

The Impact of Political Campaigns on Demand for Partisan News

Luis Menéndez*

Universitat de Barcelona

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* Universitat Autònoma de Barcelona and Barcelona School of Economics

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- There are increasing efforts to **regulate** the media: fact checking agencies, proportional rules...
- Yet evaluating these regulations requires disentangling **demand** from **supply**.

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 - ▶ **Supply:** Outlets select how and how much they talk about political parties.
 - ▶ **Demand:** Viewers choose their preferred channel to watch the news.
- Building Blocks:
 - ▶ Measurement: Machine-learning and LLMs to classify partisan slant.
 - ▶ Demand vs Supply: Novel identification strategies to recover both viewers' preferences and outlets' costs.

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- Counterfactual: The implementation of a proportional airtime rule results in a more polarized political environment.

Related Literature

- **Slant measurement.**

[Comparison] Groseclose and Milyo (2005); Gentzkow and Shapiro (2010)

[Intensity] Chiang and Knight (2011); Durante and Knight (2012); Cagé et al. (2022)

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[Demand] Fan (2013); Longuet-Marx (2025); Compiani et al. (2025)

[Supply] Goettler and Shachar (2001); Draganska et al. (2008); Wollmann (2018)

+ LLMs to capture differentiation; Identification strategies for media markets.

+ First work to evaluate content regulation policies within a structural model.

Roadmap

- ① Context: Spanish Politics and TV News.

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- **Context: Spanish Politics and TV News**

- Data, Text Analysis and Descriptive Evidence
- Demand
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Spanish Political Context

- Historically a bipartite system between the left, *Partido Socialista Obrero Español (PSOE)*, and the right, *Partido Popular (PP)*. After 2015, emergence of *Unidas Podemos (UP)* on the left and *VOX* on the right.

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- During my sample period (December 2022–July 2023), the PSOE-led coalition governed in partnership with *Unidas Podemos*.

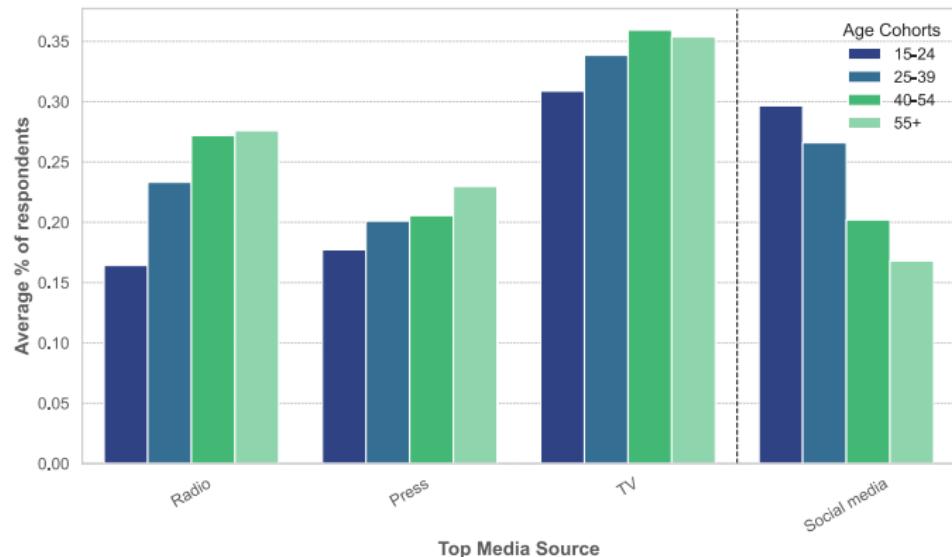
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- Throughout the analysis, I group parties into two blocs:

Left: PSOE + UP/SUMAR

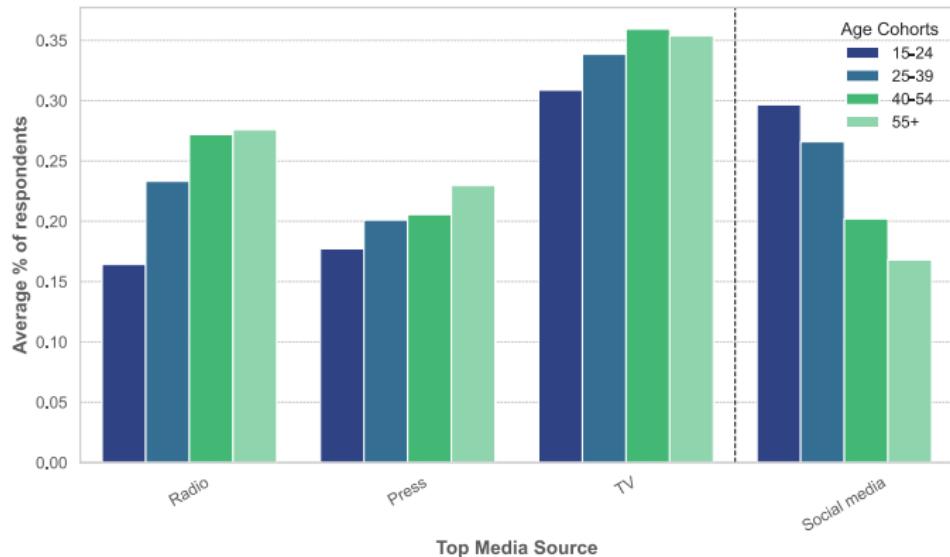
Right: PP + VOX

Main Sources of Political information in Europe



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- **Misinformation and Trust:** Concern about online misinformation is increasing and traditional broadcasters remain the most trusted news source in the EU (European Parliament, 2025).

Spanish TV market



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- Leading cable channel in:
 - ▶ **Spain** (A3) $\approx 2\text{M}$ viewers.
 - ▶ **US** (Fox News) $\approx 2.2\text{M}$ viewers.

- Context: Spanish Politics and TV News
- **Data, Text Analysis and Descriptive Evidence**
- Demand
- Supply
- Counterfactual: Proportional Airtime Rule

Data

- **Audience Data:** Audimeter, high-frequency audience data provided by Kantar Media. I have data disaggregated by *autonomous regions* in Spain for the period December 2022 to July 2023 on a daily frequency.
- **TV Content:** Self-collected transcripts of the evening TV News show for the main TV channels. [Pipeline](#) [Webpage](#)
- **Agencia EFE:** All news stories published in Spanish by one of the largest news agencies in the world. The sample contains a total of 41K stories.
- **Survey Data:** "Intention to vote" question in Centro de Investigaciones Sociológicas (CIS).
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Slant Index (TV Outlets)

- Each day d a channel j produces a set of stories S_{jd} ,



Spain's economy has once again outperformed the euro area. New figures show quarterly GDP growing by 0.5 percent, roughly double the pace of the eurozone as a whole, driven above all by strong exports and a rebound in machinery investment. Economic analysts say the data confirm that Spain is consolidating a more dynamic recovery than its neighbours, supported by targeted support for firms and households and by a more gradual withdrawal of pandemic-era measures. Spain's Supreme Court has upheld the main prison sentences in the so-called Gürtel case, one of the country's largest corruption scandals, which centred on illegal commissions and rigged public contracts linked to the conservative Popular Party, or PP. Judges confirmed a 13-year sentence for businessman Francisco Correa and 15 years for his associate Pablo Crespo over contracts awarded around Pope Benedict XVI's 2006 visit to Valencia. The ruling closes the door on further appeals in this branch of the case and reinforces the earlier finding that a long-running network of kickbacks operated around PP administrations. While the party says it "respects the decision" and stresses that the events date back to before Mariano Rajoy's time as prime minister, the verdict is a reminder of why Gürtel helped bring down his government in 2018. Commentators note that the scandal continues to weigh on the credibility of the Spanish right and deepens the sense of division among conservative forces competing for the same voters. Prime Minister Pedro Sánchez has visited the command centre in Teruel, in north-eastern Spain, where firefighters are battling one of the summer's largest wildfires. Sánchez linked the scale of the blaze to climate change and called for "serious adaptation policies" in the coming years. Shortly after the visit, his office announced a small cabinet reshuffle, with José Milánes taking over as Health Minister and Héctor Gómez assuming the Industry, Trade and Tourism portfolio, moves the government presents as a way to speed up its agenda in the second half of the term. In sports, Spanish rider Alejandro Valverde has claimed today's stage of the Vuelta a España after a powerful uphill sprint. The victory, his first in this edition of the race, puts him closer to the overall leaders and delighted the home crowd lining the final climb.

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Sentences in major corruption case tied to the right party PP

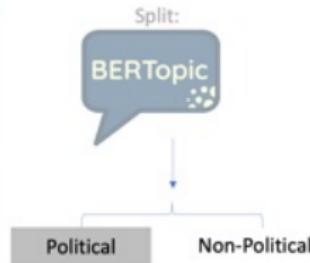
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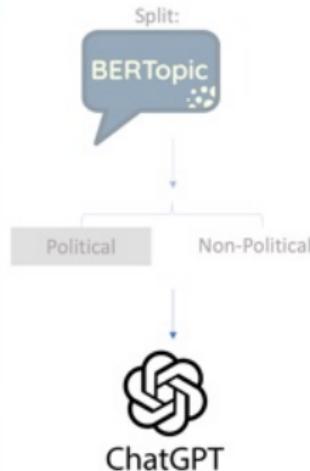
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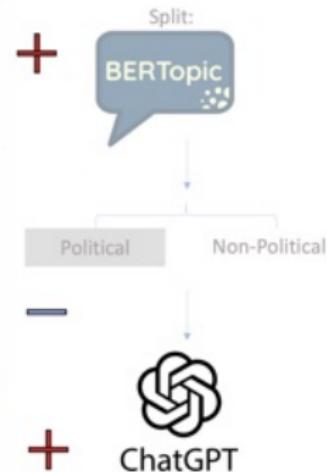
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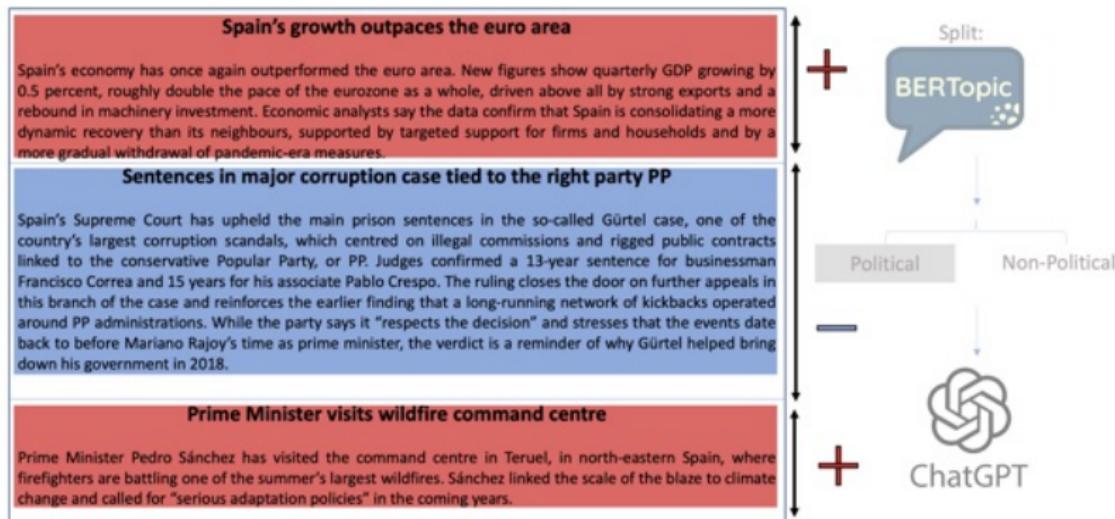
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- Then, I define the slant index as:

$$\text{Slant}_{jd} \equiv (x_{jd}^{R+} - x_{jd}^{R-}) - (x_{jd}^{L+} - x_{jd}^{L-}).$$

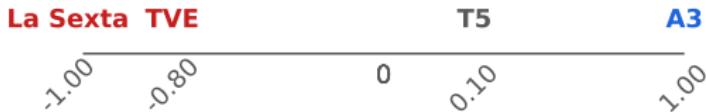
Validation of the Text Classification

Supply: Average Slant Index

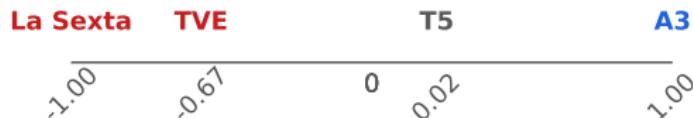


Validation of the Text Classification

Supply: Average Slant Index



Demand: Viewers' ideology



- LLMs deliver the correct ranking that is consistent with the distribution of ideology in the audience.

