

The Economics of Privacy: An Agenda

Catherine Tucker

MIT Sloan and NBER

Agenda

Challenges to Studying Privacy

The History of the Economics of Privacy

Outstanding Questions

Final Thoughts

In Depth

Challenges to Studying Privacy

Modeling it is Hard

Bound Up in Technological Change

What is Privacy?

My Favorite Definition: Freedom from Unwarranted Intrusion

CAN PRIVACY BE JUST ANOTHER GOOD?

JOSEPH FARRELL*

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In Depth

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HARVARD
LAW REVIEW.

VOL. IV.

DECEMBER 15, 1890.

NO. 5.

THE RIGHT TO PRIVACY.

"It could be done only on principles of private justice, moral fitness, and public convenience, which, when applied to a new subject, make common law without a precedent; much more when received and approved by usage."

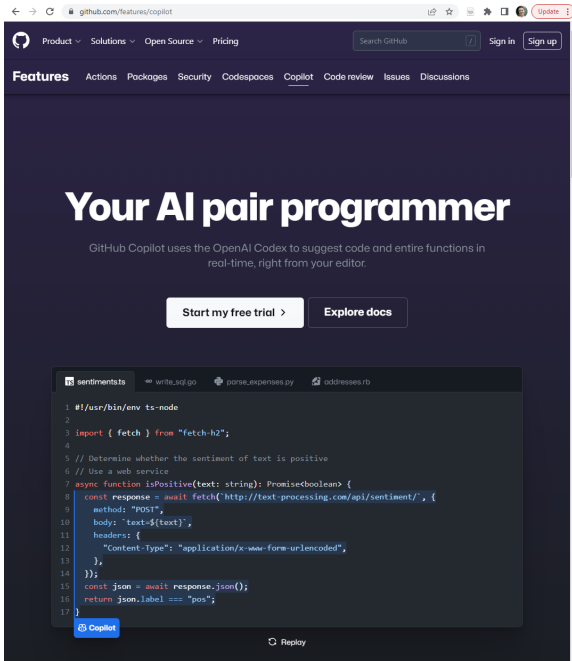
WHEAT, J., in *Miller v. Taylor*, 4 Burr. 1093, 1216.

THAT the individual shall have full protection in person and

A Shift in Costs of Data Storage

- In 2001, 1 GB cost \$19.70 to store.
- In 2010, 1 GB cost \$0.06 to store.
- In 2022, 1 GB cost \$0.0023/GB to store.

A Shift in Costs in Data-Driven Technologies



The image shows a screenshot of the GitHub Copilot website. At the top, the browser address bar shows the URL `github.com/features/copilot`. The website header includes navigation links for Product, Solutions, Open Source, and Pricing, along with a search bar and sign-in/sign-up buttons. The main heading reads "Your AI pair programmer". Below this, a sub-heading states: "GitHub Copilot uses the OpenAI Codex to suggest code and entire functions in real-time, right from your editor." Two buttons are present: "Start my free trial >" and "Explore docs". The central part of the page features a code editor window with the following JavaScript code:

```
sentiments.ts write_sql.go parse_expenses.py addresses.rb
1 #!/usr/bin/env ts-node
2
3 import { fetch } from "fetch-h2";
4
5 // Determine whether the sentiment of text is positive
6 // Use a web service
7 async function isPositive(text: string): Promise<boolean> {
8   const response = await fetch("http://text-processing.com/api/sentiment/", {
9     method: "POST",
10    body: `text-${text}`,
11    headers: {
12      "Content-Type": "application/x-www-form-urlencoded",
13    },
14  });
15  const json = await response.json();
16  return json.label === "pos";
17 }
```

At the bottom of the code editor, there is a "Copilot" button and a "Replay" button.

