Side Effects of the Tax Cuts and Jobs Act of 2017: Evidence from the Hospital Industry

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Abstract: We examine how the Tax Cuts and Jobs Act of 2017 (TCJA) altered the hospital industry. Nonprofit hospitals make up approximately 80 percent of all hospitals and generally have an advantage over their for-profit counterparts due to their tax-exempt status. Provisions in the TCJA exogenously increase the relative cash flow in for-profit hospitals compared to nonprofit hospitals. We hypothesize and find that this comparative change in tax-driven cash flows results in greater investment, primarily in capital assets, among for-profit hospitals relative to nonprofit hospitals. We then test for changes in the quality of care around the TCJA and present evidence of a reduction in relative readmissions among for-profit hospitals, indicating an increase in for-profit quality of care. Lastly, using financial data from California hospitals, we find that the TCJA reduced implicit taxes among for-profit hospitals. Our results contribute to the tax literature by providing initial evidence of how a shift in tax policy altered the dynamics of the hospital industry.

Keywords: Tax Cuts and Jobs Act (TCJA), capital investment, hospitals, tax policy

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1. Introduction

The hospital industry is unique – facilities with different ownership structures (e.g., government, private nonprofit, and for-profit hospitals) directly compete for patients by attempting to attract top physicians and investing in both more and better equipment. A nascent stream of literature examines the effects of taxes on competition (e.g., Kim, Nessa, and Wilson, 2021; Glaeser, Olbert, and Werner, 2023) and the role of implicit taxes on corporate decision making (Markle, Mills, and Williams, 2020; Chyz, Luna, and Smith, 2021). A limitation of much of this literature is that it often relies on cross-country variation in tax policy for identification and the samples do not include tax-advantaged organizations for a counterfactual (Guenther and Sansing, 2023). In contrast, we analyze the dynamics of the hospital industry by exploiting an exogenous reduction in cash tax expense among for-profit hospitals with the passage of the U.S. Tax Cuts and Jobs Act of 2017 (TCJA). We find that relative to nonprofit hospitals, the TCJA encouraged capital investment and improved patient care among for-profit hospitals. Additionally, the prevalence of nonprofit hospitals provides a tax-favored control group to directly examine implicit taxes. Consistent with the theory that lowering taxes reduces required pre-tax returns, we document a relative post-TCJA reduction in implicit taxes among for-profit hospitals. We contribute to the tax literature by documenting the consequences of the TCJA on an important industry that is often overlooked by studies examining the real effects of taxes.

The TCJA is associated with a myriad of corporate tax changes. For brevity, we discuss three key tax provisions that are salient to hospitals. First, the reduction in corporate tax rates from 35 to 21 percent increased the after-tax cash flows of taxable for-profit entities relative to non-taxable nonprofits. Second, changes to bonus depreciation deductions allowed for additional immediate expensing of new assets, similarly providing for-profit hospitals with an increase in

after-tax cash flows. Third, to restrain perceived excessive compensation in nonprofit entities, the TCJA imposed an excise tax on executive compensation in excess of $1 million for specific covered employees of nonprofit entities (Balsam, Hall, Harris, and Smith, 2023).[1] Despite all these provisions relatively benefiting for-profit hospitals, there are several reasons why the TCJA may have no differential impact on nonprofit and for-profit hospitals. First, Duggan (2000) finds that when hospitals receive cash windfalls, both for-profit and nonprofit entities invest in financial assets. If these results generalize, then for-profit hospitals may not use the additional post-TCJA cash flows for operations (e.g., capital assets, wages, etc.), and if cash is used to increase dividends or reduce leverage, these actions may not change implicit taxes.[2] Second, if cash is not a binding constraint among for-profits, then the reduction in cash tax payments may not elicit any behavioral response. Therefore, it is an empirical question whether these tax policy changes ultimately lead to changes within the hospital industry.

At the time of TCJA enactment, only 21 percent of community hospitals were for-profit organizations. The remaining 79 percent were nonprofit organizations comprised of voluntary nonprofits and government-owned entities (American Hospital Association, 2017). For U.S. tax purposes, nonprofit hospitals are not taxable entities (i.e., not subject to income taxes) to the extent they qualify under IRC §501 for performing certain socially beneficial activities (e.g., charity care).[3] In addition to being exempt from income taxes, nonprofit hospitals are older, larger, and less resource constrained than their for-profit counterparts on average (Doroghazi, 2016b; Colla, Lewis, Tierney, and Muhlestein, 2016), giving these hospitals a financial

[1] An exception is made for remuneration paid for medical services. Therefore, the excise tax will not apply to medical professionals and will likely only apply to C-suite executives in a hospital setting.
[2] For example, all things equal, if a hospital uses the reduction in taxes to pay down high interest debt, this should result in higher pre-tax income by eliminating a percentage of interest expense.
[3] Prior literature does suggest that nonprofit hospitals still care about earnings (e.g., Eldenburg, Hermalin, Weisbach, and Wosinska, 2004); they also provide extensive charity care that is not entirely driven by profit motives.

competitive edge. The TCJA acts as an exogenous tax cash "windfall" to for-profit hospitals, whereas their nonprofit competitors do not receive a similar benefit. Accordingly, we hypothesize that the TCJA decreases the competitive tax advantage of nonprofit hospitals, which may affect investment behavior (e.g., by altering incentives to invest in capital expenditures) or quality of care (e.g., by reducing the cost pressure of patient care). In addition to potentially affecting hospitals' operating environment, the TCJA provides a "shock" to implicit taxes by increasing after-tax profits via tax cuts, which in turn, may reduce the required pre-tax returns.[4] While a growing stream of tax literature documents the real effects of the TCJA, it is unclear if these results generalize to hospitals due to the different industry dynamics.[5]

We first examine the investment response and changes in patient outcomes around the TCJA using data from the Centers for Medicare and Medicaid Services (CMS) from 2015 through 2019. This data is representative of the total population of hospitals; however, we eliminate observations in states with less than 10 percent for-profit hospital presence because these hospitals may operate in a different competitive and regulatory environment. An advantage of using CMS data is that hospitals that accept Medicare and Medicaid reimbursements are required to meet a minimum set of operating criteria, thus, mitigating, at least to some degree, concerns over comparing structurally different hospitals. We posit that investment is necessary for for-profit hospitals to "gain ground" on their nonprofit competition and that for-profit hospitals are likely to focus investment in both equipment (e.g., a CT scan machine) and skilled labor (e.g., cardiologists). Additionally, many medical capital expenditures likely qualify for

[4] Chyz, Luna, and Smith (2021) define implicit taxes as: "Implicit taxes are defined as the pre-tax rate of return disadvantage for investing in something tax-favored as compared to something less tax-favored" (pg. 39).
[5] For example, corporations delayed income and accelerated deductions in order to take advantage of the lowered corporate tax rate (Dowd, Giosa, and Willingham, 2020; Gaertner, Lynch, and Vernon, 2020; Durrant, Gong, and Howard, 2021).

favorable depreciation rates from the TCJA, which we hypothesize leads to additional investment by taxable for-profit hospitals. To test the impact of the TCJA on patient outcomes, we examine hospital readmission rates. Hospital readmissions is admittedly not a perfect measure of patient care, yet it is nonetheless ubiquitous in healthcare research.[6]

To estimate hospitals' response to the TCJA, we first examine total salaries and employee benefits, which capture two major components of labor investment that are better populated in the CMS data and are representative of all levels of care. Using a generalized difference-in-differences (DiD) design, we find some evidence of an increase in benefits paid to employees at for-profit hospitals, relative to nonprofits, but no differential change in salaries. Next, we measure capital investment using two classes of depreciable property: equipment and building additions. Our results indicate that for-profit hospitals increased investment in capital assets relative to nonprofit hospitals after the TCJA. The magnitude is roughly the same between equipment and buildings and the investment response is stronger in 2018, the year immediately after the enactment of the TCJA. When examining patient outcomes, we find a drop in annual readmissions among for-profit hospitals, relative to nonprofit hospitals, largely in 2019. Additionally, CMS provides three-year averages of "abnormal" readmissions, which removes an expected value based on key considerations such as the caseload mix. We draw similar inferences using this abnormal readmission value. In sum, our results suggest that, in relation to their nonprofit competitors, for-profits increase post-TCJA investments, primarily depreciable capital assets, and improve patient outcomes.

To increase the internal validity of our results we perform several cross-sectional and

[6] For a more detailed review of the literature using readmission rate as a quality of care indicator and the context in which readmission rates should be used as a quality of care indicator, see Fischer, Lingsma, Marang-van de Mheen, Kringos, Klazinga, and Steyerberg (2014).

robustness tests. We first examine whether increases in capital expenditures are concentrated in states that are primarily Republican (i.e., "red states") because the TCJA was passed without Democratic support. Consistent with the view that the tax law may spur investment in Republican states due to a different perception of the tax law, we find the increase in capital expenditures concentrates in red states. We corroborate this null result among blue states using different hospital data from California. Next, we partition the sample based on local hospital competition, but find that for-profit hospitals increase capital expenditures independent of competition. We speculate, but do not test, that this lack of differential finding is due to national competition, particularly in elective procedures. Lastly, we partition the sample based on an increase in equipment and building additions after the TCJA and find that the reduction in readmissions concentrates in this subsample. Despite this finding, we do not claim that it is necessarily the equipment being purchased that reduces readmissions but rather, these hospitals appear to be those trying to compete with their nonprofit counterparts on quality of care.

A drawback to the CMS data is that it does not provide financial statement variables. To overcome this data limitation, we use profitability data from the California Department of Health Care to examine implicit taxes among hospitals. Guenther and Sansing (2023) note that much of the literature examining implicit taxes actually captures tax incidence. They state that "implicit tax requires (1) two differently taxed assets that have (2) the same after-tax return" (p. 204). The hospital setting around the TCJA allows for a direct comparison between taxable and nontaxable entities that operate under similar conditions. Accordingly, we predict the TCJA should lower implicit taxes among for-profit hospitals by reducing the necessary pre-tax return to maintain the same relative after-tax return between hospital types. Consistent with a change in implicit taxes

around the TCJA, we document lower pre-tax profits among for-profit relative to nonprofit hospitals in California.

In additional analyses, we examine physician pay to ensure that an increase in provider care is not masked with other cost-saving measures. We also separately examine purchases of land as a falsification test because land is not depreciable property and, therefore, the tax consequences of this investment are more muted. We fail to identify an association with physician pay or any relative changes in investment in land, reducing concerns that some other underlying mechanisms are driving our labor and capital expenditure results. Next, we examine hospital inspection deficiencies around the TCJA as an alternative measure of quality of care. Utilizing a Heckman two-stage model to account for non-random inspections (complaint based), we find no evidence of differential changes in inspection deficiencies between for-profits and nonprofits pre- to post-TCJA. Upon examining the underlying data, it is clear that patients are increasingly unhappy with all hospitals, independent of taxable status.

We make three key contributions to the tax literature. First, we expand the literature on the real effects of the TCJA. Our paper adds to the existing research on the TCJA, such as those focusing on executive compensation (e.g., De Simone, McClure, and Stomberg, 2022) and multinational taxation (e.g., Clausing 2020; Laplante, Lewellen, Lynch, and Samuel, 2021), which primarily examine publicly traded companies. Instead, we shed light on whether behavioral responses to tax policy generalize to the hospital industry, which is dominated by nonprofit entities. Second, we contribute to the literature on taxes and industry competition. Although not entirely directed at nonprofit firms, our results indicate that the TCJA may have indirectly affected tax-exempt firms through the effect of taxes on for-profit competitors, contributing to the literature on competition within the hospital industry (e.g., Keeler, Melnick,

and Zwanziger, 1999; Kessler and Geppert, 2005; Patel and Seegert, 2020). While we find an increase in both investment and patient care outcomes (i.e., readmissions), we caution against over-extrapolating these latter findings as quality of care improvements may not be fully realized within the sample period.

Finally, we contribute to the literature that examines implicit taxes (e.g., Markle et al., 2020; Chyz et al., 2021) that has struggled to extend investor-borne implicit taxes to corporate settings. Our results provide evidence of a tax law induced change in implicit taxes among California hospitals. Thus, we document implicit taxes using one of the few data sources that include financial information for both taxable and tax-favored organizations. Moreover, by exploiting an exogenous change in tax policy, the TCJA, we credibly estimate a difference-in-difference model of implicit taxes in an understudied corporate setting.

2. Background and Literature

2.1. For-Profit and Nonprofit Entities in the Medical Field

For-profit and nonprofit entities operate with different profit goals and thus adhere to different tax laws. For-profit entities are subject to a corporate income tax but are allowed to operate with looser restrictions on their revenues. Nonprofits, on the other hand, qualify for non-taxable status under IRC Section 501(c)(3) with the stipulation that they provide a benefit to their community. Accordingly, these two types of hospitals face different incentives, as for-profit hospitals prioritize profit-maximizing strategies and nonprofit hospitals are more mission-driven. Additionally, CEOs at nonprofit and for-profit hospitals face different compensation-driven incentives as nonprofit hospital CEO compensation is more closely monitored by the IRS and by hospital stakeholders, leading to a lessened use of performance-based compensation contracts

(Eldenburg and Krishnan, 2003; Eldenburg, Hermalin, Weisbach, and Wosinska, 2004; Eldenburg, Krishnan, and Krishnan, 2017).

