Experimentation in Online Advertising

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Motivation

- 2025 US online ad spend: $300 billion (IAB)
  - Annual spending per firm: $10,000 ~ $1,000,000 (ChatGPT)

- Firms need to understand incrementality to optimize ad spend
  - “Half the money I spend is wasted; the trouble is, I don’t know which half”

Platforms offer experimentation tools

Meta
About Conversion Lift

TikTok for Business

Measure what matters with Conversion Lift Study

October 07, 2024

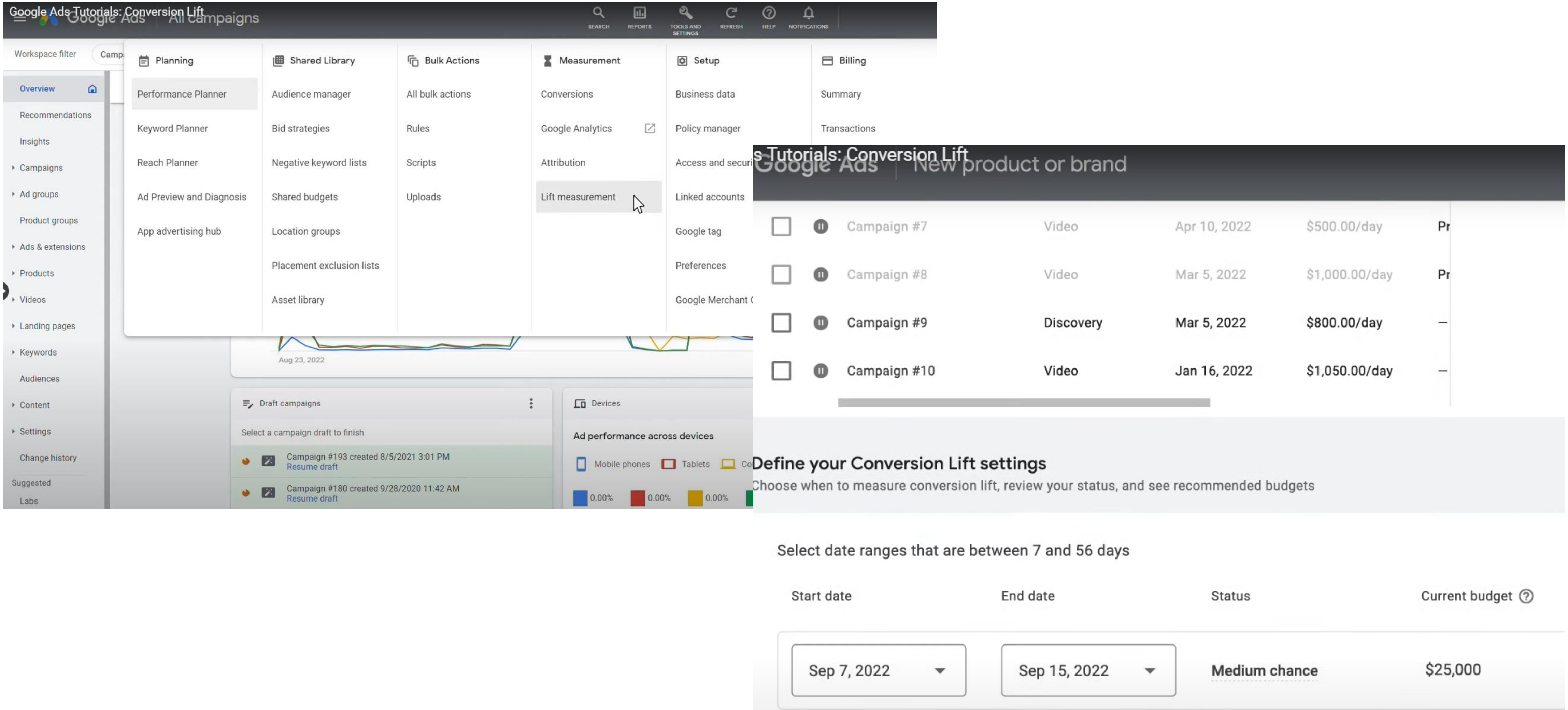
Microsoft Advertising

Google Ads

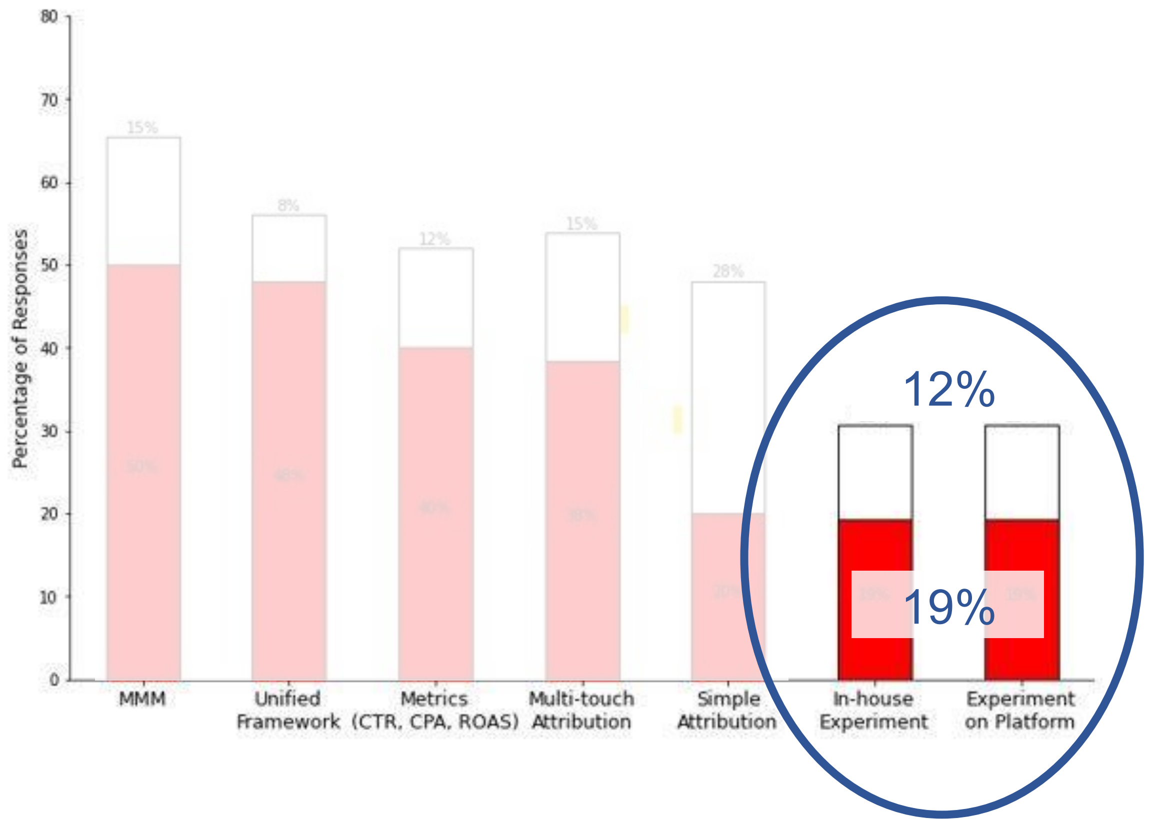
AdRoll

JD.COM

Google Ads incrementality experiment



“Under-usage” of experiments



- 15% of firms had run experiments on Meta
- “Only 12.6% of the 6,777 companies … had conducted a recent RCT”
- Major social media platform: why is adoption of experimentation services so low?

- Experiments are costly
  - “Rigorous experiment” costs $50K
  - Minimum ad spend requirement
  - Opportunity cost from hold-out
    - Avg hold-out size on Meta: 16% for 32 days
    - “Overly optimistic about ad effectiveness”

Gluck (2011), Johnson et al. (2017), Mela (LinkedIn, 2025), Runge et al. (2020), Wernerfelt et al. (2024)

Measurement tools affect ad revenue

Google Ads

Conversion Lift isn't available for all Google Ads accounts. To use Conversion Lift, contact your Google account representative.

