BATES WHITE
ECONOMIC CONSULTING

Market concentration of hospitals

Cory Capps, PhD*
David Dranove, PhD**

June 2011

The analysis contained herein was performed at the request of America's Health Insurance Plans

* Partner, Bates White Economic Consulting, Washington, DC

** Walter McNerney Professor of Health Industry Management, Kellogg School of Management, Northwestern University, Evanston, IL

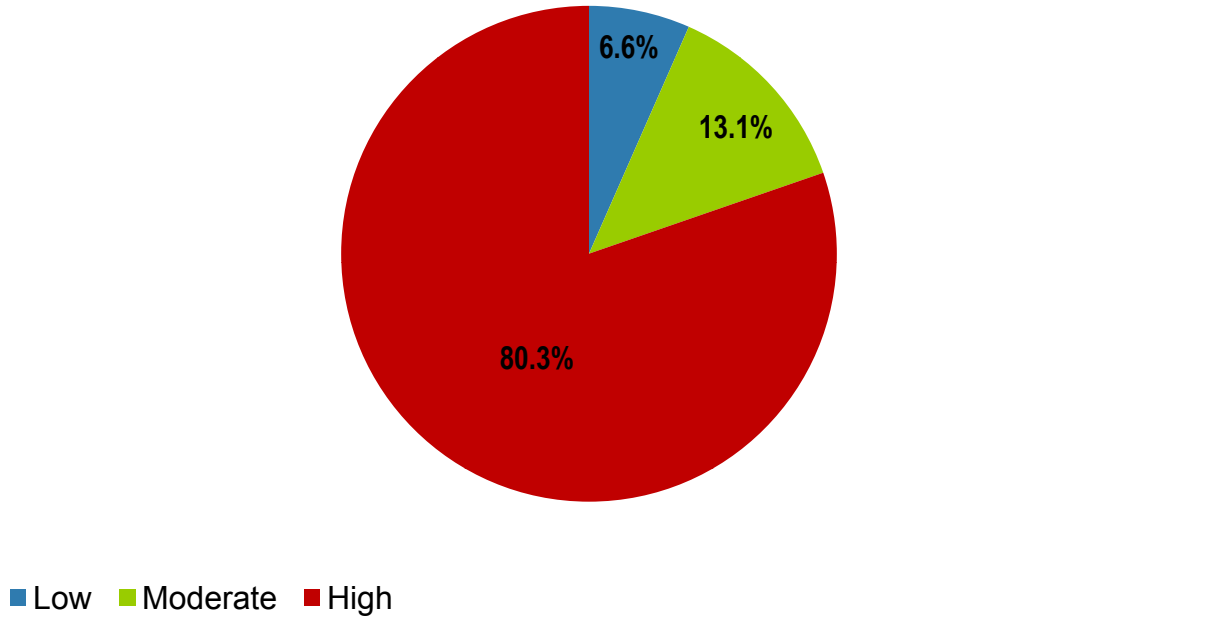
Summary of findings

- Based on DOJ and FTC thresholds, hospital ownership in 2009 is highly concentrated in 80% of metropolitan statistical areas (MSAs)
  - DOJ and FTC, *Horizontal Merger Guidelines* (August 19, 2010)
- This reflects a continuing trend that dates back to the 1990s
  - Over the last 20 years, hospital capacity in the United States has steadily shifted away from independent hospitals and towards multi-hospital systems
  - The Herfindahl-Hirschman Index (HHI) is a commonly used measure of concentration
    - 1997: Average of MSA-level HHIs of roughly 4200
    - 2006: Average of MSA-level HHIs of roughly 4650
    - 2009: Average of MSA-level HHIs of roughly 4700
  - DOJ and FTC guidelines define a market as "highly concentrated" if the HHI exceeds 2500
- Highly concentrated hospital markets remain an important policy issue
  - In an important survey article sponsored by the Robert Wood Johnson Foundation, Vogt and Town (2006) concluded that "research suggests that hospital consolidation in the 1990s raised prices by at least five percent and likely by significantly more."