It is also important to note that there are different requirements or regulations for for-profits at the state-level, resulting in many states with virtually no for-profit presence (e.g., Connecticut, New York, Vermont, Minnesota, and Hawaii). For example, New York prohibits for-profit hospitals owned by publicly traded companies from operating in the market. While Connecticut does not explicitly prohibit for-profit hospitals, the state gives nonprofit hospitals preferential treatment by only permitting this hospital type to use a medical foundation legal structure, which allows an entity to avoid issues arising from anti-kickback laws.[7]

When examining differences in the quality of care between nonprofit and for-profit entities, the literature largely concludes that nonprofits provide higher quality of care. For example, Barron and West (2017) examine adult residential care and nursing homes and find that for-profit entities have lower ratings on safety, effectiveness, respect, and meeting needs. Studies that examine healthcare plans find similar results, such as Himmelstein, Woolhandler, Hellander, and Wolfe (1999) which analyze 14 different quality of care measures to understand the difference between for-profit and nonprofit health maintenance organizations (HMOs). These measures include the immunization completion rate for 2-year-olds, the number of women receiving a postpartum checkup, and the rate of patient follow-up for patients hospitalized with mental disorders. Across nearly all measures, nonprofit HMOs exhibit better performance than their for-profit competitors. Similarly, Schneider, Zaslavsky, and Epstein (2005) specifically look at Medicare beneficiaries who participate in for-profit and nonprofit health plans. Using breast cancer screens, diabetic eye examinations, beta-blocker medication after myocardial

[7] Anti-kickback statutes prohibit offering anything of value in exchange for a referral of business reimbursable by federal healthcare programs.

infarction, and follow-up after hospitalization for mental illness, the authors also find that nonprofit health plans provide a higher quality of care than for-profits.

The maintained reasoning behind this dramatic difference in the quality of care stems from the fact that nonprofit hospitals tend to be older and more established, whereas for-profit hospitals are relatively new to the market. Thus, nonprofits have had a longer time to expand operations and build up the necessary experience and expertise. Outside of taxes, nonprofit hospitals have a competitive advantage over for-profits as they tend to be larger, which can result in access to better and more resources (Colla et al. 2016), and are more likely to be teaching hospitals, which is appealing to doctors interested in teaching and research. These effects appear to snowball – as hospital metrics become more widely available to the public, lower-performing hospitals lose low-severity, but not high-severity, patients to higher-performing hospitals (Cutler, Huckman, and Landrum, 2004). Because nonprofit facilities often provide higher care quality, these hospitals are more likely to attract relatively healthier patients, leaving for-profit facilities with relatively unhealthy patients that may be less profitable. Consistent with this, nonprofit hospitals are, on average, more profitable than their for-profit competitors (Doroghazi, 2016b).

2.2. The TCJA and the Hospital Industry

The TCJA is one of the most significant changes to U.S. tax law in recent history. As such, its impact on the corporate landscape is an important area of study.[8] While there are numerous ways the TCJA could impact the dynamics of the hospital industry, we limit our discussion to the TCJA provisions that, *a priori*, appear the most impactful on the competitive

[8] Studies include how corporations responded by shifting income and deductions in order to fully realize the benefits of the lowered corporate tax rate (Dowd et al. 2020; Gaertner et al. 2020), how corporations used the TCJA as an exogenous shock to tax gains (Andreani, Ellahie, and Shivakumar, 2022), tax policy uncertainty (Thi and Weichenrieder, 2021; Edwards, Heitzman, Klasa, and Todtenhaupt, 2023), and location incentives (Kennedy and Wheeler, 2021; Frank, Hoopes, and Lester, 2022; Arefeva, Davis, Ghent, and Park, 2023; Xu, 2023), among others.

relationship between for-profit and nonprofit hospitals. The first is the reduction of the corporate statutory tax rate from 35 percent at the highest bracket, to a 21 percent flat rate. This decrease in the statutory rate may result in cash windfalls for for-profit hospitals in the form of a lower tax liability. For-profit entities further benefit from the temporary allowance of 100 percent expensing (i.e., bonus depreciation) on capital expenditures, compared to 50 percent expensing pre-TCJA. Additionally, the TCJA increased the maximum deduction for Section 179 property from $500,000 to $1 million and the phase-out threshold increased from $2 million to $2.5 million, enabling more entities to claim immediate expensing under Section 179. Overall, these changes result in increased cash flow for for-profit hospitals through a lessened tax burden.

Conversely, the TCJA added an excise tax on executive compensation for 501(c)(3) organizations. The tax is levied on remuneration in excess of $1 million dollars paid to "covered employees." "Covered employee" is a permanent designation that applies to any current or former employee who is one of the organization's five highest compensated employees in a given taxable year. Balsam et al. (2023) find that this excise tax leads to lower growth in the executive compensation of treated employees in nonprofit entities. Their findings suggest that although the excise tax may not affect all nonprofit hospitals, it further amplifies the asymmetry of the costs and benefits introduced by the TCJA to nonprofit and for-profit firms, respectively.[9] It is important to note that in order to discourage excessive compensation for executives in for-profit institutions, the TCJA amended §162(m) of the IRC to further limit tax deductions of compensation paid to "covered executives" to $1 million (Murphy and Jensen, 2018). A number of studies have found that firms have had minimal response to this change in compensation

[9] A non-trivial number of not-for-profit executives are likely subject to this excise tax. In 2018, the CEO of Kaiser Permanente earned $18 million, making him the highest paid nonprofit CEO in the nation (Saini, Garber, and Brownlee, 2022). Doroghazi (2016a) notes that in 2011 and 2012, the average compensation of the top 30 not-for-profit healthcare executives was $6.5 million.

deductibility (Galle, Lund, and Polsky, 2020; Luna, Schuchard, and Stanley, 2020; De Simone et al., 2022).[10] Given the lack of response to this portion of the TCJA, we expect that it will not be as binding of a constraint as the changes in regulation for nonprofits.

For completeness, we mention a number of other TCJA provisions that affect the dynamics between for-profit and nonprofit hospitals. First, the TCJA eliminated advance refunding on tax-exempt bonds which many smaller hospitals rely on to obtain favorable terms and savings (King 2019). Second, the rules for unrelated business income taxes (UBIT) were changed, making it more difficult for nonprofit hospitals to reduce taxes on certain revenue-generating activities. Third, charitable contributions to nonprofits became less valuable to potential donors due to a reduction in personal income tax rate and the increased threshold for itemized deductions, which includes charitable contributions. Estimates suggest that these changes to the personal income tax reduced the number of households itemizing their charitable gifts from 37 million to 16 million in 2018 (Tax Policy Center, 2020). A full discussion of these provisions is outside the scope of this paper.

3. Hypothesis Development

We examine the impact of the TCJA on the dynamics of the hospital industry. Several recent studies, such as Kim et al. (2021) and Glaeser et al. (2023) examine the role of taxes and competition. However, these prior studies focus on competition between foreign and domestic firms and likely include very few hospitals within their samples as most hospitals are not owned by publicly traded entities. We explore three ways in which the TCJA may differentially affect for-profit hospitals compared to their nonprofit competitors. Hanlon, Hoopes, and Slemrod

[10] We note that Fox (2021) finds an increase in both the number and weight of performance measures in bonus arrangements due to the passage of the TCJA. However, this finding does not negate the previous studies on compensation amount.

(2019) find that firms benefiting from the TCJA are more likely to announce passing down tax savings in the form of compensation and investment. Accordingly, we first explore to what extent hospitals respond in kind and increase investment in labor and capital. Many provisions in the TCJA positively impact for-profit hospitals while others negatively impact nonprofits. Because for-profit hospitals are disadvantaged in relation to nonprofit hospitals, these facilities may use the cash tax windfall to make investments necessary to reduce the longstanding competitive advantage of nonprofit hospitals.

Although taxable corporations, on average, respond to investment incentives, it is unclear if for-profit hospitals will exhibit the same behavior. Duggan (2000) finds that both nonprofit and for-profit hospitals choose to spend cash windfalls on financial assets rather than investing in capital assets or improving patient care. However, Duggan (2000) utilizes a cash windfall stemming from the Disproportionate Share Program (DSP) in California rather than tax savings. In a broader setting, Guenther, Matsunaga, and Williams (2017) find that firms allocate cash that results from tax savings differently from other kinds of after-tax cash flows. Therefore, how for-profit hospitals will utilize the cash windfall from a lessened tax burden remains an open question. Moreover, the benefits of tax savings may only benefit those firms that are financially constrained (Edwards, Schwab, and Shevlin, 2016). To the extent that for-profit hospitals are not financially constrained, we may fail to see any differential changes in investment or operating behavior. We thus state our hypothesis in the null as follows:

H1: *The TCJA did not differentially impact labor and capital investments among for-profit and nonprofit hospitals.*

We next explore whether the TCJA impacted the quality of patient care. Investing in capital and labor is one means towards improving patient care, either through improving reputation that allows hospitals to hire better providers and staff or through the investments

themselves (e.g., a hospital could begin to provide services they previously could not). Although improvements to labor and capital are one path towards the quality of care, there are likely other such factors not tested that may lead to changes in the quality of care. These include having less of a focus on the profitability of patients in favor of providing services that, on the margin, impact patient outcomes. While it seems intuitive that a cash windfall should increase patient care, nonprofit hospitals are consistently viewed as the incumbent and may have significant financial reserves. Accordingly, they may respond to threats of increased competition by making changes in order to retain their competitive edge. Thus, it remains an open empirical question as to whether and to what extent the TCJA affects competition by allowing for-profit hospitals to increase patient care through an exogenous reduction in taxation. We state our second hypothesis in the null form as:

H2: *The TCJA did not differentially impact the quality of care provided by for-profit and nonprofit hospitals.*

Lastly, we examine implicit taxes. The influential Scholes and Wolfson textbook presents an implicit tax model where two assets generate different pre-tax rates of return but have identical after-tax rates of return due to the different taxability of the assets. The canonical example of implicit taxes are municipal bonds. These bonds can offer a lower pre-tax yield than a taxable corporate bond because the interest payments are not taxable to the investors. While simple in theory, the ability to document implicit taxes and how they impact corporate decision making is often hampered by the lack of an easily identifiable tax-favored reference group (Guenther and Sansing, 2023). To circumvent this issue, several recent studies rely on variation in global taxation to either analyze differences between multinationals and domestic-only firms (Chyz et al., 2021) or cross-country differences in corporate tax rates (Markle et al., 2020). In contrast, we use a relatively homogenous industry and an exogenous shift in tax policy. We

argue that while there are differences between for-profit and nonprofit hospitals, these differences should be relatively static in the short-run around the TCJA, allowing us to cleanly identify implicit taxes. Accordingly, to the extent implicit taxes are prevalent in the hospital industry, we should see a decrease in the required pre-tax rate of return among for-profit hospitals after the TCJA. We frame our third hypothesis in the null:

H3: *The TCJA did not alter implicit taxes between for-profit and nonprofit hospitals.*

4. Analysis using Centers for Medicare and Medicaid Data

4.1. Centers for Medicare and Medicaid Sample Selection

To test our first two hypotheses, we construct a sample of hospital-level data from 2015 through 2019 using the Healthcare Cost Report Information System (HCRIS) and the Hospital Compare Downloadable Database Dictionary (HCDDD). Both data sources originate from the Centers for Medicare and Medicaid (CMS), which covers around 75% of all U.S. hospitals (American Medical Association 2021).[11] HCRIS data is collected from Form CMS-2552-10, which is used for hospitals to report on a variety of measures such as whether the institution is classified as teaching, number of beds, employee wages, and capital asset purchases. HCDDD data is compiled by the Hospital Compare website, which is intended to provide quality of care information to consumers to allow for more informed healthcare decisions. This database provides information on patient survey scores, readmission rates, and mortality rates. An advantage of using CMS data is that hospitals that accept Medicare and Medicaid reimbursements are required to meet a standardized set of operating criteria such as available pharmaceutical, radiology, and laboratory services. Therefore, the hospitals included in our

[11] For an example of how else this data has been used previously, see Patel and Seegert (2020).

sample function under the same set of operating constraints. We collect data to construct labor and population control variables from the U.S. Bureau of Labor Statistics.

Table 1 presents sample selection criteria for all analyses. For analyses that use the CMS data, we first begin with all non-VA, domestic hospital-year observations present in both the HCRIS and HCDDD databases from 2015-2019. As noted in Section 2.1, many states actively discourage the presence of for-profit hospitals. A number of studies have found that competition plays an important role in the quality of care in hospitals.[12] Hospitals located in states that limit for-profit presence operate in a different competitive and regulatory environment. As such, we remove all hospitals that operate in states with less than 10% for-profit presence. A full list of the number of nonprofit and for-profit hospitals operating in each state and which states were removed from our sample can be found in Appendix B. We remove all observations for hospitals that switched between for-profit and nonprofit status over the sample period. Finally, we remove all observations without the necessary data to construct control variables.

