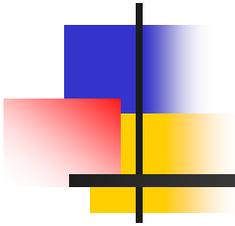


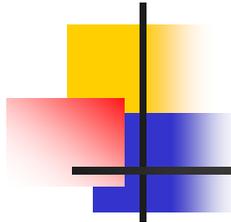
Merger Effects When Firms Compete by Choosing Both Price and Advertising



Luke M. Froeb & Steven Tenn

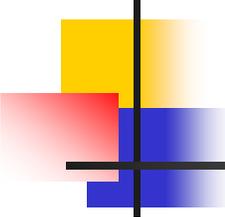
Bureau of Economics
Federal Trade Commission
January 29, 2004

The views expressed herein are not purported to reflect those of the Federal Trade Commission, nor any of its Commissioners



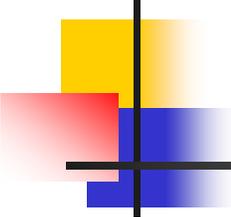
Joint Work

- Steven Tschantz, Department of Mathematics, Vanderbilt



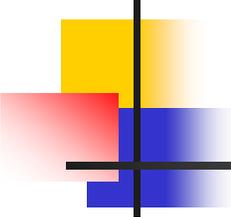
Talk Outline (Froeb part)

- Motivation
- Brief Lit Review
- Advertising taxonomy for static noncooperative models
 - Estimation Bias
 - Margin interpretation
 - Extrapolation Bias
- Big Question: What the heck does advertising do?
 - Still need good models



Literature Review: With Apologies to DCP

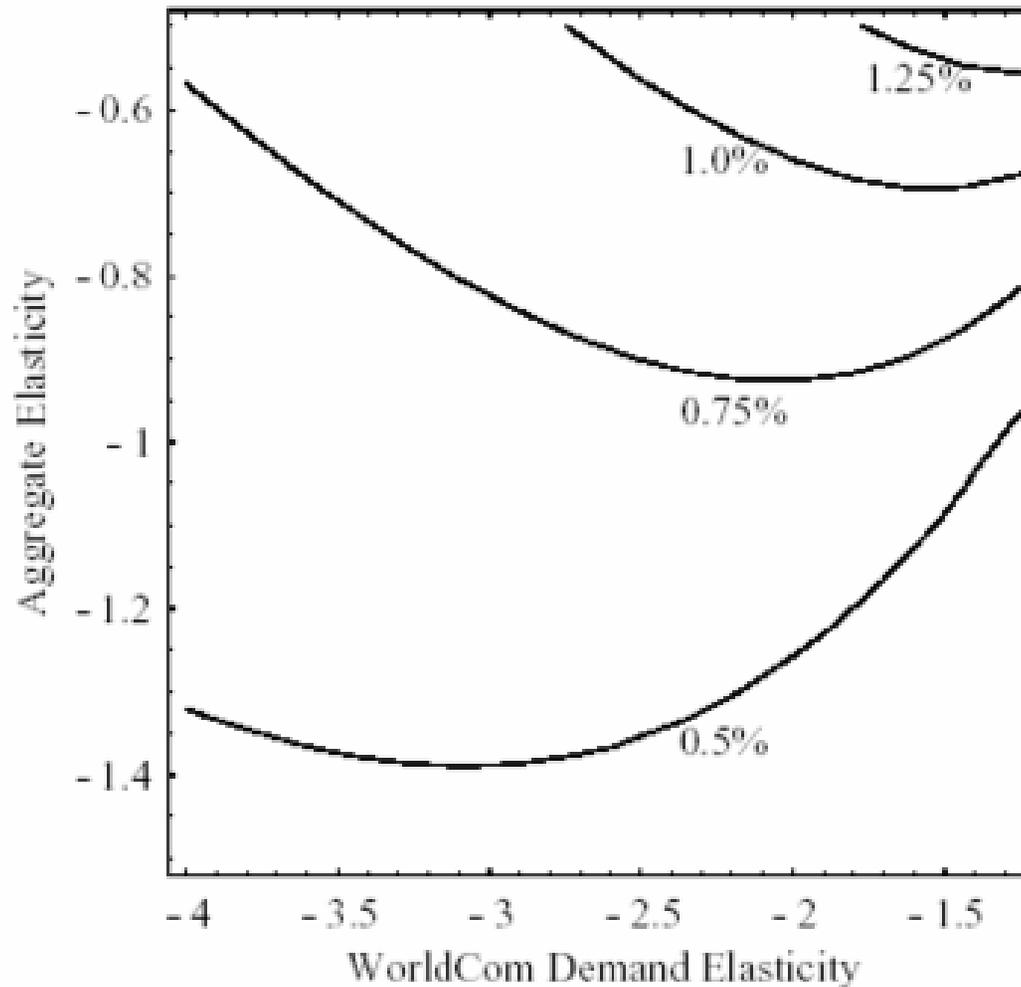
- Policy question: should advertising be regulated?
 - *Persuasive*: “shift” demand → higher prices
 - *Informative*: more elastic demand → lower prices
- ➔ READ BAGWELL’S BOOK!

