

Politics in the Facebook Era

Evidence from the 2016 US Presidential Elections

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Motivation

- ▶ The way we access (political) news has radically changed since the advent of Social Media.
- ▶ Candidates can
 - ▶ tailor messages ([political micro-targeting](#))
 - ▶ conduct campaigns with *no* regulation constraint
- ▶ Facebook (FCBK) growing source of political information:
 - 2012: 12% of Americans read political news on FCBK
 - 2016: 62% (40%) of Americans (Europeans) now do so and FCBK becomes 3rd most-cited “main source” of political information ([PEW](#))
- ▶ Debate on role of social media in shaping political views (*echo-chambers*)

Background/1

- ▶ Many fear that this new way of campaigning may:
 - ▶ facilitate polarisation and extremism;
 - ▶ affect elections:(e.g. [Brexit](#), [Catalonia](#), [Italy](#), ...)
 - ▶ undermine democracy ([Cambridge Analytica](#), [Russian scandal](#))
- ▶ **Trump is the Biggest Spender of Political Ads on FCBK**
 - ▶ 44USm spent on FCBK (vs 28m by Clinton)
 - ▶ 175,000 variations of political ads
- ▶ Speculation that FCBK and Twitter had a significant impact on Trump's victory in the 2016 elections. ([Independent](#), [Wired](#), [Guardian](#), [WashPost](#), ...)

Literature : effect of media (campaign) on voting

Three points of interest related to political campaigning:

- ▶ **Participation:**

Internet access negative effect (*Falck et al., 2014*); TV ads strong effect (*Gerber et al., 2010*); no effect (*Krasno & Green, 2008*); no effect (*Huber and Arceneaux, 2007*); Fox News positive effect (*DellaVigna & Kaplan, 2007*).

- ▶ **Persuasion:**

TV ads strong (short lived) effect (*Freedman, Franz, Goldstein, 2004*); persuasive effect (*Huber and Arceneaux, 2007*); Fox News positive effect for Republican (*DellaVigna & Kaplan, 2007*).

- ▶ **Polarisation:**

Internet and social media contribute to voters' political polarization (*Sunstein, 2001, 2009 and 2017; Pariser, 2011; Gabler, 2016*); no effect (*Boxell, Gentzkow, and Shapiro, 2017*) .

Literature on **Social Media and Politics** is recent and very limited (*Bond et al. 2012, Petrova et al. 2016, Allcott et al. 2017, Müller and Schwarz 2018*)

This paper: Research Questions

What role **FCBK political micro-targeting played in shaping electoral outcomes?**

Two (empirical) contributions:

- I) measure the **intensity** of *political* micro-targeted campaigns over alternative targeting dimensions (ideology, gender, age, race, education);
- II) estimate the **effect** these campaigns had on the *individual* behaviour of voters who relied on FCBK to gather political information.

Our study applies to the 2016 US Presidential elections.

Research Design

We cannot observe the same individual voting *with* and *without* FCBK. In order to estimate the effect of social media campaigning on *individual* voting behaviour (participation and persuasion) we need to address

Issue 1: MEASURABILITY: build audience level proxy for the way campaigns are distributed among internet users.

Issue 2: IDENTIFICATION: design quasi-experimental approach exploiting variation in individual FCBK exposure, while accounting for multiple media campaigns.

MEASURABILITY: 2-Step Approach

We address Issue 1 by building two proxies:

INTENSITY of political campaigns directed at a specific **audience**:

→ use **daily prices (CPM) of FCBK ads micro-targeted at US audiences** (by ideology, gender, age, race, education level and location).

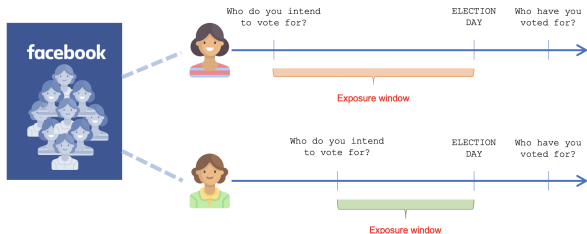
→ build similar indicators for TV, Newspapers and Radio campaigns (Nielsen Ad Data)

EXPOSURE to social media campaign across **individuals** fitting the profile of a given political audience,

→ use **self-reported media and FCBK usage** for respondents of the 2016 American National Election Survey (ANES).