A particularly vexing issue is that while the total coverage of the data is comprehensive, some of the outcome variables are missing. We handle this in two ways. First, we drop all missing values. For variables where there is a low likelihood that they are truly zero, such as salaries, this approach is appropriate. However, for some items, such as buildings, these purchases may be "lumpy" and not occur every year. Therefore, we also present specifications where we set missing values to zero and include an indicator variable, *Missing*, which is coded to one for observations missing the dependent variable of interest and zero otherwise. We allow the sample to fluctuate based on non-missing data in the other specifications, which results in a maximum sample of 11,984 hospital-year observations across 2,582 unique hospitals. In addition

[12] Examples include: Kessler and Geppert, 2005; Cooper, Gibbons, Jones, and Mcguire, 2011; and Bloom, Propper, Seiler, and Van Reenen, 2015.

to using annual readmission data, we also collect three-year "abnormal" hospital readmission data. Given there is only a single observation pre- and post-TCJA, we remove any observations for which there is no pre- or post-period for the hospital. This final sample consists of 4,128 hospital-3-year observations and 2,064 unique hospitals.

4.2. Investment and Quality of Care Measures

We aim to paint a broad picture of how changes in taxation from the TCJA affect the overall ability of hospitals to make investments and provide high-quality care to their patients. Accordingly, we examine total labor and capital expenditures as these categories largely act as a "catch-all" for many types of investment. We additionally use the readmission rate as an outcome variable, diverging from studies within the medical literature, which often limit the scope of their analysis to very narrow measures for quality of care such as cardiac surgery outcomes (Cutler et al., 2004), quality of adult care (Barron and West, 2017), or infant mortality (Duggan, 2000).

We first test whether the TCJA gave rise to changes in nonprofit and for-profit hospitals' investment in labor. Under the assumption that hospitals use compensation to attract and retain employees, we proxy for investment in labor using wages and benefits. We use one plus the natural log of total salaries for all hospital staff, *Tot_Sal*, because we do not hypothesize whether increases occur through medical care providers such as nurses or non-medical care providers such as administrative staff.[13] We also measure a hospital's investment in labor through one plus the natural log of employee benefits, *Benefit*, as hospitals may increase compensation through benefits rather than wages. We additionally examine changes in capital assets around the TCJA. We measure investment in capital as either *Equipment*, which is one plus the natural log of the

[13] Physician compensation is poorly populated, so we relegate this specification to our additional analyses.

total of all fixed and movable equipment additions for the year, or *Buildings*, which is one plus the natural log of the total of all building and building fixture additions for the year.

We use two measures of readmissions to proxy for the quality of medical care. The first is *Abn_Readmission*, which captures the average difference between the expected and the actual 30-day readmission rate during a three-year period. This measure is the differential between the expected and the actual rate; therefore, it is already adjusted for a variety of factors such as average illness severity or hospital occupancy. Second, we use the annual unadjusted measure of readmissions measured at the hospital-year level, *Readmission*. Because *Abn_Readmission* is measured as a three-year average, an annual measure of readmissions increases the sample size. The drawback of using *Readmission* is that this variable does not consider the expected readmission rate and therefore does not account for hospital-specific factors which may impact readmission. We believe that by using both *Abn_Readmission* and *Readmission*, we are able to triangulate our results using two similar but distinct measures.

4.3. Research Design for H1 and H2

To test our first two hypotheses, we use a model akin to a generalized difference-in-differences design. In a traditional difference-in-differences model, a treated group, which is affected by some factor, is compared to a control group, which is assumed to be unchanged over the course of the sample period. In this setting, there is no control group, as both nonprofit and for-profit hospitals are affected by the TCJA. However, for-profit hospitals receive an increase in cash flows, caused by a decrease in tax burden, whereas nonprofits face the opposite, a decrease in cash flows caused by an increased tax burden. Therefore, our difference-in-differences estimates should be viewed similarly to a “continuous” cash flow treatment effect between

groups that are probabilistically affected by the TCJA in relation to each other. This leads to our first regression equation:

$$Investment_{it} = \alpha + \beta_1 For\_Profit_i * YearIndicator_t + \beta_2 YearIndicator_t + \beta_3 For\_Profit_i + \Sigma\beta_k Controls_{it} + \delta_1 FE + \epsilon_{it} \quad (1)$$

For_Profit is an indicator variable equal to one if a hospital is a for-profit entity, and zero if a hospital is a nonprofit entity. We use year indicators for each of the two years before 2017 and each of the two years after (i.e., *2015, 2016, 2018,* and *2019*). 2017 acts as the reference year because the TCJA passed in December. The variable of interest is the interaction of these year indicators with *For_Profit*. Additionally, difference-in-differences models rely on the parallel trends assumption. A benefit of this model is that by including *For_Profit*2015* and *For_Profit*2016*, we provide more granular controls for any differences between the groups in the pre-period. Although this method does not necessarily guarantee that the trends in the dependent variables were parallel prior to the TCJA, it does mitigate the pre-period impact when estimating the post-period. Investment is either a proxy for labor or capital investment as discussed in Section 4.2, and we provide a full list of variables and their descriptions in Appendix A. Positive coefficients on *For_Profit*2018* or *For_Profit*2019* suggest that the TCJA increased investment among for-profit hospitals.

We use a similar model when examining readmission, in which we replace investment-based variables with *Readmission*. For the abnormal measure of readmissions, we use a parsimonious model in our analysis and examine the three-year averages from July 1, 2013 - June 30, 2016 (pre-period) to July 1, 2018 - June 30, 2021 (post-period). We cannot create individual year indicators, and instead use a *Post* indicator variable to interact with *For_Profit* in our regression as follows:

$$Readmission_{it}=\alpha+\beta_1 For\_Profit_i*Post_t+\beta_2\, Post_t+\beta_3\, For\_Profit_i+\ \epsilon_{it} \quad (2)$$

Because readmissions is measured as three-year averages, *Post* is an indicator variable equal to one for all observations measured over the three years after 2017, and zero for the three years before 2017. Our variable of interest is the *For_Profit*Post* interaction term. If the TCJA benefits for-profit hospitals, we expect this term to be negative, as readmission rates should decrease with higher care quality.

We include a vector of variables to control for differences between the two types of hospitals. These include the number of beds, *Beds*, as a proxy for hospital size because high-volume hospitals perform better than small hospitals (Kizer, 2003; Chowdhury, Dagash, and Pierro, 2007; Colla et al., 2016; Avdic, Lundborg, and Vikström, 2019). *Urban* is an indicator variable equal to one if a hospital is located in an urban area and zero if the hospital is in a rural area. Urban hospitals have been shown to have access to additional resources that rural hospitals do not receive (Colla et al., 2016). Additionally, we expect injury/illness as well as crime-related injury volume to differ between the two environments, prompting a need to control for location type. We control for whether a hospital is a teaching hospital using an indicator variable, *Teach*. Teaching within a hospital adds a host of factors that may affect care quality, such as the introduction of interns and residents and the need for specialized equipment and facilities. Additionally, compensation has been shown to be linked to a hospital's teaching status (Joynt, Le, Orav, and Jha, 2014). As competition has been shown to be associated with both hospital quality of care (Kessler and Geppert, 2005) and investment (Patel and Seegert, 2020), we include the control variable, *Competition*, which is the Herfindahl-Hirshman Index (HHI) at the MSA level using the number of beds to calculate market share. We finally control for area demographics using the population and unemployment rate in the state the hospital is located in

with *Population* and *Unemployment*, respectively. We estimate all specifications with and without hospital fixed effects and cluster standard errors at the hospital level.

5. Empirical Results For H1 and H2

5.1. Investment in Labor and Capital

Descriptive statistics for the full sample used in our tests of labor and capital investment are presented in Table 2, Panel A. We additionally present the raw values of logged variables to provide a more intuitive view of the sample. Overall, descriptives show that the sample is generally representative of the broader population of hospitals. The mean of *For_Profit* indicates that roughly 22 percent of sample hospitals are for-profit entities, consistent with the proportions reported by the American Hospital Association in 2017. *Tot_Sal* ranges from around $19.5 million at the 25th percentile to $205 million at the 90th percentile. *Phy_Sal, Phy_Hour, Benefit, Equipment, Buildings,* and *Land* demonstrate similar variation. A little more than half of the sample is located in an urban area and 26 percent of the hospitals are teaching hospitals. Figure 1 presents the logged values plotted by year. We note no obvious signs of violating the parallel trends assumption.

In Table 2, Panel B, we present the means of all variables used in our investment analysis, partitioned by pre- and post-TCJA, excluding 2017, as well as entity type. Consistent with expectations, nonprofit hospitals are significantly larger than for-profit hospitals, measured by number of beds. The averages of *Tot_Sal, Phy_Sal,* and *Phy_Hour* imply that not only do nonprofit hospitals spend more on compensation overall, but they also pay a higher rate per hour, which is a testament to their ability to attract and retain employees. Column (7) represents the univariate difference-in-differences statistics of the changes in the variables.

Table 2, Panel C presents the results of estimating Equation (1) with investment in labor dependent variables. The variables of interest are *For_Profit*2018* and *For_Profit*2019.* In Columns (1) – (3), we fail to find any statistically significant change in the total salaries between types of firms. However, consistent with a treatment effect, in Columns (4) - (6), we find a statistically significant increase in employee benefits. The point estimates in Column (6), where we reset missing values to zero, are of a similar magnitude to those in Column (4), reducing concerns over misspecification. We do find *For_Profit*2015* is positive and significant when examining employee benefits, however this difference does not persist into 2016 (nor the reference year of 2017).[14] These results provide some evidence showing that for-profit hospitals increased benefits paid to their employees relative to nonprofits. The relative increase in benefits may be indicative of an investment toward attracting and retaining quality labor.

Table 2, Panel D presents the results for tests of investment in capital assets. Across all six columns, we find that after the TCJA, for-profit entities increase equipment and building additions relative to nonprofit entities. These results tend to concentrate in 2018, which is indicative of an initial response. The difference between for-profit and nonprofits in 2015 appears less consistently in the data as compared to the labor analyses. In totality, we find evidence that for-profit hospitals increased their capital expenditures and more mixed evidence that they increased employee benefits. In either case, examining Figure 1 does not support a violation of the parallel trends assumption, but rather noise in the data. We also find that many of our control variables load consistent with expectations across both panels. For example, we find

[14] In several specifications, we see that the estimates on *For_Profit*2015* are significant. While this could be indicative of violating the parallel trends assumption, it is more likely a manifestation of the data in which 2015 is the poorest populated. For this reason, we perform a generalized DiD design to reduce the influence of 2015 data.

that *Urban* and *Beds* are frequently positive and significant, which is indicative that compensation and investment is higher in large, urban hospitals.

5.2. Hospital Readmissions

Table 3, Panel A presents descriptive statistics for the sample used to test hospital readmissions. The mean of *For_Profit* is approximately 22 percent, and because we remove observations without both pre- and post-period data, the data is split evenly between both periods (i.e. mean of *Post*=0.5*)* for the multiyear analysis. The mean (median) excess readmission rate is 0.801 (0.838). As *Abn_Readmission* is the excess over the expected readmission rate, a positive number indicates that the average hospital readmits more patients than expected. We also examine the yearly readmission rate, expressed as the annual percentage of patients who are unexpectedly readmitted in the thirty days after being discharged from the hospital. In Figure 2, we plot annual readmissions by hospital type and year, and find that from 2015 to 2018, the relative readmissions is very stable between hospital types, followed by a more pronounced decline in 2019 from for-profit hospitals.

We present the regression analysis in Table 3, Panel B and find negative and statistically significant coefficients on *For_Profit*Post* in Column (1) examining *Abn_Readmission.* The benefit of this specification is that *Abn_Readmission* takes into account many factors that we would typically control for. Thus, despite presenting a parsimonious model, many factors are controlled for by construction of the dependent variable. In Columns (2) and (3), consistent with our visual evidence from Figure 2, we find a decline in readmissions in 2019. These two analyses suggest that both annual and abnormal rates of readmission decreased in for-profit entities relative to nonprofit entities after the TCJA. We cautiously infer that the competitive advantage gained through the decreased discrepancy in tax burden between for-profit and nonprofit

hospitals materialized in patient outcomes. Although these results present consistent evidence, we advise against using these results to draw strong causal inferences. First, to avoid the confounding effects of the Covid-19 pandemic in the annual data, we are limited in the number of years we can examine. This limitation increases the risk that our results may be driven by an omitted correlated variable or simply an anomaly in the data. Second, while ubiquitous, studies in the medical literature suggest readmissions is a noisy proxy for quality of care.[15] Therefore, the results from this analysis should be considered preliminary in nature.

5.3. Cross-Sectional Tests using CMS Data

We perform three cross-sectional analyses to present a more nuanced analysis of our investment and readmission results. We first partition our sample based on whether a state voted Republican or Democratic in the 2016 presidential election. We expect that our results will concentrate in the subsample of hospitals located in Republican-leaning states because the TCJA passed without Democratic support. As such, hospitals located in Republican states may feel more positive about the tax benefits from the TCJA. This sentiment may in turn, result in a larger behavioral response in utilizing increased cash flows for investment or improving patient outcomes.[16] We present the results in Table 4, Panel A, Columns (1) – (4). Consistent with our conjecture, we find that for-profit hospitals increased their capital expenditure relative to nonprofit hospitals in 2018 and 2019 primarily in Republican states.

