

# Consolidation in Healthcare Markets *Challenges for Researchers and Enforcers*

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# The Facts

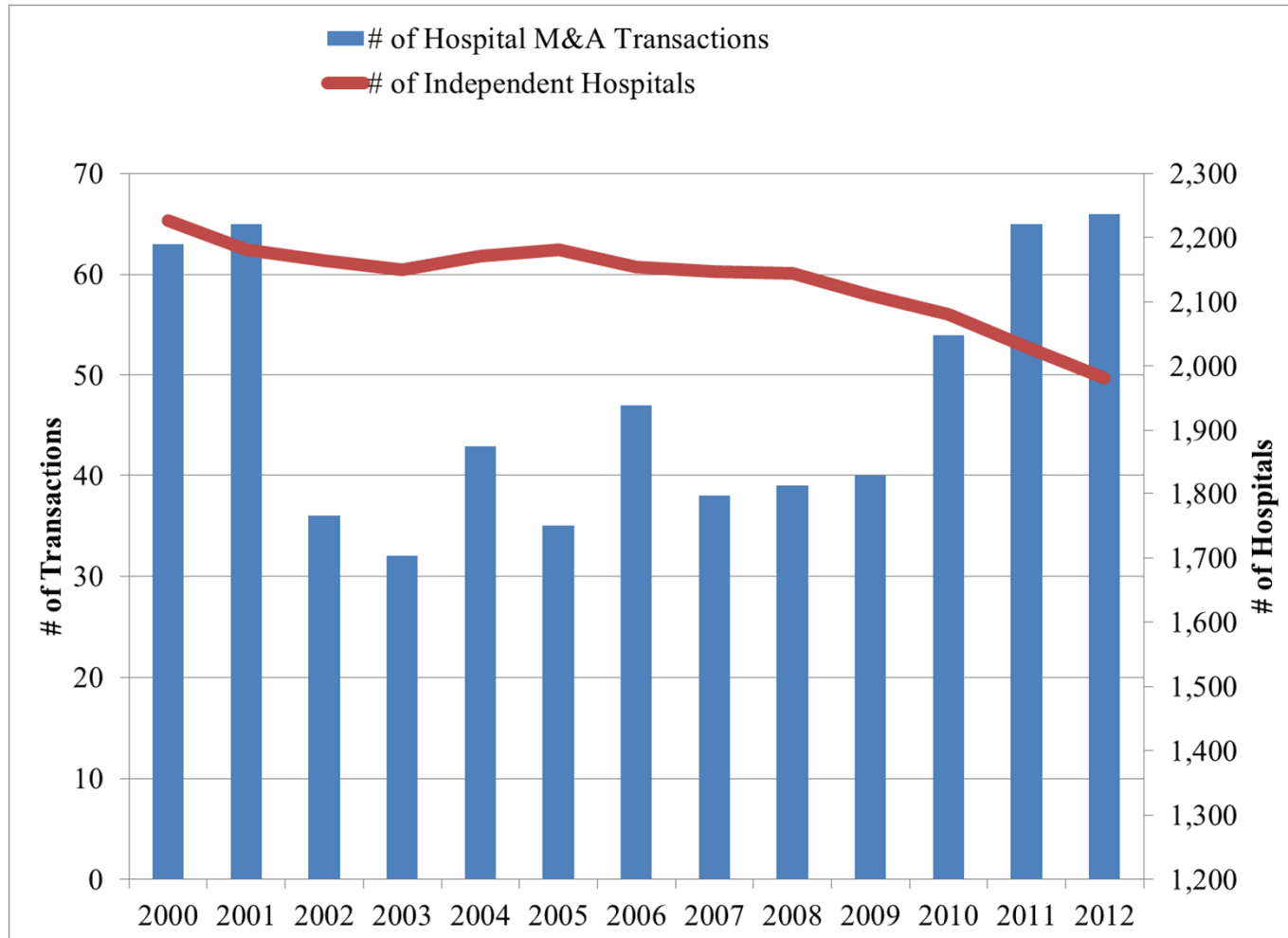
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*“Get your facts first, then you can distort them as you please.”*

