Bian, Ma and Tang (2022) "The Supply and Demand For Data Privacy: Evidence From Mobile Apps"

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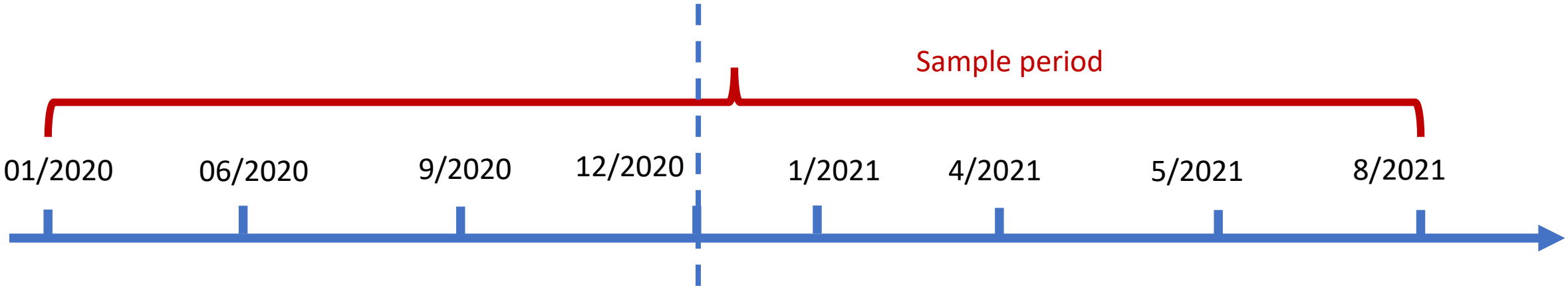
Summary of findings

- Event: Apple's iOS app store introduced privacy labels in 12/2020
- Staggered DID:
  - Same app's iOS version (treated) vs. Android version (control)
  - Different apps publish privacy labels at different times
  - Sample: top 10k US, top 10k International (9 non-US countries)
  - Data period: 1/2020 – 8/2021

Clean identification
Impressive data effort

- Findings:
  - 80-90% of sampled apps published privacy labels on iOS by the end of study period
  - Disclosure of privacy label leads to:
    - 14% drop in weekly app downloads, 15% drop in weekly app revenue
    - Bigger negative effects if the app collects more data and is more intrusive
    - Bigger negative effects in US, UK and France than in other countries
    - Stock market responds negatively to publicly traded app developers after they release privacy labels on Apple

Timing of events



Apple announced privacy labels

Apple released iOS14

Any app update for iOS14 must disclose privacy label

Apple announced and implemented app tracking transparency (ATT) for iOS14.5

Google announced a plan of “Safety Section”, to be seen by the public in Q1 of 2022

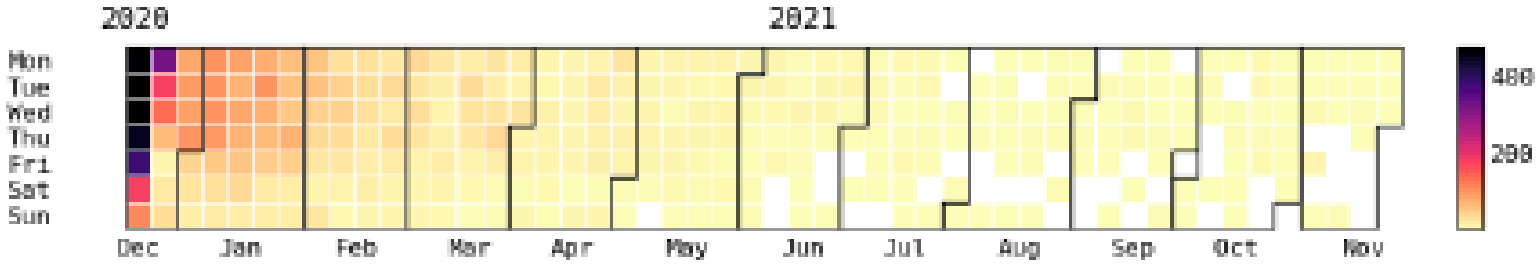
Privacy label comes after ratings and reviews

Apple pushes ATT prompt to user screen, ATT adds more difficulty in ad attribution

These changes do not apply to Apple-owned apps

Is staggered treatment random?