1. The concentration of hospital ownership in 2009

In 2009, hospital ownership was "highly concentrated" in over 80% of the 335 MSAs in the AHA data

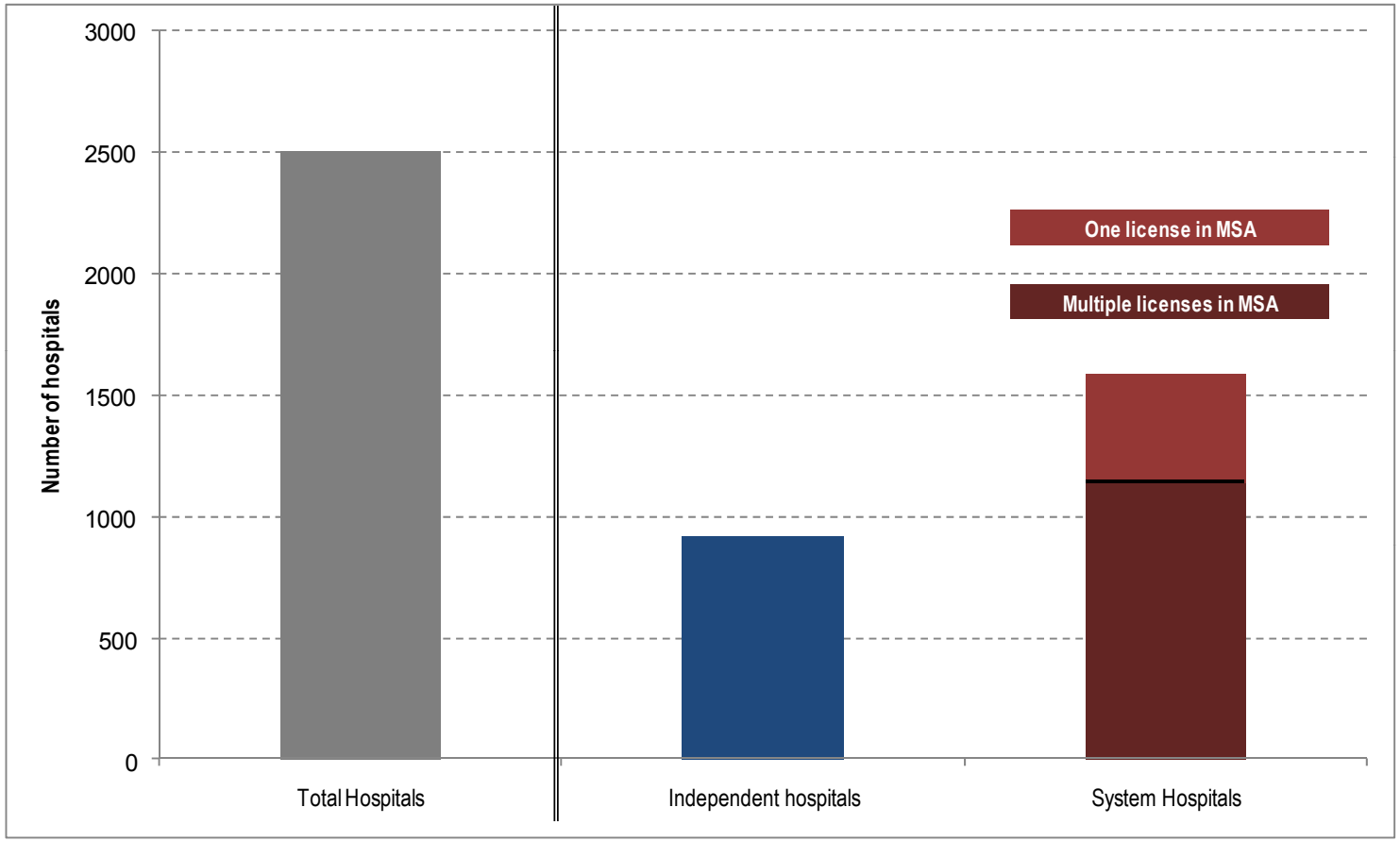
Degree of hospital ownership concentration in MSAs