Second, we divide our sample based on the local competitive environment. We partition the sample at the median level of hospital competition, as measured by the MSA-year level

[15] Kramer, Higgins, and Zimmerman (2013) find that not controlling for patient case-mix when using readmissions as a quality-of-care measure can substantially change the inference drawn from the results.
[16] Many Democratic states discourage a for-profit hospital presence and are removed from our sample. See the full list of states in Appendix B. Despite this limitation of our data, we believe that larger, Democratic-learning states which have not been removed from our sample provide a sufficient sample to draw inferences.

Herfindahl-Hirshman index (HHI). We partition the sample as "High Competition" in Table 4, Panel A, Columns (5) – (6) and "Low Competition" in Columns (7) – (8). Despite competition being a driving force within the hospital industry, we find that the results from our main analysis are consistent across both subsamples. We interpret this finding to suggest that, as the market for elective healthcare procedures becomes national, many for-profit hospitals may feel competitive pressure even if these competitors are not necessarily within the same MSA.

In addition to cross-sectional tests on investment responses, we also examine whether the reduction in readmissions by for-profit hospitals is concentrated in hospitals that increase their capital investment. This test links our two analyses in order to determine if investment is one mechanism for better patient outcomes. We partition the sample based on whether capital expenditures increase or decrease from the pre-period to the post-period. To do this, we calculate the average capital expenditures, as measured by the sum of *Equipment* and *Buildings,* for the pre-period (i.e., 2015 and 2016) and for the post-period (i.e., 2018 and 2019). Observations which see an increase from the pre-period to the post-period are included in the "increase" subsample. All other observations are included in the decrease subsample. We expect the decrease in the readmission rate to concentrate in the subsample of capital expenditure increases, which would indicate that hospitals which also increase their capital expenditures also experience a decrease in readmission rates. We present our results in Table 4, Panel B. Consistent with our predictions, we find that the drop in readmissions is concentrated in hospitals that increase their capital investments.

Taken as a whole, we find that our results are indicative of a shift in the dynamic between nonprofit and for-profit hospitals after TCJA. Relatively, for-profit facilities were able to increase labor investment via benefits offered to employees, and capital investments through

purchasing more equipment and buildings. These investments, while not necessarily the only channel to increased patient care outcomes, appear to reduce hospital readmissions.

6. Test of H3

6.1. Sample and Research Design

We next examine our third hypothesis that attempts to determine whether the TCJA altered implicit taxes in the hospital industry. The data for this test comes from the California Office of Statewide Health Planning and Development (COSHPD). The COSHPD data includes financial and non-financial information on California hospitals, such as revenue and charity care, which are not included in the CMS data. Many other states impose stricter regulations around hospital data availability, making this type of analysis infeasible for hospitals operating within those states. The managerial accounting literature often uses this data because hospitals present a setting where the availability of internal cost data enables analysis of internal processes that are unobservable in other types of entities.[17]

We follow sample selection criteria similar to those used in our main analysis. Our sample starts with all licensed hospitals in the state of California from 2015-2019. We remove observations which reported zero income or expenses, indicating incomplete data for that observation. We then remove any observations for hospitals that switch between for-profit and nonprofit status during our sample period to avoid any confounding factors associated with this change in organizational form. We finally remove any observations for which we are missing data to construct control variables. Our final sample consists of 2,043 hospital-years. Table 1, Panel D presents the sample selection process for this analysis.

[17] Examples of how this data has been used include Krishnan, 2001; Eldenburg and Krishnan, 2003; Eldenburg et al., 2004; Krishnan, 2005; Balakrishnan, Eldenburg, Krishnan, and Soderstrom, 2010; Eldenburg, Gunny, Hee, and Soderstrom, 2011; Krishnan and Yetman, 2011; and Bai and Krishnan, 2015.

To test changes in implicit taxes, we modify Equation (1) to now regress changes in pre-tax income on our DiD estimators (e.g., *For_Profit*2018*). Markle et al. (2020) regress changes in pre-tax income on a change in tax rates using cross-country data. Their identifying assumption is that changes in the statutory tax rate provide exogenous variation to determine the relative shift in implicit taxes among entities located within a country. In contrast, our research design leverages a tax-favored control group, as suggested by Guenther and Sansing (2023), and extends the findings in Markle et al. (2020) to changes in domestic tax rates. Additionally, we maintain that with our research design, we can relax the assumption that all hospitals have the same after-tax returns. Rather, the relative after-tax return should remain constant, absent a "shock" to taxes (i.e., parallel trends and "but for" assumptions). Accordingly, we examine both cross-sectional and within-hospital changes in pre-tax income with regression Equation (3):

$$Income_{it} = \alpha + \beta_1 For\_Profit_i * YearIndicator_t + \beta_2 YearIndicator_t + \beta_3 For\_Profit_i + \Sigma\beta_k Controls_{it} + \delta_1 FE + \epsilon_{it} \quad (3)$$

We rely on the COSHPD data for many control variables that are similar to our analyses which use CMS data (e.g., number of available beds). In addition, there are a few variables that we now include that may alter the profitability of a hospital. These include total net patient revenue, *Revenues*, which measures the payments received from both patients as well as third party payers (e.g., insurance companies), and *Charity*, which is the value of the services provided to patients who were unable to pay for all or part of their treatment. We present a specification that includes total revenues, charity care, and both.

6.2. Implicit Tax Results

We present our implicit tax analysis in Table 5. We begin with the descriptive statistics in Panel A. Consistent with prior literature, we find that our sample is relatively comparable to other studies using this data. We find that the hospitals in our sample have higher levels of

revenue and income, likely due to our use of more recent data, and operate in a more competitive environment, which we attribute to higher profits enticing additional entrants. It is important to note that our sample is reduced because this analysis is limited to California hospitals; however, this sample covers 425 unique facilities, a material number of hospitals. We move to our multivariate analysis in Table 5, Panel B. In this analysis, odd-numbered columns include year fixed effects and even columns year and hospital fixed effects. Additionally, we scale pre-tax income by revenues to reduce the impact of hospital size. Across all six specifications, we find consistent evidence of a change in implicit taxes (i.e., negative coefficient on *For_Profit*2019*). We interpret our results to suggest that the TCJA reduced the required pre-tax rate of return among for-profit hospitals relative to their nonprofit competitors.

Implicit taxes are difficult to document in many settings because of a lack of a tax-favored control group. However, we are able to examine how a shift in tax policy changes implicit taxes within California hospitals. While this result contributes to the tax literature on implicit taxes, which often struggles to cleanly identify implicit taxes in corporate settings, one must note that we trade off strong internal validity for a reduction in external validity. Accordingly, we make no prediction on whether these results should generalize to hospitals outside of California or other domestic industries.

7. Additional Analysis

7.1. Inspection Deficiencies

While our proxy for quality of care, readmissions, is ubiquitous in the literature, we examine the quality of care from a regulatory perspective by examining the number of deficiencies found upon inspection. Inspection deficiency data comes from Hospitalinspections.org, a website run by the Association of Health Care Journalists in an attempt to make the results of complaint-driven inspections performed by state agencies public.

Hospitals are inspected with respect to their compliance with Medicare health and safety regulations. These inspections are complaint-driven and are therefore not performed on a regular basis or randomly selected. As such, the sample for this test is greatly reduced as not every hospital will receive an inspection every year.

To control for potential selection bias, we use Heckman's (1979) two-stage procedure to ensure that the correlation between the number of deficiencies discovered during inspection and the independent variables is not driven by the determinants of receiving an inspection. We estimate a first-stage model with *Star_Rating,* a measure of overall patient satisfaction based on scores patients report in a survey during their hospital stay, as our exclusionary variable and a second-stage model that includes the inverse Mills ratio to control for sample selection.[18]

Table 6, Panel A presents descriptive statistics for the sample used for the second stage of the test of inspection deficiencies. The mean of *For_Profit* is 0.214, indicating that although the sample is reduced, the proportion of for-profit to nonprofit entities is similar to that of the larger hospital population. The average (median) number of deficiencies is 6.312 (4). The average (median) *Star_Rating* is 2.390 (3), and the 25^{th} (90^{th}) percentile is 2 (4), indicating that the majority of hospitals do not receive a one- or five-star rating. The average (median) number of beds, 248.7 (180), indicates larger hospitals than the sample used for the investment tests. This is consistent with inspectors prioritizing larger hospitals when deciding which hospitals warrant an inspection. Table 6, Panel B presents descriptives for the inspection deficiency sample separated by time and entity type. We find that both the differences between the pre- and post-period, as well as between for-profit and nonprofit hospitals, are largely insignificant. Table 6, Panel C presents the results of the Heckman two-stage model. Column (1) is the first stage of the model,

[18] We exclude hospital fixed effects from this model due to the limited within-hospital variation of inspection data.

where the dependent variable is *Inspection*. We find a significantly negative relation with *Star_Rating*, suggesting that patient satisfaction is indeed a strong indicator of whether a complaint will be filed against a hospital and an inspection will follow, and that higher patient satisfaction leads to a lower likelihood of a complaint-driven inspection. We present the second stage regression in Column (2). The coefficients on all interaction terms are insignificant. Therefore, we cannot reject the null hypothesis that the TCJA changed the quality of care in for-profit hospitals relative to nonprofit hospitals with this alternative proxy for quality of care.

7.2. Robustness Tests

We present two additional analyses in Table 7 to reduce concerns that we are drawing spurious inferences. First, we examine investment in land, *Land*, defined as one plus the natural log of all land and land improvement additions for the year. Investment in land presents a natural falsification test because the tax consequences to land largely remain unchanged with the TCJA. We acknowledge that the statutory tax rate decreased (35% to 21%), so simply paying less taxes overall may still encourage purchases of land. We argue that while this is possible, the fact that some capital expenditures are further tax-favored through accelerated depreciation suggests changes in land investments should be comparatively muted. Consistent with this line of reasoning, in Columns (1) and (2), we find no evidence that land additions change significantly in one entity type over the other. Despite this null finding, we note that our analysis uses a short-term horizon, and we cannot ascertain whether there are any long-run effects of the TCJA on land purchases in for-profit or nonprofit entities.

Second, our results in Table 2 largely fail to document any significant changes in salaries. One concern is that there may be a netting of healthcare providers' salaries if hospitals, on average, reduce compensation for the highly paid executives (to avoid TCJA-related

compensation limitations) in favor of increasing medical professional pay. Accordingly, we examine changes in total wages paid to physicians, *Phy_Sal*, and the average hourly wage for physicians, *Phy_Hour*, in Columns (3) – (6). We again fail to find any differences in salaries between these two types of hospitals post-TCJA. An important note is that due to issues with data availability, we do not set missing values to zero in this table.

8. Conclusion

We present some of the first analyses on whether the TCJA affects the competitive dynamics of the hospital industry. Consistent with the theory that taxable entities respond to tax incentives, for-profit hospitals increase purchases of buildings and equipment relative to their nonprofit competitors around TCJA. Among for-profit hospitals, changes in labor investment are largely confined to increases in employee benefits. We also find that this reduction in taxation impacted patient outcomes through a reduction in readmission rates among for-profit hospitals in the post-period relative to nonprofit hospitals. Cross-sectional evidence suggests that better patient care is, at least in part, related to the capital investments for-profit hospitals made after the TCJA. Lastly, we examine implicit taxes and find that after the TCJA, for-profit hospitals report lower pre-tax income, indicating a lower pre-tax required rate of return.

Overall, this study highlights how tax policy changes the comparative advantage of tax-exempt hospitals and contributes to the broader tax literature on the real effects of the TCJA. We contribute to the tax literature by focusing on an industry that is not dominated by publicly traded entities. Accordingly, the significant presence of tax-favored nonprofit hospitals allows for a "clean" comparison group, particularly when examining implicit taxes. Lastly, our sample ends in 2019 to avoid the confounding effects of the Covid-19 pandemic. Accordingly, our results represent a short-run response, where the impact of the TCJA may not have fully materialized.

References

American Hospital Association. (2017). Fast Facts on U.S. Hospitals. https://www.aha.org/statistics/2016-12-09-fast-facts-us-hospitals-2017-pie-charts#. Accessed 4 October 2023

American Medical Association. (2021). Historical Trends in Utilization and Personnel for Selected Years from 1946 through 2021. https://guide.prod.iam.aha.org/stats/historical-trends-utilization. Accessed 22 August 2023

Andreani, M., Ellahie, A., Shivakumar, L., Abdalla, A., Allen, E., Karuna, C., & Lennox, C. (2022). Are CEOs rewarded for luck? Evidence from corporate tax windfalls. Working Paper.

Arefeva, A., Davis, M. A., Ghent, A. C., & Park, M. (2023). The Effect of Capital Gains Taxes on Business Creation and Employment: The Case of Opportunity Zones. Working Paper.

Avdic, D., Lundborg, P., & Vikström, J. (2019). Estimating returns to hospital volume: Evidence from advanced cancer surgery. *Journal of Health Economics*, *63*, 81–99.

Bai, G., & Krishnan, R. (2015). Do Hospitals Without Physicians on the Board Deliver Lower Quality of Care? *American Journal of Medical Quality*, *30*(1), 58–65.

Balakrishnan, R., Eldenburg, L., Krishnan, R., & Soderstrom, N. (2010). The Influence of Institutional Constraints on Outsourcing. *Journal of Accounting Research*, *48*(4), 767–794.

Balsam, S., Hall, C. M., Harris, E. E., & Smith, K. A. (2023). *Taxing the Way to Lower Pay: The Impact of Section 4960 Excise Tax on Nonprofit Compensation*. Working Paper.

