procedures, outcomes, and time periods.

Hospital Profitability

Basic economic theory suggests that strong barriers to entry increase and sustain profitability. They concentrate demand and prevent new entrants from compelling greater price competition and production nearer firms' minimum efficient scale. If hospitals can freely adjust prices and quantities in profit-maximizing ways, one would expect CON laws to increase their net revenues.[21]

Surprisingly, the available evidence mostly suggests that CON laws either *reduce* hospital profitability or have no effect. Sloan (1981; 1983) find CON programs to be associated with reduced hospital profitability. Noether (1988) find higher prices for the treatment of certain conditions and infers higher margins for them but does not directly test profitability. Conover and Sloan (1998) do look at profitability using multiple dummy variables for the year before and year of CON implementation, one and two years after CON implementation, and three or more years after implementation. All three variables show statistically significant increases in profitability, making it difficult to cleanly attribute increased profitability to CON programs since one variable includes a pre-CON time period. Conover and Sloan (2003) find that CON programs were associated with reduced profitability in two ways. The first was by showing CON removal increased profitability after four years. The second was by showing that stringent CON programs were associated with reduced profitability. Dobson et al. (2007) found profitability to be higher

[21] The term "net revenue" is often used in place of profit when discussing hospitals, as most U.S. hospitals are non-profit. However, this does not mean hospitals cannot make profits, just that they cannot be distributed to shareholders.

in non-CON states for safety-net and non-safety-net hospitals. Cutler et al. (2010), looking at CABG in Pennsylvania, observe that incumbent hospitals experienced drops in profitability following repeal but recovered and ultimately had increased profitability.

To provide a more recent comparison of hospital profitability in CON law versus non-CON law states, we perform our own calculation. The Kaiser Family Foundation (2024) provides a table of average hospital operating margins by state in 2024, aggregated from data on 4,194 hospitals. This table lists the number of hospitals per state. We then generate cross-state averages within the categories of CON and non-CON states. These averages are weighted by the number of sampled hospitals in each state relative to the total in each group. The weighted averages for operating margins are 5.1% for CON law states and 5.9% for non-CON-law states.

Overall, the evidence, though limited, indicates that CON regulations *do not* increase hospitals' net revenues. This could perhaps point to these laws preventing hospitals from expanding their operations at the same time that they inhibit competition. However, we emphasize that more research is needed to make more definitive claims.

Causal Inference

Thus far, we have discussed the evidence from the literature uncritically, implicitly giving each study equal weight in terms of the overall assessment. However, the long history of CON laws and CON research coincides with important evolutions in empirical methods. Improvements in computational power and developments in econometrics are evident in the CON research timeline. In an effort to emphasize the research that might be considered most credible by current standards, this section narrows our focus to evidence employing what could be described as the modern causal inference toolkit, which includes approaches such as difference-in-differences (DiD) and regression discontinuity (RD). These methods aim to

identify effects using plausibly exogenous (i.e. good-as-random) variation. In the CON literature, this generally means leveraging *changes* in CON laws across states over time, as the timing of such changes is more likely to be exogenous than which states have or do not have laws at a given point in time.

With that said, dichotomizing studies as "causal" or "non-causal" is an oversimplification. "Causal" econometric approaches require assumptions that are difficult to directly test and may be invalid in some cases, while "non-causal" approaches can still yield credible answers if certain assumptions are met. Whether a study obtains causally interpretable estimates is not a simple "yes" or "no" question. Causal credibility is better conceptualized as the probability of the identifying assumptions holding, which tends to be higher in modern methods such as DiD. However, this probability cannot be easily determined, so dichotomizing based on objective criteria is the most practical approach, even if it is imperfect.

In the CON law literature, even if "causal" methods help improve the credibility of point estimates, they still face important challenges that limit the usefulness of the results. The first is that they often have to rely on a small number of very specific policy changes. The specific details of what CON laws do and do not regulate vary substantially across states. CON regimes are often modified incrementally rather than eliminated wholesale, with exceptions or restrictions for certain items or areas (rural vs urban) being implemented on an ad hoc basis. Given the specificity in what is regulated, few states may change their regulations for any given item listed in Cavanaugh et al (2020), such as hospital beds, non-hospital beds, equipment, buildings/facilities, and emergency transport services. Even within these categories, the change may be specific to imaging equipment rather than equipment generally. For these reasons, there tend to be few comparable changes in CON laws during any particular time period.

