Economics of Privacy

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Well Known Quote from Stigler, JPE 1961

> *One should hardly have to tell academicians that information is a valuable resource: knowledge is power. And yet it occupies a slum dwelling in the town of economics.....*

Stigler, JPE 1961


Information of Economics Revolution

Empirically there has been a seismic shift in the economics of ‘individual’ information

- In 2001, 1 GB cost $19.70 to store.
- In 2010, 1 GB cost $0.06 to store.

This has made possible the advertising-supported internet.

- As consumers learn to shut out ads, data has been used to make the ads more relevant.
- Let us be clear - a lot of data has been used.
- Example of Dictionary.com (230 tracking devices)

This has made possible the advertising-supported internet.

- Tracking Data is being used to target
- Tracking Data is being used to measure and attribute

Are these things which upset economists? Perhaps not.

A Whole New Regulatory Focus

- Regulation of use of data in advertising-supported internet (and in general)
  - Big Sector: In US, one million jobs in 2007, two million jobs in 2012
- Not enough regular economists thinking about this
  - I am (gulp) a marketing professor
  - Difficult to get mainstream IO excited

Continuation of Quote from Stigler, JPE 1961

> *..... And one of the information-producing industries, advertising, is treated with a hostility that economists normally reserve for tariffs or monopolists*

Stigler, JPE 1961

Three papers about economic effects of government intervention in economics of personal information

- How did European 2001 E-privacy directive regulation focused on consent affect advertising outcomes?
- How do firm efforts to allow consumer control over personal data affect advertising outcomes?
- How does European regulation focused on storage-length of personal information affect outcomes?

Also newer work on interaction between anti-trust and privacy regulation.

Implications

- Huge debate in Europe and US about regulation of personal data and online advertising.
- Policy focus has been on restricting use of data
- Little discussion of whether business owners have an incentive to allow users to restrict use of their data.
    - Focus on user-centric controls surrounding types of personal data might lead to better outcomes for advertising-supported online firms

The Future

- I have said very little about the benefits of personal data and personalization
- Modeling
  - Taking models of personal data beyond price discrimination (such as unobserved profitability of the customer)
- Is the use of the name ‘the economics of personal information’ a useful marketing tool?
- Extending the discussion beyond advertising
  - Extending the conversation to health and financial sector

Outline

Study regulation over personal data in Europe

- European Law become stricter 2003-4 as countries implemented E-privacy directive.
  - Some restriction of data-based targeting techniques
- Personal Data regulation elsewhere had not changed since advent of commercial internet
- Compare change in ad effectiveness in Europe relative to elsewhere.

- Data
  - Field (a/b) tests of 9596 different online display ad campaigns across multiple countries
  - For each campaign, on average 347 web users surveyed on purchase intention and ad recall. Half had seen the ad and half were in a control group
- Method: Diff-in-Diff-in-Diff
  - Difference between treatment and control groups in a/b tests
  - Difference before and after the regulation in Europe
  - Difference between Europe and elsewhere

Regulation affects performance of online ads

- Advertising effectiveness dropped 65% in the EU relative to the rest of the world
  - Drop is specific to European websites rather than European consumers
  - When EU consumers visited US websites they behaved like US visitors
- Not all websites were affected equally
  - Ads on general interest websites (e.g. yahoo.com, nytimes.com) were affected more than ads for targeted websites (e.g. cars.com, babycenter.com)
  - Ads on health websites (which were more strictly regulated) were especially affected
- Not all ads were affected equally
  - Unobtrusive ads were affected more than larger ads and multimedia ads

Implications

Regulation over use of personal data affects how well online ads work.

- If ads are less effective, it will limit the scope of the ad-supported internet.
  - Back-of-the-envelope non-equilibrium calculations bound the cost of comparable legislation at $14.8 billion to US advertisers or $5.2 billion to US-based websites
- If ads on general internet websites are particularly affected, such sites will be less able to support themselves through advertising.
  - They may become less prevalent or they may begin to support themselves by other means
  - If unobtrusive ads become less effective, advertisers may increase obtrusive multimedia advertising at the expense of subtle, well targeted ads

More Generally

- Currently, regulatory debate is conducted with little empirical guidance
- There may be good reasons to regulate use of personal data but there are trade-offs
    - The potential reduction in the size of the ad-supported internet
    - The potential change in content on the ad-supported internet
    - The potential increase in the obtrusiveness of ads.

