When private equity comes to town: The local economic consequences of rising healthcare costs*

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Abstract

We examine the effect of increased healthcare costs on local economic conditions. We use private equity buyouts of hospital systems as a shock to the healthcare costs faced by firms in affected areas. We provide evidence that private equity buyouts of hospital systems result in higher healthcare insurance premiums paid by firms, and such rises in premiums lead to higher business bankruptcies, an increase in business loan volume, slower employment and establishment growth, and reduced innovative output. The effects are more pronounced in areas with less competitive hospital markets, higher labor intensity, and fewer insurers providing coverage.

Keywords: Healthcare finance, private equity, leveraged buyout, hospital acquisitions, business bankruptcies, insurance premiums.
JEL classification: G21, G31, G32, I11, I15

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1 Introduction

Healthcare costs in the United States have increased precipitously in the past two decades. Indeed, healthcare insurance premiums averaged $25,572 for family coverage in 2024, representing a 157% increase in the past two decades that substantially outpaced both wage growth and inflation.[1] The rapid growth in average premiums is illustrated in Figure 1 below. Employer-sponsored plans in the U.S. cover approximately 159 million people, leading businesses to absorb the bulk of these increases. Healthcare costs are also among the largest expenses for businesses; for example, a 1% decrease in premiums is estimated to increase profits by an average of 2.75% (Lara et al. (2022)). Likewise, in a recent survey, nearly half of businesses reported reduced profits or a net loss to pay for increases in health insurance premiums in the last five years.[2] Indeed, the sizable yearly increases in healthcare costs have recently pushed businesses and employer groups to lobby for legislation to limit price increases, with state legislatures acknowledging that "high healthcare costs were hurting the state's efforts to lure companies and jobs" (*The Wall Street Journal*, September 28, 2023).[3] While the steep rise in healthcare costs and spending is well known, the specific effects of such heightened costs on local communities is not yet well understood.

We investigate the role of rising healthcare costs on local economic outcomes, such as business bankruptcies, loans, establishment and employment growth, and innovation activity. Our empirical strategy exploits quasi-exogenous increases in healthcare costs in local economies induced by private equity (PE) acquisitions of hospital systems, using only acquisitions by PE companies that did not have any concurrent hospital ownership and for hospitals that were not previously PE-owned. In recent years, there has been an increasing trend of PE acquisitions of both individual hospitals and hospital chains. However, as documented by Liu (2022), due to increased bargaining power by PE firms with health insurance companies, PE acquisition of a hospital typically results in a significant increase in negotiated prices with insurers. Prices increase not only for the PE-acquired hospital, but for other hospitals within the locality as well. We show that higher reimbursement rates for hospital services by insurers are passed on to businesses (and their workers) in the form of higher insurance premiums. We therefore use such buyouts as a shock to healthcare costs, and we explore how this increase in costs affects local economic outcomes and the channels

[1] These statistics are drawn from Kaiser Family Foundation (2024). Premiums for family coverage averaged $9,950 in 2004. Relatedly, total healthcare spending in the U.S. presently accounts for 18–20% of GDP.

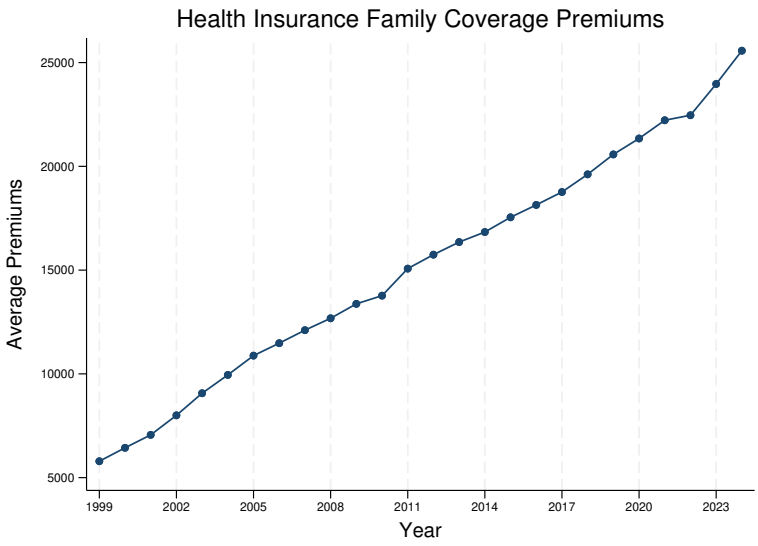
[2] See Wade and Oldstone (2023).

[3] See "These Employers Took On Healthcare Costs, and the Fight Got Nasty," *The Wall Street Journal*.

through which this occurs.

Figure 1: Rise in Premiums

This figure depicts average family healthcare insurance premiums from 1999 to 2024. The data source for family premiums is the KFF Annual Surveys of Employer-Sponsored Health Benefits (Kaiser Family Foundation (2024)).



To investigate this question, we use two specifications. In the first, we examine a difference-in-differences (DID) specification exploiting the effect of one of the first large-scale PE acquisitions of a hospital system: Community Health Systems (CHS), which owned 38 hospitals in 18 states (comprising 30 hospital referral regions) at the time of its acquisition in 1996. In the second specification, we consider a staggered DID specification including all PE buyouts of hospital systems over our full sample from 1993 to 2023, in which we compare economic outcomes in local areas affected by a PE hospital buyout to areas that were not affected. The advantage of using PE buyouts as the empirical strategy is that, unlike broader shocks to healthcare costs that are typically nationwide, PE entry into a region through a hospital system buyout influences healthcare prices at the *local* level and is specific to the particular region of entry, thereby allowing for geographic and temporal variation in healthcare costs. Additionally, there is an ongoing policy debate regarding the presence of private equity in the healthcare industry, with legislation recently introduced in the U.S. Senate aimed at regulating PE ownership of hospitals.[4] Our empirical setting allows us to speak

[4]For example, recent legislation introduced in the U.S. Senate would require greater transparency and regulations about private equity investments in the healthcare sector. See "Private equity in health care becomes a bigger Washington target," *Axios*, April 10, 2024, and "Amid Steward fiasco, Warren, Markey

to the realized community effects following PE hospital ownership, and therefore our analysis can have important social considerations and policy implications regarding both rising healthcare costs and for the presence of private equity in the healthcare industry.

Our main results are as follows. We begin by utilizing firm-level data on employer-sponsored healthcare insurance plan premiums to document that businesses indeed face a significant increase in healthcare insurance premiums following a PE acquisition of a hospital in the local area. This increase is an economically significant magnitude of 4.0–8.2% in insurance coverage expenses, amounting to 11.7–14.2% of net income for a typical firm.

We then explore a host of local economic outcomes. First, we show that business bankruptcies—Chapter 7, Chapter 11, and total bankruptcies—significantly increase at the county level following PE buyouts of hospitals. For example, following the CHS acquisition, total business bankruptcies increase by 6.9% for counties affected by the acquisition compared to unaffected counties. This is equivalent to an additional 688 business bankruptcies per year across counties affected by the large-scale hospital system acquisition. Second, consistent with the notion that firms become more strained financially due to the rising healthcare costs (thus leading to more bankruptcies), total business loan volume in affected areas significantly increases, particularly for smaller loan amounts. Finally, examining broader economic growth trends, affected areas experience significantly lower employment growth, establishment growth, and innovation output.

We provide a number of supporting analyses. First, we utilize additional establishment-level micro-data to show that there is a reduced number of new business establishments formed in affected counties compared to other counties. We further show that, at the establishment level, firms in affected areas are significantly more likely to exit and experience significantly lower employment growth compared to unaffected firms. These results are consistent with our previous county-level results. Second, we consider several heterogeneity tests and find that the main results we document are stronger for counties that are ex ante plausibly more exposed to PE acquisitions of hospitals. In particular, we show that our results are stronger for regions where the PE-acquired hospital faces less competition in the hospital market and where firms are more reliant on labor and thus more exposed to changes in healthcare premiums.

Finally, we consider a number of robustness checks. The results are insensitive to employing different empirical specifications, a placebo test randomly assigning treated counties, and restricting our analysis to areas with for-profit hospitals.

pitch bill to regulate private equity in health care," *The Boston Globe*, June 11, 2024.

Our study relates to several literatures. A number of papers examine the determinants of hospital prices, including insurer-provider bargaining (e.g., Gaynor et al. (2015), Ho and Lee (2017), Lewis and Pflum (2017)), hospital competition and mergers (e.g., Dranove and Satterthwaite (2000), Gowrisankaran et al. (2015), Dafny et al. (2019)), and private equity ownership (e.g., Liu (2022)), among other factors. Relatedly, a recent stream of literature examines negotiated hospital prices using insurance claims data, and finds variation both within and across hospitals (Cooper et al. (2022)) and the relation to quality of care (Cooper et al. (2022)). We contribute to this literature by documenting the spillover effects on businesses and local communities of increased hospital prices.

Our study is also related to the literature that examines the labor market and wage effects of increased healthcare spending and costs. Gruber (1994) finds that heightened costs following mandated maternity benefits were largely passed through to workers. In contrast, Baicker and Chandra (2006) find that a 10% increase in insurance premiums for employers is met with a 2.3% reduction in wages, indicating that businesses do not fully pass on the increase in premiums to workers. Likewise, Tong (2024) documents that a reduction in healthcare costs due to tort reforms is met with greater capital and R&D expenditures by publicly-traded companies. Related studies examine the wage effects following hospital mergers (Arnold and Whaley (2020), Prager and Schmitt (2021)) and employment shifts following government healthcare mandates, such as the Affordable Care Act (Kolstad and Kowalski (2016), Mulligan (2020), Almeida et al. (2022), Dillender et al. (2022)). In contemporaneous work, Zeller (2023) and Gao et al. (2023) also examine the effect of health insurance costs on firms. Zeller (2023) focuses on the small business and startup effects following PE hospital acquisitions and finds a decrease in employment shares among smaller businesses, along with lower entry and higher exit of startups or businesses with 20 or fewer employees.[5] Gao et al. (2023) examine the substitution between labor and information technology as related to healthcare insurance premiums and find that firms reduce low-skilled employment and invest more in information technology. Our work varies as we examine a wide range of local economic outcomes, such as bankruptcies, borrowing activity, and innovation for businesses, including small and large businesses, as well as establishment and employment growth. At the same time, our empirical strategy offers a tight link between healthcare costs and the range of economic outcomes noted above and furthermore sheds light on the specific spillover effects of private equity involvement in healthcare on local economies.

Our paper is also related to the recent literature at the intersection of healthcare and

[5]The latter result also holds for startups with 50 or fewer employees.

finance (see Lo and Thakor (2022, 2023) for a review). A number of papers examine the effect of financial markets on hospitals, such as Adelino et al. (2015), Dranove et al. (2017), and Adelino et al. (2022). A more recent strand of this literature considers the interaction between healthcare providers and financial intermediaries (e.g., Aghamolla et al. (2024)) and specifically acquisitions of providers by private equity firms, focusing primarily on hospital services and patient health outcomes (e.g., Gondi and Song (2019), Gao et al. (2021), Offodile et al. (2021), Cerullo et al. (2022), Gupta et al. (2024)). Liu (2022) considers the effect of PE buyouts on hospital negotiated prices with insurers. We add to this literature by showing how PE acquisitions of hospitals can lead to a depression of local economic activity vis à vis increasing healthcare costs. Moreover, we show that increased hospital prices pass through to local businesses in the form of higher insurance premiums.

Finally, our study contributes to the broader literature that examines the costs and benefits of private equity ownership for acquired firms.[6] These include the effects of leveraged buyouts and private equity ownership on target firms' innovation activity (Lerner et al. (2011)), operational performance and outcomes (Boucly et al. (2011), Bernstein and Sheen (2016), Bernstein et al. (2019), Eaton et al. (2020), Fracassi et al. (2022), Johnston-Ross et al. (2021)), and employment (Davis et al. (2014), Davis et al. (2021)). Bernstein et al. (2017) conduct a cross-country and cross-industry analysis to explore whether greater PE activity affects industry performance. We contribute to this literature by documenting how private equity entry into a specific vital industry—hospitals—within a community can have significant spillover effects on the local economy. As such, our study also highlights the real effects of private equity ownership in the healthcare sector, which is relevant for the recent ongoing public policy debate on the role of PE in healthcare.

2 Institutional setting and conceptual framework

Private equity hospital acquisitions

Private equity has seen increasing involvement in the healthcare industry in recent years, with numerous acquisitions of both individual hospitals and hospital systems. Indeed, the value of private equity deals in the U.S. healthcare sector has witnessed a twentyfold increase between 2000 and 2018 (Offodile et al. (2021)), and private equity investments in healthcare exceeded $151 billion in 2021 alone. Among the first of the major private equity acquisitions

[6]For reviews, see Kaplan and Schoar (2005), Kaplan and Strömberg (2009), Bernstein (2022), and Sorensena and Yasudab (2023).

was of the large-scale, publicly-traded hospital system Community Health Systems (CHS) in a $1.63 billion leveraged buyout on July 10, 1996. At the time, CHS owned 38 hospitals in 18 states (comprising 30 hospital referral regions), employing over 7,900 workers. CHS hospitals were located primarily in the southeast and southwest, with several hospitals in smaller communities of less than 75,000 residents, as well as hospitals in major metropolitan areas.

Forstmann Little & Co, the private equity firm behind the acquisition, took the publicly traded hospital system private following the acquisition. The deal was financed through $1 billion from Frostmann Little and $900 million in bank lending.[7] The debt was placed on CHS's balance sheet, resulting in total long-term liabilities of $1.2 billion and a debt to equity ratio of 161.2% (Appelbaum (2019)). As is common in private equity deals, Frostmann Little orchestrated their (partial) exit from the acquisition four years later. In 2000, the company raised $751 million for a 46% share in its return to public equity markets, with Frostmann Little maintaining a majority stake. Frostmann Little sold its shares completely in 2004.

As noted above, private equity companies seek a relatively quick return on their investments. This includes not just the higher valuation at the time of exit, but also through dividends (usually through asset sales of the acquired firm) as well as transaction and advisory fee payments to the private equity company. Moreover, sales of the acquired hospital's real estate mean that the hospital must make lease payments, tantamount to another debt obligation (Gupta et al. (2024)). Private equity-acquired hospitals are thus typically in considerable debt following the acquisition.

Negotiated prices with insurers

In-network hospitals negotiate directly with insurance companies for reimbursement rates on services, both inpatient and outpatient, provided. Reimbursement schemes for treating privately insured patients are generally set either as a percentage of Medicare reimbursement rates or as a percentage of hospital charges (i.e., listed prices) (Cooper et al. (2019)).[8] Private equity acquisition of a hospital can lead to significantly higher negotiated prices and reimbursement rates with insurers for a number of reasons. First, private equity acquisitions, as in the case of CHS, are often financed through leveraged buyouts. The debt from

[7] As reported in the *Los Angeles Times* on June 11, 1996. See https://www.latimes.com/archives/la-xpm-1996-06-11-fi-13844-story.html. Additionally, after all shares were purchased and debt refinanced, Forstmann assumed or refinanced $270 million in debt and provided $530 million to CHS to fund internal growth and the acquisition of additional hospitals.

[8] White and Whaley (2021) find that negotiated prices with insurers for employer-sponsored plans averaged 241% of medicare rates for hospital services in a sample of 25 states in 2017.

the deal is placed on the hospital's balance sheet. The heightened leverage thus requires greater payments to service the debt. As a result, a hospital that is unable to meet its debt obligations faces a credible threat of bankruptcy and closure—particularly by private equity investors, who have a reputation for closing distressed businesses (Liu (2022)). Importantly, a hospital closure within a market can raise the bargaining power of other hospitals within a given region, thus eventually leading to higher negotiated prices with the remaining hospitals.[9] As such, insurance companies have an interest in preventing hospital closure and are therefore willing to provide higher reimbursement rates to lower the chance of hospital bankruptcy. Likewise, insurance companies have an interest in keeping current in-network healthcare providers within their plans, as the loss of a major provider can make the plan less attractive to businesses and can frustrate their employees who would prefer not to change providers.[10] As noted by Liu (2022), negotiated prices for hospital services following private equity acquisitions increased by an average of 32%.

