Politics in the Facebook Era

Evidence from the 2016 US Presidential Elections

F. Liberini (Bath), M. Redoano (Warwick), A. Russo (Lough.)
A. Cuevas (UCIII), R. Cuevas (UCIII)

TAM Seminar, Leicester

18^{th} May 2022

Motivation/1

- The way we access (political) news has radically changed since the advent of Social Media.

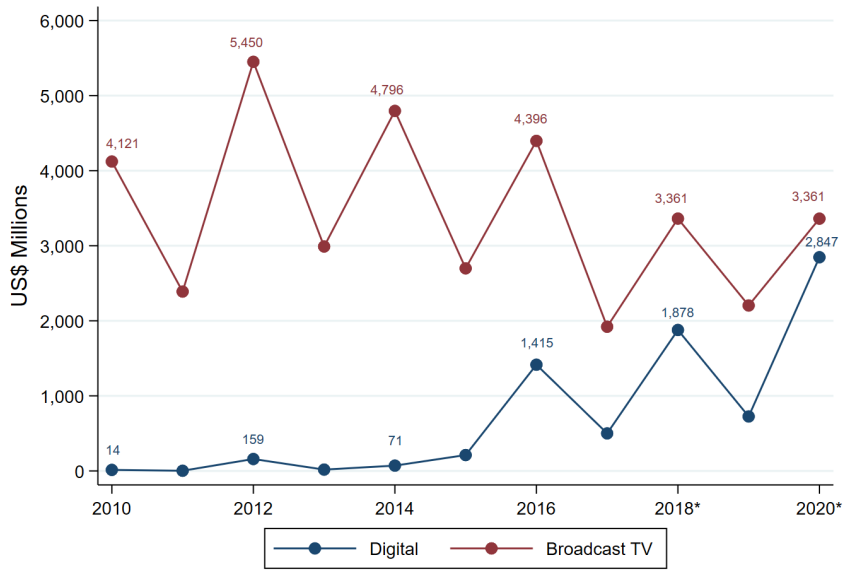
- High penetration rates have put social media on the spot light:

  62% of Americans read political content on Facebook (FCBK) in 2016 (only 12% in 2012!), now ranked 3rd most-cited "main source" of political information (PEW)

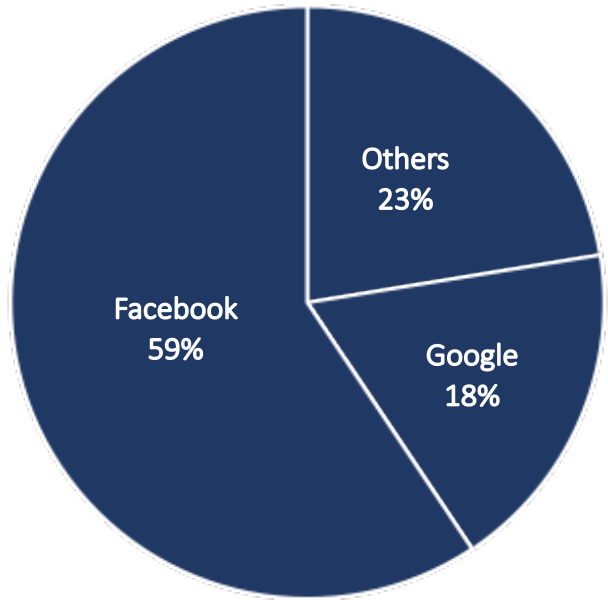
- Candidates increasigly like social media
  - tailor messages
    (political micro-targeting)
  - very little regulation
    (e.g., ad selections, no spending disclosure, no liability)

The result is **fast growing spending on political digital ads**, with Facebook holding a predominant market position.

Political Ads Spending Growth (Digital vs. TV, US)



Political Ads Revenue Shares (US)



Source: Borrell Associates and eMarketers

Motivation/2

Growing debate on role of social media in shaping political views

- Many fear that this new way of campaigning may:
  - affect elections:(e.g. Brexit, Catalonia, Italy, . . .)
  - facilitate polarisation and extremism;
  - undermine democracy (Cambridge Analytica, Russian scandal)

Amid growing pressure, major platforms started to self-regulate

- Twitter political ad ban (22 Nov. 2019)
- Facebook ads library (2018) and authorisation process for ads on social issues or politics.

Literature: social media and political behaviour

The literature on **traditional media** and voting has historically focused on Participation, Persuasion, and Polarization .

Researchers have recently turned their attention to **social media**:

- Facebook network effects on *turnout* (Bond et al. 2012)
- Facebook usage effects on *echo chambers* and *polarization* (Alcott et al. 2019, Settle 2018)
- Facebook usage and *(fake) news spreading* (Alcott and Gentzkow 2017)
- Russian Social media and *collective action* (Petrova et al. 2019)
- Facebook usage and political hate crime (Müller and Schwarz 2018)
- Voter responses to incumbent performance information disseminated through social media (Enríquez et al. 2019)

Our paper

What is the role of FCBK political ad micro-targeting in shaping electoral outcomes?

Three (empirical) contributions:

I) micro-targeting on ideology, gender and race is effective;

II) targeted voters less likely to deviate from initial intentions;

III) significant effects on both turnout and candidate choice, particularly among moderate voters

Our study is based on the 2016 US Presidential elections.

Research Design

GOAL→ **Estimate the effect of social media campaigning on voting behaviour (participation and persuasion).**

We cannot observe the voting behaviour of the same individual when on and off social media, while suppressing exposure to other media. We need to address

Issue 1: IDENTIFICATION: design quasi-experimental approach exploiting variation in individual FCBK exposure, *while accounting for other media outlets*.

Issue 2: MEASURABILITY: build audience-level proxies for the intensity of campaigns targeting social media users.

Research Design: 2-Step Approach

We tackle these issues with a two-steps approach:

(1) use ANES (2016), **map individual respondents** to a FCBK audience and collect information on their FCBK **EXPOSURE**.

(2) **scrape daily prices** of ads targeted at political audiences, and build a proxy for **INTENSITY** of FCBK political campaigns.

$\Rightarrow$ Exploiting the random assignment of respondents to ANES interview dates, we estimate the effect of FCBK political ads on changes in voting behaviour.

Matching ANES respondents to FCBK audiences

For the analysis of individual responses to social media political campaign, we start from **survey data** (ANES, 2016).

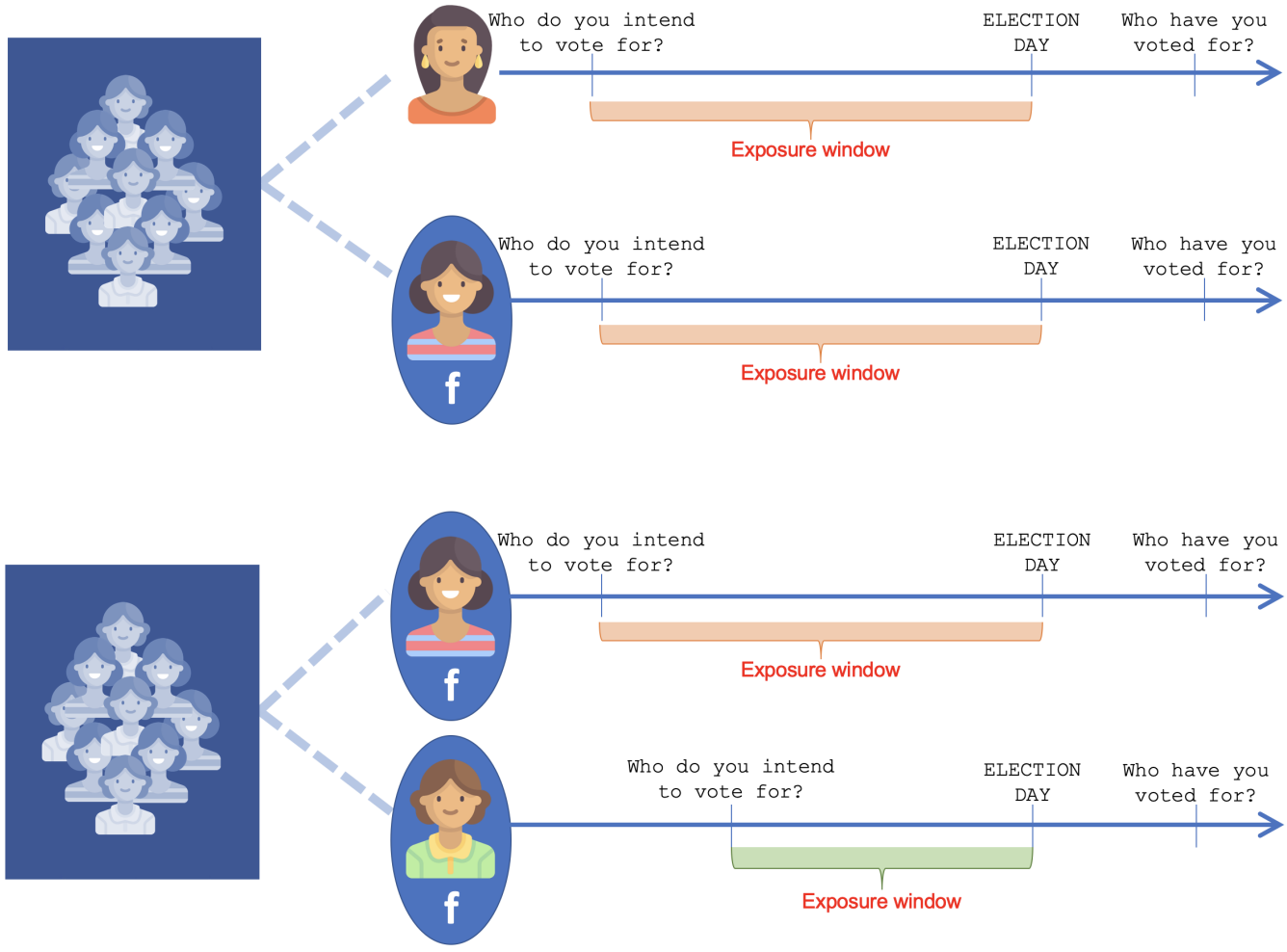
We build a **profile** for each ANES respondent based on location, gender, ethnicity, education, age and ideology. This allows us to **match** each respondent to a specific FCBK audience.