Outline

Can firms win by catering to consumers' concerns about privacy

- Low click-through rates on websites such as Facebook attributed by commentators to privacy concerns
  - Intrusive advertising can lead to reactance (Clee and Wicklund 1980; White et al 2008)
- Study how websites' attempts to resolve these privacy concerns affects advertising outcomes.
  - If consumers have perception of control they may be more likely to click on ads
  - *Or* consumers may resent privacy-intrusive advertising more

Study non-profit's field experiment on Facebook

- Mission to increase awareness in US of its educational programs for women in East Africa.
- Wanted to try more 'tailored' advertising but worried it might be 'creepy'
  - Use randomized field test on Facebook to compare personalized with non-personalized campaigns
  - Personalized variant mentioned a celebrity the user was a fan of or a school they attended.
- Wanted to increase clicks to its Facebook page

Change in policy had three components

- By May 2010 Facebook faced a lot of pressure over privacy
  - NYT, Lawsuits
- On May 26 unveiled new privacy controls

1. Easier access to data sharing controls
2. Information no longer had to be public
3. Third-party sharing easier to turn off and opt out of.

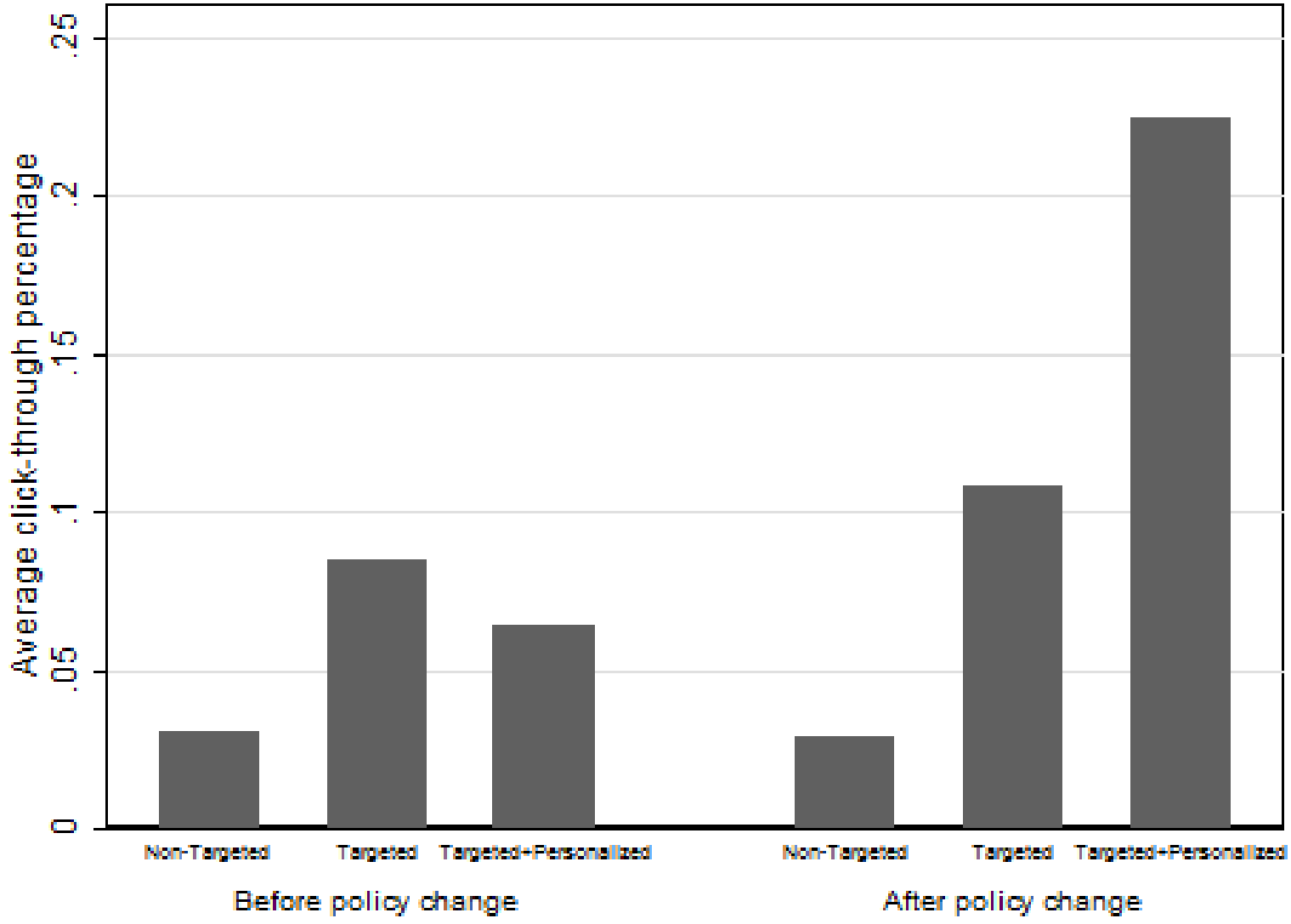
Warmly received in Press

> *The addition of simplified options (combined with the continued ability to fine-tune your settings if you wish) and user control over Facebook's 'connections' are significant improvements to Facebook's privacy.*

Chris Conley, American Civil Liberties Union

- But advertising data and methodology did not change
  - Facebook sent out an email to its advertisers saying that 'this change will not affect your advertising campaigns'
  - Facebook views advertising data as anonymous.