Furthermore, neighboring (or rival) hospitals (which are not private equity-owned) can also raise their negotiated prices with insurers following private equity ownership of another hospital within the region (Liu (2022)). The loss of the rival hospital within the insurer's network can result in more patients utilizing services at the private equity-owned hospital, which is more costly for the insurer due to the higher reimbursement rates. Consequently, the bargaining posture of neighboring hospitals increases, and the insurer is willing to provide higher rates with neighboring hospitals to keep these hospitals within their network. Hence, the entrance of private equity ownership within a region can raise reimbursement rates, and thus the overall cost of care, for several hospitals within the region. (Payments for hospital services make up the largest percentage of costs for insurers.)

While insurance companies appear to bear the financial brunt of private equity entrance

[9]For example, as noted in recent media coverage, following private equity ownership of a prominent Philadelphia hospital, "the insurance companies had an incentive to compromise: if Hahnemann closed, the privately insured patients treated there would go to other city hospitals, where the cost of their care would rise. 'You go into Blue Cross and you say, 'We need some help, and it's in your best interest to help us,' [former Hahnemann CEO Mike] Halter explained. 'Give us ten million dollars more per year'—versus losing fifty million per year'" (*The New Yorker*, June 7, 2021).

[10]Media reports provide anecdotal evidence of private equity-acquired hospitals aggressively renegotiating payment rates with insurers immediately following the PE acquisition. For example, in the case of HCA Healthcare, which was acquired by private equity firms in 2006, it was reported that "[Healthcare insurance company] United had claimed that HCA-HealthOne demanded a 35 percent reimbursement rate increase over four years in Colorado. HCA-HealthOne countered that its requested increase would translate into a 1.6 percent premium increase per year for employers and individuals. [...] United had strong motivation to ink a deal to prevent the loss of customers during the open-enrollment season, said Dr. Mark Linkow, a gastroenterologist at Rose Medical Center in Denver, an HCA-HealthOne facility. 'Other insurance carriers were having some success in getting business' from United, said Linkow" (*The Denver Post*, November 3, 2006).

into a region, insurers in turn pass these cost increases on to the local communities in the form of higher premiums—the cost of an insurance policy—for businesses and individuals. Indeed, as discussed further in the following section, we observe significant increases in insurance premiums in areas following private equity acquisitions. Local businesses can respond to these increases by absorbing the costs or by scaling back benefits, raising deductibles, raising mandatory contributions by employees, or lessening wage increases, among other responses (Rosen (1986)).[11] However, passing these costs fully to employees can be difficult, as both skilled and unskilled workers generally find benefits, along with wages, to be an important component of their compensation. Moreover, an effective cut in wages through higher employee contributions can over time lead to greater worker turnover (Dale-Olsen (2006)) or worker migration, especially of talented employees, to neighboring localities which did not experience a rise in premiums. Likewise, recent anecdotal evidence additionally documents that employers are reluctant to raise employee contributions due to concerns with both hiring and retention.[12] Furthermore, as noted by Baicker and Chandra (2005), we may not observe corresponding decreases in wages as premiums rise due to the presence of heterogeneous preferences for benefits among employees, as well as minimum wage laws that restrict the firm's ability to lower wages for lower-skilled workers. Hence, higher premiums can contribute to thinner profit margins to local businesses.

Nevertheless, if businesses are able to fully transfer the costs of higher premiums to employees through lower effective wages, then such responses are likewise detrimental to the local economy. Lower effective wages can depress spending within the community, leading to lower revenues and thus eventually lower profits for local businesses. These negative effects can further propagate and compound economic conditions; for example, local firms that are forced to close due to negative margins lead to lower overall employment and thus lower consumer spending (Bergman et al. (2020)).

[11] Businesses can also attempt to switch insurers. However, this can be costly as employers must hire lawyers and consultants when selecting a new plan, while also soliciting bids for insurance plans. Changing insurers can also dissatisfy employees who would prefer to continue with their current providers.

[12] For example, with regard to the recent increases in healthcare costs, it is reported that "many employers are expected to take on the lion's share of the increase, partly due to a labor market that remains tight in many sectors, benefits consultants said. Retail-display maker Bench Dogs was hit with a 24% health-coverage increase when its plan renewed on July 1, but didn't boost the share of the insurance cost paid by employees—currently set at 20% for a single worker, and half for one covering a family—or expand deductibles" (*The Wall Street Journal*, September 7, 2023).

3 Research design and data

3.1 Empirical methodology

Specification 1: PE acquisition of CHS hospital system

Our first identification strategy consists of the acquisition of the CHS hospital system by private equity. A key part of this strategy is the large-scale nature of the acquisition, which helps to mitigate selection concerns of private equity targeting specific localities. More specifically, we run difference-in-differences (DID) regressions that examine outcomes following the CHS acquisition on treated areas that contained a CHS hospital compared to control areas without a CHS hospital. We first establish that healthcare costs rise as a result of the PE acquisition by examining the effect on employer-sponsored health insurance premiums at the firm-year level via the following regression from 1993 to 1999:

$$\log(Premium_{j,i,t}) = \alpha + \beta\, CHS\ Hospital_{j,i} \times Post_t + FEs + \varepsilon_{i,t}. \tag{1}$$

In equation (1), $\log(Premium_{j,i,t})$ is the employer-sponsored health insurance plan premium for firm j which is located in county i; we consider both the average premium paid by the firm for a covered employee, as well as the sum total of premiums paid by each firm to show that the costs are not offset by changes in insurance plan participants.[13] $CHS\ Hospital_{j,i}$ is an indicator variable that takes a value of one if firm j is located in a county i that was served by a CHS hospital as of 1995, and zero otherwise. We define a county i as being served by a particular hospital if the county falls within the hospital referral region (HRR) of the hospital, a standard geographical unit in healthcare that tracks whether patients in an area can be referred by providers for emergencies or procedures to a particular hospital.[14] $Post_t$ is an indicator variable that takes a value of one if year t is 1996, the year that CHS was acquired by the PE firm, or later, and zero otherwise. The coefficient β thus tests whether health insurance premiums at the firm level increased following the CHS acquisition if the business was located in an area that contained a CHS hospital, relative to firms in unaffected areas. We include firm and industry-by-year fixed effects and cluster standard errors at the firm level. Our sample consists of 9,825 treated and 52,651 control firms.[15]

[13] For all of the outcome variables in which we take logarithms, we add one to the variable before taking logs in order to account for potential zeroes.

[14] There are 306 HRRs in the United States. HRRs typically span multiple counties; our results are robust to only considering a county as treated if the county contains a CHS hospital or is within close geographical proximity to a CHS hospital.

[15] Our results are also robust to forming our control group based on propensity score matching.

After investigating the effect of private equity ownership of CHS on healthcare insurance premiums, we proceed to explore county-level local economic outcomes using the following regression specification:

$$Y_{i,t} = \alpha + \beta CHS\ Hospital_i \times Post_t + FEs + \varepsilon_{i,t}. \tag{2}$$

Equation (2) examines outcomes Y for treated counties i (counties that were served by a CHS hospital as of 1995, measured by $CHS\ Hospital_i$) in time t compared to control counties before and after the PE acquisition of CHS. We include county and time fixed effects and cluster standard errors at the county level.

We run equations (1) and (2) from 1993 to 1999, a six-year window around the acquisition year of 1996 (we begin our window in 1993 as this is the earliest year for which we have consistent data for premiums and other outcomes). At the time of the PE acquisition, CHS owned 38 hospitals in 18 states (comprising 30 hospital referral regions), which provides a total of 608 treated counties for which $CHS\ Hospital_i = 1$. To ensure that the treatment and control groups are comparable, we choose control counties using propensity score matching, resulting in a total of 1,158 control counties and 579 treated counties. We provide more details on our matching procedure in the following section.

Specification 2: Full sample of hospital system acquisitions by PE

To provide additional evidence that the effects we document with our first specification hold more generally and are not specific to the CHS acquisition, we also run specifications examining the effect of *all* PE buyouts of hospital systems from 1993 to 2023:

$$Y_{i,t} = \alpha + \beta PE\ Buyout_{c,i,t} + FEs + \varepsilon_{i,t}, \tag{3}$$

where $PE\ Buyout$ is an indicator variable that takes a value of one if county i is served by a PE-acquired hospital system as of year t, and zero otherwise. As before, we first run equation (3) at the firm-year level (examining $\log(Premium_{j,i,t})$ as the dependent variable and $PE\ Buyout_{c,j,i,t}$ as the independent variable), and then examine outcomes at the county-year level. Equation (3) is estimated using a "stacked" DID design (e.g., Cengiz et al. (2019), Deshpande and Li (2019)) with treatment-control cohorts formed at the county level, indexed by c, formed for each event over a window from $t-4$ to $t+4$. We include firm and year fixed effects by cohort. To ensure that the treatment and control groups are comparable and to be consistent with the approach in our first specification, we construct each cohort using

propensity score matching.[16]

In our sample, we include only those hospital system acquisitions by PE companies which did not have any concurrent hospital ownership, thereby excluding local hospital mergers and acquisitions by PE-owned hospital systems. Furthermore, we consider acquisitions of Medicare-certified short-term acute care hospitals, whose reimbursement rates can have the largest impact on healthcare insurance premiums and are the types of hospitals most affected by the negotiation process previously described. As such, we exclude government-owned hospitals and long-term care and other specialty facilities (such as rehabilitation centers). We further only consider acquisitions of hospitals that previously had no private equity ownership. Our sample thus consists of 36 deals of hospital system acquisitions by private equity companies, comprising a total of 304 short-term acute care hospitals. This provides us with a total of 35,881 treated and 87,253 unique control firms for our firm-level regressions and 1,506 treated and 1,818 unique control counties for our county-level regressions.

3.2 Data description and summary statistics

Our overall dataset is from 1993 to 2023 and consists of data from a variety of different sources. For our firm-level regressions examining health insurance premiums, we obtain insurance information from Form 5500 reports filed with the U.S. Department of Labor.[17] For every insurance contract with employer-sponsored plans, firms file individual Schedule A reports (as defined in the Department of Labor's Group Health Plan Research Files), which has information on the insurance carrier, premiums, and welfare benefit type. We only include insurance contracts that indicate the presence of health coverage, and exclude standalone dental, vision, life, and other ancillary insurance contracts. With this data on individual insurance plans offered by each firm, we then aggregate to the firm level. Specifically, in each year, we calculate $Avg\,Premium$ as the sum of the individual health insurance plan

[16] Our results are also consistent if we do not construct cohorts using propensity score matching, thus using all counties in the sample in the estimation. Furthermore, while we utilize a DID specification, an alternative approach would be to use a two-stage least squares (2SLS) specification, first instrumenting for average health insurance premiums at the county level using the acquisition of CHS (in the case of the main specification) or any hospital system (in the case of the full sample specification) by private equity, and then examining the relationship between instrumented insurance premiums and the various outcomes we consider. In robustness tests, we show that we obtain very similar results using this specification (see Section 5). Our preferred specification is a DID because, as we describe below, the data for insurance premiums does not include firms with fewer than 100 employees. This has the potential to introduce noise when calculating instrumented premiums and examining the effects on outcomes in the second stage, as the average premiums at the county level will not reflect very small firms.

[17] These reports are filed annually by employers maintaining welfare benefit plans covered by the Employee Retirement Income Security Act (ERISA). Firms with less than 100 plan participants are not required to file Form 5500.

premiums for the firm divided by the total number of insured, defined as the total number of persons that were covered by the health insurance contracts at the end of the policy or contract year.[18] Our overall sample includes information on 142,155 businesses from 1993 to 2023.

We use the PitchBook database to identify acquisitions of hospitals by private equity firms. We manually identify all buyouts of hospitals or hospital system chains where the purchaser is a PE firm and also obtain the locations of each affected hospital. In total, we consider 36 deals of private equity buyouts of hospital systems over our sample period that comprise 304 individual hospitals across 104 hospital referral regions (HRRs). Figure 2 provides maps showing the HRRs affected by PE acquisitions of hospitals over our sample period. As the maps indicate, the affected regions are dispersed across the U.S. and are not confined to a particular geographical area.

To construct county-level economic outcome variables, we use data from Robert Dinterman's Historical Bankruptcy Repository, the Community Reinvestment Act (CRA) Data Files, and various U.S. government sources. We construct measures of the number of business bankruptcies in a given county and year for our CHS specification from Robert Dinterman's Historical Bankruptcy Repository, which is sourced from data hosted by the Administrative Office of the U.S. Courts. Our data include the number of Chapter 7 business bankruptcies, Chapter 11 business bankruptcies, and total business bankruptcies (which include any type of business bankruptcy filing).

We obtain the number of small business loans originated in each county, segmented by the size of the loan, from the Community Reinvestment Act (CRA) data files. The CRA data files begin in 1996 and are available until 2022; this precludes us from exploring loan outcomes for our CHS specification (equation (2)), but we are able to examine these outcomes for our full sample (equation (3)). We calculate establishment growth and employment growth as the yearly growth in total establishments and employment, respectively, in a county as of a given year using data from the U.S. Bureau of Labor Statistics. To explore additional economic outcomes, we examine firm innovation activity in a local area from the U.S. Patents and Trademark Office (USPTO). Specifically, we construct data on patents filed by businesses in a given county from the USPTO's PatentsView database, and data on trademarks registered to businesses in a given county as another measure of innovation (e.g., Mendonça et al. (2004)). Finally, for supporting analyses, we supplement our county-level data with establishment-level data on firm entry, exit, and employment using the National

[18]This includes employees who had coverage through the firm and is aggregated across different health insurance contracts engaged by the firm.

Establishment Time-Series (NETS) database.[19]

Table 1 provides summary statistics for the various outcome variables that we study for the CHS sample from 1993 to 1999 (Panel A) and for the full sample from 1993 to 2023 (Panel B). As previously noted, for both of our specifications, we construct our sample using propensity score matching. More specifically, for the CHS specification, we do two-to-one matching based on the county unemployment rate, establishment growth, percentage of small firms, and an indicator variable for whether the county is service-industry-dependent[20] in the pre-period from 1993 to 1995, resulting in 579 treated and 1,158 control counties. For the full sample, we perform the matching procedure based on the same variables for each cohort in the period prior to the hospital PE acquisition in that cohort. Table 2 provides a balance test for our treatment and control groups for the CHS sample in the 1993–1995 pre-period based on this matching procedure, while Table 3 provides a balance test for the full sample. In particular, we provide the means for our various outcome variables for the treatment and control groups, a t-test of the difference in means, and the normalized difference following Imbens and Rubin (2015).[21] As the tables indicate, our matching procedure results in no significant differences between treated and control counties across almost all of our outcome variables. The exception is establishment growth; however, the absolute value of the normalized differences is less than the threshold of 0.20 suggested by Imbens and Rubin (2015), indicating a reasonable balance between the treatment and control groups in both samples. Furthermore, as we subsequently show, our outcome variables exhibit parallel trends prior to the PE hospital acquisitions.

4 Results

4.1 Insurance Premiums

We begin by establishing our first-stage results, whereby private equity acquisitions of hospitals lead to an increase in healthcare costs. Table 4 provides the firm-level results for average (i.e., per participant within a firm) and aggregate (i.e., across all participants within

[19] We use the D&B Private Listing Data available through the Mergent Data Explr platform. It provides data on a subset of NETS variables, namely, sales figures, employee counts, SIC Codes, addresses, and family tree.