IDENTIFICATION

1. Match each ANES respondent to a political audience based on **demographics, location** and **political ideology**.
2. Estimate effect of exposure to FCBK campaign on **changes in voter behaviour w.r.t. revealed intentions**.



For **individuals matching the same political audience**, exploit variation across **intensity** of Social Media Political Campaign (**randomly assigned interview date**) and **exposure** to Social Media Usage (**predetermined and time invariant**).

1.

A new Measure for the Intensity
of social media Political Campaigning

Measuring the Intensity of Political Campaign

Intensity by audience type

(defined by State, s , Characteristics, c , and Political Ideology, p)

Relative CPM: $p_{scp} = P_{scp}/P_{sc}$

Relative CPM Ratio: $r_{scp,w} = p_{scp,e}/p_{scp,w}$

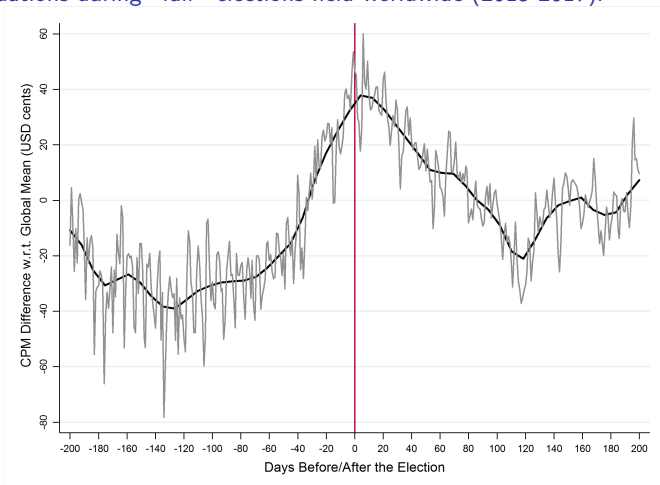
We argue that variations in prices across audiences with different political ideologies are due to Political micro-targeting.

→ During electoral season, candidates (*temporarily*) enter online auctions. Their bids reflect the impact selected audiences can have on their winning probability (Moshary, 2017).

→ Prices convey information about candidates' strategies, and about the intensity of the competition to reach different types of voters in different states at different points in time.

Test I: Entrance and Exit of Political Candidates

CPM fluctuations during “fair” elections held worldwide (2015-2017):



Facebook CPM Median daily prices for Country-Specific Audiences. Prices are expressed as difference from global trend, and conditioned on country-specific and time fixed effects. Sample covers all 45 Fair Elections that took place between July 2015 and February 2017. Free Elections defined on the basis of the Freedom House Electoral Democracy rating.

◀ BlackFriday

Test II: Prices and Election Winning Probabilities

CPM Fluctuations proportional to distance in candidates winning probability

Daily State-specific Facebook Ad prices respond to variations in **Daily State-specific winning probability**¹, during the three months preceding the elections (8th August - 8th of November 2016).

Dep. Variable: State CPM Median	Republican Partisan States	Democrat Partisan States	Swing States
Lag of CPM median	0.533** (0.031)	0.545** (0.026)	0.502** (0.042)
Abs. Value of Difference in Winning Prob	-2.887** (0.640)	5.814** (0.907)	1.687** (0.508)
Abs. Value of Difference in Winning Prob $\times 1[T > C]$			-2.390** (0.921)

Model is $cpm_{s,t} = \alpha cpm_{s,t-1} + \beta_1 PDIFF_{s,t-1} + \beta_2 (PDIFF_{s,t-1} \times TADV_{s,t-1}) + e_{s,t}$, with $PDIFF_{s,t} = |(P_{s,t}^T - P_{s,t}^C)|$, and $P_{s,t}^T$ and $P_{s,t}^C$ indicate the winning probability of Trump and Clinton, respectively. $TADV_{s,t}$ is an indicator variable with value 1 for all cases where Trump has the lead on the election forecast. Model also controls for cyclical fluctuations in Internet usage (day of the week dummies) and for a time trend (week of the year dummies).