Consequently, many "causal" analyses are case studies involving a single, unique policy change, such as Pennsylvania's 1996 CON law repeal (Cutler et al. 2010; Li and Dor 2014).

Relying on a single or only a few policy changes leads to two distinct limitations. The first is generalizability to other states, time periods, types of CON law changes, and outcomes. To illustrate, Perry (2017) employs an RD strategy using a policy change related to MRIs in North Carolina. Even if that study credibly identifies impacts on outcomes related to MRIs, there is little reason to believe that those effects would be similar to, say, the effects of changing restrictions related to hospital beds on outcomes related to hospital beds in a different state at a different time. Similarly, the effects of a full repeal like the one in Pennsylvania in 1996 are likely quite different than those of an incremental change in a different state in a different time period. The second limitation is that relatively recent developments in econometric theory have shown that standard errors can be substantially understated if identification comes from a small number of treated or control units, and that conventional solutions like clustering standard errors are inadequate (e.g. Cameron and Miller, 2015). Most of the studies in the CON literature were completed prior to this issue and potential solutions being commonly understood, meaning that they could have overstated levels of statistical significance.

For these reasons, we emphasize below only the studies that use a causal inference methodology and identifying variation from a number of states. These studies have already been briefly mentioned above within the subsection corresponding to their outcome variables. However, we discuss them in more detail here.

The first such study is Conover and Sloan (2003), who implement a DiD for lifting CON laws where the comparison year is four years before lifting. They examine various outcomes from 1980 to 2000, with some variation in start and end years depending on data. They do not

find an effect on cost containment. Some evidence suggests that removing CON laws resulted in a decrease in the number of beds per capita; however, this decrease began two years *before* removal. They find no evidence of an effect on hospital admissions per capita or on expenses per adjusted patient day or per admission. However, lifting CON laws increased hospital profitability four or more years after removal and they find no trends in the pre-removal period. They suggest they find no lasting effect of lifting CON laws on technology diffusion. Their short-term findings suggest that CON removal may have reduced cardiac catheterization laboratories for the first three years, but the effect fades into insignificance thereafter. The dissipation appears to be due to a smaller point estimate rather than growing imprecision.

Ho et al. (2009) examine CABG and PCI outcomes from 1989-2002. They use a DiD strategy to compare outcomes in seven states that dropped their CABG-related CONs to 28 states that maintained such regulations. They also employ a similar approach for PCI. They find that states that dropped CABG-related CONs had lower CABG mortality initially but not permanently, saw no differences in PCI mortality, had more providers performing these procedures, had lower average hospital volume statewide for CABG and PCI, and saw no change in the statewide number of procedures.

Ho and Ko-Guto (2013) adopt a similar approach, examining changes in CABG and PCI-related costs and reimbursements for Medicare beneficiaries. Their results suggest that CABG costs declined after CON repeal, and these cost savings exceeded the fixed costs of new facilities entering the market. They also find that while hospital length of stay is unaffected, complications from stroke are reduced. They did not find similar evidence for PCI.

Next, Choudhury et al. (2022) examine the effects of states repealing or suspending their CON laws during the COVID-19 pandemic. They find that doing so reduced mortality from

COVID-19, septicemia, diabetes, chronic lower respiratory disease, influenza or pneumonia, and Alzheimer's Disease. However, their sample period spans only March to June of 2020, early in the COVID-19 pandemic, limiting the contexts to which their results may be generalized.

Bailey and Hamami (2023) use a DiD approach to evaluate the effect of CON repeal on health care spending in the Medical Expenditure Panel Survey from 1996 to 2016. During this time, Pennsylvania (1996), Indiana (1999), Wisconsin (2012), and New Hampshire (2016) repealed their CON programs, illustrating the challenge in finding adequate, recent policy variation even across long periods of time. They find CON programs to be associated with a three percent increase in per capita health care spending, but increases were unevenly distributed based on health. They found no evidence that those in excellent health were affected, while the less healthy saw increases up to 12 percent.