[20] We use USDA typology codes to identify service-industry-dependent counties. A county is classified as service-industry-dependent if the service activities contributed a three-year weighted annual average of 50% or more in labor and proprietor income.

[21] The normalized difference provides the difference in means between the treatment and control groups, divided by the square root of the average variance of the treatment and control groups.

a firm) employer-sponsored health insurance premiums following PE acquisitions of hospital systems. Panel A provides the estimation results for the CHS setting in specification (1). The results show that, relative to firms in unaffected control areas, firms in areas affected by the PE acquisition of the CHS hospital system experienced a significant increase in premiums for employer-sponsored health insurance plans. These results are very similar when including firm and year fixed effects, as well as firm and industry-by-year fixed effects. In particular, average and total premiums increased by 6.8 and 8.2%, respectively, for treated firms after the PE buyout of CHS hospitals relative to control firms. Panel B provides corresponding results for the long-run sample, indicating a respective increase of 3.9% and 4.0% in average and total premiums among firms in affected regions following PE entry. These results indicate that the increase in premiums corresponds to a total cost increase for a given firm.

To provide texture to these coefficient estimates, we gather summary data from the U.S. Census on business payroll expenses and income.[22] The 8.2% increase in premiums in the CHS specification amounts to 14.2% of net income, indicating the economically sizable magnitude of the rise in healthcare costs.[23] The portion of profit is similar for the full sample, with the increase in premiums comprising 11.7% of net income.[24] Likewise, as a percentage of total payroll expenses for a given business (excluding fringe), the premium is equivalent to a 5.5% (4.8% for the full sample) increase in payroll expenses.[25] For firms with less than 1,000 employees, we find more pronounced effects, with the increase in premiums amounting to 13.3% of payroll expenses and 38.6% of net income (12.2% and 36.4%, respectively, for the full sample).[26]

A key assumption of the DID framework is that the treatment and control groups exhibit parallel trends prior to the shock. Figure 3 provides the parallel trend graphs for these specifications, with Panel A corresponding to the CHS buyout and Panel B providing

[22] As most businesses in the U.S., and thus in our firm-level analysis, are private, we cannot directly observe financial statement information for these firms.

[23] To calculate average profit or net income, we multiply total revenue by net profit margin and divide by the number of firms. This gives us a value of $213,964 average profit. The median total premium payment by firms to insurers in the CHS sample is $370,922; an increase of 8.2% is therefore $30,416, which is 14.2% of average profit. Revenue and the number of firms are for 1997 (as they are released every five years) and taken from the Census Statistics of U.S. Businesses (SUSB) dataset.

[24] Average firm profit in the full sample is $335,800 (and average revenue of $4.8 million) with a median total premium of $984,592. A 4.0% increase in premiums amounts to $39,383, or 11.7% of average profit.

[25] Average payroll expense is calculated by dividing total payroll expenses by the number of firms, resulting in a value of $549,973. Payroll expense is taken from the Census SUSB data and is for 1997 (this data is released every five years).

[26] The coefficient estimate for the increase in premiums for this subsample in the CHS specification is 11.6% (5.1% in the full sample specification).

parallel trends for the full sample. For the full sample, we follow the method of Callaway and Sant'Anna (2021) for examining parallel trends. As noted by Callaway and Sant'Anna (2021), this methodology circumvents issues raised in the literature regarding interpreting dynamic treatment effects in staggered DID specifications. For both specifications, Figure 3 shows that there are no significant differences between treated and control firms and no discernible pre-trends; however, premiums for both specifications significantly jump for treated firms compared to control firms immediately after exposure to PE hospital acquisition. Overall, the results provide validation for our use of PE buyouts of hospitals in a given local economic area as a positive shock to healthcare costs.

4.2 Business Bankruptcies and Loan Volumes

To explore the direct consequences of this increase in healthcare costs and whether they lead to depressed economic outcomes in an area, we begin by examining business bankruptcies. Table 5 examines the number of Chapter 7 (liquidation), Chapter 11 (reorganization), and total business bankruptcy filings in a given county and year. Panel A provides the results for the CHS buyout employed in specification (2). The results indicate an important negative spillover effect of heightened healthcare costs—communities which experienced a rise in healthcare costs through PE entry saw a significant rise in business bankruptcies following the acquisitions. In other words, the increase in healthcare costs for local firms within an area led to higher bankruptcies within that area. In particular, treated counties affected by the CHS buyout experienced 4.1% greater Chapter 7 and 6.7% greater Chapter 11 business bankruptcies relative to control counties. When examining combined business bankruptcies (which also includes other kinds of bankruptcies), treated counties experienced 6.9% greater bankruptcies relative to control counties. This equates to an additional 688 business bankruptcies per year across affected counties due to rising healthcare costs.[27] These results are also consistent with recent survey evidence where nearly 50% of small businesses reported that they experienced a profit decrease or a negative profit due to having to pay for increases in health insurance premiums (Wade and Oldstone (2023)). Premium increases are particularly salient for companies with very tight profit margins, whereby a 4–8% increase in health insurance costs can cripple the firm's profits, eventually driving it to bankruptcy.

Panel B examines effects for the full sample of PE buyouts via estimating specification (3). We see that the results are consistent with those in Panel A—treated counties experienced

[27] As noted in Table 1, the mean number of business bankruptcies per year in CHS counties is 17.23. In the CHS sample, we have 579 treated counties. The total number of additional business bankruptcies due to PE entry across affected counties in a given year is therefore given as $6.9\% \times 17.23 \times 579 = 688$.

significantly higher business bankruptcies than control counties. Moreover, due to the longer sample period and thus greater data availability, our full sample specification also allows us to dive deeper and explore what may be leading to this increase in bankruptcies. In order to do so, we examine business loan volumes as outcome variables.[28] Column (4)–(6) of Panel B examines the number of new business loans originated within a given county for various loan amounts ranging from under $100K to over $250K.

We find that, across all loan sizes, the volume of business loans originated in treated areas *increases* relative to untreated areas. Moreover, the effect is strongest, with an increase of 5.3%, for loans of relatively smaller amounts—between $100K and $250K—which are likely for small- to medium-sized businesses that are more cash constrained. This implies an additional 484 loans of size $100–250K taken out per year across counties affected by rising healthcare costs due to PE entry in a given year, amounting to at least $48.4 million in additional lending to businesses in a given year.[29] Furthermore, this increase in loans is consistent with firms in a local area requiring additional external financing following the rise in healthcare costs.[30] The combination of higher costs and the resulting increase in leverage leaves businesses more susceptible to negative economic shocks, thus leading to an increase in bankruptcies.[31]

4.3 Effect on Economic Growth

We now proceed to examine whether rising healthcare costs, and their subsequent effect on business bankruptcies and leverage, lead to real effects in terms of economic growth in local economies. Specifically, in Table 6 we examine employment and business establishment growth at the county-level. Focusing first on the CHS specification in Panel A, both employment and establishment growth significantly decline in treated areas following the PE acquisition of CHS hospitals. The coefficients imply 2,858 *fewer* establishments launched

[28] As previously noted, our data on business loans from the CRA data files starts in 1996, and thus we cannot examine this as an outcome for our CHS specification.

[29] The average number of loans between $100K and $250K in our full sample is 72.49. The average number of affected counties in our full sample is 126 counties per year. The average increase in loans across counties in a given year is therefore $72.49 \times 5.3\% \times 126 = 484$.

[30] For example, an affected firm that must pay higher premiums can have a higher cost of labor and lower net income. As such, this firm must rely more on external funds, such as debt (rather than retained earnings), to finance its operations.

[31] This is in line with the effect documented by Bergman et al. (2020), where positive cash inflows in a strained economic environment lead to a decrease in loan delinquencies. More specifically, a negative macroeconomic shock that reduces revenues and net income can lead to covenant violations (which increase the cost of credit) or missed payments to creditors, pushing the business into financial distress. As a result, the presence of heightened healthcare costs through insurance premiums can accelerate and amplify poor outcomes for firms following negative economic shocks. (see, e.g., Bernanke et al. (1999)).

per year aggregated across affected counties, relative to unaffected counties which did not experience PE entry into their healthcare systems.[32] Likewise, the rising healthcare costs result in 104,992 fewer jobs created per year across affected counties.[33] We see a similar pattern with the full sample in Panel B.[34]

Figure 4 provides the parallel trend graphs for these outcomes. In Panel A, treated and control counties are insignificantly different from one another prior to the PE buyout of CHS and exhibit no pre-trends, while employment and establishment growth for treated counties significantly drop relative to control counties following the CHS buyout. Similarly, in Panel B for the full sample, the treated and control counties do not exhibit any apparent trend prior to PE buyouts of hospitals; however, following the buyouts, there is a clear and significant drop for treated counties relative to control counties.

As additional evidence of the impact of the rise in premiums on economic outcomes, we explore innovation activity, as this outcome is also closely linked to economic growth (e.g., Grossman and Helpman (1993)). We examine the number of patents filed by businesses (column (3) in Panels A and B), and find a significant reduction in patents for treated compared to control counties after PE entry in both specifications. Another measure of innovation that has been posited in the literature is trademarks registered to firms (Mendonça et al. (2004)). Using this measure (column (4)), we observe a significant reduction in trademarks for treated counties under both specifications. In the CHS sample, these estimates amount to 759 fewer patents and 868 fewer trademarks filed per year across affected counties relative to unaffected counties.[35] Overall, these effects provide further evidence of a depression in economic activity due to rising healthcare costs induced by PE buyouts of hospitals.

[32] As noted in Panel A of Table 1, we have an average of 2,224 establishments per county in the CHS sample, with a decline in the growth rate of -0.222 as noted in column (2), and 579 treated counties. We therefore calculate $2{,}224 \times -0.222 \times 579$ and then divide this number by 100 to scale for the percentage embedded in the variable construction, giving us $-2{,}858$ across treated counties.

[33] Average employment in each county per year in our CHS sample is 31,925. Our calculation is therefore $31{,}925 \times -0.568 \times 579$ and dividing by 100, giving us $-104{,}992$ across treated counties.

[34] In Appendix Table A.1, we additionally examine the number of business establishments following PE hospital buyouts. We find a decrease in the number of firms with more than 100 employees and a slight increase in the number of firms with less than 100 employees. This is consistent with a composition change, whereby firms in affected areas are not expanding and may be downsizing.

[35] Average patents per county in the CHS sample is 21.85. We therefore calculate $21.85 \times -6.0\% \times 579 = -759$ across treated counties. Similarly, average trademark filings per county is 23.05; this gives us $23.05 \times -6.5\% \times 579 = -868$.

4.4 Firm-level Evidence

As additional supporting evidence for our main effects, we leverage firm-level data from the National Establishment Time-series (NETS) database, which tracks individual business establishments (including private firms) across the U.S.[36] We utilize this data to examine three additional outcomes directly related to our main results.

First, we examine our main specification at the county level examining entry of new businesses, i.e., the logarithm of the number of new establishments that appear in counties affected by PE acquisitions of hospitals compared to other counties. Second, we run our main specification but at the *establishment* level, examining outcomes for firms that are located in areas affected by PE buyouts of hospitals compared to other firms.[37] We examine firm exit as an outcome using a binary variable (i.e., equal to zero or one) that tracks if an establishment is no longer operating, and we also examine employment growth from year $t-1$ to year t for a given establishment.

The results are provided in Table 7. Panel A provides the results for the CHS buyout, while Panel B shows results for the full sample of all PE hospital buyouts. Column (1) in Panel A shows that treated counties gained a significantly lower (4.4%) number of new establishments following the CHS buyout compared to control counties. The sign is also negative for the full sample, albeit insignificant. Column (2) in both panels considers the propensity of a given establishment to exit, and both sets of results show that firms are significantly more likely to exit when located in treated counties compared to control counties. Finally, column (3) in both panels shows that establishments in treated counties experience significantly lower employment growth versus establishments in control counties. These findings at the firm-level reinforce our main findings above and are also consistent with anecdotal evidence of business owners struggling to stay afloat following increases in healthcare costs.

5 Heterogeneity and Robustness

In this section, we explore heterogeneity in responses to PE entry and provide a number of robustness and additional tests.

[36] The advantage of this granularity is that it allows us to observe individual establishment closures within a larger franchise. Specifically, each branch of a firm—e.g., each individual location of Domino's Pizza—is considered a separate establishment in the database. Barnatchez et al. (2017) document that the NETS database covers roughly 75% of U.S. private sector employment.

[37] In these specifications, we include establishment and industry-by-year fixed effects.

5.1 Heterogeneity

We consider a number of heterogeneity tests to further explore the underlying economic forces that drive our baseline effects. First, as noted previously, the rise in healthcare premiums stems from bargaining between the PE-acquired hospital and insurers, resulting in the hospital negotiating higher reimbursement rates and insurers passing along higher premiums to employers. As such, we expect that acquired hospitals with greater bargaining power can command larger increases in negotiated prices following the acquisition. To explore this possibility, we exploit variation in hospital bargaining power based on the level of hospital competition within a given hospital referral region. With a greater number of hospitals providing services within an area, a given hospital will have a weaker bargaining posture, as losing a hospital from the insurer's network is less damaging for the insurer if there are other hospitals that can be substituted into the insurer's network.

We examine this bargaining channel by partitioning the sample based on whether a given referral region has an above- or below-median Herfindahl–Hirschman index (HHI) based on total hospital beds, with a higher HHI indicating a more concentrated, and thus less competitive, hospital market.[38] We then run our main specification (3). The results are presented in Panel A of Table 8 (for parsimony, we present only our main economic variables). We find more pronounced negative economic effects—greater total bankruptcies, lower employment growth, and lower establishment growth—in regions that experienced PE hospital buyouts and had above-median HHI. These findings indicate more severe price increases, and thus more damaging economic effects, in regions where hospitals had greater leverage in negotiating prices. Moreover, the findings are consistent with the notion that hospital bargaining posture was an important aspect of the price negotiations between insurers and hospitals following PE buyouts.

We next consider heterogeneity in the pass-through of increased hospital reimbursement rates to local businesses. As noted in Section 2, following a rise in negotiated hospital prices, insurers can pass these cost increase to employers in the form of higher insurance premiums, which then negatively impacts local economic outcomes. While our analysis at the firm level regarding premium increases in Table 4 provides evidence for this mechanism, we examine whether greater insurer presence within a region helps to mitigate the economic consequences. For example, a region where a greater number of insurers provide coverage

[38] In our heterogeneity analyses, for each cohort in the full sample, we take an average of the variable of interest in the pre-period and partition the counties based on the pre-period average. We investigate the tests presented in Table 8 only for our long-run sample because of incomplete coverage of data in the early part of the sample.

allows employers more options to switch insurance providers following premium increases. Insurers in these areas may therefore be less inclined to fully pass on their increased costs to businesses following PE acquisitions.[39]

To test this channel, we partition the sample based on whether a given referral region has an above- or below-median number of insurers providing coverage in that area (e.g., by having at least one in-network hospital). We then investigate specification (3) on the resulting subsamples.[40] In Panel B of Table 8, we see that the effects are concentrated in regions where fewer insurers provide coverage, consistent with the notion that greater coverage in an area limits the pass-through effects of hospital price increases.

Next, the increase in healthcare insurance premiums is more costly for businesses or industries which rely more on labor. As such, we expect counties composed of industries which are more labor-intensive to exhibit more pronounced reactions to the rise in insurance premiums following a PE hospital acquisition. To explore this further, we partition our sample based on labor intensity in a given county. In particular, for each county, we calculate labor intensity as the weighted average of the labor shares of all industries present in that county, weighted by the proportion of establishments in the county comprised of that industry.[41] We then run our main specification on subsamples for counties that are above- and below-median in terms of labor intensity. The results are provided in Table 9, which shows that our results are stronger for counties with higher labor intensity.