All These Mean That How We Model And Think About
Privacy is Constantly Changing

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The Economics of Privacy†

ALESSANDRO ACQUISTI, CURTIS TAYLOR, AND LIAD WAGMAN*

This article summarizes and draws connections among diverse streams of theoretical and empirical research on the economics of privacy. We focus on the economic value and consequences of protecting and disclosing personal information, and on consumers' understanding and decisions regarding the trade-offs associated with the privacy and the sharing of personal data. We highlight how the economic analysis of privacy evolved over time, as advancements in information technology raised increasingly nuanced and complex issues. We find and highlight three themes that connect diverse insights from the literature. First, characterizing a single unifying economic theory of privacy is hard, because privacy issues of economic relevance arise in widely diverse contexts. Second, there are theoretical and empirical situations where the protection of privacy can both enhance and detract from individual and societal welfare. Third, in digital economies, consumers' ability to make informed decisions about their privacy is severely hindered because consumers are often in a position of imperfect or asymmetric information regarding when their data is collected, for what purposes, and with what consequences. We conclude the article by highlighting some of the ongoing issues in the privacy debate of interest to economists. (JEL D82, D83, G20, I10, L13, M31, M37)

And let me assure you are speakers today will more than justice to this...

9:00 am	Introductions
9:15 am	Introduction to the Economics of Privacy Catherine Tucker, Massachusetts Institute of Technology and NBER
10:15 am	Break
10:30 am	Theory and Privacy (slides) Alessandro Bonatti, Massachusetts Institute of Technology
11:30 am	Break
11:45 am	Privacy of Digital Health Information Amalia R. Miller, University of Virginia and NBER
12:45 pm	Lunch - Room Longfellow A
1:45 pm	Empirical Economic Research on Privacy Regulation: Lessons from the GDPR and Beyond (slides) Garrett Johnson, Boston University
2:45 pm	Break
3:00 pm	The Economics of Privacy at a Crossroads Alessandro Acquisti, Carnegie Mellon University
4:00 pm	Future Directions (General Discussion)

So What Am I Going To Do?

Well I am a Marketing Professor....

Share Some Ideas About Good Research Topics for Junior Researchers

Not in any way intended to be exhaustive.

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Privacy Preferences and Contextual Integrity

Privacy Preferences and Information Security Concerns

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I am completely guilty of this

Privacy and Innovation

Avi Goldfarb and Catherine Tucker

Rotman School of Management, University of Toronto MIT Sloan School of Management and NBER

 Abstract

 Full Text

 PDF



 Sections

 More

Abstract

Information and communication technologies now enable firms to collect detailed and potentially intrusive data about their customers both easily and cheaply. Privacy concerns are thus no longer limited to government surveillance and public figures' private lives. The empirical literature shows that privacy regulation may affect the extent and direction of data-based innovation. We also show that the impacts of privacy regulation can be extremely heterogeneous. We therefore argue that digitization has made privacy policy a part of innovation policy.

Privacy Regulation Might Halt The Spread of Data Associated With Unfounded Stigma

- Mental Health
- Reproductive Health
- Past Crimes

Privacy Regulation Might Halt The Spread of Data Associated With Addiction

- Health
- Spending
- Gambling

But if we want to measure more global benefits to privacy regulation we need to model consumer tastes for privacy better

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Valuing Intrinsic and Instrumental Preferences for Privacy

Tesary Lin 

Published Online: 13 May 2022 | <https://doi.org/10.1287/mksc.2022.1368>

Abstract

I empirically separate two components in a consumer's privacy preference. The intrinsic component is a "taste" for privacy, a utility primitive. The instrumental component comes from the consumer's anticipated economic loss from revealing his private information to the firm and arises endogenously from a firm's usage of consumer data. Combining an experiment and a structural model, I measure the revealed preferences separately for each component. Intrinsic preferences have seemingly small mean values, ranging from \$0.14 to \$2.37 per demographic variable. Meanwhile, they are highly heterogeneous across consumers and categories of data: The valuations of consumers at the right tail often exceed the firm's valuation of consumer data. Consumers' self-selection into data sharing depends on the respective magnitudes and correlation between the two preference components and often deviates from the "low types are more willing to hide" argument. Through counterfactual analysis, I show how this more nuanced selection pattern changes a firm's inference from consumers' privacy decisions and its data-buying strategy.

