Climate policy, political attitudes and populist backlash: Evidence from Germany

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Malmsten Workshop - Gothenburg

23.01.2026

A populist surge in Germany and beyond
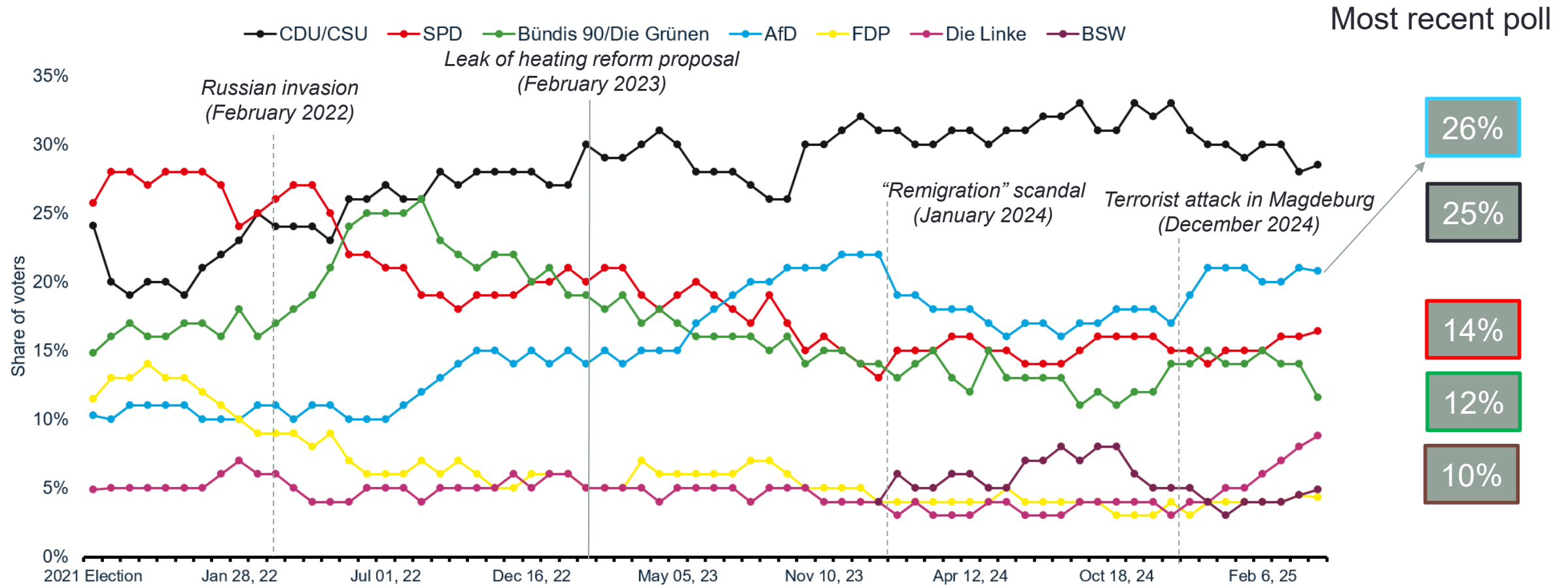

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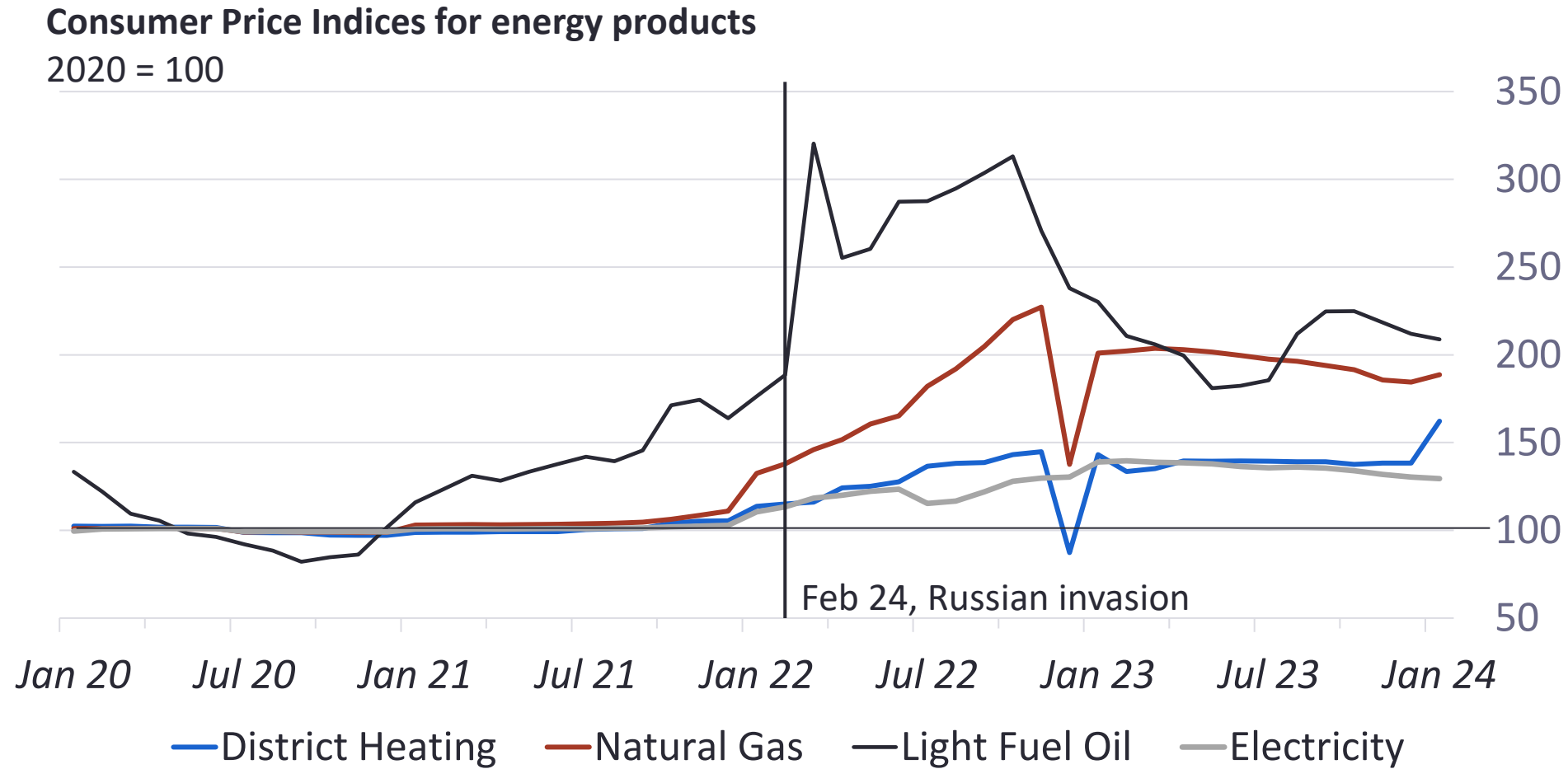