FIGURE A.1
Release Dates of Privacy Labels - US Sample

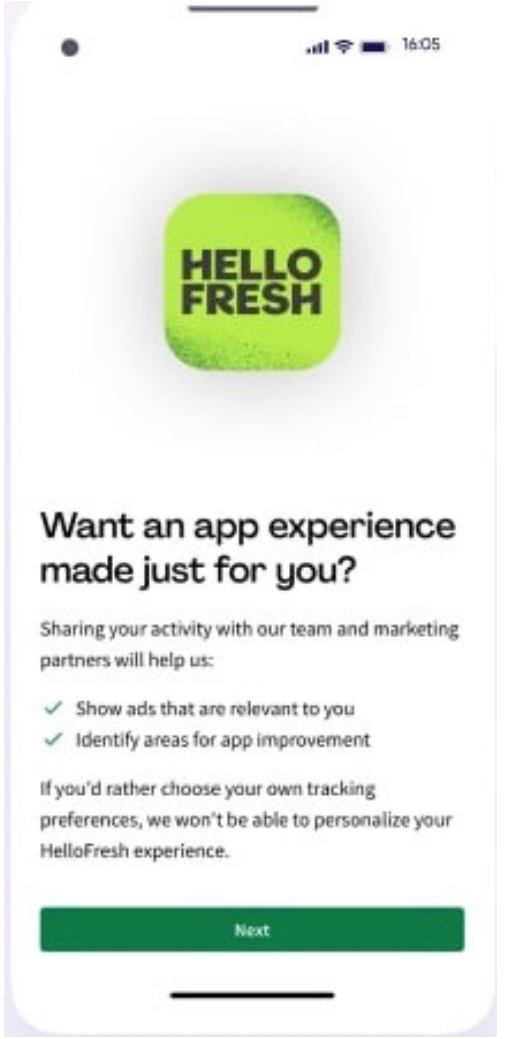


- Disclosure of privacy labels is “voluntary”, upon update under iOS 14
- Adoption of ATT is also “voluntary”, upon update under iOS14.5 or choose the default of no user tracking
- Why did some apps adopt privacy label earlier or later than others?
  - Any selection by app observable attributes?
  - Any delay in version updating, especially for intrusive, data-intensive apps?
  - Switch priority to Android users?

Demand and supply interactions

- Why is there little change in privacy labels if consumers & investors respond vigorously?
  - Too costly to change data collection practice and business models?
  - Collect less but more valuable data? (Aridor, Che and Salz 2022)
  - Consumers and investors respond to ATT instead of privacy labels?
  - App developers adopt pre-prompts to counter ATT
- Investor response:
  - To what extent do investors know the content and timing of privacy label disclosure per app?
  - Public app developers often have multiple apps, the paper uses average data of disclosure. What about first date of disclosure?
  - Figure 11: most effects on CARs occurred 60 days later
  - Figure 13: immediate response to ATT

} how much of the effect of privacy label is also driven by ATT?



Further study

- Mechanisms behind the strong consumer demand response
  - Aversion to data collection of all apps?
  - Switching from more intrusive apps to less intrusive apps?
  - Avoid certain categories?
  - Less salient concerns on Google Android?
  - Why differ across countries?
- More heterogenous effects?
  - By revenue dependence on advertising (rather than in-app purchase or subscription)?
  - By competition with Apple-owned apps?
  - By dependence on Apple vs. Android?
- Policy implications?
  - To what extent does the market-driven solution work?