And Also



Athey, Susan, Christian Catalini, and Catherine Tucker. The digital privacy paradox: Small money, small costs, small talk. No. w23488. National Bureau of Economic Research. 2017.

What This Tells Me We Need

Papers with individual-level privacy choice data over time across difference dimensions. Without that it is hard to make much progress given our current tool kit. (But even this would suffer truncation)

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The Theory of Contextual Integrity May Give Us
Insights into How To Model Heterogeneity of Privacy
Preferences Across Domains, Times and Individuals

Contextual Integrity Theory: Helen Nissenbaum

PARAMETERS

Actors

Sender
Recipient
Subject

Information types

Transmission Principles

VALUES

Physician, merchant, bank, friend, merchant, police, Verizon, shopper, investor, reader, advertiser, voter, insurance company, parent, spouse, teacher, friend, student, FBI, CIA, neighbor

Demographic, biographical, transactional, what you read, movies you've seen, metadata, purchases, salary, address, medical diagnosis, facial image, SSN, how much you paid for your house, grades, spoons of sugar in your coffee, sexual orientation

Consent, coerce, compel, steal, buy, sell, in confidence, surreptitiously, with notice, with a warrant, with authorization, reciprocal, as required by law

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Can This Framework Help Us Distinguish Between Information Security and Privacy Concerns?

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American Economic Review: Papers & Proceedings 2012, 102(3): 349–353
<http://dx.doi.org/10.1257/aer.102.3.349>

Shifts in Privacy Concerns[†]

By AVI GOLDFARB AND CATHERINE TUCKER*

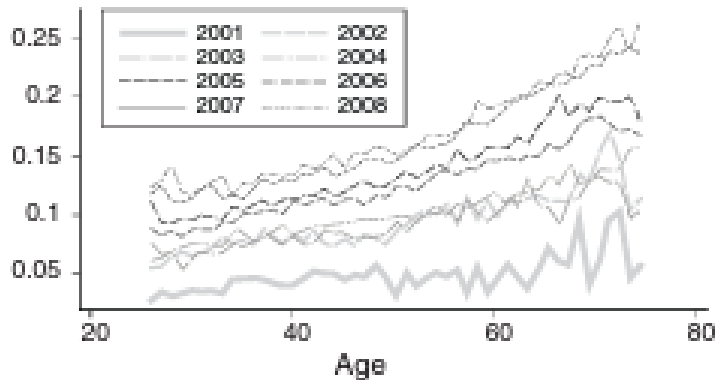


FIGURE 1. FRACTION REFUSING TO REVEAL INCOME BY AGE AND YEAR

Inferences From Data Created In Your Youth



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Individual Data Markets

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All Economists When Asked to Comment on Privacy

Coase Theorem



PROPERTY DISPUTE



RESOLVED AMICABLY WITHOUT
ANY EXTERNAL COST



BEST OUTCOME FOR BOTH THE
PARTIES IRRESPECTIVE OF THE
NATURE OF THE RESULT

But are Property Rights Easy to Define?

- Beyond Binary Data
- Spillovers
- Inferences Rather than Data

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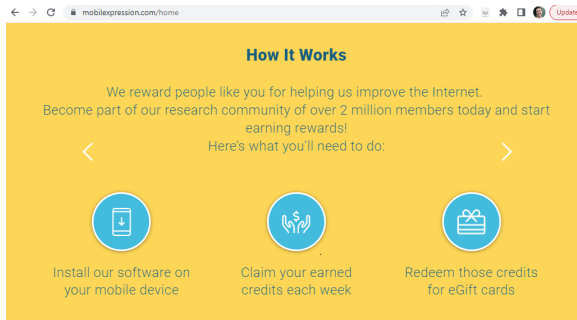
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Why haven't Individual Data Markets worked?