Source: Politico

Source: Spiegel

"The AfD rejects any policy and any tax that invokes alleged climate protection, because humans cannot protect the climate. We also want to withdraw from the Paris Climate Agreement."

(AfD, manifesto for the 2025 federal elections)

A populist surge in Germany

Most recent poll

CDU/CSU — SPD — Bündis 90/Die Grünen — AfD — FDP — Die Linke — BSW

Russian invasion (February 2022)

Leak of heating reform proposal (February 2023)

"Remigration" scandal (January 2024)

Terrorist attack in Magdeburg (December 2024)

26%
25%
14%
12%
10%

Share of voters

35%
30%
25%
20%
15%
10%
5%
0%

2021 Election | Jan 28, 22 | Jul 01, 22 | Dec 16, 22 | May 05, 23 | Nov 10, 23 | Apr 12, 24 | Oct 18, 24 | Feb 6, 25

Source: Statista (Data from Forschungsgruppe Wahlen/ARD)

The Russian invasion and German household energy prices ...

Consumer Price Indices for energy products

2020 = 100

Feb 24, Russian invasion

District Heating — Natural Gas — Light Fuel Oil — Electricity

Own illustration based on Destatis, 2024
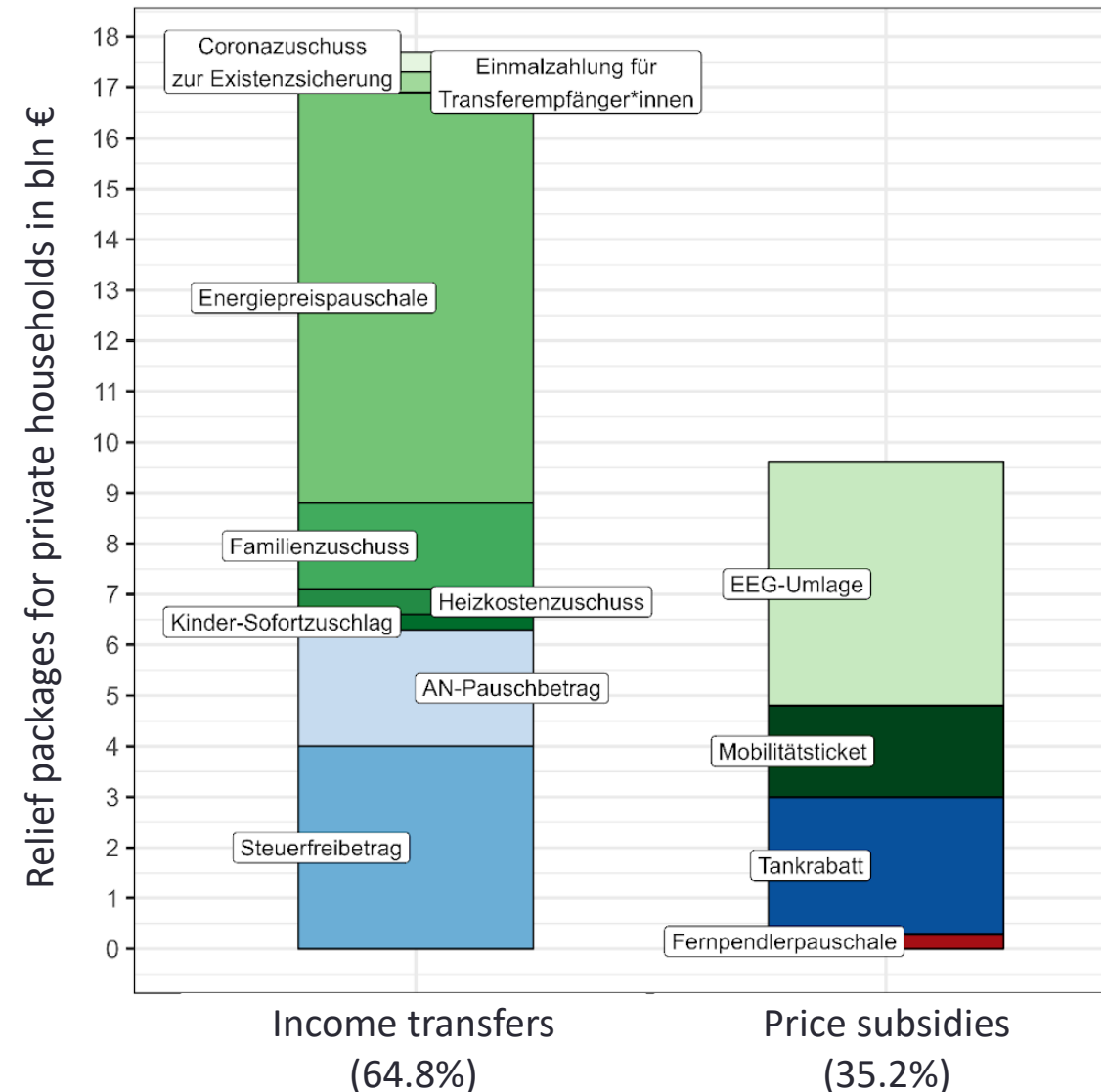
… and issue attention