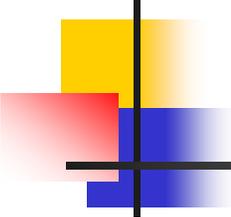


Merger Policy Question

- Big question: how do mergers affect advertising?
 - Positive, not normative
- Little question: How do mergers affect advertising in static games?
 - And what happens when we ignore it?
- Issue in WorldCom-Sprint Merger Investigation
 - WorldCom margin of 30% used to infer own-price elasticity
 - Does advertising “count” as part of marginal costs?
 - Joe Farrell, “NO”

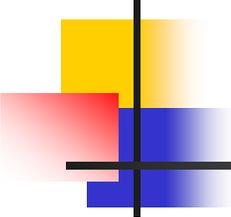
WorldCom-Sprint Merger





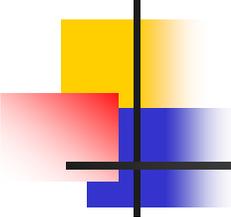
Definition: Advertising

- Merger policy application: any variable that affects demand, is optimally chosen by firms, and potentially changes post-merger
 - Promotion, Location, Advertising, etc.
- I call them all “advertising”



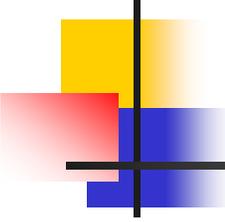
If Advertising is set Optimally: Dorfman-Steiner Oligopoly Model

- FOC's if $q=q(a,p)$
 - $0=q+(p-mc)dq/dp,$
 - $0=-1+(p-mc)dq/da\}$
- FOC if $q=q(a(p),p)$
 - $0=q+(p-mc')dq/dp;$
 $mc'=mc+(da/dp)/(dq/dp)$
- Observational Equivalence:
 - Price-only model with $mc' \approx$
price+advertising model



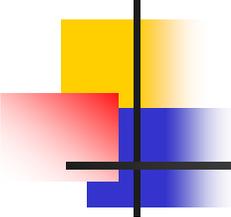
“Marginal Cost” of Advertising: Total vs. Partial Differentiation

- Ignoring advertising:
 $mc' = mc + (da/dp)/(dq/dp)$
- e.g., optimal advertising increases with quantity,
 - $a(p)$ is negatively sloped, $da/dp < 0$
 - $(da/dp)/(dq/dp)$ is positive
 - $mc' > mc$
 - Omitted advertising increases with quantity



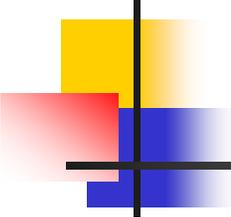
Examples

- $MC' > MC$ (need label, e.g., “elastic”)
 - $Utility = k - a(p) * p$
 - Demand becomes more elastic
- $MC' < MC$ (“persuasive”)
 - $Utility = a(p) - p$
 - Demand becomes less elastic
- $MC' = MC$ (“informative”)
 - $Q = f(a) * g(p)$
 - Optimal advertising is independent of price
 - e.g., advertising puts you in the choice set



Implications of ignoring advertising where $MC' > MC$

- Estimated demand is too elastic
 - Omitted variables bias
- Observed margins are too small
 - Because $MC' > MC$
- Predicted post-merger prices are too big
 - Extrapolation bias: if post-merger quantity falls, optimal advertising should also fall.
 - If we ignore advertising, we implicitly hold advertising constant.
 - Implies post merger Q and P are too big.



Caveats Galore

- What if advertising is not optimally set?
 - Does it change post merger?
- Our taxonomy is not really structural
 - Need structural model of advertising, built on optimization, a la Butters
- **NEED BETTER INFO ON HOW ADVERTISING WORKS!**