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PERSPECTIVES ON EMPIRICAL RESEARCH

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Not all data are created equal



Experimental data allow for precise estimates

Ex. People Behavior in Experimental settings



Publicly accessible estimates by institutions and data companies

Ex. Eurostat, SEC, StatCounter, Gartner



Private data confidentially provided by digital platforms

Ex. Ad data provided by search engines



Private data publicly provided by digital platforms

Ex. Meta library, company statements



Research opportunities and methodology are largely dependent on the **available data**

Company may provide data voluntarily or in compliance with regulation



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Experiments Avoid Limits of Observational Data

Experimental Data

- ✓ Researcher can produce their "own" data
- ✓ Data is independent form external sources
- ✓ Data allows to study individual responses
- ✗ Experimental data is costly and long to gather

Researcher can build «custom» datasets to fit their research purpose

Researcher do not depend on external entities for data access, increasing independence

Experimental data allows to study reactions at the micro level, without relying on aggregates

Experiments often take time to be conducted and must limit the amount of participants due to budget constraints

Famous example: The Welfare Effects of Social Media By Alcott et al. (2020)¹



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Notes: ¹ Alcott H, Braghieri L, Eichmeyer S, Gentzkow M (2020). *The Welfare Effects of Social Media*. American Economic Review

Public Data: Pervasive, Growingly So (?)

Competition and Defaults in Online Search¹

- Default effects in mobile search
- Three policy interventions by EEA, Russia, and Turkey
- Differences in policy design and local market characteristics results in policy **outcomes of identical direction but largely different magnitudes**

Public Data Sources

Market Share (Primary)	StatCounter	Monthly market shares for SEs after 2009; EC's main data source during free-to-play
Market Share (Alternative)	Yandex Radar	Alternative source used for the Russian market
Device Shipments	Gartner	Quarterly phone shipments for the largest 50 countries after 2016
Market Size	Newzoo	after 2016 annual measure of population, active smartphone devices and users
Apps Download	Apptweak	Daily app downloads in over 70 countries
Search Advertising	SEMrush	Average cost per click and search volume among time, countris and keywords

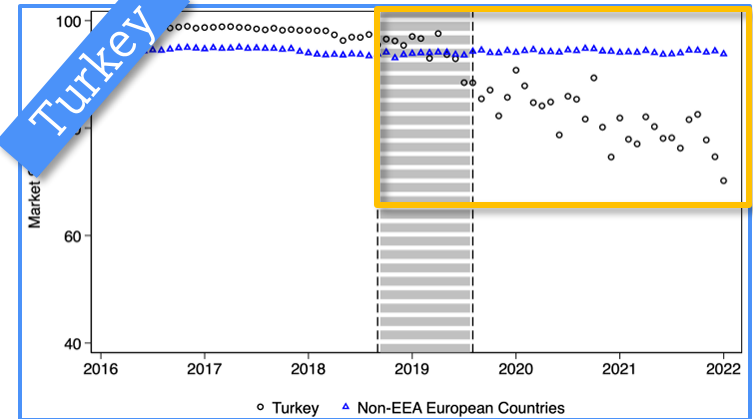
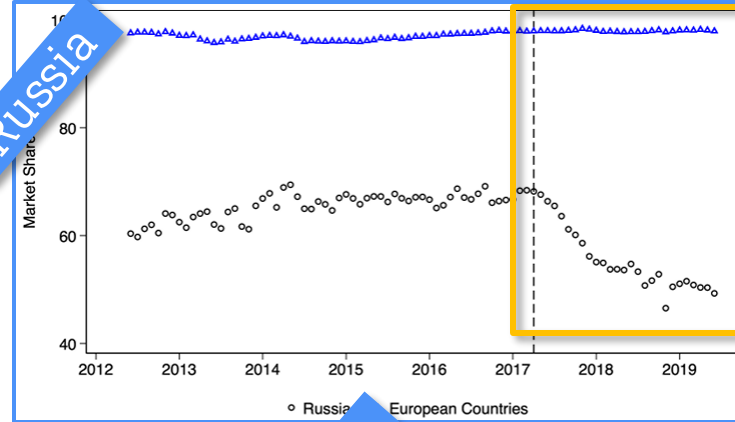
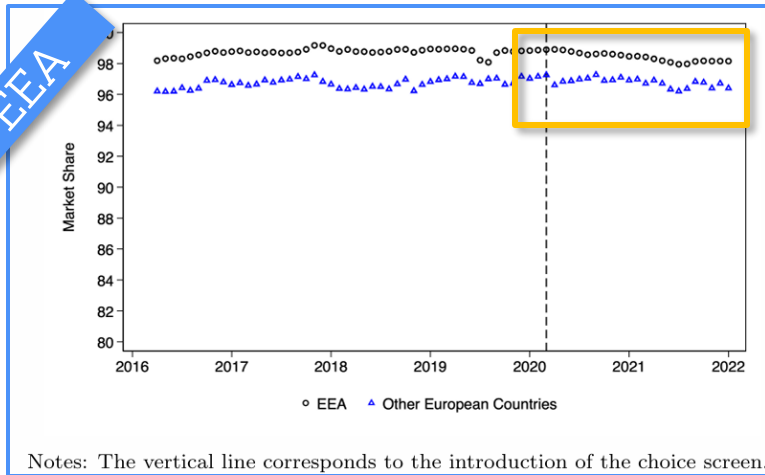


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Notes: ¹F. Decarolis, M. Li and F. Patemollo, "Competition and Defaults in Online Search" AEJ-Microeconomics, *forthcoming*

Public Data Allows Reduced-Form Models



Using Public, Aggregated Data We
Can Look at Macro Trends

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Confidential Data Allows Structural Models