**--Mark Twain**

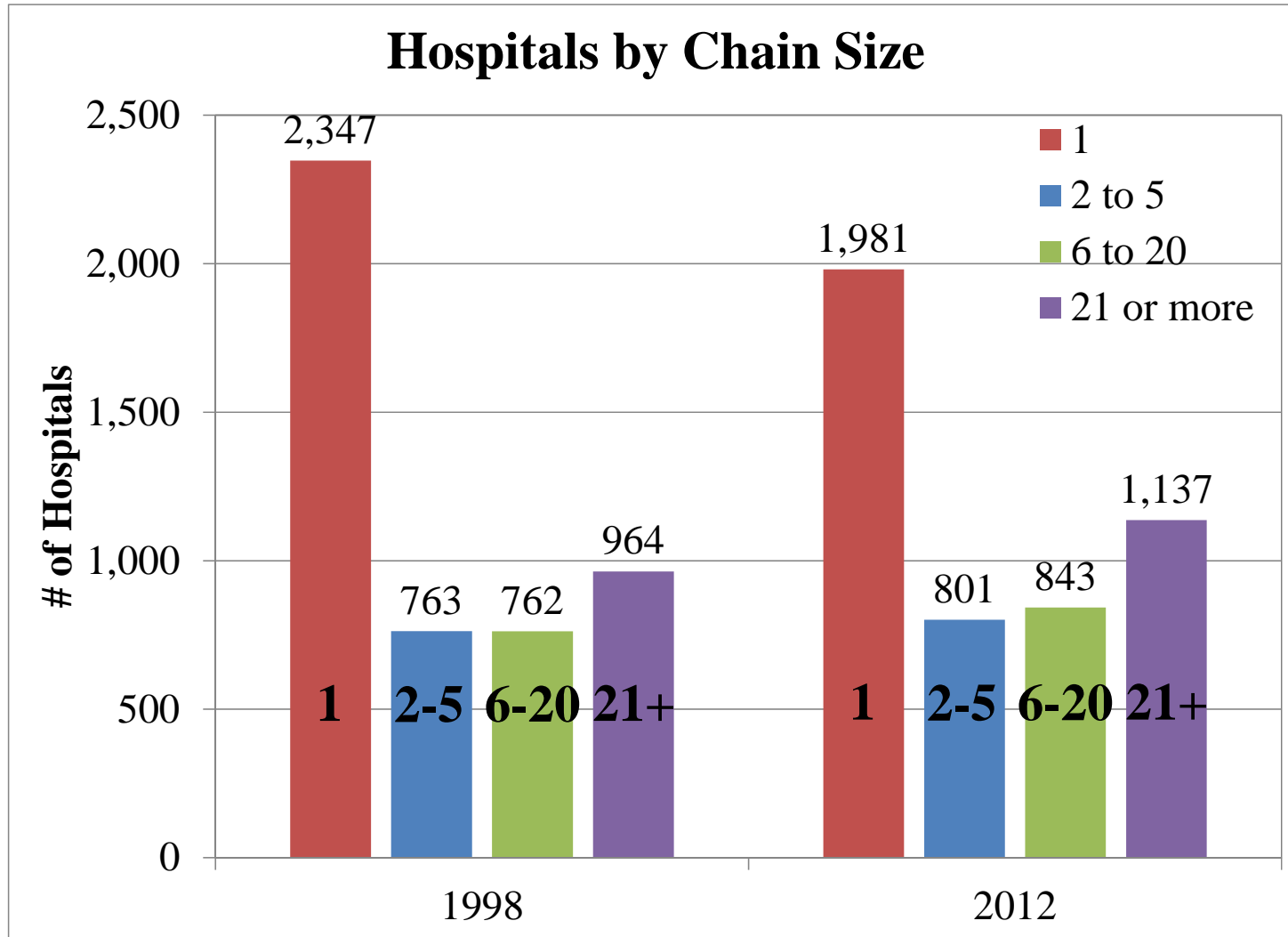


# Hospital consolidation is on the rise



Sources: Irving Levin Hospital Acquisition Reports, 1998-2013 and my tabulations

# Growth of large hospital chains is especially strong



# Other provider sectors consolidating as well

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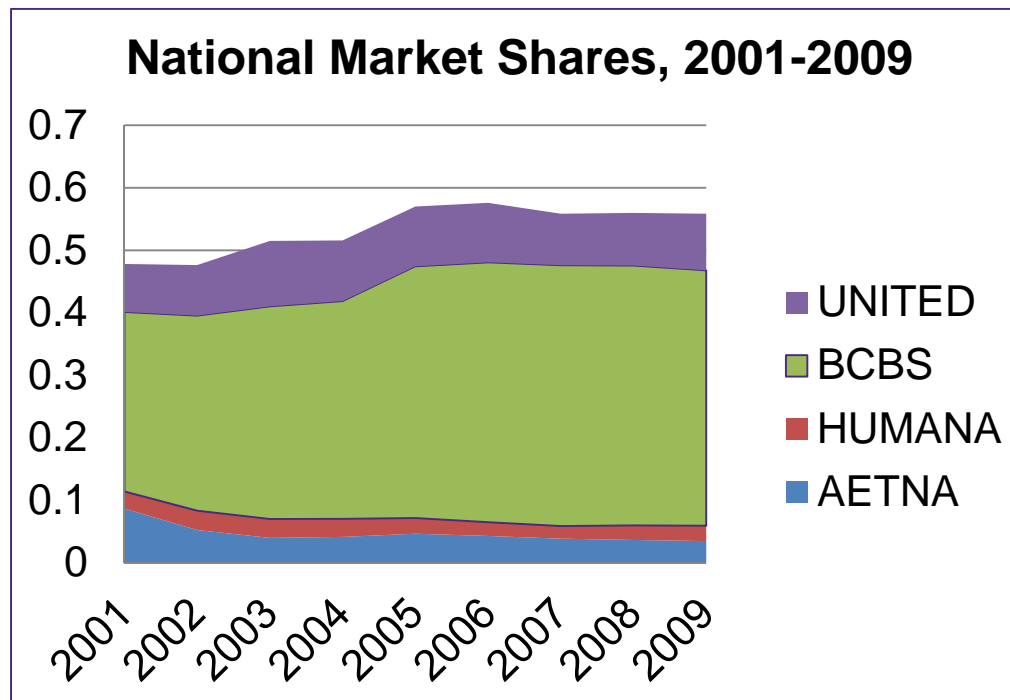
- Physician practices
  - Increase in mean practice size outside hospitals
  - Increase in hospital employment of MDs: 29% now employed by hospitals or hospital-owned practices (up from 16% in 2007)
- Dialysis clinics
  - Share of top two chains is ~2/3 (up from ~1/3 in 2000); jointly operate 3500+ clinics
- Long-term care pharmacies
  - Share of top two chains is now 57%; jointly operate 200+ pharmacies

Sources: American Medical Association, Cutler et al. 2013, FTC



# Insurance markets have become more concentrated, too

- 400+ mergers between 1996 and 2009
  - Recent examples: Aetna-Coventry, Wellpoint-Amerigroup
- Consolidation occurring within and across geo markets
  - More than half of metro areas have an insurer with >50% share



# Cross-provider and provider-payer integration

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- Hospital-physician acquisitions and joint ventures
- Other cross-provider partnerships
  - DaVita and Healthcare Partners
  - Kindred and Gentiva
- Payer-provider mergers and joint ventures
  - Highmark BC and West Penn Allegheny Health
  - Humana and Concentra (urgent care centers)
  - JV: Anthem and Cedars-Sinai, UCLA, others in LA



# So what? Maybe bigger is better

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- Little evidence this is true for horizontal combinations