Slant Index (Newswire Agency)

- To proxy the *daily news landscape*, I use all stories published in Spanish by the newswire agency EFE ($N \approx 32.5K$).
- I classify every EFE story with the same pipeline and construct daily measures of the political mix:

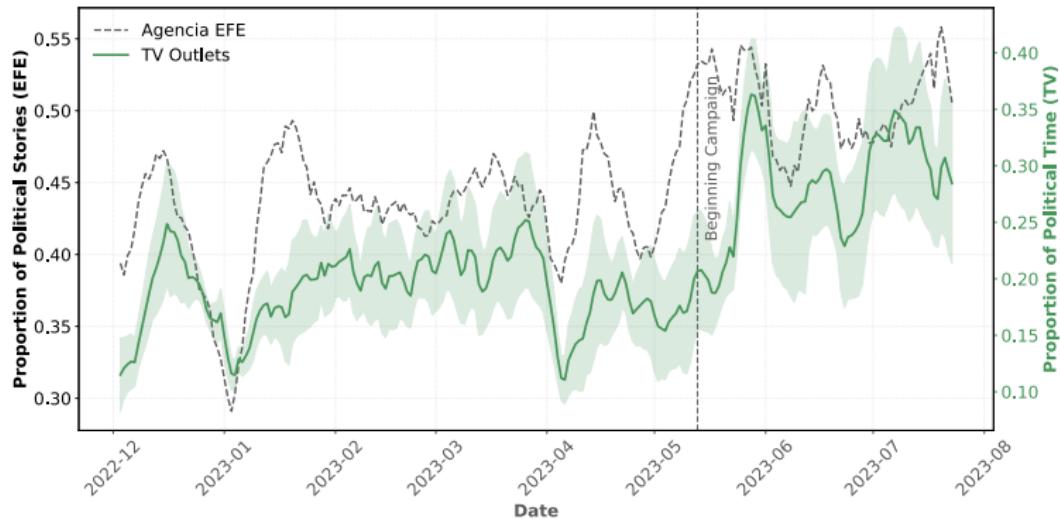
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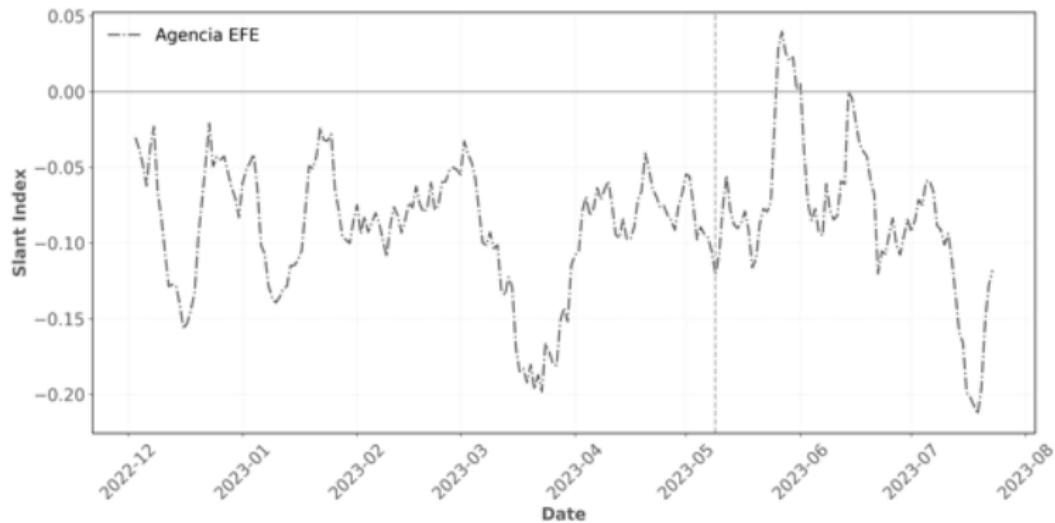
Political Coverage

Proportion of Political Coverage over Time

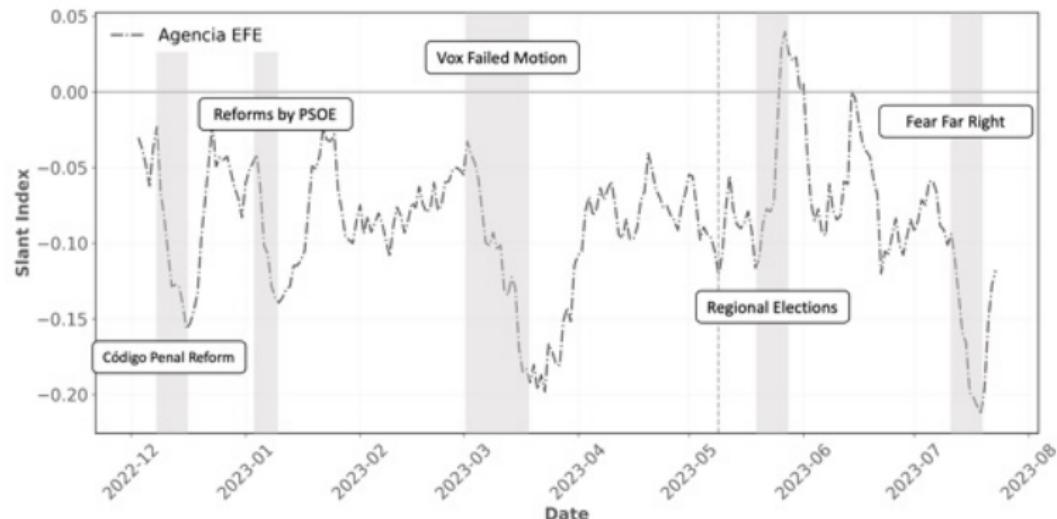


- Campaigns shift attention to politics:
 - — 43% → 51% for the newswire agency (EFE).
 - 18% → 30% for TV outlets (A3 > La Sexta > TVE > T5).

Evolution of the Slant Index

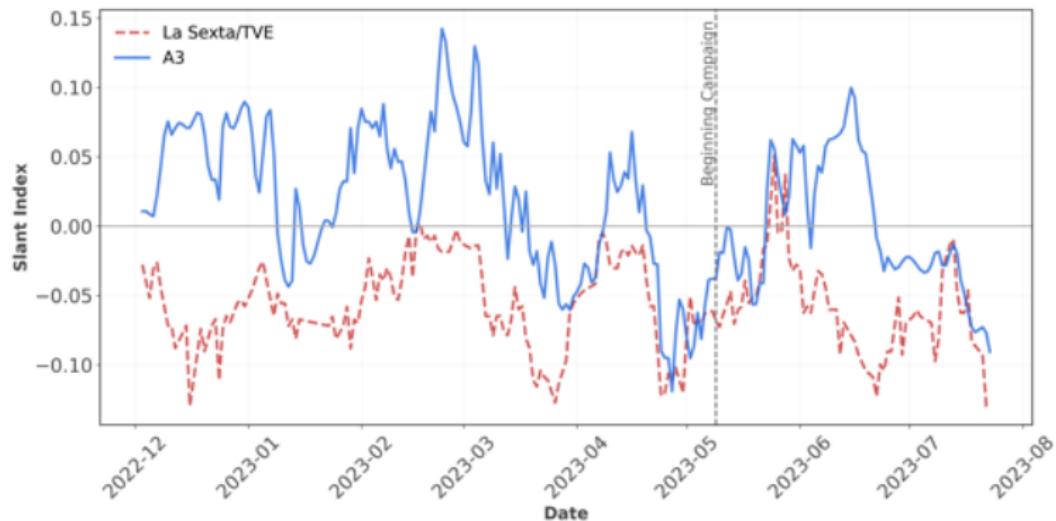


Evolution of the Slant Index



- Major political events are captured by the index.

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- Major political events are captured by the index.
- Convergence in outlets' ideological positions after March, which persists until favorable post-election results for the right.

- Context: Spanish Politics and TV News
- Data, Text Analysis and Descriptive Evidence
- **Demand**
- Supply
- Counterfactual: Proportional Airtime Rule

Demand Model

An individual i in region r chooses between an outlet $j \in \mathcal{J} \equiv \{La\ Sexta, TVE, T5, A3\}$ to watch at the beginning of day d or the outside option ($j = 0$). The expected utility of watching channel j is:

$$U_{ijrd} = \sum_k x_{jd-1}^k \beta^k + w_{rd} \gamma + \xi_{jrd} + \sum_k x_{jd-1}^k (\sigma^k \nu_{ird}^k + \pi^k y_{irm}) + \epsilon_{ijrd}$$

- x_{jd-1}^k : Proportion of minutes on content type $k \in \{L+, L-, R+, R-, political\}$

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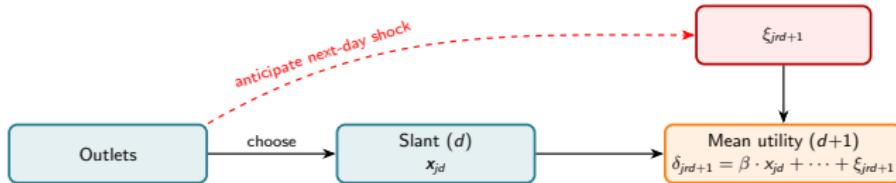
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Endogeneity in Demand



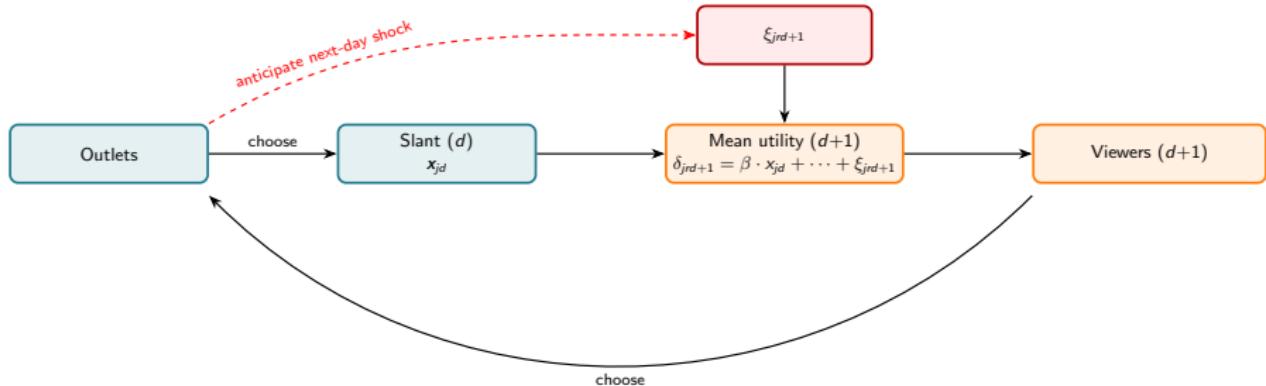
- **Outlets** (day d) choose slant x_{jd} .

