

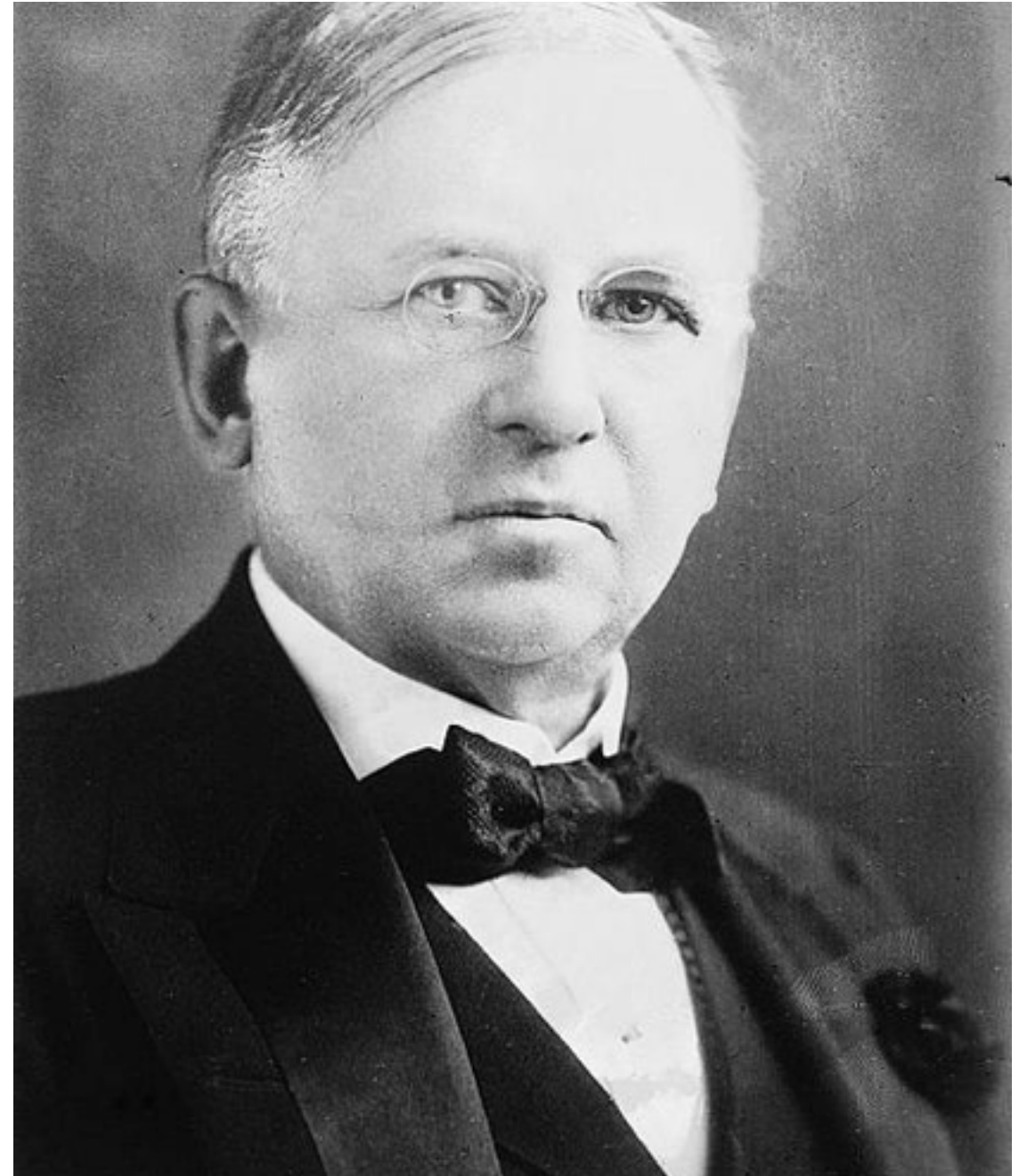
Towards a Digital Attribution Model: Measuring Impact of Display Advertising on Online Consumer Behavior

Ghose & Todri

Discussant: John Horton, NYU Stern

“the trouble”

- “Half the money I spend on advertising is wasted; the trouble is I don't know which half.”
- John Wanamaker



What makes this a difficult problem in general?