We measure **individual EXPOSURE** to social media campaign, based on **self-reported media and FCBK usage**.

We focus on changes between actual vote at election and intentions stated at initial interview date.

Identification

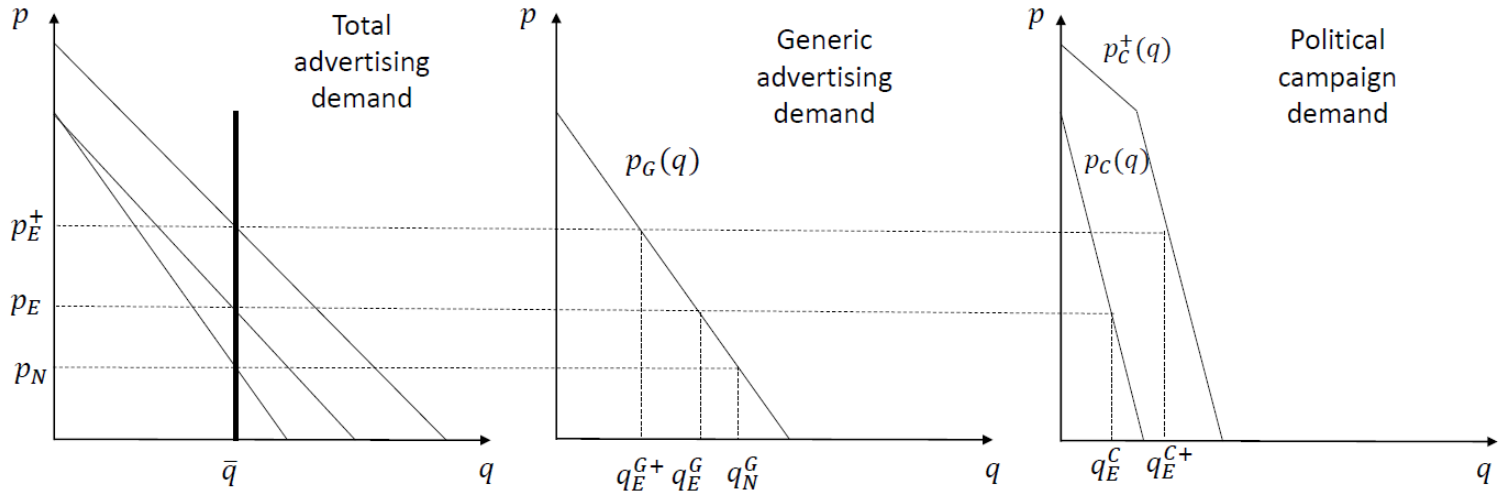
Estimate effect of exposure to FCBK campaign on **changes in voter behaviour w.r.t. revealed intentions**.



More on our proxy of Campaign Intensity

Why do we claim that ad prices are a good proxy for ad intensity?

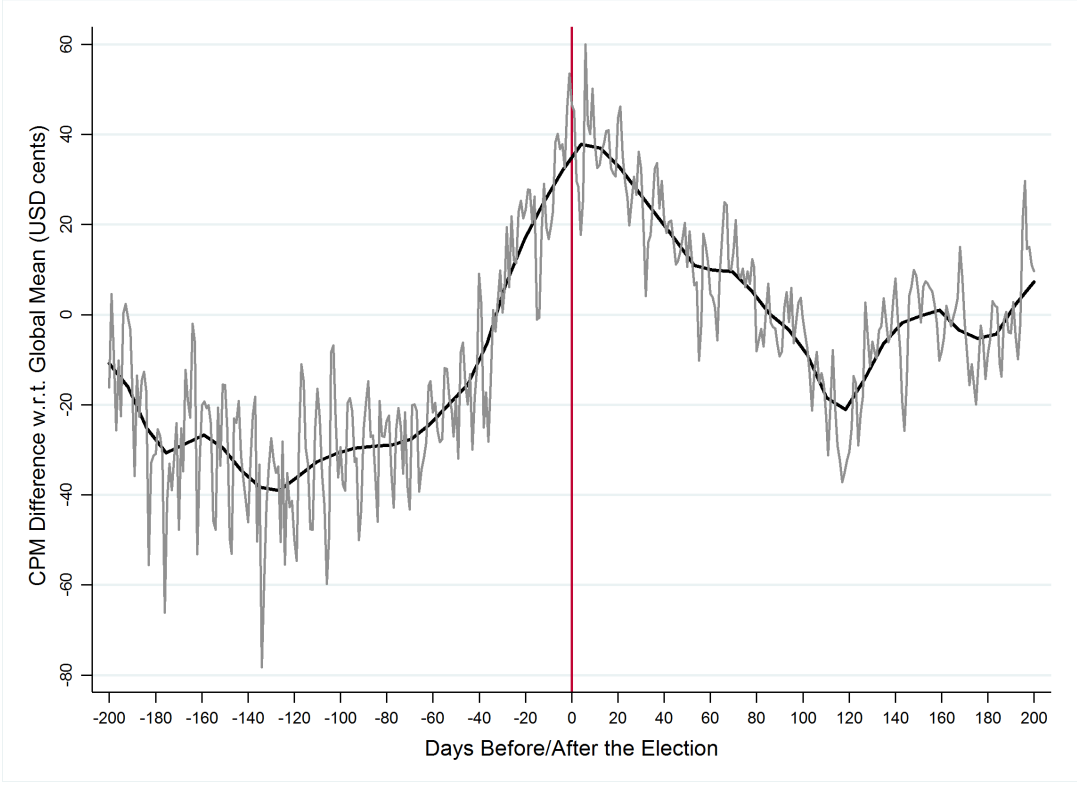
FCBK advertising market uses an online auction mechanism:
- users dislike receiving too many ads (limited supply)
- advertisers compete for the attention of an audience.



We argue that variations in prices across audiences are due to political advertising

Test: Entrance and Exit of Political Candidates

During electoral season, candidates (*temporarily*) enter online auctions.



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

Generic vs Political Campaigns

Advertising intensity vary over several dimensions.

GEOGRAPHY: political campaigns clearly vary across states but so do the non-political ads for generic products.


DEMOGRAPHY: political campaigns target demographic groups differently, but also non-political ads for generic products.

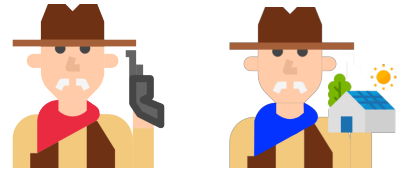

$\Rightarrow$ we fix geography and demographics by taking:

$$\frac{adprices_{ideol,geo,dem}}{adprices_{geo,dem}}$$

Generic vs Political Campaigns - cont.

However, preferences for some products are correlated to ideology

IDEOLOGY: obviously political campaigns target specific ideology groups, but some (non political) products or services may be correlated with ideology.



so we limit the analysis to the variation over time of relative prices.

Underlying assumption: since preferences for goods correlated to ideology are constant (at least in the short period), we assume the non political advertiser is not responding to the political campaign.

Proxy for Political Campaign Intensity

Our indicators for the **INTENSITY** of the political campaign is based on **daily prices (CPM) of FCBK ads micro-targeted at US audiences** (by ideology, gender, age, ethnicity, education and location). ◂ Scraping

Intensity by audience type
(defined by State, s, Demography, c, and Political Ideology,p)

Relative CPM: $p_{scp} = \mathrm{P}_{scp}/\mathrm{P}_{sc}$

Intensity: $r_{scp,w} = \sum_{w}^{e} p_{scp,w}/(e-w)$

Finally...exposure to Traditional Media

We control for exposure to campaigns conducted on **traditional media** in two ways:

- indicators on self reported usage of tradition media as ways to access political news (from ANES, exposure to TV, Radio and Newspapers)
- CPM for ads displayed on TV shows reported as preferred by ANES respondents (NIELSEN)

Effect of FCBK campaigns on Voters Behaviour

For the 2,426 respondents, we estimate

$$Y_i^{at} = \alpha EXP_i + \beta INT^{at} + \gamma EXP_i \times INT^{at} + controls + \epsilon_i^{at}$$

with $Y_i^{at} = 1$ 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.
- *controls* include duration, exposure to traditional media (TV, Internet, Radio, Newspaper, Talk Show), CPM for (generic) TV advertising campaigns ($CPMTV_{it}^t$) and demographics and time, audience and state dummies.

Results: Political Micro-Targeting

Three main results:

1. Political Micro-Targeting has significant effects when based on geographical location, ideology and *gender* or *ethnicity*.
2. Social-Media ads make it *less* likely for individuals to change their vote intentions
3. Reduced turnout among targeted liberals and increased turnout and Trump support among targeted moderate voters.

Results: US Elections

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 intensity between the election week and the pre-election interview reduces the likelihood of changing voting decisions for FCBK users: 4 pp for turnout, 2.5 pp for Trump vote and 1 pp for Clinton vote.

Dependent Variable:	Change in Turnout	Change in Trump Support	Change in Clinton Support
	(1)	(2)	(3)
News Access on FCBK (Exposure)	0.310***	0.274**	-0.136
	(0.108)	(0.117)	(0.144)
CPM runup (Intensity)	0.123	0.0928	-0.183
	(0.0900)	(0.0980)	(0.126)
FCBK Exposure x Intensity	-0.274***	-0.228**	0.109
	(0.0980)	(0.106)	(0.132)
Observations	2,076	2,076	2,076
R-squared	0.110	0.119	0.123

Note: the dependent variable equal to 1 if the respondent changed her voting behaviour, compared to the intentions revealed at the pre-election interview. This pertain any change in turnout or presidential vote. The CPM runup is measured as the integral between the relative CPM price at the election week and the relative CPM price at the week of the pre-electoral interview, normalized by the duration of this interval. 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. Standard Errors are clustered at the Ideology-State level.