The screenshot shows a web browser window with the address bar displaying "mobileexpression.com/home". The page content is on a yellow background and is titled "How It Works". The text reads: "We reward people like you for helping us improve the Internet. Become part of our research community of over 2 million members today and start earning rewards! Here's what you'll need to do:". Below this text are three steps, each with a circular icon and a description:

- Install our software on your mobile device**: Represented by an icon of a smartphone with a downward arrow.
- Claim your earned credits each week**: Represented by an icon of two hands holding a dollar sign.
- Redeem those credits for eGift cards**: Represented by an icon of a gift box with a ribbon.

One obvious explanation is asymmetric information and moral hazard

Another explanation is that data is just very cheap

← → ↻ technical.ly/startups/how-drunk-mode-app-became-data-location-company-x-mode-social/ 🏠 ☆ 📄 ⚙️ 🗄️ 👤

Technical.ly


 STARTUPS

Feb. 27, 2020 12:45 pm

How Drunk Mode, an app for the inebriated, became data location company X-Mode Social

The Reston, Virginia-based company pivoted from an earlier app known as a "condom for your phone" and is now working to drive data collection to be "a more transparent, privacy-conscious industry."

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Privacy & Market Concentration: Intended & Unintended Consequences of the GDPR

57 Pages • Posted: 15 Nov 2019 • Last revised: 22 Sep 2022

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Stanford Institute for Economic Policy Research

Date Written: September 21, 2022

Abstract

We show that websites' vendor use falls after the European Union's General Data Protection Regulation (GDPR), but that market concentration also increases among technology vendors that provide support services to websites. We collect panel data on the web technology vendors selected by more than 27,000 top websites internationally. The week after the GDPR's enforcement, website use of web technology vendors falls by 15% for EU residents. Websites are relatively more likely to retain top vendors, which increases the concentration of the vendor market by 17%. Increased concentration predominantly arises among vendors that use personal data such as cookies, and from the increased relative shares of Facebook and Google-owned vendors, but not from website consent requests. Though the aggregate changes in vendor use and vendor concentration dissipate by the end of 2018, we find that the GDPR impact persists in the advertising vendor category most scrutinized by regulators. Our findings shed light on potential explanations for the sudden drop and subsequent rebound in vendor usage.

Keywords: Privacy, GDPR, Competition, Web Technology, Regulatory compliance

JEL Classification: D04, K21, L11, L22, L51, L86, M30, M38, O38

Suggested Citation:

Let's Look at the Dynamics Elsewhere

Global EdTech and Smart Classrooms Market Report 2022-2027 Featuring Leading Players - Apple, Cisco, Blackboard, IBM, Dell EMC, Google, Microsoft, Oracle, SAP, & Instructure - ResearchAndMarkets.com

August 04, 2022 08:37 AM Eastern Daylight Time

DUBLIN--(BUSINESS WIRE)--The "Global EdTech and Smart Classrooms Market by Hardware (Interactive Displays, Interactive Projectors), Education System Solution (LMS, TMS, DMS, SRS, Test Preparation, Learning & Gamification), Deployment Type, End User and Region - Forecast to 2027" report has been added to **ResearchAndMarkets.com's** offering.

Global EdTech and Smart Classrooms Market by Hardware (Interactive Displays, Interactive Projectors), Education System Solution (LMS, TMS, DMS, SRS, Test Preparation, Learning & Gamification), Deployment Type, End User and Region -

The publisher forecasts the global EdTech and smart classrooms market to grow from USD 125.3 billion in 2022 to USD 232.9 billion by 2027, at a Compound Annual Growth Rate (CAGR) of 13.2%

The major factors driving the growth of the EdTech and smart classrooms market include growing adoption of eLearning solutions, impact of COVID-19 pandemic and growing need for online teaching-learning models to continue education system in lockdown.

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Let's Move Beyond Studies of Ad Blocking and Move to the Firm

Product Category Descriptions

Privacy program management – solutions designed specifically for the privacy office.

Assessment managers tend to automate different functions of a privacy program, such as operationalizing privacy impact assessments, locating risk gaps, demonstrating compliance and helping privacy officers scale complex tasks requiring spreadsheets, data entry and reporting.

Consent managers help organizations collect, track, demonstrate and manage users' consent.