¹Source: **FiveThirtyEight 2016 Election Forecast**, Chance of Winning estimated using the "Polls-plus forecast" model, which combines polls, the economy and historical data.

2.
Estimating the effects
of social media Political Campaign on voting outcomes

Effect of FCBK campaigns on Voters Behaviour

Combining FCBK price data with the ANES 2016 Survey

For the effect of FCBK campaigns on voters behaviour, we observe:

- **individual exposure to the political campaign:**

match ANES' individual respondents to a Facebook Audience, use their media and FCBK habits to proxy for individual exposure;

- **individual ideology and voting decisions:**

use ANES political ideology and participation in 2012 and 2016 Elections as individuals preferences and voting decisions.

- **trend of political campaigns on other media:**

use CPM for TV programs, Newspapers, Radio, major US internet sites and favorite TV shows

Effect of FCBK campaigns on Voters Behaviour

For the 2,426 respondents of the 2016 ANES, estimate

$$Y_{iat} = \alpha EXP_i + \beta INT_{at} + \gamma EXP_i \times INT_{at} + \delta_1 X_i + \delta_2 TrM_i \times TrCPM_{it} + D_s + D_p + DOW_t + MOY_t + \epsilon_{iat}$$

with $Y_{iat} = 1$ if i **changed** her voting preferences between the pre- and post-election interview dates.

- ▶ Respondent i matched to FCBK Audience (a) based on State (s), Political Ideology (p) and demographic characteristics.
- ▶ **Intensity of Political Campaign** (INT_{at}) at audience-day level, and **Exposure to social media** (EXP_i) at individual level.
- ▶ Exposure to traditional media (TrM_i) and CPM for their (generic) advertising campaigns ($TrCPM_{it}$).

Results: Political Micro-Targeting

Three general results:

1. Political Micro-Targeting has significant effects when based on geographical location, ideology and *gender* or *race*
2. Social-Media Political campaigns *make it less likely for individuals to change their vote intentions (polarization)*.
3. *Increase Turnout and Trump support* among moderate voters targeted with highly intense campaigns.

Results: US Elections

The least valuable (and less targeted) audiences see their relative price drop by about 15% by the time of the election, whereas the most valuable (and most targeted) audiences see theirs raise by up to 35%.

1. Effects on change in Voter Behavior [VChange](#)
2. Effects on Trump Support [Trump](#)
3. Effects on Clinton Support [Clinton](#)
4. Effects on Vote Turnout [Turnout](#)

Effect of FCBK campaigns on Change in Voter Behaviour

An increase of 10% in the relative CPM between the interview and the election week reduces the likelihood of changing one's vote, compared to stated intentions, by 3.9%. This effect is almost double in size for Men and for Conservative voters.

Dep. Variable: Change in Voter Behavior	All (1)	Women (2)	Men (3)	Lib. (4)	Swing (5)	Cons. (6)	Dem 2012 (7)	Rep 2012 (8)	Clint Int (9)	Trump Int (10)	White (11)	Eth. Min. (12)
News Access on FCBK (Exposure)	0.417* (0.213)	0.225 (0.306)	0.648** (0.330)	-0.308 (0.403)	0.679 (0.467)	0.631** (0.320)	0.492 (0.333)	0.0519 (0.317)	0.241 (0.285)	0.259 (0.278)	0.342 (0.231)	1.251** (0.599)
CPM runup (Intensity)	0.0987 (0.161)	0.0496 (0.236)	0.154 (0.238)	-0.131 (0.332)	0.226 (0.345)	0.581** (0.261)	0.219 (0.270)	-0.0876 (0.260)	-0.0491 (0.217)	-0.00479 (0.240)	0.0116 (0.177)	0.945* (0.485)
FCBK Exposure x Intensity	-0.390** (0.197)	-0.228 (0.282)	-0.598* (0.305)	0.255 (0.373)	-0.613 (0.435)	-0.609** (0.293)	-0.454 (0.308)	-0.0227 (0.292)	-0.218 (0.262)	-0.219 (0.251)	-0.316 (0.212)	-1.185** (0.559)
Observations	2,076	1,147	929	571	818	687	1,031	688	944	742	1,537	539
R-squared	0.134	0.164	0.202	0.289	0.198	0.238	0.172	0.216	0.220	0.256	0.157	0.283