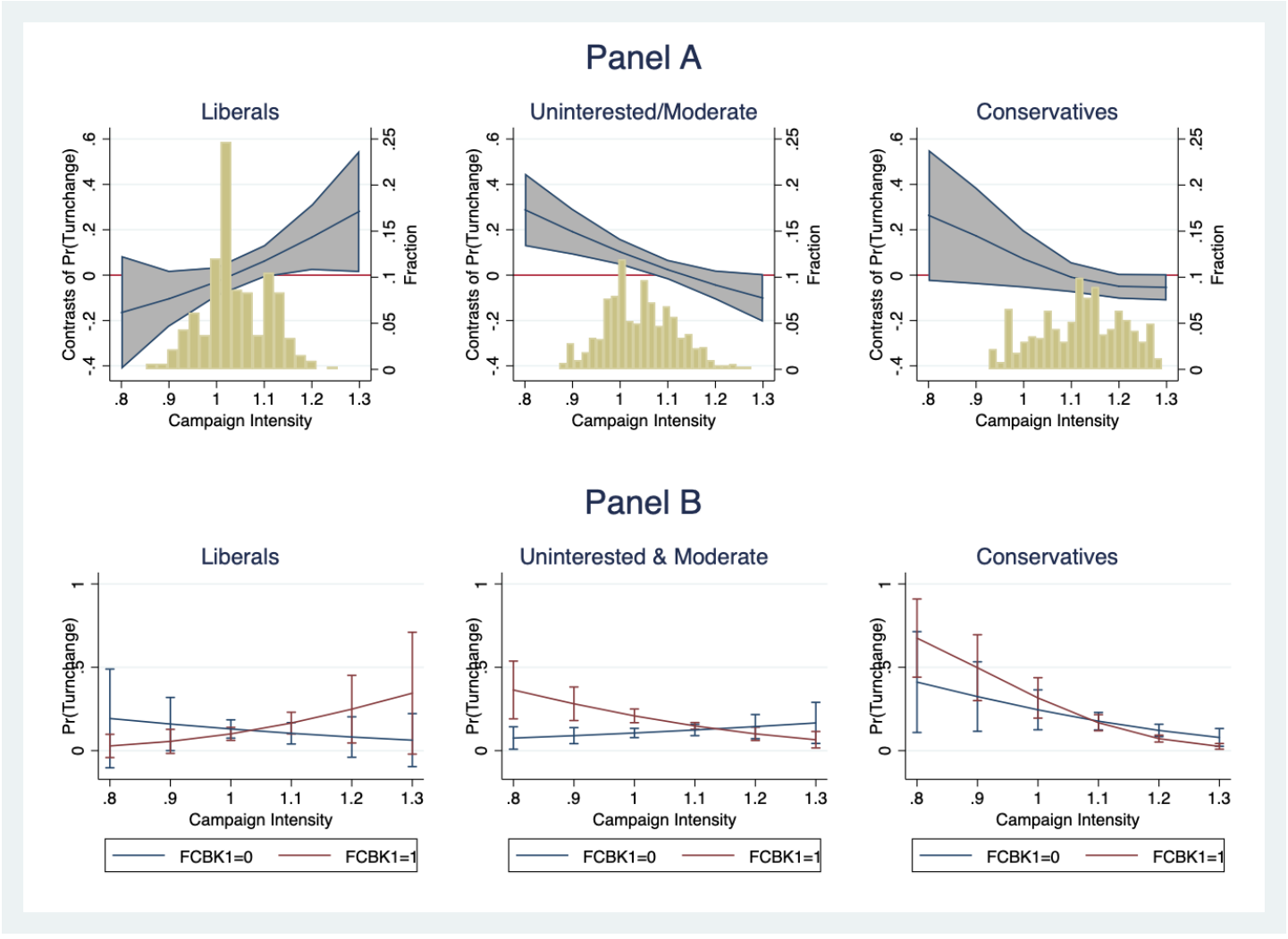
Effect of FCBK campaigns on Change in Turnout

An increase of 10% in the intensity between the election week and the pre-election interview reduces the likelihood of changing the decision to go to vote by 3.9 pp for women, 4.5 pp for Moderates , 4.7pp for the Conservatives.

		Gender		Ideology			State Type			Past Vote		Ethnicity	
	All	Women	Men	Liberal	Moderate	Conservative	Blue	Red	Swing	Dem2012	Rep2012	White	Minotiries
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Exposure	0.310***	0.355**	0.201	-0.233	0.556***	0.410	0.418**	0.542*	0.388	0.336*	0.503***	0.241**	0.308
	(0.108)	(0.179)	(0.174)	(0.170)	(0.167)	(0.260)	(0.174)	(0.299)	(0.242)	(0.200)	(0.149)	(0.107)	(0.244)
Intensity	0.123	0.207	-0.0320	-0.175	0.121	-0.0464	0.104	0.402	0.0186	0.188	0.0369	0.0309	0.291
	(0.0900)	(0.161)	(0.188)	(0.317)	(0.164)	(0.233)	(0.127)	(0.247)	(0.163)	(0.173)	(0.189)	(0.101)	(0.216)
Exposure X Intensity	-0.274***	-0.356**	-0.144	0.236	-0.482***	-0.386*	-0.373**	-0.480*	-0.339	-0.320*	-0.389***	-0.199**	-0.284
	(0.0980)	(0.165)	(0.165)	(0.158)	(0.151)	(0.228)	(0.149)	(0.269)	(0.225)	(0.190)	(0.126)	(0.0975)	(0.226)
Observations	2,076	1,147	929	571	818	687	812	706	558	1,031	688	1,537	539
R-squared	0.110	0.158	0.164	0.209	0.184	0.226	0.155	0.192	0.199	0.152	0.235	0.128	0.230

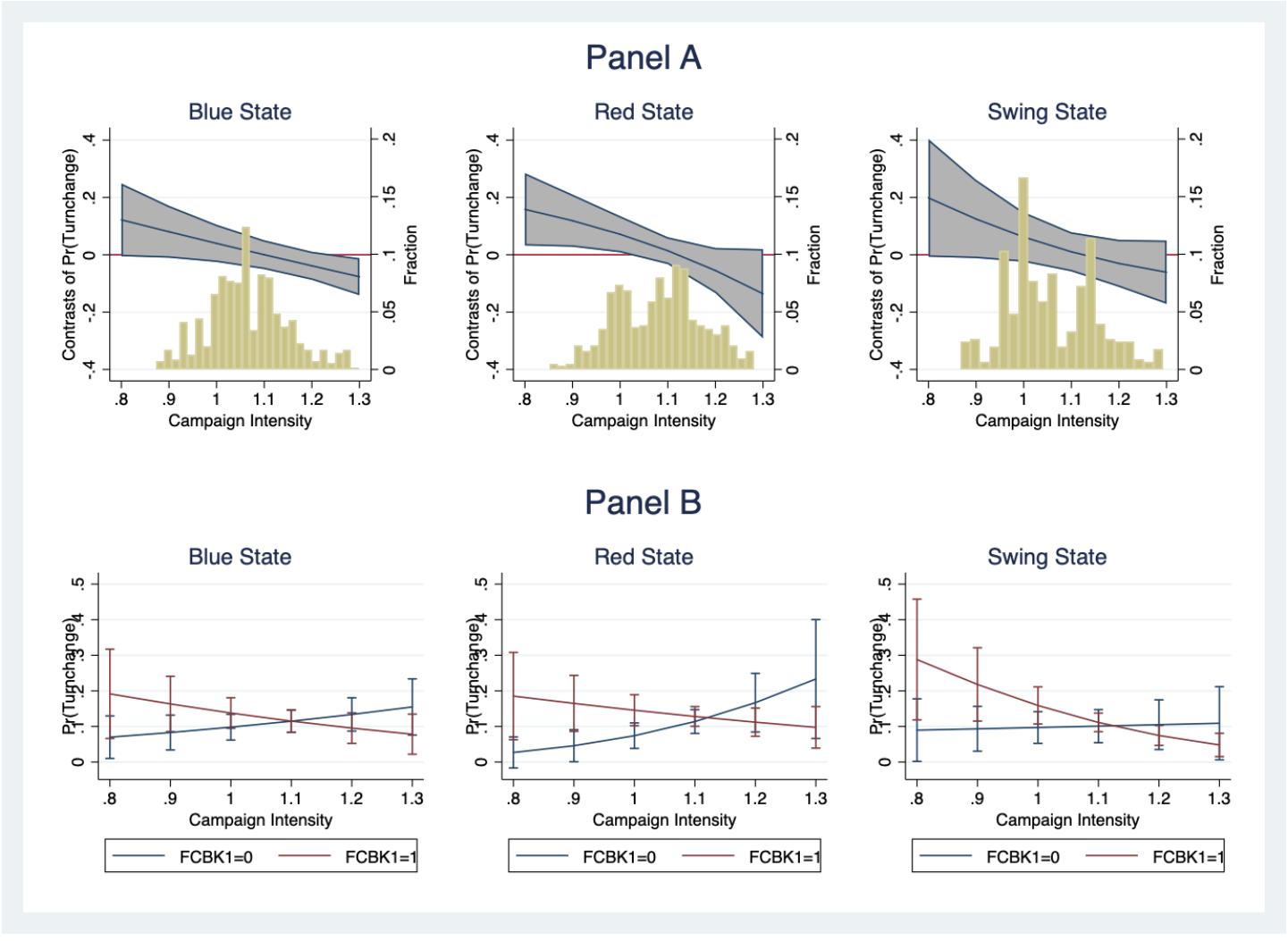
Note: the dependent variable 1 if the respondent changed her turnout decision, compared to the intentions revealed at the pre-election interview. The CPM runup is measured as the integral between the relative CPM price at the election week and the relative CPM price at the week of the pre-electoral interview, normalized by the duration of this interval. 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. Standard Errors are clustered at the Ideology-State level.