  - Mergers of competing hospitals lead to higher prices and (likely) lower quality (Gaynor and Town 2012)
  - Recent studies suggest consolidation may also raise price in outpatient settings
    - Physician services (e.g., Dunn and Shapiro 2012)
  - Insurance mergers lead to higher premiums even though providers may be paid less (Dafny, Duggan and Ramanarayanan 2012)
- **But above pertains to combinations in same product and geographic market**





## So what? Maybe bigger is better, *continued*

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- Early evidence on non-horizontal integration is discouraging
  - Price and total spending increases in areas with increases in physician-hospital financial integration (Bundorf et al 2014)
  - Disappointing early results from ACOs
  - Independent hospitals acquired by systems outside their market raise price 14-18% (Lewis and Pflum 2014)
- **But it is proceeding anyway, and unscrambling eggs does not seem to be getting easier**



# Challenges for enforcers, part 1

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- Section 7: prohibits acquisitions where the effect “may be substantially to lessen competition, or to tend to create a monopoly”
- Where does that leave
  - Mergers that facilitate exercise of pre-existing market power
  - Mergers that facilitate price discrimination
  - Mergers that bundle services in distinct patient and/or geographic markets



## Challenges for enforcers, part 2

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- Evaluating efficiencies. Cognizable efficiencies are *merger-specific* and *verifiable*
  - “Efficiency claims will not be considered if they are vague, speculative, or otherwise cannot be verified by reasonable means.”

