

Hospital Mergers, Health Care Prices, Labor Markets, and Inequality

Zack Cooper

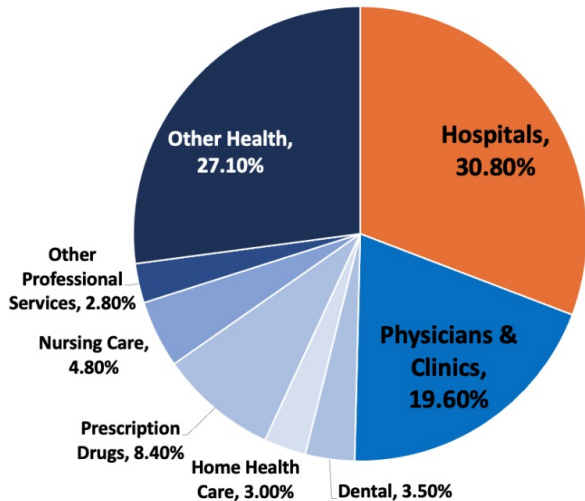
Yale University and the NBER
zack.cooper@yale.edu

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DISCLAIMER: This research was conducted while two of the authors were employees at the U.S. Department of the Treasury. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors and do not necessarily reflect the views or the official positions of the U.S. Department of the Treasury. Any taxpayer data used in this research was kept in a secured Treasury or IRS data repository, and all results have been reviewed to ensure that no confidential information is disclosed.

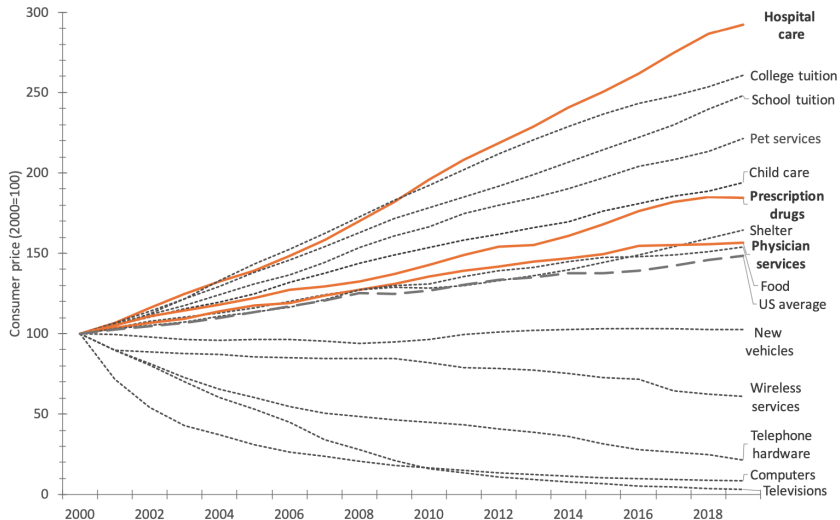
\$25,572

Hospital Account for the Plurality of Health Spending



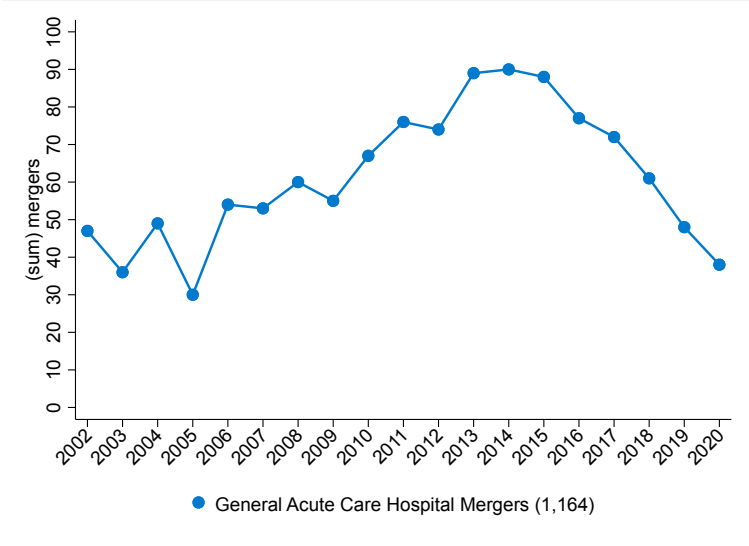
Note: Data from the Kaiser Family Foundation.

Health Care Prices Are Rising Rapidly

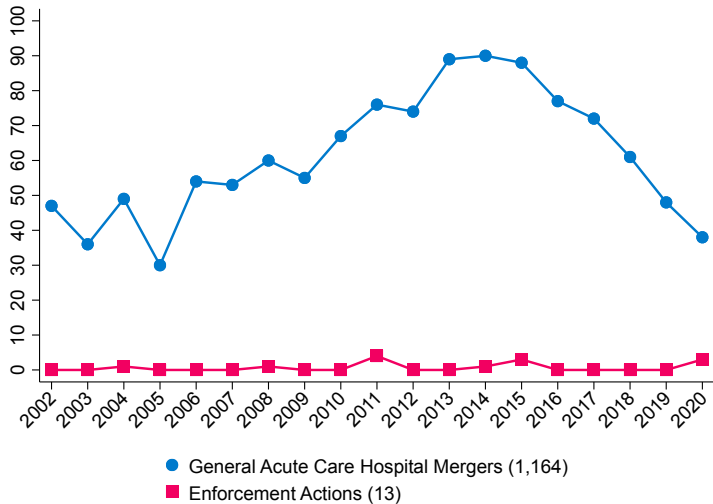


Note: Data from the Bureau of Labor Statistics

Hospital Mergers Between 2002 and 2020



Hospital Mergers Between 2002 and 2020



Is There Too Little Antitrust Enforcement in the Hospital Sector?