Bid Coordination in Sponsored Search Auctions¹

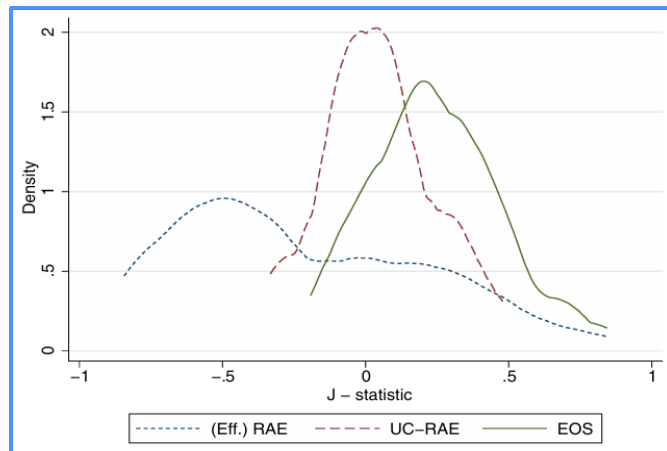
- Confidential data from a major search engine used to estimate a structural model of bidding in search ad auctions
- Detect bid coordination and estimate a bound on the revenue impacts
- Coordination is detected in 55% of the cases of delegated bidding and the search engine's revenue loss ranges between 5.3% and 10.4%



Using Detailed Confidential Data We Can Look at Micro-Level effects



Confidential data imposes limits on research transparency



If $J_t \geq 0$: suggests competitive bidding
 If $J_t = 0$: suggests UC-RAE (undistinguishable coordination)
 If $J_t < 0$: suggests Eff-RAE (efficient coordination)



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Notes: ¹F. Decarolis, M. Goldmanis, A. Penta, K. Shakhgildyan, [Bid Coordination in Sponsored Search Auctions: Detection Methodology and Empirical Analysis](#), Journal of Industrial Economics, 2023

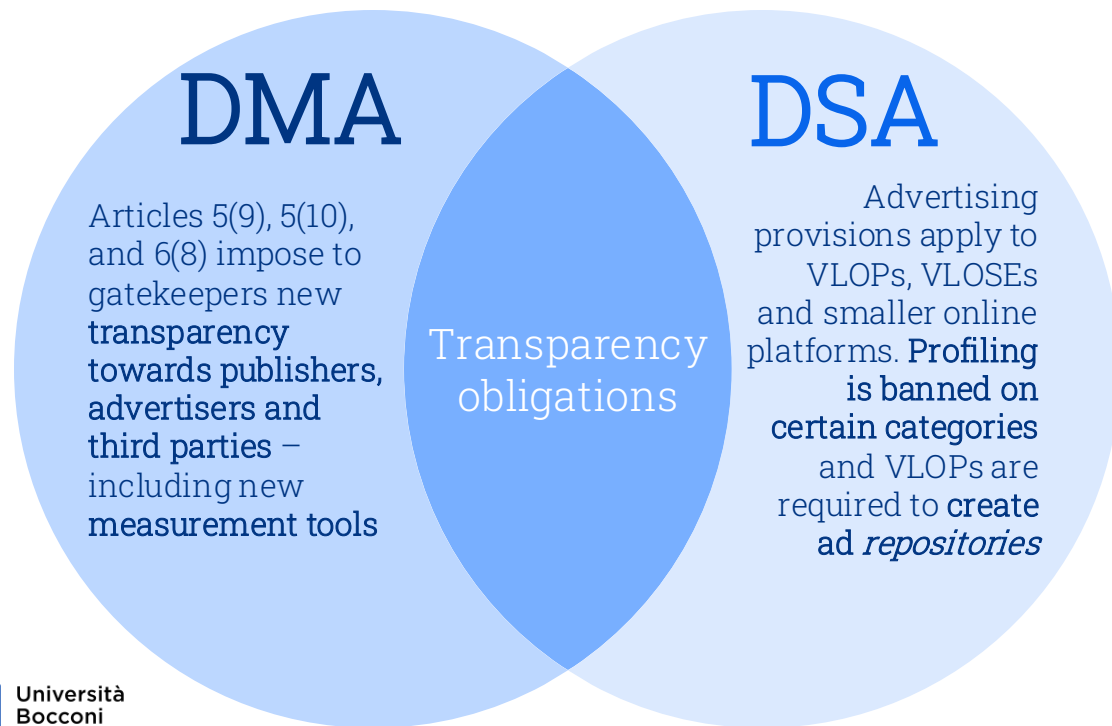
Confidential Data Have Pros and Cons

Confidential Record of Major Search Engine

- ✓ **Granularity:** disaggregated data allow to estimate sophisticated models
- ✓ **Completeness:** data possibly covering an entire market
- ✓ ***Ground truth vs estimates:*** actual outcomes rather than estimates as in the case of (some) public data

- ✗ **Confidentiality:** Limited transparency, as researchers cannot freely disclose information about the dataset
- ✗ **Difficulty in access:** Companies rarely allow researcher to access their datasets and sometimes vet results
- ✗ **Time-limited:** Timespan often involves older data and is can be short

A New Kind of Data is Emerging: Example of Ads



Brussels Effect for Data Availability?