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“Population health management means services must be coordinated ... This requires hospital systems to provide a full suite of services for their patient populations, warranting expansion through acquisitions of other hospitals, as well as physician medical practices and outpatient clinics.” -Mt. Sinai CEO, *Wall Street Journal* 9/15/2015

“Each of us has always been focused on reducing costs...but we have the luxury of time now to analyze the operations for efficiencies.”

-Advocate Healthcare CEO, post 9/2014 merger announcement

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- Mass mailing of *Horizontal Merger Guidelines* (or 1996 *Healthcare Statements*) in order?

# Challenges for enforcers, part 2 *continued*

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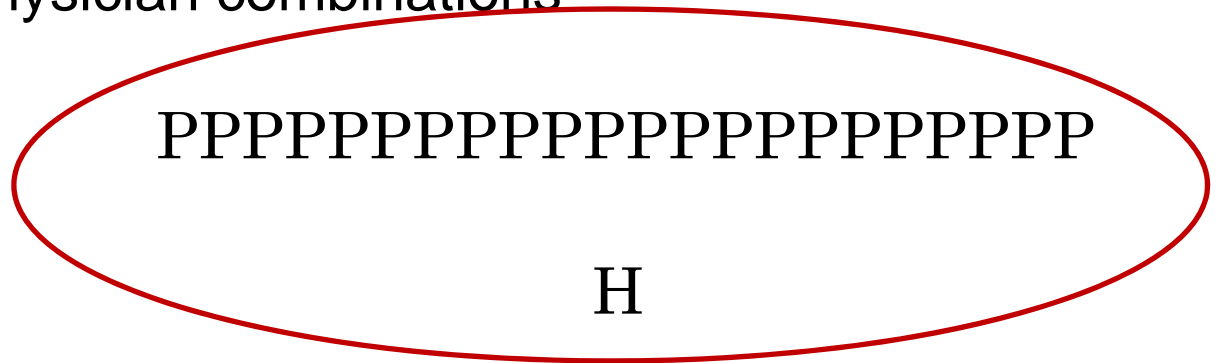
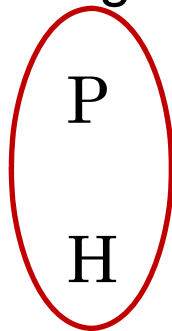
- Quantifying cognizable efficiencies will be tricky
  - Usual danger of confirmatory bias
    - “People tend to test hypotheses in a one-sided way, by searching for evidence consistent with their current hypothesis” *Wikipedia*
    - E.g., looking for economies of scale in cardiac surgery conditional on location
  - Can’t assume cost-minimization
    - Fee-for-service is still rampant



# Challenges for Researchers

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- Theoretical and empirical research on cross-market combinations of all kinds
- Need to identify empirical effects and also mechanisms generating those effects
  - E.g. hospital-physician combinations



- Needs to consider effect on total area costs, not just merging components
  - Maybe no change in price, but redirection of patients to more expensive providers (e.g. academic medical centers)



# Taking on that challenge...

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- How might provider combinations across non-overlapping end-user markets generate a “lessening of competition”? (Dafny, Ho and Lee *work in progress*)
- Previous approach requires patients to view providers as substitutes *at point of service* for a merger of those providers to enable a higher negotiated price



# Background

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- WTP(G) for a hospital network G. For a given hospital A, define:

$$\Delta WTP_A = WTP(G) - WTP(G \setminus A).$$

- Assume that insurer M and hospital H bargain over gains from trade

$$p^* = \operatorname{argmax} [\Pi_M(WTP(G)) - p - \Pi_M(WTP(G \setminus H))] \times [\Pi_H(G) + p - \Pi_H(G \setminus H)]$$

- If hospitals A and B are substitutes (for a given patient), then

$$\Delta WTP_{A,B} > \Delta WTP_A + \Delta WTP_B$$

– Result: if 2 substitutes merge,  $p^*$  will increase

- If  $\pi_M$  is linear in WTP, then no effect of merger when

$$\Delta WTP_{A,B} = \Delta WTP_A + \Delta WTP_B$$


# What if the insurer maximizes profits?

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$$p^* = \operatorname{argmax} [\Pi_M(WTP(G)) - p - \Pi_M(WTP(G \setminus H))] \times [\Pi_H(G) + p - \Pi_H(G \setminus H)]$$