What is the most important problem in Germany currently?

The German response to the energy crisis

- \> € 150 Bln in earmarked funding to relieve firms and households (> 4% of GDP)

- Large relief package for households
  - Lump-sum payments to households of a few hundred euros in November/December 2022
  - Tax breaks
  - Abolition of feed-in tariff levy

- Mostly transfer-based, some price subsidy, no price control, i.e. close to economics textbook

- Mostly targeting poor or middle-class households → progressive

Relief packages for households by volume in billion € and primarily targeted income group (progressive green, middle class blue, regressive, red).

Source: Kellner et al., 2022

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The role of political backlash

- Crisis, economic decline and political alienation as significant drivers of right-wing backlash (Scheiring et al. 2024)

- Evidence of more economic nationalism due to import shocks in Western Europe (Colantone and Stanig, 2018) and of heightened political polarization in the US (Autor et al., 2020), with heterogeneous effects on groups of the population (e.g. Clark et al. 2022 on gendered effects)

- Coal mining job losses significantly increased Republican vote shares in US presidential elections (Egli et al., 2022; Gazmarian, 2025)

- Climate policies can boost the popularity of populist parties (Colantone et al. 2024, Brännlund and Peterson, 2024)

- Exposure to international trade lowers green voting and lowers positive attitudes towards the environment (Bez et al. 2024)

What we do not know: What is the political backlash we should expect from energy price increase, e.g. induced by climate policy? And why would it happen?
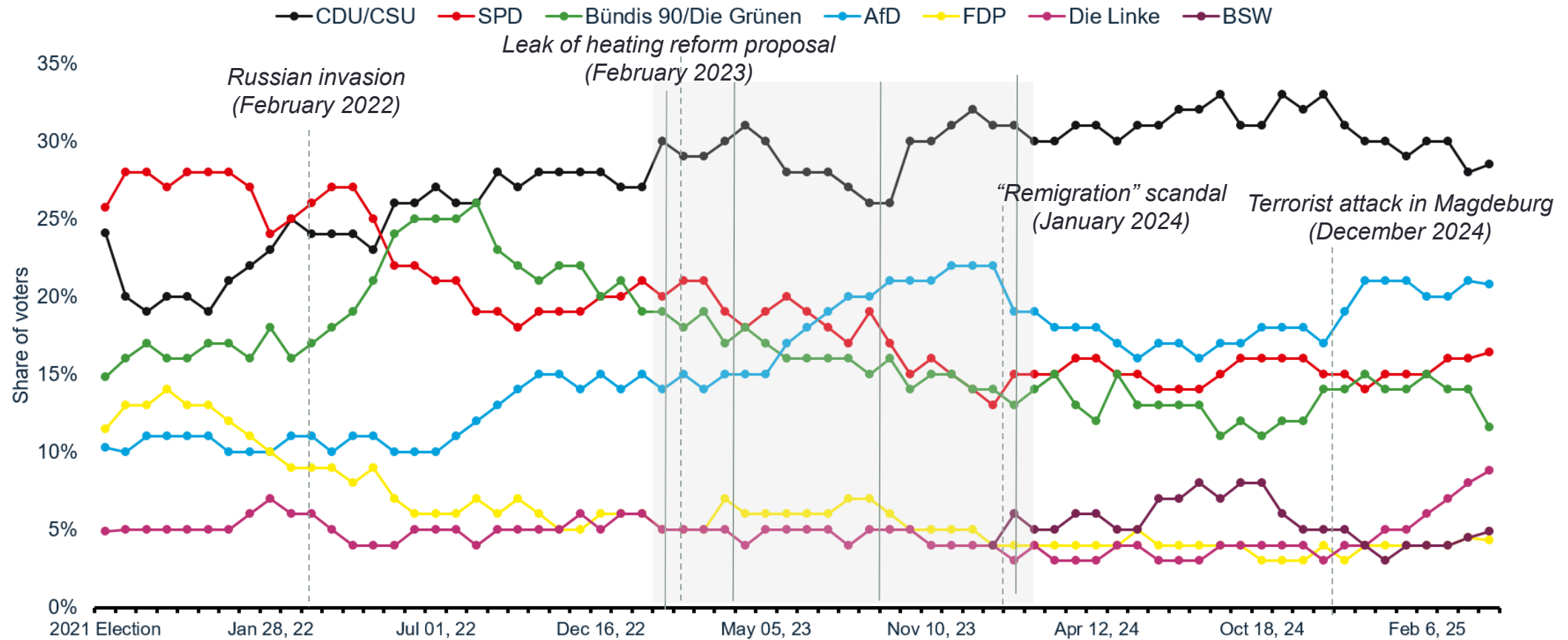
Our study in a nutshell

Key question: What is the causal effect of of individual electricity price changes on AfD support and underlying political attitudes?