Finally, we further examine the channel of rising health insurance premiums driving the decline in business performance within communities. In particular, we expect that areas where businesses have tighter profit margins will be more impacted, as rising insurance premiums more heavily strain finances for businesses with thinner profit margins. We test this channel using the share of firms that operate in the service industry, which typically have very tight margins, within a county. We define a business that operates in the service industry based on the NAICS "service-providing industries" supersector classification. We

[39] While businesses are not typically inclined to switch insurers due to the costs associated with finding new plans and since employees have a preference for keeping their current health provides, a more competitive market for insurance plans can limit the increases that insurers can make on premiums.

[40] We use the Form 5500 data to collect insurance company IDs and use the S&P CapitalIQ Insurance Database to match insurers to their parent companies starting from 1999, which is when the data are available from. We then calculate the unique number of insurers in a particular HRR for each year.

[41] More formally, define the weight of industry k in county c as $weight_{k,c}$, equaling the number of establishments in industry k in county c divided by the total number of establishments in county c. Labor intensity in county c is therefore $\sum_k LaborShare_k \times weight_{k,c}$, where $LaborShare_k$ is the proportion of current-dollar output in an industry that is attributed to the use of labor. Our measure therefore captures a weighted sum of these industry-level labor intensities, which is essentially an approximation of the proportion of a county's total current-dollar output attributed to labor use. Labor shares are sourced from the Bureau of Labor Statistics, Office of Productivity and Technology.

then partition the sample based on whether a given county has an above- or below-median share of firms that operate in the service industry. Table 10 presents the results of this analysis, which indicates that counties with a greater share of firms in the service sector exhibit more pronounced declines in growth and a greater increase in business bankruptices.

5.2 Patient outcomes

We additionally consider whether the entrance of private equity and the increase in health premiums is met with a change in hospital performance following the buyouts. For example, the increase in hospital prices could be accompanied by an improvement in patient health outcomes, thus perhaps justifying the price increases. In Panel A of Appendix Table A.2, we examine specification (3) at the hospital-year level comparing quality of care outcomes for hospitals acquired through PE buyouts compared to other hospitals. We utilize data from the Healthcare Provider Cost Reporting Information System (HCRIS) from the Centers for Medicare and Medicaid Services (CMS) on mortality rates for various conditions (a common measure used by researchers and government agencies for quality of care). The sample begins in 2004 as it is from this year that the data is available. We find that quality of care is largely unchanged in hospitals acquired by private equity, indicating that these hospitals are not improving measurable patient treatment following the acquisition.[42]

We relatedly investigate broader changes in health of the population at the county-level. Specifically, we examine whether counties with PE hospital buyouts experienced any changes in mortality rates following PE entry. This can be the case, for example, if fewer patients utilize hospital services following PE entry. The results of this analysis, presented in Panel B of Table A.2, show no significant changes in county-level mortality rates following PE entry along several measures.

5.3 Alternative specifications

First, in our specifications, we do not include county-level control variables, as many such variables may themselves be affected by the shock. Furthermore, we use propensity-score matching to closely align our treated and control counties along with county fixed effects, which control for time-invariant differences between counties. Nonetheless, we verify that our results hold when including county-level controls for population and income per capita. Appendix Table A.3 provides the results for the CHS specifications (equations (1) and (2)),

[42]These results are consistent with the prior literature that examines the effects of PE ownership on healthcare quality (e.g., Offodile et al. (2021), Gupta et al. (2024)).

while Appendix Table A.4 provides results with controls for the full sample (equation (3)). The results are very similar to those of our main specifications.

Second, along similar lines, our results also hold when controlling for time-varying geographic trends; Appendix Tables A.5 and A.6 provide these results for the different specifications.[43] Finally, an alternative to our DID specifications is to run a two-stage least squares (2SLS) specification, in which we explicitly instrument average county-level insurance premiums in the first stage using the acquisition of either CHS or any hospital system by private equity, and then use the instrumented insurance premiums in the second stage to explore the effects on economic outcomes. Table A.7 provides the estimation results for CHS (Panel A) and the full sample (Panel B). The results line up closely with our DID specifications.

5.4 Sample selection

To show that our results are not driven by potential sample selection concerns, we examine two additional robustness tests. First, we consider a placebo test in which we randomly assign counties as "treated" counties, and the control counties are then selected among the remaining counties using the matching procedure described earlier. Appendix Tables A.8 and A.9 provide this placebo test for the CHS specification and the full sample specification, respectively. Across all of the specifications and outcomes, we find insignificant results, providing evidence that our results are specific to our treatment effects and not due to spurious correlations in our sample.

Second, we show that our results continue to hold when we restrict our sample to counties with at least one for-profit hospital. While non-profit and for-profit hospitals generally have similar financial motivations and behavior (Duggan (2000)), non-profit hospitals may be less aggressive in reimbursement rate negotiations following PE acquisitions of rival hospitals. Appendix Tables A.10 and A.11 provide these results, which are in line with our main specifications.

6 Concluding remarks

This paper explores the economic consequences of increases in healthcare costs. We provide two related specifications to investigate this important question. In the first, we exploit the

[43] We note that since our treatment is at the HRR level—and HRRs may extend across state lines with some states having only have a small number of HRRs—we do not have enough variation to be able to include state-by-year fixed effects. As a result, in these tables we instead include Census-region-by-year fixed effects.

private equity acquisition of a large hospital system, Community Health Systems, as a quasi-natural experiment that increased premiums for employer-sponsored healthcare insurance plans in the areas affected hospitals operated in. We additionally examine a long-run sample with all private equity deals of hospital systems from 1993 to 2023. This empirical approach is advantageous in the sense that it allows us to capture increases in healthcare costs at the local level that is specific to particular regions. As such, our strategy provides a tight link between rising healthcare costs and changes in local economic conditions.

Utilizing detailed firm-level data, we first establish that the acquisition of hospitals by PE investors leads to an increase in healthcare insurance premiums faced by firms operating in an area served by the affected hospital. We then provide evidence that, following these acquisitions and the resultant increase in premiums, affected areas experience increases in business bankruptcies and greater business loan volume. Exploring additional economic outcomes, we find lower employment and establishment growth in these areas, as well as lower average wages and depressed innovation output. The results broadly illustrate an overall depression of economic outcomes within a community following the rise in healthcare costs.

Our study sheds light on how healthcare costs, which have been rapidly rising over the past two decades, can impact local businesses and economic growth within communities. Overall, our results point to negative consequences to local areas following rises in healthcare premiums, as well as negative spillovers that are associated with the recent trend of hospital acquisitions by private equity firms. The study also helps us to understand the broader consequences of private equity entry into the healthcare system, which has been a recent and growing concern in public policy discussions. Previous studies have focused on hospital-specific effects of private equity entry. However, our analysis indicates that the effects of private equity entry in the healthcare sector are not limited to hospital-level outcomes but are instead more widely shared by community residents through changes in economic conditions.

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Figure 2: Map of PE Buyouts of Hospitals

This figure provides a map of hospital referral regions (HRRs) affected by PE buyouts of hospitals across the US over our sample. Each shape represents an HRR, and the different shadings indicate the year in which a hospital in the HRR was acquired by a PE firm. The top map shows CHS hospitals, and the bottom map shows hospital system buyouts over the full sample.

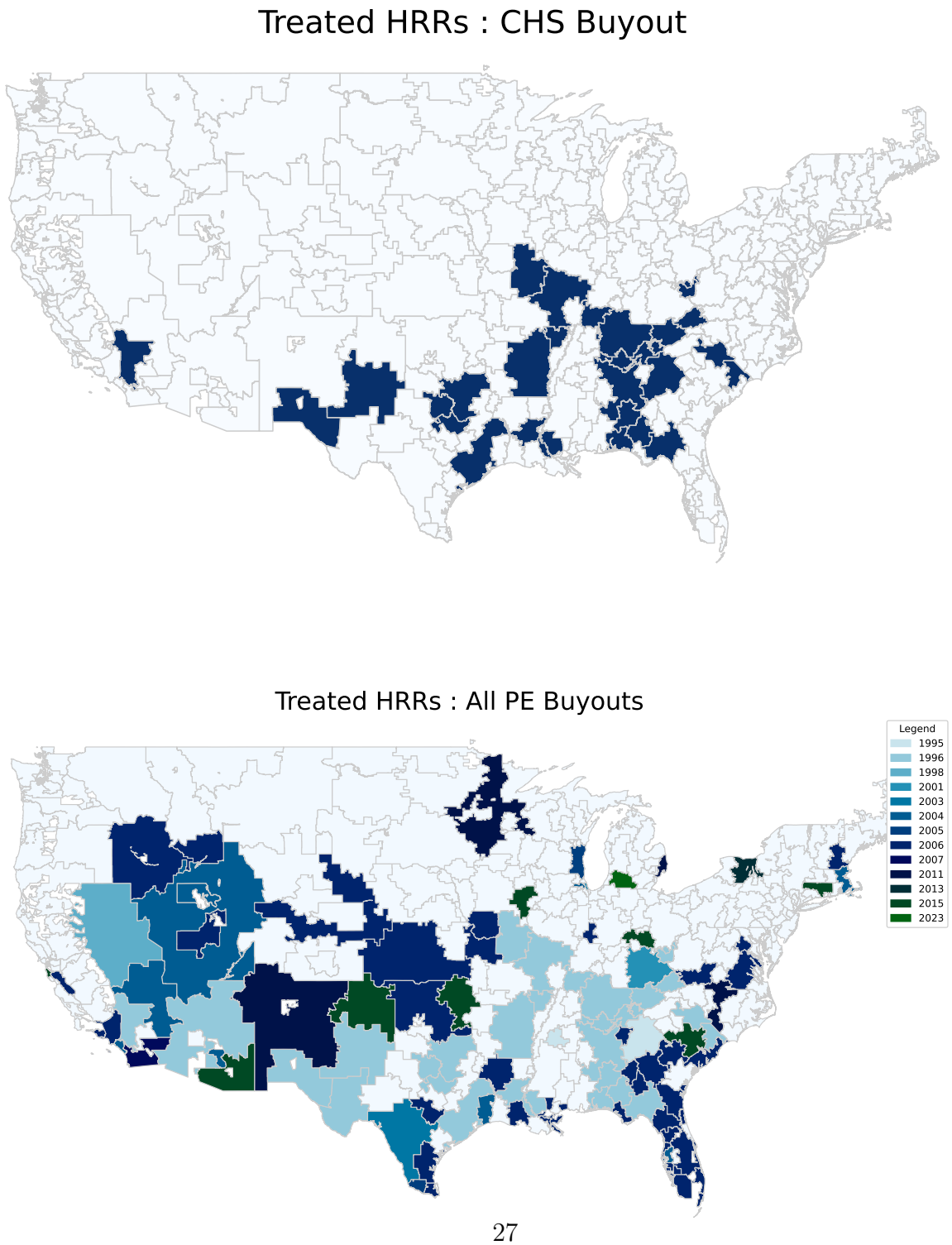
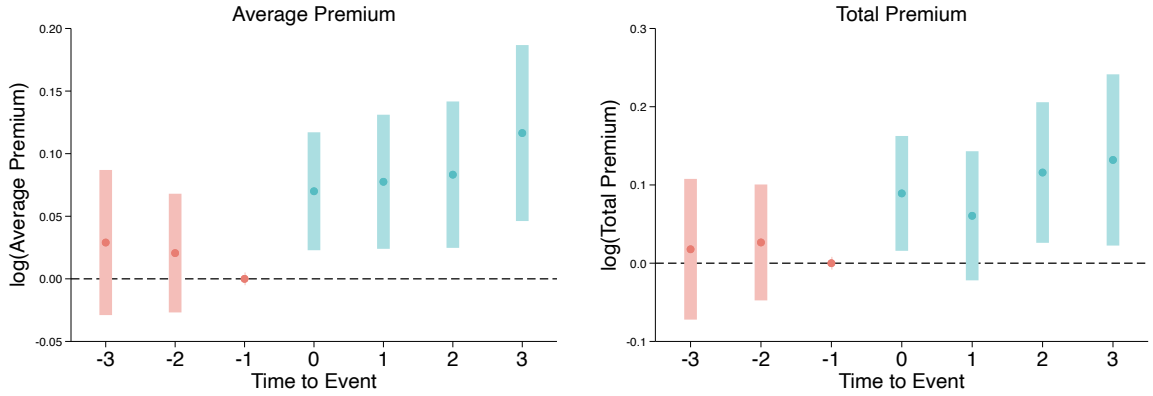


Figure 3: Parallel Trends: Premiums

This figure provides parallel trends for premiums at the firm-year level for firms in areas affected by private equity buyouts of hospital systems. Panel A provides results for the CHS specification. Panel B provides full sample results from 1993 to 2023. Dynamic treatment effects are estimated following Callaway and Sant'Anna (2021) in Panel B. *Avg Premium* is the average premium that a firm paid for employer-sponsored health insurance plans in a given year. *Total Premium* is the aggregate amount of premiums that a firm paid for its employer-sponsored health insurance plans in a given year.

Panel A: CHS Buyout



Panel B: Full Sample

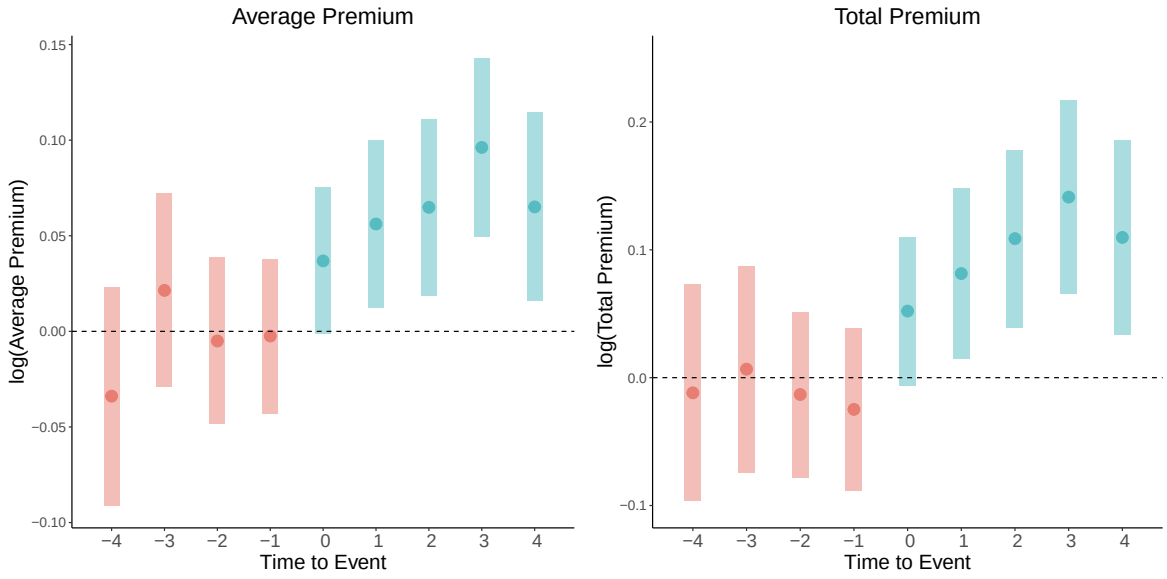
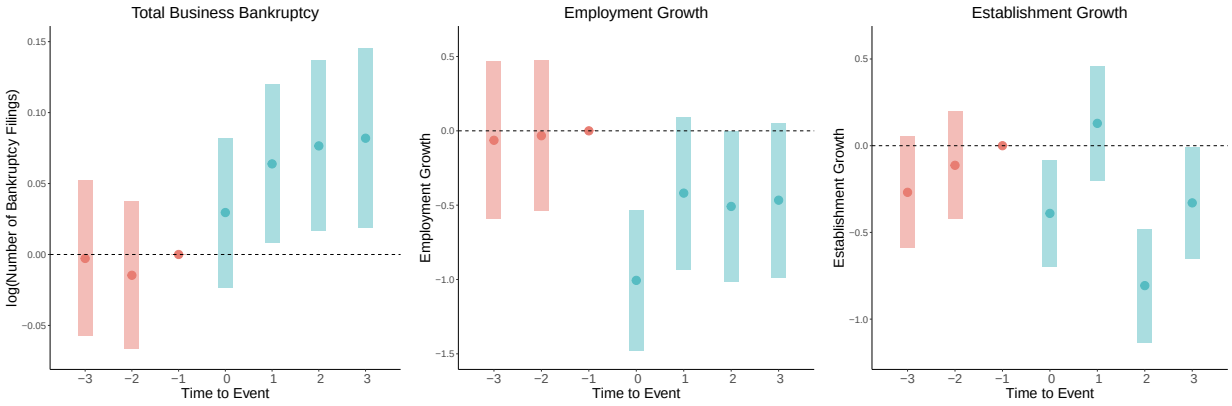


Figure 4: Parallel Trends: Economic Variables

This figure provides parallel trends for county-level business bankruptcies for counties in areas affected by private equity buyouts of hospital systems. Both panels provide results for total business bankruptcies, employment growth, and establishment growth. Panel provides results for the CHS specification. Panel B provides full sample results for from 1993 to 2023. Dynamic treatment effects are estimated in Panel B following Callaway and Sant'Anna (2021).