Note: the dependent variable 1 if the respondent changed her voting behaviour, compared to the intentions revealed at the pre-election interview. This pertains any change in turnout or presidential vote. The CPM runup is measured as the difference between the relative CPM price at the election week and the relative CPM price at the week of the pre-electoral interview. All models include Income Class FE, State FE, Day of the Week FE and Weekly FE. They also control for exposure to other media (TV, Internet, Radio, Talk Show, Newspaper), CPM for TV ads, Political Ideology, Turnout and Vote at the 2012 Elections, party registration, vote at the Primary, gender, religion, age, marital status, education, race, number of children, employment status, home ownership and gun ownership status.

Effect of FCBK campaigns on Change in Trump Vote

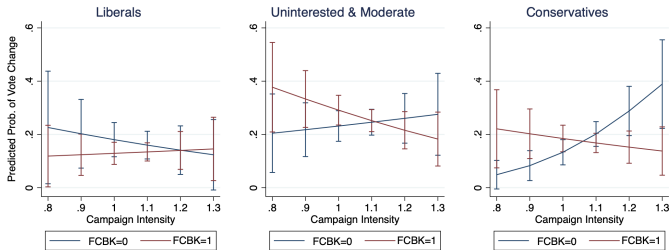
An increase of 10% in the relative CPM between the interview and the election week reduces the likelihood of changing one's vote on Trump, compared to stated intentions, by 4.5%.

Dep. Variable:	All	Women	Men	Lib.	Swing	Cons.	Dem 2012	Rep 2012	Clinton Int	Trump Int	White	Eth. Min.
Change in Voter Behavior	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
News Access on FCBK (Exposure)	0.495*** (0.184)	0.539* (0.283)	0.460* (0.276)	-0.0793 (0.137)	0.625* (0.336)	0.806** (0.378)	0.415** (0.209)	0.693* (0.385)	0.0216 (0.136)	0.712** (0.342)	0.489** (0.225)	0.452 (0.305)
CPM runup (Intensity)	0.338** (0.133)	0.388 (0.247)	0.259 (0.197)	0.0749 (0.111)	0.106 (0.218)	0.995*** (0.296)	0.284* (0.152)	0.511 (0.313)	-0.0389 (0.111)	0.661** (0.288)	0.278* (0.158)	0.413 (0.265)
FCBK Exposure x Intensity	-0.447*** (0.173)	-0.498* (0.265)	-0.416 (0.261)	0.0621 (0.128)	-0.533* (0.314)	-0.764** (0.351)	-0.376* (0.196)	-0.620* (0.358)	-0.0122 (0.127)	-0.641** (0.316)	-0.441** (0.209)	-0.420 (0.293)
Observations	2,076	1,147	929	571	818	687	1,031	688	944	742	1,537	539
R-squared	0.120	0.165	0.177	0.273	0.193	0.232	0.178	0.189	0.150	0.262	0.143	0.339

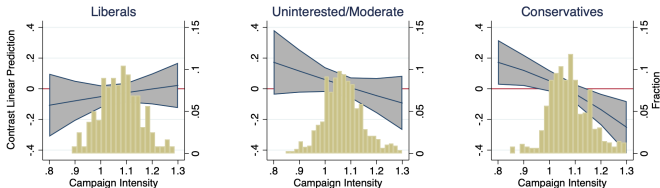
Note: Note: the dependent variable is 1 if the respondent changed her voting intention wrt to Trump, compared to the intentions revealed at the pre-election interview. This pertains any change in turnout or presidential vote. The CPM runup is measured as the difference between the relative CPM price at the election week and the relative CPM price at the week of the pre-electoral interview. All models include Income Class FE, State FE, Day of the Week FE and Weekly FE. They also control for exposure to other media (TV, Internet, Radio, Talk Show, Newspaper), CPM for TV ads, for Political Ideology, Turnout at the 2012 Elections, party registration, vote at the Primary, gender, religion, age, marital status, education, race, number of children, employment status, home ownership and gun ownership status.