Source: 2009 AHA Annual Survey

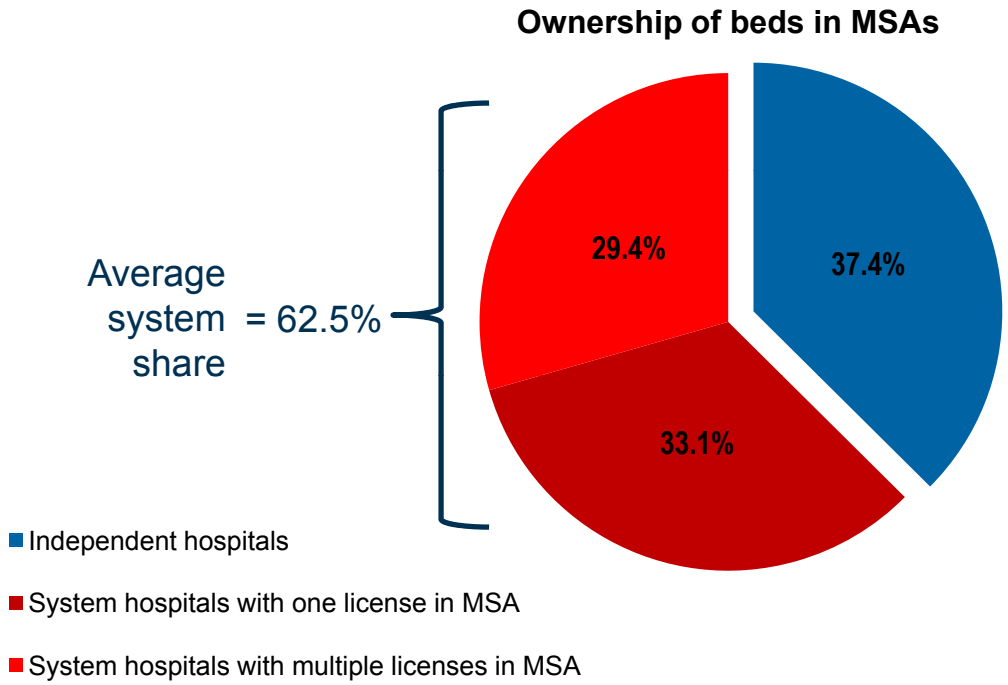
- Categorization is based on revised thresholds issued by the DOJ and FTC in August 2010
  - Low concentration: HHI < 1500
  - Moderate concentration: HHI between 1,500 and 2,500
  - High concentration: HHI > 2500

In 2009, 63% of hospitals in MSAs were members of systems



Source: 2009 AHA Annual Survey (numbers reflect only hospitals located in MSAs)

2009 Ownership of bed capacity, by system status



Source: 2009 AHA Annual Survey

- In the average MSA, systems own over 60% of beds, nearly half of which is attributable to systems with multiple hospitals in an MSA
- Weighting by MSA admissions (giving more weight to larger MSAs) shows that the typical patient resides in an MSA in which systems control over 60% of beds, over two-thirds of which is attributable to systems with multiple hospitals in the MSA

DOJ and FTC concentration thresholds

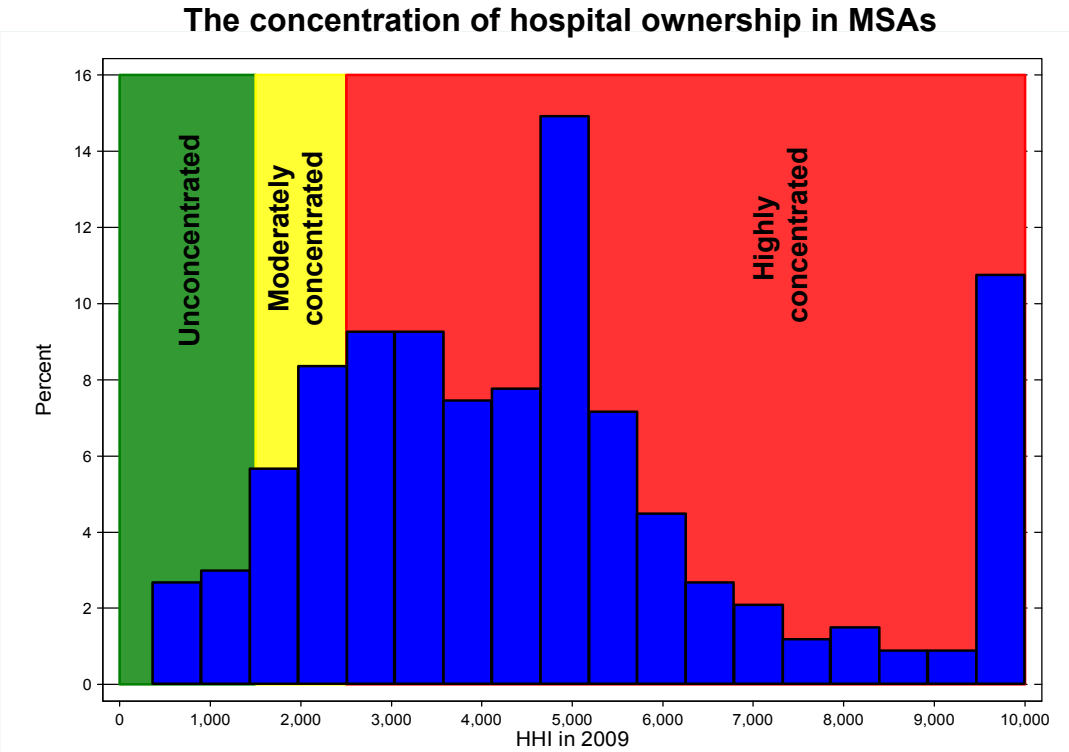
- The DOJ and FTC use the Herfindahl-Hirschman Index (HHI) to classify the degree of concentration in markets:
  - Unconcentrated: HHI below 1,500
    - "Mergers resulting in unconcentrated markets are unlikely to have adverse competitive effects and ordinarily require no further analysis"
  - Moderately concentrated: HHI between 1,500 and 2,500
    - "Mergers resulting in moderately concentrated markets . . . potentially raise significant competitive concerns and often warrant scrutiny"
  - Highly concentrated: HHI above 2,500
    - "Mergers resulting in highly concentrated markets . . . potentially raise significant competitive concerns and often warrant scrutiny"
  - Note: The DOJ and FTC issued these revised thresholds in an August 2010 update of the *Horizontal Merger Guidelines*

