Collaborative Network Arrangements and Hospital Pricing Behavior

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Outline of the Presentation

- Background on Definition of Networks and Potential FTC Interest in Issue
- Theoretical Issues and Concerns
- Example Sample and Data Sources: California
- Measuring Hospital Competition Methods
- Measuring Inpatient Prices Methods
- Further Questions and Issues

Definition of Networks

- Non-Ownership Collaborative Relationship
- Also Known as Strategic Alliances, Joint Ventures, or Collaboratives
- Activities Include Sharing Capital, Pooling Specialized Resources, Purchasing Collaboratives, Outpatient Outreach Centers
- Can Be Precursor to Ownership System Relationship or Substitute for It

Literature Review

- Recent Focus on Profits/Nonprofits
  - Lynk (1995), Simpson and Shin (1998), Dranove and Ludwick (1999), Keeler, Melnick, and Zwanziger (1999), Young, Desai, and Hellinger (2000)
- Network Research Compares Networks to Systems (Ownership vs. Network Contract)
  - Bazzoli, Shortell, et al. (1999), Bazzoli, et al. (2000), Robinson and Casalino (1996)
- Market Area Calculation Methodology
  - Zwanziger, Melnick, & Mann (1990)

FTC Interest in Networks

- Hospitals – Horizontal Networks and Vertical Arrangements Session Today
- DOJ/FTC (2000) Jointly Issued Guidelines on Provider Collaborative Arrangements
- Balancing Between Pro-Consumer Benefits and Potential Problems
- Existing Enforcement Actions in 2000
- State Mechanisms for Antitrust Exemptions (Hellinger, 1998)

Theoretical Issues and Concerns

- Healthcare as Multiproduct Good Produced by a Complex Firm (Internal Dynamics)
- Standard Coasean Economic Theory of a Firm Based on Single Product Definition
- New Theories Developed in Healthcare (e.g. Option Demand) Attempt to Explain Behavior Across Horizontal/Vertical Arr.
- But Still Primarily an Empirical Field

Sample and Data Sources: CA

- Market Growth and Level of Network Arrangements High in California 94-98
- MSA Restriction (rural areas different)
- 1493 Hospitals, 308 Separate Entities, Average of 4.8 Hospital Observations/Year
- AHA Data PLUS Special AHA Data on Networks
- OSHPD Patient Data, ARF Demographics

Networks & Market Competition

- County Measures (esp. in CA) Problematic
- Patient Flow Approach using Zwanziger
  - Compute HHI for each zip code in a hospital's market by patient origin (residence)
  - Weight zip code for each hospital based on the zip's proportion of that hospital's admissions
  - Sum weighted zip code HHI's to each hospital
- Compute Four HHI's for each Hospital

Consider Systems vs. Networks

- Hospital Systems Represent an Ownership Relationship Between Hospitals
- Hospital Networks Represent a Contractual Relationship Between Hospitals
- Usual Approach (e.g. Keeler, et al.) Treats Systems as a Single Hospital
- Attempt to Test Network Relationship by Using Four HHI's (HHI, HHI-S (systems), HHI-N (networks), and HHI-SN (systems and networks)

Example With Five Hospitals

Mkt.Sh.: A(0.5), B(0.3), C(0.1), D(0.05), E(0.05)	Not Accounting for Hospitals in a Network	Accounting for Hospitals in a Network(AB/AE)
Not Accounting for Hospitals in a System	HHI = 0.355 (5:A,B,C,D,E)	HHI-N = 0.735 (3:ABE,C,D)
Accounting for Hospitals in a System(AD)	HHI-S = 0.405 (4:AD,B,C,E)	HHI-SN = 0.82 (2:ABDE,C)