Effect of FCBK campaigns on Vote Change

Ideology Differences in the Effects of Campaign Intensity of Vote Change

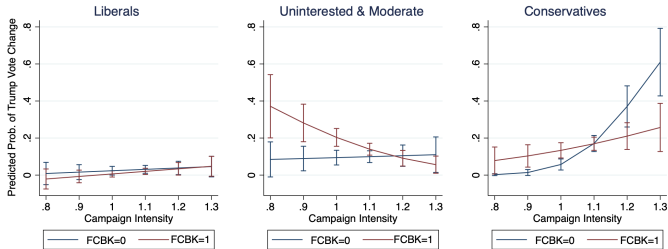


Ideology Differences in the Effects of Campaign Intensity on Vote Change

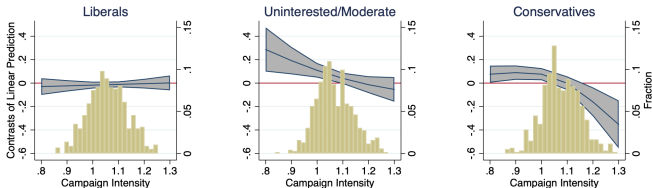


Effect of FCBK campaigns on Trump Vote Change

Ideology Differences in the Effects of Campaign Intensity of Trump Vote Change

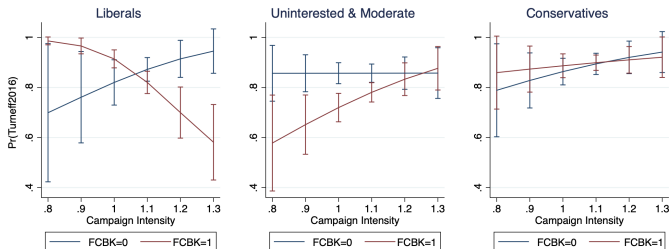


Ideology Differences in the Effects of Campaign Intensity on Trump Vote Change

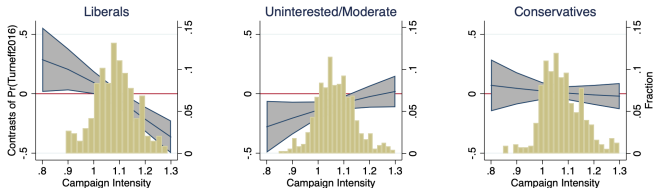


Effect of FCBK campaigns on Turnout: Ideology

Ideology Differences in the Effects of Campaign Intensity of Vote Turnout

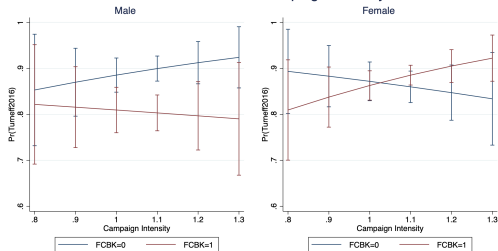


Ideology Differences in the Effects of Campaign Intensity of Vote Turnout

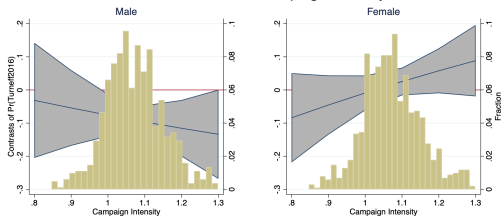


Effect of FCBK campaigns on Turnout: Gender

Gender Differences in the Effects of Campaign Intensity of Vote Turnout

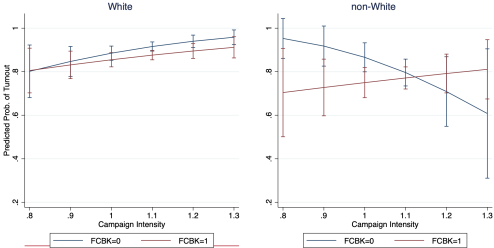


Gender Differences in the Effects of Campaign Intensity of Vote Turnout

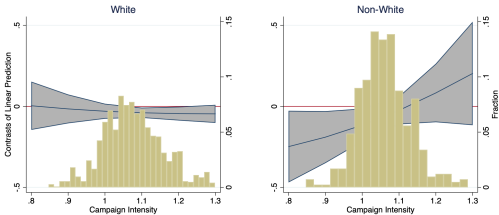


Effect of FCBK campaigns on Turnout: Race

Race Differences in the Effects of Campaign Intensity of Vote Turnout

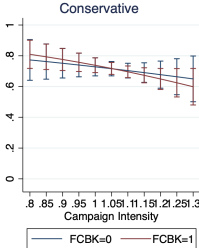
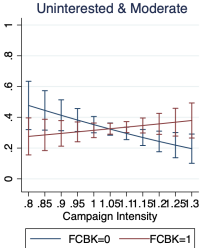
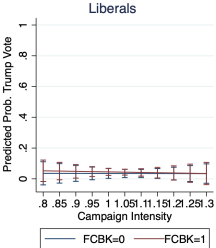


Race Differences in the Effects of Campaign Intensity of Vote Turnout

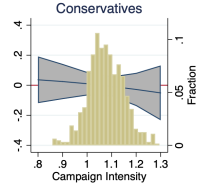
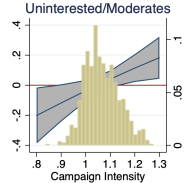
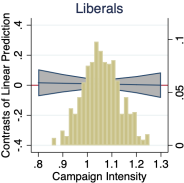