- Pre-electronic commerce: we did not know who **saw our advertisements** nor who ultimately **made a purchase**
- Now: with the modern web, tracking and online purchases, the data are there.
 - The measurement problem is more or less solved.
- New problem: With active targeting and endogenous exposure to advertisements, causal attribution is difficult.

Example: Buying a new laptop

The screenshot shows a Google search for "surface book". The search bar and the Google logo are highlighted with a red dashed border. The search results page displays several organic results and a prominent sponsored advertisement for the Microsoft Surface Book. The advertisement is also highlighted with a red dashed border. The organic results include links to Microsoft.com, MicrosoftStore.com, Amazon.com, and another Microsoft link. The sponsored advertisement provides details about the Microsoft Surface Book, including its screen size, operating system, battery life, weight, storage, and connectivity. It also shows the price as \$2,099.00 with free shipping.

Google surface book

Web News Videos Shopping Images More Search tools


About 373,000,000 results (0.37 seconds)

Surface™ Book - Microsoft.com
Ad www.microsoft.com/Surface
New. The Ultimate Laptop. Do Great Things.
Windows 10 Pro · 6th Gen Intel® Core™ · Includes Surface Pen
The most exciting Windows laptop in years. — WIRED
[Buy Yours Now](#)
Buy Yours Now And Get
Free Shipping from Microsoft Store.
[See All Surface Devices](#)
Meet The New Surface Family.
Powered By Windows 10.

Buy Surface Book - MicrosoftStore.com
Ad www.microsoftstore.com/Surface_Book
Surface Book from \$1499 on Official Microsoft Store. Order Now!
Ratings: Website 9.5/10 - Shipping 9/10 - Selection 9/10 - Quality 9/10
Microsoft Store has 1,592 followers on Google+
[Buy Surface 3](#) - [Surface Accessories](#) - [Buy Surface Pro 4](#) - [Microsoft Surface Book](#)

Surface Book at Amazon - Top-Rated Surface book
Ad www.amazon.com/computers
Free 2-Day Shipping w/Amazon Prime!

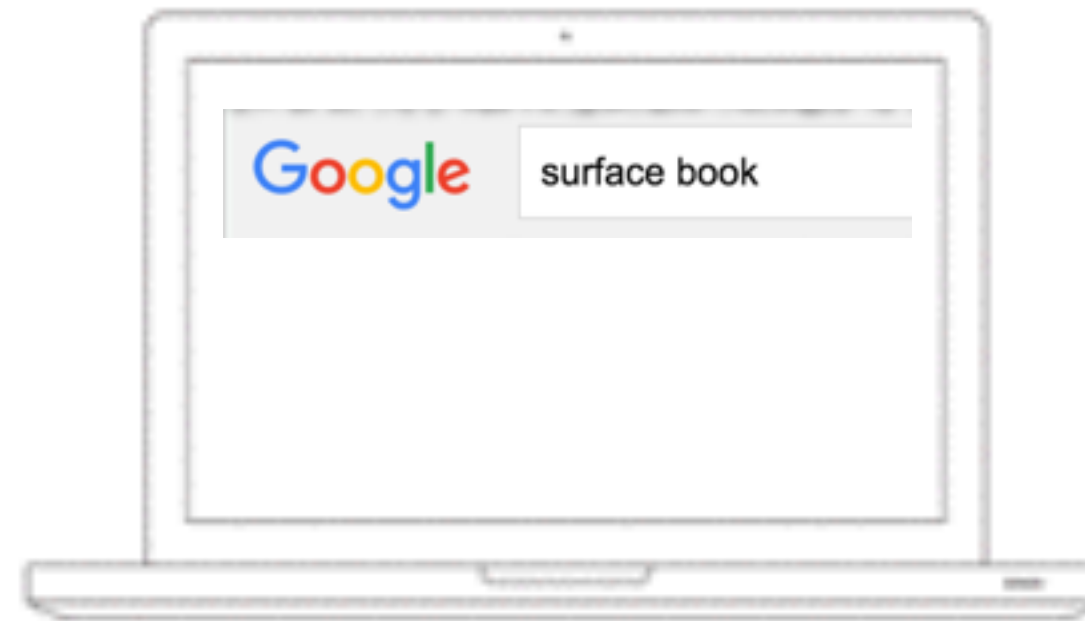
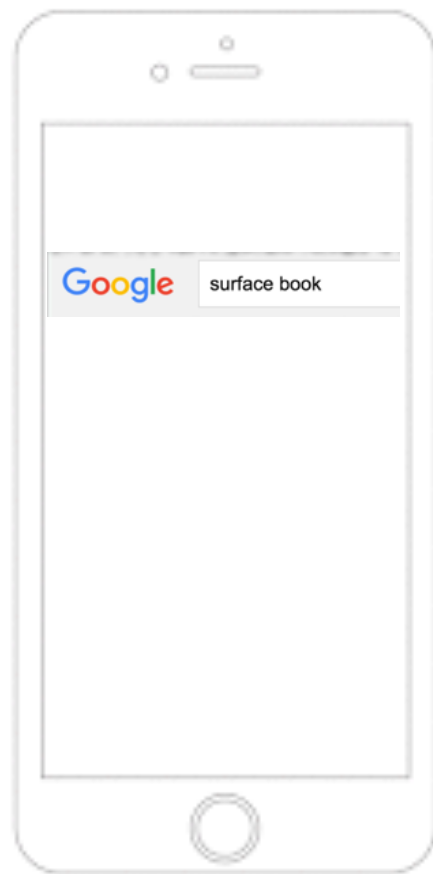
Surface Book - The ultimate laptop - Microsoft
<https://www.microsoft.com/surface/.../surface-boo...> Microsoft Corporation
Surface Book is a powerful laptop with a full sized, backlit keyboard for fast and natural