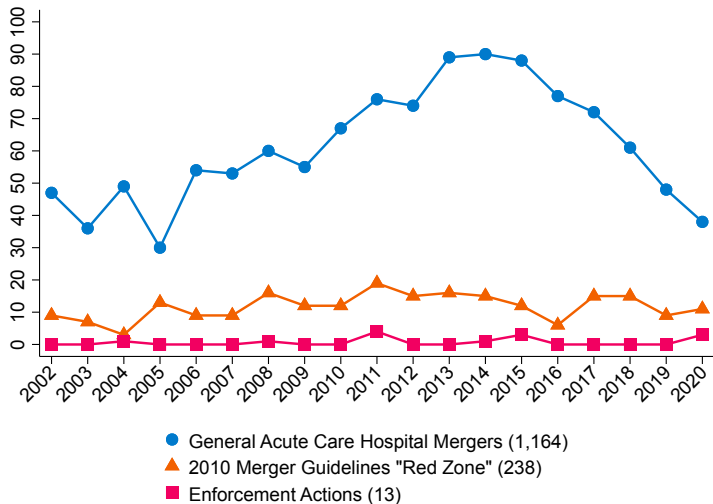
- Arguments of late that the DOJ/FTC has not taken sufficient action against mergers (Kwoka 2013, Baer et al. 2020)
 - Especially given that enforcement rates are low (Kades 2017, Billman and Salop 2020)
- Low enforcement rates are not necessarily evidence of *under*-enforcement
 - The agencies shouldn't take action on most mergers and acquisitions if most are benign!
 - Existing enforcement could be serving as effective deterrence
- **A formal test:** Do permitted mergers reduce competition?
 - If agencies are enforcing optimally, should not be true of permitted mergers

Do Predictably Bad Mergers Raise Prices Ex Post?

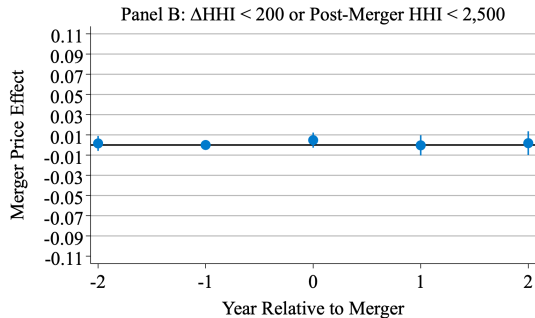
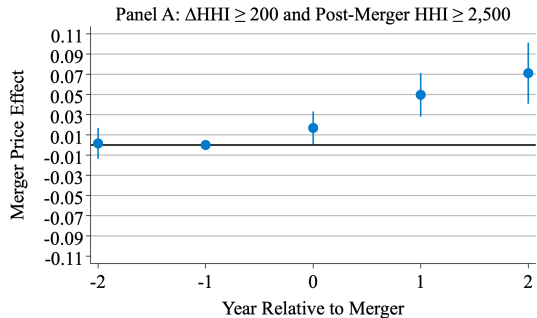
Use two screening tools used by the FTC to predict the effect of mergers:

- ① Measures of hospital HHI as proscribed by the 2010 Horizontal Merger Guidelines
 - Used in other industries but less so in hospital sector
- ② Changes in willingness-to-pay (Capps et al. 2003)
 - More standard approach in hospital sector that enabled FTC to win hospital merger cases (Capps 2014)

Hospital Mergers Between 2002 and 2020



Mergers and Hospital Prices



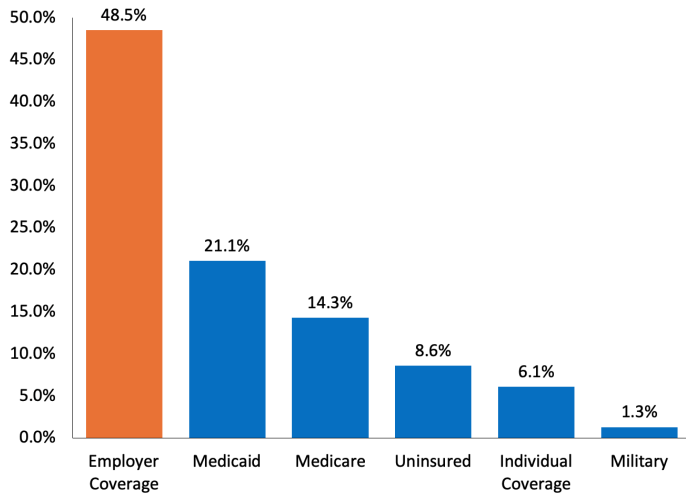
FTC Enforcement vs. Average Merger

- Comparison of changes in HHI and WTP for three groups of mergers:
 - All mergers in our sample
 - Mergers flagged by our HHI/WTP approaches
 - Mergers that the FTC took enforcement action against (not necc. consummated)
- Measure the **maximum** within the transaction, reflecting the piece FTC would likely pursue:

	Full Sample	Flagged Mergers	FTC Enforced
Δ HHI	458.79	1,842.98	3398.50
% Δ WTP	1.3%	9.6%	22.9%