- We collect four waves of panel data of 2,000 German households between January 2023 and February 2024, during a time of rising energy prices due to an exogenous shock, i.e. Russia's invasion in Ukraine

- Our survey includes detailed questions on energy consumption and pricing (including expectations), political party preferences, underlying attitudes, as well as socio-economic data

- We hypothesize that households that have experienced higher energy prices are more likely to support the AfD

A populist surge in Germany

Source: Statista (Data from Forschungsgruppe Wahlen/ARD)

Data

- **Panel data with 4 survey waves, from January 2023 to February 2024 (N=8335), including:**

  - Self reported data on electricity and heating bills

  - Attitudes toward liberal democracy

  - Xenophobic attitudes

  - Attitudes toward redistribution

  - Attitudes toward climate policies

  - Attitudes toward Russian/Ukraine war

  - …

We measure the effect of rising energy costs on political attitudes using an event –study design.

Desciptive statistics

Variable	Wave 1	Wave 2	Wave 3	Wave 4
Socio-demographics				
Age	50.575 (14.123)	50.944 (14.138)	51.295 (14.102)	51.541 (14.142)
Female	0.500 (0.500)	0.502 (0.500)	0.502 (0.500)	0.501 (0.500)
Net monthly income	7.448 (2.570)	6.914 (3.498)	7.000 (3.435)	7.098 (3.457)
Dwelling owner	0.448 (0.498)	0.451 (0.498)	0.451 (0.498)	0.452 (0.498)
Live in eastern Germany	0.166 (0.372)	0.166 (0.372)	0.166 (0.372)	0.163 (0.369)
Electricity and heating				
Gas primary heating source	0.571 (0.496)	0.564 (0.496)	0.579 (0.494)	0.589 (0.493)
Electricity instalment payments	107.577 (98.630)	112.438 (106.315)	115.235 (106.933)	118.065 (110.401)
Heating instalment payments	122.544 (129.524)	112.013 (132.747)	109.443 (132.900)	114.935 (126.753)
Electricity from renewables	0.211 (0.408)	0.164 (0.371)	0.159 (0.366)	0.175 (0.380)
Expectations				
Expect increase in electricity bill	0.608 (0.489)	0.392 (0.489)	0.367 (0.482)	0.388 (0.487)
Expect increase in heating bill	0.591 (0.492)	0.416 (0.493)	0.408 (0.492)	0.400 (0.490)
Energy behaviour				
Invest in efficient appliances	0.167 (0.373)	0.127 (0.334)	0.160 (0.367)	0.130 (0.337)
Invest in efficient heating	0.078 (0.269)	0.066 (0.249)	0.078 (0.268)	0.053 (0.223)
Reduced car use	0.266 (0.442)	0.214 (0.410)	0.240 (0.427)	0.239 (0.427)
Reduced temperature	0.535 (0.499)	0.458 (0.498)	0.479 (0.500)	0.446 (0.497)
Improved insulation	0.086 (0.280)	0.059 (0.236)	0.069 (0.254)	0.073 (0.260)
Electricity savings	0.460 (0.499)	0.380 (0.486)	0.429 (0.495)	0.380 (0.486)
Attitudes				
Trust Government	0.307 (0.462)	0.264 (0.441)	0.244 (0.430)	0.215 (0.411)
Climate change primarily human-induced	0.553 (0.497)	0.540 (0.499)	0.531 (0.499)	0.535 (0.499)
AfD voter	0.118 (0.323)	0.137 (0.344)	0.183 (0.387)	0.163 (0.370)
Survey is politically neutral	0.806 (0.396)	0.787 (0.410)	0.801 (0.399)	0.813 (0.390)

Our study in a nutshell

Key question: What is the *causal* effect of individual electricity price changes on AfD support and underlying political attitudes?

Correlation Vs. Causation

Source: 9GAG

Getting at causality requires:

- Exogenous supply shock (Russia → prices)
- Idiosyncratic billing timing → staggered treatment
- Event-study DID robust to heterogeneity
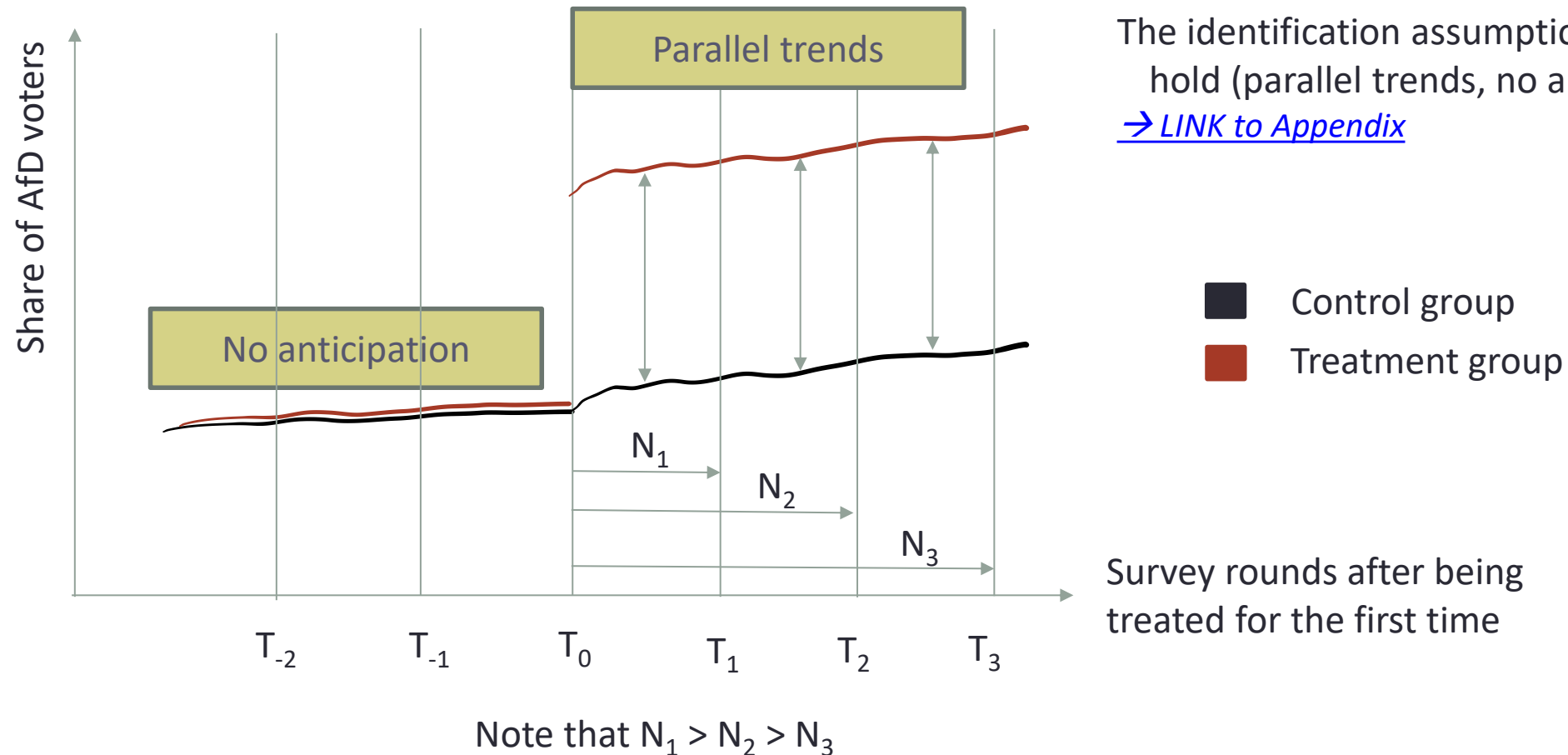- Extensive placebo & pre-trend checks

Treatment

- German households receive actual electricity and heating bills once a year to pay for their onsumption in the previous year (i.e., bills received in 2023 cover the year 2022 consumption)

- Utilities can adjust installment payments → increase in energy costs

- German households are treated highly idosyncratically, which is a particularity of the German system → Quasi-experimental interpretation

- Staggered treatment: not all households receive their bills at the same time (at any given point, some are treated and others are not *yet* treated)

- Many potential treatments in our design: increase in electricity costs (binary), relative change in electricity costs (continuous), increase in heating costs …

- Here: Binary variable indicating an experienced increase in electricity costs

Method: Event study design

We estimate the "actual-versus-status-quo" effect of the treatment (De Chaisemartin and d'Haultfoeuille, 2024)
- Accounts for heterogeneous and dynamic effects. Treatments with fixed effects are biased when these effects exist (Callaway and Sant'Anna, 2021; De Chaisemartin et al., 2022)
- Handles **staggered** treatments, both binary and continuous, → *Formal notation, link to Appendix*.

The identification assumptions are likely to hold (parallel trends, no anticipation)
→ *LINK to Appendix*

Note that $N_1 > N_2 > N_3$

Identification: Exogenous price shocks?

- Pure supply shock, linked to terminiation of contracts with Gazprom

- Increase in consumption price linked to suppliers' idiosyncrasies and likely exogenous from the household's perspective
  - Relatively high liberalisation of the energy market with local competition

- Expectations of increased energy costs has a negative effect on eventual increase:
  - Consistent with a general demand-side reaction to the energy concern, less with knowledge of utilities' idiosyncrasies

- For households: Energy price increases very salient, but electricity price increases might have come as a surprise to households