Panel A: CHS Buyout



Panel B: Full Sample

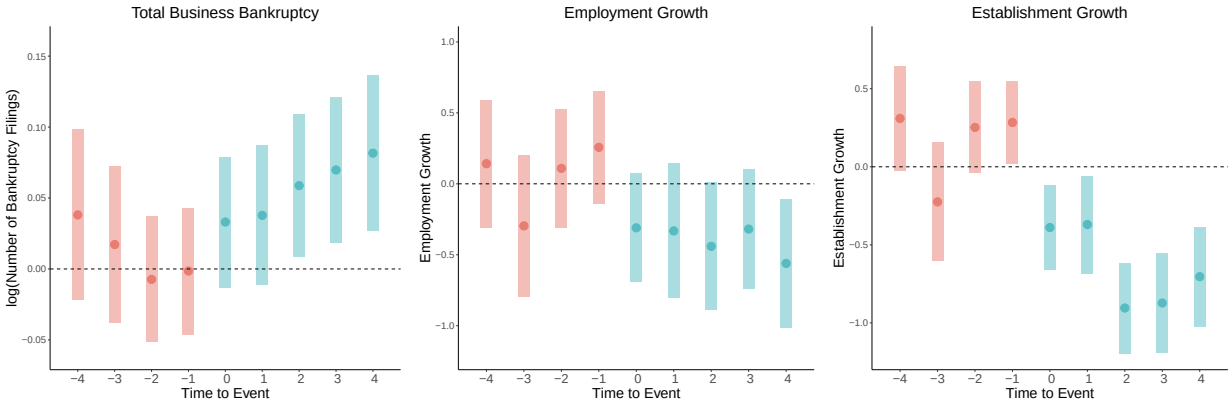


Table 1: Summary Statistics

This table provides summary statistics for the variables used in this study. Panel A provides summary statistics for the CHS sample from 1993–1999, and Panel B provides summary statistics for the full sample from 1993–2023. Average Premium is the total premiums for any health insurance contract at the firm-year level scaled by the number of insured, calculated using Schedule A of Form 5500 as defined in the Department of Labor's Group Health Plan Research Files. Total Insured is the total number of persons at the firm-year level that were covered by health insurance contracts at the end of the policy or contract year. Total Participants is the total number of employees at the firm-year level who are covered by a firm's welfare benefit plan. Business Ch7 Bankruptcy is the number of businesses filing for Chapter 7 bankruptcy, while Business Ch11 Bankruptcy is the number of businesses filing for Chapter 11 bankruptcy, both at the county-year level. Total Business Bankruptcy is the number of businesses filing for any type of bankruptcy, at the county-year level. Establishment Growth is the annual growth in total establishments in a county. Employment Growth is the annual growth in total employment in a county. Patents is the number of patents filed in the county by businesses, and Trademarks is the number of trademarks registered in the county. Population is the total population in the county. Employment Growth (NETS) is year-over-year growth in employment at the establishment level, and Exit (NETS) is a variable at the establishment level that takes a value of 1 if the establishment exited in a given year, and 0 otherwise. Entry (NETS) indicates the number of new establishments in a given year at the county level.

Panel A: CHS Sample

	N	Mean	SD	p10	p25	Median	p75	p90
Average Premium	176,935	2,623.36	2694.94	129.18	754.29	2222.794	3629.75	5160.91
Total Premium	177,144	1,121,708	2,912,246.12	16,667.00	103,636.50	370922	886,930.50	2,271,232.00
Total Insured	177,144	518.47	1091.50	39.00	104.00	189.00	423.00	1,091.00
Total Participants	177,144	925.21	2,444.952	59.00	128.00	237.00	587.00	1,801.00
Business Ch7 Bankruptcy	12,114	10.172	54.035	0.000	0.000	2.000	6.000	18.000
Business Ch11 Bankruptcy	12,114	3.404	21.605	0.000	0.000	0.000	1.000	5.000
Total Business Bankruptcy	12,114	17.228	84.620	0.000	1.000	4.000	10.000	30.000
Employment Growth	12,159	2.455	4.679	−2.800	0.100	2.400	4.800	7.700
Establishment Growth	12,159	1.977	3.204	−1.800	0.000	1.800	3.800	6.000
Patents	12,159	21.854	155.311	0.000	0.000	0.000	3.000	18.000
Trademarks	12,124	23.051	142.436	0.000	0.000	1.000	6.000	30.000
Population	12,012	91,152.885	32,4145.084	5,935.600	11,653.500	25,258.000	64,148.000	184,381.100
Establishment Count	12,159	2,224.074	8,851.203	124.000	237.000	538.000	1,401.500	4,307.800
Employment Growth (NETS)	35,598,218	1.532	24.663	0.000	0.000	0.000	0.000	0.000
Exit (NETS)	42,376,212	0.118	0.323	0.000	0.000	0.000	0.000	1.000
Entry (NETS)	12,092	505.649	1942.336	21.000	49.000	124.500	336.000	969.000

Panel B: Full Sample

	N	Mean	SD	p10	p25	Median	p75	p90
Average Premium	1,041,995	5,891.703	4,750.534	496.678	2,078.884	5,155.991	8,447.62	12,052.4
Total Premium	1,042,668	2,098,148.00	3,911,628.06	91,602.00	377,376.50	984,592.00	2,039,828.00	4,421,744.00
Total Insured	1,042,668	494.030	1,038.49	78.00	122.00	196.00	394.00	955.00
Total Participants	1,042,668	897.18	2,430.78	110.00	147.00	243.00	534.00	1,588.00
Business Ch7 Bankruptcy	95,299	7.266	34.463	0.000	0.000	1.000	4.000	14.000
Business Ch11 Bankruptcy	95,053	2.529	15.160	0.000	0.000	0.000	1.000	4.000
Total Business Bankruptcy	98,165	11.129	51.046	0.000	0.000	2.000	6.000	20.000
No. of Loans < $100K	87,112	1883.454	8699.647	46.000	113.000	314.000	964.000	3321.000
$100K < No. of Loans < $250K	87,112	72.492	259.177	1.000	3.000	12.000	47.000	163.000
No. of Loans > $250K	87,112	67.191	246.604	0.000	2.000	9.000	37.000	145.000
Employment Growth	93,146	0.930	4.674	−4.500	−1.300	0.900	3.300	6.000
Establishment Growth	93,146	1.115	3.361	−2.700	−0.800	0.800	2.900	5.300
Patents	105,037	30.557	314.710	0.000	0.000	0.000	2.000	16.000
Trademarks	99,968	40.180	259.375	0.000	0.000	2.000	9.000	47.000
Population	92,663	97,023.915	311,465.925	5,153.000	11,053.500	25,490.000	66,150.500	194,900.400
Establishment Count	93,146	2,606.756	10,585.006	118.000	237.000	559.000	1,482.000	4,767.000
Employment Growth (NETS)	478,790,811	1.14	19.03	0.00	0.00	0.00	0.00	0.00
Exit (NETS)	576,304,338	0.10	0.30	0.00	0.00	0.00	0.00	1.00
Entry (NETS)	87,384	363.86	2,438.49	3.00	8.00	31.00	125.00	506.00

Table 2: Balance Test, CHS Treatment

This table provides differences between the control group and treatment group for the CHS specification sample in the pre-period from 1993–1995. The treatment group consists of counties that contain a CHS hospital as of 1995, while the control group consists of propensity-score-matched counties that do not contain a CHS hospital as of 1995. Control counties are matched based on the county unemployment rate, establishment growth, percentage of small firms, and an indicator variable for whether the county is service-industry-dependent, yielding 579 treated and 1,158 control counties. Means of each variable for the treatment and control groups (columns (1) and (2)), a t-test of the differences (column (3)), and the normalized difference (column (4)) following Imbens and Rubin (2015) are provided.

	(1)	(2)	(3)	(4)
Variable	Control group	Treatment group	Difference	Normalized Diff.
Business Ch7 Bankruptcy	9.23	11.96	2.73	0.041
	(23.93)	(92.34)	(3.91)	
Business Ch11 Bankruptcy	3.34	3.99	0.65	0.024
	(12.45)	(36.07)	(1.55)	
Total Business Bankruptcy	16.00	21.32	5.31	0.048
	(42.39)	(150.31)	(6.39)	
Employment Growth	2.98	3.11	0.14	0.029
	(4.61)	(4.86)	(0.24)	
Establishment Growth	2.17	2.70	0.54***	0.168
	(3.36)	(2.99)	(0.16)	
Patents	25.54	15.56	−9.99	0.067
	(167.67)	(126.09)	(7.19)	
Trademarks	21.66	21.92	0.26	0.002
	(98.18)	(180.56)	(8.05)	

Table 3: Balance Test, Stacked Full Sample

This table provides differences between the control group and treatment group for the full sample from 1993 to 2023. The treatment and control groups are matched for each cohort based on county unemployment rate, establishment growth, percentage of small firms, and an indicator variable for whether the county is service-industry-dependent, yielding 1,506 treated and 1,818 unique control counties. Means of each variable for the treatment and control groups (columns (1) and (2)), a t-test of the differences (column (3)), and the normalized difference (column (4)) following Imbens and Rubin (2015) are provided.

Variable	(1) Control group	(2) Treatment group	(3) Difference	(4) Normalized Diff.
Business Ch7 Bankruptcy	8.47	9.94	1.48	0.032
	(23.21	(60.97)	(1.63)	
Business Ch11 Bankruptcy	2.73	3.05	0.32	0.016
	(12.44)	(24.88)	(0.68)	
Total Business Bankruptcy	13.61	15.98	2.37	0.031
	(39.42)	(98.98)	(2.66)	
No. of Loans < \$100K	1746.85	2254.33	507.48	0.083
	(4517.68)	(7353.03)	(268.43)	
\$100K < No. of Loans < \$250K	67.01	73.99	6.98	0.036
	(157.34)	(222.96)	(8.34)	
No. of Loans > \$250K	64.61	76.54	11.93	0.054
	(172.49)	(260.32)	(9.63)	
Employment Growth	1.92	2.11	0.19	0.040
	(4.54)	(5.06)	(0.15)	
Establishment Growth	1.37	2.04	0.68***	0.195
	(3.32)	(3.61)	(0.11)	
Patents	28.10	36.46	8.36	0.028
	(191.66)	(370.58)	(10.17)	
Trademarks	29.30	35.20	5.90	0.033
	(150.66)	(204.80)	(5.97)	

Table 4: PE Buyouts and Insurance Premiums

This table provides regression results examining premiums at the firm-year level for firms in areas affected by private equity (PE) buyouts of hospital systems. Panel A provides results for the CHS specification. Panel B provides full sample results from 1993 to 2023 for all hospital PE buyouts. $CHS\ Hospital_{j,i}$ is an indicator variable that takes a value of 1 if firm j is located in county i that contained a CHS system hospital as of 1995, and zero otherwise. $Post_t$ is an indicator variable that takes a value of 1 if t is year 1996 or later, and 0 otherwise. $PE\ Buyout_{c,j,i,t}$ is an indicator variable that takes a value of 1 if firm j in cohort c is located in county i that experienced a PE buyout of a hospital system as of year t, and zero otherwise. $Avg\ Premium_{j,t}$ is the average premium that firm j paid for employer-sponsored health insurance plans in year t. $Total\ Premiums_{j,t}$ is the total amount of premiums that firm j paid for employer-sponsored health insurance plans in year t. Standard errors are clustered at the firm level, and firm and industry-by-year fixed effects are included, as indicated. *** indicates significance at the 1% level, ** significance at the 5% level, and * significance at the 10% level.

Panel A: CHS Buyout

Dependent Variable:	$\log(Avg\ Premium)$		$\log(Total\ Premiums)$	
	(1)	(2)	(3)	(4)
$CHS\ Hospital_{j,i} \times Post_t$	0.066***	0.068***	0.074**	0.082**
	(0.025)	(0.025)	(0.037)	(0.038)
Firm FEs	Y	Y	Y	Y
Year FEs	Y	N	Y	N
Industry × Year FEs	N	Y	N	Y
Y Mean	2,658	2,658	1,166,940	1,166,736
N	163,410	163,381	163,455	163,426
Adj. R^2	0.544	0.544	0.576	0.577

Panel B: Full Sample

Dependent Variable:	$\log(Avg\ Premium)$		$\log(Total\ Premiums)$	
	(1)	(2)	(3)	(4)
$PE\ Buyout_{c,j,i,t}$	0.033**	0.039**	0.039**	0.040**
	(0.013)	(0.013)	(0.019)	(0.019)
Firm-cohort FEs	Y	Y	Y	Y
Year-cohort FEs	Y	N	Y	N
Industry × Year-cohort FEs	N	Y	N	Y
Y Mean	4,844	4,844	1,834,222	1,834,222
N	1,931,756	1,931,756	1,933,906	1,933,906
Adj. R^2	0.546	0.546	0.553	0.554

Table 5: Business Bankruptcies and Loans

This table provides regression results examining county-level business bankruptcies and loan originations for counties in areas affected by private equity (PE) buyouts of hospital systems. Panel A provides results for the CHS specification from 1993 to 1999. Panel B provides full sample results from 1993 to 2023 for all hospital PE buyouts. $CHS\,Hospital_i$ is an indicator variable that takes a value of 1 if county i served by a CHS system hospital as of 1995, and zero otherwise. $Post_t$ is an indicator variable that takes a value of 1 if t is year 1996 or later, and 0 otherwise. $PE\,Buyout_{c,i,t}$ is an indicator variable that takes a value of 1 if county i in cohort c experienced a PE buyout of a hospital system as of year t, and zero otherwise. $Ch\,7$ is the number of Chapter 7 business bankruptcies, $Ch\,11$ is the number of Chapter 11 business bankruptcies, and $Total$ is the total number of business bankruptcies in county i in year t. $Loans < 100K$ is the number of loans originated in county i with face value of less than \$100K. *Loans* 100–250K is the number of loans originated in county i with face value of between \$100K and \$250K. $Loans > 250K$ is the number of loans originated in county i with face value of greater than \$250K. Regressions are run at the county-year level. Standard errors are clustered at the county level, and county and year fixed effects are included, as indicated. *** indicates significance at the 1% level, ** significance at the 5% level, and * significance at the 10% level.