"Conversion Lift available for Video, but not for Display and Search. Reach out to your Google account representative."

Ad platforms also behave strategically in experimentation game

Meta Ads

Disabling tests with a holdout

Holdout tests were paused in the Experiments tool on April 26, 2021.

A/B tests with a holdout and Holdout tests in the Experiments tool are no longer available.

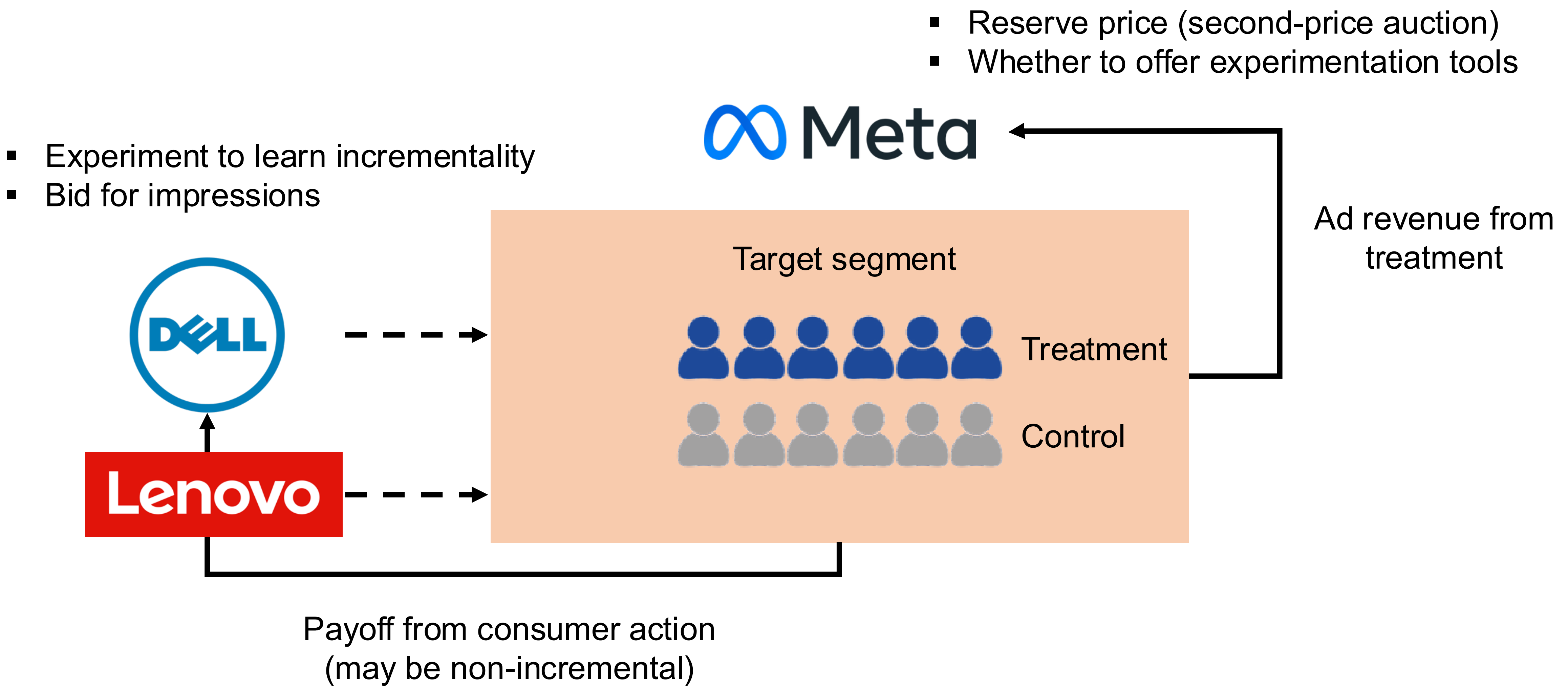
Divergent ad delivery creates group imbalance for A/B tests (Burtch et al., 2025)

Research questions

- **When should advertisers experiment?**
  - Depends on fixed cost and opportunity cost (hold-out)
  - Opportunity cost depends on ad price, determined endogenously via auction
    - E.g., low ad price $\Rightarrow$ high opportunity cost from hold-out