Measuring Inpatient Prices

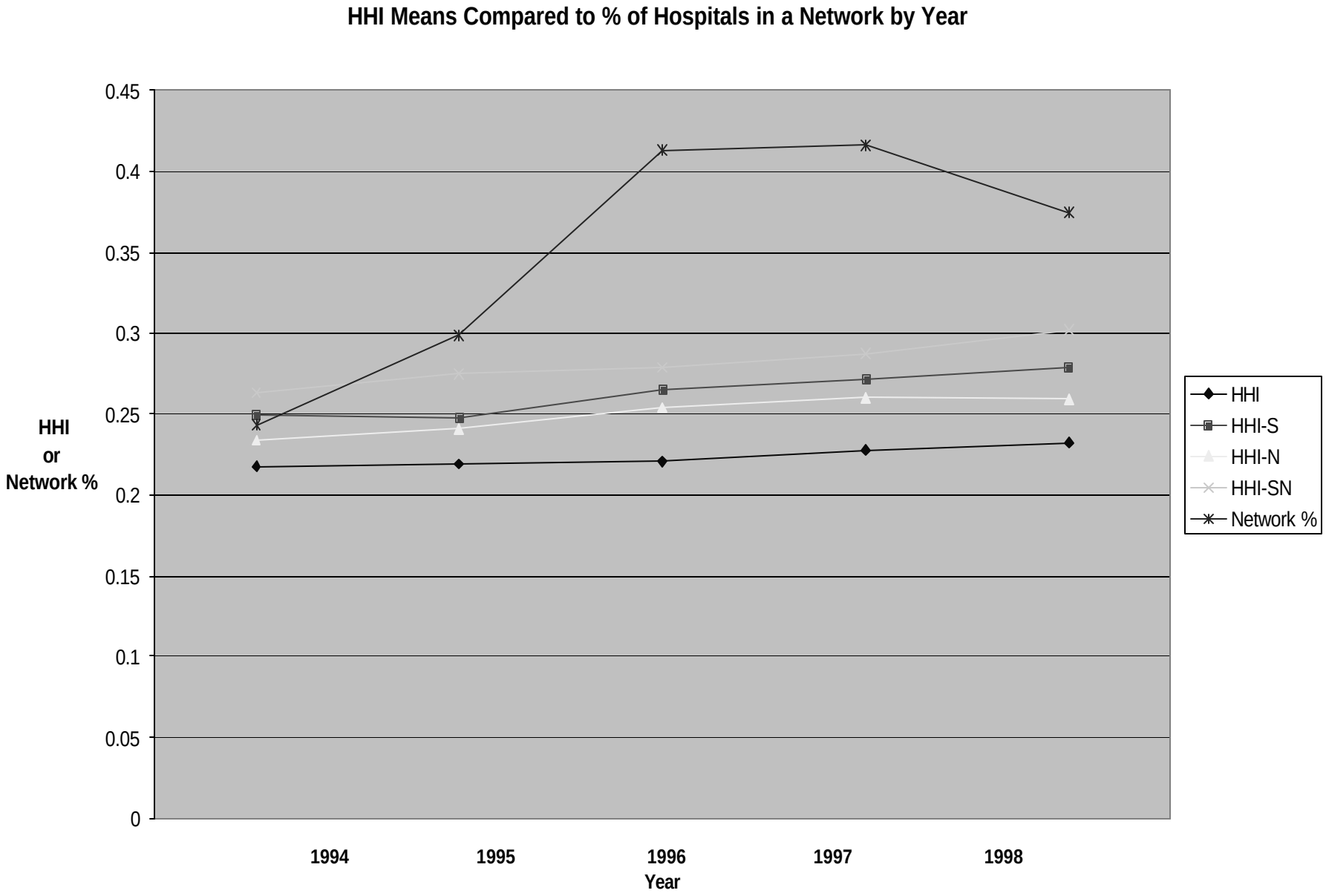
- Keeler, et al. Adaptation of Lynk
- Price Index for Ten DRG's
- Protects against Bias from Service Mix
- Common, Possibly Complicated, Stays
- Exclude Medicare Stays (following Keeler, et al.)
- Average Net (of Gross Charges) Price
- Regression Coefficient Modeling Precisely as Keeler, et al. from Log(Net Price) for each DRG

Ten DRG's in Price Index

- DRG 14: Cerebrovascular Disorders Except TIA
- DRG 89: Simple Pneumonia/Pleurisy w/CC
- DRG 96: Bronchitis/Asthma w/CC
- DRG 127: Heart Failure and Shock
- DRG 174: Gastrointestinal Hemorrhage w/CC
- DRG 182: Esophagitis, Gastroent., misc. w/CC
- DRG 183: Esophagitis, Gastroent., misc. w/o CC
- DRG 243: Medical Back Problems
- DRG 296: Nutritional and misc. Metabolic w/CC
- DRG 320: Kidney and Urinary Tract Infec. w/CC

Price Index Calculation Details

- For Each Year and Each DRG, Regression using Log (Net Price) against factors affecting price
- Use Keeler, et al. Independent Variable List (e.g. gender, race, disposition, Log (LOS+1))
- Hospital Indicator Variable Yields 10 DRG Coefficients in each of 385 Hospitals (incl. Non-MSA) for each of Five Years (19,250 coeff.)
- Weighted Price Index by Avg. Number of DRG Cases in the Entire California Sample
- Small Number of Hosp. (mostly non-MSA) used Population Average Price where Missing DRG


HHI Means Compared to % of Hospitals in a Network by Year
HHI or Network %
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1994
1995
1996
1997
1998
Year
HHI
HHI-S
HHI-N
HHI-SN
Network %

Some Preliminary Results

- Confounding Independent Variable Coefficients Stable Across HHI Measures
  - No Correlation Between HHI and other Factors Affecting Hospital Prices (multicollinearity)
- Change in HHI's Almost Entirely Generated by System/Network Changes => Not Surprising that HHI (no systems or networks) Statistically Zero
- Problem: Disentangling System and Network Effects Extremely Difficult

Ongoing Work: System vs. Network

- Some Collaborative Networks Become Ownership Systems
- More Recent Data Reverses that Trend (not in the current analysis)
- Internal Variation May or May Not Be Great Enough to Separate Network/System Effects on Prices

Ownership Results

- Not the Main Focus of this Study, but Interesting Comparison to Make
- Positive For Profit Effect on Prices Slightly Higher than in Keeler, et al. Study, Not Anticipated Given Other Similar Results
- Negative Government Ownership Effect on Prices Precisely the Same as Keeler, et al. in all Specifications So Far (note stability)

Future Research and Issues

- California has Unique Market Properties
  - High Levels and Increases in Network Activity
- Use of Network Clinical Services or Network Operating Officer Information
  - Understanding Where Relationships Exist
- More Detailed Work with Profit/Nonprofit
  - Role of Aggressive Pricing Practices Can Spill Over into Higher Payments from Other Payors