A Cat and Dog Story

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Introduction

- Merger analysis in antitrust is often delegated to industrial organization economists
- IO provides theoretical models that form the foundation for *ex post* empirical studies
- Sometimes theories are sufficient to make predictions about merger effects
- Often the theories provide the basis for empirical tests that can be used to predict outcomes of future mergers
- Sometimes, merger analysis runs ahead of the theory
  - Some analyses rely on *ad hoc* approaches with shaky theoretical foundations

From Theory to Evidence

- There is a long history of IO economists developing and empirically implementing theories of competition
- Cournot's model provides a good example
  - The simple game theoretic model provides the foundation for using the Herfindahl index to predict merger effects
  - Agency guidelines cite HHI ranges which, while not definitive of how the agencies will view mergers, have a large practical impact
  - The Cournot model describes a world with homogeneous goods where firms make simultaneous capacity/output decisions; surely this is an approximation (at best) of most markets
  - Even so, SCP studies suggest that HHI may be a *decent* predictor of pricing in many settings
- The fact that Cournot is directionally correct in many markets should not foreclose further theoretical and empirical study

Measuring HHI is Not Enough

- In order to measure market structure (whether for merger analysis or for SCP regression analysis), we must define the market
- Prior to the SSNIP test, market definition was *ad hoc*
  - Rely on SIC codes, geographic boundaries, stylized evidence about substitution patterns, etc.
- The SSNIP test provides a guide for defining markets, but does not specify how the test should be implemented
  - SCP studies could tell us the impact of a hypothetical increase in the market HHI, but this is circular
  - Need to define the market to measure the HHI

The Benefits of Structural Modeling

- Structural modeling offers several advantages for merger analysis
  - Assumptions about market conduct can be tailored to the institutions
  - Model can specify (in theory) and recover (from data) conduct parameters
  - Structural modeling provides a way to avoid *ad hoc* market definitions
  - Armed with estimates of conduct parameters, it is usually straightforward to analyze a wide range of hypothetical scenarios.
  - Thus, it is possible to perform the SSNIP test
- Paraphrasing Garth Saloner, structural models can provide an "audit trail" that allows us to better understand how specific assumptions generate specific conclusions
  - *Ad hoc* specifications keep everything hidden in a black box

Structural Models Have Their Own Problems

- Models that exactly describe the real world would be intractable
  - For example, the full version of a model I will describe would require solving 16 million simultaneous equations
- Models must be developed with an eye towards available data
  - The well-known BLP method for studying demand in differentiated goods markets exists because we don't normally have transactions level data
  - If we had transactions level data, we could do better than BLP
- As a result, models represent a compromise between describing the real world and ease of implementation
  - It can be difficult to ascertain where the results come from
  - Results may be sensitive to the specific assumptions about market conduct

Case Study: Hospital Merger Analysis

- Nearly all of these issues have arisen in the context of hospital mergers
- Industry has undergone massive consolidation
  - Local mergers become commonplace in late 1980s, perhaps in response to managed care
  - Insurers claim that merged hospitals use market power to rise prices
  - DOJ and FTC challenged many mergers, including some that appear at first to be “3 to 2” or even “2 to 1” mergers
  - Yet agencies lost nearly every challenge, including seven consecutive challenges in the 1990s
- IO economists have turned attention to hospital markets
  - As analytic methods have evolved from *ad hoc* to SCP to structural,

"Early Days" – The Rockport Decision

- Prior to 1990, there were few local hospital mergers and little enforcement activity
  - SCP studies at the time suggested that competition might actually cause prices to increase
  - This might have been true given the dominance of traditional indemnity insurance
- U.S. vs. Rockport Memorial Hospital – 1990
  - DoJ blocks proposed merger
  - Defines market using patient flow analysis based on *Elzinga and Hogarty* studies of coal and other commodity markets
  - Shows that Rockport and Chicago are separate markets
- EH: Market is well-defined if "inflows" represent less than 10-25% of patients at local hospitals and "outflows" of local patients to distant hospitals represent less than 10-25% of all patients

A Decade of Futility

- Between 1994 and 2001, DoJ and FTC lost seven consecutive merger challenges
  - These included what seemed to be 3 to 2 or even 2 to 1 mergers
    - E.g., mergers in Joplin, MO and in Dubuque, IA
- In all but one case, the court decision hinged on EH-style flow analysis (or on related “critical loss” analysis)
  - Flow analysis suggested that hospital markets are very large
  - E.g., Hospitals in Dubuque compete with hospitals in Iowa City, which is about 70 miles away
  - (In the other case, the court accepted published evidence that nonprofits do not exploit market power; that evidence was challenged in later publications)
- Some courts were openly skeptical of whether competition led to lower prices in health care
  - Skepticism based on older SCP studies that had severe econometric problems