Endogeneity in Demand



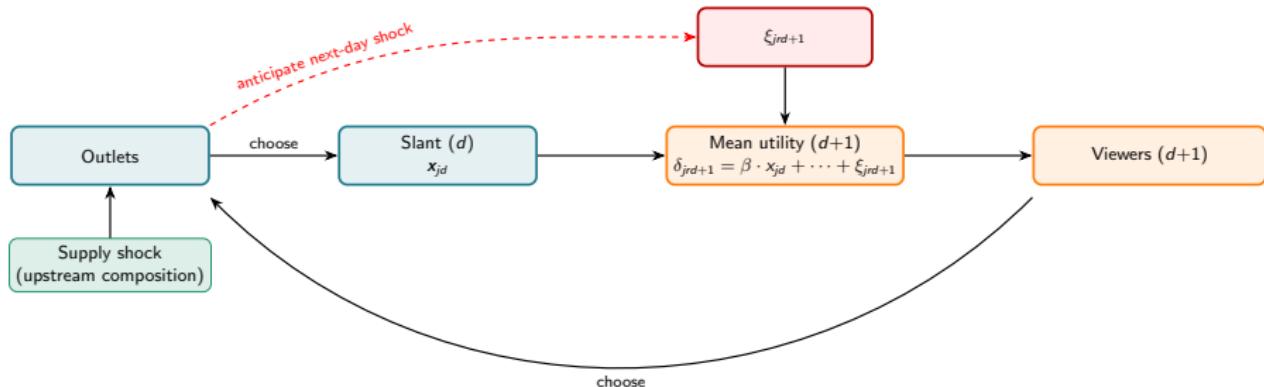
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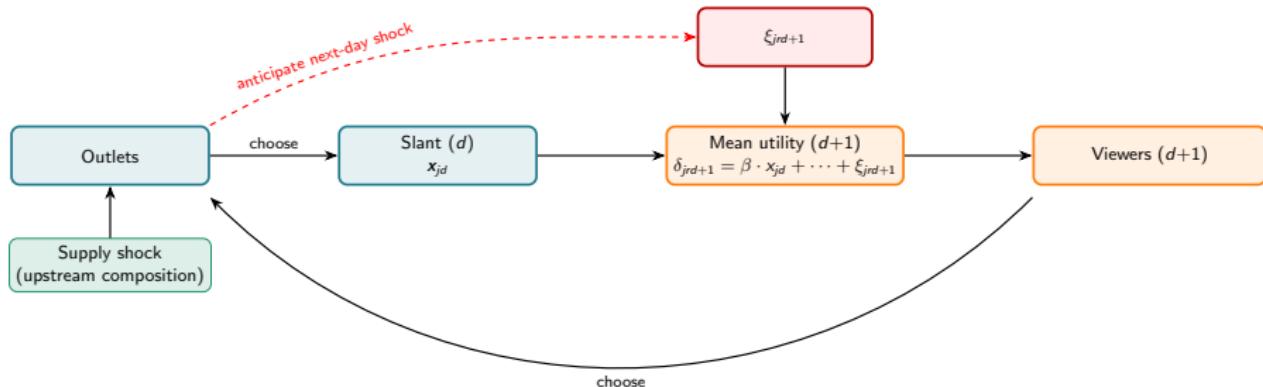
- **Outlets (day d)** choose slant x_{jd} .
- Slant affects the mean utility (day $d+1$) includes ξ_{jrd+1} : e.g., breaking scandal, regional tastes.
- **Viewers (day $d+1$)** choose outlet; since outlets *anticipate* ξ_{jrd+1} , $E[x_{jd} \xi_{jrd+1}] \neq 0$

Supply Shocks I



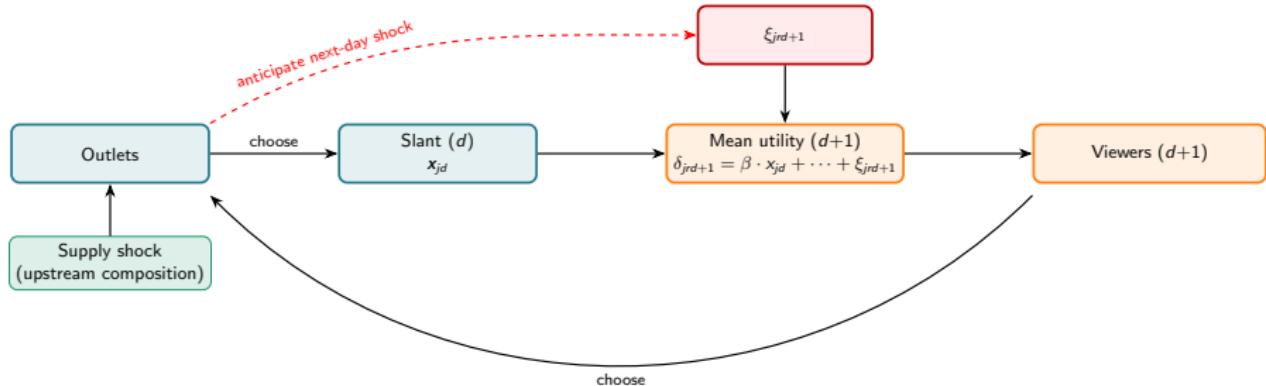
- **Supply shock:** Affects demand only through changes in x_{jd} .
 - ▶ I exploit the fact that traditional media heavily rely on newswire agencies.

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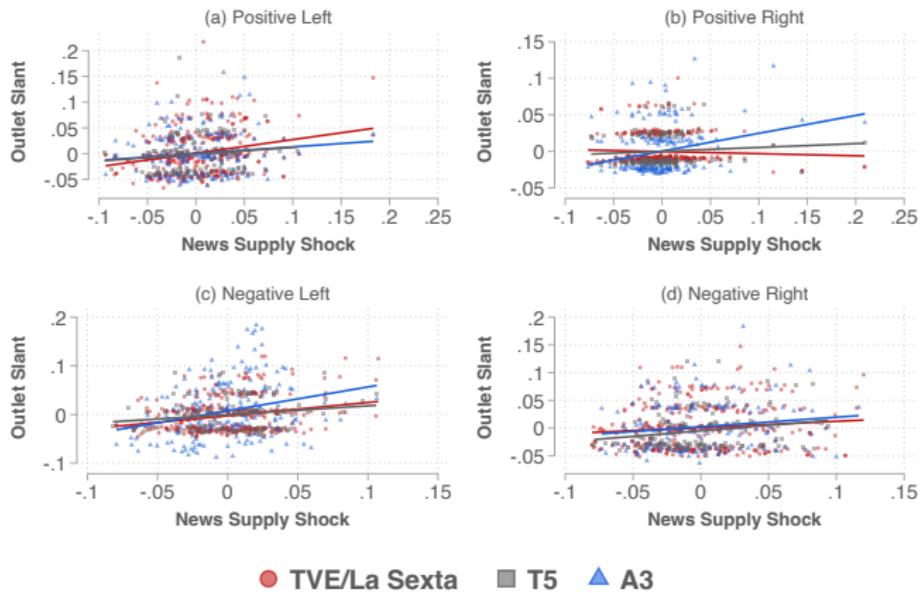
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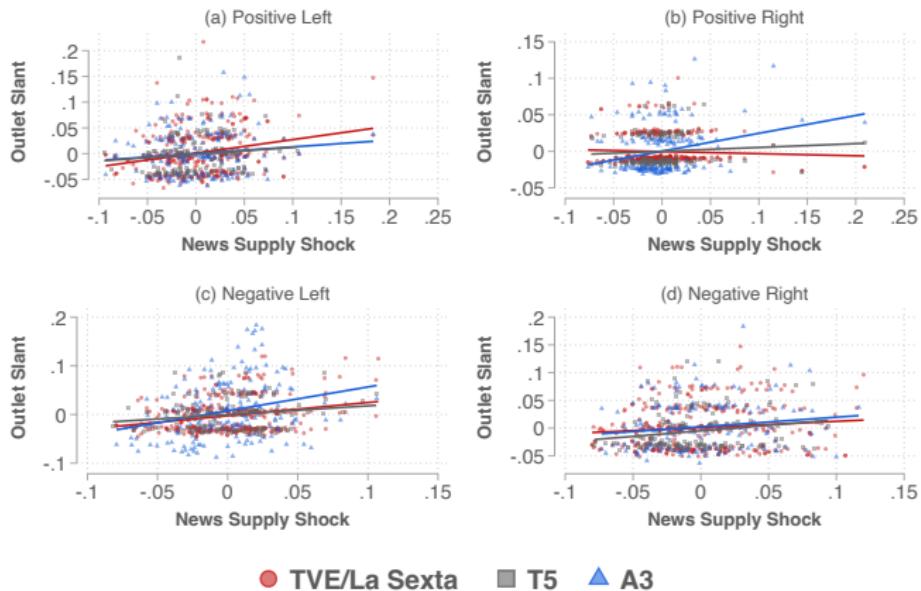


- **Supply shock:** Affects demand only through changes in x_{jd} .
 - ▶ I exploit the fact that traditional media heavily rely on newswire agencies.
 - ▶ Shift-share logic.
 - ▶ **How do outlets react to exogenous changes on the political composition of the days?**

Supply Shocks II



Supply Shocks II



- Outlets' reactions are consistent with an **issue intensity approach**: outlets react on the intensive margin.

Demand Estimation

- Market shares are computed as the integral over the individual choice indicators:

$$s_{jrd} = \int d_{ijrd}(\boldsymbol{\delta}_{rd}, \boldsymbol{\mu}_{ird}) d\boldsymbol{\mu}_{ird} d\boldsymbol{\epsilon}_{ird}$$

where d_{ijrd} equals 1 if $U_{ijrd} > U_{ikrd}$ $\forall j \neq k$ and 0 otherwise.

- I estimate the model with the BLP algorithm Berry et al. (1995).
- To target (β, π) I use $[\hat{x}_j, \bar{y}\hat{x}_j]$ and following Gandhi and Houde (2019), I use $(\hat{x}_j - \sum_{k \neq j} \hat{x}_k)^2$ to target σ .

Results of the Demand Estimation—Off-Campaign

Before the campaign begins:

- There are no significant asymmetries in the preferences of the right and left-leaning audiences.
- There is a taste for negative content, regardless on whether it hurts their own party (i.e. consistent with entertainment seeking behavior).

Demand Estimates—Campaign

Coefficient	Parameter	Estimate	Std. Error
Positive Left	β^{L+}	134.16**	(65.57)
Positive Right	β^{R+}	-129.79***	(48.43)
Negative Left	β^{L-}	-104.84**	(41.32)
Negative Right	β^{R-}	92.62**	(41.63)
Political	$\beta^{political}$	-6.43**	(3.26)
Weather	γ	0.00	(0.01)
Positive Left	σ^{L+}	0.00	(320.36)
Positive Right	σ^{R+}	19.25*	(10.89)
Negative Left	σ^{L-}	0.00	(134.33)
Negative Right	σ^{R-}	0.02	(73.18)
Political	$\sigma^{political}$	0.00	(19.55)
Right-Wing \times Positive Left	π^{L+}	-421.99**	(176.15)
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Right-Wing \times Negative Left	π^{L-}	288.65**	(116.22)
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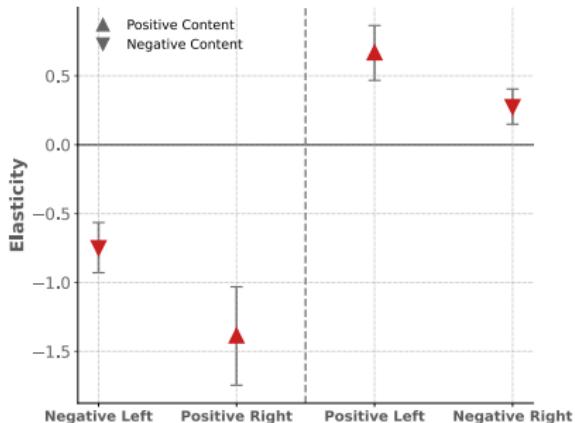
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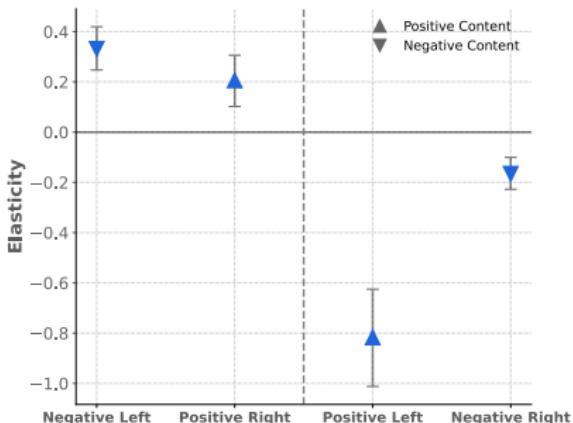
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Elasticities—Campaign

(a) Left Markets



(b) Right Markets



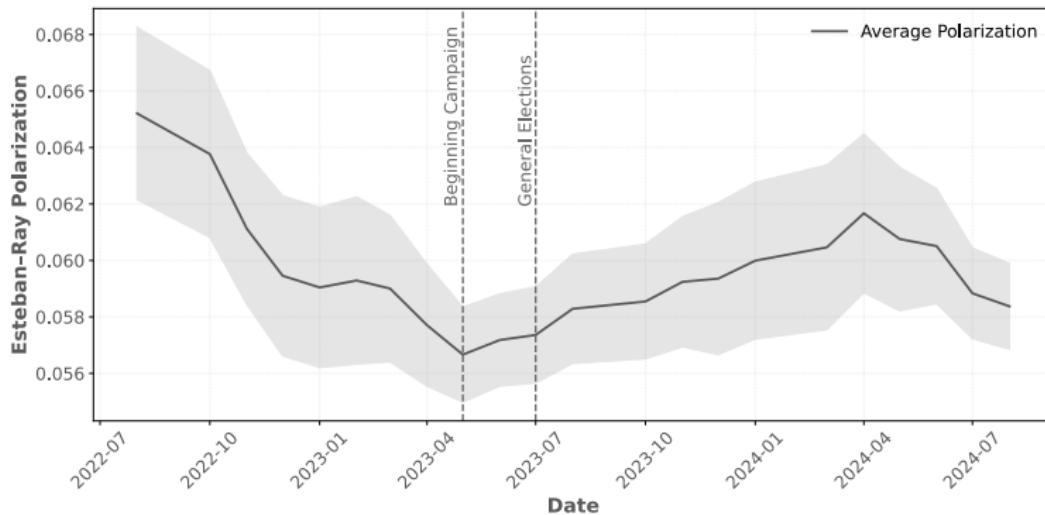
- If $\uparrow R+$ of one minute, then in right-markets :
 - ▶ Off-Campaign: $\uparrow 2363$ viewers.
 - ▶ Campaign: $\uparrow 7296$ viewers.