▶ Back

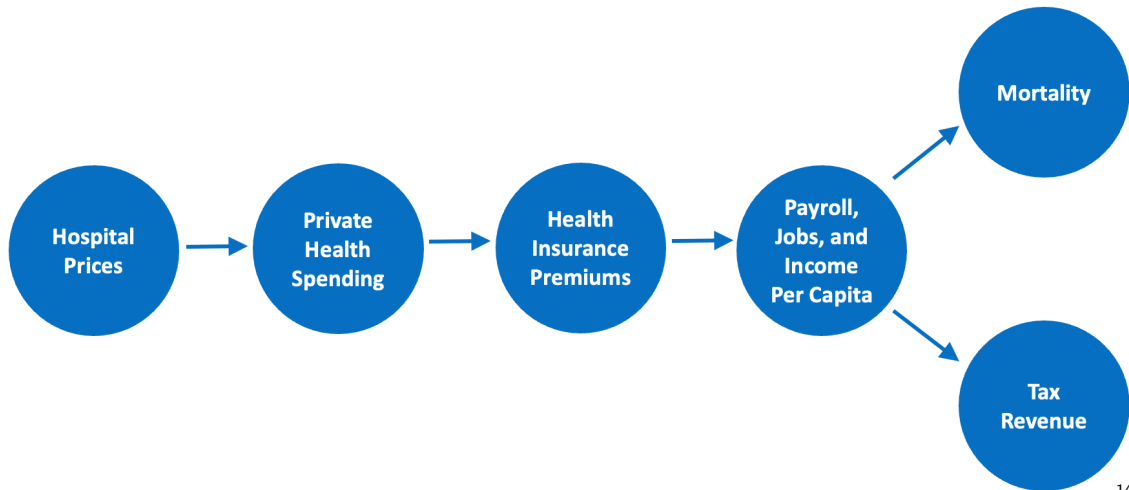
The Modal Individual in the US Gets Insurance Coverage as a Fringe Benefit Via Their Employer



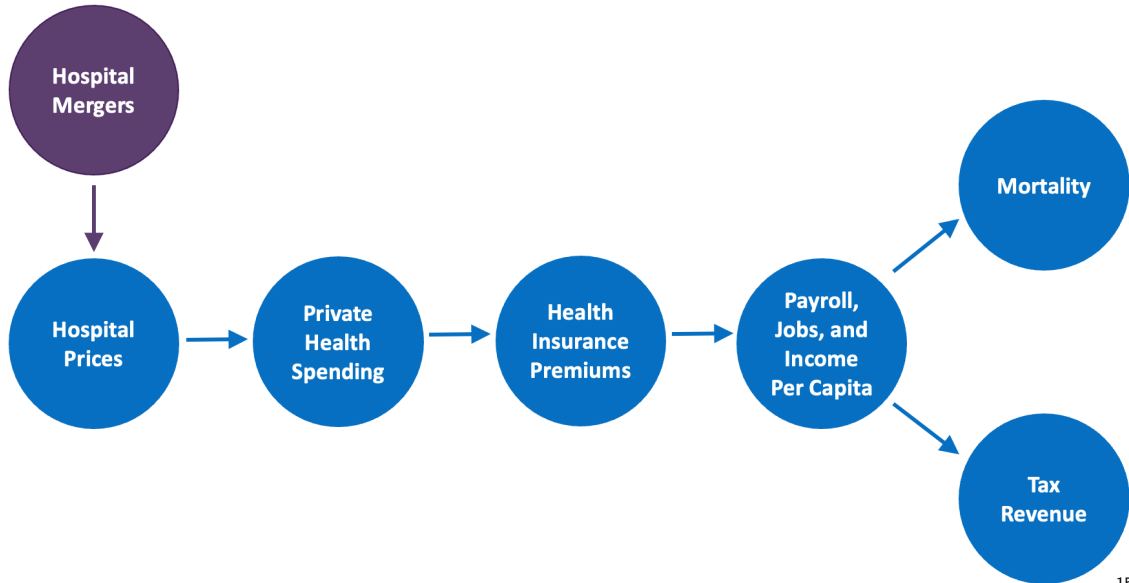
Note: Data from Kaiser Family Foundation and the American Community Survey, 2021

Who Pays For Rising Prices?

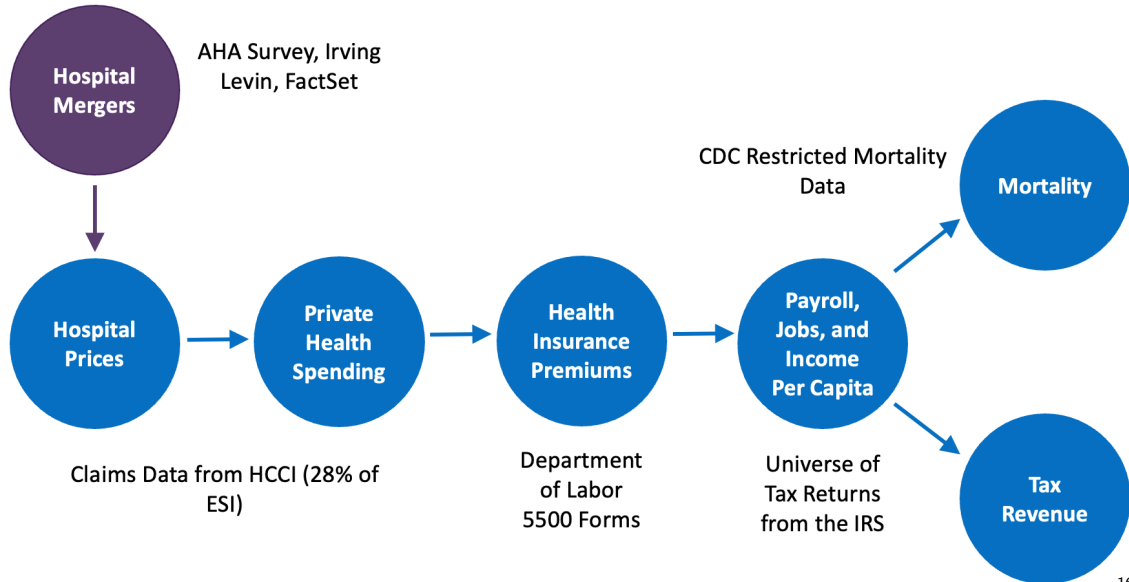
- A long literature shows fringe employment benefits (e.g., health insurance) is financed out of wages (Summers 1989, Gruber and Krueger 1991, Gruber 1994, Baicker and Chandra 2006, Kolstad and Kowalski 2016)
 - If workers value fringe benefit at cost, there's no distortionary effect
 - This literature is mostly about **new mandates**, not rising cost of existing mandates (e.g., price increases)
- A new literature posits employer financing of benefits is a source of inequality in wages and employment (Saez and Zucman, 2019, Case and Deaton, 2020, Finkelstein et al., 2023)
 - ESI premiums serve as a regressive head tax on employment
 - Finkelstein et al. (2023) suggest impact of ESI on inequality on par with effect of outsourcing, robot adoption, rising trade, and growth of real minimum wage