- **Does ad platform want advertisers to experiment? Under what condition should it facilitate or deter experimentation?**
  - Advertising experimentation improves efficiency, but platform jointly bears opportunity cost

Model



Reserve price (second-price auction)
Whether to offer experimentation tools
Meta
Experiment to learn incrementality
Bid for impressions
Target segment
Treatment
Control
Ad revenue from treatment
DELL
Lenovo
Payoff from consumer action (may be non-incremental)

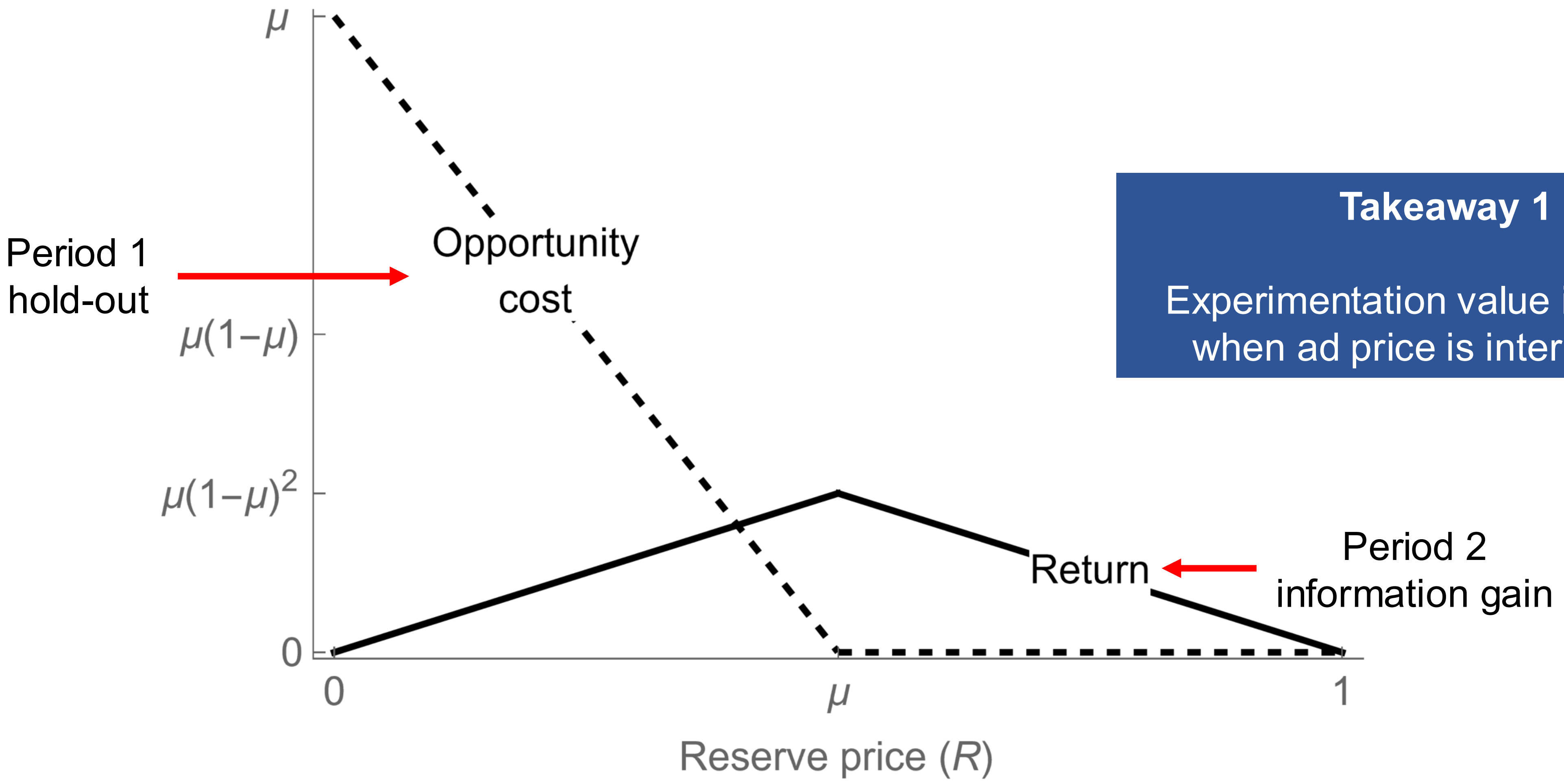
Model (cont'd)