Stratmann et al (2024) use a DiD to estimate the effect of ASC CONs on ASC supply from 1991 to 2019. During this time, six states repealed their ASC CON laws. They find that ASC-CON repeal increases states' per capita ASCs by over 40 percent, with over 90 percent increases in rural areas. They find no evidence of increased rural hospital closures or service discontinuations, and argue this undercuts claims that CON laws protect against cream-skimming.

Other studies aim to circumvent the need for identifying off changes over time in CON laws by instead utilizing cross-sectional variation and "zooming in" on areas on both sides of a state border, arguing that both sides are plausibly similar except for state CON laws. The primary challenge with such an approach is potential difficulty in separating the effects of CON laws from the effects of other state policies.

Horwitz and Polsky (2015) evaluate the effects of MRI CON laws on border counties in 2012. The authors categorize a border county as a similar-regime county or different-regime county based on the presence or absence of an MRI CON in the county itself and its neighbors. An indicator for different regimes is interacted with an MRI CON dummy to evaluate MRI CON laws' effect in unregulated border counties. The proposition is that freestanding MRI facilities would increase in unregulated counties to capture demand in neighboring regulated counties. Horwitz and Polsky find significant spillover effects, as unregulated different-regime counties had 6.4 more MRIs per million people than regulated different-regime counties. This effect is seen more strongly in border counties that are not divided by a major river, suggesting ease of access plays a role, and reemphasizing the intent of cross-border demand capture.

Building on Horwitz and Polsky (2015), Horwitz et al. 2024 use an RD border discontinuity strategy to examine the effect of CONs on the location of imaging providers among census tracts. They find moving from a tract in an unregulated state across the border to one in a regulated state results in a 14 percent lower probability that the tract has an MRI provider, but without a similar finding for computed tomography providers. Medicare beneficiaries in CON states were less likely to receive any imaging, but this was driven by reductions in low-value imaging.

Chiu (2021) uses a "border discontinuity" approach to examine the effects of CON laws on heart attack mortality from 1968 to 1982. He uses border county pairs, comparing a CON county to a similar non-CON county on its border. Chiu's model includes county and county-pair-by-year fixed effects. He finds that CON regulations increased heart attack deaths three years after implementation by six to ten percent.

In other studies leveraging border discontinuities, Stratmann (2022) and Polsky et al. (2014) examine hospital referral regions (HRRs) that cross state borders, where one state has a CON law and the other does not. Stratmann examines hospital quality, while Polsky et al. investigate home health care use. Both papers control for HRR fixed effects.[22] Stratmann finds that CON laws led to higher rates of mortality for surgical inpatients with serious but treatable complications, pneumonia, and heart failure. Polsky et al. (2014) find that CON states use less home health care but find overall Medicare expenditures, rehospitalization rates, and home health practice patterns otherwise similar.[23]

V. Discussion

Existing reviews of the impact of CON laws generally interpret the available evidence as suggesting that they have been unsuccessful. However, it is important not to analyze them in a vacuum. They are but one of innumerable interventions by different levels of government into health care markets. Some, like the requirement to treat emergencies regardless of ability to pay

[22] Two other studies aim to identify causal effects of CON laws using instrumental variable approaches. However, we do not emphasize them in this discussion because we see little reason to believe that their exclusion restrictions – that the instruments only affect the outcomes via CON laws – are satisfied. Fayissa et al (2020) use Republican party affiliation as their instrument and find that health survey scores tabulated by healthcare professionals are nearly 18-24% lower in CON states. However, state residents' political views likely affect numerous other health care policies besides CON laws. Paul et al. (2019a) explore CON laws' effects on hospitals' share of inpatient admissions in a given HRR by using state-level science and technology index, excise tax rate on beer, and Gini index as instruments. Ultimately, they state they cannot reject the exogeneity of their CON dummy and downplay their insignificant IV results. Their ordinary least squares (OLS) regression results indicate that CONs reduce market concentration as measured by share of inpatient admissions. Paul et al. (2019b) explore CON laws' effects on emergency department length of stay, using a similar IV approach but replacing the beer tax instrument with the Consumer Price Index. In this study, both the OLS and IV results indicate reductions in emergency department length of stay.