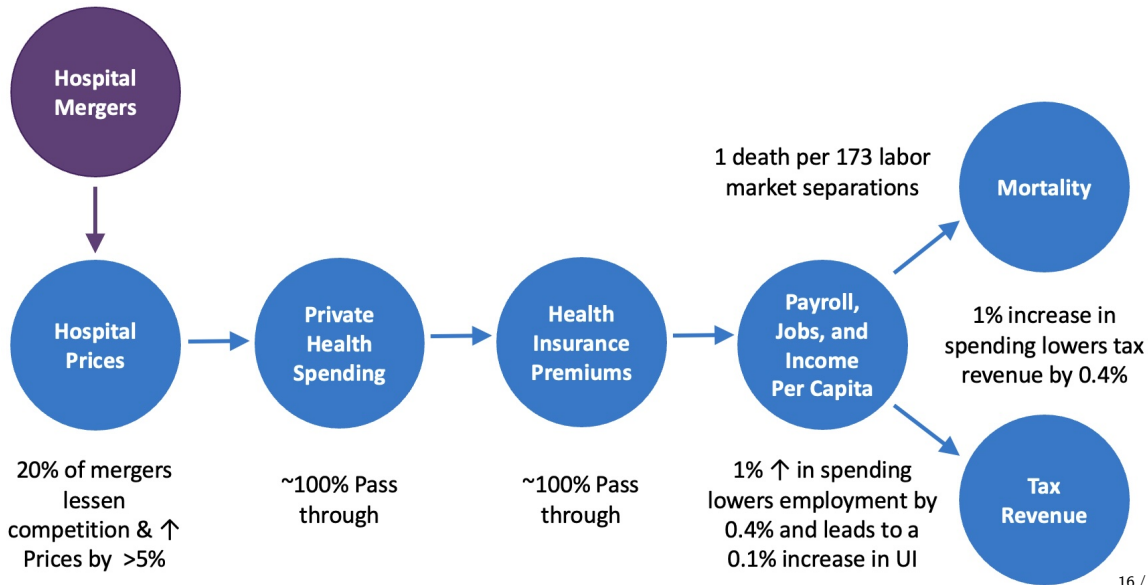
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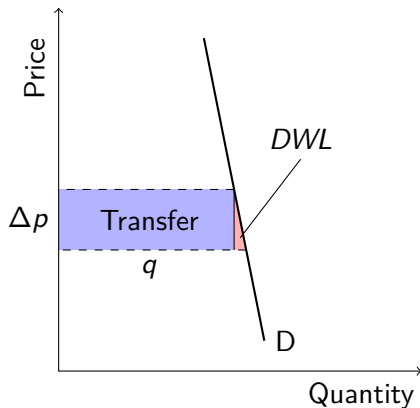
This Paper



Theory: Hospital Mergers, Prices, and Labor Market Outcomes

Hospital Mergers and Deadweight Loss

- Mergers can soften competition and allow hospitals to raise prices



- Relative inelasticity of demand at a given hospital implies small deadweight loss
- The price increases generate a transfer from consumers to producers

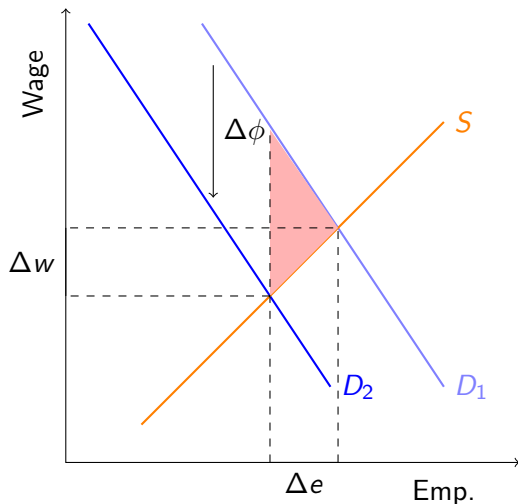
A Theory of the Effect of Rising Health Care Costs on ESI Premiums and Labor Market Outcomes

- The vast majority of the cost of hospital care is funded by insurers, not patients
- As the price of care rises, it is passed through into a $\Delta\phi$ increase in ESHI premiums of local employers
- Employer expenses per worker therefore rise by $\Delta\phi$

Labor Market Effects of Rising Health Care Costs with ESI

Predictions from Gruber and Krueger, 1991

- Increases in premiums shift labor demand curve down by $\Delta\phi$
- Unlike benefits mandates, no effect on labor supply: Workers don't value price-driven premium increases
- Wage incidence akin to usual tax incidence formula: $\frac{dw}{d\phi} = \frac{E^D}{E^S - E^D}$ for elasticities of supply and demand E^S, E^D
- Employment response
$$\frac{de}{d\phi} = \frac{E^D E^S}{E^S - E^D} \frac{e}{w}$$