- Ad platform sells ad opportunities via second-price auction across two periods
  - Reserve price: minimum bid to participate in auction
- Two advertisers bid for ad opportunities and decide whether to experiment
  - Advertiser expected payoff per action (e.g., click) normalized to 1
  - Dual costs of experimentation

Fixed cost	**Opportunity cost**
Upfront operational, labor costs	Missed ad opportunities from hold-out

- Ad incrementality
  - Advertisers have a rough idea, but need to experiment to learn precise incrementality

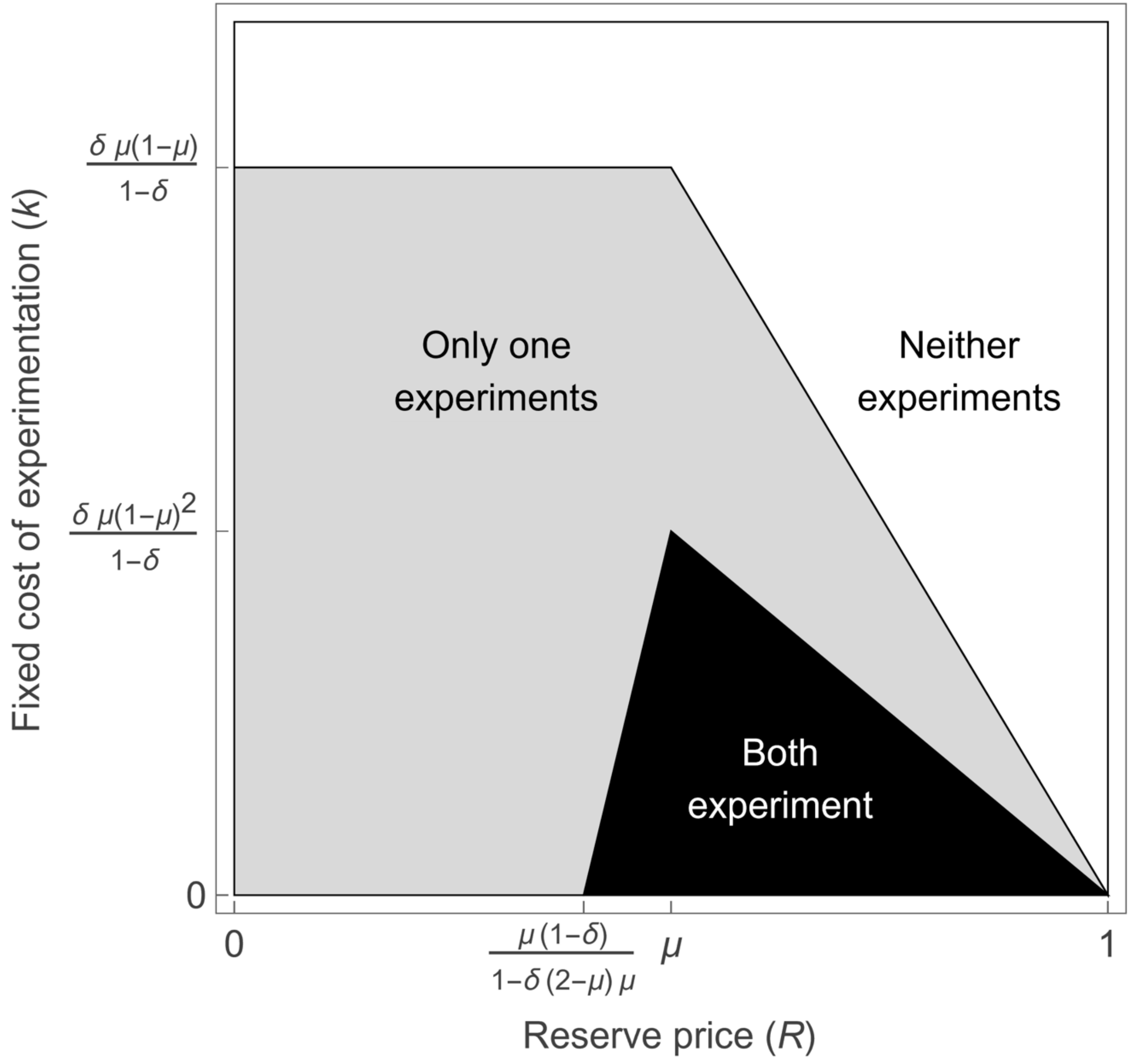
When do advertisers want to experiment?



