Merger Simulation in an Administrative Context

Conference Policy Lecture

2010 CRESSE Conference

Jonathan B. Baker

American University

Washington College of Law

Topics

- What is Different in the Administrative Context?
- Simple Simulations
  - Screens and Presumptions
- Complements to Comprehensive Simulations
  - Unilateral Effects of Horizontal Mergers
  - Coordinated Effects of Horizontal Mergers

Academic vs. Administrative Context

- Simulation in an academic context
  - More comprehensive to increase precision
- Simulation in an administrative context
  - Generalist decision-makers
  - Guidance to merging firms
  - Calls for using simple simulations too

Enforcement Issues in the US: Administrative Context

- Unilateral effects
  - Shaky ground in the courts
    - *Staples* (1997), *Oracle* (2004); *Whole Foods* (2007)
  - Litigation dilemma
    - Late 1970s US brewing
      - Bud = 25%; Bud + Miller + Schlitz = 55%
      - Pabst, Coors, Stroh: nat'l firms with 5-15% shares
    - Pabst constrains Bud
      - Simulation: post-merger $\Delta P > 10\%$
  - Inadequate guidance
    - Market shares measure buyer first choices
    - Unilateral effects turn on buyer second choices

Common Problems in the US: Administrative Context Cont'd

- Coordinated effects
  - Limitations of "dinner party story"
    - Empirical support limited
      - No critical concentration ratio
      - Other factors matter too
    - What is the mechanism?
- Can simulation help?
  - Advantages of comprehensive simulations
  - Advantages of screens and presumptions

Unilateral Effects

- Economic issue
  - Premerger price s.t. $\Delta P^1Q^1 = (P^1-C^1)\,\Delta Q^1$
  - Post-merger, incentive to raise P^1 because $\Delta P^1Q^1 + (P^2-C^2)\,\Delta Q^2 > (P^1-C^1)\,\Delta Q^1$
  - Both P^1 and P^2 may rise
- Intuitions
  - Recapture lost profits
  - Increase in opportunity cost
  - Removing competitive constraint

Simulation of Unilateral Effects

- Basic comprehensive model
  - Premerger: $L = -1/\varepsilon$ [n equations]
    - Assumes Bertrand-Nash conduct
  - Postmerger: $L = -1/\varepsilon$ $i \neq 1,2$ [n-2 eqns]

    $L^1 = -1/\varepsilon^{11} - L^2(\varepsilon^{12}/\varepsilon^{11})(Q^2P^2)/(Q^1P^1)$

    $L^2 = -1/\varepsilon^{22} - L^1(\varepsilon^{21}/\varepsilon^{22})(Q^1P^1)/(Q^2P^2)$
- Simulation in this framework
  - Estimate/calibrate demand & cost, solve

Comprehensive Simulation Can Increase Precision

- Synthesize information
- Metric for anticompetitive concern
- Identify critical parameters
- Identify subtle effects in dense markets
- Account for pre-merger rivalry and post-merger reactions
- Tradeoff harm against efficiencies

Comprehensive Simulation in Administrative Context

- Difficult and time-consuming
  - Approach tailored to industry, information
  - Judgment calls consider tractability
  - Technical problems: internal consistency, discrete changes in price and output
- Poor fit with administrative process?
  - Short window to decide to seek addt'l info
  - Lack of guidance: firms can't anticipate
  - Too complex for generalist judges?

Unilateral Effects Screens and Presumptions

- Candidate screens
  - $\Delta P^1/P^1 \geq d^{12}(P^2-C^2)(P^2/P^1)/2$ (Shapiro)
  - $d^{12}(P^2-C^2) \geq EC^1$ (Farrell & Shapiro)
- Accounts for "first order" issues
  - Buyer substitution & profit recapture, not rivalry, repositioning, efficiencies
- More easily applied & gives guidance
  - But how much error in practice?

Simulation of Coordinated Effects Less Developed

- Comprehensive simulation approach?
  - Specify non-cooperative oligopoly solution
  - Compute post-merger cooperative equilibrium
    - Nash barg.? Balanced temptation ? Focal rule?
    - Incentive constraint: no firm prefers to cheat
- Simple simulation methods in adminsitrative context
  - Maverick as basis for presumption

Incomplete Coordination and Mavericks

- Coordination: imperfect & incomplete
  - Punishment limited
  - No side payments
  - Cheating may be costly to deter
    - *E.g.* negative demand shocks lead to price war
  - Hard to reach consensus without communication
- Mavericks: indifferent to cheating
  - Likely only one maverick

Coordination: Premerger Incentive Constraint

Industry output Q(P), price P

Cost and capacity may differ across firms

Firms reach consensus on price, shares

Each firm prefers coordination to cheating

Cheater charges P-ε, sells k for t periods

- (P-C)sQ/(1-δ) ≥ (P-C)kt(1-δ^t)/(1-δ)
- sQ(P)/kt ≥(1-δ^t)

Mavericks Constrain Coordinatin

- $sQ(P)/kt \geq (1-\delta^t)$ for all firms
- sQ/kt intuition: benefit from continued cooperation vs. ability to expand inexpensively before rivals react
- Max coordinated price just deters cheating by maverick (min sQ/kt)
  - P ≤ joint profit-maximizing price
  - Coordination is incomplete

Merger Can Relax Constraint Imposed by Maverick

- $(s^1+s^2)Q(P)/(k^1+k^2)n \geq (1-\delta^t)$
- If merged firm remains the maverick, constraint satisfied at higher price
- If merged firm no longer the maverick, new maverick may allow price to rise
- In principle, could simulate price rise
  - Outside model: if non-mavericks merge alter maverick incentives, create maverick

Coordinated Effects Presumption

- Short of simulation: presumption against merger involving maverick
  - If firms coordinating pre-merger (incompletely), will merger make worse?
  - Ways to identify maverick
    - Structural features, nat'l experiment, conduct
  - Presumption when can't identify maverick
    - Random merger w/maverick: prob = 2/n
    - Probability higher if reduces asymmetries

Simple Simulations Address the Administrative Context

- Comprehensive simulation
  - Academic context values precision
    - Min error costs; tractability, info constraints
    - Analogous to unstructured standard
- Simple simulation as supplement
  - Adminisrative context also values accessibility and guidance
    - Minimize administrative costs, if error limited
    - Screen, presumption resemble bright line rule

Concluding Comment

- Simulation in an Administrative Context
  - Encourages Screens and Presumptions
- US Horizontal Merger Guidelines (proposed April 2010)
  - Unilat'l: value of diverted sales ($\Delta Q(P^2\text{-}C^2)$) as indicator of upward pricing pressure
    - no metric/standard proposed
  - Coordin'td: presumption from HHI & ΔHHI
    - also recognize role of maverick