- The Herfindahl-Hirschman Index (HHI) is the sum of squared market shares
  - 4 firms with 25% share each: HHI = $25^2 + 25^2 + 25^2 + 25^2 = 2{,}500$

Note: MSAs are useful for summarizing national trends but may not correspond to relevant antitrust geographic markets

- Antitrust geographic hospital markets are often smaller than MSAs
- Relevant antitrust markets may be more concentrated than MSA-level statistics indicate

The distribution of MSA-level hospital ownership concentration in 2009 (as measured by the HHI)



- A more granular look at year 2009 MSA-level HHIs shows
  - Slightly more than 10% of MSAs have only one hospital owner
  - The majority of the highly concentrated MSAs have HHIs between 2,500 and 5,000
    - 2,500 ≡ four equal-size firms
    - 5,000 ≡ two equal-size firms (duopoly)

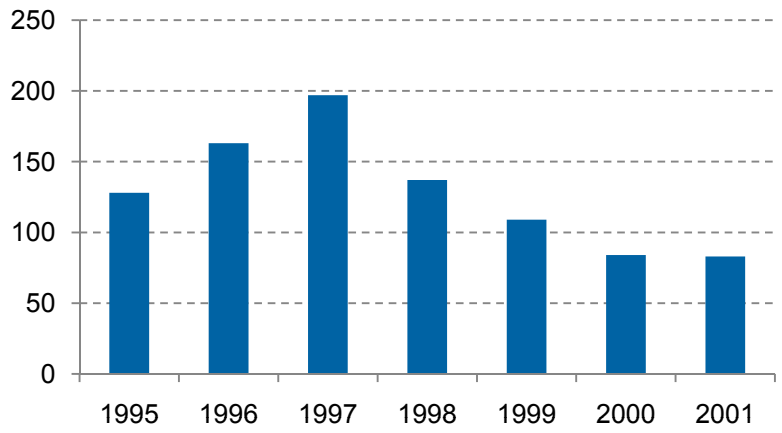
2. How hospital ownership became highly concentrated

The hospital merger wave of the 1990s

- Economists Robert Town and Bill Vogt published a survey, commissioned by the Robert Wood Johnson Foundation, of the literature on the effects of hospital consolidation
  - Vogt, W., and R. Town. "How Has Hospital Consolidation Affected the Price and Quality of Hospital Care?" RWJF Research Synthesis Report No. 9, February 2006