- Concavity of  $\pi_M$  is sufficient to generate an impact of from a combination of noncompeting providers
- *Example 1:* monopolist MCO and simple logit demand with outside option:

$$D(WTP) = \frac{\exp(WTP)}{1 + \exp(WTP)}$$


$$\Pi_M = D(WTP) * (\text{premium} - mc) - FC$$

$$\frac{\partial^2 D}{\partial WTP^2} < 0 \rightarrow \frac{\partial^2 \Pi_M}{\partial WTP^2} < 0$$



## What if the insurer maximizes profits? *cont*

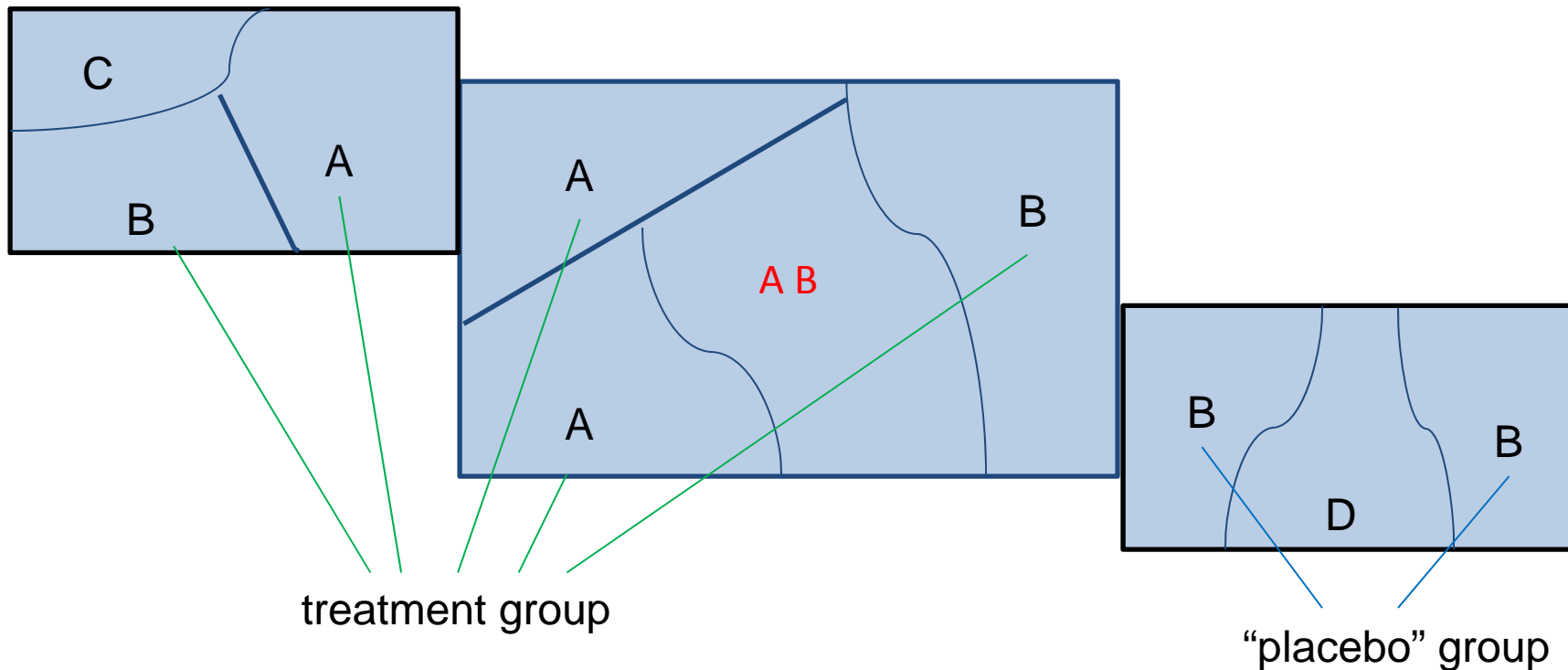
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- *Example 2*: non-zero insurance plan switching costs
  - Generalizing the insurer's objective function expands the set of combinations possibly generating price increases: any combination of providers with nonzero WTP can reduce insurer's disagreement payoff
  - Limiting principle: purchasers of insurance (i.e. consumers over which WTP is aggregated) must value both merging parties, e.g. employers with employees in distinct provider markets
  - Future work: what if insurers value providers across different markets (even if consumers do not)?
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# Empirical Approach: Overview

Question: how does price change if a hospital gains a system member in an adjacent geographic market, *all else equal*?