[23] Other studies fit our categorization of "causal" but are outside the scope of our review because they study outcomes that do not directly relate to hospitals. Bae and Bailey (2024) employed a triple differences approach to estimate CON laws' effect on the labor market from 1979 to 2019. They compare health care workers across states and time to non-health care workers across states and time. They find no evidence that CONs influenced health care workers' employment or wages relative to other workers. Yu and Whaley (2024) employ a DiD strategy to study the effect of moratoria on CON regulations for nursing home beds during the COVID-19 pandemic. They evaluate whether these moratoria had an impact on nursing home capacity. Using Healthcare Provider Cost Reporting Information System data from 2015 to 2021 and employing the moratoria information found in Choudhury et al (2022), they find that the temporary moratoria on CONs had little effect on nursing home capacity.

and the setting of fees for publicly insured patients that are lower than those for privately insured patients, disadvantage hospitals and can lead to dire financial situations for hospitals in low income and rural communities. Therefore, even if CON laws are unsupported by economic theory in isolation, when viewed in the context of all the other distortions, they might play an important role in keeping safety-net hospitals financially viable.

Consequently, our review focused on the literature on the impacts of CON laws, with an emphasis on whether the available evidence supports the contention that hospitals benefit from the barriers to competition that these laws provide. If they do not, then policymakers could have more confidence that removing CON laws will not have detrimental effects on access to health care. While at first it may seem obvious that incumbent hospitals benefit from CON laws, this is not necessarily the case. First, while CON laws make entry more cumbersome, if the review process is generous and fast enough, they may not ultimately affect the supply of health care service providers. Additionally, CON laws might not only reduce the entry of new facilities but also hinder expansion by existing facilities. Therefore, hospitals might benefit from reduced competition but suffer from the inability to expand, leading to ambiguous net effects on revenue and profitability.

Table 1 summarizes the results discussed in Section IV in table form based on whether they would generally be seen as beneficial or harmful to incumbent hospitals. The second column indicates which direction of effect would be beneficial to these hospitals or says "unclear" if it is ambiguous. The remaining columns list the papers that find increases, decreases, or unclear/null/mixed effects on the given outcome. Papers that meet our criteria to be considered "causal" are in bold.

Viewed in their totality, the results from the literature show signs of both the competition-reducing and expansion-reducing effects of CON laws. The literature clearly establishes a reduction in competing facilities and programs, with all sixteen studies in that category leading to that conclusion, including three that we consider "causal". Similarly, all three studies (two of which are causal) that look at competing imaging providers find a decrease. Fewer competitors should mean greater market concentration, which is the result found by two of the three studies that directly examine concentration. Also, all eighteen studies on surgeries per hospital find an increase, though only one meets our "causal" criteria. Together, this evidence shows that CON laws reduce the number of competitors, leaving more business for incumbent hospitals. However, CON laws also appear to reduce the number of beds and imaging machines per hospital, implying binding constraints on expansion. Six of the seven studies in those categories find reductions, though none meet the criteria we outlined above for "causal" (quasi-experimental research design and several treated units).

A sizeable portion of the literature on CON laws – two dozen studies – have examined different outcomes related to quality of care. All but two of these studies find either worse quality or mixed/unclear results. Of the six that use a causal methodology, five find lower quality and one obtains unclear results. Accordingly, we conclude that CON laws hurt quality of care for at least some procedures in some settings. We view lower quality of care as a negative outcome for hospitals due to reputational damage and an altruistic desire to help the community. Since most hospitals are non-profit, it seems reasonable to assume that net revenue is not the only motivating factor for hospitals. Lower quality could result from either reduced competition or hospitals being unable to expand, and it is difficult to distinguish between these two possibilities based on the available evidence.

Results for other outcomes that are important to hospitals are more mixed. Increased market power generally leads to higher prices, but the available evidence is split evenly in terms of whether CON laws increase or decrease prices. This may point to most health care prices being determined by government fee setting and negotiation with private insurers rather than the usual market forces of supply and demand. With that said, none of the seven studies on prices meet our criteria to be considered "causal".