Problems with Flow Analysis

- *Ad hoc*

Structural Modeling to the Rescue

- In early 2000s, several economists proposed structural models to predict merger outcomes
  - Town and Vistnes (2001) recognize that prices are set through negotiations between hospitals and insurers
  - Capps, Dranove, Satterthwaite (CDS, 2003) refine Town and Vistnes and introduce the concept of "Willingness to Pay" as a measure of the value that a hospital brings to a network
  - Gaynor and Vogt (2003) develop a more traditional model of pricing by differentiated firms, yet their key equation measuring market power resembles the key equations in CDS and Town/Vistnes
  - Key equations in all three studies are very similar and can be estimated using patient level utilization data commonly available from state agencies
- All three studies predict substantial price effects of mergers, even in markets that would pass muster using EH
  - Implication: Geographic markets are smaller than those predicted using EH
  - Direct predictions of merger effects also suggest that many local mergers are anticompetitive

The Empire Strikes Back

- The Federal Trade Commission had all of these issues in mind when it revised its strategy for assessing hospital mergers
  - It developed retrospective studies knowing that facts on the ground trump theoretical predictions
  - Challenged a consummated merger – Evanston/Northwestern Healthcare
  - Retained Ken Elzinga to testify against use of EH in hospital markets
  - Economics expert Haas-Wilson developed theory of two-stage competition, in which first stage follows the bargaining ideas introduced by Town/Vistnes and CDS
- FTC won the trial, although ENH may have had the last laugh
  - For reasons that remain unclear, FTC chose to allow ENH to remain intact, with requirements that member hospitals bargain independently

Subsequent Events

- FTC invited Robert Town to serve as economics expert for additional merger challenges
  - Town used modified CDS model to predict merger effects
  - FTC challenged mergers in Virginia and Ohio
    - Virginia merger was abandoned
    - Ohio investigation pending court decision
- CDS finding its way into private litigation
  - Market definition is critical in attempted monopolization cases
  - E.g., hospitals allegedly tying inpatient and outpatient services
  - Hospitals invariably won these cases when market power was determined using EH
  - CDS leads to different conclusions

Is This the End Game?

- CDS is valuable because it yields better predictions than EH
  - Identifies as problematic mergers that have actually led to increased prices
  - But “even” CDS can be improved upon
- CDS uses a simple bargaining model
  - Bargainers are “naïve”, ignoring impact of their contract on the contracts that the insurer will sign with other hospitals
  - This was a necessarily modeling convenience, but it is *ad hoc*
- Dranove and Satterthwaite try again
  - In immediate aftermath of publication of CDS, we tried to develop a more sophisticated bargaining model
  - Move into realm of dynamic bargaining models
  - These are hard to develop and solve for symmetric agents
  - Developing a model for asymmetric agents that could be taken to the data proved difficult

Dranove, Satterthwaite, and Sfekas

- Bargaining with foresight
  - We relax the assumption of naïve bargaining
  - Allow bargainers to think “one level” ahead
  - E.g., Insurer and hospital A know that if A is excluded from network, this may affect the outcome of the negotiation between insurer and hospital B
- Our main purpose is to improve the bargaining model
  - This is a very hard problem
  - There are no published studies, either theoretical or empirical, showing how to identify foresight in this kind of two sided asymmetric bargaining game
- Our model necessarily simplifies the bargaining problem
  - E.g., Suppose insurer excludes A and then reaches an impasse with B; in our model, the insurer cannot go back to A

Importance of DSS to Theory and Practice

- DSS develops a term that captures the idea of foresight using data
  - By itself, this is an important contribution to bargaining literature
  - Examining several markets, DSS find evidence of bargaining with foresight
- DSS use results to predict outcomes of mergers
  - Predicted merger effects are different than those predicted by CDS
  - This is necessarily so
- But…
  - … it is difficult to say why the predicted effects are different
  - … it is difficult to know the role played by the simplifying assumptions about the bargaining process
  - When someone improves upon our work, predicted merger effects are likely to change yet again

What Should an Economist Do?

- Economists who are not being paid as experts are happy with these results
  - Bargainers show foresight
  - Future research will refine our understanding of how foresight affects bargains
- Economic experts cannot wait for future research
  - At any point in time, all we can do is utilize the best available models
  - *Ad hoc* approaches and SCP models may be touted for their simplicity and durability, but they give very poor predictions
  - Structural models such as CDS are harder to explain, but they give better predictions
  - Structural models are also easier to criticize
    - The assumptions are clearer (the "audit trail")
    - It seems that each iteration changes the results
    - This is the nature of the beast

What I Learned from Socrates and Eleanor

- Over the past decade, through wars and economic calamity, I have admired the serenity of my cat and the constant joy of my dog
  - To them, the world is a simple place
- Learning how to do structural modeling is a bit like gaining a conscience
  - You begin to see more of the complexity of the real world
  - You realize that, sometime soon, another veil will be lifted and things will become even clearer
- And yet…
  - …The view today is clearer than it was yesterday
  - Antitrust analysis cannot wait for the last researcher to stand on the last pair of shoulders
  - Antitrust analysts who work with structural models will never enjoy the serenity and joy of Socrates and Eleanor