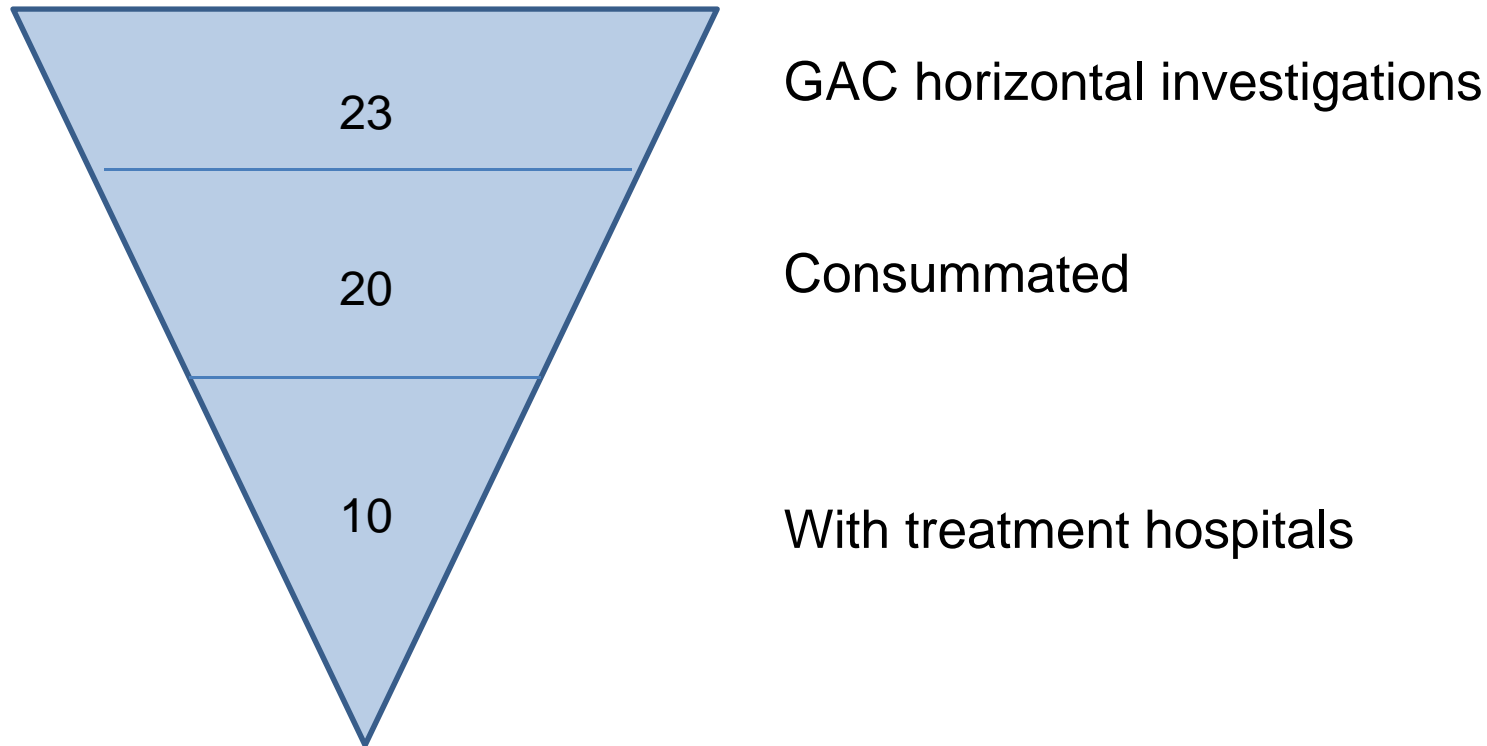
Approach: Study effect of horizontal mergers on bystanders



Notes: Each rectangle is a state; each market is an HSA.

