In Defense of Merger Simulation

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Approaches to the Analysis of the Competitive Effects of a Merger

- "Fact based inquiry," based on documents, depositions, interviews with customers, and institutional details
- Merger simulation

These need not (and should not) be substitutes – they are complements

Merger Simulation

- Requirements
  - Consumer demand functions
    - Can be estimated through econometric methods applied to data on actual transactions, if such data is available
    - Sometimes can be estimated from other information
  - Model of firm behavior (could explicitly address several levels of distribution)
    - Typically an assumption
- When I refer to “merger simulation” today, I mean to include both pieces

Why Merger Simulation?

- The “documents” approach has a long history and is well-accepted among attorneys; almost all economists find it of at least some value also
- What does the merger simulation approach add?
  - It moves merger analysis closer to “science”

When Does a Method of Analysis Constitute Science?

- Based on theories that are testable
- The underlying assumptions are clearly delineated
- The results of the analysis can be replicated
- The precision of the results can be calculated (perhaps conditional on the assumptions)

Why Should Merger Analysis Aspire to Science?

- Objective, not subjective
- Certainty – everyone knows the rules of the game
- The sources of any disagreements between the parties are easily identified
  - Vague market definition arguments based on documents can be replaced with a quantitative argument about the size of demand elasticities
- Through the scientific process, bad methods are weeded out and good methods are replaced by better ones in a systematic fashion
- Level of precision can be determined and used in the decision-making process

Merger Simulation is Science

- Based on well-established economic theory
  - E.g., econometric theory, theory of consumer demand, and oligopoly theory
- Underlying assumptions are clearly laid out and can often be tested
  - Demand model can be tested
  - Nash-Bertrand assumption can be tested by comparison to pre-merger margins
- Process and results can be replicated
  - A third party following the same steps would reach the same results
  - Even though there are modeling choices along the way, these choices are fully described
- A standard error for a predicted price change can be calculated

The “Documents” Approach is Not Really Science

- Only loosely linked to well-established economic theory
- Underlying assumptions are not well specified and often cannot be tested
  - E.g., can we really assume that the authors of documents are analyzing aspects of the industry that matter to merger analysis?
    - FTC v. Staples and Office Depot
  - Customer interviews subject to sampling bias
- The results cannot be replicated
  - Two reasonable people could review the same documents and reach different conclusions
- No quantitative prediction
- No measure of precision available

Is Merger Simulation a "Perfected" Technique?

- No – but no scientific inquiry is ever complete, and no scientific theory is ever "final"
- Nor need it be to be useful
  - A scientific theory in its current state can be very useful in the present even though it may later be or improved upon or even superceded

Theory of Evolution Has Itself Evolved

- Darwin (1859)
  - Current forms of life theorized to have descended from previously existing forms
  - Evolution thought to occur gradually through natural selection
- Modern Synthesis (1930s and 1940s)
  - Recently developed genetic theories helped explain how the mechanism of evolution actually worked
  - Validated the natural selection mechanism
- Punctuated Equilibria (1972)
  - Theory that periods of no change are interrupted by short periods of rapid evolution
  - Contradicted the idea that evolution occurred gradually
  - Explained apparent “gaps” in the fossil record

Does Merger Simulation Always Provide an Answer?

- No, but that is a consequence of merger simulation being science
  - The available data may be inadequate to come up with reasonable estimates of demand
  - A tractable model that captures the important economic processes may not be viable
  - The underlying assumptions of the model may be rejected
- The "documents" approach is (almost) always able to provide an answer precisely because it is not science
  - Often two "answers" – one for defendant and one for plaintiff with no scientific way to choose

Does Merger Simulation Involve Choices?

- Yes, and dispute about those choices may arise between opposing experts
- Often the choices are subject to testing
- That's why both parties have experts
- Doesn't mean merger simulation is not science
  - Scientific disputes have existed as long as science has existed

Is Merger Simulation the Only Scientific Form of Merger Analysis?

- No – other scientific analyses are possible
  - Analyze the effects of "natural experiments"
    - Cost increases
    - Imposition of taxes
    - Supply interruptions
  - Analyze the effects of entry, new product introduction, line extension
    - Somewhat more complex analysis because might have to account for endogeneity of such decisions
- These alternatives may be more appropriate or practical in some cases
  - FTC v. Staples and Office Depot

Should Merger Simulation Replace the “Documents” Approach?

- As I said at the outset, the two approaches are complements
- Qualitative information in documents can help specify the demand estimation equations or the oligopoly model
- Documents can indicate institutional details that are crucial to build into the simulation
- Documents can provide information that allows formal or informal testing of the merger simulation

Merger Simulation May Not Appeal to Attorneys

- Unlike examining documents, it takes a high level of expertise to analyze a merger simulation
  - As a result, attorneys may not feel comfortable relying on merger simulation
- General feeling that the use of highly sophisticated methods leads to a “battle of the experts” that no one else understands
  - As a result, the two experts cancel each other out
- Some may feel that merger simulation is “too new” to be attempted in a courtroom

Law Moves More Slowly Than Science

- Intellectual Property Lost Profits Damages
  - Originally, had to show an absence of non-infringing substitutes to get lost profits
    - Obviously wrong as a general rule from an economics point of view
  - Then, share-based infringing sales allocation
    - Better, but based on the “logit” type model

Law Moves More Slowly Than Science (cont.)

- Then, if products compete in different segments (premium vs. economy), no lost profits
  - Goes too far since products may compete to some degree across segments
- Simulation-type analysis, where possible, would improve the validity and reliability of IP damages calculations

Court Acceptance of Merger Simulation

- Courts have endeavored to eliminated "junk science"
  - As a general matter, merger simulation passes the Daubert standards as to what constitutes "scientific" testimony
  - Contrast to "conspiratology" in price-fixing cases
    - Expert testifies that, e.g., there was a conspiracy because market shares were "stable"
    - However, the "theory" that there is a conspiracy is not testable by examining share stability; share stability will likely exist whether there is a conspiracy or a lawful tight knit (lawful) oligopoly

Court Acceptance of Merger Simulation (cont.)

- Courts also impose the more stringent requirement that the method used must "fit the facts of the case"
  - But, a method does not need to fit every fact of the case to be valuable to the fact finder
  - This makes the court's decision regarding exclusion of economic testimony difficult
    - What facts of the case are important to address and which are not?
    - Does the failure of any test occasion the exclusion of the expert's testimony?
- There exists the potential for economic testimony to be excluded too often or not often enough
  - Should a method that would be accepted by a respectable peer-reviewed academic journal be excluded because it did not "sufficiently" fit some industry facts?
  - Should a judge exclude testimony only if it has zero evidentiary value?

Prediction Accuracy

- It would be helpful to have studies that make predictions based on simulation-type analysis, then compare predictions to actual outcomes
  - Such tests are standard scientific practice
  - Hausman and Leonard, JIE (2002)
- However, since every industry is potentially different, it is not clear to what extent such tests would justify applying merger simulation in a given situation

Directions for Future Development of Merger Simulation

- Oligopoly model
  - Alternatives to static Nash-Bertrand
  - Repeated game
- Distribution
  - Role of retailer as middleman
- Non-price aspects of competition
  - Advertising
  - Shelf space
  - Lump sum payments to retailers