New data has been made available by companies to comply with the EU DMA and DSA regulations



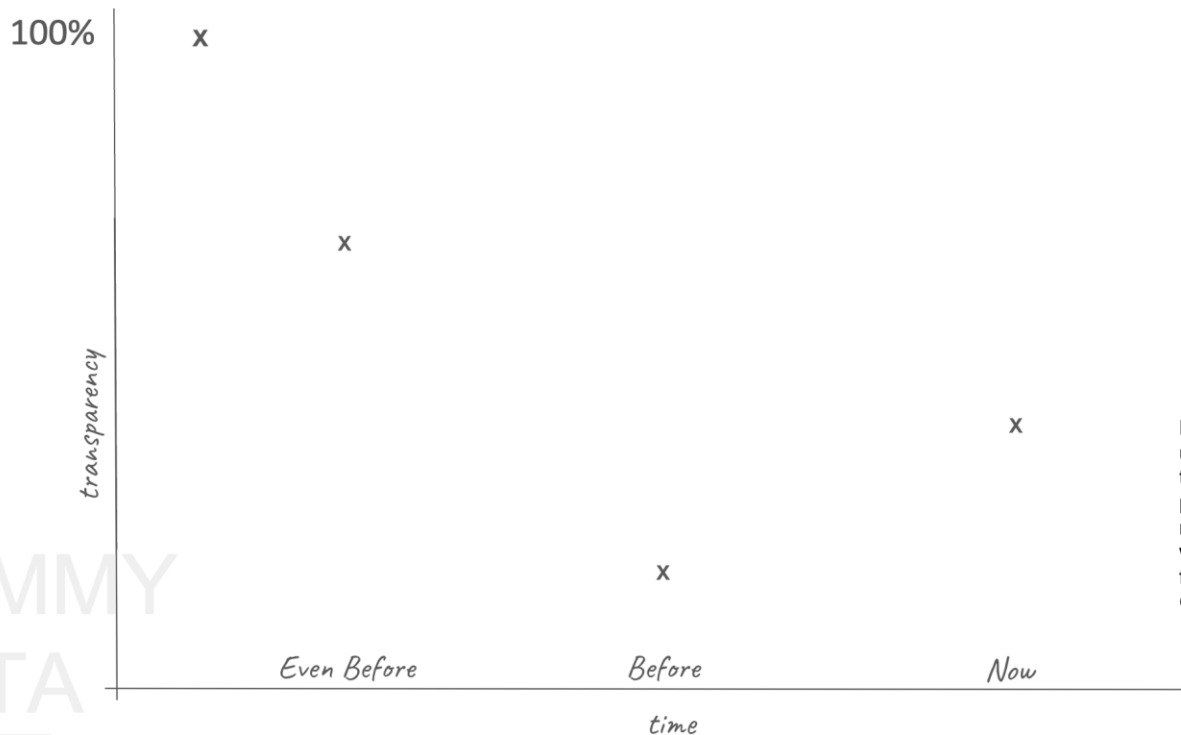
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From the Business Side, Not so Bright

a personal representation on what transparency feels like on Google Ads

View from a EU mid size (500 employees) firm active in most EU countries and specialized in media buying, marketing analytics and ad creativity



Note: This graph uses dummy data to provide a personal representation of what transparency feels like on Google Ads

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Meta Ad Library Has Research Potential

Meta Ad Access

- A comprehensive, searchable database for ads transparency.
- Tools:
 1. Ad Library (free access)
 2. Report (free access)
 3. API (free access)
 4. Targeting Data (only approved)

Ad Type	Social issues, elections or politics	EU	Other Ad
Time Frame	7 years	1 year	No historical data
Information	<ul style="list-style-type: none"> • Ad content • Basic information (when the ad started running, which advertiser is running it) • Additional transparency about spend, reach and funding entities 	<ul style="list-style-type: none"> • Ad content • Basic information (when the ad started running, which advertiser is running it) • Additional transparency specific to the EU 	<ul style="list-style-type: none"> • Ad content • Basic information (when the ad started running, which advertiser is running it)

“Ad Targeting Data” Access Is Not So Transparent

Ad Targeting Dataset

- **Ad Targeting dataset:** information selected by advertisers who ran ads about social issues, elections or politics category
- **Access:** only approved researcher
- **Time Frame:** Ads after August 2020 on the Facebook and Instagram platforms
- **Coverage:** more than 120 countries



Only researchers can request access to the Ad Targeting Dataset...

But is the access process transparent?



Our Experience

1. 2024 Apr: Researcher 1 submits research proposal → **Denied**
2. 2024 May: Researcher 2 submits **polished** research proposal → **Denied**
3. 2024 Sep: Researcher 1 submits same polished research proposal → **Accepted**



Transparency issue



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THANK YOU



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Appendix



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Transparency in Advertising



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Appendix: Choice Screen



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Default Effects in Mobile Search

- ❖ If users are rational, they cluster on Google due to the superior quality of its service:
 - Regulations, like data sharing, that enhance the quality of alternative search engines will strengthen competition.

- ❖ If there is no quality advantage of Google relative to its rivals. Consumers- due to a default effect- use whatever search engine they find pre-installed on their device:
 - Regulations, like mandatory data sharing, are completely
 - ineffective in fostering competition in search.
 - Regulatory intervention would need to account for users'
 - behavioral biases.

EU Intervention

In July 2017, the European Commission (EC) fined Google €4.34 billion for bundling

- Play Store
- Chrome
- Google Search

to Android mobile manufacturers in the EEA.

EC and Google agreed to implement a choice screen for all new Android mobile devices purchased after March 2020.

Criteria determining which search engines are shown evolved over time:

- ❖ **Pay-to-Play choice screen:** competing search providers participated in an auction:
 - quarterly and separately for each EEA member state
 - top 3 are winners
 - criticized by competing search engines and by Ostrovsky (2023)
- ❖ **Free-to-Play choice screen:** free participation for competing search engines, with the top five search engines selected based on market shares.
 - top five search engines selected based on market shares
 - bottom seven search engines are randomly chosen

Russian Intervention

In April 2017, Russia's Federal Antimonopoly Service (FAS) agency fined Google 438 million roubles (\$6.5 million USD) for violating the antimonopoly legislation.