Demand for News and Electoral Polarization

- Does polarization in the demand for news link to electoral attitudes?

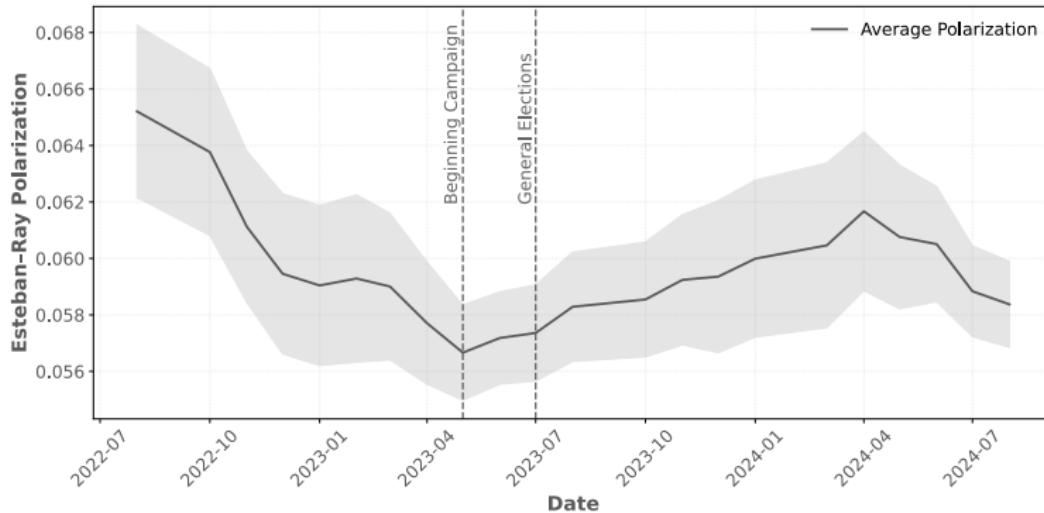
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Demand for News and Electoral Polarization

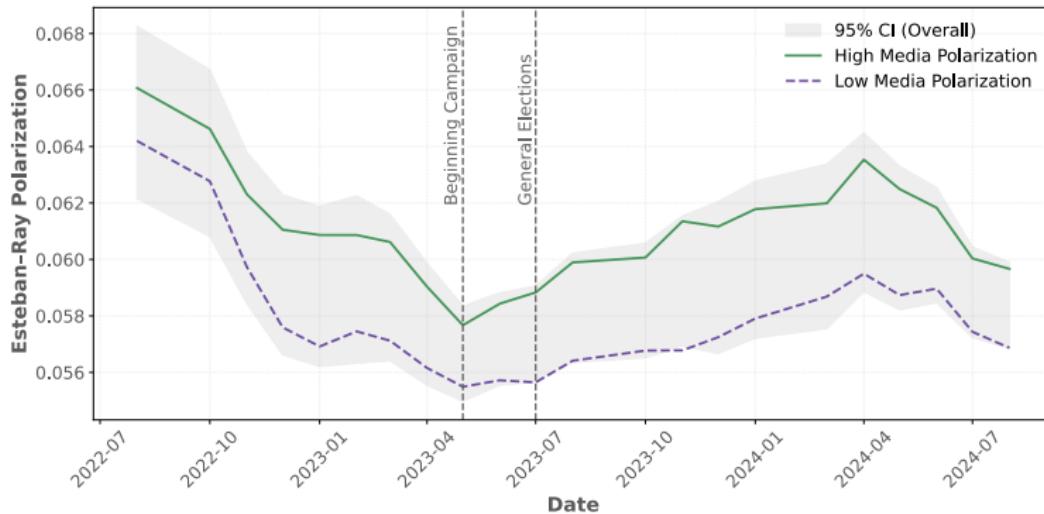
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Demand for News and Electoral Polarization

- Does polarization in the demand for news link to electoral attitudes?



- Trend break in survey based polarization is consistent with the one in the demand model.
From the *model elasticities*, I classify regions by how extreme they react to opposed content.
- Cross-sectional link: Regions where the model implies greater polarization in news demand also have more polarized electorates.

- Context: Spanish Politics and TV News
- Data, Text Analysis and Descriptive Evidence
- Demand
- **Supply**
- Counterfactual: Proportional Airtime Rule

"Even in a news program, it's deeply subject to the daily variation of audiences [...] A drop of half a point when tackling a current issue can provoke the decision not to revisit that topic... simply because audience is lost, and thus, profitability."

– Vicente Vallés, Director and presenter of Antena 3 TV News, 2014

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Supply Model

- Channel j on day d and edition $h \in \{0 \text{ (midday), } 1 \text{ (evening)}\}$ solves:

$$\begin{aligned} & \max_{\{\boldsymbol{x}_{jdh}\}} \left\{ \sum_r \widehat{s_{jrd+1}}(\boldsymbol{x}_{jdh}, \boldsymbol{x}_{-jdh}) L_r - \mathcal{C}(\boldsymbol{x}_{jdh}, \boldsymbol{z}_{dh}, \boldsymbol{\eta}_{jd}, \boldsymbol{\nu}_{jdh}; \boldsymbol{\lambda}_j) \right\} \\ \text{s.t. } & x_{jdh}^{L+} + x_{jdh}^{R+} + x_{jdh}^{L-} + x_{jdh}^{R-} + x_{jdh}^{\emptyset} = x_{jdh}^{political} \\ & x_{jdh}^k \in [0, 1] \quad \forall k. \end{aligned}$$

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- **Expected audience:** $\widehat{s_{jrd+1}}(\mathbf{x}_{jdh}, \mathbf{x}_{-jdh}) L_r$ is the predicted next-period share from demand; L_r is potential audience in region r .
- **Production cost:** $\mathcal{C}(\cdot)$ depends on slant \mathbf{x}_{jdh} , the abundance of stories \mathbf{z}_{dh} and unobserved factors $(\boldsymbol{\eta}_{jd}, \boldsymbol{\nu}_{jdh})$.

Marginal Costs

$$mc(x_{jdh}^k, z_{dh}^k, \eta_{jd}^k, \nu_{jdh}^k; \lambda_j^k) = 2 \lambda_j^k \frac{x_{jdh}^k}{z_{dh}^k} + \eta_{jd}^k + \nu_{jdh}^k$$

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- **Relative abundance of content** $2\lambda_j^k x_{jdh}^k / z_{dh}^k$: producing more of tone k than the upstream pool offers is costly.
- **Unobserved cost factors**
 - ▶ η_{jd}^k : Day shock known to the outlet e.g., key reporter on sick leave, equipment issues, owner interests etc.
 - ▶ ν_{jdh}^k : i.i.d. idiosyncratic shock.

Identification

Midday

Evening

Identification

2023-05-29

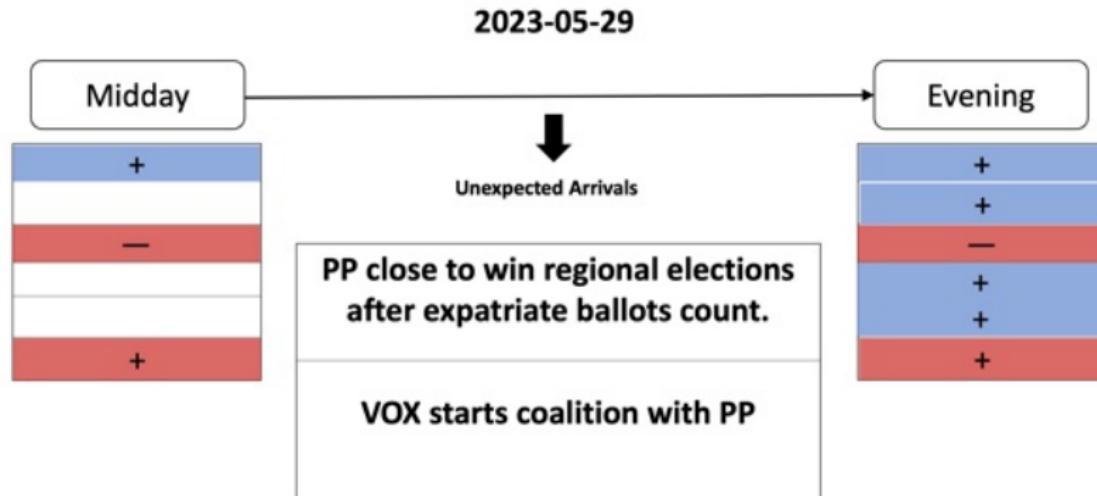
Midday

+
—
—
—
+

Evening

+
—
—
+
+
+

Identification



- Changes in content aired from the evening to the midday editions is mainly driven by unexpected story arrivals in the interim.

Estimation

- From the FOCs:

$$\underbrace{\sum_r \frac{\partial \widehat{s_{jrd+1}}}{\partial x_{jdh}^k} L_r}_{\equiv g_{jdh+1h}(x_{jdh}^k)} = 2\lambda_j^k \frac{x_{jdh}^k}{z_{dh}^k} + \underbrace{\eta_{jd}^k + \nu_{jdh}^k}_{\equiv u_{jdh}^k} \quad \forall(j, k)$$

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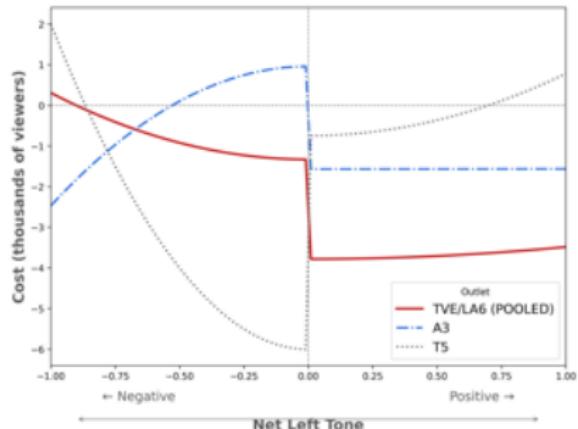
- I use **within-day variation** to control for unobserved marginal cost shifters η_{jd}^k .

$$\Delta g_{jd+1}^k = 2\lambda_j^k \Delta \left(\frac{x_{jd}^k}{z_d^k} \right) + \Delta \nu_{jd}^k, \quad \forall(j, k).$$

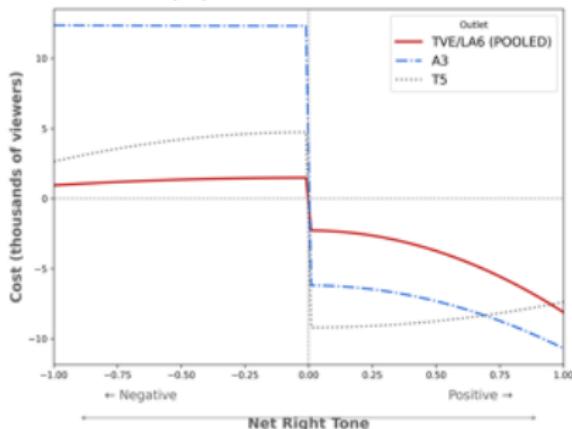
- The system is estimated under GMM with conditions $\mathbb{E} \left[\Delta \left(\frac{x_{jd}^k}{z_d^k} \right) \times \Delta \nu_{jd}^k \right]$.