Next, there are only a handful of studies on the effect of CON laws on hospital net revenue (profitability). The majority – including the only causal study – point to a *decrease* rather than an increase, as does our own calculation using the most recent available data. Relatedly, two studies examine impacts on the financial health of rural hospitals, with one finding an improvement but the one with a causal methodology finding no evidence of an effect. Further research is needed before definitive claims can be made, but the evidence to date points more strongly towards CON laws not affecting hospital net revenue or decreasing it, rather than towards increasing it. This may seem surprising in light of the relatively clear evidence of increased volume per hospital. Together, these results imply that the costs of handling the additional volume roughly offset the increase in revenue. This could conceivably be because CON-law-induced restrictions on expansion prevent hospitals from implementing the lowest-cost approach to treating more patients. At the same time, the inability to easily adjust prices prevents hospitals from increasing revenues as much as they might otherwise.

Estimated effects on total patient days and average length of stay are also mixed, though none of the evidence in this category qualifies as causal. Recall that our previous discussion characterized increases in these outcomes as favorable to hospitals only before the implementation of the Medicare Prospective Payment System and rise of managed care.

Focusing only on evidence from before these payment reforms began in the mid-1980s, four studies find no evidence of a change in total patient days. For these null results to be consistent with the evidence of increased number of procedures, average length of stay would have to decline. One early study finds this to be the case, while another finds no clear change. Later evidence is mixed, with studies finding both increases and decreases in total patient days and both decreases and no discernable change in length of stay.

Finally, we turn to the categories of outcomes for which we argued that it is not clear which effect direction favors incumbent hospitals. Numerous studies – though none that qualify as "causal" – examine measures of efficiency such as average cost. As discussed in the preceding section, producing more efficiently is generally advantageous, but in the case of hospitals, it could also signal a loss of market power, leading to the ambiguity. The seventeen papers on the effect of CON laws on efficiency are almost evenly split between finding reductions and no evidence of an effect. It is somewhat remarkable that evidence indicating improvement is limited to Granderson (2011) and an implied improvement by Mayo and McFarland (1989). Consistent with economic theory, hospitals appear to respond to increased competition from CON law repeal by finding ways to deliver care at a lower average cost. A natural concern would be whether this cost cutting worsens quality of care, but the evidence on quality discussed above points, if anything, in the opposite direction.

Recall above that the available evidence points strongly towards CON laws increasing the number of surgeries per hospital. However, the preponderance of evidence suggests that the total number of surgeries across all providers either declines or stays the same, with the one "causal" study finding a null result. A decline in aggregate surgeries would indicate that the drop in the number of providers outweighs the rise in surgeries per hospital. This could be interpreted as

supporting the MAR hypothesis, with repeal of CON laws triggering entry, in turn causing incumbent hospitals to induce demand to recoup the lost revenue. Alternatively, CON laws could also reduce aggregate surgeries simply by creating provider shortages. These two possibilities have vastly different implications for social welfare, and it is not possible to distinguish between them based on the existing evidence.

Results for a related outcome – aggregate expenditures on hospital services – are mixed. Four studies point to CON laws increasing aggregate expenditures, two find a decrease, and three find inconclusive results. The three studies in this category that we consider causal are evenly split, with one finding an increase, one a decrease, and one no evidence of an effect. On balance, then, the literature leans towards the seemingly contradictory conclusions that CON laws decrease aggregate surgeries but increase aggregate expenditures. However, neither are consensus results, and given the wide range of settings, data, and methods used in the literature, the most appropriate conclusion might simply be that the effects can vary.

VI. Conclusion

Economic theory predicts that regulations imposing barriers to entry like CON laws lead to reduced competition and therefore higher prices, lower aggregate quantities, and greater profitability for existing firms. The extensive empirical literature on the impacts of CON laws does provide substantial evidence of a reduction in the number of competitors faced by incumbent hospitals. However, effects on prices, aggregate quantities, and hospital profits are much less clear, with some studies finding the predicted effect, others finding the opposite, and still others finding no clear evidence in either direction. In all cases, more evidence using causal research designs is needed. With that said, the available evidence is inconsistent with the contention that hospitals obtain substantial financial benefits from CON laws.