- ❖ FAS and Google agreed to implement a **choice screen**
- ❖ Distinctive features of the Russian choice screen:
 - accessible for **all** Android mobile devices in the country
 - search engines appearing on the choice screen were **fixed**: *Yandex* and *Mail.ru*

Turkish Intervention

Turkish Intervention

- ❖ In September 2018, the Turkish Competition Authority (TCA) concluded Google's agreements with mobile manufacturers constituted abusive behavior.
- ❖ The TCA mandated Google alter its contracts with OEMs to remove any provision providing Google privileged access to the device's search access points.
 - TCA case was initiated by Yandex
 - no choice screen was ever implemented
 - Huawei soon signed a contract with Yandex after the regulation

Intervention Comparison: Discussion

❖ EEAvs. Russia:

- Choice screen visibility

 - new Android devices vs all Android devices

 - list of search engines in the Russian choice screen is fixed ◦ Pre-existing market sizes of the largest local competitor → Yandex had almost 30% share in Russia before the choice screen → comparative advantages: consumer awareness, network effects, and quality

❖ EEAvs. Turkey:

- remedies can be effective despite the initial lack of a strong competitor

- Yandex has strong investment motivation in Turkey 22/29

- TCA remedy does not necessarily improve welfare

Mechanism Analysis

❖ Supply Side

- Ostrovsky (2023): adverse selection produced by Google's auction design
- Complementary Findings: frequent success in the auctions is either from low-quality search engines or increases in consumer awareness

❖ Demand Side

- Search engines with higher consumer awareness gain the most from the EC remedy

❖ Advertiser Side

- Revenues for Google drop proportionally to the baseline demand estimates (very small decline in EEA, more substantial declines in both ad volume and revenues in Russia and Turkey)

Appendix: Bid Coordination



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How Sponsored Search Auctions Work

- ❖ **Generalized Second Price (GSP) Auction**
 - Advertisers bid for positions on search results page
 - Positions ranked by quality-adjusted bids $(e_i)(b_i)$

- ❖ **Two Types of Bidders:**
 - **Independent advertisers:** bid individually
 - **Agency clients:** bids coordinated through common intermediary

- ❖ **Payment Rule:** Each winner pays minimum needed to maintain position

Summary Statistics

Due to **confidentiality issues**, the paper describes some stylized features of the market through publicly available data on Google sponsored search.

The summary combines two datasets offering a snapshot of the Google search ads in the US market as of January 2017.

1. The first dataset is **Redbook**, linking **advertisers to intermediaries**
2. The second is **SEMrush**, linking **advertisers to search auctions**.

TABLE I
SUMMARY STATISTICS: *Google Search Auctions—US, 2017*

	A				B				C				D			
	Full sample				Keywords with at least 1 network				Keywords with coalition of size 2				Keywords with no networks			
	Mean	Median	SD	Obs	Mean	Median	SD	Obs	Mean	Median	SD	Obs	Mean	Median	SD	Obs
Cost-per-click (CPC)	1.58	0.74	3.23	2113	1.53	0.81	2.66	1102	1.55	0.80	1.94	248	1.63	0.68	3.76	1011
Search volume	0.99	0.25	10.17	2113	0.65	0.25	2.50	1102	0.64	0.25	1.52	248	1.35	0.25	14.47	1011
# of words	1.86	2.00	0.83	2113	1.85	2.00	0.82	1102	1.81	2.00	0.79	248	1.87	2.00	0.83	1011
# of characters	11.06	11.00	5.02	2113	10.86	10.00	4.96	1102	10.48	10.00	4.42	248	11.28	11.00	5.08	1011
Long tail	0.03	0.00	0.18	2113	0.03	0.00	0.18	1102	0.04	0.00	0.19	248	0.04	0.00	0.19	1011
Coalition	0.21	0.00	0.41	2113	0.41	0.00	0.49	1102	1.00	1.00	0.00	248				
Coalition size	2.79	2.00	1.17	449	2.79	2.00	1.17	449	2.00	2.00	0.00	248				

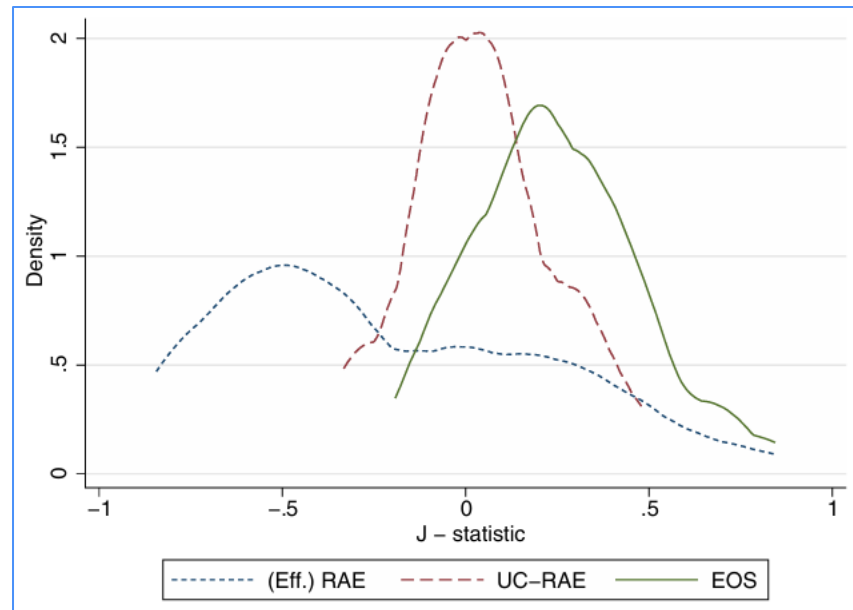
Notes: Statistics at the keyword level. The last four columns are for the full sample, while the first four are for the subset of keywords with at least one ad coming from an intermediary. *Cost-per-click* is in USD; *Search Volume* is the (average) monthly number of searches (in millions); the next three variables measure features of the keywords' length; *Long Tail* is an indicator variable for keywords composed by at least 4 words; *Coalition* is an indicator for the presence among the keyword ads of multiple advertisers affiliated with the same intermediary; *Coalition size* is the number of advertisers under the coalition, calculated exclusively for those keywords with coalitions.