Results of the Cost Estimation

(a) Left Tone



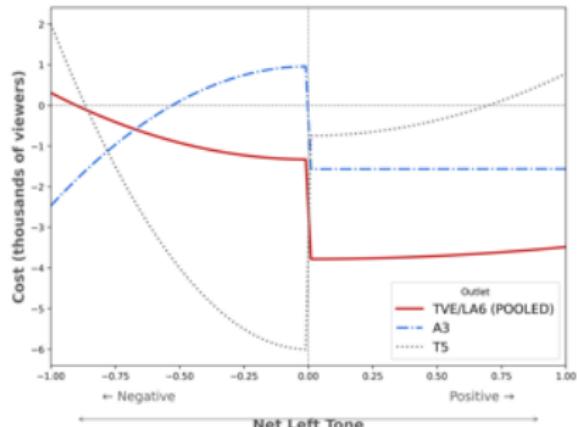
(b) Right Tone



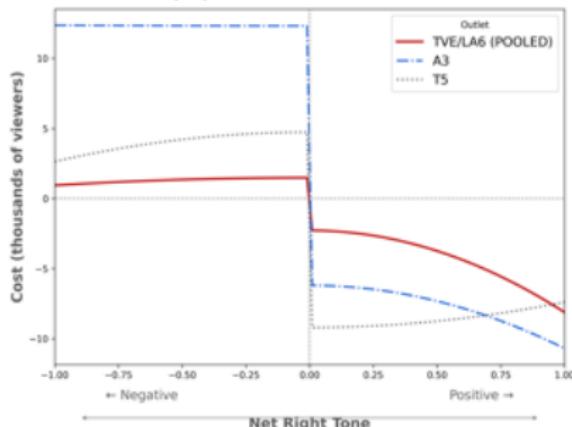
- Making coverage on the right 1 p.p. more negative \Rightarrow audience share loss:
 - ≈ 1.1 p.p. for A3
 - ≈ 0.5 p.p. for La Sexta / TVE

Results of the Cost Estimation

(a) Left Tone



(b) Right Tone



- Making coverage on the right 1 p.p. more negative \Rightarrow audience share loss:

≈ 1.1 p.p. for A3

≈ 0.5 p.p. for La Sexta / TVE

$\rightarrow \approx 6\% \text{ of loss when there is a football match.}$

$\rightarrow \approx 3\% \text{ ""}$

- Context: Spanish Politics and TV News
- Data, Text Analysis and Descriptive Evidence
- Demand
- Supply
- **Counterfactual: Proportional Airtime Rule**

Proportional Airtime Rule

Le Monde

L'Arcom renforce les règles de contrôle du pluralisme dans les médias audiovisuels

L'Autorité de régulation de la communication audiovisuelle et numérique s'appuiera désormais sur un « faisceau d'indices » pour évaluer le respect du pluralisme, conformément à la décision du Conseil d'Etat du 13 février, a-t-elle annoncé, jeudi 18 juillet.

Temps de parole, procuration et second tour... les règles des élections législatives

par manus



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But a spokesperson says 'the FCC has not made any determination regarding political programming rules'



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The Washington Post

THE EQUAL-TIME RULE
SUPPRESSES POLITICAL
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BLAME THE LAW, NOT THE NETWORKS

EL PAÍS

TVE, en la diana de los partidos

Unidas Podemos y Vox acusan a la televisión pública de no respetar la neutralidad en la campaña electoral



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FRANCE



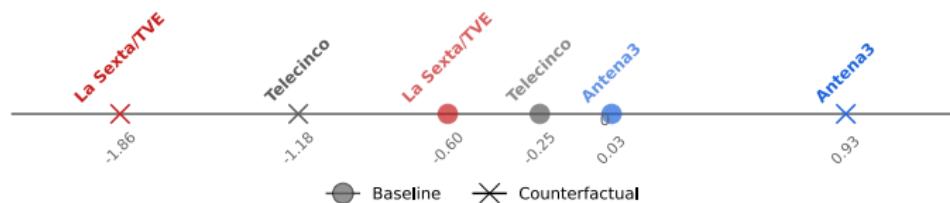
Counterfactual Problem

$$\begin{aligned} & \max_{\{\mathbf{x}_{jd}\}} \left\{ \sum_r \widehat{s_{jrd+1}}(\mathbf{x}_{jd}, \mathbf{x}_{-jd}) L_r - \sum_k \left(\hat{\lambda}_j^k \frac{(x_{jd}^k)^2}{z_d^k} + \hat{\eta}_{jd}^k x_{jd}^k \right) \right\} \\ s.t. \quad & \frac{x_{jd}^{R+} + x_{jd}^{R-}}{x_{jd}^{political}} = vote^R \equiv 0.49 \\ & \frac{x_{jd}^{L+} + x_{jd}^{L-}}{x_{jd}^{political}} = vote^L \equiv 0.51 \\ & x_{jd}^k \in [0, 1] \quad \forall k \end{aligned} \tag{1}$$

- Computationally demanding:
 - ▶ Pool left channels.
 - ▶ Discretize the action space and find Nash in the normal form game.

Equilibrium: Baseline vs Counterfactual

- The proportional airtime rule pushes channels toward **more extreme positions**.



- Why does polarization increase?
 - Channels reallocate minutes to comply with the rule.
 - Their objective function is:

Audience – Costs
↓
Already polarized

Conclusion

- I propose an integrated framework that combines machine learning and LLM-based measures of partisan tone with a structural model of news demand and supply.
- The framework links (i) voters' demand off- vs. on-campaign periods, (ii) outlets' content choices, and (iii) policy counterfactuals.
- **Main results:**
 - ▶ Demand polarizes during campaigns (affective polarization).
 - ▶ Outlets specialize in partisan coverage, with lower costs for ideologically closer slant.
- **Policy implication:** Existing regulation that ignores tone can shift incentives toward more extreme slant.

Extra Slides

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Text

- ▶ Average Tone
- ▶ LLM Robustness
- ▶ Pipeline
- ▶ Prompt
- ▶ Stability Table
- ▶ Common Words
- ▶ Image
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Demand

- ▶ BLP Algorithm
- ▶ Tone Changes
- ▶ Table BLP Off
- ▶ Elasticities-Off
- ▶ Elasticity Changes
- ▶ Elasticities – Table
- ▶ Diversion Ratios

Supply

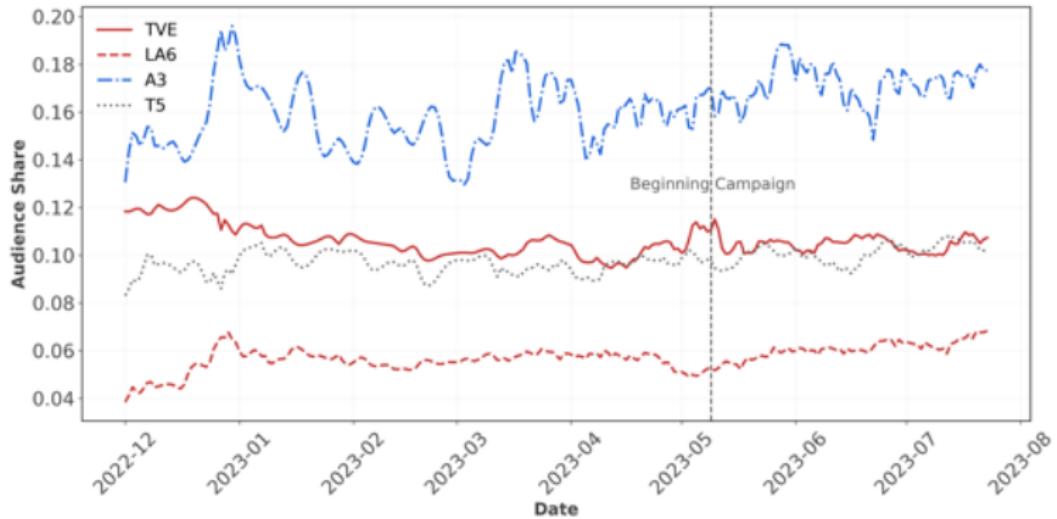
- ▶ Neg. Left Example
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- ▶ Regressions / Tests
- ▶ Cost Table
- ▶ Cost Robustness

Others

- ▶ Audience Shares
- ▶ Media Pol.
- ▶ Total Audience
- ▶ EFE vs TV
- ▶ TV all
- ▶ ER
- ▶ Media Pol.
- ▶ Table Count.
- ▶ Surface Payoffs

TV News Consumption

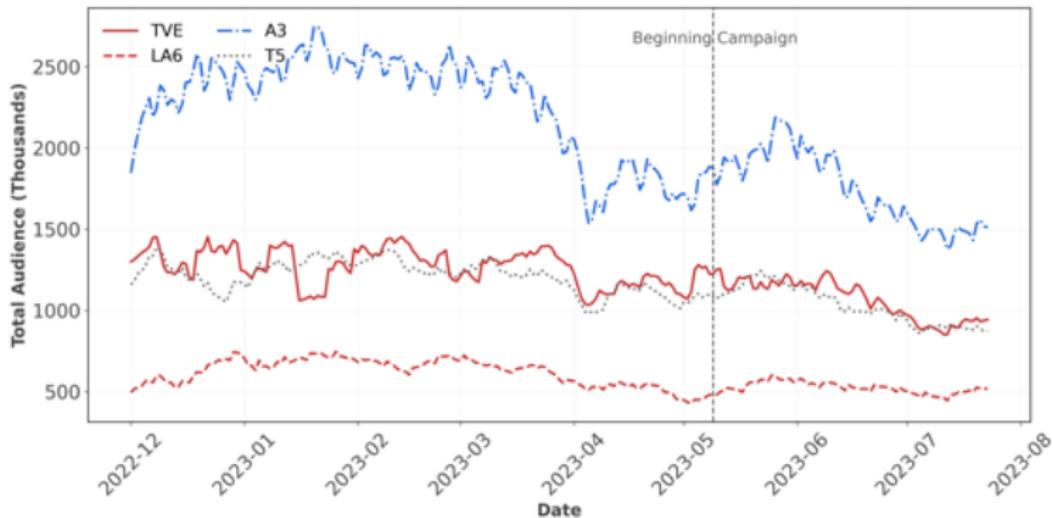
TV Audience over Time



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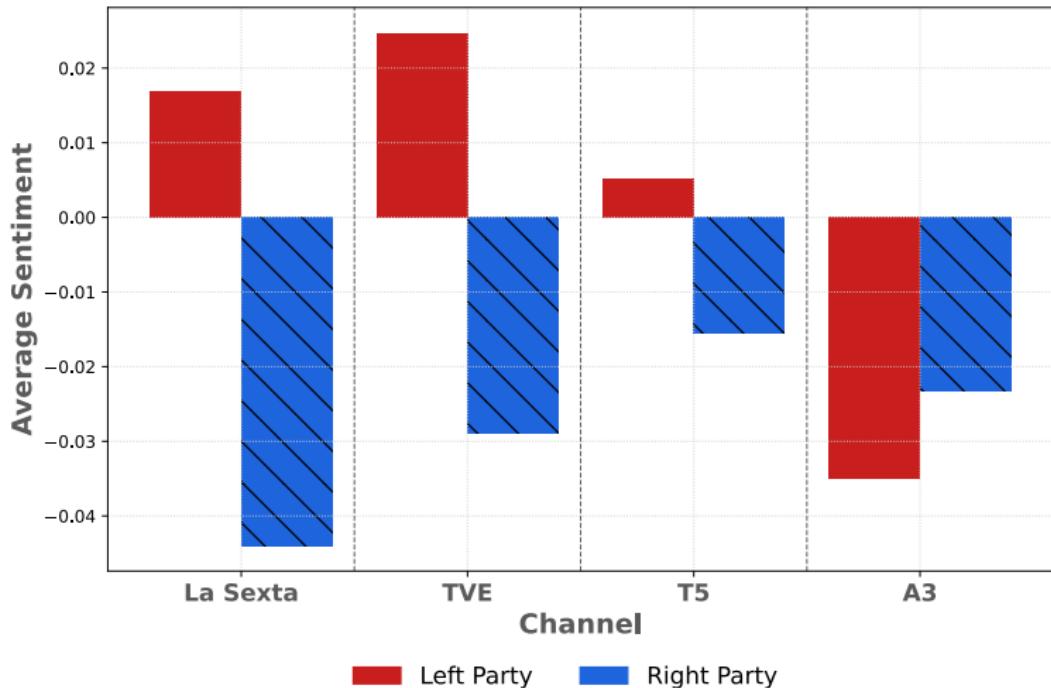
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TV Audience over Time