Data mapping solutions can come in manual or automated form and help organizations determine data flows throughout the enterprise.

Data subject request solutions help organizations facilitate inquiries made by individuals who wish to exercise their data rights. These can include requests involving the right to access, rectification, portability and erasure.

Incident response solutions help companies respond to a data breach incident by providing information to relevant stakeholders of what was compromised and what notification obligations must be met.

Privacy information managers provide organizations with extensive and often automated information on the latest privacy laws around the world.

Website scanning is a service that primarily checks a client's website to determine what cookies, beacons and other trackers are embedded to help ensure compliance with various applica-

Enterprise privacy management – solutions designed to service the needs of the privacy office alongside the overall business needs of an organization.

Activity monitoring helps organizations determine who has access to personal data and when it is being accessed or processed. These solutions often come with controls to help manage activity.

Data discovery tends to be an automated technology that helps organizations determine and classify what kind of personal data they possess to help manage privacy risk and compliance.

Deidentification/Pseudonymity solutions help data scientists, researchers and other stakeholders derive value from datasets without compromising the privacy of the data subjects in a given dataset.

Enterprise communications are solutions that help organizations communicate internally in a secure way to avoid embarrassing or dangerous leaks of employee communications.

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Costs of Regulation or Privacy Enhancing?

2022 Privacy Tech VENDOR REPORT

By IAPP Staff Writer Alex LaCasse

The IAPP presents its sixth annual "Privacy Tech Vendor Report." In previous editions, the report examined the growth and trends of the privacy technology marketplace year over year. This issue, the IAPP lists 364 privacy technology vendors, each featured in the [directory section](#) of this report.

In the last six years, privacy tech has become a critical industry offering solutions for an ever-evolving global regulatory system that places a greater emphasis on user privacy. A key takeaway is that while the privacy tech industry has grown exponentially, it stands on the precipice of a fundamental sea change, facing possible consolidation and specialization geared toward specific customer solutions.

This year's "Privacy Tech Vendor Report" finds the industry at a crossroads of sorts. As privacy has shifted from an afterthought to a necessity within the last decade, the conversation today regarding its place in product development has evolved from the abstract to the technical implementation of an array of solutions.

"Companies are now moving toward understanding what their privacy tech

Chief Strategy Officer Mark Thompson, CIPP/E, CIPM, CIPT, FIP. "For the vendors that have 'got it right,' there is a clear opportunity to differentiate from the pack by showing an enhanced understanding of customer needs and how their products help solve these challenges."

Astrachain co-founder and CEO Yosra Jarraya said the privacy tech marketplace has grown past the point of solely playing catch-up with the implementation and enforcement of privacy laws around the world. Instead, it now looks to build comprehensive technical solutions to big-picture data security concerns.

Companies are now moving toward understanding what their privacy tech requirements are, and I can't say enough about how that was just not a thing, even a few years ago.

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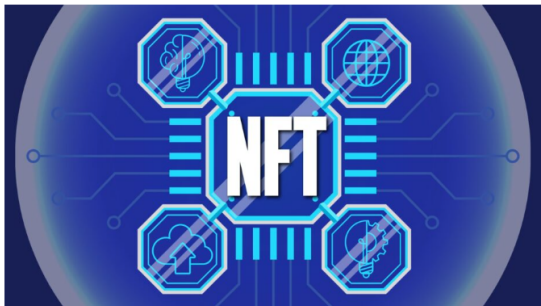
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Perhaps you can do better than me here....

Cryptoeconomy: NFTs could be the way to data privacy

Por *staff* -04/08/2022



"Anything that you post on the internet isn't yours anymore." A lot of us who grew up in the age of the internet heard that a lot because it's virtually true. Once you post something online, any and everybody can download it, manipulate it and you have no control over it. **However, this might be changing with the introduction of NFTs as the next resource for digital identity management and data privacy.**

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Do we care about data privacy or inferential privacy?