Barron, D. N., & West, E. (2017). The quasi-market for adult residential care in the UK: Do for-profit, not-for-profit or public sector residential care and nursing homes provide better quality care? *Social Science and Medicine*, *179*, 137–146.

Bloom, N., Propper, C., Seiler, S., & Van Reenen, J. (2015). The impact of competition on management quality: Evidence from public hospitals. *Review of Economic Studies*, *82*(2), 457–489.

Chowdhury, M. M., Dagash, H., & Pierro, A. (2007). A systematic review of the impact of volume of surgery and specialization on patient outcome. *British Journal of Surgery*, *94*(2), 145-161.

Chyz, J. A., Luna, L., & Smith, H. E. (2021). Implicit taxes of U.S. domestic and multinational firms during the past quarter century. *Journal of the American Taxation Association*, *43*(2), 37–61.

Clausing, K. A. (2020). Profit shifting before and after the tax cuts and jobs act. *National Tax Journal*, *73*(4), 1233.

Colla, C. H., Lewis, V. A., Tierney, E., & Muhlestein, D. B. (2016). Hospitals Participating in ACOs Tend To Be Large And Urban, Allowing Access to Capital and Data. *Health Affairs*, *35*(3), 431–439.

Cooper, Z., Gibbons, S., Jones, S., & Mcguire, A. (2011). Does hospital competition save lives? Evidence from the English NHS patient choice reforms. *Economic Journal*, *121*(554), F228–F260.

Cutler, D. M., Huckman, R. S., & Landrum, M. B. (2004). The Role of Information in Medical Markets: An Analysis of Publicly Reported Outcomes in Cardiac Surgery. *Information, Pricing, and Productivity of Medical Technology*, *94*(2), 342–346.

De Simone, L., McClure, C., & Stomberg, B. (2022). Examining the Effects of the TCJA on Executive Compensation. *Contemporary Accounting Research*, *39*(4), 2376–2408.

Doroghazi, R. M. (2016a). Negative Secular Trends in Medicine: High CEO Salaries. *American Journal of Medicine*, *129*(2), e1-e2.

Doroghazi, R. M. (2016b). Negative Secular Trends in Medicine: High Hospital Profits. *American Journal of Medicine*, *129*(11), 1141-1142.

Dowd, T., Giosa, C., & Willingham, T. (2020). Corporate behavioral responses to the TCJA for tax years 2017–2018. *National Tax Journal*, *73*(4), 1109–1134.

Duggan, M. G. (2000). Hospital Ownership and Public Medical Spending. *The Quarterly Journal of Economics*, 115(4), 1343–1373.

Durrant, J., Gong, J. J., & Howard, J. (2021). In the nick of time: Performance-based compensation and proactive responses to the tax cuts and jobs act. *Journal of Management Accounting Research*, *33*(1), 53–74.

Edwards, A., Heitzman, S., Klasa, S., & Todtenhaupt, M. (2023). Private merger negotiation responses to ongoing tax legislation. Working Paper.

Edwards, A., Schwab, C., & Shevlin, T. (2016). Financial constraints and cash tax savings. *The Accounting Review*, *91*(3), 859–881.

Eldenburg, L. G., Gunny, K. A., Hee, K. W., & Soderstrom, N. (2011). Earnings management using real activities: Evidence from nonprofit hospitals. *The Accounting Review*, *86*(5), 1605–1630.

Eldenburg, L. G., Krishnan, H. A., & Krishnan, R. (2017). Management Accounting and Control in the Hospital Industry: A Review. *Journal of Governmental & Nonprofit Accounting*, *6*(1), 52–91.

Eldenburg, L., Hermalin, B. E., Weisbach, M. S., & Wosinska, M. (2004). Governance, performance objectives and organizational form: Evidence from hospitals. *Journal of Corporate Finance*, *10*(4), 527–548.

Eldenburg, L., & Krishnan, R. (2003a). Public versus private governance: A study of incentives and operational performance. *Journal of Accounting and Economics*, *35*(3), 377–404.

Fischer, C., Lingsma, H. F., Marang-van De Mheen, P. J., Kringos, D. S., Klazinga, N. S., & Steyerberg, E. W. (2014). Is the readmission rate a valid quality indicator? A review of the evidence. *PLoS ONE*, *9*(11): e112282.

Fox, Z. D. (2021). *Taxes and the Use of Subjectivity in Executive Bonus Plans*. Working Paper.

Frank, M., Hoopes, J. L., & Lester, R. (2022). What determines where opportunity knocks? Political affiliation in the selection of Opportunity Zones. *Journal of Public Economics*, *206*, 104588.

Gaertner, F. B., Lynch, D. P., & Vernon, M. E. (2020). The Effects of the Tax Cuts and Jobs Act of 2017 on Defined Benefit Pension Contributions. *Contemporary Accounting Research*, *37*(4), 1990–2019.

Galle, B., Lund, A., & Polsky, G. (2020). *Does tax matter? Evidence on executive compensation after 162(m)'s repeal*. Working Paper.

Glaeser, S. A., Olbert, M., & Werner, A. C. (2023). Tax Competition and Employment. *The Accounting Review*, *98*(5), 267–296.

Guenther, D. A., Matsunaga, S. R., & Williams, B. M. (2017). Is tax avoidance related to firm risk? *The Accounting Review*, *92*(1), 115–136.

Guenther, D. A., & Sansing, R. C. (2023). Implicit Tax, Tax Incidence, and Pretax Returns. *The Accounting Review*, *98*(2), 201–214.

Hanlon, M., Hoopes, J. L., & Slemrod, J. (2019). Tax Reform Made Me Do It! *National Bureau of Economic Research*, 163.

Heckman, J. J. (1979). Sample Selection Bias as a Specification Error. *Econometrica*, *47*(1), 153–161.

Himmelstein, D. U., Woolhandler, S., Hellander, I., & Wolfe, S. M. (1999). Quality of Care in Investor-Owned vs Not-for-Profit HMOs. *Journal of the Americal Medical Association*, *282*(2), 159–163.

Joynt, K. E., Le, S. T., Orav, E. J., & Jha, A. K. (2014). Compensation of chief executive officers at nonprofit US hospitals. *JAMA Internal Medicine*, *174*(1), 61–67.

Keeler, E. B., Melnick, G., & Zwanziger, J. (1999). The changing effects of competition on non-profit and for-profit hospital pricing behavior. *Journal of Health Economics*, *18*(1), 69–86.

Kennedy, P., & Wheeler, H. (2021). Neighborhood-Level Investment from the U.S. Opportunity Zone Program: Early Evidence. Working Paper.

Kessler, D. P., & Geppert, J. J. (2005). The effects of competition on variation in the quality and cost of medical care. *Journal of Economics and Management Strategy*, *14*(3), 575–589.

Kim, J., Nessa, M., & Wilson, R. J. (2021). How do reductions in foreign country corporate tax rates affect U.S. domestic manufacturing firms? *The Accounting Review*, *96*(3), 287-311.

King, E. (2019). Tax Reform, Mixed-Entity Markets, and Hospitals: How the 2017 Tax Cuts and Jobs Act Favors the For-Profit Hospital Model. *Yale Law and Policy Review*, *37*, 527–588.

Kizer, K. W. (2003). The Volume-Outcome Conundrum. *The New England Journal of Medicine*, *349*(22), 2159–2161.

Kramer, A. A., Higgins, T. L., & Zimmerman, J. E. (2013). The association between ICU readmission rate and patient outcomes. *Critical Care Medicine*, *41*(1), 24–33.

Krishnan, R. (2001). Market restructuring and pricing in the hospital industry. *Journal of Health Economics*, *20*, 213–237.

Krishnan, R. (2005). The Effect of Changes in Regulation and Competition on Firms' Demand for Accounting Information. *The Accounting Review*, *80*(1), 269–287.

Krishnan, R., & Yetman, M. H. (2011). Institutional drivers of reporting decisions in nonprofit hospitals. *Journal of Accounting Research*, *49*(4), 1001–1039.

Laplante, S. K., Lewellen, C. M., Lynch, D. P., & Samuel, D. M. P. (2021). "Just BEAT It" Do firms reclassify costs to avoid the base erosion and anti-abuse tax (BEAT) of the TCJA? *WU International Taxation Research Paper Series , 2021*(3).

Luna, L., Schuchard, K., & Stanley, D. (2020). The Impact of CEOs on Changes to Executive Compensation After the TCJA: Initial Evidence. Working Paper.

Markle, K. S., Mills, L. F., & Williams, B. (2020). Implicit corporate taxes and income shifting. *Accounting Review*, *95*(3), 315–342.

Murphy, K. J., & Jensen, M. C. (2018). The Politics of Pay: The Unintended Consequences of Regulating Executive Compensation. *Center for Law and Social Science Research Papers Series*, *3*(2), 189–242.

Patel, E., & Seegert, N. (2020). Does Market Power Encourage or Discourage Investment? Evidence from the Hospital Market. *Journal of Law and Economics*, *63*(4), 667–698.

Saini, V., Garber, J., & Brownlee, S. (2022, February 10). Nonprofit Hospital CEO Compensation: How Much Is Enough? *Health Affairs*. https://www.healthaffairs.org/content/forefront/nonprofit-hospital-ceo-compensation-much-enough#:~:text=A%202021%20report%20from%20the,were%20paid%20on%20average%20%24600%2C000. Accessed 7 August 2023

Schneider, E. C., Zaslavsky, A. M., & Epstein, A. M. (2005). Quality of care in for-profit and not-for-profit health plans enrolling Medicare beneficiaries. *American Journal of Medicine*, *118*(12), 1392–1400.

Scholes, M., Wolfson, M., Erickson, M., Maydew, E., Shevlin, T., (2009). *Taxes and Business Strategy: A Planning Approach, sixth ed.* Pearson Prentice-Hall.

Tax Policy Center. (2020). How did the TCJA affect incentives for charitable giving? *Urban Institute & Brookings Institution*. https://www.taxpolicycenter.org/briefing-book/how-did-tcja-affect-incentives-charitable-giving. Accessed 2 August 2024

Thi, H., & Weichenrieder, A. (2021). *C and S Corporation Banks: Did Trump's Tax Reform Lead to Differential Effects?* Working Paper.

Thomas, J. W., & Hofer, T. P. (1999). Accuracy of Risk-Adjusted Mortality Rate As a Measure of Hospital Quality of Care. *Medical Care*, *37*(1), 83–92.

Xu, J. (2023). The Effect of Tax Incentives on Local Private Investments and Entrepreneurship: Evidence from the Tax Cuts and Jobs Act of 2017. Working Paper.

APPENDIX A

Variable Definitions

Variable	Definition
Labor and Capital Variables	
Beds	is the number of beds available for occupancy in a hospital.
Benefit	is one plus the natural log of the total amount of benefit compensation paid to all hospital employees.
Buildings	is one plus the natural log of the sum of buildings and building fixture additions for the year.
Competition	is the Herfindahl-Hirschman Index calculated by MSA and scaled by 1,000.
Equipment	is one plus the natural log of the sum of fixed and movable equipment purchases for the year.
For_Profit	equals 1 if a hospital is a for-profit entity, and 0 if the hospital is a nonprofit entity.
Land	is one plus the natural log of the sum of land and land improvement additions for the year.
Missing	equals 1 if the dependent variable of interest is missing, and 0 otherwise.
Phy_Hour	is one plus the natural log of the average hourly wage received by all physicians in a hospital.
Phy_Tot	is one plus the natural log of the total wages paid to all physicians in a hospital.
Population	is the population in a given year for the state the hospital is located in.
Teach	equals 1 if a hospital is designated as a teaching hospital, and 0 otherwise.
Tot_Sal	is one plus the natural log of the total salaries paid to all employees of the hospital.
Unemployment	is the annual unemployment rate of the state in which the hospital is located in.
Urban	is an indicator variable equal to 1 if the hospital is located in an urban area, and 0 if the hospital is located in a rural area.