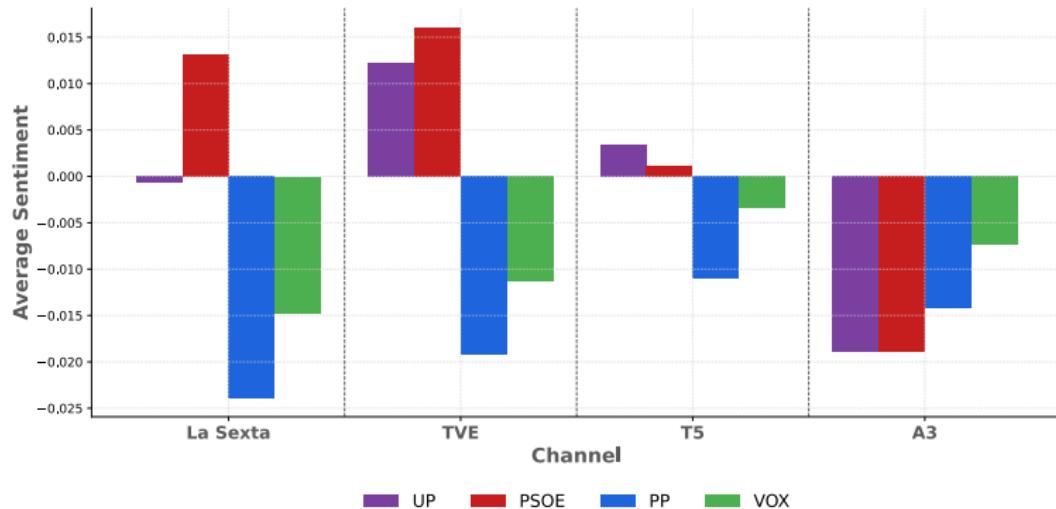


- All channels lose audience levels in this period—on the order of 15–25%—with A3 still the largest (roughly 2.2M viewers off-campaign vs. 1.7M during the campaign)

Average Tone from Text Classification



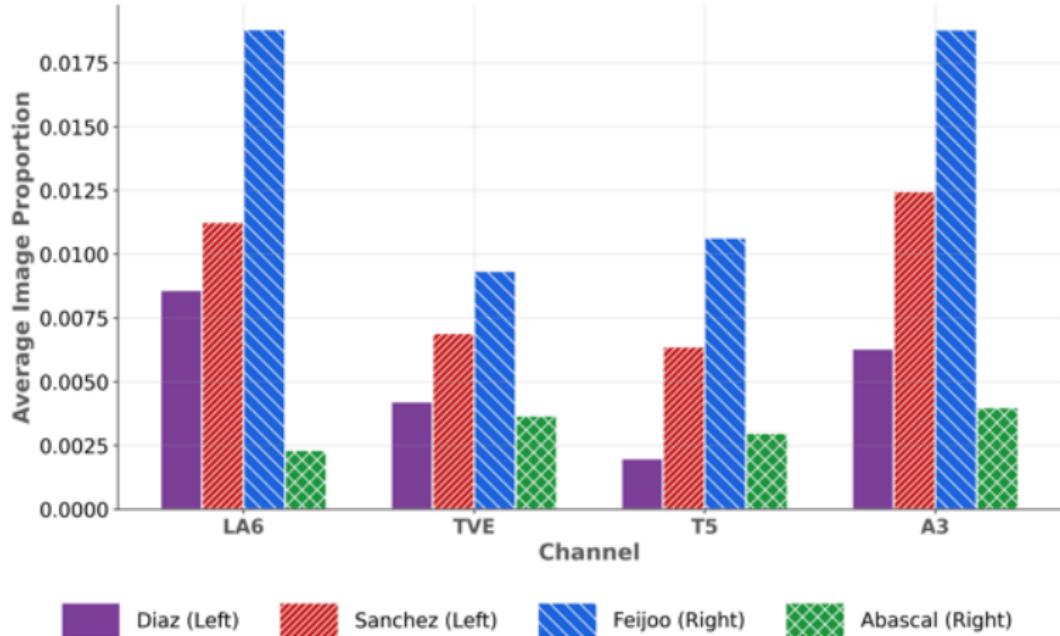
Average Tone from Text Classification



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Average Image Proportion



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Validation of the Text Classification (Congress)

Supply: Gentzkow-Shapiro



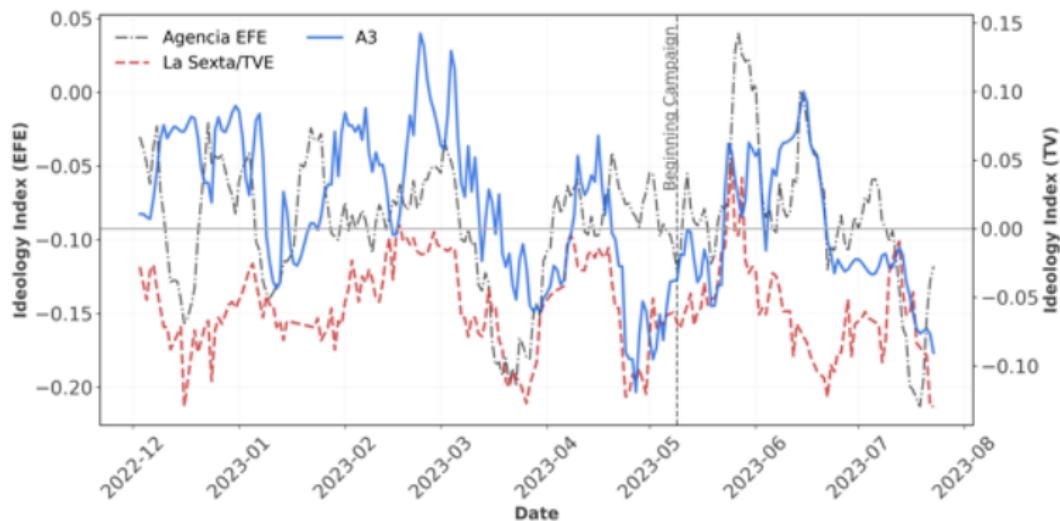
Demand: Viewers' ideology



Method	R^2 (Between outlets)	$1 - R^2$ (Within outlets)
Slant (ChatGPT)	0.303	0.697
Slant (Congress)	0.023	0.977

- Congress based measure \implies weak differentiation.

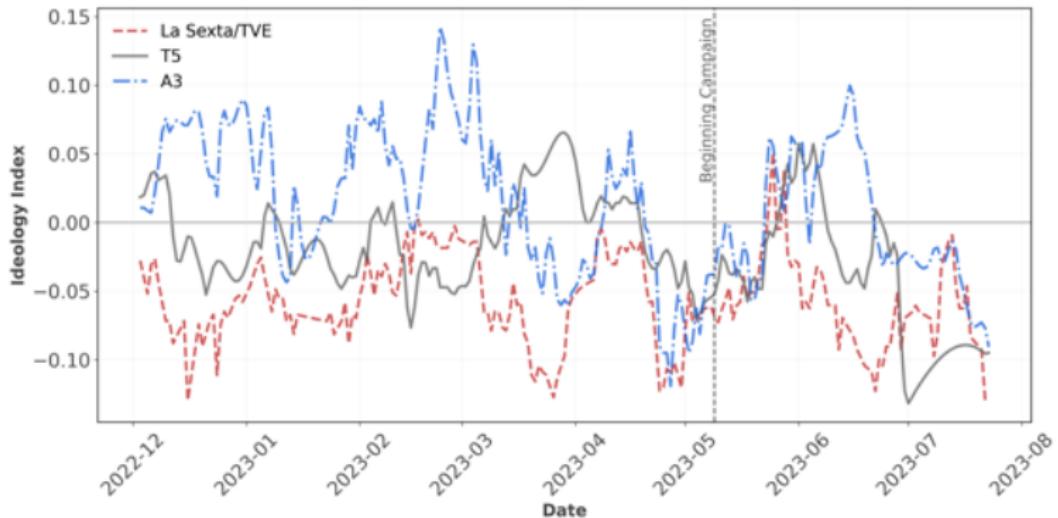
Evolution of the Slant



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Evolution of the Slant



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Robustness LLMs I

- **Two main challenges** arise when using LLMs for political text classification:
 - ① **Prompt instability:** LLMs are inherently stochastic — results may vary even with the same prompt.
(Atil et al., 2024) Prompt Stability

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Robustness LLMs I

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 - ② **Performance evaluation:** LLMs often outperform supervised models and even human annotators (see, e.g., Le Mens and Gallego, 2023; Törnberg, 2023; Gilardi et al., 2023).

Robustness LLMs I

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 - ② **Performance evaluation:** LLMs often outperform supervised models and even human annotators (see, e.g., Le Mens and Gallego, 2023; Törnberg, 2023; Gilardi et al., 2023).
- While LLMs show impressive accuracy, **validating ideological classifications remains essential.**
- I test robustness by replicating the methodology of Laver et al. (2003) using the full corpus of **congressional speech transcripts**.

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Robustness LLMs II

Mean and Standard Error for 100 Rounds of ChatGPT Classification

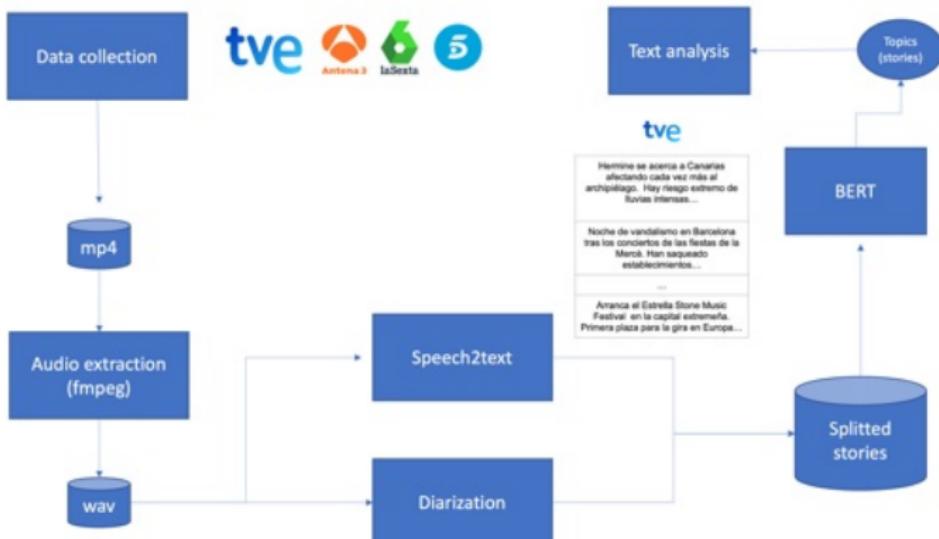
Statistic	PP	PSOE	VOX	UP
Mean	-0.014	0.106	-0.053	0.024
Standard Error	0.003	0.004	0.001	0.002

Note: The table shows the mean and standard error for 100 rounds of ChatGPT classification of political content with 40 random political stories.

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Pipeline



Prompt

Analyze the sentiment of the following news article with respect to the political parties (and their members) in Spain: PP, Podemos/Sumar, PSOE, VOX. Only use numeric values from the set [-1, 0, 1].

Evaluate the sentiment towards each party with a number between -1 and 1, where -1 indicates an extremely negative perception, 0 indicates neutrality or irrelevance for the party, and 1 indicates an extremely positive perception.

Consider only the values -1, 0, and 1.

Base your evaluation solely on the explicit content of the news article. If the article does not mention or imply any sentiment towards a party, assign a 0 to that party.

The format must always be a list [PP , PSOE , UP , VOX] where X represents the numeric sentiment value.

```
1: Draw  $\nu_{jrd}^k$ , a vector of normal draws for each product-market combina-
   tion.
2: Initialize  $\sigma_k$  for all  $k$  randomly.
3: for  $t \in N_t$  do
4:   if  $t == 1$  then
5:      $\hat{\delta}_1 \leftarrow \mathbf{0}_{N_j}$ 
6:   else
7:      $\hat{\delta}_t \leftarrow \hat{\delta}_{t-1}$ 
8:   end if
9:   while  $\text{Tol} < \text{Tol}'$  do
10:     $\hat{s}_{jt} \leftarrow F\left(\hat{\delta}_{t-1}, \sigma_0, \nu_{jt}\right)$ 
11:     $\hat{\delta}_t \leftarrow \hat{\delta}_{t-1} + \ln(s_{jt}) - \ln(\hat{s}_{jt})$ 
12:     $\text{Tol}' = \sum_t \left( \hat{\delta}_t - \hat{\delta}_{t-1} \right)^2$ 
13:   end while
14:    $\hat{\delta}^* \leftarrow \hat{\delta}_t$ 
15: end for
```

Assign values to α .