While this conclusion may appear surprising at first glance, it is plausible since the market for hospital services bears little resemblance to the idealized markets of economics textbooks. CON laws not only restrict the entry of new competitors but also often inhibit expansion by incumbent facilities. Therefore, while incumbent hospitals are clearly able to add volume to some extent given the extensive evidence that CON laws increase surgeries per hospital, they may not be able to fully accommodate the additional demand created by facing less competition. Firms unable to fully meet demand would typically raise prices, but hospitals are unable to readily do so. They may increase nominal charges, but the actual payments they receive are typically determined either by the government or negotiation with private insurers. In other words, hospitals are constrained in terms of their ability to change all of the components of net revenue: price, quantity, and cost.

What, then, would be the ideal approach to CON laws from an incumbent hospital's perspective? Importantly, CON laws vary from state to state in terms of the details of which types of providers are affected and how. Conceivably, a CON law could apply only to new facilities and not expansion decisions by existing facilities. From a hospital's perspective, such a law would retain the benefits and eliminate the downside. However, the limitations on price-setting would remain. Additionally, a CON law revision that specifically exempts existing providers would likely be controversial and a difficult sell politically.

A bigger-picture approach may ultimately be more fruitful. According to the American Hospital Association (2017), hospitals face 341 distinct regulations from the federal government alone. An average hospital devotes 59 full-time employees and $7.6 million annually simply to ensure compliance, to say nothing of the substantive effect of these regulations on hospital revenues and costs. These regulations do not each exist in a vacuum, but instead often result

from a process of give-and-take involving lobbying from different groups representing stakeholders, federal agencies, and elected representatives. State regulations and federal and state policies related to insurance and payment – such as Medicare and Medicaid reimbursement rates – are also important components of the public policy landscape. Given the evidence presented in this review, CON laws may be less valuable to hospitals than other regulatory or payment reforms. For instance, the American Hospital Association report cited above recommends twelve specific regulatory reforms. CON laws provide a point of leverage that conceivably could be "traded" for other reforms of greater value.

With that said, our review does document strong evidence that CON laws lead to at least some outcomes that incumbent hospitals would presumably view favorably – particularly the reduction in competitors and increase in surgical volume. These benefits are indirect, though. If they do not lead to additional net revenue, it is unclear that they are of much value. With that said, there is an important logical distinction between (1) the existing empirical evidence not providing sufficient evidence to conclude that CON laws increase hospital profitability and (2) the evidence conclusively showing that CON laws do not increase hospital profitability. The distinction is akin to a preponderance of evidence standard versus a standard of beyond reasonable doubt. There are only a handful of studies that specifically examine profit, and these studies vary in terms of methodological rigor, data sources, time periods, and results. Additional high-quality research is needed to make more definitive claims.