- The identification assumptions are likely to hold (parallel trends, no anticipation)
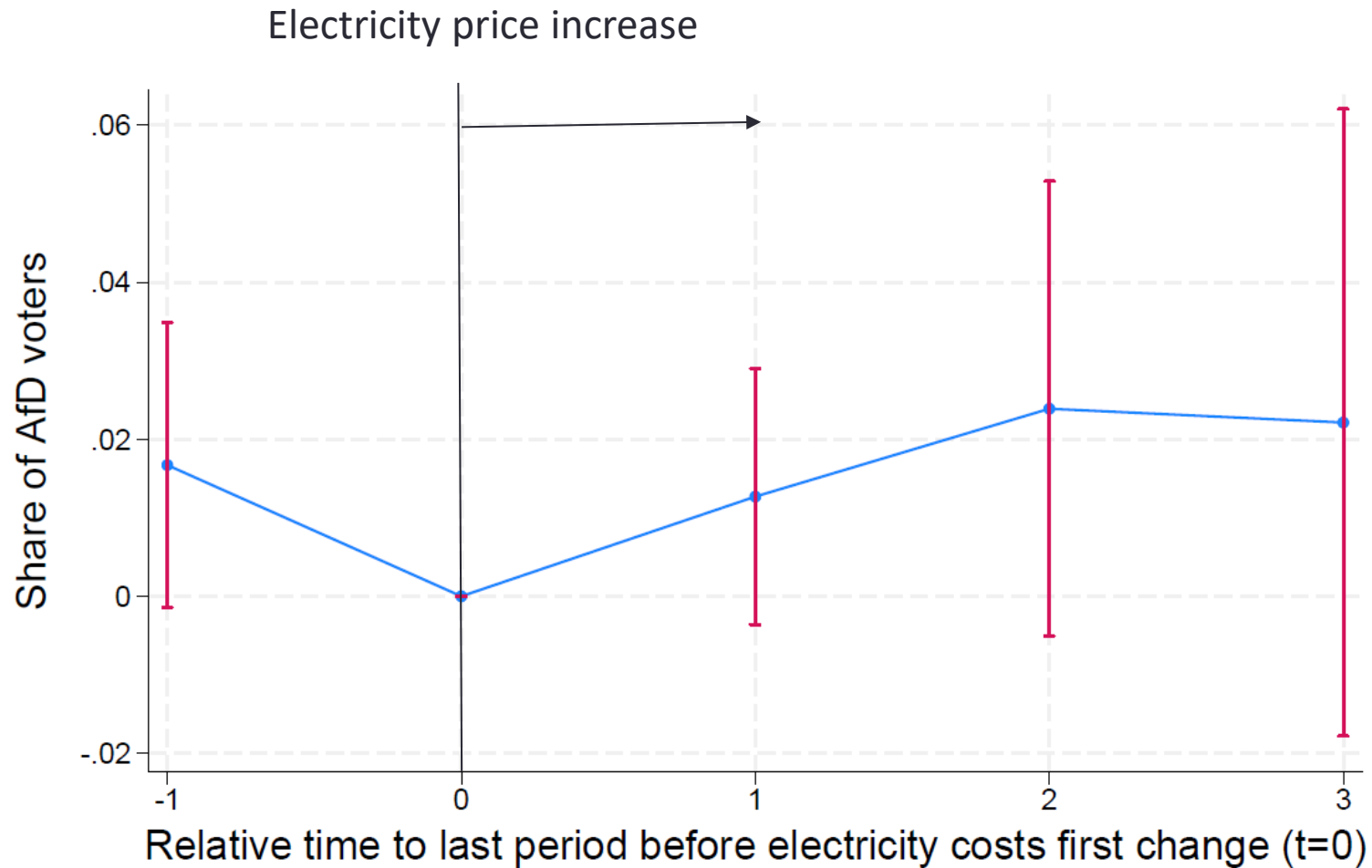→ *LINK to Appendix*

Identification: Main issues

- Pure control group is made up of people who do not report a cost increase between January 2023 and February 2024

    - People could have been treated before we started collecting data

    - Likely underestimation of the treatment effect

- Data quality and measurement errors

    - Restrict the sample to people who declare being responsible for the bills in their household

    - Use a binary treatment allevates some concerns about the reporting quality of respondents

    - Correct for over-reporting: Some people report increases in costs every 4 months → unlikely