Sponsored ⓘ
Microsoft Surface Book
13.5" Touchscreen Tabl...

Stores
MicrosoftStore Free shipping - \$2,099.00
[View all stores and prices »](#)
Details
Screen size: 13.5 inch
Operating system: Windows
Battery life: 12 hour battery
Weight: 3.5 pound
Storage: 256 GB
Connectivity: Wi-Fi Only
Similar products

This paper

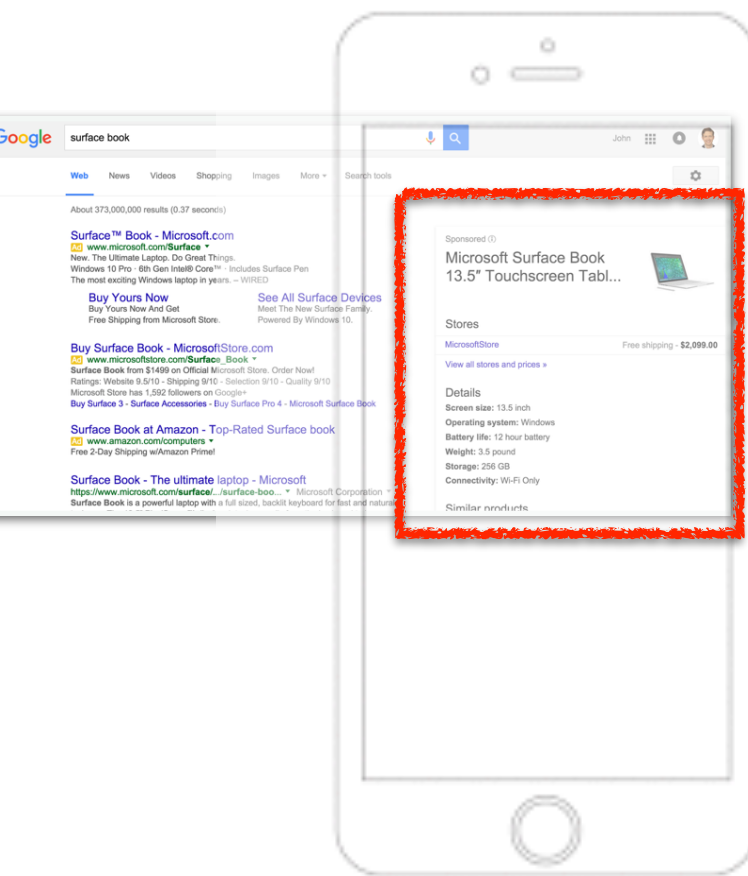
- Very rich and complete dataset from a larger advertiser with both exposures and purchase data
- Clever use of econometric approaches to tease out causality
- A promising method that can be used for future research

Consider three customers searching for “surface book”