Effect of FCBK campaigns on Trump Vote: Ideology

Ideology Differences in the Effects of Campaign Intensity of Trump Vote

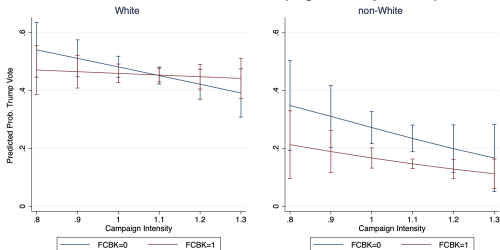


Ideology Differences in the Effects of Campaign Intensity of Trump Vote

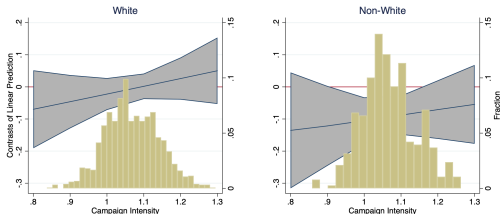


Effect of FCBK campaigns on Turnout: Race

Race Differences in the Effects of Campaign Intensity of Trump Vote

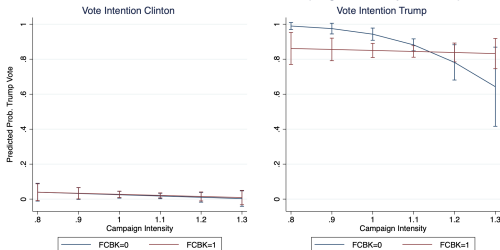


Ideology Differences in the Effects of Campaign Intensity of Trump Vote

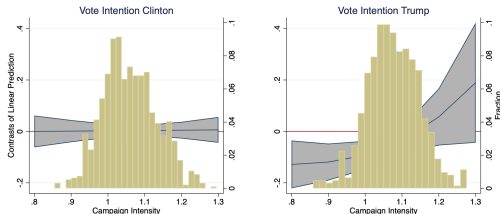


Effect of FCBK campaigns on Turnout: Vote Intentions

Intentions Differences in the Effects of Campaign Intensity of Trump Vote

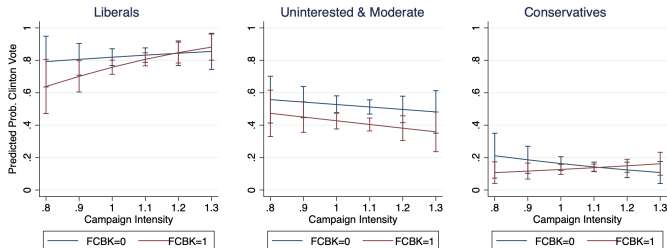


Intentions Differences in the Effects of Campaign Intensity of Trump Vote

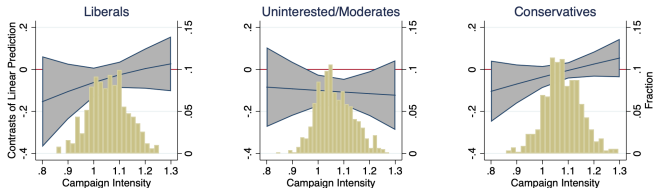


Effect of FCBK campaigns on Clinton Vote: Ideology

Ideology Differences in the Effects of Campaign Intensity of Clinton Vote



Ideology Differences in the Effects of Campaign Intensity of Clinton Vote



Conclusions

- ▶ Online advertising prices for politically relevant audiences can be used to proxy for the intensity of micro-targeted political campaigns conducted on social-media.
- ▶ Political micro-targeting based on users Gender/Race, Geographical Location and Political Ideology is effective on Vote Change, Turnout and Trump Vote, less so on Clinton Vote.

THANK YOU!

Measuring the intensity of political campaigns

Targeting Political Audience on Facebook