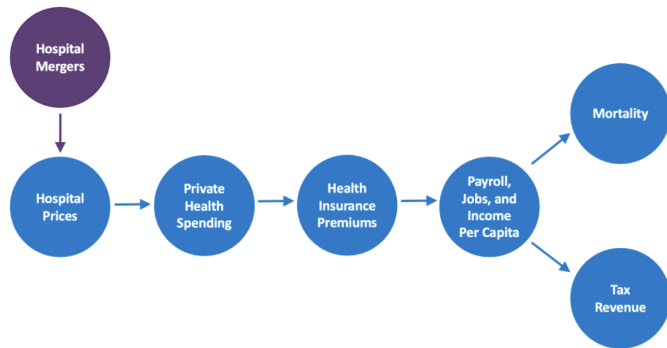


Who Pays for Rising Health Care Costs?

$$\frac{de}{d\phi} = \frac{E^D E^S}{E^S - E^D} \frac{e}{w}$$

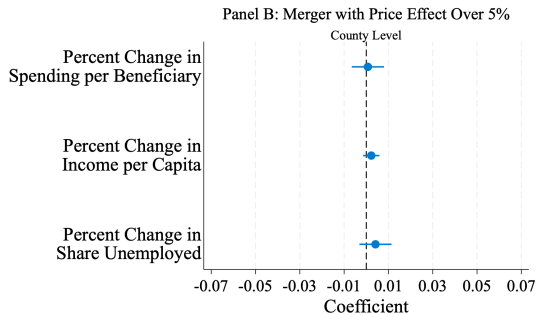
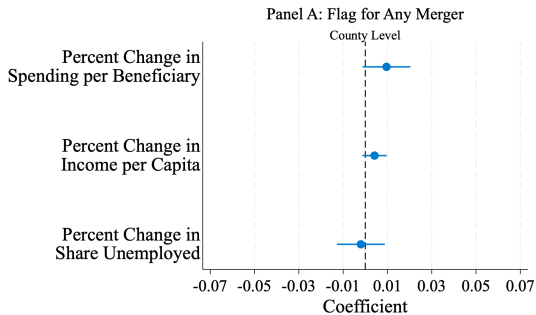
- **Premiums are a health head tax:** health tax larger relative to wages for lower wage workers → low-wage workers face greater incidence (Saez & Zucman, 2019; Case & Deaton, 2020; Finkelstein et al., 2023)
- **Elastically-demanded workers:** Employers more willing to cut back on hiring of workers for whom health care costs account for a higher share of their marginal product
- **Elastically-supplied workers:** Downward wage rigidities would lead to employment cuts, not wage reductions

Our Empirical Strategy

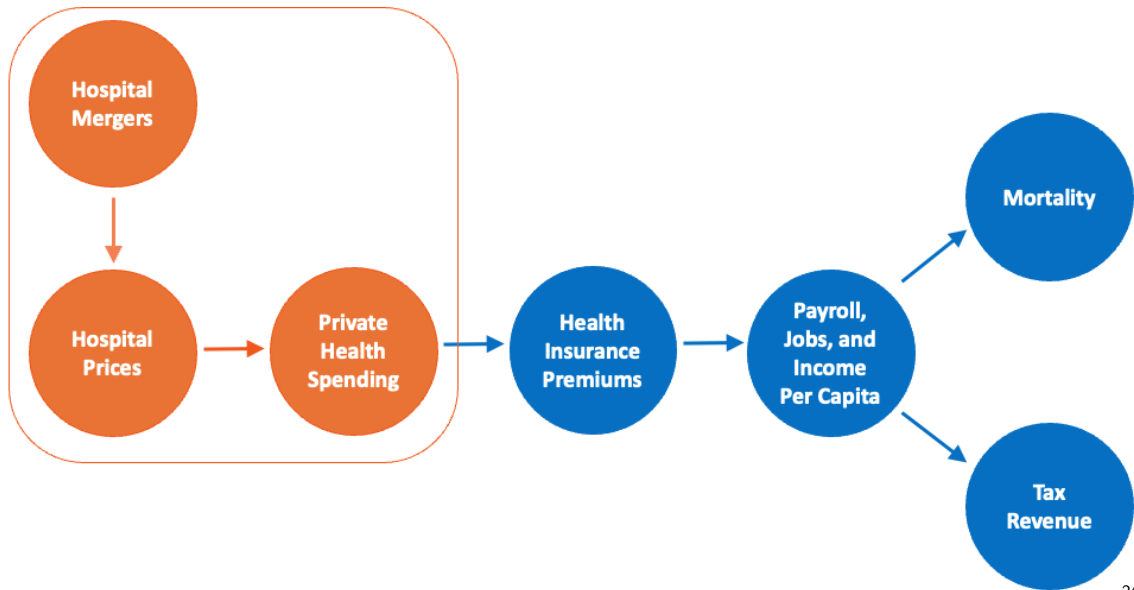


1. Build a panel of firms
2. Map health spending onto firms
3. Identify the price increases generated by mergers
4. Show how firm-level spending is impacted by mergers
5. Show you that the merger driven price increases are not related to firm-specific trends in labor outcomes