Effect of FCBK campaigns on Turnout - by Ideology



Back

Effect of FCBK campaigns on Turnout - by State Type



Back

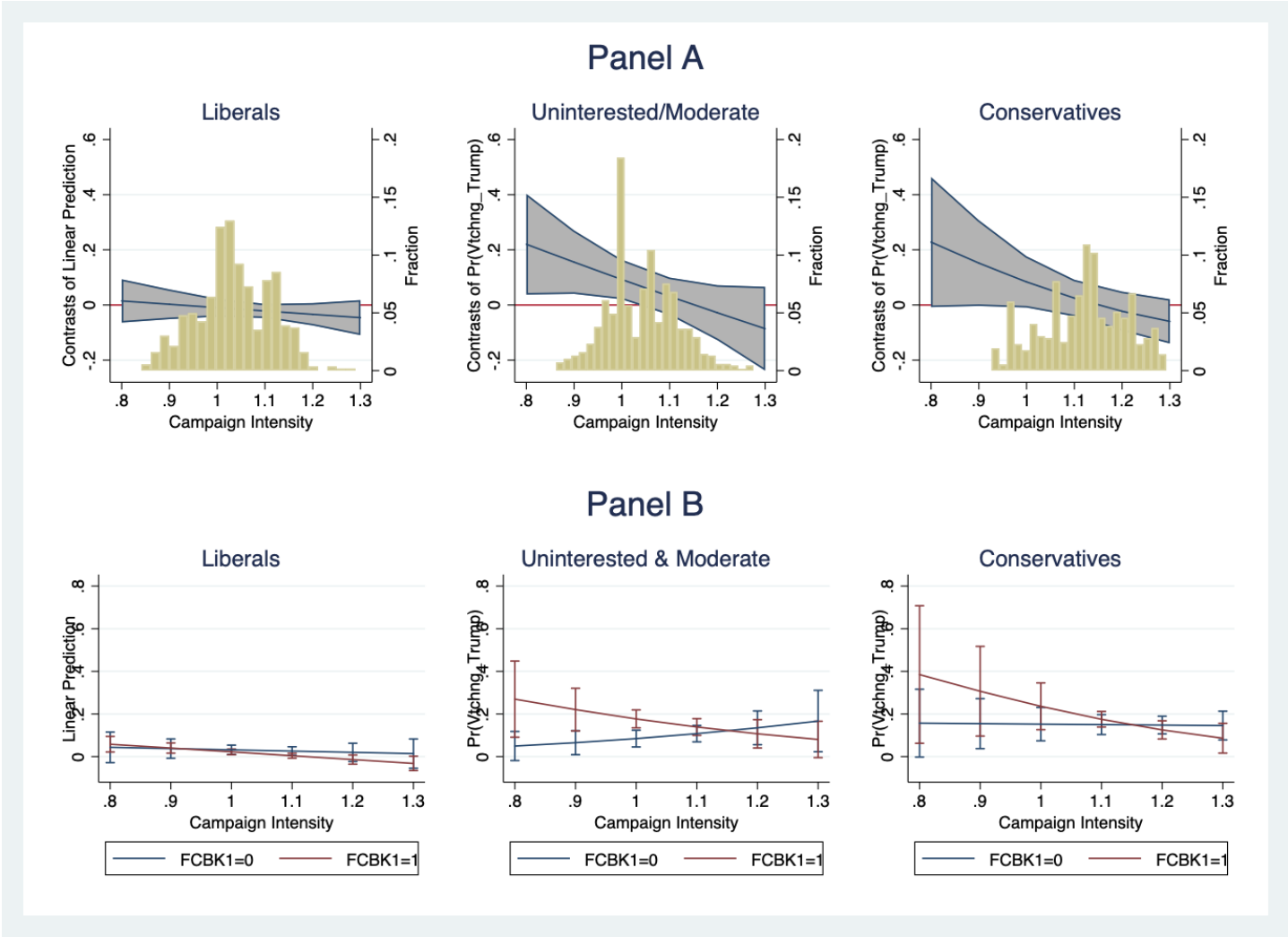
Effect of FCBK campaigns on Change in Trump Vote

An increase of 10% in intensity between the interview and the election week reduces the likelihood of changing one's vote, compared to stated intentions, by 2.8 percentage points for Liberal, 4.8 pp for Moderates, and 4.5 pp for those living in swing states.

		Gender		Ideology			State Type			Past Vote		Ethnicity	
	All	Women	Men	Liberal	Moderate	Conservative	Blue	Red	Swing	Dem2012	Rep2012	White	Minotiries
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1.FCBK1	0.274**	0.349*	0.0577	0.272**	0.546**	0.192	0.209	0.174	0.630***	0.308	0.504***	0.317***	-0.145
	(0.117)	(0.184)	(0.163)	(0.112)	(0.249)	(0.288)	(0.190)	(0.292)	(0.181)	(0.204)	(0.180)	(0.121)	(0.275)
inten	0.0928	0.122	-0.0573	0.0683	0.177	0.0151	-0.0689	0.0651	0.341**	0.282*	0.0576	0.0582	0.0623
	(0.0980)	(0.155)	(0.168)	(0.130)	(0.232)	(0.241)	(0.129)	(0.218)	(0.167)	(0.169)	(0.173)	(0.107)	(0.177)
1.FCBK1#c.inten	-0.228**	-0.321*	-0.0123	-0.267**	-0.470*	-0.159	-0.206	-0.156	-0.519***	-0.276	-0.432***	-0.261**	0.134
	(0.106)	(0.170)	(0.148)	(0.107)	(0.236)	(0.242)	(0.169)	(0.261)	(0.153)	(0.201)	(0.148)	(0.105)	(0.261)
Observations	2,076	1,147	929	571	818	687	812	706	558	1,031	688	1,537	539
R-squared	0.119	0.165	0.178	0.280	0.192	0.216	0.168	0.188	0.206	0.178	0.192	0.145	0.336

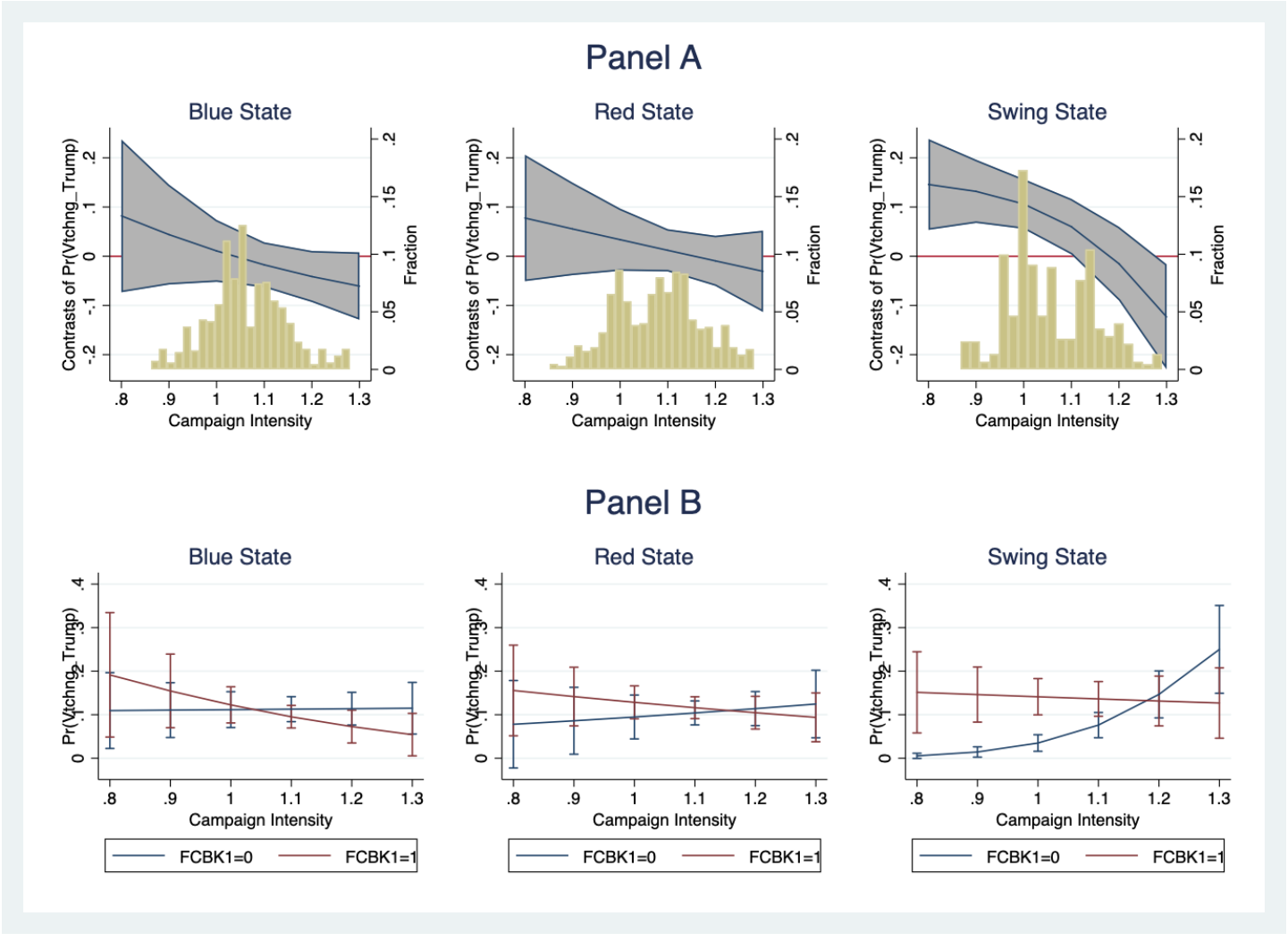
Note: the dependent variable 1 if the respondent changed her Trump Vote decision, compared to the intentions revealed at the pre-election interview. The CPM runup is measured as the integral between the relative CPM price at the election week and the relative CPM price at the week of the pre-electoral interview, normalized by the duration of this interval. 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. Standard Errors are clustered at the Ideology-State level.