We scrape **Daily Prices** for **State/Ideology specific Audiences**. We extract both CPM (Cost per Mille Impressions) and CPC (Cost per Click). We further do this for Age, Gender, Race and Education State/Ideology specific audiences.

The image shows a screenshot of the Facebook Ads targeting interface with three numbered annotations:

- 1**: A red circle highlights "Texas" on a map of the United States.
- 2**: A red circle highlights "Age" (18-65+) and "Gender" (All, Men, Women) in the "Detailed targeting" section.
- 3**: A red circle highlights the "Bid amount" section, which shows "Automatic" selected, a bid of "\$2.20 per post engagement", and a "Suggested bid: \$2.96 USD (\$2.43-\$3.82)". A red arrow points from the suggested bid to the bid amount field.

The "Detailed targeting" section includes a list of interests and behaviors:

- INCLUDE people who match at least ONE of the following
- Self reported: 39,743,933 people
- US politics (conservative)
- US politics (liberal)
- US politics (moderate)
- US politics (very conservative)
- US politics (very liberal)

"The bid range shows a spectrum of bids that are currently winning auctions to reach the same audience you're targeting."

Go Back

Inelastic Ads Supply - Evidence

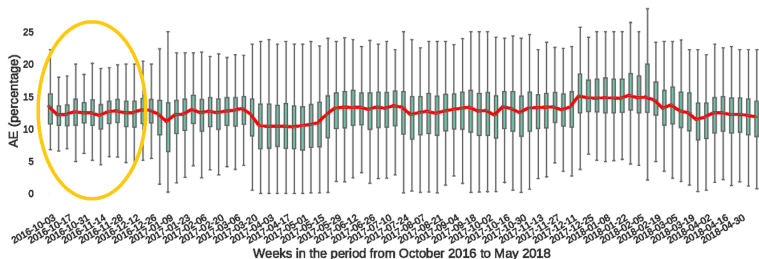
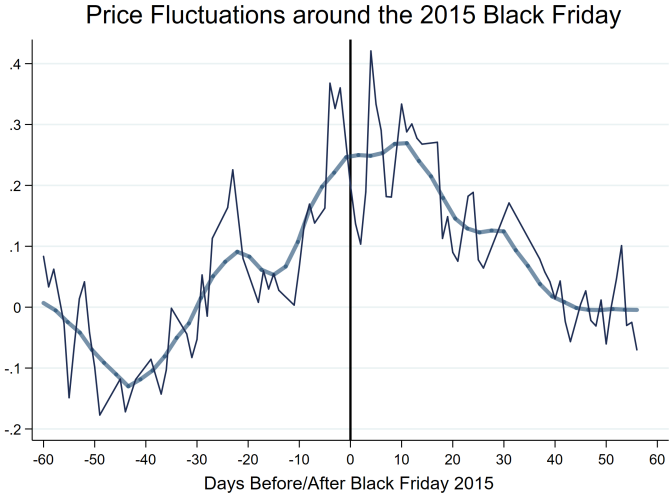


Fig. 5: Evolution of the metric $AE = \frac{\#ads}{\#posts + \#ads}$ in the period October 2016 - May 2018 per week. Each week presents a boxplot of the metric that includes the distribution of the AE across all the users with active sessions in each week. Note AE is represented as percentage rather than portion in this figure.