PNAS PNAS PNAS

Private traits and attributes are predictable from digital records of human behavior

Michal Kosinski^{1,2}, David Stillwell², and Thore Graepel³

¹Tree School Lane, The Psychometrics Centre, University of Cambridge, Cambridge CB2 3RQ United Kingdom; and ²Microsoft Research, Cambridge CB1 2FB, United Kingdom

Edited by Kenneth Wachtler, University of California, Berkeley, CA, and approved February 12, 2013 (received for review October 29, 2012)

We show that easily accessible digital records of behavior, Facebook Likes, can be used to automatically and accurately predict a range of highly sensitive personal attributes including: sexual orientation, ethnicity, religious and political views, personality traits, intelligence, happiness, use of addictive substances, parental separation, age, and gender. The analysis presented is based on a dataset of over 58,000 volunteers who provided their Facebook Likes, detailed demographic profiles, and the results of several psychometric tests. The proposed model uses dimensionality reduction for preprocessing the Likes data, which are then entered into logistic/linear regression to predict individual psychodemographic profiles from Likes. The model correctly discriminates between homosexual and heterosexual men in 88% of cases, African Americans and Caucasian Americans in 95% of cases, and between Democrat and Republican in 85% of cases. For the personality trait "Openness," prediction accuracy is close to the test-retest accuracy of a standard personality test. We give examples of associations between attributes and Likes and discuss implications for online personalization and privacy.

social networks | computational social science | machine learning | big data | data mining | psychological assessment

browsing logs (11–15). Similarly, it has been shown that personality can be predicted based on the contents of personal Web sites (16), music collections (17), properties of Facebook or Twitter profiles such as the number of friends or the density of friendship networks (18–21), or language used by their users (22). Furthermore, location within a friendship network at Facebook was shown to be predictive of sexual orientation (23).

This study demonstrates the degree to which relatively basic digital records of human behavior can be used to automatically and accurately estimate a wide range of personal attributes that people would typically assume to be private. The study is based on Facebook Likes, a mechanism used by Facebook users to express their positive association with (or "Like") online content, such as photos, friends' status updates, Facebook pages of products, sports, musicians, books, restaurants, or popular Web sites. Likes represent a very generic class of digital records, similar to Web search queries, Web browsing histories, and credit card purchases. For example, observing users' Likes related to music provides similar information to observing records of songs listened to online, songs and artists searched for using a Web search engine, or subscriptions to related Twitter channels. In contrast to these other sources of information, Facebook Likes are unusual in that they are currently publicly available by default. However



Inferential Privacy Makes Real The Question of The
Unpredictability of Algorithmic Progress

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The debate on privacy harms has moved on to algorithmic discrimination

[Home](#) > [Management Science](#) > [Vol. 65, No. 7](#) >

Algorithmic Bias? An Empirical Study of Apparent Gender-Based Discrimination in the Display of STEM Career Ads

Anja Lambrecht , Catherine Tucker 

Published Online: 10 Apr 2019 | <https://doi.org/10.1287/mnsc.2018.3093>

Abstract

We explore data from a field test of how an algorithm delivered ads promoting job opportunities in the science, technology, engineering and math fields. This ad was explicitly intended to be gender neutral in its delivery. Empirically, however, fewer women saw the ad than men. This happened because younger women are a prized demographic and are more expensive to show ads to. An algorithm that simply optimizes cost-effectiveness in ad delivery will deliver ads that were intended to be gender neutral in an apparently discriminatory way, because of crowding out. We show that this empirical regularity extends to other major digital platforms.

Fig

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The FTC Echoes This

BILLING CODE: 6750-01-P

FEDERAL TRADE COMMISSION

16 CFR Part 464

Trade Regulation Rule on Commercial Surveillance and Data Security

AGENCY: Federal Trade Commission.

ACTION: Advance notice of proposed rulemaking; request for public comment; public forum.

SUMMARY: The Federal Trade Commission ("FTC") is publishing this advance notice of proposed rulemaking ("ANPR") to request public comment on the prevalence of commercial surveillance and data security practices that harm consumers. Specifically, the Commission invites comment on whether it should implement new trade regulation rules or other regulatory alternatives concerning the ways in which companies (1) collect, aggregate, protect, use, analyze, and retain consumer data, as well as (2) transfer, share, sell, or otherwise monetize that data in ways that are unfair or deceptive.