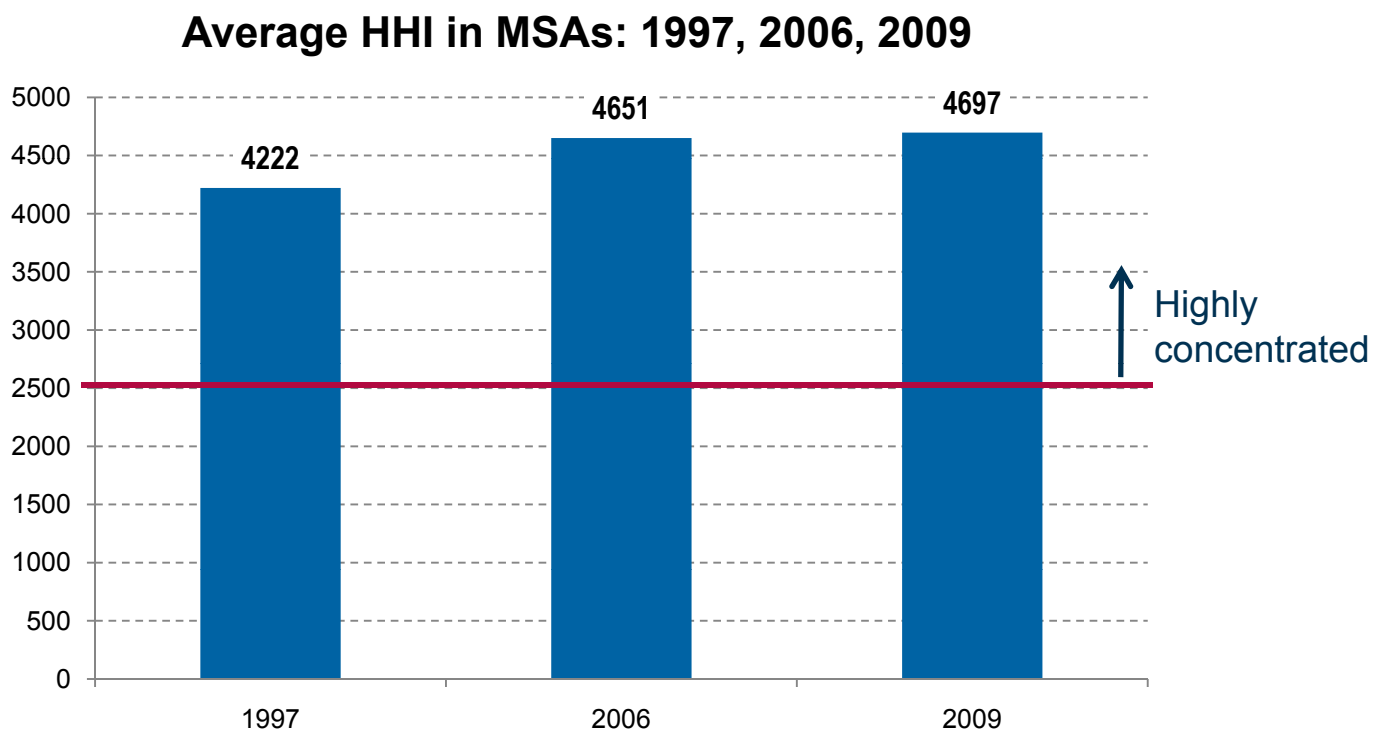
Over the 1990s the hospital industry underwent a wave of consolidation that transformed the inpatient hospital market place. By the mid-1990s, hospital merger and acquisition activity was nine times its level at the start of the decade. The wave of mergers dramatically increased market concentration for inpatient hospital services as measured by the Herfindahl Hirschman Index.

Annual hospital M&A announcements



Source: Irving Levin Associates Hospital M&A reports

By 1997, most MSAs were highly concentrated and concentration has increased steadily since then



- From 1997 to 2009, the average HHI increased from 4222 to 4697, an increase of 11%.

Sources: (1) Cory Capps, "Price implications of hospital consolidation," *The Healthcare Imperative: Lowering Costs and Improving Outcomes*, Ch. 5, Institute of Medicine of the National Academies (2010): 177–187; (2) 2006 AHA Annual Survey; (3) 2009 AHA Annual Survey

The 2010 Massachusetts study of Health Care Cost Trends*

- The Massachusetts Division of Health Care Finance and Policy and the Attorney General gathered data on healthcare costs
- With respect to hospital costs and pricing, the report concludes that:
  - *Increased prices were found to be the most important factor driving rising health care spending*
  - *Price variations are not correlated to (1) quality of care, (2) the sickness of the population served or complexity of the services provided, (3) the extent to which a provider cares for a large portion of patients on Medicare or Medicaid . . . or (5) . . . differences in hospital costs of delivering similar services at similar facilities*
  - *Price variations are correlated to market leverage as measured by the relative market position of the hospital or provider group compared . . . .*
  - *Price increases, not increases in utilization, caused most of the increases in health care costs during the past few years in Massachusetts*
  - *Higher priced hospitals are gaining market share at the expense of lower priced hospitals, which are losing volume*

* Notes:

- Massachusetts Health Care Cost Trends, 2010 Final Report, http://www.mass.gov/Eeohhs2/docs/dhcfp/cost_trend_docs/final_report_docs/health_care_cost_trends_2010_final_report.pdf
- See also, Office of Attorney General Martha Coakley, "Examination of Health Care Cost Trends and Cost Drivers," March 16, 2010 at http://www.mass.gov/Cago/docs/healthcare/final_report_w_cover_appendices_glossary.pdf

3. Recent trends: 2006–2009

Recent trends

1. Hospital consolidation continues at a steady, albeit reduced, pace
   - Most MSAs were already highly concentrated by 1997
   - From 2006 to 2009, both the unweighted and weighted average HHIs across MSAs increased by more than 50 points
2. Federal hospital merger enforcement has reappeared
   - 2002: FTC launches hospital merger retrospective "to determine whether there is evidence of anticompetitive effects [from particular hospital mergers]"
     - http://www.ftc.gov/opa/2002/08/mergerlitigation.shtm
   - 2004: FTC sues to unwind a 2000 merger in Evanston, IL
     - Prevailed on the substance, but no divestiture
     - http://www.ftc.gov/os/adjpro/d9315/index.shtm
   - 2008: FTC sues to block a proposed merger in Northern Virginia
     - Acquirer abandoned the deal after the FTC sued
     - http://www.ftc.gov/os/adjpro/d9326/index.shtm
   - 2011: FTC sues to unwind a consummated merger and to prospectively block another
     - Outcomes as yet unknown
     - Ohio: http://www.ftc.gov/os/adjpro/d9346/index.shtm
     - Georgia: http://www.ftc.gov/os/adjpro/d9348/index.shtm