Problematic Mergers Are Not Correlated With Trends in Labor Outcomes



First-Stage: Mergers, Hospital Prices, and Health Spending

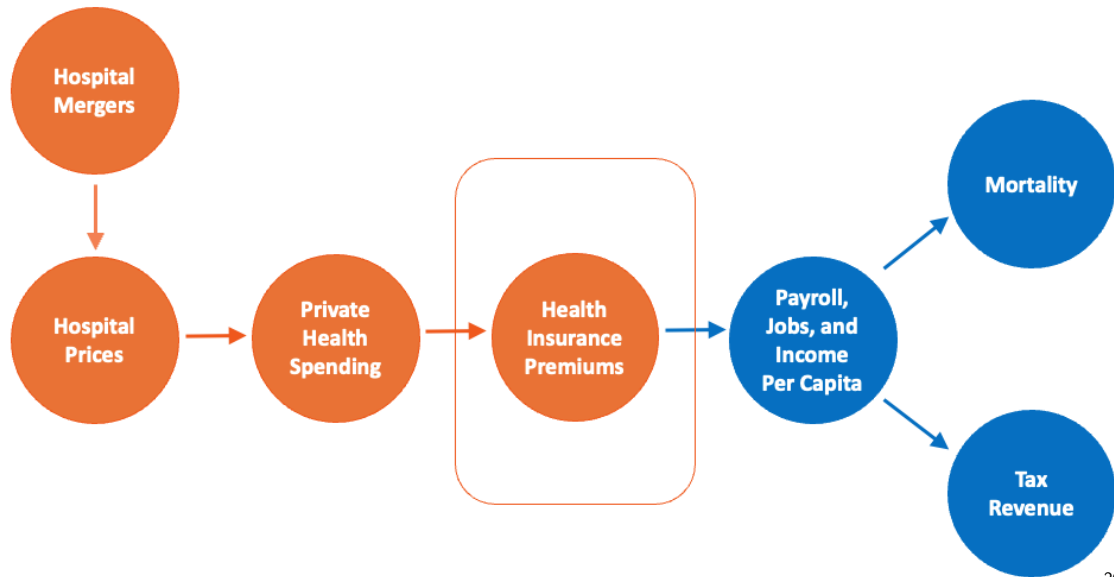


	Firm Level
	Post Merger (1)
First Stage	0.649*** (0.022)
Variation	All (Timing, Price Effects, Spending Shares)
Observations	1,403,000
F Stat	864.776

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses. Regressions include unit and year fixed effects. Standard errors are clustered at the unit-level. Data is at the unit-year level.

- First stage: Regress employer-level average spending on simulated employer-level spending (measured in percentage point increases)
- Variation in the price effects of our hospital mergers is critical to our research design
- Can rely on post-merger price increases or ΔWTP predicted price increases [▶ More details](#)

Premiums and HSA Use

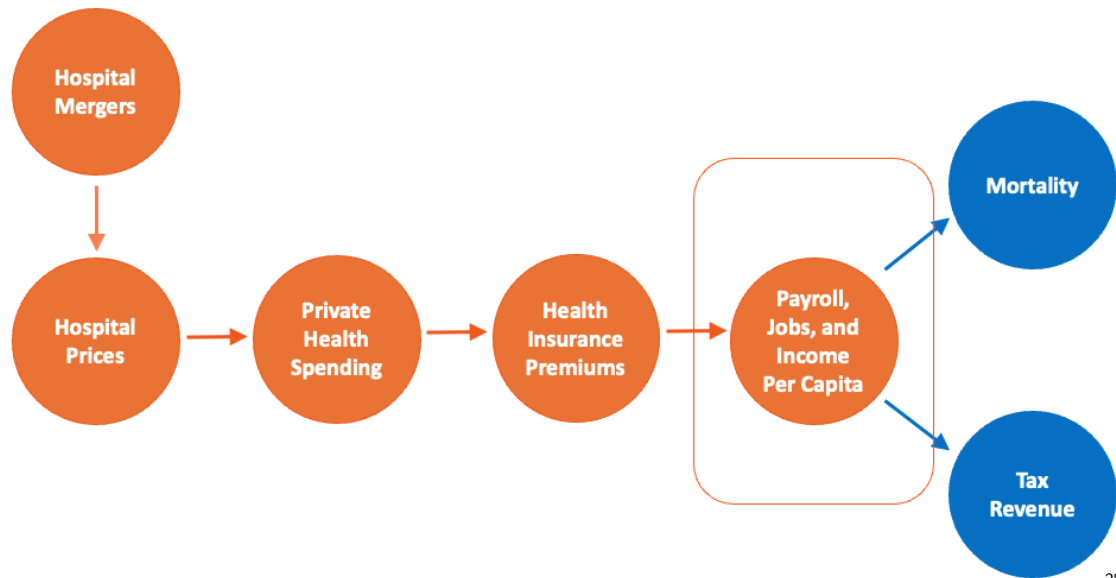


Insurance Market Outcomes

	Log(Insurance Premiums)	Share of Employees with HSA
Log(Spending)	0.947* (0.535)	0.0004 (0.042)
LSH Mean	5,036	0.038
Obs.	39,700	1,403,000
F Stat	43.391	864.776

- Measure employer health insurance premiums from DOL Form 5500
 - ERISA-mandated reporting for employers with >100 employees
 - Focus on fully-insured employers (uninformative for self-insured)
- Match on EIN to our sample of employers in the tax data (thus smaller sample size)
- Measure insurance generosity by whether employees take up Health Savings Account
 - Can only do if offered high-deductible health plan

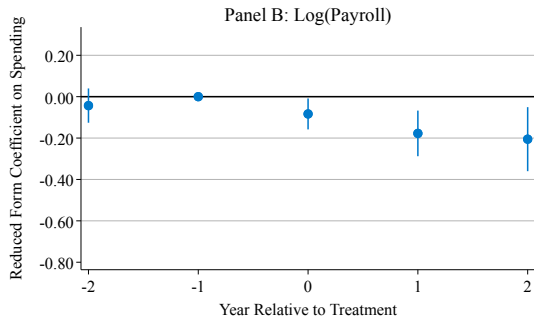
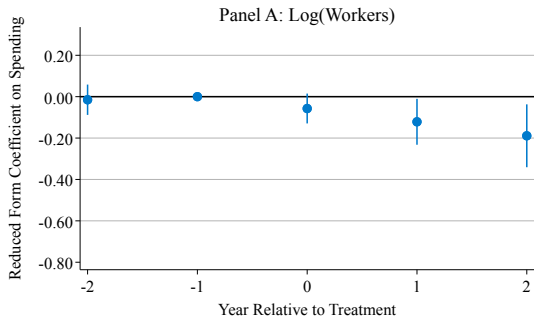
Rising Hospital Prices and Labor Market Outcomes