Calculate product quality shocks:

$$\xi_{jt} \leftarrow \hat{\delta}_{jt}^* - \mathbf{x}_{jt}\alpha$$

For each candidate vector, calculate the GMM objective:

$$Q(\theta) = \left[\frac{1}{N_{\text{obs}}} \sum_{i=1}^{N_{\text{obs}}} z_i' \xi_i^*(\theta) \right]' W \left[\frac{1}{N_{\text{obs}}} \sum_{i=1}^{N_{\text{obs}}} z_i' \xi_i^*(\theta) \right]; \theta = [\alpha, \pi, \sigma]$$

Repeat until convergence.

Topic Negative Left

- Reduction of a convicted rapist's sentence in Salamanca under the "Solo sí es sí" law
 - Seville Court reduces a murder and sexual assault sentence by 5 years due to the "Solo sí es sí" law
 - Vox formally submits a motion of no confidence against Prime Minister Pedro Sánchez
 - Madrid's regional president, Isabel Díaz Ayuso, predicts that the "Mediator Case" will bring down the government
-

Main stories contributing to negative left content on 2023-02-27

Channel Proportion of Negative Left

La Sexta	0.01
TVE	0.037
T5	0.037
A3	0.185

Proportion of minutes devoted to negative left content per channel on 2023-02-27

Topic Negative Right

- Congress declarations against Ayuso over alleged "bribes" to her brother
 - Marinaleda criticizes the "abusive" arrest of two residents during a protest against Vox
 - The Senate rejects a PP motion on the government's alleged partisan use of the Falcon jet
-

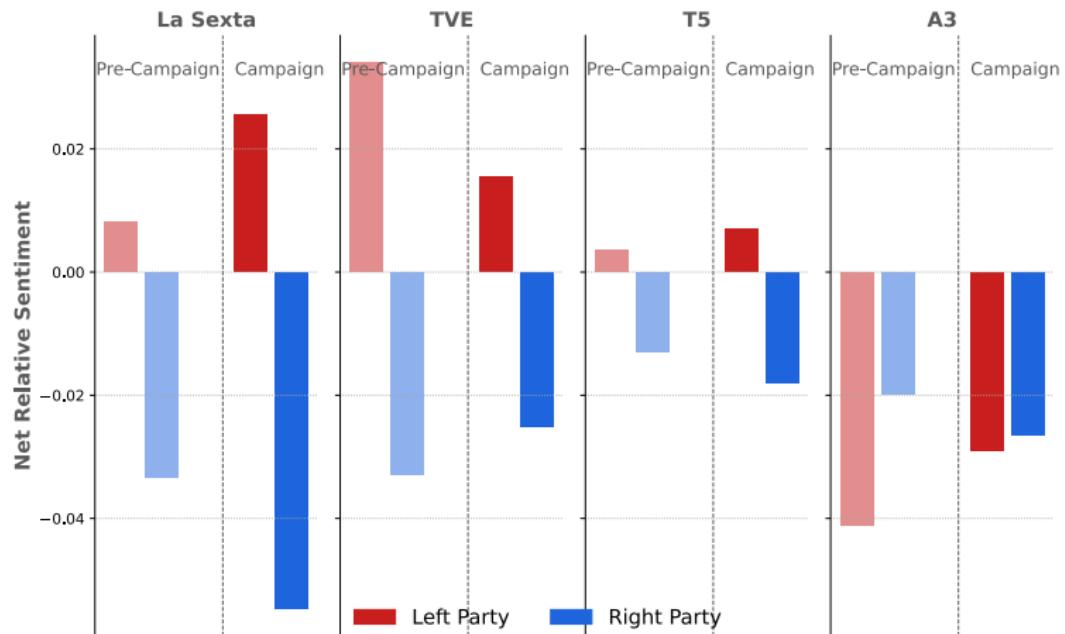
Main stories contributing to negative right content on 2023-05-17

Channel Proportion of Negative Right

La Sexta	0.148
TVE	0.074
T5	0.067
A3	0.038

Proportion of minutes devoted to negative right content per channel on 2023-05-17

Changes in Tone Off to Campaign



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Demand Estimates—Off-Campaign

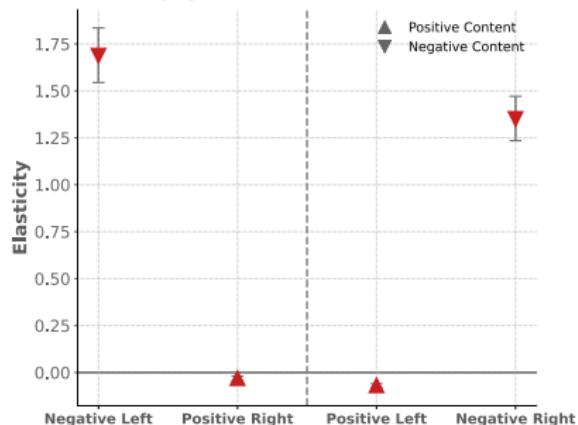
Coefficient	Parameter	Estimate	Std. Error
Off-campaign			
Positive Left	β^{L+}	-16.90	(11.73)
Positive Right	β^{R+}	-25.53	(31.03)
Negative Left	β^{L-}	28.29	(25.89)
Negative Right	β^{R-}	56.44**	(28.45)
Political	$\beta^{political}$	11.49***	(4.28)
Weather	γ	0.00	(0.03)
Positive Left	σ^{L+}	0.44	(296.90)
Positive Right	σ^{R+}	0.68	(715.26)
Negative Left	σ^{L-}	12.64	(8.68)
Negative Right	σ^{R-}	21.99	(13.83)
Political	$\sigma^{political}$	0.00	(46.79)
Right-Wing \times Positive Left	π^{L+}	46.26	(48.70)
Right-Wing \times Positive Right	π^{R+}	77.81	(95.92)
Right-Wing \times Negative Left	π^{L-}	-70.09	(57.97)
Right-Wing \times Negative Right	π^{R-}	-103.71	(97.76)
Right-Wing \times Political	$\pi^{political}$	-25.17**	(12.59)

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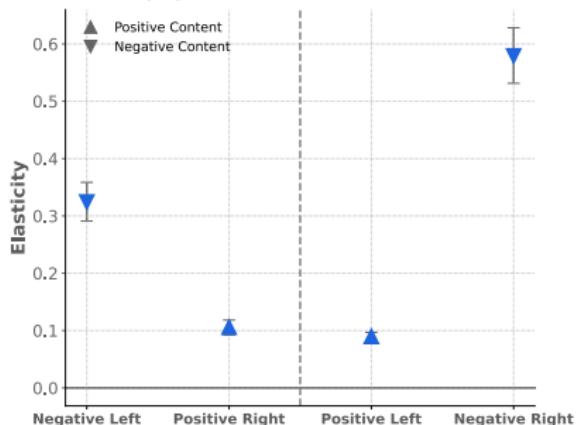
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Elasticities—Off-Campaign

(a) Left Markets



(b) Right Markets

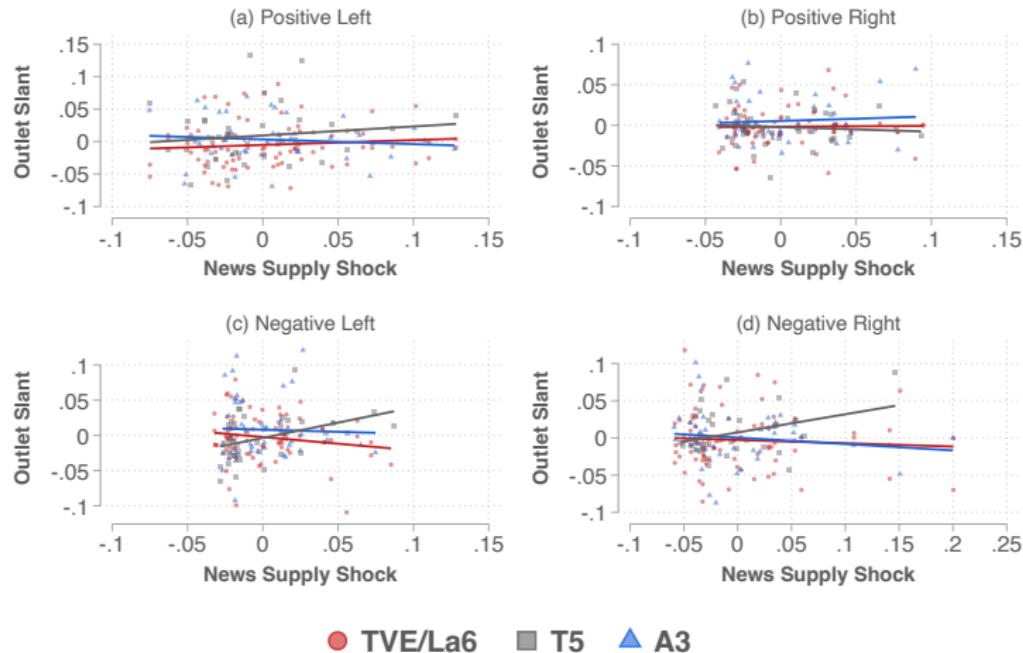


- Before the campaign begins, there is taste for negative content.

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Added Variable Plots for Production of Political Content (within day)



Changes in Elasticities

Characteristic	Market	Pre-Campaign	Campaign	Net Change
R+	Right	2363	7296	4933
R+	Left	-1485	-39627	-38142
L+	Right	3457	-24371	-27828
L+	Left	-2990	20577	23567
R-	Right	23676	-6309	-29985
R-	Left	58849	10577	-48271
L-	Right	12784	11053	-1731
L-	Left	69527	-20199	-89726

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Factual Viewer Change from a 1% Increase in Tone Coverage

Characteristic	Right Market		Left Market	
	Viewer Change (Thousands)	Change in SDs	Viewer Change (Thousands)	Change in SDs
Positive Right	2.1	0.01	-14.4	-0.07
Negative Right	-1.7	-0.01	2.9	0.01
Positive Left	-8.5	-0.04	6.9	0.03
Negative Left	3.4	0.02	-7.7	-0.04

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Elasticities

$$\bar{\epsilon}^k = \frac{1}{J \times R \times D} \sum_j \sum_r \sum_d \left(\frac{\partial s_{jrd}}{\partial x_{jt}^k} + \frac{\partial s_{jrd}}{\partial x_{jt}^{political}} \right) \frac{x_{jd}^k}{s_{jrd}}$$

Estimated Elasticities by Left and Right markets

Characteristic	Pre-campaign		Campaign	
	Left Market	Right Market	Left Market	Right Market
Negative Left	1.481	0.136	-0.681	0.380
Positive Left	-0.011	0.129	0.754	-0.716
Negative Right	1.358	0.469	0.462	-0.182
Positive Right	-0.029	0.152	-1.371	0.133

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Regressions Added Variable Plots

$$x_{jd}^{party,tone} = \sum_k \sum_{j'} \left(d_j(j') \times z_d^k \right) \alpha_j^k + \gamma_{dow} + \epsilon_{jd}, \quad (2)$$

Tests for Differences in Coefficients

Characteristic	F-test	F-test p-value	T-test	T-test p-value
$L-$	2.69	0.07	3.51	0.06
$L+$	1.31	0.27	1.87	0.17
$R-$	0.42	0.66	0.34	0.56
$R+$	8.78	0.00	17.55	0.00

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Diversion Ratios

Diversion Ratios by Characteristic and Outlet (Campaign period)

	Positive Left				Positive Right				Negative Left				Negative Right				Political			
Destination ↓	TVE	T5	A3	La6	TVE	T5	A3	La6	TVE	T5	A3	La6	TVE	T5	A3	La6	TVE	T5	A3	La6
TVE	0.00	0.03	0.01	0.01	0.00	0.02	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.02	0.00	0.00	0.00	0.02	0.01	0.00
T5	0.01	0.00	0.02	0.03	0.05	0.00	0.15	0.10	0.02	0.00	0.26	0.03	0.00	0.00	0.03	0.06	0.06	0.00	0.17	0.02
A3	0.04	0.05	0.00	0.50	0.00	0.04	0.00	0.01	0.00	0.03	0.00	0.00	0.01	0.10	0.00	0.91	0.01	0.07	0.00	0.01
La6	0.00	0.01	0.23	0.00	0.01	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00
Outside	0.94	0.90	0.74	0.45	0.94	0.93	0.84	0.88	0.98	0.95	0.72	0.96	0.99	0.88	0.94	0.04	0.93	0.91	0.82	0.97

Note: The table reports diversion ratios: for a 1% increase in outlet j 's characteristic x_j^k , the entry is the fraction of j 's audience loss (columns) that diverts to outlet destination I (rows). With the share changes Δs_i^t from a 1% change in x_j^k , I define

$D_{j \rightarrow I}^{k,t} = \frac{\max\{\Delta s_I^t, 0\}}{-\Delta s_j^t}$ for $\Delta s_j^t < 0$. as the diversion rate from alternative j to I and characteristic k on market t . Then,

conditioning on markets that loose audience I compute $D_{j \rightarrow I}^k = \frac{\sum_{t: \Delta s_I^t < 0} (-\Delta s_I^t) D_{j \rightarrow I}^{k,t}}{\sum_{t: \Delta s_I^t < 0} (-\Delta s_I^t)}$, $\sum_{I \neq j} D_{j \rightarrow I}^k + D_{j \rightarrow 0}^k = 1$. which

is the reported loss-weighted averages across markets.