Detection Method

$$J_t = \frac{e_{i3}b_{i3}x^2 - e_{i4}b_{i4}x^3}{x^2 - x^3} - \frac{e_{i4}b_{i4}x^3 - e_{i5}b_{i5}x^4}{x^3 - x^4}$$

Analysis of J-statistic Distribution:

- ❖ Competition: $J > 0$
- ❖ Undistinguishable Coordination (UC-RAE): $J \approx 0$
- ❖ Efficient Coordination (Eff-RAE): $J < 0$
 - Multiple Auctions per Keyword
 - Classification Based on Statistical Tests



Revenue Effects

$\min_d \sum_{i>1} (d_i - 1)^2$ subject to:

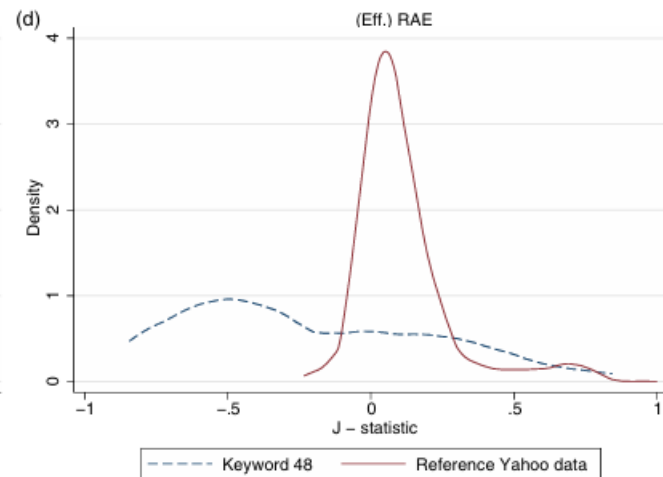
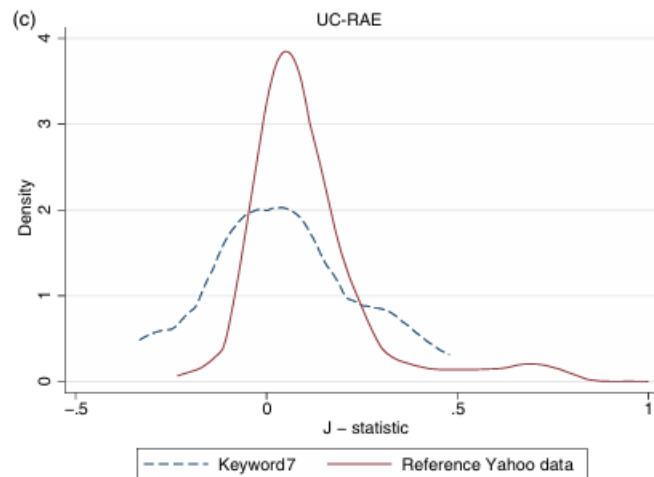
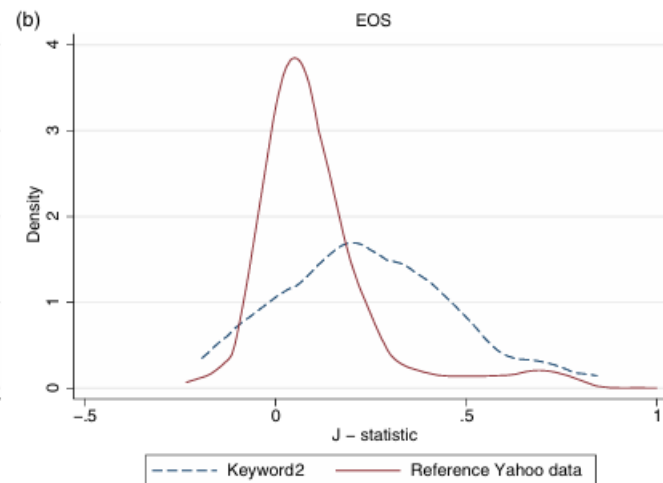
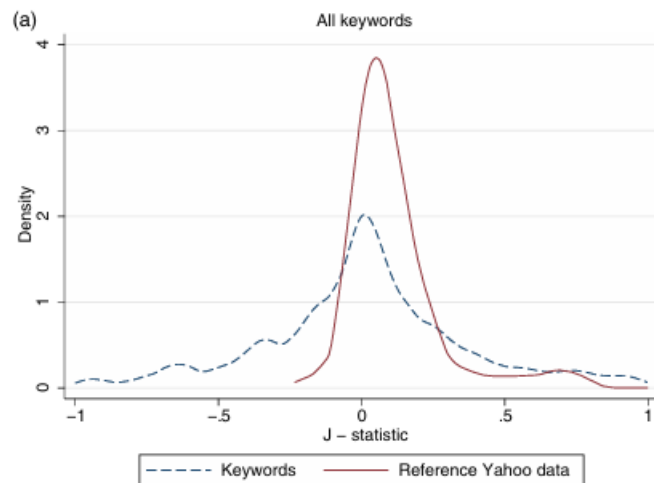
$$\begin{cases} \frac{\tilde{b}_i x^{i-1} - \tilde{b}_{i+1} x^i}{x^{i-1} - x^i} \geq \frac{\tilde{b}_{i+1} x^i - \tilde{b}_{i+2} x^{i+1}}{x^i - x^{i+1}}, & \text{if } i \notin C \text{ or } i \in \{\min(C)\}; \\ \tilde{b}_i x^{i-1} = \frac{x^{i-1} - x^i}{x^{i+1} - x^{i+2}} [\tilde{b}_{i+2} x^{i+1} - \tilde{b}_{i+3} x^{i+2}] \\ \quad + \gamma d_i e_i [x^{i-1} - x^i] + \tilde{b}_{i+1} x^i, & \text{if } i \in C \setminus \{\min(C)\}; \end{cases}$$

