Effects of Mergers and Closures

Estimation and Identification of Merger Effects: An Application to
Hospital Mergers

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Overview

Find unbiased estimates of the effect of mergers by using physical colocation as an instrument

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Dafny avoids the endogeneity problems of the previous reduced-form literature and finds large, significant price increases resulting from hospital mergers from 1989-1996.

Key Insights

1. Comparing merging firms to nonmerging rivals yields substantial underestimates
2. Mergers of independent hospitals lead to large increases in prices
3. Estimates are consistent with structural model predictions
4. Most geographic definitions of a hospital market for urban areas are too large

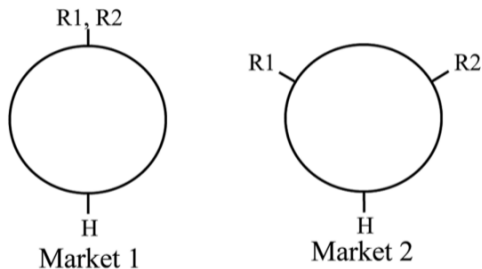# Salop's Circular City (1979)

FIGURE 2
THE CIRCULAR MARKET

- location of firms is exogenous
- consumers are uniformly distributed
- transport cost td_{ij}
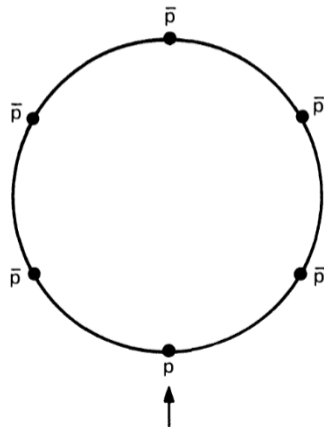
Modeling Colocation

- 'Colocated' hospitals must be within 0.3 miles and 5 blocks of each other
- 'Rival' hospitals have two or more rivals within 7 miles

Institutional Background

- Financial pressures motivated hospitals to consolidate
- 74 mergers (1983-1988) vs 190 mergers (1989-1996)
- Economists tend to focus on cost pre- and postmerger
  - big endogeneity problem!
  - may find no relative price increase but a large absolute price increase

Data

Data from Dranove and Lindrooth (2003)

- American Hospital Association (AHA)
    - Annual Survey of Hospitals
    - Annual Guide to Hospitals
- CMS Prospective Payment Impact Files
    - Case-Mix Index (CMI) for Medicare patients
- Healthcare Cost Report Information System
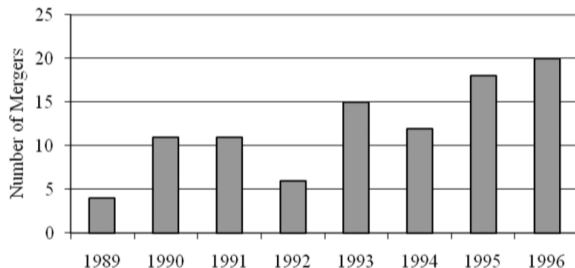- Tele Atlas's Geocode.com

Figure 2. Timing of independent hospital mergers 1989–96 (Dranove and Lindrooth 2003)

First Stage

Table 2
Relationship between Merger/Rival Merger and Colocation/Rival Colocation: First Stage

	Own Merger		Number of Rival Mergers	
	(1)	(2)	(3)	(4)
Colocated	.066**	.062**		
	(.016)	(.016)		
Colocated rival pairs			.119**	.112**
			(.018)	(.019)
Hospital characteristics:				
For profit	−.005	.003	.071	.090*
	(.009)	(.009)	(.044)	(.046)
Government	−.045**	−.037**	−.067	−.045
	(.007)	(.008)	(.047)	(.047)
Teaching hospital	.027*	.022	−.008	−.006
	(.015)	(.015)	(.045)	(.044)
Medicaid share	.040	.037	.399**	.321*
	(.031)	(.032)	(.130)	(.130)
Debt/asset ratio	−.009	−.008	−.006	−.059
	(.008)	(.008)	(.049)	(.048)
Occupancy rate	.012	−.004	.189	−.125
	(.020)	(.021)	(.120)	(.126)

Effects on Price Growth

Table 3
Relationship between Price Growth and Rival Colocation: Reduced Form

	ln(1988 Price) − ln(1985 Price)		ln (1997 Price) − ln(1988 Price)		ln (2000 Price) − ln(1997 Price)	
	(1)	(2)	(3)	(4)	(5)	(6)
Colocated rival pairs	−.016	−.013	.045**	.034*	−.008	−.001
	(.010)	(.011)	(.014)	(.015)	(.013)	(.014)
Hospital characteristics:						
For profit	.001	−.009	−.087*	−.052	−.026	−.018
	(.024)	(.025)	(.035)	(.036)	(.027)	(.029)
Government	.062*	.056*	.021	.042	.023	.034
	(.025)	(.026)	(.037)	(.037)	(.034)	(.035)
Teaching hospital	−.052*	−.048*	.014	.018	−.013	−.007
	(.024)	(.024)	(.035)	(.035)	(.030)	(.031)
Medicaid share	−.501**	−.441**	.315**	.224*	.066	.059
	(.079)	(.082)	(.102)	(.103)	(.073)	(.077)
Debt/asset ratio	−.155**	−.040	.046	.004	.021	.012
	(.033)	(.035)	(.038)	(.038)	(.032)	(.034)
Occupancy rate	−.255**	−.024	.107	−.079	.025	.033
	(.071)	(.078)	(.093)	(.100)	(.073)	(.078)

Extensions and Robustness

Table 4

Effect of Rival Mergers on Price Growth: ln(1997 Price) − ln(1988 Price)

	Instrumental Variables		Ordinary Least Squares	
	(1)	(2)	(3)	(4)
Number of rival mergers	.376**	.301*	.016	−.003
	(.132)	(.147)	(.026)	(.027)
State fixed effects	No	Yes	No	Yes

Note. Hospital and market characteristics are included for all specifications. $N = 877$.
* Significant at $p < .05$.
** Significant at $p < .01$.

- Could it be that omitted factors (managed care) are affecting the changes in prices?
  - A firm in a more competitive market would be more sensitive to changes in v

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- Could it be that omitted factors (managed care) are affecting the changes in prices?
  - A firm in a more competitive market would be more sensitive to changes in v
- Results are robust to alternate definitions of colocation and market boundaries

Takeaways

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There is evidence that this results in increases in producer surplus, but there would have to be a massive quality improvement in order for this to increase consumer surplus.

Discussion

1. Is it fair to assume that the placement of hospitals in an area is exogenous?
2. What is the best way to regulate this kind of activity and prevent further losses to consumer surplus?
3. Salop's model has that consumers are uniformly distributed around the circle but of course that's not realistic - would these effects be larger if we restricted the sample to only rural areas?

References

Dafny, Leemore. 2009. Estimation and Identification of Merger Effects: An Application to Hospital Mergers. Journal of Law and Economics 52 (3): 523-50.

Salop, S. C. (1979). Monopolistic Competition with Outside Goods. The Bell Journal of Economics, 10(1), 141-156. https://doi.org/10.2307/3003323