Panel A: CHS Buyout

Dep. Variable:	log($Ch\,7$)	log($Ch\,11$)	log($Total$)
	(1)	(2)	(3)
$CHS\,Hospital_i \times Post_t$	0.041*	0.067***	0.069***
	(0.021)	(0.017)	(0.022)
County FEs	Y	Y	Y
Year FEs	Y	Y	Y
Y Mean	10.17	3.40	17.23
N	12,114	12,114	12,114
Adj. R^2	0.841	0.810	0.860

Panel B: Full Sample

Dep. Variable:	log($Ch\,7$)	log($Ch\,11$)	log($Total$)	log($Loans$ $<100K$)	log($Loans$ 100–$250K$)	log($Loans$ $>250K$)
	(1)	(2)	(3)	(4)	(5)	(6)
$PE\,Buyout_{c,i,t}$	0.056***	0.050***	0.057***	0.030***	0.053***	0.029*
	(0.014)	(0.010)	(0.015)	(0.009)	(0.017)	(0.016)
County-cohort FEs	Y	Y	Y	Y	Y	Y
Year-cohort FEs	Y	Y	Y	Y	Y	Y
Y Mean	8.43	2.78	13.30	1837.11	68.58	64.78
N	37,809	37,770	38,153	32,791	32,791	32,791
Adj. R^2	0.812	0.764	0.831	0.980	0.936	0.944

Table 6: Economic Activity

This table provides regression results examining county-level establishment growth, and employment growth in areas affected by private equity (PE) buyouts of hospital systems. Panel A provides results for the CHS specification from 1993 to 1999. Panel B provides full sample results from 1993 to 2023 for all hospital PE buyouts. $PE\,Buyout_{c,i,t}$ is an indicator variable that takes a value of 1 if county i in cohort c experienced a PE buyout of a hospital as of year t, and zero otherwise. $CHS\,Hospital_i$ is an indicator variable that takes a value of 1 if county i served by a CHS system hospital as of 1995, and zero otherwise. $Post_t$ is an indicator variable that takes a value of 1 if t is year 1996 or later, and 0 otherwise. $Emp\,Growth$ is the growth in total employment for county i in from year $t-1$ to year t. $Estab\,Growth$ is the growth in the number of businesses in county i in from year $t-1$ to year t. $\log(Patents)$ is the logarithm of the number of patents filed in county i in year t. $\log(Trademarks)$ is the logarithm of the number of trademarks registered in county i in year t. Regressions are run at the county-year level. Standard errors are clustered at the county level, and county and year fixed effects are included, as indicated. *** indicates significance at the 1% level, ** significance at the 5% level, and * significance at the 10% level.

Panel A: CHS Buyout

Dep. Variable:	$Emp\,Growth$	$Estab\,Growth$	$\log(Patents)$	$\log(Trademarks)$
	(1)	(2)	(3)	(4)
$CHS\,Hospital_i \times Post_t$	−0.568***	−0.222**	−0.060***	−0.065***
	(0.180)	(0.113)	(0.019)	(0.018)
County FEs	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y
Y Mean	2.455	1.977	21.854	23.051
N	12,159	12,159	12,159	12,124
Adj. R^2	0.182	0.259	0.932	0.919

Panel B: Full Sample

Dep. Variable:	$Emp\,Growth$	$Estab\,Growth$	$\log(Patents)$	$\log(Trademarks)$
	(1)	(2)	(3)	(4)
$PE\,Buyout_{c,i,t}$	−0.204*	−0.331***	−0.023**	−0.036***
	(0.110)	(0.075)	(0.011)	(0.012)
County-cohort FEs	Y	Y	Y	Y
Year-cohort FEs	Y	Y	Y	Y
Y Mean	1.092	1.156	32.394	35.128
N	38,483	38,483	38,513	38,270
Adj. R^2	0.160	0.182	0.930	0.921

Table 7: Establishment-level Results: Entry, Exit, and Employment Growth

This table provides regression results using establishment-level data examining entry, exit, and employment growth in areas affected by private equity (PE) buyouts of hospital systems. Panel A provides results for the CHS specification from 1993 to 1999. Panel B provides full sample results from 1993 to 2023 for all hospital PE buyouts. $PE\,Buyout_{c,i,t}$ is an indicator variable that takes a value of 1 if county i in cohort c experienced a PE buyout of a hospital as of year t, and zero otherwise. $CHS\,Hospital_i$ is an indicator variable that takes a value of 1 if county i served by a CHS system hospital as of 1995, and zero otherwise. $Post_t$ is an indicator variable that takes a value of 1 if t is year 1996 or later, and 0 otherwise. *Entry* is the growth in total employment for county i in from year $t-1$ to year t. *New Estabs* is the number of new establishments in county i in year t. *Exit* is an establishment-level variable that takes a value of 1 if establishment j exited in year t, and 0 otherwise. *Emp Growth* is the growth in employment at the establishment-level in from year $t-1$ to year t. Regressions are run at the county-year or establishment-year level, as indicated. Standard errors are clustered at the county level in column (1) in both panels, at the establishment level in columns (2)-(3) in Panel A, and at the establishment-cohort level in Panel B. Fixed effects are included, as indicated. *** indicates significance at the 1% level, ** significance at the 5% level, and * significance at the 10% level.

Panel A: CHS Buyout

Dep. Variable:	$log(New\,Estabs)$	*Exit*	*Emp Growth*
	(1)	(2)	(3)
$CHS\,Hospital_i \times Post_t$	−0.044**	0.011***	−0.181***
	(0.020)	(0.000)	(0.021)
Regression Level	County	Establishment	Establishment
County FEs	Y	-	-
Year FEs	Y	-	-
Establishment FEs	-	Y	Y
Industry × Year FEs	-	Y	Y
Y Mean	505.649	0.118	1.532
N	12,092	42,376,212	35,598,218
Adj. R^2	0.907	0.392	−0.063

Panel B: Full Sample

Dep. Variable:	$log(New\,Estabs)$	*Exit*	*Emp Growth*
	(1)	(2)	(3)
$PE\,Buyout_{c,i,t}$	−0.001	0.001***	−0.037***
	(0.010)	(0.000)	(0.006)
Regression Level	County	Establishment	Establishment
Year-cohort FEs	Y	-	-
County-cohort FEs	Y	-	-
Establishment-cohort FEs	-	Y	Y
Industry × Year-cohort FEs	-	Y	Y
Y Mean	363.86	0.100	1.140
N	175,391	936,298,397	785,649,959
Adj. R^2	0.951	0.494	0.247

Table 8: Heterogeneity: Hospital Market Competitiveness and Insurer Presence

This table provides heterogeneity results based on insurer and hospital concentration for the full sample of hospital PE buyouts. Panel A provides results partitioning the sample based on counties that are above- or below-median in terms of the hospital Herfindahl–Hirschman index (HHI; based on total hospital beds) in the hospital referral region (HRR) where the county is located. Panel B provides results partitioning the sample based on counties that are above or below-median in terms of the number of health insurers operating in the HRR where the county is located. $PE\,Buyout_{c,i,t}$ is an indicator variable that takes a value of 1 if county i in cohort c experienced a PE buyout of a hospital as of year t, and zero otherwise. $Total$ is the total number of business bankruptcies in county i in year t. $Emp\,Growth$ is the growth in total employment for county i in from year $t-1$ to year t. $Estab\,Growth$ is the growth in the number of businesses in county i in from year $t-1$ to year t. The sample is from 1994–2023 in Panel A and from 1996–2023 in Panel B. Regressions are run at the county-year level. Standard errors are clustered at the county level, and county and year fixed effects are included, as indicated. *** indicates significance at the 1% level, ** significance at the 5% level, and * significance at the 10% level.

Panel A: Hospital HHI

	Above-median Hospital HHI			Below-median Hospital HHI		
Dep. Variable:	$log(Total)$	$Emp\,Growth$	$Estab\,Growth$	$log(Total)$	$Emp\,Growth$	$Estab\,Growth$
	(1)	(2)	(3)	(4)	(5)	(6)
$PE\,Buyout_{c,i,t}$	0.102***	−0.580***	−0.603***	0.033	−0.021	−0.227**
	(0.022)	(0.171)	(0.128)	(0.021)	(0.149)	(0.169)
County-cohort FEs	Y	Y	Y	Y	Y	Y
Year-cohort FEs	Y	Y	Y	Y	Y	Y
N	19,700	19,910	19,910	18,279	18,364	18,364
Adj. R^2	0.831	0.154	0.185	0.827	0.158	0.173

Panel B: Number of Health Insurers in the Market

	Above-median No. of Insurers			Below-median No. of Insurers		
Dep. Variable:	$log(Total)$	$Emp\,Growth$	$Estab\,Growth$	$log(Total)$	$Emp\,Growth$	$Estab\,Growth$
	(1)	(2)	(3)	(4)	(5)	(6)
$PE\,Buyout_{c,i,t}$	0.025	0.464***	0.010	0.108***	−0.624**	−1.155***
	(0.027)	(0.175)	(0.128)	(0.032)	(0.249)	(0.169)
County-cohort FEs	Y	Y	Y	Y	Y	Y
Year-cohort FEs	Y	Y	Y	Y	Y	Y
N	12,420	12,486	12,486	12,464	12,670	12,670
Adj. R^2	0.838	0.102	0.087	0.714	0.034	0.036

Table 9: Heterogeneity: Labor Intensity

This table provides heterogeneity results based on the average labor intensity of industries in an area, defined as the labor share of each industry in the area weighted by the share of establishments in the area comprised of that industry. Panel A provides results for the CHS specification from 1993 to 1999. Panel B provides full sample results from 1993 to 2023 for all hospital PE buyouts. Sample splits are based on whether a county is above- or below-median in terms of labor intensity. $CHS\,Hospital_i$ is an indicator variable that takes a value of 1 if county i served by a CHS system hospital as of 1995, and zero otherwise. $Post_t$ is an indicator variable that takes a value of 1 if t is year 1996 or later, and 0 otherwise. $PE\,Buyout_{c,i,t}$ is an indicator variable that takes a value of 1 if county i in cohort c experienced a PE buyout of a hospital as of year t, and zero otherwise. $Total$ is the total number of business bankruptcies in county i in year t. $Emp\,Growth$ is the growth in total employment for county i in from year $t-1$ to year t. $Estab\,Growth$ is the growth in the number of businesses in county i in from year $t-1$ to year t. Regressions are run at the county-year level. Standard errors are clustered at the county level, and county and year fixed effects are included, as indicated. *** indicates significance at the 1% level, ** significance at the 5% level, and * significance at the 10% level.

Panel A: CHS Buyout

	Above-median Labor Intensity			Below-median Labor Intensity		
Dep. Variable:	$log(Total)$	$Emp\,Growth$	$Estab\,Growth$	$log(Total)$	$Emp\,Growth$	$Estab\,Growth$
	(1)	(2)	(3)	(4)	(5)	(6)
$CHS\,Hospital_i \times Post_t$	0.088***	−0.983***	−0.385**	0.048	−0.178	−0.199
	(0.032)	(0.259)	(0.157)	(0.030)	(0.249)	(0.156)
County FEs	Y	Y	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y	Y	Y
N	5,870	5,887	5,887	6,188	6,202	6,202
Adj. R^2	0.901	0.180	0.256	0.763	0.196	0.279

Panel B: Full Sample

	Above-median Labor Intensity			Below-median Labor Intensity		
Dep. Variable:	$log(Total)$	$Emp\,Growth$	$Estab\,Growth$	$log(Total)$	$Emp\,Growth$	$Estab\,Growth$
	(1)	(2)	(3)	(4)	(5)	(6)
$PE\,Buyout_{c,i,t}$	0.086***	−0.384***	−0.560***	0.025	−0.025	−0.155
	(0.021)	(0.145)	(0.104)	(0.020)	(0.164)	(0.107)
County-cohort FEs	Y	Y	Y	Y	Y	Y
Year-cohort FEs	Y	Y	Y	Y	Y	Y
N	18,893	18,987	18,987	19,100	19,305	19,305
Adj. R^2	0.874	0.179	0.191	0.695	0.134	0.163

Table 10: Heterogeneity: Services Industry Share

This table provides heterogeneity results based on the share of the services industry in an area, defined as the percentage of establishments in an area comprised of the services industry. Panel A provides results for the CHS specification from 1993 to 1999. Panel B provides full sample results from 1993 to 2023 for all hospital PE buyouts. Sample splits are based on whether a county is above- or below-median in terms of employment share in the services industry. $CHS\,Hospital_i$ is an indicator variable that takes a value of 1 if county i served by a CHS system hospital as of 1995, and zero otherwise. $Post_t$ is an indicator variable that takes a value of 1 if t is year 1996 or later, and 0 otherwise. $PE\,Buyout_{c,i,t}$ is an indicator variable that takes a value of 1 if county i in cohort c experienced a PE buyout of a hospital as of year t, and zero otherwise. $Total$ is the total number of business bankruptcies in county i in year t. $Emp\,Growth$ is the growth in total employment for county i in from year $t-1$ to year t. $Estab\,Growth$ is the growth in the number of businesses in county i in from year $t-1$ to year t. Regressions are run at the county-year level. Standard errors are clustered at the county level, and county and year fixed effects are included, as indicated. *** indicates significance at the 1% level, ** significance at the 5% level, and * significance at the 10% level.

Panel A: CHS Buyout

	Above-median Service Share			Below-median Service Share		
Dep. Variable:	$log(Total)$	$Emp\,Growth$	$Estab\,Growth$	$log(Total)$	$Emp\,Growth$	$Estab\,Growth$
	(1)	(2)	(3)	(4)	(5)	(6)
$CHS\,Hospital_i \times Post_t$	0.107***	−0.906***	−0.633**	0.038	−0.276	0.006
	(0.031)	(0.253)	(0.157)	(0.031)	(0.249)	(0.155)
County FEs	Y	Y	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y	Y	Y
N	5,695	5,712	5,712	6,363	6,377	6,377
Adj. R^2	0.898	0.227	0.256	0.769	0.196	0.294

Panel B: Full Sample

	Above-median Service Share			Below-median Service Share		
Dep. Variable:	$log(Total)$	$Emp\,Growth$	$Estab\,Growth$	$log(Total)$	$Emp\,Growth$	$Estab\,Growth$
	(1)	(2)	(3)	(4)	(5)	(6)
$PE\,Buyout_{c,i,t}$	0.084***	−0.293*	−0.557***	0.030	−0.125	−0.169
	(0.021)	(0.150)	(0.108)	(0.020)	(0.157)	(0.105)
County-cohort FEs	Y	Y	Y	Y	Y	Y
Year-cohort FEs	Y	Y	Y	Y	Y	Y
N	18,206	18,309	18,309	19,787	19,983	19,983
Adj. R^2	0.872	0.158	0.160	0.713	0.154	0.190

Online Appendix: Additional Tables
(For Online Publication)

Table A.1: Additional Outcomes: Number of Establishments by Size

This table provides regression results examining the county-level number of establishments by size for counties in areas affected by private equity (PE) buyouts of hospitals. The CHS specification run from from 1993 to 1999, and the full sample results run from 1993 to 2023. $CHS\,Hospital_i$ is an indicator variable that takes a value of 1 if county i was served by a CHS system hospital as of 1995, and zero otherwise. $Post_t$ is an indicator variable that takes a value of 1 if t is year 1996 or later, and 0 otherwise. $PE\,Buyout_{c,i,t}$ is an indicator variable that takes a value of 1 if county i in cohort c experienced a PE buyout of a hospital as of year t, and zero otherwise. $\log(Estabs, > 100\,Emp)$ is the logarithm of the number of establishments in county i in year t which have more than 100 employees, and $\log(Estabs, < 100\,Emp)$ is the is the logarithm of the number of establishments with less than 100 employees. $Avg\,Wage$ is the average wage in the county. Regressions are run at the county-year level. Standard errors are clustered at the county level, and county and year fixed effects are included, as indicated. *** indicates significance at the 1% level, ** significance at the 5% level, and * significance at the 10% level.