# Empirical Approach: Identifying Mergers

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Treatment group: 113 hospitals  
Placebo group: 29 hospitals

Note: excludes 2 consummated transactions currently being litigated

# Data

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- Healthcare Cost Report Info System (HCRIS), 1996-2013
  - Price = non-Medicare net inpt revenue/non-Medicare admissions
  - Case Mix Index
  - Urban/rural (0/1 derived from rural-urban continuum code)
  - Census division (9 areas)
  - For-Profit status (0/1)
  - Beds
- American Hospital Association *Annual Survey*
  - System identifiers (verified/supplemented through online searches)
- FTC Merger Investigation List
  - Overlap HSA




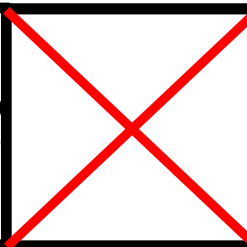
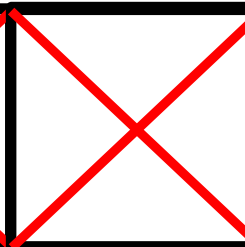
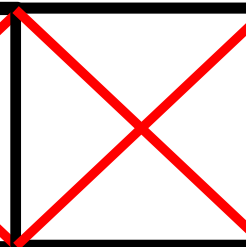
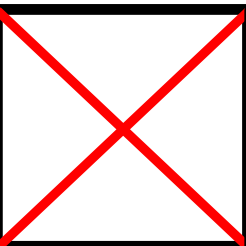
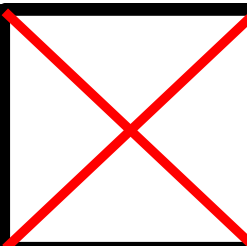
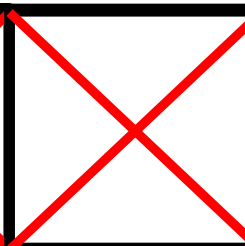
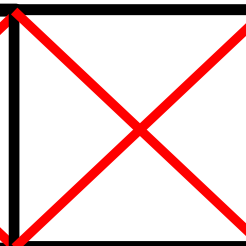
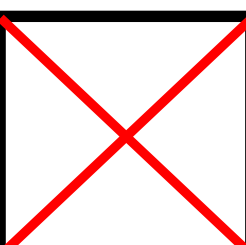
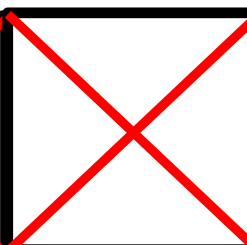
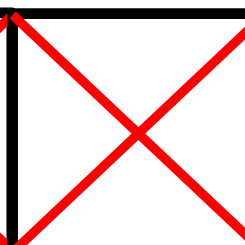
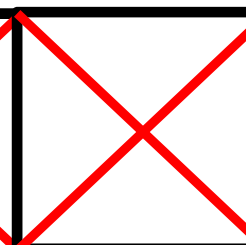
# Empirical Approach: Matching Control Hospitals

Step 1: exact match of Census Division, Urban/Rural status, and For-Profit status

Treatment hospital i



Division 1  
Urban  
Not-for-profit


	Urban, NFP	Rural, NFP	Urban, FP	Rural, FP
Division 1				
Division 2				
...				
Division 9				

# Empirical Approach: Matching Control Hospitals, *continued*

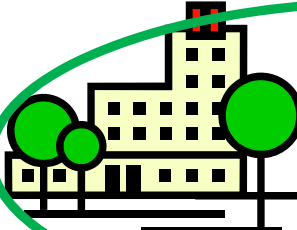
Step 2: find 2 closest matches in terms of beds and CMI