APPENDIX A

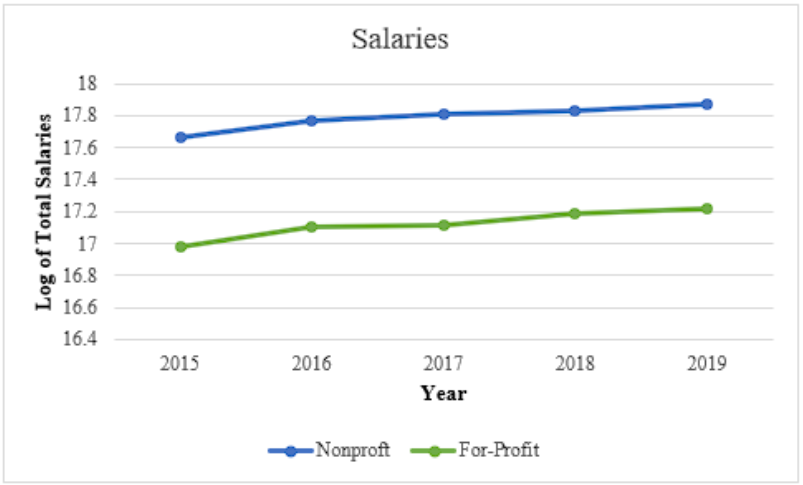
Variable Definitions

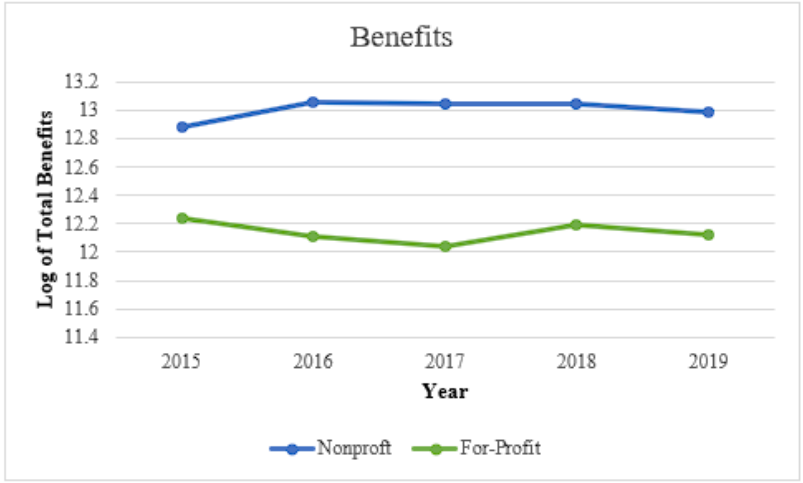
Variable	Definition
Year Indicator	is an indicator variable for each of the four years comprising the pre- and post-periods (*2015, 2016, 2018,* and *2019*).
Readmissions Variables	
Abn_Readmission	is the excess of the actual three-year, 30-day average rate of readmission over the expected three-year, 30-day average rate of readmission averaged over five measurement cases: heart attack patients, coronary artery bypass grafting (CABG) surgery, chronic obstructive pulmonary disease (COPD) patients, stroke patients, and heart failure patients.
Readmission	is the unplanned readmission rate within 30 days of discharge from hospitalization for any cause related to medical conditions.
Implicit Tax Variables	
Charity	is the sum of charity care and bad debts, which sums to the total amount of uncompensated care provided by the hospital.
Competition	is the Herfindahl-Hirschman Index calculated by MSA and scaled by 1,000.
PTNI	is pre-tax net income, calculated as the sum of net patient revenue, other operating revenue, and nonoperating revenue less operating expenses and nonoperating expenses.
Revenues	equals total net patient revenue.
Inspection Deficiency Variables	
Deficiencies	is the number of deficiencies in accordance with Medicare health and safety regulations discovered upon inspection.
Inspection	is an indicator variable equal to 1 if the hospital received an inspection, and 0 otherwise.
Star_Rating	equals a number between 1-5, indicating a patient's overall satisfaction with their experience in the hospital with 5 being the highest possible score and 1 being the lowest.

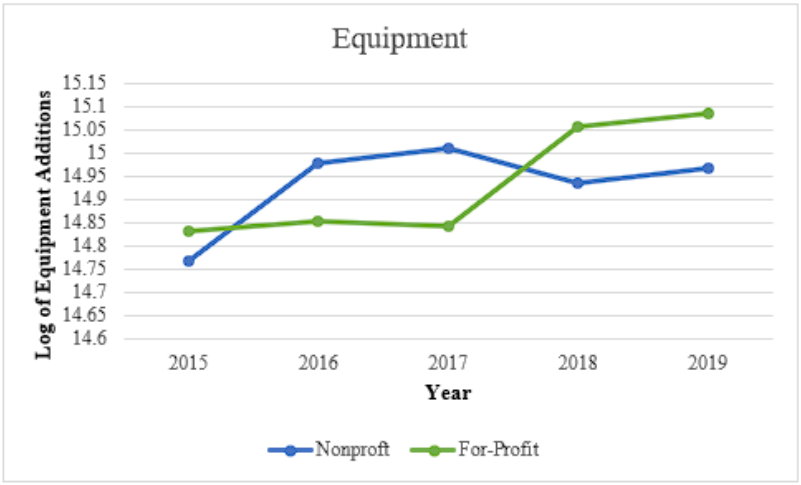
APPENDIX B

State	Nonprofit	For-Profit	State	Nonprofit	For-Profit
Alaska*	75	5	Montana*	257	9
Alabama	309	104	Nebraska*	358	21
Arkansas	254	80	New Hampshire*	114	9
Arizona	253	89	New Jersey*	300	28
California	1,149	341	New Mexico	133	46
Colorado*	334	20	New York*	766	13
Connecticut*	141	12	North Carolina	440	62
District of Columbia	20	10	North Dakota*	191	0
Delaware*	29	0	Nevada	86	52
Florida	524	325	Ohio*	718	45
Georgia	474	118	Oklahoma	320	112
Hawaii*	85	8	Oregon*	266	5
Idaho	163	26	Pennsylvania	525	111
Illinois*	754	50	Rhode Island	41	9
Indiana	468	71	South Carolina	204	74
Iowa*	471	16	South Dakota*	221	24
Kansas*	540	57	Tennessee	282	136
Kentucky	324	70	Texas	1,063	552
Louisiana	362	116	Utah	136	66
Maine*	150	9	Vermont*	70	0
Maryland*	198	4	Virginia	321	57
Massachusetts	247	49	Washington*	414	8
Michigan	538	64	West Virginia	196	27
Minnesota*	607	6	Wisconsin*	550	20
Mississippi	345	102	Wyoming*	96	9
Missouri	436	62			

States in which for-profit hospitals make up less than 10% of the total hospital population are marked with an *.







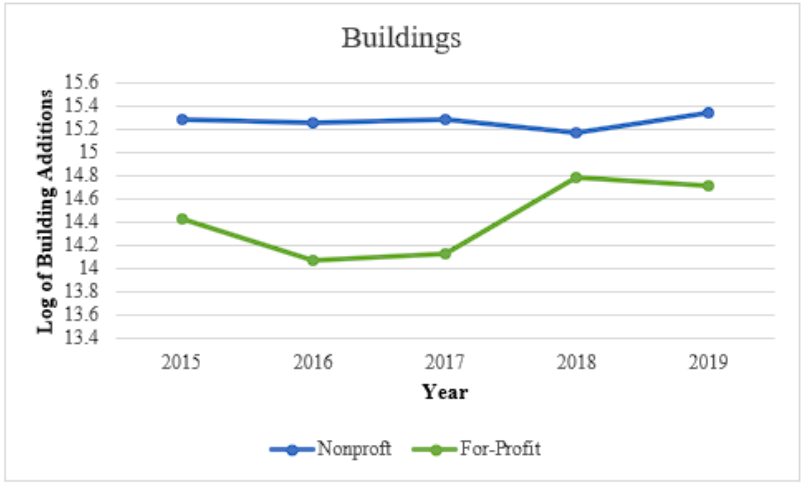


Fig 1 These figures depict the logged dependent variables used in our labor and capital analysis (*Salaries*, *Benefit*, *Equipment*, and *Buildings*) over the five years of our sample period (2015-2019), split by nonprofit and for-profit hospitals.

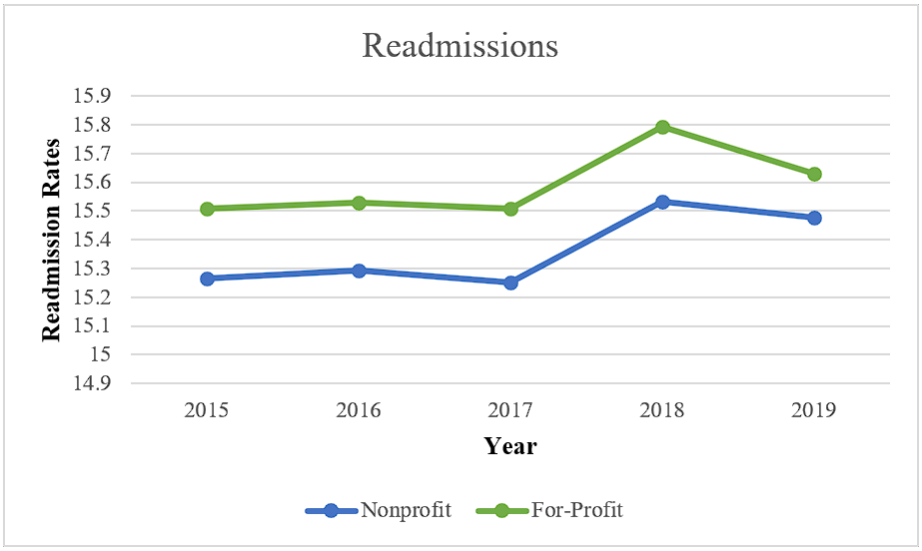


Fig 2 This figure represents the annual readmission rate graphed over the five years of our sample period (2015-2019), split by nonprofit and for-profit hospitals.

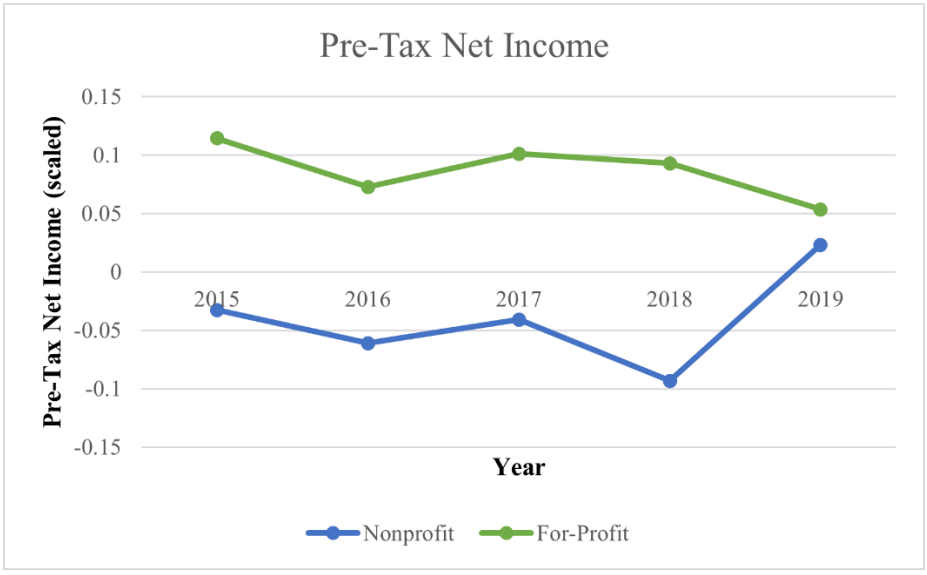


Fig 3 This figure represents pre-tax net income, scaled by total revenues, for our implicit tax sample graphed over the five years of our sample period (2015-2019), split by nonprofit and for-profit hospitals.

Table 1

Panel A: Labor and Capital Investment Sample Selection	
Non-VA, domestic hospital-year observations present in both the HCRIS and HCDDD databases	23,038
Less:	
Hospital-year observations in states with less than 10% for-profit presence	8,926
Hospital-year observations for hospitals which switch entity type	702
Observations missing data needed to construct control variables	1,426
Total hospital-year observations in final sample	11,984
Total unique hospital facilities in final sample	2,582
Panel B: Readmission Rates Sample Selection	
Total observations for labor and capital investment test	11,984
Less:	
Observations missing readmissions data	866
Total hospital-year observations in final sample	11,118
Total unique hospital facilities in final sample	2,458
Panel C: Excess Readmission Rates Sample Selection	
Non-VA, domestic hospital-3-year observations present in both the HCRIS and HCDDD databases	7,324
Less:	
Hospitals without data in both pre-period and post-period	1,006
Observations in states with less than 10% for-profit presence	2,190
Total observations in final sample	4,128
Total unique hospital facilities in final sample	2,064

Panel D: Implicit Taxes Sample Selection	
Total hospital-year observations present in the COSHPD database	2,228
Less:	
Hospital-years which reported zero income or expenses	176
Hospital-year observations which switch entity type	5
Observations missing the data needed to construct control variables	4
Total observations in final sample	2,043
Total unique hospital facilities in final sample	425
Panel E: Inspection Deficiencies Sample Selection	
Total observations for labor and capital investment test	11,984
Less:	
Hospital-years which were not inspected	8,962
Total observations in final sample	3,022
Total unique hospital facilities in final sample	1,708