Esteban-Ray Polarization

- For the four main parties in the sample $\mathcal{P} = \{\text{UP}, \text{PSOE}, \text{PP}, \text{VOX}\}$. Define v_{prm} as the share of intention to vote towards party p on region r in month m ; where I renormalize within \mathcal{P} so that $\sum_{p \in \mathcal{P}} v_{prm} = 1$. The ER index is defined as:

$$ER_{rm} = \sum_{p \in \mathcal{P}} \sum_{q \in \mathcal{P}} v_{prm}^{1+\alpha} v_{qrm} d_{pq},$$

- where α is set to the standard value of 1.5 and d_{pq} denotes the ideological distance between parties.

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Media Polarization

$$\text{Media-Demand Polarization}_r = \begin{cases} \bar{\epsilon}_r^{(L-)} - \bar{\epsilon}_r^{(L+)} & \text{if } p(r) = R \\ \bar{\epsilon}_r^{(R-)} - \bar{\epsilon}_r^{(R+)} & \text{if } p(r) = L \end{cases}$$

- For right-wing regions ($p(r) = R$), media polarization refers to the difference in taste for negative content on the left versus positive on the left and analogously for the left-wing regions.

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Cost Table

Estimated Cost Parameters (λ): Unrestricted and Restricted (NLLS)

	La Sexta		TVE		Telecinco (T5)		Antena 3 (A3)	
	Unr.	NLLS	Unr.	NLLS	Unr.	NLLS	Unr.	NLLS
Positive Right	-89.09 (85.99)	0.00 (0.00)	-103.74 (121.36)	0.00 (0.00)	-13.87 (91.62)	0.00 (0.00)	-240.52 (77.50)	0.00 (0.00)
Negative Right	4.07 (4.80)	2.62 (1.86)	-8.88 (11.41)	0.00 (0.00)	31.13 (36.16)	25.78 (26.73)	35.16 (53.89)	4.44 (20.13)
Positive Left	12.82 (44.44)	10.38 (8.50)	6.27 (2.63)	6.69 (1.66)	108.34 (60.39)	112.34 (53.00)	-38.96 (23.79)	0.00 (0.00)
Negative Left	36.11 (52.70)	14.88 (14.68)	3.36 (13.12)	7.89 (5.71)	24.03 (43.99)	16.62 (23.57)	-40.03 (84.81)	0.00 (0.00)
Political	-0.35 (0.61)	0.00 (0.00)	0.32 (0.62)	0.23 (0.21)	1.50 (1.05)	1.64 (0.87)	1.45 (1.25)	0.00 (0.00)

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Cost Estimates Robustness

Estimated Cost Parameters (λ) by Channel and Content Type (NLLS)

	La Sexta (Left)	TVE (Left)	Telecinco (T5) (Middle)	Antena 3 (A3) (Right)
Positive Right	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Negative Right	2.62 (1.86)	0.00 (0.00)	25.78 (26.73)	4.44 (20.13)
Positive Left	10.38 (8.50)	6.69 (1.66)	112.34 (53.00)	0.00 (0.00)
Negative Left	14.88 (14.68)	7.89 (5.71)	16.62 (23.57)	0.00 (0.00)
Political	0.00 (0.00)	0.23 (0.21)	1.64 (0.87)	0.00 (0.00)

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Counterfactual vs Baseline

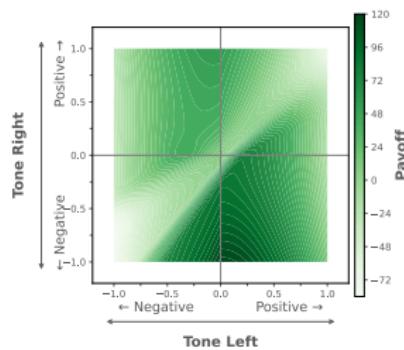
	La Sexta/TVE		T5		A3	
	Baseline	Count.	Baseline	Count.	Baseline	Count.
Positive Left	0.09	0.10	0.04	0.06	0.06	0.01
Negative Left	0.06	0.05	0.04	0.23	0.09	0.45
Negative Right	0.09	0.15	0.04	0.29	0.07	0.39
Positive Right	0.03	0.00	0.03	0.00	0.04	0.05
Political	0.42	0.30	0.18	0.58	0.39	0.90

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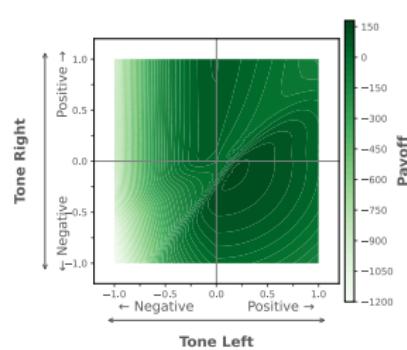
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Payoff Plot

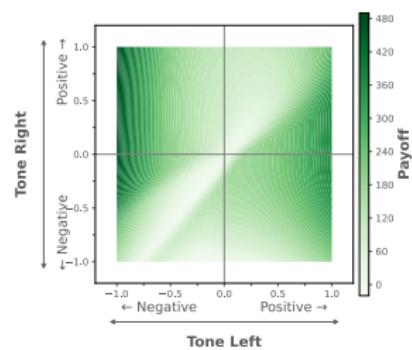
La Sexta/TVE



T5



A3



Common Words by Tone Category

Top trigrams by sentiment and ideology in the EFE dataset

Pos. Right	Neg. Right	Pos. Left	Neg. Left
vox secretary general	gürtel national service	agriculture fisheries food	ere court sevilla
vox ignacio garriga	gürtel trial service	minister agriculture fisheries	social rights ione
general vox ignacio	valencia francisco camps	dec gov president	social ione belarra
núñez feijóo called	gürtel trial gürtel	fisheries food luis	andalusian government jos
pp candidate elections	former president valencian government	food luis planas	andalusia josé antonio
vox parties madrid	valencian government francisco	jan gov president	enforcement only yes law
josé sáenz buruaga	psoe deputy secretary general	psoe deputy secretary general	former president andalusia
núñez feijóo requested	gürtel trial madrid	council ministers approved	mediator case las palmas
maría josé sáenz	abortion law reform	minister economic affairs	mediator las palmas gran
may pp president	former valencian president francisco	first vice president minister	núñez feijóo accused

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References I

- Atil, B., Chittams, A., Fu, L., Ture, F., Xu, L., and Baldwin, B. (2024). LLM Stability: A Detailed Analysis with Some Surprises. *CoRR*, abs/2408.04667.
- Berry, S. T., Levinsohn, J. A., and Pakes, A. (1995). Automobile Prices in Market Equilibrium. *Econometrica*, 63:841–890.
- Boxell, L., Gentzkow, M., and Shapiro, J. M. (2024). Cross-Country Trends in Affective Polarization. *Review of Economics and Statistics*, 106:557—565.
- Cagé, J., Hengel, M., Hervé, N., and Urvoy, C. (2022). Hosting Media Bias: Evidence from the Universe of French Broadcasts, 2002–2020. SSRN Electronic Journal. Working paper; later issued as CEPR Discussion Paper No. 18905 (2024).
- Chiang, C.-F. and Knight, B. (2011). Media Bias and Influence: Evidence from Newspaper Endorsements. *The Review of Economic Studies*, 78(3):795—820. Accessed 19 June 2025.

References II

- Compiani, G., Morozov, I., and Seiler, S. (2025). Demand Estimation with Text and Image Data.
- Draganska, M., Mazzeo, M. J., and Seim, K. (2008). Beyond plain vanilla: Modeling joint product assortment and pricing decisions. *QME*, 7:105–146.
- Durante, R. and Knight, B. (2012). Partisan Control, Media Bias, and Viewer Responses: Evidence from Berlusconi's Italy. *Journal of the European Economic Association*, 10(3):451—481.
- Enikolopov, R., Rochlitz, M., Schoors, K. J. L., and Zakharov, N. (2025). Polarize and Rule: Independent Media in Autocracy and the Role of Social Media. *SSRN Working Paper*. Available at SSRN:
<https://ssrn.com/abstract=4131355> or
<http://dx.doi.org/10.2139/ssrn.4131355>.
- European Parliament (2025). Social Media Survey 2025. Flash Eurobarometer (FL014EP).

References III

- Fan, Y. (2013). Ownership Consolidation and Product Characteristics: A Study of the U.S. Daily Newspaper Market. *American Economic Review*, 103(5):1598—1628.
- Gandhi, A. and Houde, J.-F. (2019). Measuring Substitution Patterns in Differentiated Products Industries. Technical Report 26375, National Bureau of Economic Research.
- Gentzkow, M. and Shapiro, J. M. (2010). What Drives Media Slant? Evidence from U.S. Daily Newspapers. *Econometrica*, 78(1):35—71.
- Gilardi, F., Alizadeh, M., and Kubli, M. (2023). ChatGPT Outperforms Crowd Workers for Text-Annotation Tasks. *Proceedings of the National Academy of Sciences of the United States of America*, 120.
- Goettler, R. L. and Shachar, R. (2001). Spatial Competition in the Network Television Industry. *RAND Journal of Economics*, pages 624–656.

References IV

- Groseclose, T. and Milyo, J. (2005). A Measure of Media Bias. *The Quarterly Journal of Economics*, 120(4):1191—1237.
- Laver, M., Benoit, K., and Garry, J. (2003). Extracting Policy Positions from Political Texts Using Words as Data. *American Political Science Review*, 97(2):311—331.
- Le Mens, G. and Gallego, A. (2023). Positioning Political Texts with Large Language Models by Asking and Averaging. *arXiv e-prints*, page arXiv:2311.16639.
- Longuet-Marx, N. (2025). Party Lines or Voter Preferences? Explaining Political Realignment. Presented at the Spring 2025 IOG-BFI Conference, March 28–30, 2025.
- Martin, G. J. and Yurukoglu, A. (2017). Bias in Cable News: Persuasion and Polarization. *American Economic Review*, 107(9):2565—2599.
- Puglisi, R. and Snyder, J. M. J. (2011). Newspaper Coverage of Political Scandals. *The Journal of Politics*, 73:931–950.

References V

- Reiljan, A. (2019). Fear and Loathing Across Party Lines (Also) in Europe: Affective Polarisation in European Party Systems. *European Journal of Political Research.*
- Schneider-Strawczynski, S. and Valette, J. (2025). Media Coverage of Immigration and the Polarization of Attitudes. *American Economic Journal: Applied Economics*, 17(1):337—368.
- Simonov, A. and Rao, J. (2022). Demand for Online News Under Government Control: Evidence from Russia. *Journal of Political Economy*, 130(2):259—309.
- Törnberg, P. (2023). ChatGPT-4 Outperforms Experts and Crowd Workers in Annotating Political Twitter Messages with Zero-Shot Learning. *arXiv*, abs/2304.06588.
- Wollmann, T. G. (2018). Trucks without Bailouts: Equilibrium Product Characteristics for Commercial Vehicles. *American Economic Review*.