REVENUE EFFECTS FOR THE 36 UC-RAE KEYWORDS

	Observed	Counterfactual Upper bound	Difference $\Delta = \text{UpperB.} - \text{Obs.}$
Normalized total revenues	100	107.90	7.9 [5.32; 10.44]
Payments from agency advertisers	33.20	35.28	2.08 [1.49; 2.68]
Payments from independent advertisers	66.80	72.62	5.82 [3.73; 7.91]

Notes: Separately for each of the 36 keywords, the normalized revenues set total observed revenues (i.e., the sum of all payments across all auctions for the same keyword) equal to 100. The three rows report: total revenues, revenues originating from the payments by agency advertisers; revenues originating from payments by independent advertisers. The three columns report the observed (normalized) revenues, the upper bound of the counterfactual revenues and the difference between the two. The values in the squared bracket are the endpoints of a 95% confidence interval for matched differences in the average revenues.

Test of Validity



Appendix: Meta Ad Library



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Basic Information

- **Meta Ad Library:** is a comprehensive, searchable database for ads transparency. People can use the Ad Library to get more information about the ads they see across Meta technologies.
- **Time Frame:**
- **Three tools:**
 - Ad Library (free access)
 - Report (free access)
 - API (free access)
 - Targeting Data (only approved)

Ad Type	Social issues, elections or politics	EU	Other Ad
Time Frame	7 years	1 year	No historical data
Information	<ul style="list-style-type: none"> • Ad content • Basic information such as when the ad started running and which advertiser is running it • Additional transparency about spend, reach and funding entities 	<ul style="list-style-type: none"> • Ad content • Basic information such as when the ad started running and which advertiser is running it • Additional transparency specific to the EU 	<ul style="list-style-type: none"> • Ad content • Basic information such as when the ad started running and which advertiser is running it

A Quick Look of Meta Ad Library

The screenshot displays the Meta Ad Library interface. At the top, the Meta logo is visible. Below it, there are filters for 'France', 'All ads', and a search bar containing 'Google Chrome'. The main content area shows the Google Chrome logo and the text 'Google Chrome'. Below this, there are links for 'Ads' and 'About', and a notification that '~250 results' are found. A section titled 'Launched April 2024' is also present. The bottom part of the screenshot shows three ad cards, each with a library ID, status (Active), start date (April 8, 2024), and a 'See summary details' button. The first two cards show a video ad with a play button, and the third card shows a text-based ad with a play button and a 'See ad details' button.

Like a Search Engine

Access: anyone

Mandatory Filters:

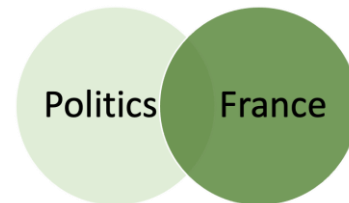
1. Country: over 180 countries
2. Ad Category: All, Issues, elections, or politics, Housing, Employment, Credit.
3. Keywords:
 - Exact Words (with quotation)
 - Words in any order: Find ads that contain all these words but not necessarily in order.
 - Advertisers: Type the name of an advertiser into the search bar and select their page from the drop down menu.

Ad Library API

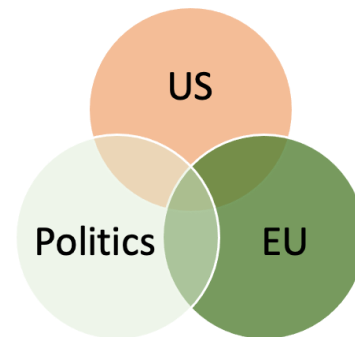
- **API:** deeper analysis of ads about **social issues, elections or politics**, as well as **ads that deliver to the EU**
- **Access:** anyone has a Facebook developer account
- **16 Search Filters:** ad reached countries/search terms/search type/publisher platforms/ad active status/ad delivery date max/ad delivery date min
- **Rate Limit:** 200 calls/hour (cannot make very general search.)
- **Output:**
 - Ads about social issues, election or politics that were delivered anywhere in the world during the past 7 years
 - Ads of any type that were delivered to the European Union during the past year