Table 2
Panel A: Labor and Capital Full Sample Descriptive Statistics

	N	Mean	P25	Median	P75	P90	SD
For_Profit	11,984	0.217	0.000	0.000	0.000	1.000	0.412
2015	11,984	0.128	0.000	0.000	0.000	1.000	0.334
2016	11,984	0.218	0.000	0.000	0.000	1.000	0.413
2018	11,984	0.218	0.000	0.000	0.000	1.000	0.413
2019	11,984	0.218	0.000	0.000	0.000	1.000	0.413
Tot_Sal (raw)	9,121	90,132,026	19,586,559	48,408,985	104,082,873	205,290,359	133,855,316
Phy_Sal (raw)	3,879	6,876,117	355,465	1,302,790	5,544,151	16,998,892	18,127,279
Phy_Hour (raw)	3,923	195.8	105.2	169.1	268.5	344.9	126.6
Benefit (raw)	7,183	1,060,669	150,537	355,332	948,197	2,411,141	2,551,248
Equipment (raw)	5,445	9,599,944	1,116,254	3,781,608	9,454,647	20,919,177	23,502,387
Buildings (raw)	2,508	17,801,082	1,029,787	3,691,542	13,378,785	37,547,573	82,263,802
Land (raw)	1,015	3,260,848	250,607	934,732	2,962,060	7,417,082	7,839,694
Tot_Sal	9,121	17.62	16.79	17.70	18.461	19.14	1.226
Phy_Sal	3,879	14.07	12.78	14.08	15.53	16.65	1.980
Phy_Hour	3,923	5.092	4.665	5.136	5.596	5.846	0.614
Benefit	7,183	12.76	11.92	12.78	13.76	14.70	1.610
Equipment	5,445	14.94	13.93	15.15	16.06	16.86	1.592
Buildings	2,508	15.03	13.85	15.12	16.41	17.44	1.966
Land	1,015	13.63	12.43	13.75	14.90	15.82	1.793
Urban	11,984	0.559	0.000	1.000	1.000	1.000	0.497
Beds	11,984	179.9	37.00	114.0	252.0	426.0	192.5
Teach	11,984	0.258	0.000	0.000	1.000	1.000	0.438
Competition	11,984	0.510	0.095	0.173	0.595	1.171	1.042
Population	11,984	10,752,266	3,515,061	5,543,887	17,273,996	30,568,839	9,661,092
Unemployment	11,984	4.393	3.700	4.300	4.900	5.500	0.883

Panel B: Labor and Capital Descriptive Statistics by Hospital Type

	Pre-TCJA			Post-TCJA			
	Nonprofit (n=3,239) (1)	For-Profit (n=911) (2)	Difference (3) = (1) – (2)	Nonprofit (n=4,105) (4)	For-Profit (n=1,122) (5)	Difference (6) = (4) – (5)	Difference-in-Differences (7) = (3) – (6)
Tot_Sal	98,578,413	41,424,957	57,153,456***	112,624,376	47,575,451	65,048,925***	-7,895,469
Phy_Sal	6,642,463	2,181,055	4,461,408***	8,097,033	2,100,911	5,996,122***	-1,534,714
Phy_Hour	194.94	144.98	49.96***	207.58	163.36	44.22***	5.742
Benefit	1,293,339	319,954	973,384***	1,401,789	320,445	1,081,344 ***	-107,960
Equipment	8,985,904	5,216,154	3,769,750***	11,440,196	7,996,007	3,444,189***	325,561
Buildings	17,231,347	6,383,236	10,848,111***	26,205,909	9,440,999	16,764,910**	-5,916,799
Land	2,101,035	3,539,043	-1,438,008**	3,561,788	4,455,048	-893,260	544,748
Urban	0.536	0.740	-0.204***	0.492	0.699	-0.206***	0.002
Beds	179.6	161.4	18.20***	186.3	168.6	17.70***	0.500
Teach	0.253	0.198	0.055***	0.278	0.247	0.031**	0.024
Competition	0.574	0.409	0.165***	0.525	0.367	0.158***	0.007***
Population	9,973,058	12,108,442	-2,135,384***	10,586,984	12,393,989	-1,807,004***	328,380
Unemployment	5.112	5.156	-0.440	3.818	3.805	0.013	-0.057*

Panel C: Labor Investment Analysis

	(1)	(2)	(3)	(4)	(5)	(6)
DV=		***Tot_Sal***			***Benefit***	
VARIABLES	*Controls*	*Hospital FE*	*Missing*	*Controls*	*Hospital FE*	*Missing*
*For_Profit*2015*	-0.01	0.03	-0.02	0.27***	0.20***	0.25***
	(-0.17)	(1.18)	(-0.37)	(2.77)	(2.95)	(3.53)
*For_Profit*2016*	0.04	-0.00	0.02	0.07	0.06	0.05
	(1.62)	(-0.15)	(1.06)	(1.12)	(1.29)	(1.14)
*For_Profit*2018*	0.04	0.02	0.04	0.13**	0.07*	0.13***
	(1.01)	(1.11)	(1.13)	(2.18)	(1.77)	(2.88)
*For_Profit*2019*	0.04	0.02	0.05	0.12*	0.03	0.11**
	(0.96)	(0.99)	(1.29)	(1.76)	(0.55)	(2.15)
For_Profit	-0.44***		-0.40***	-0.79***		-0.64***
	(-9.22)		(-8.83)	(-10.28)		(-10.65)
Urban	0.31***	-0.02	0.21***	0.16**	-0.04	0.02
	(9.31)	(-1.52)	(6.65)	(2.50)	(-0.94)	(0.46)
Beds	0.00***	0.00***	0.00***	0.00***	0.00	0.00***
	(36.77)	(6.34)	(36.80)	(15.38)	(1.44)	(12.33)
Teach	0.41***	0.00	0.33***	0.14**	0.01	0.08
	(12.47)	(0.03)	(9.69)	(2.07)	(0.16)	(1.35)
Competition	0.04**	-0.02	0.02**	0.04	0.02	0.03**
	(2.11)	(-0.96)	(2.30)	(1.35)	(1.12)	(2.25)
Population	0.00***	0.00	0.00***	0.00***	0.00	0.00***
	(6.87)	(1.02)	(6.28)	(5.48)	(0.60)	(4.85)
Unemployment	-0.01	-0.01	-0.02	0.06	-0.10***	0.02
	(-0.41)	(-0.60)	(-1.14)	(1.35)	(-2.64)	(0.88)
Missing			-16.81***			-12.49***
			(-419.16)			(-290.51)
Year Indicators	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,121	9,121	11,984	7,183	7,183	11,984
Adj. R-squared	0.670	0.965	0.993	0.250	0.857	0.969
Fixed Effects	None	Hospital	None	None	Hospital	None

Panel D: Capital Multivariate Analysis

	(1)	(2)	(3)	(3)	(4)	
DV=	***Equipment***			***Buildings***		
VARIABLES	*Controls*	*Hospital FE*	*Missing*	*Controls*	*Hospital FE*	*Missing*
*For_Profit*2015*	0.14	0.17*	0.09	0.43*	0.51**	0.09
	(1.55)	(1.84)	(1.58)	(1.96)	(2.16)	(1.46)
*For_Profit*2016*	0.03	0.07	0.03	-0.01	0.12	-0.02
	(0.38)	(1.00)	(0.58)	(-0.05)	(0.61)	(-0.25)
*For_Profit*2018*	0.21***	0.18**	0.15***	0.66***	0.55***	0.19***
	(2.71)	(2.53)	(3.16)	(3.55)	(3.07)	(3.88)
*For_Profit*2019*	0.13	0.14*	0.14***	0.31	0.23	0.14***
	(1.49)	(1.76)	(2.80)	(1.61)	(1.19)	(2.75)
For_Profit	-0.16**		-0.06	-0.70***		-0.26***
	(-2.37)		(-1.32)	(-4.60)		(-5.77)
Urban	0.70***	-0.02	0.24***	0.40***	-0.19	0.01
	(12.67)	(-0.30)	(8.14)	(4.18)	(-1.25)	(0.41)
Beds	0.00***	0.00	0.00***	0.00***	0.00	0.00***
	(29.75)	(1.57)	(16.74)	(19.02)	(1.58)	(10.29)
Teach	0.39***	0.07	0.21***	0.61***	0.89***	0.16***
	(7.88)	(0.69)	(5.82)	(7.00)	(3.38)	(5.23)
Competition	-0.03	-0.04	-0.03**	-0.03	-0.03	-0.01
	(-1.25)	(-1.30)	(-2.29)	(-0.71)	(-0.49)	(-0.78)
Population	0.00***	0.00	-0.00	0.00***	0.00	0.00**
	(2.83)	(0.61)	(-0.01)	(3.32)	(0.61)	(2.54)
Unemployment	-0.10***	0.01	-0.05**	-0.17***	0.04	-0.06***
	(-2.79)	(0.28)	(-2.28)	(-2.63)	(0.29)	(-3.37)
Missing			-14.75***			-14.89***
			(-421.13)			(-280.83)
Year Indicators	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,445	5,445	11,984	2,508	2,508	11,984
Adj. R-squared	0.498	0.764	0.984	0.359	0.612	0.981
Fixed Effects	None	Hospital	None	None	Hospital	None

This table presents descriptive statistics and the regression results from tests of H1. All continuous variables are winsorized at the 1st and 99th percentiles unless otherwise noted. Variable definitions are presented in Appendix A. Panel A presents summary statistics, Panel B presents variable means by group and time period (the pre-TCJA period consists of measurement periods 2015 and 2016, and the post-TCJA period consists of measurement periods 2018 and 2019), Panels C and D present the results of estimating Equation (1) with labor and capital dependent variables, respectively, the constant not reported for brevity. Standard errors are clustered at the hospital-level and t-statistics are in parentheses. *, **, and *** signify statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table 3

Panel A: Readmissions Analyses Descriptive Statistics

	N	Mean	P25	Median	P75	SD
Readmission Variables						
Abn_Readmission	3,658	0.801	0.663	0.838	0.974	0.200
Readmission	11,118	15.42	15.00	15.40	15.80	0.741
Independent Variables Multiyear Sample						
For_Profit	4,128	0.227	0.000	0.000	0.000	0.419
Post	4,128	0.500	0.000	0.500	1.000	0.500
Independent Variables Annual Sample						
For_Profit	11,118	0.221	0.000	0.000	0.000	0.415
2015	11,118	0.130	0.000	0.000	0.000	0.336
2016	11,118	0.221	0.000	0.000	0.000	0.415
2018	11,118	0.222	0.000	0.000	0.000	0.416
2019	11,118	0.206	0.000	0.000	0.000	0.405
Tot_Sal	11,118	14.08	15.80	17.31	18.30	7.190
Phy_Sal	11,118	4.800	0.000	0.000	12.87	6.780
Phy_Hour	11,118	1.757	0.000	0.000	4.742	2.452
Benefit	11,118	8.117	0.000	11.78	13.19	6.285
Equipment	11,118	7.013	0.000	0.000	15.04	7.552
Buildings	11,118	3.248	0.000	0.000	0.000	6.249
Land	11,118	1.194	0.000	0.000	0.000	3.889
Urban	11,118	0.567	0.000	1.000	1.000	0.496
Beds	11,118	185.5	42.00	121.0	256.0	193.1
Teach	11,118	0.263	0.000	0.000	1.000	0.440
Competition	11,118	0.510	0.095	0.177	0.604	1.171
Population	11,118	10,697,671	3,515,061	5,543,887	17,273,996	9,640,186
Unemployment	11,118	4.400	3.700	4.300	5.000	0.883

Panel B: Readmissions Multivariate Analysis

VARIABLES	(1) *Abnormal Readmissions*	(2) *Cross-Sectional Readmissions*	(3) *Within Hospital Readmissions*
*For_Profit*Post*	-0.02***		
	(-3.12)		
For_Profit	0.01		
	(0.73)		
Post	-0.04***		
	(-13.88)		
*For_Profit*2015*		-0.01	-0.03
		(-0.29)	(-0.74)
*For_Profit*2016*		-0.02	-0.03
		(-0.53)	(-0.80)
*For_Profit*2018*		0.00	-0.01
		(0.07)	(-0.16)
*For_Profit*2019*		-0.10***	-0.12***
		(-2.73)	(-3.39)
For_Profit		0.27***	
		(7.12)	
Urban		-0.05*	-0.05
		(-1.80)	(-1.53)
Beds		0.00***	-0.00
		(4.08)	(-0.10)
Teach		0.07*	0.03
		(1.72)	(0.45)
Competition		-0.04***	-0.01
		(-4.98)	(-0.63)
Population		-0.00**	-0.00
		(-2.55)	(-0.94)
Unemployment		0.06***	0.03
		(3.68)	(1.32)
Year Indicators	No	Yes	Yes
Observations	3,658	11,118	11,118
Adj. R-squared	0.014	0.067	0.667
Fixed Effects	None	None	Hospital

This table presents descriptive statistics and the regression results from tests of H2 in which the dependent variable is readmission rates. Variable definitions are presented in Appendix A. Panel A presents summary statistics and Panel B presents the results of estimating Equation (2), the constant not reported for brevity. Standard errors are clustered at the hospital-level and t-statistics are in parentheses. *, **, and *** signify statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table 4

Panel A: Capital Investment Cross-Sectional Analyses

	Red		***Blue***		***High Competition***		***Low Competition***	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
DV=	*Equipment*	*Buildings*	*Equipment*	*Buildings*	*Equipment*	*Buildings*	*Equipment*	*Buildings*
*For_Profit*2015*	0.12**	0.15**	0.19*	-0.01	0.11	0.06	0.19**	0.17**
	(2.00)	(2.15)	(1.88)	(-0.10)	(1.49)	(0.74)	(2.32)	(1.98)
*For_Profit*2016*	0.06	-0.06	-0.05	0.15	0.01	-0.11	0.03	0.09
	(1.29)	(-0.83)	(-0.59)	(1.30)	(0.09)	(-1.20)	(0.44)	(1.07)
*For_Profit*2018*	0.17***	0.22***	0.10	0.06	0.14**	0.17***	0.12*	0.22***
	(3.38)	(3.91)	(1.01)	(0.57)	(2.21)	(2.69)	(1.87)	(2.80)
*For_Profit*2019*	0.12**	0.15***	0.15	0.10	0.08	0.16**	0.12*	0.13
	(2.20)	(2.59)	(1.44)	(0.99)	(1.26)	(2.47)	(1.67)	(1.56)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,970	8,970	3,014	3,014	6,018	6,018	5,966	5,966
Adj. R-squared	0.993	0.989	0.993	0.991	0.993	0.988	0.993	0.990
Fixed Effects	Hospital	Hospital	Hospital	Hospital	Hospital	Hospital	Hospital	Hospital