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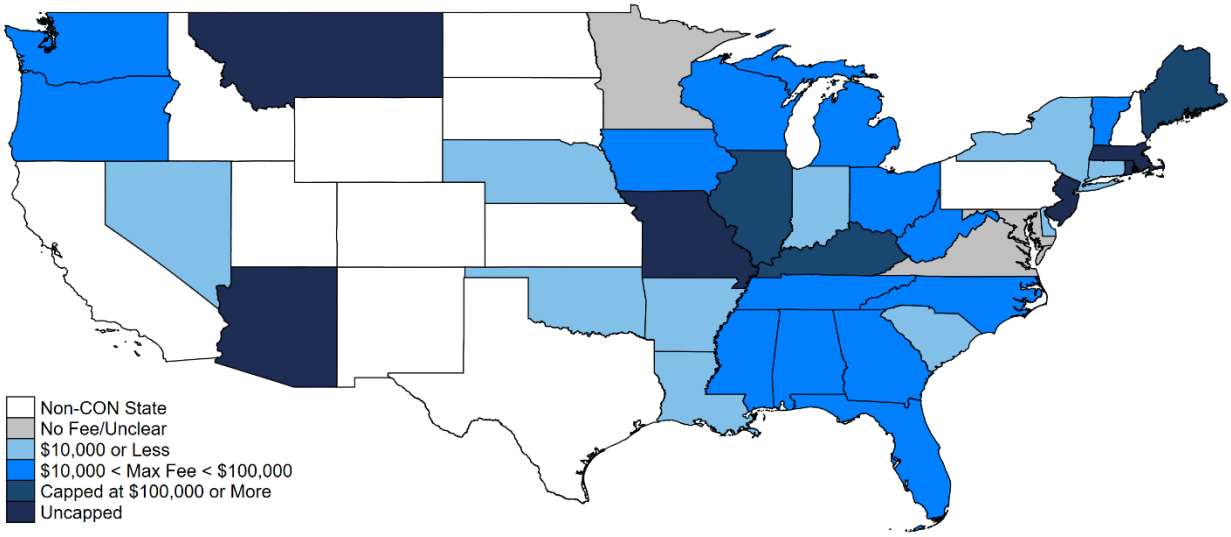
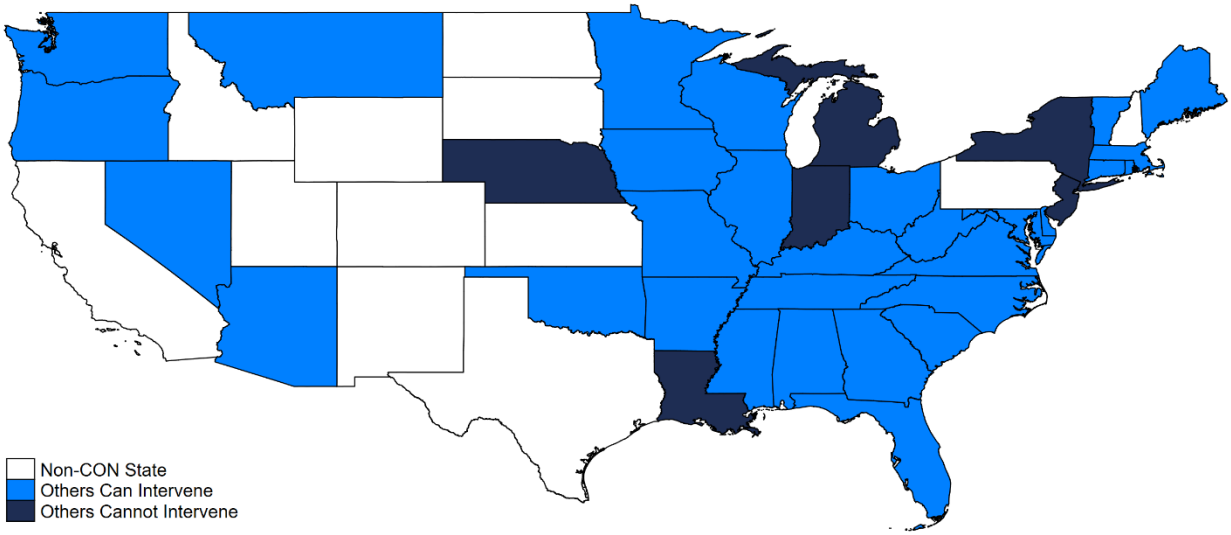
Figure 1. Application Fee Categories for U.S. States



Notes: Not shown: Alaska ($10,000 < Max Fee < $100,000) and Hawaii (Uncapped). Arizona is technically uncapped as shown; however, Arizona only regulates ambulances, and the application fee is $100 + $200 × number of ambulances.

Figure 2. CON Application Intervention Categories for U.S. States



Notes: Not shown: Alaska and Hawaii both allow intervention.

Table 1 – Summary of Results in Literature from Perspective of Incumbent Hospitals

	Better outcome for incumbent hospitals	Increase	Decrease	Neither or unclear
Competing facilities and programs	Decrease		• Broecker et al. (2024) • Cantor et al. (2009) • **Conover and Sloan (2003)** • Custer et al. (2006) • Cutler et al. (2010) • DeLia et al. (2009) • Eichmann and Santerre (2011) • Hellinger (2009) • **Ho et al. (2009)** • Li and Dor (2014) • Lorch et al. (2012) • Popescu et al. (2006) • Robinson et al. (2001) • Short et al. (2008) • Stratmann and Koopman (2016) • **Stratmann et al. (2024)** • Vaughn-Sarrazin et al. (2010)	
Market concentration	Increase	• Custer et al. (2006) • Yuce et al. (2020)	• Paul et al. (2019a)	
Beds per hospital	Increase	• Anderson (1991)	• Eichmann and Santerre (2011) • Joskow (1980) • Mayo and MacFarland (1989) • Paul et al. (2019b)	