❖ Two examples

- ❖ Ad reached country: France



- ❖ Ad reached country: US



API Variables

	Variable
All	<p>ID: Ad ID, Page ID, and etc.</p> <p>Ad Content: creative bodies/caption/title/url/language and etc.</p> <p>Ad Delivery Date: creation time/delivery start time/delivery end time, and etc.</p> <p>Platform: Facebook, Instagram, etc.</p>
Politics	<p>Bylines/Currency: the name of the person, company, or entity that provided funding for the ad.</p> <p>Demographic distribution: The demographic distribution of Accounts Center accounts reached by the ad. <i>E.g., 'percentage': '0.008772', 'age': '18-24', 'gender': 'male'</i></p> <p>Delivery by Region: Regional distribution of Accounts Center accounts reached by the ad. Provided as a percentage and where regions are at a sub-country level. <i>E.g., 'percentage': '0.003371', 'region': 'New York'</i></p> <p>Estimated Audience Size/Impression/Spend: Categorical variable of a range</p>
EU	<p>Age country gender reach breakdown: demographic distribution <i>E.g., DE/Age: 18-24/male: 2</i></p> <p>Total EU reach: estimated combined ad reach in EU</p> <p>Target gender: gender selected for targeting</p> <p>Target age: age ranges selected for ad targeting</p> <p>Target location: locations included or excluded for ad targeting</p> <p>Beneficiary and payers</p>



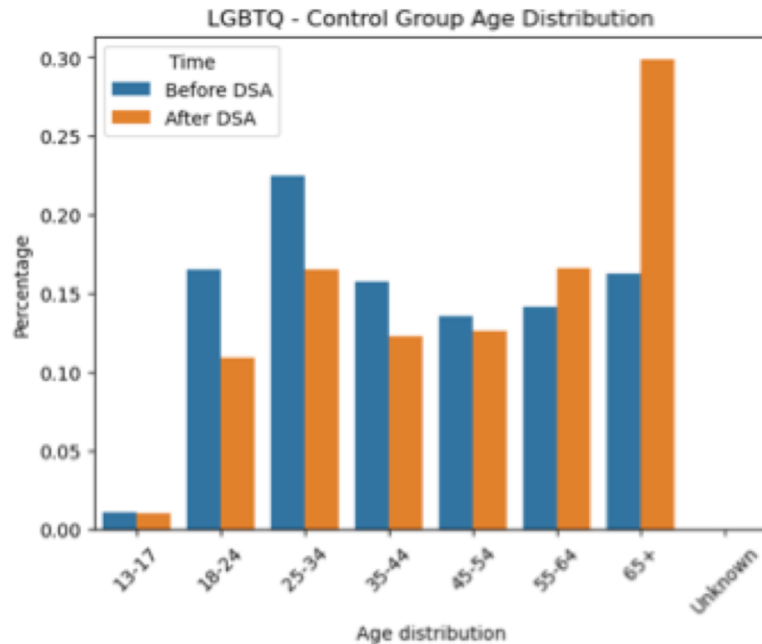
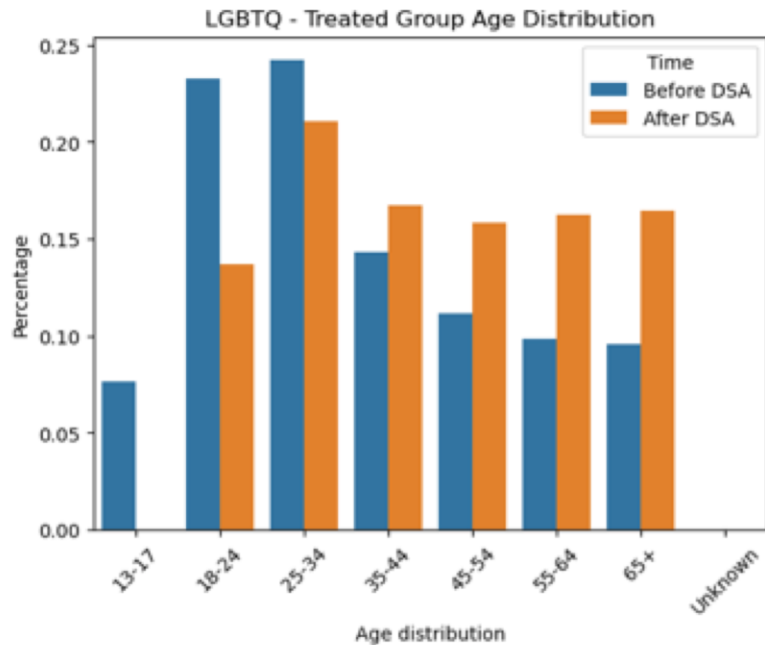
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A Simple Example

Sample: LGBTQ search in Ad Library with country filter set to Germany (DE), France (FR), Spain (ES), Italy (IT), Netherlands (NL), and the United States (US)

Treated: Ad delivered in EU & Control: Ad delivered not in EU

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Ad Library Report

- **Ad library report:** provides an aggregated and comprehensive view of ads about **social issues, elections or politics** in a selected country for a given time period.
- **Access:** anyone
- **Time frame:** after 2019 April 15th
- **Mandatory Filters:**
 1. Country: over 180 countries
 2. Time Frame: Last day/Last 7 days/Last 30 days/ Last 90 days/All dates

- ❖ **Spending by advertiser:** spending totals by specific Facebook Pages and disclaimers for the selected date range.

Page ID	Page name	Disclaimer	Amount spent	Number of ads in Library
39435457457	Greenpeace	Greenpeace	2318464	7607

- ❖ **Spending by location:** spending totals by specific location in the selected country for the selected date range.

Location name	Amount spent (EUR)
Alsace	1535255
Aquitaine	2922034
Auvergne	943171

Ad Targeting Dataset

- ❖ **The Ad Targeting dataset:** targeting information selected by advertisers who ran ads about **social issues, elections or politics category**
- ❖ **Access:** only approved researcher
- ❖ **Time Frame:** Ads after August 2020 on the Facebook and Instagram platforms
- ❖ **Coverage:** more than 120 countries
- ❖ **Some Critical Dates:**

2021 February

- August 3 - November 1, 2020 (with U.S. data only)

2022 May 31

- August 3, 2020 - April 21, 2022 (All main countries)

2022 September 7

- Researchers could apply for access to the Ad Targeting Dataset

How to gain access?