$$x_i \equiv (beds_i, CMI_i)$$



hospital a

$$d(x_i, x_a) = .14$$


hospital b

$$d(x_i, x_b) = .04$$


hospital c

$$d(x_i, x_c) = .62$$

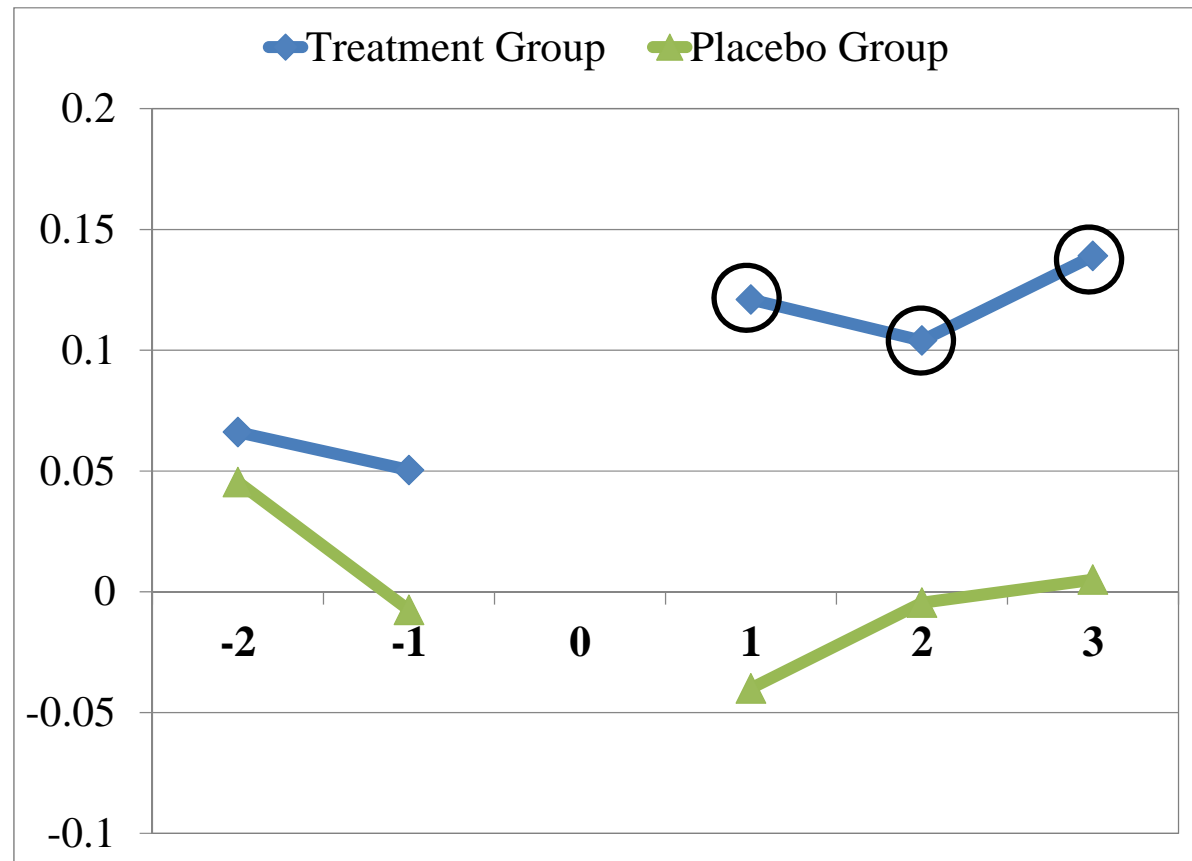
Standardized Euclidean distance:

$$d(x_i, x_j) = \sqrt{\left(\frac{beds_i - beds_j}{\sigma_{beds}}\right)^2 + \left(\frac{CMI_i - CMI_j}{\sigma_{CMI}}\right)^2}$$

# Results: Effects on Treatment & “Placebo” Groups

$$\ln(p_{ij}) = \alpha_i + \gamma_j + \beta \cdot \ln(CMI_{ij}) + \sum_k \lambda_k \cdot 1[j = \tau_i + k] + \varepsilon_{ij}$$

$(k = -2, -1, 1, 2, 3)$   
 $i = \text{hospital}$   
 $j = \text{year}$   
 $\tau_i = \text{year } i \text{ affected}$   
 $\text{by merger}$



⊙ denotes  $p < 0.05$ . Std errors clustered by hospital, observations weighted by mean discharges

# Results: Pooled Pre and Post Periods

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	<b>Treatment</b>	<b>Placebo</b>
post*treatment	0.067*	-0.020
	(0.036)	(0.092)
post	0.101***	0.080
	(0.030)	(0.085)
ln(cmi)	0.132	0.054
	(0.312)	(0.913)
N	658	155
R-sq (within)	0.157	0.042
# of hospitals	334	81

Notes: Standard errors are clustered by hospital, observations weighted by mean discharges





# Preliminary Conclusions and Implications

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- Adding adjacent system members (=hospitals in different HSAs and same state) appears to increase price; no sig effect on system members not gaining an adjacent hospital
  - If result holds up, implies hospitals in different markets constrain one another's pricing
- If robust, suggest broadening criteria for deal investigations
  - But there must also be a limiting principle