Takeaway 1

Experimentation value is highest when ad price is intermediate

Advertisers' experimentation decisions



Asymmetric experimentation strategies

- Competitor's experimenting reduces my returns from experimenting.
- Why?

Takeaway 2
Do not always experiment,
even if operational cost is negligible

Summary so far

- Experimentation value highest for intermediate reserve price
  - Low enough that efficiency gains are not extracted away by platform
  - High enough that Period 1 opportunity cost is low

- Even if fixed cost is negligible, don't always experiment
  - Low reserve price increases opportunity cost
  - Competitor's experimenting reduces returns from experimentation

What about platforms?

Google Ads

TikTok

Meta

JD.COM

Do platforms want advertisers to experiment?

- Platform wants advertisers to know incrementality ⇒ create more value
- But experiments are costly ⇒ cost transfers to platform

Platform's reserve price

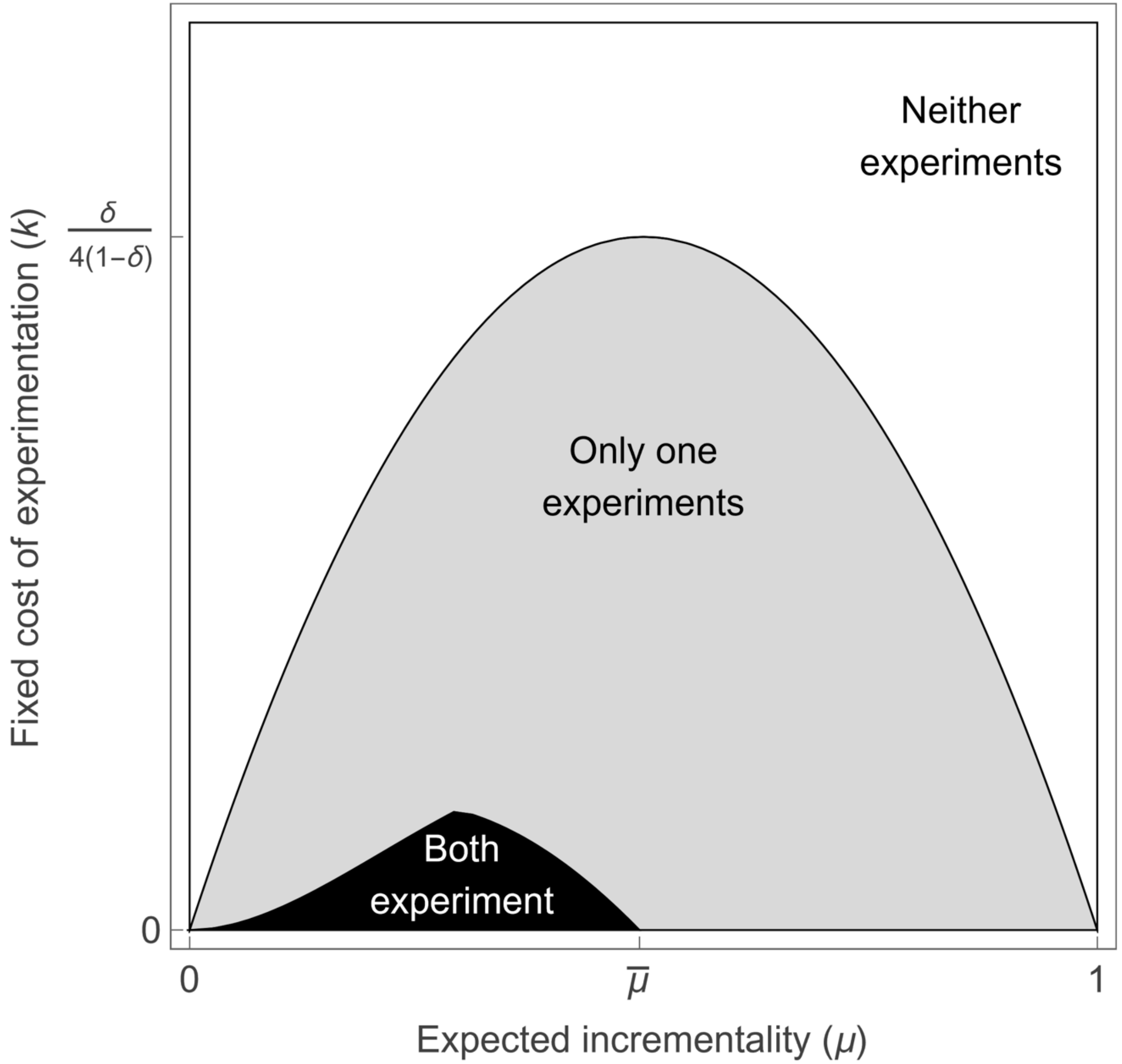