	All Employers	
	Log(Payroll)	Log(Workers)
	(1)	(2)
Log(Spending)	-0.362*** (0.130)	-0.356*** (0.129)
LHS Mean	12,721,000	297
Obs.	1,403,000	1,403,000
F Stat	864.776	864.7765

- Focus on two employer-level outcomes:
 - ① Log total payroll: Sum of wages across all W-2s for an employer
 - ② Log employment: Count of W-2s for an employer
- Results robust to:
 - ① Alternative versions of IV
 - ② Tossing out quarters of firms from our sample
- All our results are driven by changes at non-health care firms

Rising Health Spending and Non-Health Sector Firms' Payroll and Employment



Notes: Vertical lines are 95% confidence intervals. We regress the change in outcomes between $t + k$ and $t - 1$ on the change in spending between t and $t - 1$, instrumenting for the latter with the change in the instrument between t and $t - 1$. We do so for $k \in -2, 0, 1, 2$, excluding $k = -1$ as a normalization.

Putting the Scale of Our Results in Context

	Setting	Disemployment Response to 1pp Payroll Tax Increase
Anderson and Meyer (1997)	US, 1978-1984	0.7-0.9%
Gruber (1997)	Chile, 1979-1985	0.0-0.3%
Saez (2019)	Sweden, 2003-2013	1.0%
Benzarti and Harju (2021)	Finland, 1996-2015	3.4%
Johnston (2021)	US, 2003-2012	1.5%
Biro (2022)	Hungary, 2010-2015	0.3%
Guo (2023)	US, 2008-2013	1.1-2.4%
Lobel (2023)	Brazil, 2008-2017	0.5%
Our estimate	US, 2008-2017	1.7%

The Aggregate Effects of Rising Hospital Prices on Labor Market Outcomes

Concern: Perhaps we are simply observing reallocation of employees across firms

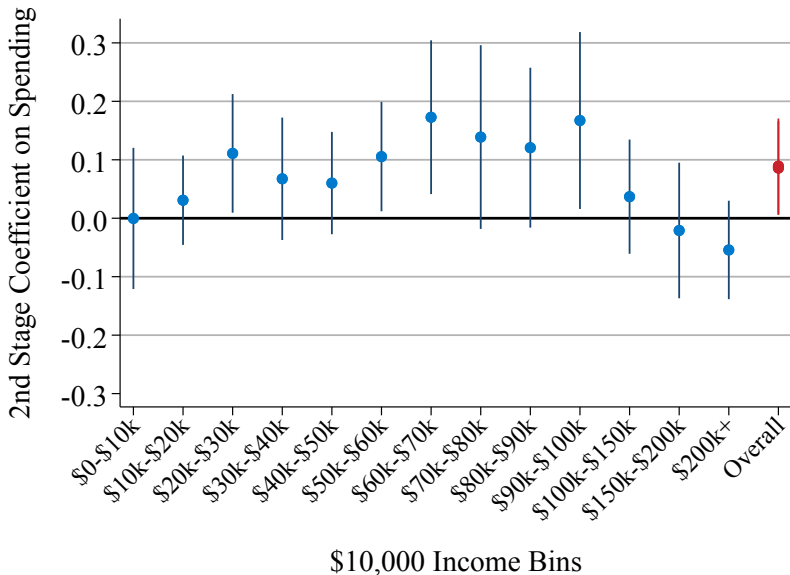
- Collapse our firm-level instrument to county-level based on firms' employees' county of residence (e.g., weighted average for a firm's employees' location)
- Focus on labor market outcomes of individuals 25-64 (likely recipients of ESI)
- Analyze three county-level labor market outcomes
 - ① Income per capita
 - ② Unemployment - receive UI or have zero income among those previously employed
 - ③ Federal income tax revenue

County-Level Labor Market Outcomes

	Log(Income Per Capita) (1)	Share Unemployed (2)	Log(Tax Revenue) (3)
Log(Spending)	-0.268* (0.149)	0.086** (0.041)	-0.358* (0.188)
LHS Mean	41,908	0.089	7,009
Obs.	17,090	17,090	17,090
F Stat	41.960	41.960	41.960

- County-level income reduction about 65% of employer-level payroll reduction
- Unemployment rises (measured through combo of no income and/or take-up of UI measured on 1099-G)
- Compensation shift from taxed wages to untaxed ESI reduces federal tax collection