Effect of FCBK campaigns on Trump Vote - by Ideology



Back

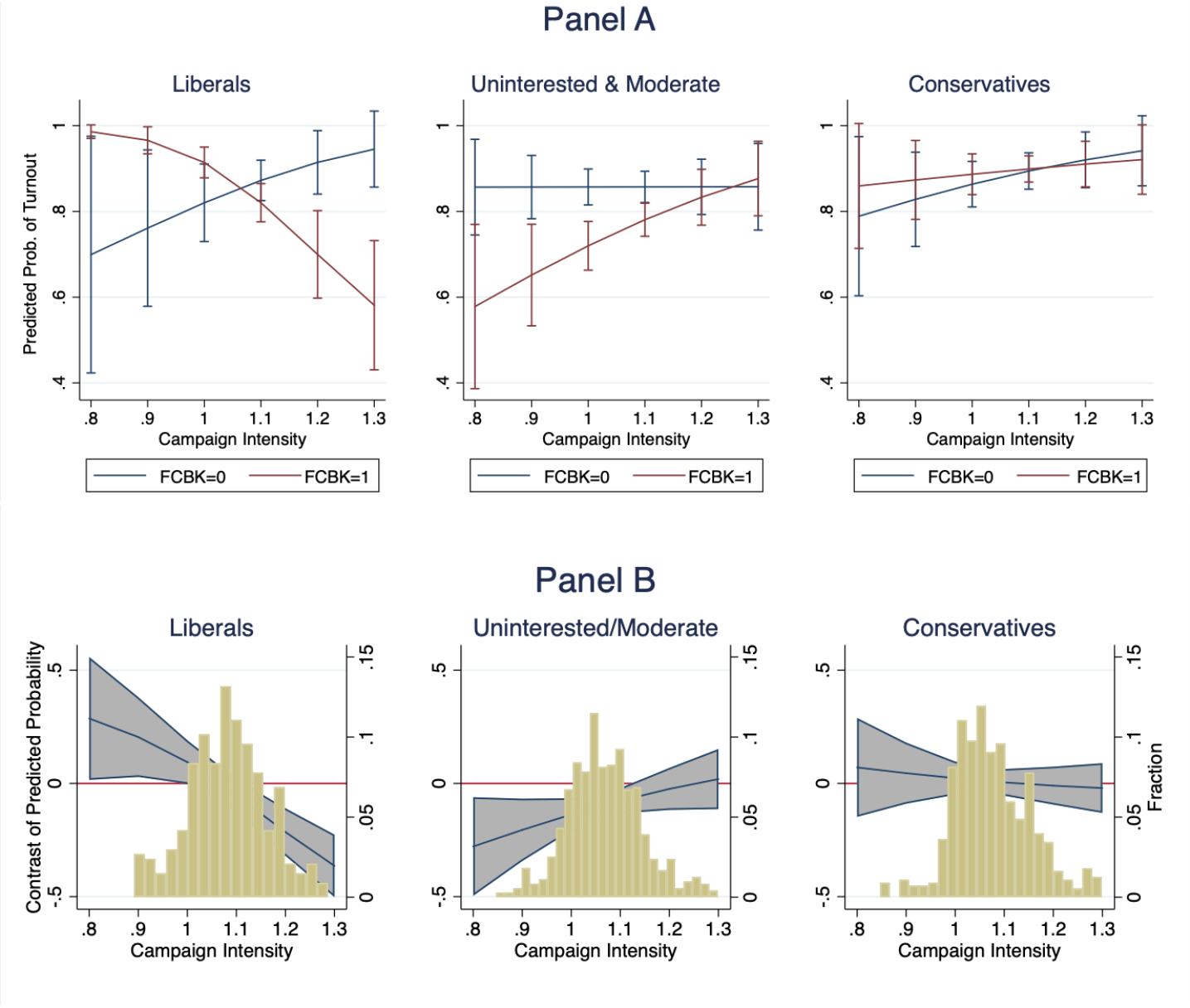
Effect of FCBK campaigns on Trump Vote - by State Type



Back

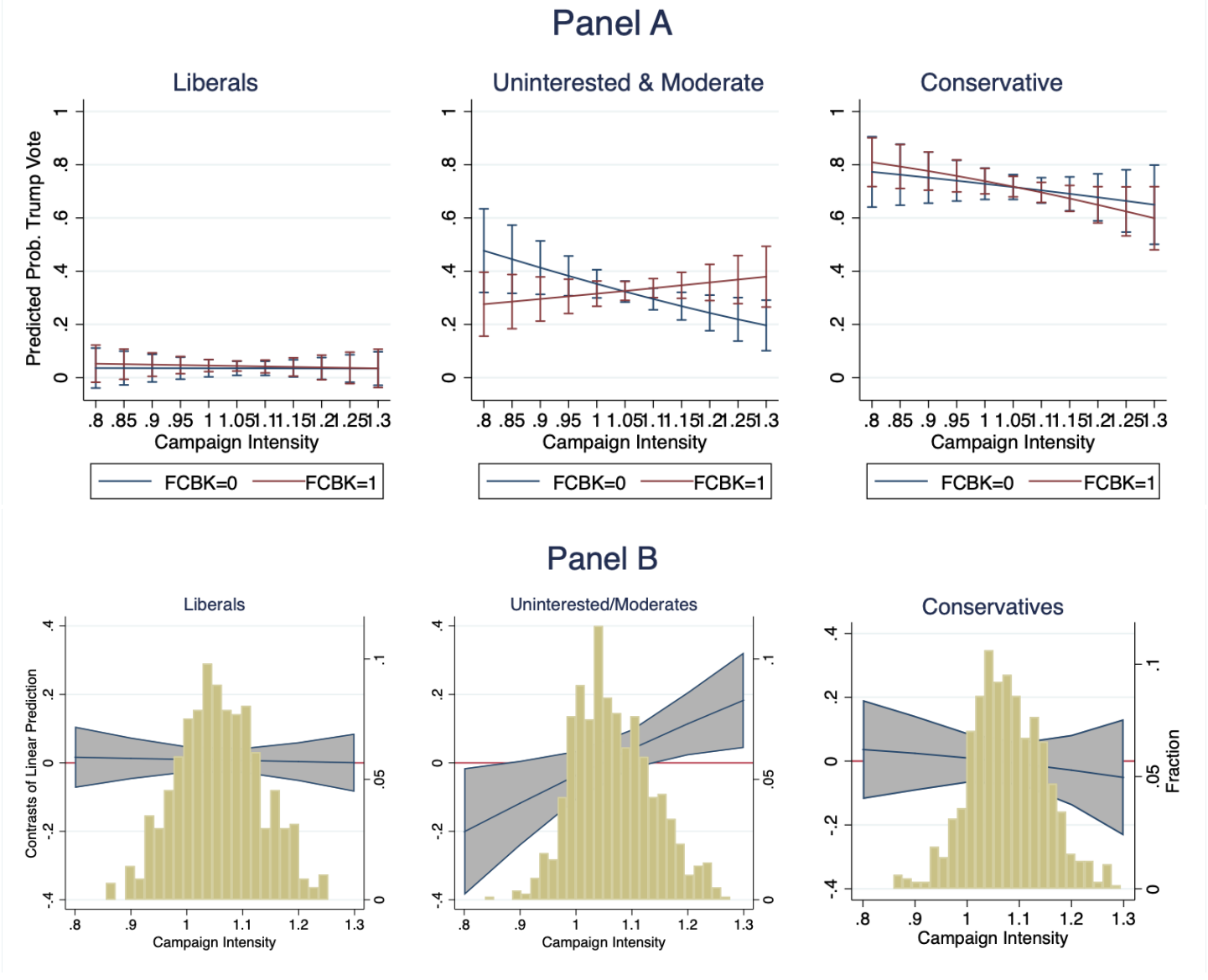
To ease the interpretability, we also estimate our model on precise voting outcome: turnout, vote cast in favour of Trump and vote cast in favour of Clinton.

Effect of FCBK campaigns on Turnout: Ideology



Back

Effect of FCBK campaigns on Trump Vote: Ideology

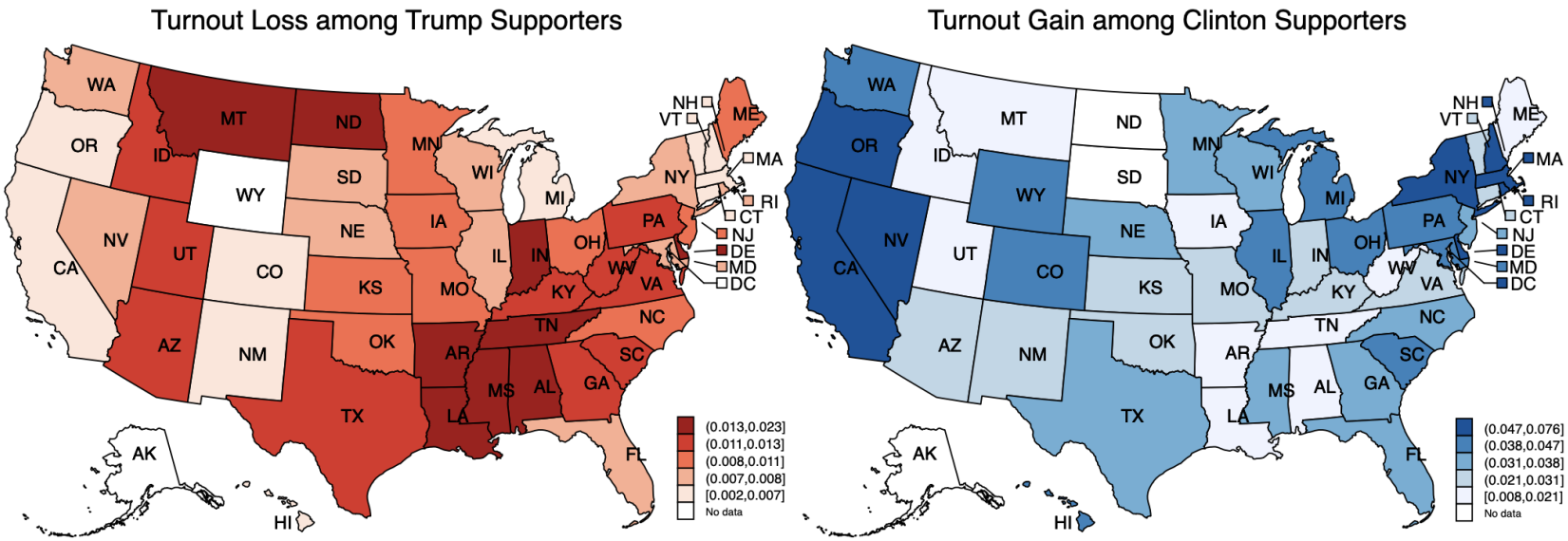


Back

How much does it matter?