Eligibility requirements: applicants must be affiliated with a qualified academic institution or a qualified research institution.

Application and access process:

- **Step 1:** Review the application requirements and submit an application (like a survey requiring your information, detailed research proposal with purpose and required variables, passport, and payslip from university)
- **Step 2:** Fulfill additional data access requirements (sign many agreements)
- **Step 3:** Gain Access (not able to download raw data, only perform analysis on its research platform)



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❖ Our Experience

- 2024 Apr: research proposal submitted through Muxin's account and then rejected
- 2024 May: polished research proposal submitted through Francesco's account and then rejected
- 2024 Sep: **same** research proposal submitted through Muxin's account, was approved at the end of 2024 Nov.

Ad Targeting Variables

	Representative Variable						
Ad Targeting	<p>Age: Age group targeted by the ad. <i>E.g., 25-65+</i></p> <p>Gender: gender group targeted by the ad. <i>E.g., female</i></p> <p>Exclude/Include location: Locations (cities, countries, zip codes) excluded/targeted by the ad, plus an optional radius in miles. <i>E.g., {"United States":{"Indiana"}}}</i></p> <p>Exclude/Include: Ad excludes/targets people who are categorized by ANY of the items listed, with at least one item in each group. Items can include behavior, field of study, education level, school, job title, and many more. <i>E.g., [{"College grad": "Education level"}, {"Organic food": "Interests"}]</i></p> <p>Type of Location: Ad targets people by their relationship to a location. <i>E.g., Location - Living In/Location - Traveling In</i></p>						
Location Data	<p>Ad targeting data provided the location options chosen by advertisers when these levels have been set to zip code level or greater. For smaller geographic designations, it note the type of selection (such as an address, place, or location pin drop), the city it falls in, and the radius specified by the advertiser.</p> <table border="1"> <thead> <tr> <th>Advertiser selection</th> <th>Transformed dataset value</th> </tr> </thead> <tbody> <tr> <td>Seattle + 5 miles</td> <td>Seattle (+5 miles) (no change)</td> </tr> <tr> <td>38 North Almaden Blvd, San Jose +5 miles</td> <td><address>, San Jose (+5 miles)</td> </tr> </tbody> </table>	Advertiser selection	Transformed dataset value	Seattle + 5 miles	Seattle (+5 miles) (no change)	38 North Almaden Blvd, San Jose +5 miles	<address>, San Jose (+5 miles)
Advertiser selection	Transformed dataset value						
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38 North Almaden Blvd, San Jose +5 miles	<address>, San Jose (+5 miles)						

Appendix: Transparency in Advertising



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A combination of 3 articles

- ❖ 5(9): The gatekeeper shall give transparency to advertisers on pricing, fees and publisher revenues.
- ❖ 5(10): The gatekeeper shall give transparency to publishers on remuneration, fees and prices paid by advertisers.
- ❖ 6(8): The gatekeeper shall provide advertisers, publishers and authorized third parties with access to measurement tools and data, in order to allow for independent verification and measurement.



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What does it mean?

- ❖ Upon an **advertiser's request**, or that of their authorized agent, gatekeepers must:
- ❖ Provide **daily, free information** on **each advertisement** by the advertiser, including:
 - Prices, fees, deductions, and surcharges for each online advertising service;
 - Publisher remuneration, including deductions and surcharges, with consent. Without consent, provide daily average remuneration details;
 - Basis for calculating prices, fees, and remunerations.
- ❖ Allow access to performance measurement tools and data, both aggregated and non-aggregated, enabling advertisers to verify and measure ad effectiveness.
- ❖ Symmetric obligations upon a **publisher's** request.

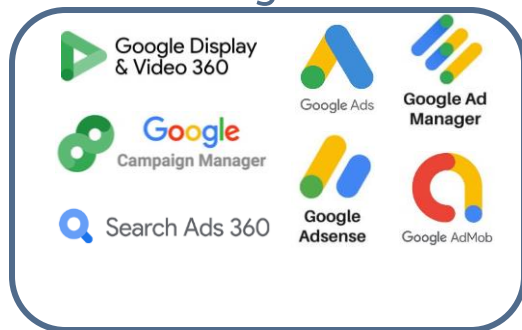
Who is (directly) affected?

- The compliance reports indicate efforts only for the services included in Ads CPS.

Core Platform Service



Google



Amazon



B

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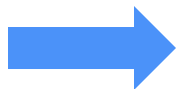
Other CPS with ads that are considered out of scope by gatekeepers - at least for 5(9)-5(10)



DMA+DSA provisions on ads affect all big tech

The DSA's advertising provisions are pervasive:

- apply not only to VLOPs/VLOSEs, but also to smaller "online platforms"
- ban all profiling of minors or based on special category data
- impose transparency towards consumers
 - they must be able to identify "in a clear, concise and unambiguous manner and in real time" if it is an ad, who paid for its, what targeting was used
- require VLOPs to create ad repositories
- VLOPs/VLOSEs must conduct assessments of systemic risks



A movement toward contextual advertising, away from personalized ads

Interaction with further regulations

- Other rules within the DMA
 - Data combination across services is forbidden, absent consent
 - Data portability enhances the switching to other ad platforms
- GDPR



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Potential for research?

Upside:

Potentially substantial increase in amount & quality of data

Possibility to use DSA art. 40 to obtain even more

Downside:

Hardly feasible to isolate effects of specific rules



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