Panel B: Investment and Readmissions

DV=Readmissions	*Increase in Capital Investments*		*Decrease in Capital Investments*	
	(1)	(2)	(3)	(4)
VARIABLES	Controls	Hospital FE	Controls	Hospital FE
*For_Profit*2015*	0.02	-0.06	-0.00	-0.00
	(0.25)	(-0.89)	(-0.02)	(-0.04)
*For_Profit*2016*	-0.01	-0.02	-0.03	-0.03
	(-0.18)	(-0.43)	(-0.67)	(-0.75)
*For_Profit*2018*	-0.00	-0.01	0.01	-0.00
	(-0.09)	(-0.12)	(0.13)	(-0.05)
*For_Profit*2019*	-0.15***	-0.17***	-0.06	-0.08
	(-2.69)	(-3.17)	(-1.24)	(-1.63)
For_Profit	0.41***		0.17***	
	(6.92)		(3.37)	
Urban	-0.08*	-0.08	-0.01	-0.03
	(-1.88)	(-1.54)	(-0.46)	(-0.76)
Beds	0.00***	0.00	0.00***	-0.00
	(3.65)	(0.31)	(3.42)	(-0.51)
Teach	0.05	0.00	0.08	0.09
	(1.00)	(0.03)	(1.43)	(0.87)
Competition	-1.53***	-0.02	-0.91***	0.15
	(-3.43)	(-0.07)	(-3.11)	(0.87)
Population	-0.00*	-0.00	-0.00**	-0.00
	(-1.71)	(-0.68)	(-2.15)	(-0.56)
Unemployment	0.09***	0.05*	0.07***	0.00
	(3.40)	(1.75)	(3.24)	(0.14)
Observations	4,636	4,636	6,479	6,479
Adj. R-squared	0.089	0.690	0.059	0.649
Fixed Effects	None	Hospital	None	Hospital

This table presents additional tests of H1 and H2. All continuous variables are winsorized at the 1st and 99th percentiles unless otherwise noted. Variable definitions are presented in Appendix A. Panel A presents the results of estimating Equation (1), partitioning our sample by whether the hospital was located in a state which voted Republican or Democratic in the 2016 election in Columns (1) – (4) or partitioning our sample on high versus low competition in Columns (5) – (8). In this panel, we omit the constant and control variables for brevity. Panel B presents the results of estimating Equation (2), partitioning our sample by hospitals which increased or decreased their capital investments from the pre-period to the post-period. We omit the constant for brevity. Standard errors are clustered at the hospital-level and t-statistics are in parentheses. *, **, and *** signify statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table 5:

Panel A: Implicit Taxes Descriptive Statistics

	N	Mean	P25	Median	P75	P90	SD
For_Profit	2,043	0.320	0.000	0.000	1.000	1.000	0.466
2015	2,043	0.199	0.000	0.000	0.000	1.000	0.399
2016	2,043	0.200	0.000	0.000	0.000	1.000	0.400
2018	2,043	0.200	0.000	0.000	0.000	1.000	0.400
2019	2,043	0.199	0.000	0.000	0.000	1.000	0.400
PTNI	2,043	18,744,527	-1,068,499	3,997,498	19,550,456	62,781,651	66,616,461
Urban	2,043	0.720	0.000	1.000	1.000	1.000	0.449
Beds	2,043	207.4	61.00	145.0	298.0	435.0	240.26
Teach	2,043	0.074	0.000	0.000	0.000	0.000	0.262
Competition	2,043	0.420	0.112	0.243	0.630	1.006	0.457
Population	2,043	3,491,527	502,469	1,916,285	3,338,330	10,085,416	3,880,540
Revenues (raw)	2,043	263,999,310	36,785,731	114,635,854	330,016,778	614,890,921	479,434,785
Charity (raw)	2,043	15,059,157	873,265	6,298,378	18,008,500	39,369,829	25,695,032
Revenues	2,043	18.41	17.42	18.56	19.62	20.23	1.584
Charity	2,020	13.70	13.79	15.68	16.71	17.49	5.438

Panel B: Implicit Taxes Among California Hospitals

DV=PTNI	(1)	(2)	(3)	(4)	(5)	(6)
		Hospital		Hospital		Hospital
VARIABLES	Controls	FE	Controls	FE	Controls	FE
*For_Profit*2015*	-0.06	-0.06	-0.03	-0.04	-0.04	-0.06
	(-1.46)	(-1.45)	(-0.78)	(-1.11)	(-0.97)	(-1.43)
*For_Profit*2016*	-0.06	-0.07*	-0.06	-0.06	-0.02	-0.06
	(-1.25)	(-1.85)	(-1.17)	(-1.07)	(-0.26)	(-1.24)
*For_Profit*2018*	0.05	0.04	0.05	0.07	0.06	0.03
	(0.52)	(0.54)	(0.52)	(0.70)	(0.62)	(0.45)
*For_Profit*2019*	-0.11***	-0.10**	-0.10**	-0.08**	-0.09**	-0.10*
	(-2.64)	(-2.02)	(-2.37)	(-2.02)	(-2.26)	(-1.79)
For_Profit	0.28***		0.20***		0.28***	
	(4.57)		(4.11)		(4.54)	
Revenues	0.23***	1.02			0.16***	1.22**
	(2.82)	(1.63)			(3.45)	(2.10)
Charity	-0.03*	-0.01	0.01**	0.01		
	(-1.96)	(-1.42)	(2.42)	(0.86)		
Urban	-0.17**	0.04	-0.10*	0.02	-0.10	0.06*
	(-2.28)	(1.62)	(-1.69)	(0.82)	(-1.48)	(1.95)
Beds	-0.00**	0.00	0.00***	0.00***	-0.00**	-0.00
	(-2.13)	(0.06)	(2.62)	(2.75)	(-2.23)	(-0.25)
Teach	-0.18**	0.19	-0.02	0.06	-0.19***	0.23
	(-2.47)	(1.12)	(-0.54)	(0.98)	(-2.63)	(1.12)
Competition	-0.03	0.00	-0.05	-0.00	-0.05	0.00
	(-0.60)	(0.06)	(-0.95)	(-0.29)	(-0.97)	(0.04)
Population	0.00	-0.00	0.00	-0.00	0.00	-0.00
	(0.47)	(-0.78)	(0.39)	(-1.19)	(0.04)	(-0.58)
Year Indicators	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,020	2,020	2,020	2,020	2,043	2,043
Adj. R-squared	0.096	0.489	0.025	0.389	0.079	0.511
Fixed Effects	None	Hospital	None	Hospital	None	Hospital
SE Cluster	Hospital	Hospital	Hospital	Hospital	Hospital	Hospital

This table presents descriptive statistics and the regression results from tests of H3. All continuous variables are winsorized at the 1st and 99th percentiles unless otherwise noted. Variable definitions are presented in Appendix A. Panel A presents summary statistics, and Panel B presents the results of estimating Equation (3), the constant not reported for brevity. Standard errors are clustered at the hospital-level and t-statistics are in parentheses. *, **, and *** signify statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table 6

Panel A: Inspection Deficiencies Full Sample Descriptive Statistics

	N	Mean	P25	Median	P75	P90	SD
For_Profit	3,023	0.214	0.000	0.000	0.000	1.000	0.410
2015	3,023	0.128	0.000	0.000	0.000	1.000	0.334
2016	3,023	0.211	0.000	0.000	0.000	1.000	0.408
2018	3,023	0.212	0.000	0.000	0.000	1.000	0.409
2019	3,023	0.221	0.000	0.000	0.000	1.000	0.415
Deficiencies	3,023	6.312	2.000	4.000	8.000	15.00	7.612
Star_Rating	3,023	2.390	2.000	3.000	3.000	4.000	1.386
Urban	3,023	0.601	0.000	1.000	1.000	1.000	0.490
Beds	3,023	248.7	49.00	180.0	355.0	610.0	239.1
Teach	3,023	0.357	0.000	0.000	1.000	1.000	0.479
Competition	3,023	0.033	0.004	0.011	0.033	0.097	0.057
Population	3,023	10,617,685	3,583,947	6,624,960	17,061,122	21,776,098	9,102,098
Unemployment	3,023	4.372	3.700	4.300	5.000	5.500	0.871

Panel B: Inspection Deficiencies Descriptive Statistics by Hospital Type

	Pre-TCJA			Post-TCJA			
	Nonprofit (n=786) (1)	For-Profit (n=238) (2)	Difference (3) = (1) – (2)	Nonprofit (n=1,043) (4)	For-Profit (n=266) (5)	Difference (6) = (4) – (5)	Difference-in-Differences (7) = (3) – (6)
Deficiencies	5.174	5.790	-0.616	6.645	6.169	0.476	-1.092
Star_Rating	2.435	2.349	0.086	2.414	2.143	0.271***	-0.185
Urban	0.593	0.739	-0.146***	0.542	0.741	-0.199***	0.053
Beds	251.6	221.9	29.70*	256.2	248.8	7.400	22.30
Teach	0.349	0.307	0.042	0.380	0.376	0.004	0.038
Competition	0.036	0.028	0.008	0.034	0.024	0.010***	-0.002
Population	10,018,691	12,560,982	-2,542,291***	10,336,547	12,663,664	-2,327,117***	215,174
Unemployment	5.125	5.113	0.012	3.797	3.707	0.090**	-0.078

Panel C: Heckman 2-Stage		
	(1)	(2)
VARIABLES	*Inspection*	*Deficiencies*
*For_Profit*2015*		1.64
		(1.14)
*For_Profit*2016*		1.12
		(0.86)
*For_Profit*2018*		-0.02
		(-0.01)
*For_Profit*2019*		0.47
		(0.36)
2015		-2.03***
		(-2.69)
2016		-2.36***
		(-3.71)
2018		-0.75
		(-1.19)
2019		-1.09*
		(-1.71)
For_Profit		-0.82
		(-0.89)
Star_Rating	-0.04***	
	(-4.31)	
Urban	-0.07**	-0.40
	(-2.45)	(-0.55)
Beds	0.00***	-0.02***
	(16.50)	(-3.20)
Teach	0.08**	-1.65**
	(2.41)	(-2.09)
Competition	0.56**	-11.49**
	(2.40)	(-2.12)
Population	-0.00***	0.00***
	(-3.33)	(3.57)
Unemployment	-0.02*	0.28
	(-1.66)	(0.77)
IMR		-19.28***
		(-3.10)
Observations	11,984	3,022
Adj. R-Squared	0.053	0.003
Fixed Effects	None	None

This table presents additional tests of H1 in which the dependent variable of interest is inspection deficiencies. All continuous variables are winsorized at the 1st and 99th percentiles unless otherwise noted. Variable definitions are presented in Appendix A. Panel A presents summary statistics and Panel B presents variable means by group and time period (the pre-TCJA period consists of measurement periods 2015 and 2016, and the post-TCJA period consists of measurement periods 2018 and 2019) for the sample of hospitals which received an inspection. Panel C presents the results of the first stage of the Heckman Two-Stage estimation, presented in Column (1), and the second stage of the Heckman Two-Stage, presented in Column (2), the constant not reported for brevity. Standard errors are clustered at the hospital-level and t-statistics are in parentheses. *, **, and *** signify statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table 7
Additional Analyses

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
DV=	*Land*	*Land*	*Phy_Sal*	*Phy_Sal*	*Phy_Hour*	*Phy_Hour*
*For_Profit*2015*	1.21*	1.53	-0.05	0.16	0.07	0.10*
	(1.91)	(1.14)	(-0.21)	(1.03)	(1.00)	(1.74)
*For_Profit*2016*	0.66	0.98	-0.10	0.01	-0.01	-0.01
	(1.05)	(0.65)	(-0.50)	(0.05)	(-0.24)	(-0.23)
*For_Profit*2018*	0.77	1.33	-0.24	-0.09	0.02	-0.04
	(1.32)	(1.24)	(-1.61)	(-0.96)	(0.32)	(-0.82)
*For_Profit*2019*	0.95	1.42	-0.39**	-0.17	0.01	-0.02
	(1.57)	(1.33)	(-2.10)	(-1.41)	(0.18)	(-0.41)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,015	1,015	3,879	3,879	3,923	3,923
Adj. R-squared	0.161	0.446	0.146	0.886	0.064	0.744
Fixed Effects	None	Hospital	None	Hospital	None	Hospital

This table presents additional tests of H1. All continuous variables are winsorized at the 1st and 99th percentiles unless otherwise noted. Variable definitions are presented in Appendix A. The results presented are from the estimation of Equation (1), replacing the dependent variable with *Land* (Columns (1) and (2)), *Phy_Sal* (Columns (3)-(4)), and *Phy_Hour* (Columns (5)-(6)), the constant and control variables not reported for brevity. Standard errors are clustered at the hospital-level and t-statistics are in parentheses. *, **, and *** signify statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.