Intense targeting of Facebook political ads affected turnout, in opposite directions among Trump or Clinton Supporters.

Reduction (by 1%) in the intensity of Facebook political campaign

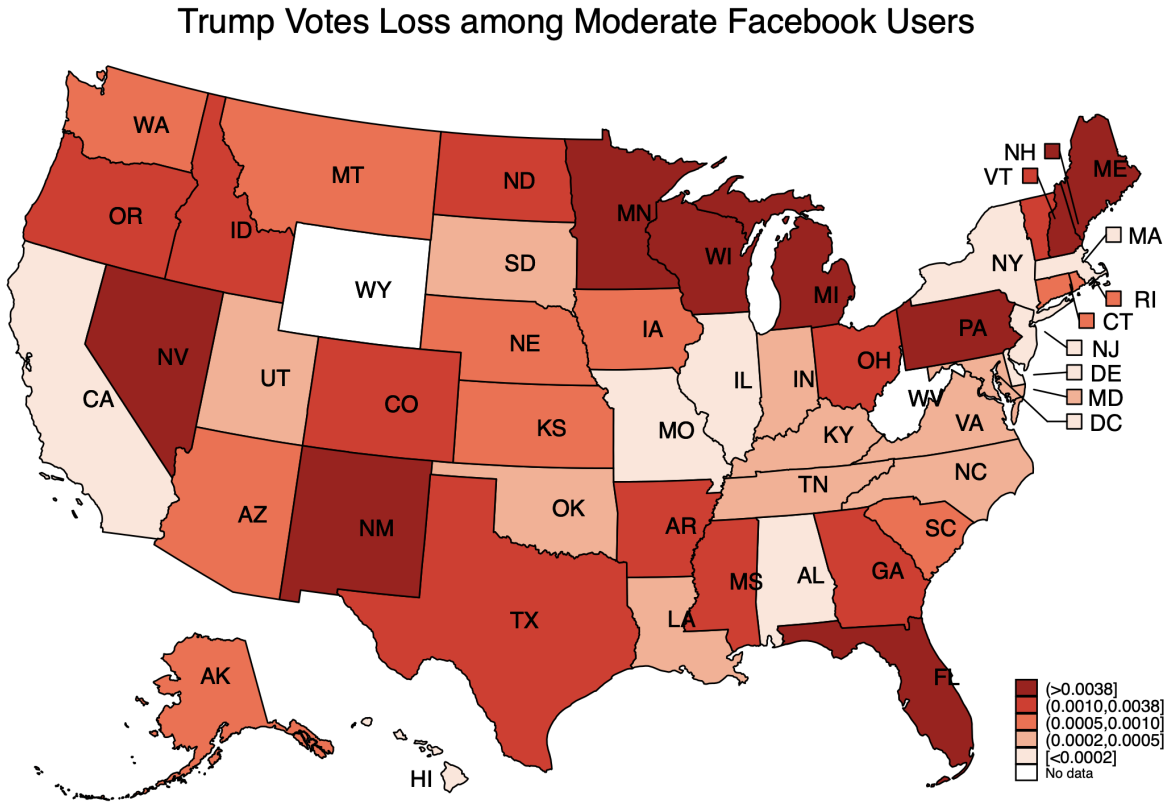


Note: simulation based on 2016 electoral outcomes

How much does it matter?

Intense targeting of Facebook political ads persuaded Moderate voters to favour Trump in the final election.

Reduction (by 1%) in the intensity of Facebook political campaign



Note: simulation based on 2016 electoral outcomes

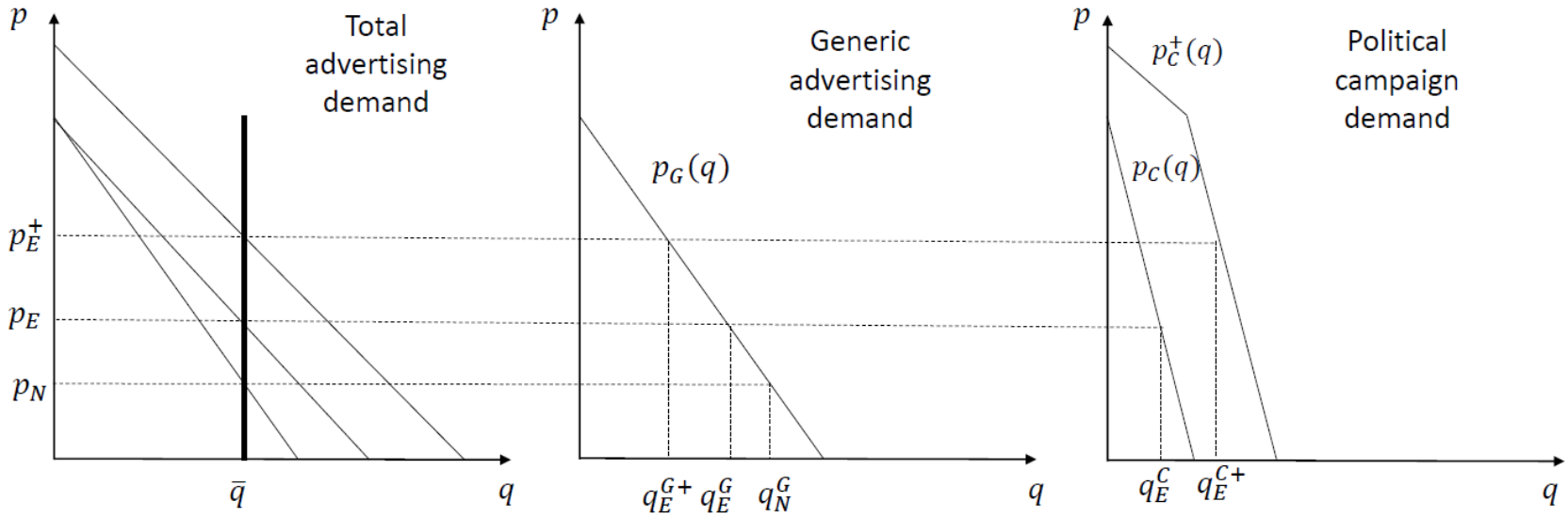
Conclusions

- 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!

Graphical illustration

The platform supplies an **inelastic** quantity of ads ($\bar{q}$).
Two States of the World $i = \{0, E\}$, depending on Elections (E).



- In state 0 ads are demanded only by Generic (G) Advertisers.
- In state E, Political Advertisers (P) enter the auction determined to win a piece of the pie. **The equilibrium price (p_E) increases and the quantity assigned to generic advertiser (q_E^G) decreases** .

Go Back

Inelastic Ads Supply - Evidence

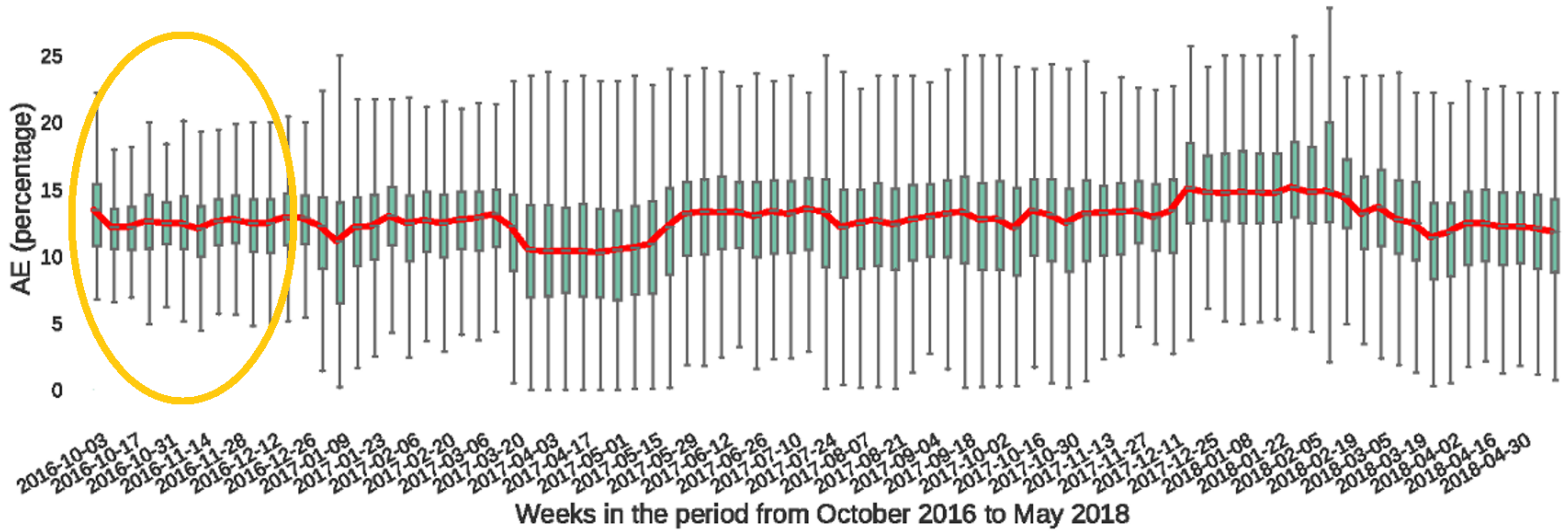


Fig. 5: Evolution of the metric $AE = \frac{\#ads}{\#posts+\#ads}$ in the period October 2016 - May 2018 per week. Each week presents a boxplot of the metric that includes the distribution of the AE across all the users with active sessions in each week. Note AE is represented as percentage rather than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