From 2006 to 2009, the HHI increased by 500 or more points in 30 MSAs

Change in HHI from 2006–2009	Number of MSAs	Degree of change in HHI
-10,000 to -2,000	1	Large decrease
-2,000 to -1,500	3	
-1,500 to -1,000	2	
-1,000 to -500	9	
-500 to 0	116	Modest change
0	40	
0 to 500	134	
500 to 1,000	19	Large increase
1,000 to 1,500	6	
1,500 to 2,000	3	
2,000 to 10,000	2	

Source: 2006, 2009 AHA Annual Survey

- Over the 3 years from 2006 to 2009:
  - Most MSAs saw modest changes in the HHI
  - The average HHI across MSAs increased by 61 points
  - 30 MSAs saw increases in the HHI of more than 500 points
  - Large increases in the HHI outnumbered large decreases by a 2-to-1 margin

4. Hospital ownership concentration in selected areas

Selected areas

- Examine ownership concentration in selected areas in which hospital systems have been alleged to possess market power
- We do not independently review evidence on or reach conclusions regarding pricing or market power

Markets selected for examination

Area	Basis for market power concern
San Francisco Bay Area	▪ 2001 *State of California v. Sutter* hospital merger case ▪ 2011 study of price increases following Sutter's acquisition of Summit Alta Bates
Northern Virginia	▪ 2008 *FTC v. Inova* hospital merger case
Boston Area	▪ 2010 Massachusetts AG and DHCFP Reports
Toledo Area	▪ 2011 *FTC vs. ProMedica* federal district court hospital merger decision

Hospital ownership concentration in the San Francisco Bay Area

- 2000: The California Attorney General loses its attempt to block Sutter Health's acquisition of Summit Medical Center
  - Sutter also owned Alta Bates Medical Center, located 2.5 miles away
- 2011: Steven Tenn's study of the price effects of Sutter's acquisition of Summit
  - "Summit and Alta Bates were located in a large urban area with many other hospitals that offered a similar range of services . . . A central issue raised by the Sutter–Summit transaction was whether . . . travel costs were sufficiently low that the presence of other hospitals would prevent an anticompetitive price increase. Our results suggest they were an insufficient constraint."
  - "Although Alta Bates' post-merger price change is similar to the price change for other hospitals, **Summit's price increase is one of the largest of any comparable hospital in California**. The empirical evidence indicates that, for this transaction, the merger of a higher-priced hospital with a lower-priced competitor produced two higher-priced hospitals"
  - Based on an analysis of pre- and post-merger claims data obtained by the FTC

Sutter Health's share in the Bay Area (2009)

- Shares are in a 30-minute drive time radius around downtown San Francisco (San Francisco County and parts of Marin, Alameda, Contra Costa, and San Mateo)

System	Hospital	Beds	Shares[1]		
			Beds	Non-government admissions	Non-government inpatient days
Sutter	Alta Bates Summit Medical Center	355	6.6%	9.7%	9.1%
	Alta Bates Summit Medical Center - Summit Campus	408	7.5%	5.2%	5.9%
	California Pacific Medical Center	798	14.7%	15.9%	13.1%
	Mills-Peninsula Health Services	389	7.2%	9.3%	5.4%
	St. Luke's Hospital	229	4.2%	2.5%	3.0%
	SUBTOTAL	**2,179**	**40.2%**	**42.7%**	**36.5%**
Catholic Healthcare West	Saint Francis Memorial Hospital	239	4.4%	3.1%	2.8%
	Sequoia Hospital	173	3.2%	6.3%	3.4%
	St. Mary's Medical Center	232	4.3%	3.0%	2.2%
	SUBTOTAL	644	11.9%	12.4%	8.5%
Independent / System hospitals with one license in the area	Alameda Hospital	131	2.4%	1.1%	1.5%
	Chinese Hospital	54	1.0%	0.3%	0.2%
	Doctors Medical Center-San Pablo Campus	140	2.6%	2.1%	1.4%
	Marin General Hospital[2]	235	4.3%	5.8%	3.5%
	San Francisco General Hospital Medical Center	501	9.3%	9.0%	11.0%
	San Mateo Medical Center	446	8.2%	2.5%	9.8%
	Seton Medical Center (Daughters of Charity Health)	429	7.9%	5.5%	9.4%
	UCSF Medical Center	660	12.2%	18.7%	18.4%
	SUBTOTAL	2,596	47.9%	44.9%	55.0%