Figure : Comparison in click-through rates before and after



Also obtain similar results with regressions

- Little change in click conversions (correlation unchanged)
- Little change demographics
- Little change usage behavior
- Little change prices
- No change in kind of ads served.
- Increase more pronounced for personal information that is more unusual
    - Very personal advertising perceived as more intrusive and more likely to lead to reactance (White et al 2008)

Outline

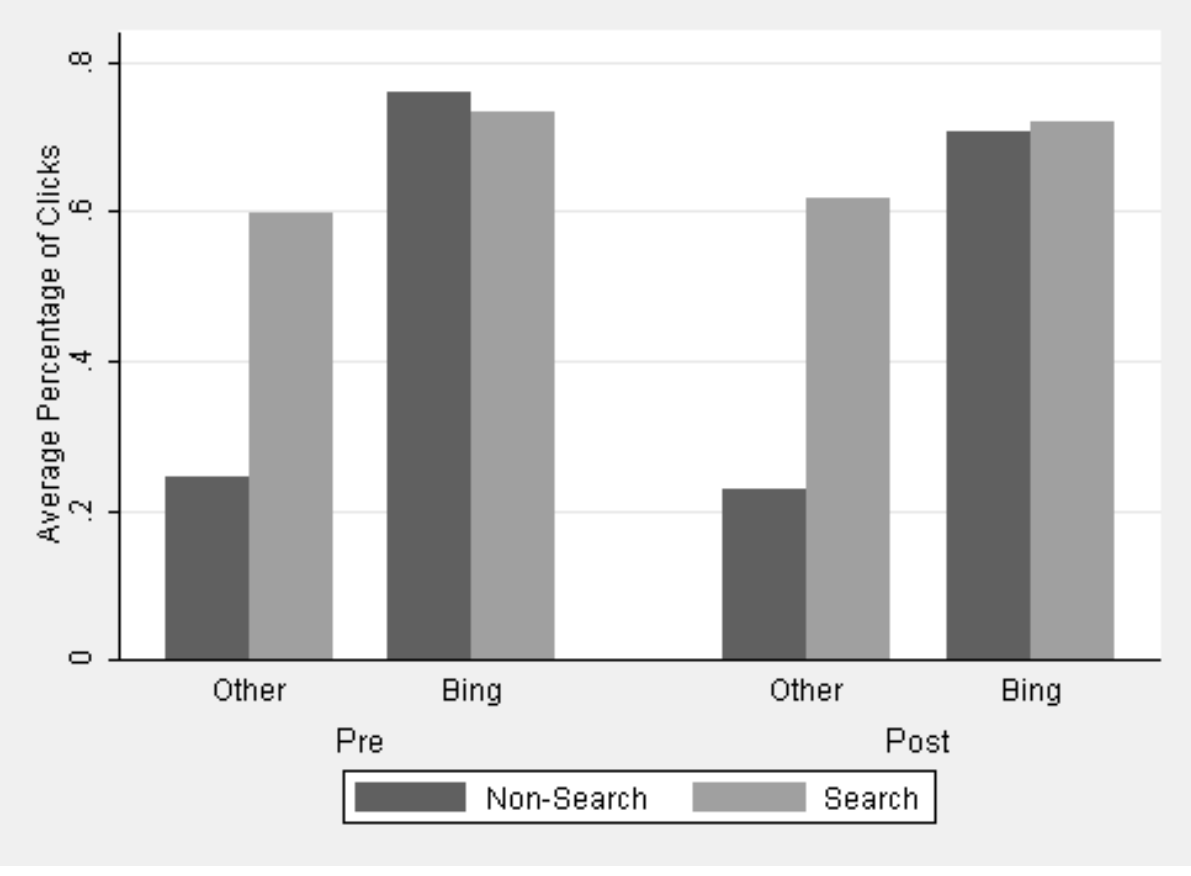
There are other potential types of regulation governing personal data

- Another example of regulation that Europe has experimented with is limiting how long data is stored.
- Search engines have been a target
  - Voluntarily adjusted the length of time they store individual search logs after pressure from EU commissioner.
- Compare search engine accuracy under new self-imposed limits.

- Data
  - Data from Comscore on aggregate search engine usage behavior.
  - Focus on whether or not after using a search engine a user did another search as proxy for search engine accuracy
- Method: Diff-in-Diff
  - Difference between search engines that changed their policies verses those that did not.
  - Difference before and after the change for these search engines.

Little measured effect on search engine performance

Figure : Bing January 19, 2010: Storage time reduced from 18 to 6 months



Implications

Storage time privacy regulation appears to have little effect.

- But the length of time that data is stored does increase the risk of privacy-harm to an individual
  - Think of AOL scandal
- It may be because:
  - Old Data is not that valuable for predicting current behavior.
  - Other ways of predicting behavior (such as structure of web itself) dominates.