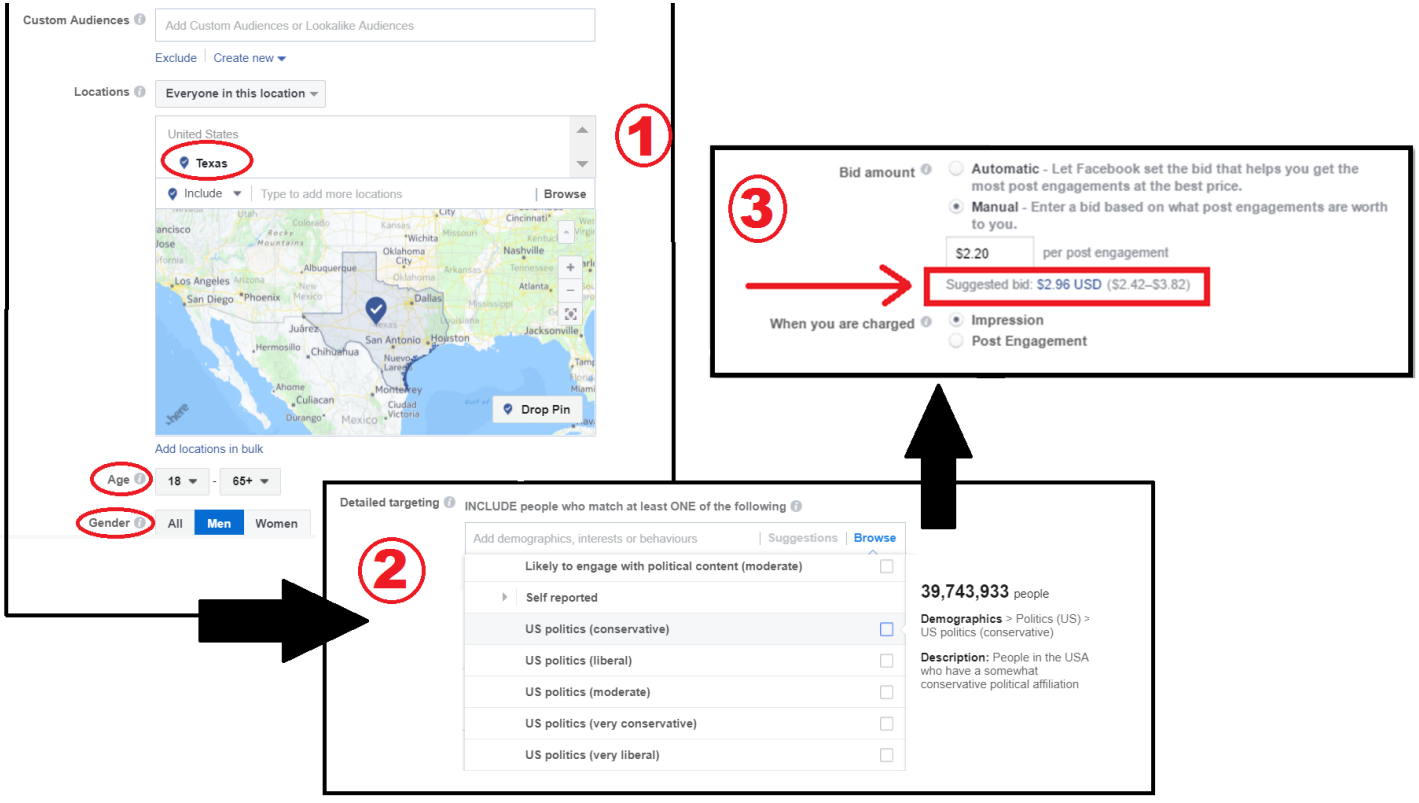
Source: Arrate et al. (arXiv:1811.10921)

◂ Go Back

Measuring the intensity of political campaigns

Targeting Political Audience on Facebook

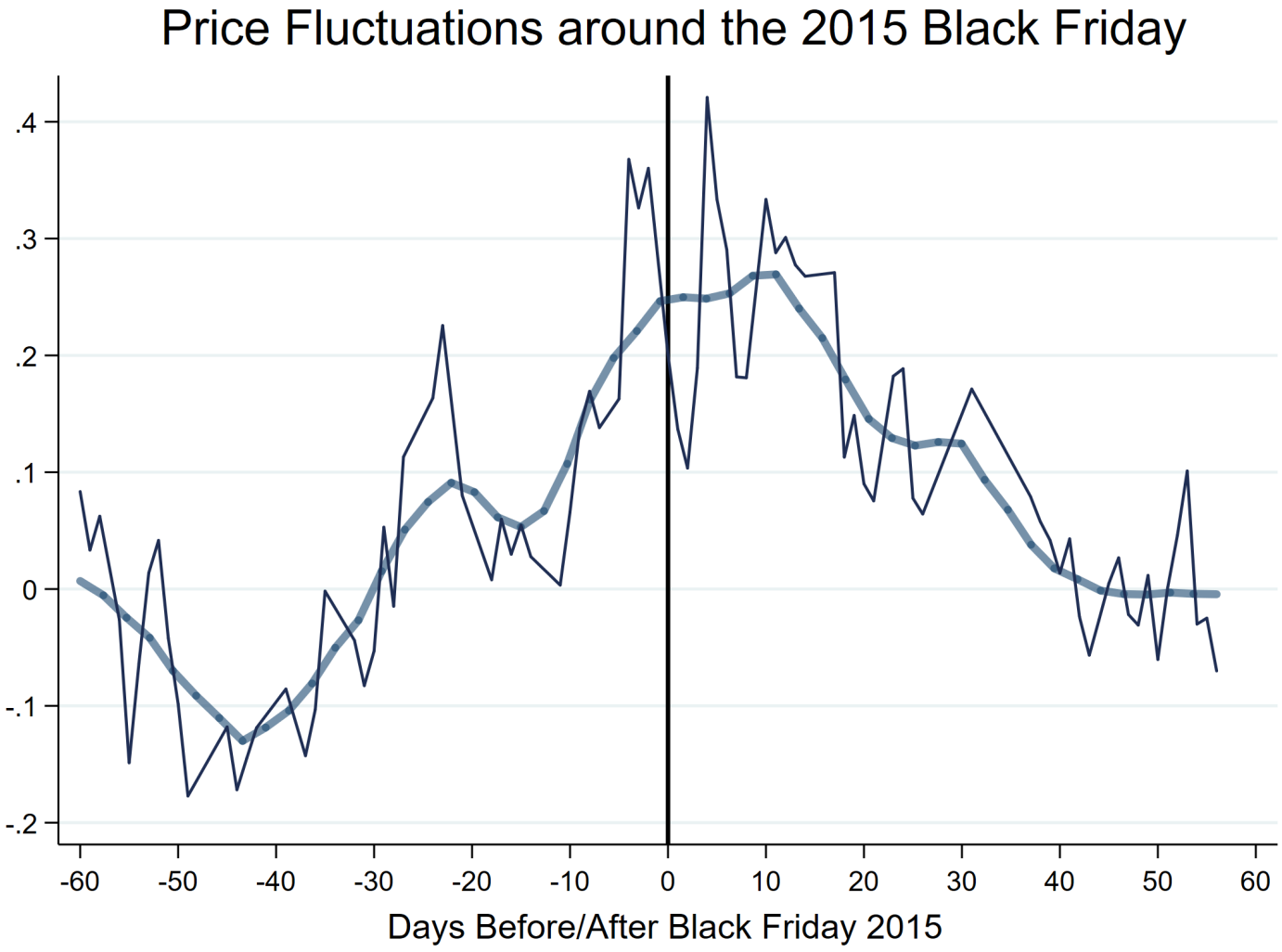
We scrape **Daily Prices** for **State/Ideology specific Audiences**. We extract both CPM (Cost per Mille Impressions) and CPC (Cost per Click). We further do this for Age, Gender, Race and Education State/Ideology specific audiences.