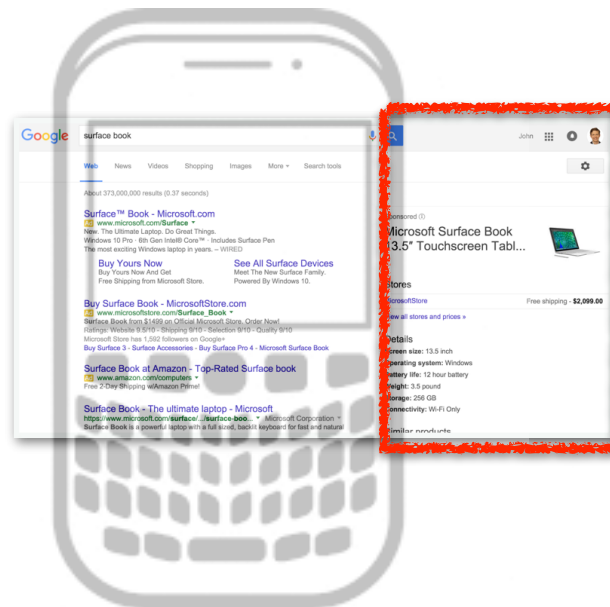


Difference screen sizes and user scrolling behavior creates variation in ad exposure

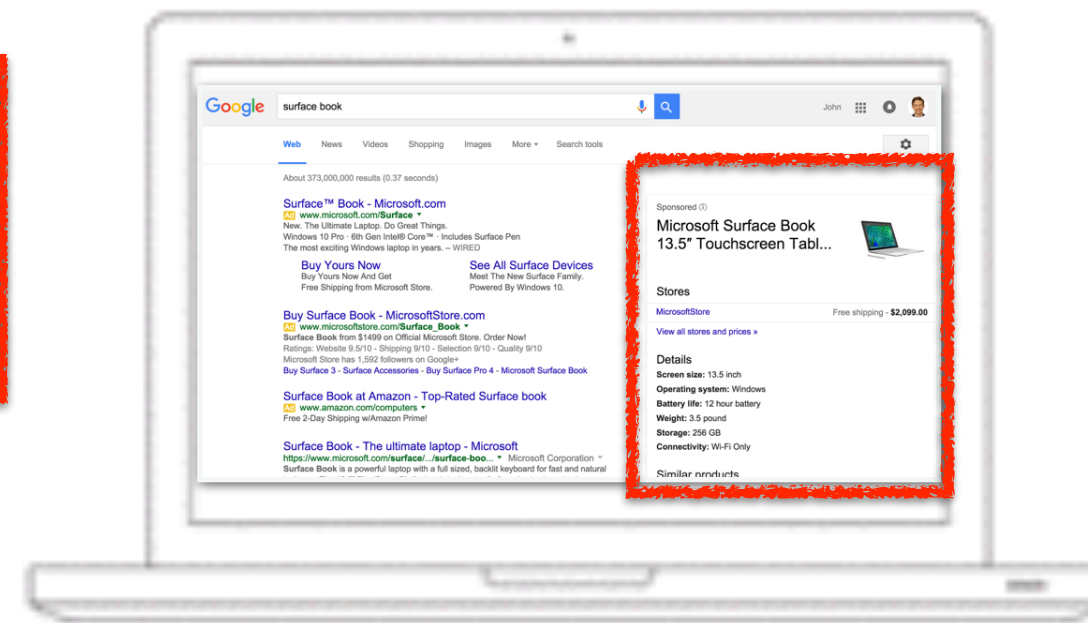
Treated



Control



Treated



Main threats to identification

- “Viewability” of an advertisement could be related to individual characteristics correlated with outcomes of interest
- The paper uses a variety of methods (matching, individual-specific fixed effects and so on) to deal with this possibility
- In addition, they use micro data on weather to create an instrument for exposure

Recommendations & Comments

- Given clear usefulness of quasi-experimental results (and the enormous samples), can advertisers be persuaded to run true experiments?
- I'm skeptical that any CMO & team would have the technical ability to replicate Ghose & Todri - econometrics is hard; simple t-tests are not.
- Also, these are marginal effects (& they are LATE effects)—what would ATE look like, conditioned upon different prior exposures of different channel types?
 - In other words, we'd like to know $\hat{Y}(\vec{X})$ not just $\frac{\partial \hat{Y}(\vec{X})}{\partial \vec{X}}$