[1] Excludes Kaiser hospitals and Children's Hospital and Research Center at Oakland
[2] Marin hospital left Sutter in June 2010

Hospital ownership concentration in Northern Virginia

- In May of 2008, the FTC and the Virginia Attorney General sued to block Inova Health System's proposed acquisition of Prince William Hospital
- The FTC's complaint alleged the following:
  - "**Competition between Inova and PWHS currently constrains the rates that the merging parties, particularly PWHS, are able to negotiate with health plans**."
  - The relevant geographic market in which to analyze the Merger is an area no larger than the counties of Arlington, Fairfax, Fauquier, Loudoun, and Prince William, as well as the independent cities of Alexandria, Fairfax, Falls Church, Manassas, and Manassas Park.
  - "As a result of the Merger, there would be only five firms left in the relevant market . . . **Inova would control over 73 percent of the licensed hospital beds in Northern Virginia**."
  - "Because one of the key factors influencing bargaining leverage for a health plan is the availability of independent substitutes for the negotiating hospital, a merger of close substitutes eliminates this competitive discipline. **After the Merger, health plans will no longer have the threat of excluding PWHS because it will be part of the Inova system, which is currently PWHS' closest substitute**. Without this competitive discipline, Inova . . . will force health plans to pay higher prices for services from PWHS."
- Inova abandoned the acquisition after the FTC sued

Inova Health System's share in Northern Virginia (2009)

System	Hospital	Beds	Shares		
			Beds	Non-government admissions	Non-government inpatient days
Inova	Inova Alexandria Hospital	334	11.9%	8.2%	9.2%
	Inova Fair Oaks Hospital	196	7.0%	9.6%	7.4%
	Inova Fairfax Hospital	927	33.0%	37.7%	41.3%
	Inova Loudoun Hospital	183	6.5%	7.2%	6.0%
	Inova Mount Vernon Hospital	237	8.4%	4.4%	6.6%
	SUBTOTAL	**1,877**	**66.9%**	**67.1%**	**70.5%**
HCA	Reston Hospital Center	147	5.2%	8.7%	7.3%
Sentara	Sentara Potomac Hospital	176	6.3%	7.4%	6.2%
Novant	Prince William Hospital	168	6.0%	4.2%	3.5%
Independent / System hospitals with one license in the area	Fauquier Hospital	97	3.5%	2.5%	2.1%
	Virginia Hospital Center - Arlington	342	12.2%	10.2%	10.4%
	SUBTOTAL	439	15.6%	12.7%	12.5%

Hospital ownership concentration in the Boston Area

- The Massachusetts Attorney General and Division of Health Care Finance and Policy conducted a detailed study of healthcare cost growth drivers and concluded:
  - "Price variations are not correlated to (1) quality of care, (2) the sickness of the population served or complexity of the services provided, (3) the extent to which a provider cares for a large portion of patients on Medicare or Medicaid, or (4) whether a provider is an academic teaching or research facility. Moreover, (5) price variations are not adequately explained by differences in hospital costs of delivering similar services at similar facilities."
  - "**Price variations are correlated to market leverage as measured by the relative market position of the hospital or provider group compared with other hospitals or provider groups** within a geographic region or within a group of academic medical centers."
  - Office of Attorney General Martha Coakley, "Examination of Health Care Cost Trends and Cost Drivers," March 16, 2010, p. 4 ["*Coakley Report*"]

- The Attorney General's report shows that Partners HealthCare's hospital prices for a common basket of services are among the highest in the state
  - *Coakley Report*, pp. 10-12, 28-31
  - See also, Massachusetts Health Care Cost Trends, 2010 Final Report

Partners HealthCare's share in the Boston Area (2009)

- The "Boston Area" is defined as a 30-minute drive time radius around downtown Boston
- Includes Suffolk County and parts of Essex, Norfolk, Middlesex, and Plymouth