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

Go Back

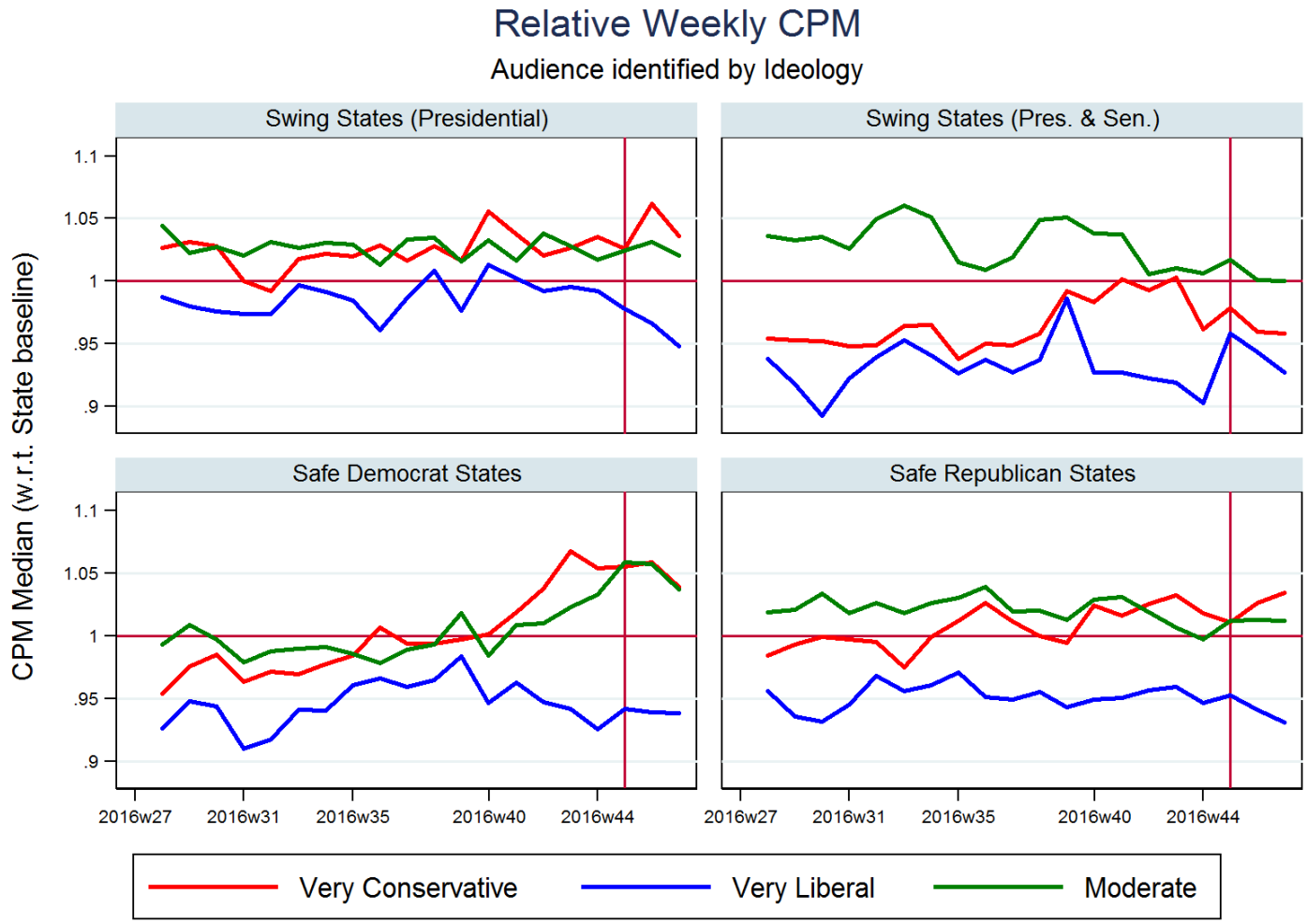
Test I - Robustness



back

Politcs on FCBK: the 2016 US Presidential Elections

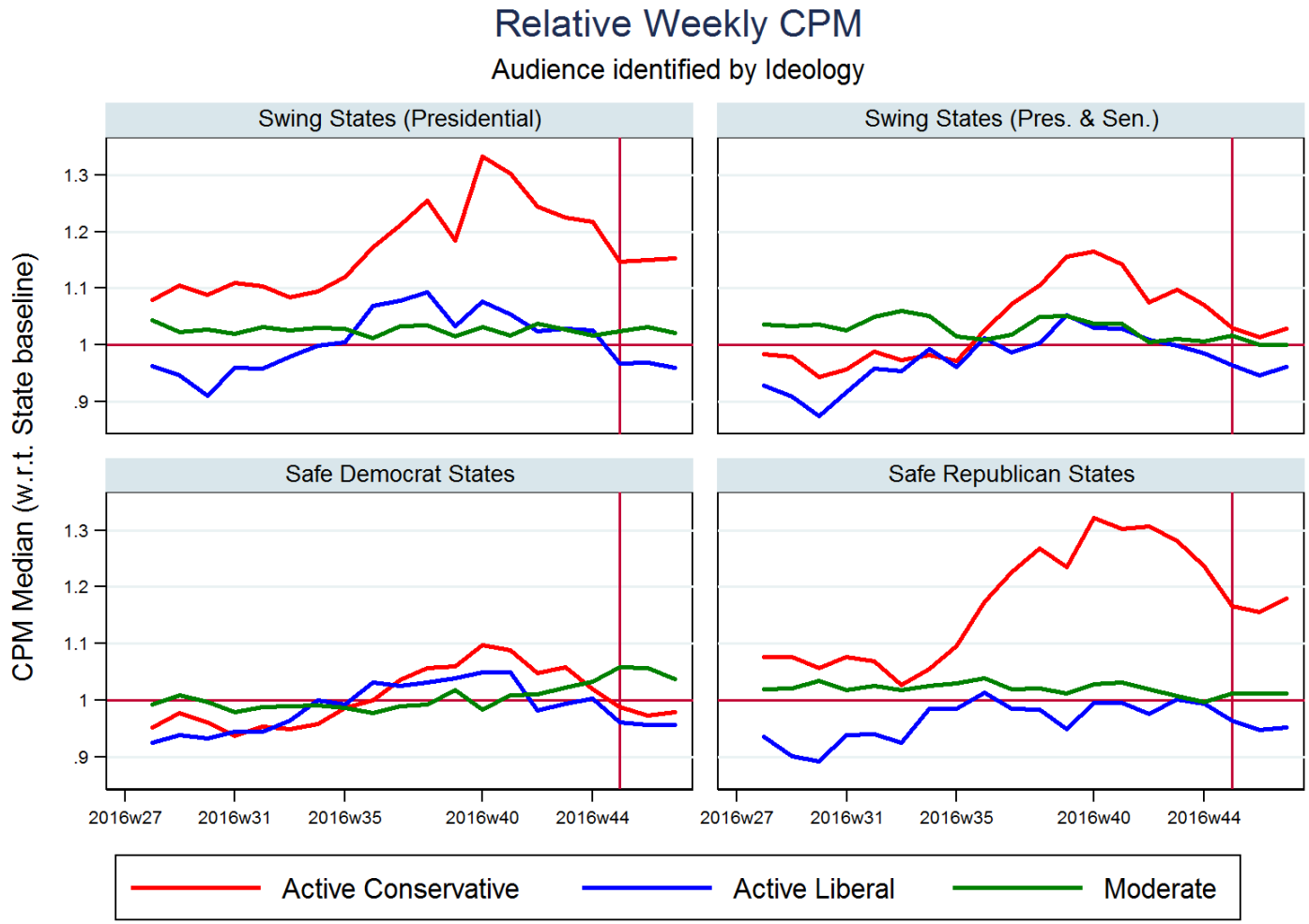
Trends of Prices for Ideology Specific Audiences



back

Politcs on FCBK: the 2016 US Presidential Elections

Trends of Prices for Ideology Specific Audiences



back

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).

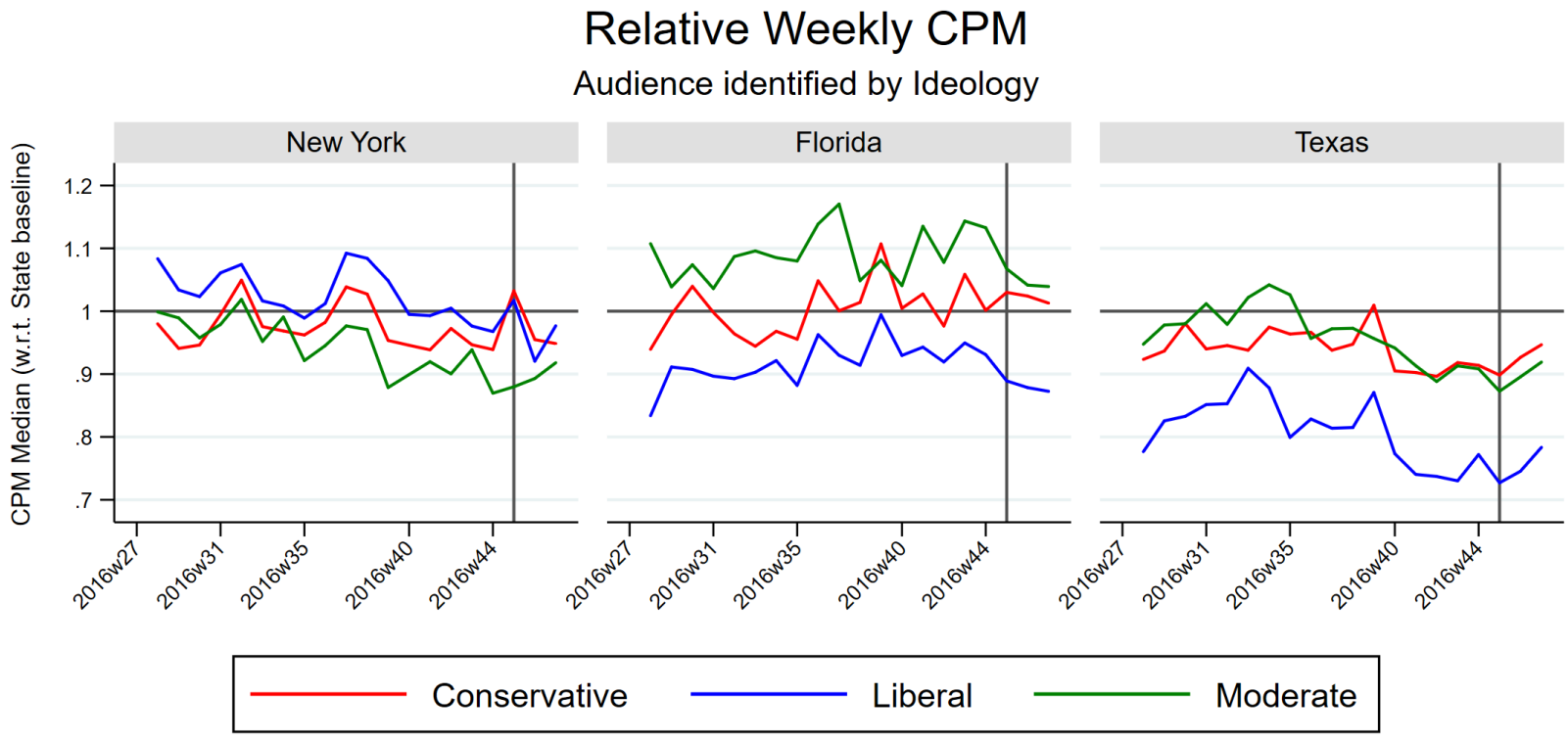
Dep. Variable: State CPM Median	Republican Partisan States	Democrat Partisan States	Swing States
Lag of CPM median	0.533**	0.545**	0.502**
	(0.031)	(0.026)	(0.042)
Abs. Value of Difference in Winning Prob	-2.887**	5.814**	1.687**
	(0.640)	(0.907)	(0.508)
Abs. Value of Difference in Winning Prob $\times 1[T > C]$			-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 $PDIFF_{s,t} = |(P^T_{s,t} - P^C_{s,t})|$, and $P^T_{s,t}$ and $P^T_{s,t}$ 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).

back

[1] Source: **FiveThirthyEight 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



back