    - Under-reporting is likely to lead to underestimating the treatment effect
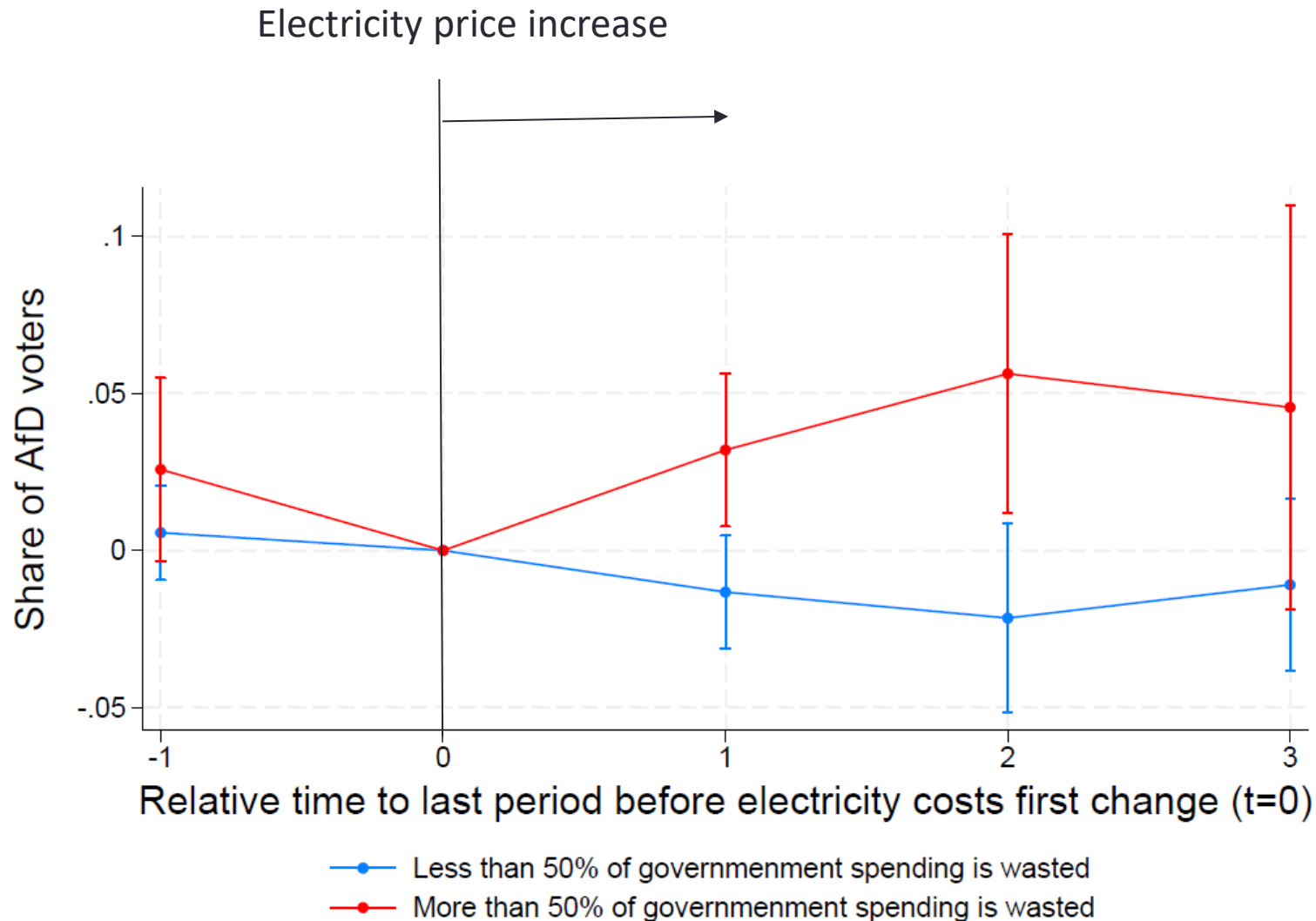
Results: Full sample

Electricity price increase

For the full sample we find a slight increase of AfD votes, increasing over time.

However: Results are not statistically significant!

Results: Government spending (as proxy for trust)

Electricity price increase

For people who previously thought that the government wastes tax money, rising electricity prices lead to an average 5 percentage point increase in AfD support
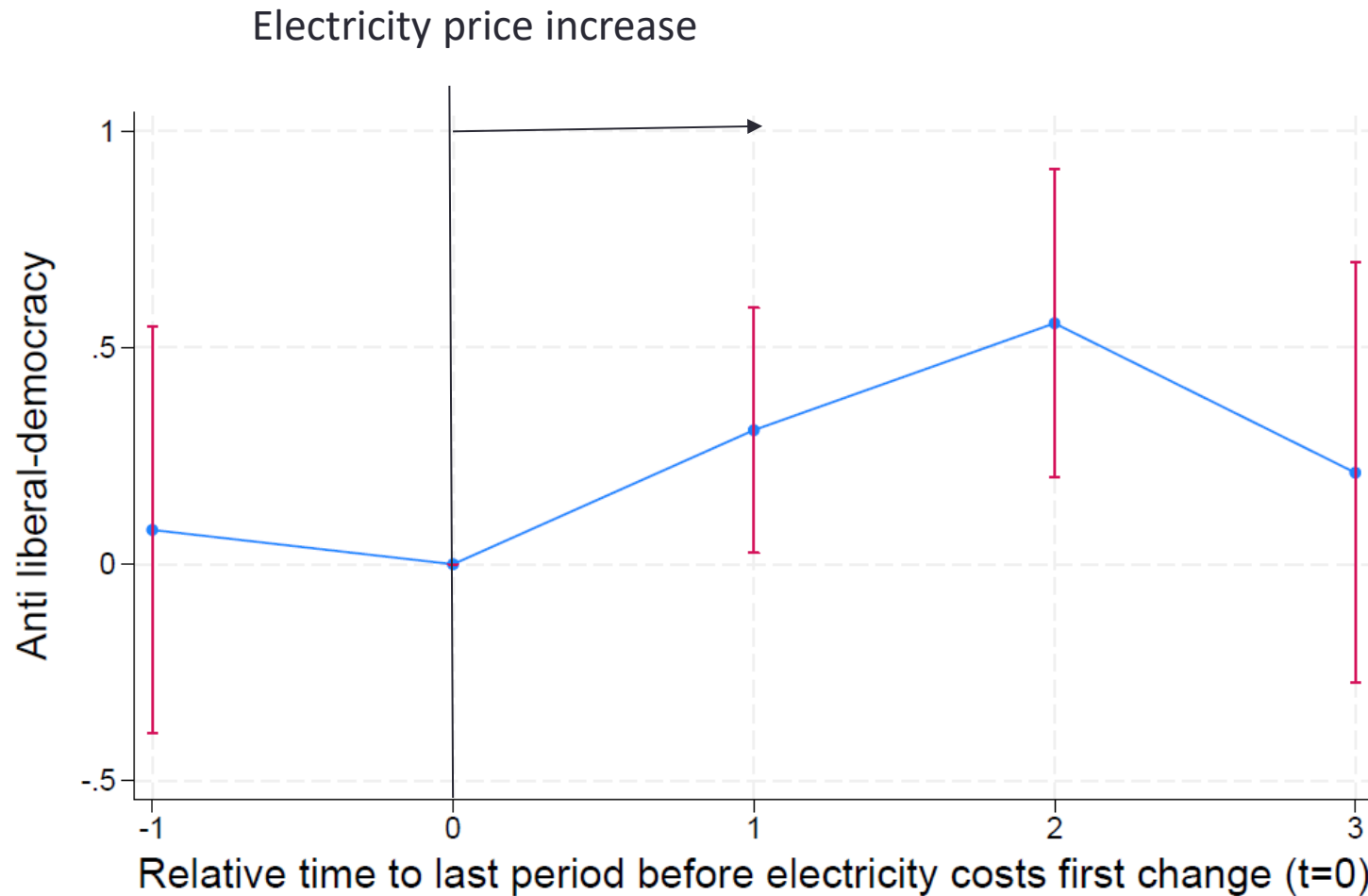
Share of AfD voters