System	Hospital	Beds	Shares		
			Beds	Non-government admissions	Non-government inpatient days
Partners	Brigham and Women's Hospital	773	11.8%	14.1%	17.7%
	Faulkner Hospital	115	1.8%	2.0%	1.8%
	Massachusetts General Hospital	907	13.8%	13.0%	15.0%
	Newton-Wellesley Hospital	205	3.1%	7.2%	5.4%
	SUBTOTAL	**2,000**	**30.5%**	**36.3%**	**39.9%**
Caritas	Caritas Good Samaritan Medical Center	190	2.9%	3.3%	2.6%
	Caritas Norwood Hospital	205	3.1%	2.7%	2.4%
	Caritas St. Elizabeth's Medical Center	338	5.2%	3.2%	3.2%
	Carney Hospital	133	2.0%	1.4%	1.5%
	SUBTOTAL	866	13.2%	10.6%	9.9%
CareGroup	Beth Israel Deaconess Medical Center	621	9.5%	10.4%	11.0%
	Mount Auburn Hospital	207	3.2%	2.8%	2.3%
	New England Baptist Hospital	93	1.4%	2.3%	2.2%
	SUBTOTAL	921	14.0%	15.5%	15.5%
Independent / System hospitals with one license in the area	Boston Medical Center, Cambridge Health Alliance, Cape Cod Hospital (Cape Cod Healthcare System), Hallmark Health System, Lahey Clinic Hospital, MetroWest Medical Center, Milton Hospital, Quincy Medical Center, South Shore Hospital, Tufts Medical Center, Winchester Hospital	2,773	42.3%	37.6%	34.8%

Note: Excludes Children's Hospital Boston

Hospital ownership concentration in the Toledo, Ohio Area

- In May of 2010, ProMedica Health System in Lucas County, Ohio entered into an agreement to acquire St. Luke's Hospital, also in Lucas County
- The merger consummated in September 2010, subject to a "Hold Separate Agreement" during the FTC's review of the competitive implications of the merger
- In January of 2011, the FTC filed a complaint alleging that the merger would reduce hospital competition in and around Lucas County, OH
- In March of 2011, a federal District Court judge extended the Hold Separate Agreement pending trial, holding:
  - "The Acquisition significantly increases concentration in the already highly-concentrated Lucas County markets for [general acute care] and [obstetric] services."
  - "SLH's own ordinary-course documents show that **St. Luke's was fully aware that its acquisition by ProMedica would increase SLH's bargaining leverage and result in higher healthcare prices to health plans, employers, and patients**."
  - "The Acquisition increases ProMedica's market shares for inpatient general acute-care services and obstetrics and its bargaining leverage with health plans."
  - This decision extends the Hold Separate Agreement pending a full trial, which is scheduled to begin on May 31, 2001.

- *FTC v. ProMedica*, Case No. 3:11 CV 47, at http://www.ftc.gov/os/caselist/1010167/110329promedicafindings.pdf

ProMedica's share in Lucas County, OH (2009)

System	Hospital	Beds	Shares		
			Beds	Non-government admissions	Non-government inpatient days
ProMedica	Bay Park Community Hospital	72	3.4%	1.3%	1.7%
	Flower Hospital	223	10.4%	10.8%	11.7%
	The Toledo Hospital	619	28.8%	34.5%	36.7%
	SUBTOTAL	**914**	**42.5%**	**46.7%**	**50.2%**
Catholic Healthcare Partners	Mercy St. Anne Hospital	100	4.7%	5.4%	4.9%
	Mercy St. Charles Hospital	264	12.3%	7.8%	5.5%
	St. Vincent Mercy Medical Center	445	20.7%	18.7%	18.5%
	SUBTOTAL	809	37.6%	31.9%	28.9%
Independent / System hospitals with one license in the area	St. Luke's Hospital*	198	9.2%	9.9%	10.1%
	University of Toledo Medical Center	228	10.6%	11.6%	10.8%
	SUBTOTAL	426	19.8%	21.4%	20.9%

* St. Luke's is currently owned by ProMedica, but is operating under a Hold Separate Agreement pending resolution of the FTC litigation

Takeaways

- Hospital market power can be a concern even in large metropolitan areas
- The FTC, DOJ, courts, and state Attorneys General have concluded in various instances that hospital market power can be problematic
- Hospital market power can exist even when shares within the broader metropolitan area are below the range commonly associated with antitrust concerns
  1. In some cases, metropolitan area shares below 30% can signify market power
  2. Relevant antitrust markets can be smaller than metropolitan areas
     - Metropolitan area shares may understate market power
     - ENH had a very high share in Chicago's northern suburbs, but a low share in Cook County
     - Similarly, in the Summit-Alta Bates merger, the postmerger share in the broader Bay Area was much lower than in the Inner East Bay
- Systems can gain market power one acquisition at a time
  - Through actions in Virginia, the FTC has shown a willingness to oppose this "roll up" strategy
- It may be difficult for the agencies to undo consummated mergers
  - Divestitures can be disruptive to patients and providers
  - Places a premium on premerger enforcement

BATES WHITE
ECONOMIC CONSULTING

Market concentration of hospitals

Cory Capps, PhD
David Dranove, PhD

June 2011

The analysis contained herein was performed at the request of America's Health Insurance Plans