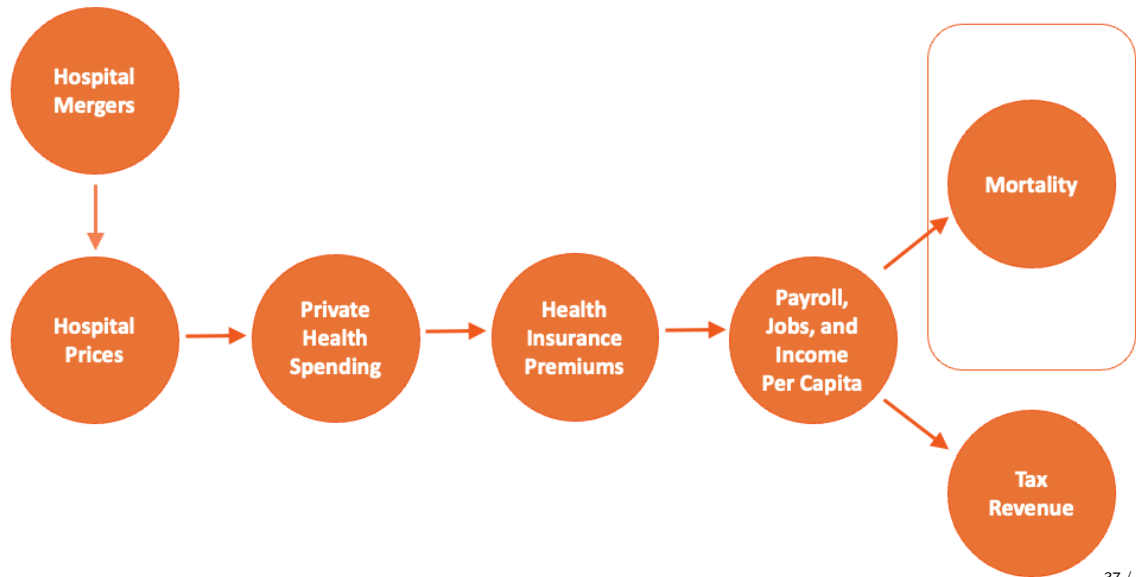
County-Level Employment Effects Across the Income Distribution



Efficiency Cost of Hospital Financing

- How much income lost per \$1 of revenue spent on hospitals?
- 1% increase in spending → 0.268% reduction in per capita labor income
- 0.268% reduction in per capita labor income: **\$112**
- 1% increase in spending: \$42
 - Multiplied by 2 enrolled lives per worker: **\$84**
 - Upper bound—lower when dependents include working spouses
- Around \$1.33 reduction in labor income per \$1 hospital revenue paid

Rising Hospital Prices and Deaths of Despair



The Effects of Job Losses on Health Are Devastating

- Job loss, particularly for men, can lead to a substantial increase in mortality
 - Sullivan and Von Wachter (2009): One death per 546 job losses via study of deaths of male workers in Pennsylvania in 1970s and 1980s
 - Eliason and Storrie (2009): One death for every 587 job losses via study of plant closures in Sweden in 1980s
 - Pierce and Schott (2020): One death for every 400 job losses via study of increases in trade with China in US in 2000s
 - Venkataramani et al. (2020): one opioid death per 300 job losses via study of automobile plant closures in the US in 2000s
- **Possible Mechanism:** Eliason and Storrie (2009): Job losses from establishment closures in the 1980s led to a substantial increases in hospitalizations from alcohol-related conditions, traffic accidents, overdoses, and self-harm

Measuring Mortality

- Measure the number of deaths per 100,000 population per county using the National Center for Health Statistics (NCHS) Restricted Vital Statistics from the Centers for Disease Control and Prevention
- Data capture information from all death certificates filed in the US and includes the causes of death
- Three Death Measures:
 - ① “Deaths of despair” following Case and Deaton (2020) and Piecre and Schott (2020), which include deaths from accidental poisonings, poisonings of undetermined intent, and suicides. Focus on individuals age 25-64.
 - ② “Deaths of despair” for individuals age 65 and older
 - ③ All deaths, minus deaths of despair
 - ④ All cancer deaths

Deaths of Despair

	Placebos			
	Deaths from Suicide and Overdoses per 100k Age 25-65	Deaths from Suicide and Overdoses per 100k Age 65+	All Deaths Excluding Suicide and Overdoses per 100k Age 25-65	Cancer Deaths per 100k Age 25-65
	(1)	(2)	(3)	(4)
IV Effect	61.873** (29.744)	-10.428 (9.589)	-39.985 (73.574)	6.362 (34.464)
LHS Mean	26.467	3.402	213.858	65.207
Observations	17,090	17,090	17,090	17,090
F Stat	41.960	41.960	41.960	41.960

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Our findings are consistent with prior estimates

	Setting	Time Period	Death per job losses
Sullivan and Von Wachter (2009)	USA (PA)	1970s, 1980s	1 in 546
Eliason and Storrie (2009)	Sweden	1980s	1 in 587
Pierce and Schott (2020)	USA	2000s	1 in 400
Vekataramani et al. (2020)	USA	2000s	1 in 300

We estimate*:

1 in 173

Notes: We measure labor market separations, not job losses, which may explain higher impact.

*Calculated as: $100,000 * (\text{IV coefficient on unemployment} / \text{IV coefficient on deaths})$.

Scaling the Effects of Hospital Mergers

The Effect of Mergers on Local Labor Markets

We can use our estimates to quantify the average effect of individual mergers on aggregate income, employment, and tax revenue, and mortality

- For mergers of interest, we compute the change in our instrument induced by those mergers for every county nation-wide
- We multiply this quantity by our first-stage estimate and then our IV estimate for the relevant outcome

Results

- The average effect of a merger that raised prices by 1.2%: \$6 million reduction in income, 39 job losses, and a \$1.3 million reduction in income tax revenue
- The average effect of merger that raised HHI by > 200 and led to post merger HHI $> 2,500$: \$16 million reduction in income, 110 job losses, \$6.8 million reduction in federal income tax revenue, and ≈ 1 death from suicide or overdose

Concluding Thoughts

The Consequences of Rising Hospital Prices in the US

- Because of the link between insurance and labor markets in the US, rising hospital prices from mergers is leading to lower employment and tax revenue
- So, who pays for merger-driven hospital price increases? **Workers**
- Ultimately, the merger-driven price increases are borne by those who do and **do not** necessarily consume care in a given year
- The labor market effects of rising prices play out differently for poor and wealthy workers, raising inequality
- Mergers don't just induce a transfer from consumers to producers: there is deadweight loss in the adjacent labor market from job losses and the death of workers
- More to come: we are now looking at which workers within the merging hospitals receive the revenues from the price increases