	CHS Specification		Full Sample	
Dep. Variable:	$\log(Estabs,$ $>100\ Emp)$	$\log(Estabs,$ $<100\ Emp)$	$\log(Estabs,$ $>100\ Emp)$	$\log(Estabs,$ $<100\ Emp)$
	(1)	(2)	(3)	(4)
$CHS\,Hospital_i \times Post_t$	−0.033***	0.009**		
	(0.011)	(0.005)		
$PE\,Buyout_{c,i,t}$			−0.012*	0.006**
			(0.007)	(0.003)
County FEs	Y	Y	N	N
Year FEs	Y	Y	N	N
County-cohort FEs	N	N	Y	Y
Year-cohort FEs	N	N	Y	Y
N	12,159	12,159	38,454	38,454
Adj. R^2	0.987	0.998	0.986	0.994

Table A.2: Hospital Quality Measures

This table provides regression results examining indicators for hospital quality. Panel A examines hospital-level quality measures in hospitals acquired by private equity (PE). Full sample results from 2004 to 2021 are provided for all hospital buyouts. $PE\,Buyout_{c,h,t}$ is an indicator variable that takes a value of 1 if hospital h (or county i) in cohort c experienced a PE buyout of a hospital as of year t, and zero otherwise. Columns (1)–(6) are mortality rates for coronary artery bypass grafting (CABG), pnuemonia, heart failure, chronic obstructive pulmonary disease, acute myocardial infarction, stroke and all diseases/procedures in hospital h in year t. Panel B examines mortality rates for counties in areas affected by PE buyouts. $PE\,Buyout_{c,i,t}$ is an indicator variable that takes a value of 1 if county i in cohort c experienced a PE buyout of a hospital as of year t, and zero otherwise. Columns (1)–(4) indicate mortality rates calculated using deaths in hospital, deaths due to pregnancy, deaths due to suicides, and total deaths in county i in year t. Regressions are run at the hospital-year level for Panel A and at the county-year level for Panel B. Standard errors are clustered at the hospital level in Panel A and at the county level in Panel B, and hospital, county and year fixed effects are included, as indicated. *** indicates significance at the 1% level, ** significance at the 5% level, and * significance at the 10% level.

Panel A: Hospital Mortality Rates

	Hospital Mortality Rates					
Dep. Variable:	*CABG*	*Pnuemonia*	*HeartFailure*	*COPD*	*AMI*	*Stroke*
	(1)	(2)	(3)	(4)	(5)	(6)
$PE\,Buyout_{c,h,t}$	−0.003*	0.003	0.001	0.000	−0.001	−0.001
	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
Hospital-cohort FEs	Y	Y	Y	Y	Y	Y
Year-cohort FEs	Y	Y	Y	Y	Y	Y
N	26,654	234,321	224,259	101,088	169,377	79,304
Adj. R^2	0.518	0.787	0.595	0.576	0.722	0.968

Panel B: County Mortality Rates

	County Mortality Rates			
Dep. Variable:	*Hospital*	*Pregnancy*	*Suicides*	*Total*
	(1)	(2)	(3)	(4)
$PE\,Buyout_{c,i,t}$	0.003	−0.001	−0.121	−1.732
	(0.003)	(0.001)	(0.129)	(3.343)
County-cohort FEs	Y	Y	Y	Y
Year-cohort FEs	Y	Y	Y	Y
N	142,580	142,580	142,580	142,580
Adj. R^2	0.344	0.251	0.521	0.825

Table A.3: Robustness: CHS Specification with County-level Controls

This table provides regression results examining outcomes following the CHS buyout by private equity (PE). Regressions run from from 1993 to 1999. $CHS\,Hospital_{j,i}$ is an indicator variable that takes a value of 1 if firm j is located in county i that was served by a CHS system hospital as of 1995, and zero otherwise. $Post_t$ is an indicator variable that takes a value of 1 if t is year 1996 or later, and 0 otherwise. $CHS\,Hospital_i$ is an indicator variable that takes a value of 1 if county i was served by a CHS system hospital as of 1995, and zero otherwise. $Avg\,Premium_{j,t}$ is the average premium that firm j paid for employer-sponsored health insurance plans in year t. $Ch\,7$ is the number of Chapter 7 business bankruptcies, $Ch\,11$ is the number of Chapter 11 business bankruptcies, and $Total$ is the total number of business bankruptcies in county i in year t. $Emp\,Growth$ is the growth in total employment for county i in from year $t-1$ to year t. $Estab\,Growth$ is the growth in the number of businesses in county i in from year $t-1$ to year t. Loan variables represent the logarithm of the number of small business loans of a given size or for firms of a given revenue in county i in year t. $\log(Patents)$ is the logarithm of the number of patents filed in county i in year t. $\log(TM)$ is the logarithm of the number of trademarks registered in county i in year t. Regressions are run at the firm-year level for premiums and at the county-year level for other outcomes. Standard errors are clustered at the county level, and county and year fixed effects are included, as indicated. County-level controls include county population and income per-capita. *** indicates significance at the 1% level, ** significance at the 5% level, and * significance at the 10% level.

Dep. Variable:	$\log(Avg\,Prem)$	$\log(Ch\,7)$	$\log(Ch\,11)$	$\log(Total)$	$Emp\,Growth$	$Estab\,Growth$	$\log(Patents)$	$\log(Trademarks)$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$CHS\,Hospital_{j,i} \times Post_t$	0.069***							
	(0.025)							
$CHS\,Hospital_i \times Post_t$		0.039*	0.068***	0.067***	−0.480**	−0.195*	−0.066**	−0.075***
		(0.021)	(0.017)	(0.022)	(0.184)	(0.114)	(0.019)	(0.018)
County Controls	Y	Y	Y	Y	Y	Y	Y	Y
County FEs	-	Y	Y	Y	Y	Y	Y	Y
Year FEs	-	Y	Y	Y	Y	Y	Y	Y
Firm FEs	Y	-	-	-	-	-	-	-
Industry×Year FEs	Y	-	-	-	-	-	-	-
N	159,836	11,967	11,967	11,967	12,012	12,012	12,012	11,977
Adj. R^2	0.543	0.842	0.813	0.861	0.189	0.261	0.932	0.920

Table A.4: Robustness: Full PSM Sample, Stacked Cohort Specification with Controls

This table provides regression results examining outcomes following all buyouts of hospitals by private equity (PE) over the full sample from from 1993 to 2023 using a stacked cohort DID specification with county-level controls. $PE\,Buyout_{c,j,i,t}$ is an indicator variable that takes a value of 1 if firm j in cohort c is located in county i that experienced a PE buyout of a hospital system as of year t, and zero otherwise. $PE\,Buyout_{c,i,t}$ is an indicator variable that takes a value of 1 if county i in cohort c experienced a PE buyout of a hospital as of year t, and zero otherwise. $Avg\,Premium_{j,t}$ is the average premium that firm j paid for employer-sponsored health insurance plans in year t. $Ch\,7$ is the number of Chapter 7 business bankruptcies, $Ch\,11$ is the number of Chapter 11 business bankruptcies, and $Total$ is the total number of business bankruptcies in county i in year t. $Emp\,Growth$ is the growth in total employment for county i in from year $t-1$ to year t. $Estab\,Growth$ is the growth in the number of businesses in county i in from year $t-1$ to year t. Loan variables represent the logarithm of the number of small business loans of a given size or for firms of a given revenue in county i in year t. $\log(Patents)$ is the logarithm of the number of patents filed in county i in year t. $\log(TM)$ is the logarithm of the number of trademarks registered in county i in year t. $Loans < 100K$ is the number of loans originated in county i with face value of less than \$100K. $Loans$ 100–$250K$ is the number of loans originated in county i with face value of between \$100K and \$250K. $Loans > 250K$ is the number of loans originated in county i with face value of greater than \$250K. Regressions are run at the firm-year or county-year level, as indicated. Standard errors are clustered at the firm-cohort (column (1)) or county-cohort level (other columns) levels, and fixed effects are included, as indicated. County-level controls include county population and income per-capita *** indicates significance at the 1% level, ** significance at the 5% level, and * significance at the 10% level.

Dep. Variable:	log ($Avg\,Prem$)	log($Ch\,7$)	log($Ch\,11$)	log($Total$)	log ($Loans$ $<100K$)	log ($Loans$ 100–$250K$)	log ($Loans$ $>250K$)	$Emp\,Growth$	$Estab\,Growth$	log($Patents$)	log(TM)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
$PE\,Buyout_{c,j,i,t}$	0.034***										
	(0.013)										
$PE\,Buyout_{c,i,t}$		0.051***	0.048***	0.054***	0.019**	0.047***	0.019	−0.122	−0.305***	−0.027**	−0.045***
		(0.014)	(0.010)	(0.015)	(0.009)	(0.017)	(0.016)	(0.109)	(0.074)	(0.011)	(0.012)
Unit of Analysis	Firm-year	County-year	County-year	County-year	County-year	County-year	County-year	County-year	County-year	County-year	County-year
County Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Cohort - County FEs	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Cohort - Year FEs	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Cohort - Firm FEs	Y	-	-	-	-	-	-	-	-	-	-
Industry×Cohort - Year FEs	Y	-	-	-	-	-	-	-	-	-	-
N	1,868,460	37,165	37,129	37,505	32,241	32,241	32,241	37,831	37,831	37,832	37,590
Adj. R^2	0.546	0.814	0.765	0.833	0.980	0.936	0.944	0.175	0.190	0.930	0.922

Table A.5: Robustness: CHS Specification with Time-varying Region Fixed Effects

This table provides regression results examining outcomes following the CHS buyout by private equity (PE), including time-varying region fixed effects. Regressions run from from 1993 to 1999. $CHS\,Hospital_{j,i}$ is an indicator variable that takes a value of 1 if firm j is located in county i that was served by a CHS system hospital as of 1995, and zero otherwise. $Post_t$ is an indicator variable that takes a value of 1 if t is year 1996 or later, and 0 otherwise. $CHS\,Hospital_i$ is an indicator variable that takes a value of 1 if county i was served by a CHS system hospital as of 1995, and zero otherwise. $Avg\,Premium_{j,t}$ is the average premium that firm j paid for employer-sponsored health insurance plans in year t. $Ch\,7$ is the number of Chapter 7 business bankruptcies, $Ch\,11$ is the number of Chapter 11 business bankruptcies, and $Total$ is the total number of business bankruptcies in county i in year t. $Emp\,Growth$ is the growth in total employment for county i in from year $t-1$ to year t. $Estab\,Growth$ is the growth in the number of businesses in county i in from year $t-1$ to year t. Loan variables represent the logarithm of the number of small business loans of a given size or for firms of a given revenue in county i in year t. $\log(Patents)$ is the logarithm of the number of patents filed in county i in year t. $\log(TM)$ is the logarithm of the number of trademarks registered in county i in year t. Regressions are run at the firm-year level for premiums and at the county-year level for other outcomes. Standard errors are clustered at the county level, and county and Census region-by-time fixed effects are included, as indicated. *** indicates significance at the 1% level, ** significance at the 5% level, and * significance at the 10% level.

Dep. Variable:	$\log(Avg\,Prem)$	$\log(Ch\,7)$	$\log(Ch\,11)$	$\log(Total)$	$Emp\,Growth$	$Estab\,Growth$	$\log(Patents)$	$\log(Trademarks)$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$CHS\,Hospital_{j,i} \times Post_t$	0.058**							
	(0.031)							
$CHS\,Hospital_i \times Post_t$		0.051**	0.035*	0.067***	−0.262	−0.276**	−0.035*	−0.057**
		(0.024)	(0.019)	(0.025)	(0.206)	(0.123)	(0.021)	(0.020)
Region×Year FEs	Y	Y	Y	Y	Y	Y	Y	Y
County FEs	-	Y	Y	Y	Y	Y	Y	Y
Firm FEs	Y	-	-	-	-	-	-	-
Industry×Year FEs	Y	-	-	-	-	-	-	-
N	162,606	12,114	12,114	12,114	12,159	12,159	12,159	12,124
Adj. R^2	0.543	0.809	0.772	0.832	0.017	0.111	0.918	0.903

Table A.6: Robustness: Full Sample, Stacked Cohort Specification with Time-varying Region Fixed Effects

This table provides regression results examining outcomes following all buyouts of hospitals by private equity (PE) over the full sample from from 1993 to 2023 with time-varying region fixed effects. $PE\,Buyout_{c,j,i,t}$ is an indicator variable that takes a value of 1 if firm j in cohort c is located in county i that experienced a PE buyout of a hospital system as of year t, and zero otherwise. $PE\,Buyout_{c,i,t}$ is an indicator variable that takes a value of 1 if county i in cohort c experienced a PE buyout of a hospital as of year t, and zero otherwise. $Avg\,Premium_{j,t}$ is the average premium that firm j paid for employer-sponsored health insurance plans in year t. $Ch\,7$ is the number of Chapter 7 business bankruptcies, $Ch\,11$ is the number of Chapter 11 business bankruptcies, and $Total$ is the total number of business bankruptcies in county i in year t. $Emp\,Growth$ is the growth in total employment for county i in from year $t-1$ to year t. $Estab\,Growth$ is the growth in the number of businesses in county i in from year $t-1$ to year t. Loan variables represent the logarithm of the number of small business loans of a given size or for firms of a given revenue in county i in year t. $\log(Patents)$ is the logarithm of the number of patents filed in county i in year t. $\log(TM)$ is the logarithm of the number of trademarks registered in county i in year t. $Loans < 100K$ is the number of loans originated in county i with face value of less than \$100K. $Loans$ 100–$250K$ is the number of loans originated in county i with face value of between \$100K and \$250K. $Loans > 250K$ is the number of loans originated in county i with face value of greater than \$250K. Regressions are run at the firm-year or county-year level, as indicated. Standard errors are clustered at the firm-cohort (column (1)) or county-cohort level (other columns) levels, and fixed effects are included, as indicated. *** indicates significance at the 1% level, ** significance at the 5% level, and * significance at the 10% level.