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Technology

Amazon to Bring Same-Day Delivery to Roxbury After Outcry

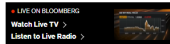
- Largely black Boston neighborhood was excluded from service
- Illinois Congressman wants FTC to investigate delivery areas



Photographer: David Paul Morris/Bloomberg

By [Spencer Soper](#)

April 26, 2016 at 5:19 PM EDT *Updated on April 26, 2016 at 8:22 PM EDT*



The Mirror of Privacy Policy: Data Deserts



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AI-tocracy
Martin Beraja, Andrew Kao, David Y. Yang, and Noam Yuchtman
NBER Working Paper No. 29466
November 2021
JEL No. E00,L5,L63,O25,O30,O40,P00

ABSTRACT

Can frontier innovation be sustained under autocracy? We argue that innovation and autocracy can be mutually reinforcing when: (i) the new technology bolsters the autocrat's power; and (ii) the autocrat's demand for the technology stimulates further innovation in applications beyond those benefiting it directly. We test for such a mutually reinforcing relationship in the context of facial recognition AI in China. To do so, we gather comprehensive data on AI firms and government procurement contracts, as well as on social unrest across China during the last decade. We first show that autocrats benefit from AI: local unrest leads to greater government procurement of facial recognition AI, and increased AI procurement suppresses subsequent unrest. We then show that AI innovation benefits from autocrats' suppression of unrest: the contracted AI firms innovate more both for the government and commercial markets. Taken together, these results suggest the possibility of sustained AI innovation under the Chinese regime: AI innovation entrenches the regime, and the regime's investment in AI for political control stimulates further frontier innovation.

Added Inducement

Government Surveillance and Internet Search Behavior

53 Pages · Posted: 23 Mar 2014 · Last revised: 15 Mar 2017

[Alex Marthews](#)

Digital Fourth / Restore The Fourth

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Abstract

This paper displays data from the US and its top 40 trading partners on the search volume of select keywords from before and after the surveillance revelations of June 2013, to analyze whether Google users' search behavior changed as a result. The surveillance revelations are treated as an exogenous shock in information about how closely users' internet searches were being monitored by the US government. Each search term was independently rated for its degree of privacy sensitivity along multiple dimensions. Using panel data, our results suggest that search terms that were deemed both personally-sensitive and government-sensitive were most negatively affected by the PRISM revelations, highlighting the interplay between privacy concerns relating to both the government and the private individual. Perhaps surprisingly, the largest 'chilling effects' were not found in countries conventionally treated as intelligence targets by the US, but instead in countries that were more likely to be considered allies of the US. We show that this was driven in part by a fall in searches on health-related terms. Suppressing health information searches potentially harms the health of search engine users and, by reducing traffic on easy-to-monetize queries, also harms search engines' bottom line. In general, our results suggest that there is a chilling effect on search behavior from government surveillance on the Internet, and that government surveillance programs may damage the profitability of US-based internet firms relative to non-US-based internet firms.

Keywords: surveillance, Snowden, prism, chilling effects, international trade

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The vote, which is expected to pass, is required by a law that President Biden signed last year.

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Jessica Rosenworcel, the F.C.C. chairwoman, said the agency “remains committed to protecting our national security by ensuring that untrustworthy communications equipment is not authorized for use within our borders.” Pool photo by Jonathan Newton

By **David McCabe** and **Cecilia Kang**

Oct. 13, 2022 Updated 2:33 p.m. ET



Biden hopes privacy appeals for EU citizens will save data flows

The president is signing an order implementing the details of an agreement with the EU to replace Privacy Shield.



Agenda

Challenges to Studying Privacy

The History of the Economics of Privacy

Outstanding Questions

Final Thoughts

If I get to this final slide in an hour I literally won't believe it

But thank you a lot for listening and can't wait for your thoughts and ideas about where the field should go
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