Promote experiment

Harvest efficiency effect

Deter experiment

Reduce opportunity cost

Total equilibrium



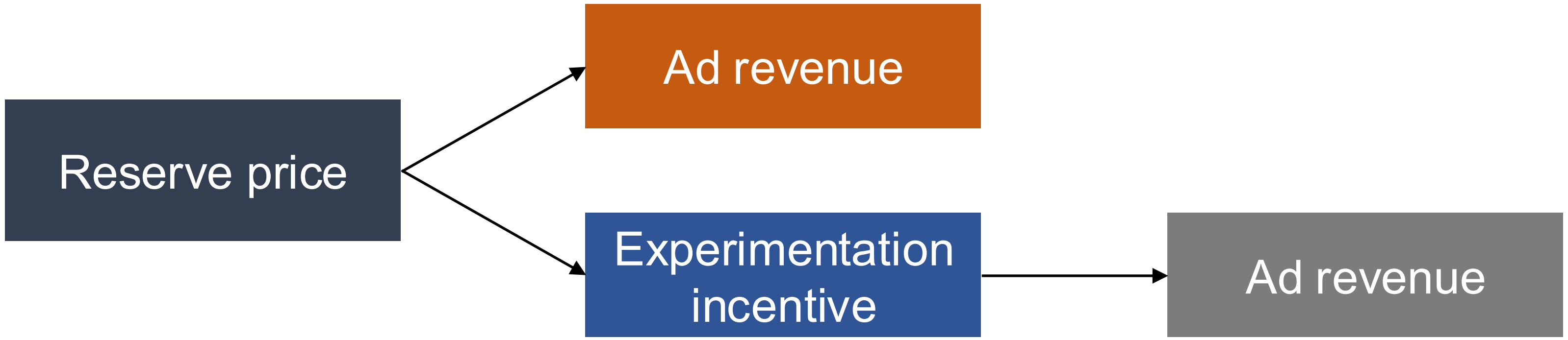
Platform jointly bears opportunity cost

- The better the ads (larger μ), the greater the missed ad revenues from hold-out
- Decrease reserve price to deter experimentation

Takeaway 3
Allowing experimentation distorts reserve price both downward and upward

So what?

- Advertisers
  - Don’t benchmark experimentation value in isolation; monitor whether competitors are experimenting
  - If ad price moderate, experiment *more* to mitigate over-paying for non-incremental campaigns
  - If ad price high, experiment *less* because little gains retained
- Platforms



  - Promote experimentation if opportunity cost is low, and deter otherwise
  - Experimentation and advertising teams should work closely together to jointly optimize platform profit

Q&A

Thank you

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