Dep. Variable:	log ($Avg\,Prem$)	log($Ch\,7$)	log($Ch\,11$)	log($Total$)	log ($Loans$ $<100K$)	log($Loans$ 100–$250K$)	log ($Loans$ $>250K$)	$Emp\,Growth$	$Estab\,Growth$	log($Patents$)	log(TM)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
$PE\,Buyout_{c,j,i,t}$	0.029**										
	(0.013)										
$PE\,Buyout_{c,i,t}$		0.043***	0.038***	0.046***	0.022**	0.044**	0.013	−0.104	−0.389***	−0.018	−0.028**
		(0.016)	(0.011)	(0.016)	(0.009)	(0.019)	(0.017)	(0.121)	(0.083)	(0.012)	(0.013)
Unit of Analysis	Firm-year	County-year	County-year	County-year	County-year	County-year	County-year	County-year	County-year	County-year	County-year
Region×Year FEs	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
County-cohort FEs	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year-cohort FEs	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm-cohort FEs	Y	-	-	-	-	-	-	-	-	-	-
Industry×Year-cohort FEs	Y	-	-	-	-	-	-	-	-	-	-
N	1,916,076	37,809	37,770	37,153	32,791	32,791	32,791	38,483	38,483	38,513	38,270
Adj. R^2	0.547	0.813	0.764	0.831	0.981	0.936	0.944	0.162	0.206	0.929	0.921

Table A.7: Robustness: 2SLS Regressions

This table presents regression results from a two-stage least squares (2SLS) specification. Panel A provides results for the CHS specification from 1993 to 1999. Panel B provides full sample results from 1993 to 2023 for all hospital PE buyouts. Column (1) in both panels estimates the first stage. $\log(Avg\,Premium)$ is the logarithm of the county-level average premium, and is instrumented by $CHS\,Hospital_i \times Post_t$ and $PE\,Buyout_{i,t}$ in Panels A and B, respectively. $CHS\,Hospital_i$ is an indicator variable that takes a value of 1 if county i served by a CHS system hospital as of 1995, and zero otherwise. $Post_t$ is an indicator variable that takes a value of 1 if t is year 1996 or later, and 0 otherwise. $PE\,Buyout_{c,i,t}$ is an indicator variable that takes a value of 1 if county i in cohort c experienced a PE buyout of a hospital as of year t, and zero otherwise. All other columns represent second-stage estimates. $Ch\,7$ is the number of Chapter 7 business bankruptcies, $Ch\,11$ is the number of Chapter 11 business bankruptcies, and $Total$ is the total number of business bankruptcies in county i in year t. $Emp\,Growth$ is the growth in total employment for county i in from year $t-1$ to year t. $Estab\,Growth$ is the growth in the number of businesses in county i in from year $t-1$ to year t. Loan variables represent the logarithm of the number of small business loans of a given size or for firms of a given revenue in county i in year t. $\log(Patents)$ is the logarithm of the number of patents filed in county i in year t. $\log(TM)$ is the logarithm of the number of trademarks registered in county i in year t. $Loans < 100K$ is the number of loans originated in county i with face value of less than \$100K. $Loans$ 100–$250K$ is the number of loans originated in county i with face value of between \$100K and \$250K. $Loans > 250K$ is the number of loans originated in county i with face value of greater than \$250K. Regressions are run at the county-year level, and the sample in Panel B is constructed using a stacked cohort method. Standard errors are clustered at the county level, and county and year fixed effects are included, as indicated. *** indicates significance at the 1% level, ** significance at the 5% level, and * significance at the 10% level.

Panel A: CHS Buyout

	First Stage	Second Stage						
Dep. Variable:	$\log(Avg\,Premium)$	$\log(Ch\,7)$	$\log(Ch\,11)$	$log(Total)$	$Emp\,Growth$	$Estab\,Growth$	$\log(Patents)$	$\log(Trademarks)$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$CHS\,Hospital_i \times Post_t$	0.128***							
	(0.011)							
$\log(\widehat{Avg\,Premium}_{i,t})$		0.315*	0.524***	0.533***	−4.417***	−1.725*	−0.465***	−0.505***
		(0.168)	(0.144)	(0.180)	(1.485)	(0.894)	(0.151)	(0.154)
County FEs	Y	Y	Y	Y	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y	Y	Y	Y	Y
N	12,111	12,111	12,111	12,111	12,156	12,156	12,156	12,121
F-Stat	135.832							
Adj. R^2		0.836	0.788	0.847	0.108	0.233	0.925	0.911

Panel B: Full Sample

	First Stage	Second Stage									
Dep. Variable:	log ($Avg\,Prem$)	log($Ch\,7$)	log($Ch\,11$)	log($Total$)	log ($Loans$ <100K)	log($Loans$ 100–250K)	log ($Loans$ >250K)	$Emp\,Growth$	$Estab\,Growth$	log($Patents$)	log(TM)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
$PE\,Buyout_{i,t}$	0.075***										
	(0.007)										
$\log(\widehat{Avg\,Premium}_{i,t})$		0.752***	0.660***	0.760***	0.693**	1.228***	0.658*	−2.659*	−4.341***	−0.296**	−0.466***
		(0.209)	(0.151)	(0.213)	(0.272)	(0.467)	(0.389)	(1.481)	(1.098)	(0.149)	(0.156)
Cohort-County FEs	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Cohort-Year FEs	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	38,144	37,800	37,761	38,144	32,791	32,791	32,791	38,474	38,474	38,475	38,232
F-Stat	120.722										
Adj. R^2		0.782	0.728	0.804	0.969	0.907	0.935	0.138	0.065	0.927	0.917

Table A.8: Robustness: CHS Placebo, Random Treatment Assignment

This table provides placebo regression results examining outcomes following the CHS buyout by private equity (PE), randomly assigning counties as treated. Regressions are run from 1993 to 1999. $CHS\,Hospital'_{j,i}$ is an indicator variable that takes a value of 1 if firm j is located in county i that was served by a CHS system hospital as of 1995, and zero otherwise. $Post_t$ is an indicator variable that takes a value of 1 if t is year 1996 or later, and 0 otherwise. $CHS\,Hospital'_i$ is an indicator variable that takes a value of 1 if county i was served by a CHS system hospital as of 1995, and zero otherwise. $Avg\,Premium_{j,t}$ is the average premium that firm j paid for employer-sponsored health insurance plans in year t. $Ch\,7$ is the number of Chapter 7 business bankruptcies, $Ch\,11$ is the number of Chapter 11 business bankruptcies, and $Total$ is the total number of business bankruptcies in county i in year t. $Emp\,Growth$ is the growth in total employment for county i in from year $t-1$ to year t. $Estab\,Growth$ is the growth in the number of businesses in county i in from year $t-1$ to year t. Loan variables represent the logarithm of the number of small business loans of a given size or for firms of a given revenue in county i in year t. $\log(Patents)$ is the logarithm of the number of patents filed in county i in year t. $\log(Trademarks)$ is the logarithm of the number of trademarks registered in county i in year t. Regressions are run at the firm-year or county-year level, as indicated. Standard errors are clustered at the county level, and county and year fixed effects are included, as indicated. *** indicates significance at the 1% level, ** significance at the 5% level, and * significance at the 10% level.

Dep. Variable:	$\log(Avg\,Prem)$	$\log(Ch\,7)$	$\log(Ch\,11)$	$\log(Total)$	$Emp\,Growth$	$Estab\,Growth$	$\log(Patents)$	$\log(Trademarks)$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$CHS\,Hospital'_{j,i} \times Post_t$	−0.003							
	(0.019)							
$CHS\,Hospital'_i \times Post_t$		−0.011	0.008	−0.007	−0.199	0.016	0.002	0.004
		(0.015)	(0.013)	(0.016)	(0.130)	(0.086)	(0.013)	(0.014)
Unit of Analysis	Firm-year	County-year	County-year	County-year	County-year	County-year	County-year	County-year
County FEs	-	Y	Y	Y	Y	Y	Y	Y
Year FEs	-	Y	Y	Y	Y	Y	Y	Y
Firm FEs	Y	-	-	-	-	-	-	-
Industry×Year FEs	Y	-	-	-	-	-	-	-
N	165,185	20,769	20,769	20,769	20,888	20,888	20,888	20,755
Adj. R^2	0.543	0.837	0.812	0.855	0.164	0.247	0.933	0.919

Table A.9: Robustness: Full Sample, Random Treatment Assignment

This table provides regression results examining outcomes following all buyouts of hospitals by private equity (PE) over the full sample from 1993 to 2023, randomly assigning counties as treated. $PE\,Buyout'_{c,j,i,t}$ is an indicator variable that takes a value of 1 if firm j in placebo county i in cohort c experienced a PE buyout of a hospital system as of year t, and zero otherwise. $PE\,Buyout'_{c,i,t}$ is an indicator variable that takes a value of 1 if placebo county i in cohort c experienced a PE buyout of a hospital system as of year t, and zero otherwise. $Avg\,Premium_{c,j,t}$ is the average premium that firm j in cohort c paid for employer-sponsored health insurance plans in year t. $Ch\,7$ is the number of Chapter 7 business bankruptcies, $Ch\,11$ is the number of Chapter 11 business bankruptcies, and $Total$ is the total number of business bankruptcies in county i in year t. $Emp\,Growth$ is the growth in total employment for county i in from year $t-1$ to year t. $Estab\,Growth$ is the growth in the number of businesses in county i in from year $t-1$ to year t. Loan variables represent the logarithm of the number of small business loans of a given size or for firms of a given revenue in county i in year t. $\log(Patents)$ is the logarithm of the number of patents filed in county i in year t. $\log(TM)$ is the logarithm of the number of trademarks registered in county i in year t. $Loans < 100K$ is the number of loans originated in county i with face value of less than \$100K. $Loans$ 100–$250K$ is the number of loans originated in county i with face value of between \$100K and \$250K. $Loans > 250K$ is the number of loans originated in county i with face value of greater than \$250K. Regressions are run at the firm-year or county-year level, as indicated. Standard errors are clustered at the county level, and county and year fixed effects are included, as indicated. *** indicates significance at the 1% level, ** significance at the 5% level, and * significance at the 10% level.

Dep. Variable:	log ($Avg\,Prem$)	log($Ch\,7$)	log($Ch\,11$)	log($Total$)	log ($Loans$ $<100K$)	log($Loans$ 100–$250K$)	log ($Loans$ $>250K$)	$Emp\,Growth$	$Estab\,Growth$	log($Patents$)	log(TM)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
$PE\,Buyout'_{c,j,i,t}$	−0.008										
	(0.011)										
$PE\,Buyout'_{c,i,t}$		−0.016	−0.002	−0.016	−0.011	0.014	−0.009	0.009	0.078	0.001	−0.006
		(0.012)	(0.009)	(0.013)	(0.008)	(0.014)	(0.012)	(0.088)	(0.061)	(0.011)	(0.010)
Unit of Analysis	Firm-year	County-year	County-year	County-year	County-year	County-year	County-year	County-year	County-year	County-year	County-year
County-cohort FEs	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year-cohort FEs	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm-cohort FEs	Y	-	-	-	-	-	-	-	-	-	-
Industry× Year-cohort FEs	Y	-	-	-	-	-	-	-	-	-	-
N	1,544,001	65,525	65,401	66,531	61,440	61,440	61,440	67,225	67,225	67,632	67,143
Adj. R^2	0.524	0.822	0.773	0.839	0.982	0.941	0.947	0.157	0.169	0.928	0.926

Table A.10: Robustness: CHS Specification, Counties with For-profit Hospitals

This table provides regression results examining outcomes following the CHS buyout by private equity (PE), restricting the sample to HRRs with at least one for-profit hospital. Regressions run from from 1993 to 2020. $CHS\,Hospital_{j,i}$ is an indicator variable that takes a value of 1 if firm j is located in county i that was served by a CHS system hospital as of 1995, and zero otherwise. $Post_t$ is an indicator variable that takes a value of 1 if t is year 1996 or later, and 0 otherwise. $CHS\,Hospital_i$ is an indicator variable that takes a value of 1 if county i was served by a CHS system hospital as of 1995, and zero otherwise. $Avg\,Premium_{j,t}$ is the average premium that firm j paid for employer-sponsored health insurance plans in year t. $Ch\,7$ is the number of Chapter 7 business bankruptcies, $Ch\,11$ is the number of Chapter 11 business bankruptcies, and $Total$ is the total number of business bankruptcies in county i in year t. $Emp\,Growth$ is the growth in total employment for county i in from year $t-1$ to year t. $Estab\,Growth$ is the growth in the number of businesses in county i in from year $t-1$ to year t. Loan variables represent the logarithm of the number of small business loans of a given size or for firms of a given revenue in county i in year t. $\log(Patents)$ is the logarithm of the number of patents filed in county i in year t. $\log(Trademarks)$ is the logarithm of the number of trademarks registered in county i in year t. Regressions are run at the firm-year level for premiums and at the county-year level for other outcomes. Standard errors are clustered at the county level, and county and year fixed effects are included, as indicated. *** indicates significance at the 1% level, ** significance at the 5% level, and * significance at the 10% level.

Dep. Variable:	$\log(Avg\,Prem)$	$\log(Ch\,7)$	$\log(Ch\,11)$	$\log(Total)$	$Emp\,Growth$	$Estab\,Growth$	$\log(Patents)$	$\log(Trademarks)$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$CHS\,Hospital_{j,i} \times Post_t$	0.080***							
	(0.027)							
$CHS\,Hospital_i \times Post_t$		0.035	0.041**	0.047*	−0.666***	−0.187	−0.053***	−0.067***
		(0.024)	(0.020)	(0.026)	(0.216)	(0.137)	(0.020)	(0.022)
County FEs	-	Y	Y	Y	Y	Y	Y	Y
Year FEs	-	Y	Y	Y	Y	Y	Y	Y
Firm FEs	Y	-	-	-	-	-	-	-
Industry×Year FEs	Y	-	-	-	-	-	-	-
N	99,386	7,991	7,991	7,991	8,013	8,013	8,013	7,995
Adj. R^2	0.569	0.840	0.807	0.857	0.198	0.270	0.931	0.918

Table A.11: Robustness: Full Sample, Counties with For-profit Hospitals

This table provides regression results examining outcomes following all buyouts of hospitals by private equity (PE) over the full sample from from 1993 to 2023, restricting the sample to HRRs with at least one for-profit hospital. $PE\,Buyout_{c,i,t}$ is an indicator variable that takes a value of 1 if county i in cohort c experienced a PE buyout of a hospital as of year t, and zero otherwise. $Avg\,Premium_{j,t}$ is the average premium that firm j paid for employer-sponsored health insurance plans in year t. $Ch\,7$ is the number of Chapter 7 business bankruptcies, $Ch\,11$ is the number of Chapter 11 business bankruptcies, and $Total$ is the total number of business bankruptcies in county i in year t. $Emp\,Growth$ is the growth in total employment for county i in from year $t-1$ to year t. $Estab\,Growth$ is the growth in the number of businesses in county i in from year $t-1$ to year t. Loan variables represent the logarithm of the number of small business loans of a given size or for firms of a given revenue in county i in year t. $\log(Patents)$ is the logarithm of the number of patents filed in county i in year t. $\log(TM)$ is the logarithm of the number of trademarks registered in county i in year t. $Loans < 100K$ is the number of loans originated in county i with face value of less than \$100K. $Loans$ 100–$250K$ is the number of loans originated in county i with face value of between \$100K and \$250K. $Loans > 250K$ is the number of loans originated in county i with face value of greater than \$250K. Regressions are run at the firm-year or county-year level, as indicated. Standard errors are clustered at the county level, and county and year fixed effects are included, as indicated. *** indicates significance at the 1% level, ** significance at the 5% level, and * significance at the 10% level.

Dep. Variable:	log ($Avg\,Prem$)	log($Ch\,7$)	log($Ch\,11$)	log($Total$)	log ($Loans$ $<100K$)	log($Loans$ 100–$250K$)	log ($Loans$ $>250K$)	$Emp\,Growth$	$Estab\,Growth$	log($Patents$)	log(TM)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
$PE\,Buyout_{c,j,i,t}$	0.027*										
	(0.015)										
$PE\,Buyout_{c,i,t}$		0.060***	0.039***	0.057***	0.049***	0.061***	0.044**	−0.203	−0.345***	−0.002	−0.017
		(0.018)	(0.012)	(0.018)	(0.011)	(0.020)	(0.018)	(0.130)	(0.089)	(0.013)	(0.014)
Unit of Analysis	Firm-year	County-year	County-year	County-year	County-year	County-year	County-year	County-year	County-year	County-year	County-year
County-cohort FEs	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year-cohort FEs	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm-cohort FEs	Y	-	-	-	-	-	-	-	-	-	-
Industry×Year-cohort FEs	Y	-	-	-	-	-	-	-	-	-	-
N	1,115,076	25,764	25,742	26,018	23,309	22,309	22,309	26,217	26,217	26,217	26,071
Adj. R^2	0.553	0.813	0.762	0.828	0.978	0.933	0.941	0.128	0.160	0.933	0.921