Source: Arrate et al. (arXiv:1811.10921)

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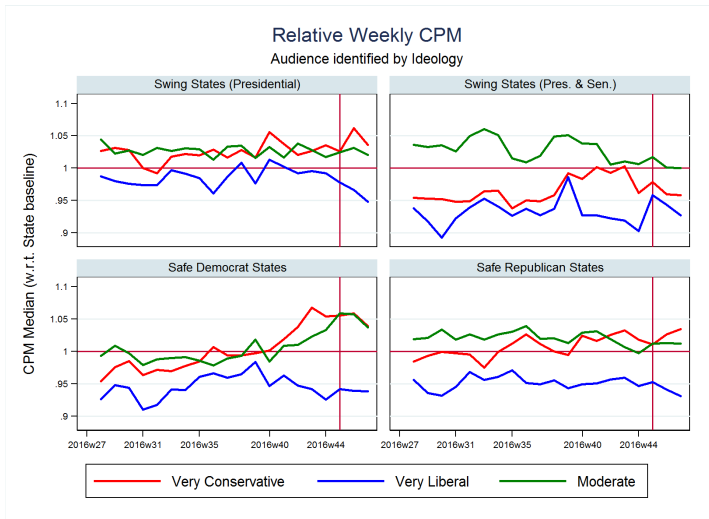
Test I - Robustness



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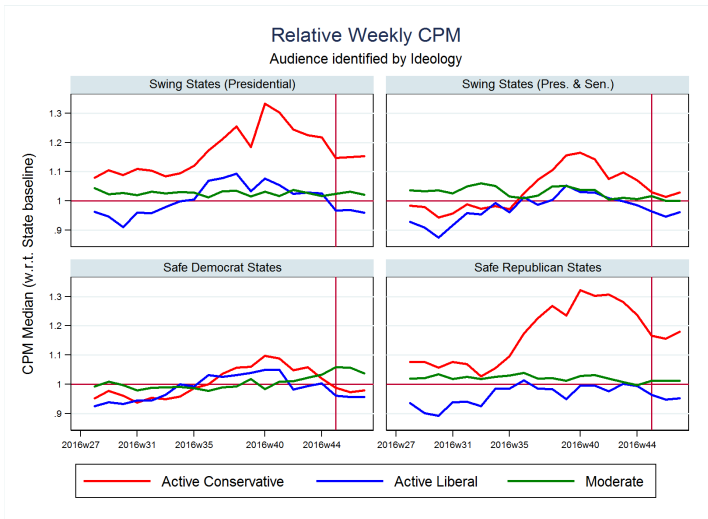
Politics on FCBK: the 2016 US Presidential Elections

Trends of Prices for Ideology Specific Audiences



Politics on FCBK: the 2016 US Presidential Elections

Trends of Prices for Ideology Specific Audiences



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CPM Fluctuations proportional to distance in candidates winning probability

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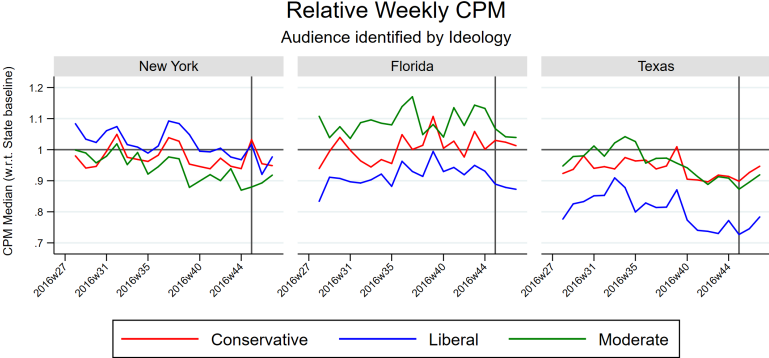
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²Source: **FiveThirtyEight 2016 Election Forecast**, Chance of Winning estimated using the “Polls-plus forecast” model, which combines polls, the economy and historical data.

Intensity of Political Campaign - example



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