			• Stratmann and Russ (2014)	
Total patient days	Increase (prior to payment reforms)	• Mitchell and Stratmann (2022)	• Paul et al. (2019b)	• Ashby (1984) • Cromwell and Canak (1982) • Salkever and Bice (1976) • Salkever and Bice (1979)
Average length of stay	Increase (prior to payment reforms)	• Casp et al. (2019)	• Sloan (1983; length of stay) • Kahn et al. (2012)	• Ashby (1984) • Ho and Ku-Guto (2013)
Aggregate surgeries	Unclear	• Custer et al. (2006) • Schultz et al. (2021) • Ziino et al. (2021)	• Cancienne et al. (2020) • Li and Dor (2014) • Malik et al. (2019) • Popescu et al. (2006) • Sridharan et al. (2020) • Vaughn-Sarrazin et al. (2010)	• Browne et al. (2018) • Casp et al. (2019) • Conover and Sloan (1998) • Cutler et al. (2010) • Fric-Shamji and Shamji (2010) • **Ho et al. (2009)** • Robinson et al. (2001)
Surgeries per hospital	Increase	• Baker and Stratmann (2021) • Cancienne et al. (2020) • Casp et al. (2019) • Cutler et al. (2010) • DiSesa et al. (2006) • Dobson et al. (2007) • Fric-Shamji and Shamji (2010) • Ho (2004) • Ho (2007) • **Ho et al. (2009)** • Li and Dor (2014) • Malik et al. (2019) • Myers and Sheehan (2020)		

		• Robinson et al. (2001) • Short et al. (2008) • Sridharan et al. (2020) • Vaughn-Sarrazin et al. (2002) • Vaughn-Sarrazin et al. (2010)		
Competing imaging providers	Decrease		• Baker and Stratmann (2021) • **Horwitz and Polsky (2015)** • **Horwitz et al. (2024)**	
Imaging machines per hospital	Increase		• Perry (2017)	
Financial health of rural hospitals	Increase	• D'Aunno et al. (2000)		• **Stratmann et al. (2024)**
Prices	Increase	• Custer et al. (2006) • Noether (1988) • Schultz et al. (2021)	• Cancienne et al. (2020) • Casp et al. (2019) • Wu et al. (2025)	• Mayo and MacFarland (1991)
Efficiency	Unclear	• Granderson (2011) • Mayo and McFarland (1989)	• Ashby (1984) and Noether (1988) • Anderson (1991) • Antel et al. (1995) • Conover and Sloan (1998) • Eakin (1991) • Guto (2013) • Rivers et al. (2007) • Rivers et al. (2010)	• Bates et al. (2006) • Coelen and Sullivan (1981) • Mayo and McFarland (1991) • Salkever and Bice (1976) • Salkever and Bice (1979) • Sloan (1981) • Sloan (1983) • Sloan and Steinwald (1980)
Aggregate expenditures	Unclear	• Lanning et al. (1991) • **Bailey and Hamami (2023)** • Malik et al. (2019)	• **Conover and Sloan (2003)** • Liang and Lindsey (2024)	• Averett et al. (2019) • Conover and Sloan (1998)

		• Sridharan et al. (2020)		• **Polsky et al. (2014)**
Quality of care	Increase	• **Horwitz et al. (2024)** • Vaughn-Sarrazin et al. (2002) • Cancienne et al. (2020)	• Averett et al. (2019) • Casp et al. (2019) • **Chiu (2021)** • **Choudhury et al. (2022)** • Cutler et al. (2010) • **Ho et al. (2009)** • **Ho and Ko-Guto (2013)** • Kolstad (2009) • Li and Dor (2014) • **Stratmann (2022)** • Stratmann and Baker (2020)	• Cosby (2011) • Cromwell and Kanak (1982) • Custer et al. (2006) • DiSesa et al. (2006) • Lorch et al. (2012) • Malik et al. (2019) • **Polsky et al. (2014)** • Popescu et al. (2006) • Sridharan (2020)
Profitability	Increase	• Noether (1988)	• **Conover and Sloan (2003)** • Cutler et al. (2010) • Dobson et al. (2007) • Sloan (1981; 1983)	• Conover and Sloan (1998)