Relative time to last period before electricity costs first change (t=0)

Less than 50% of governmenment spending is wasted
More than 50% of governmenment spending is wasted

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Results: Salience of transfers

Electricity price increase

For people who did not realize that they got compensated (about 60% in the sample!) rising electricity prices lead to a 5 percentage point increase in AfD support.

The effect strengthens with time.

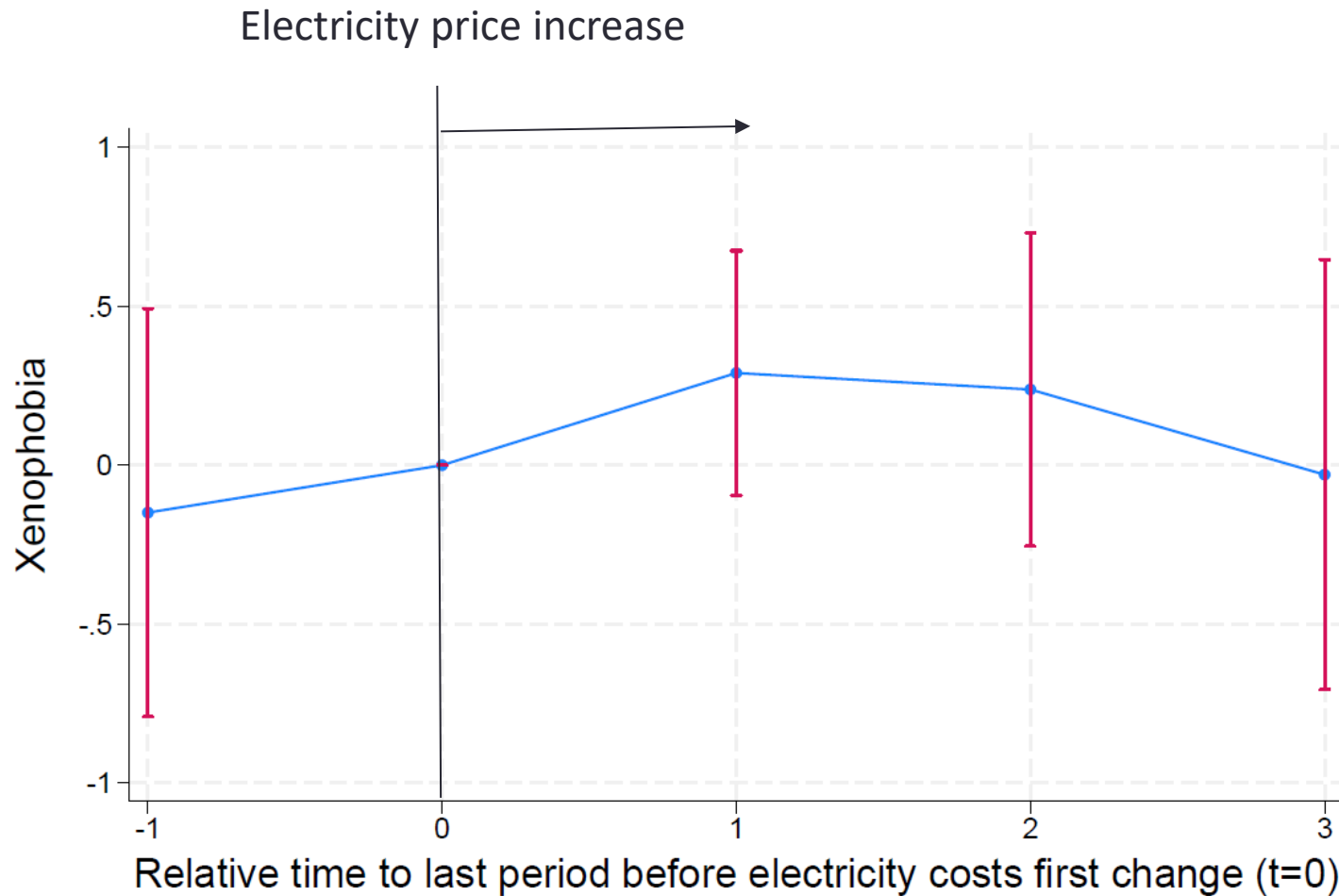# Results: Liberal democracy

Electricity price increase

Support for liberal democracy shrinks after treatment (full sample).

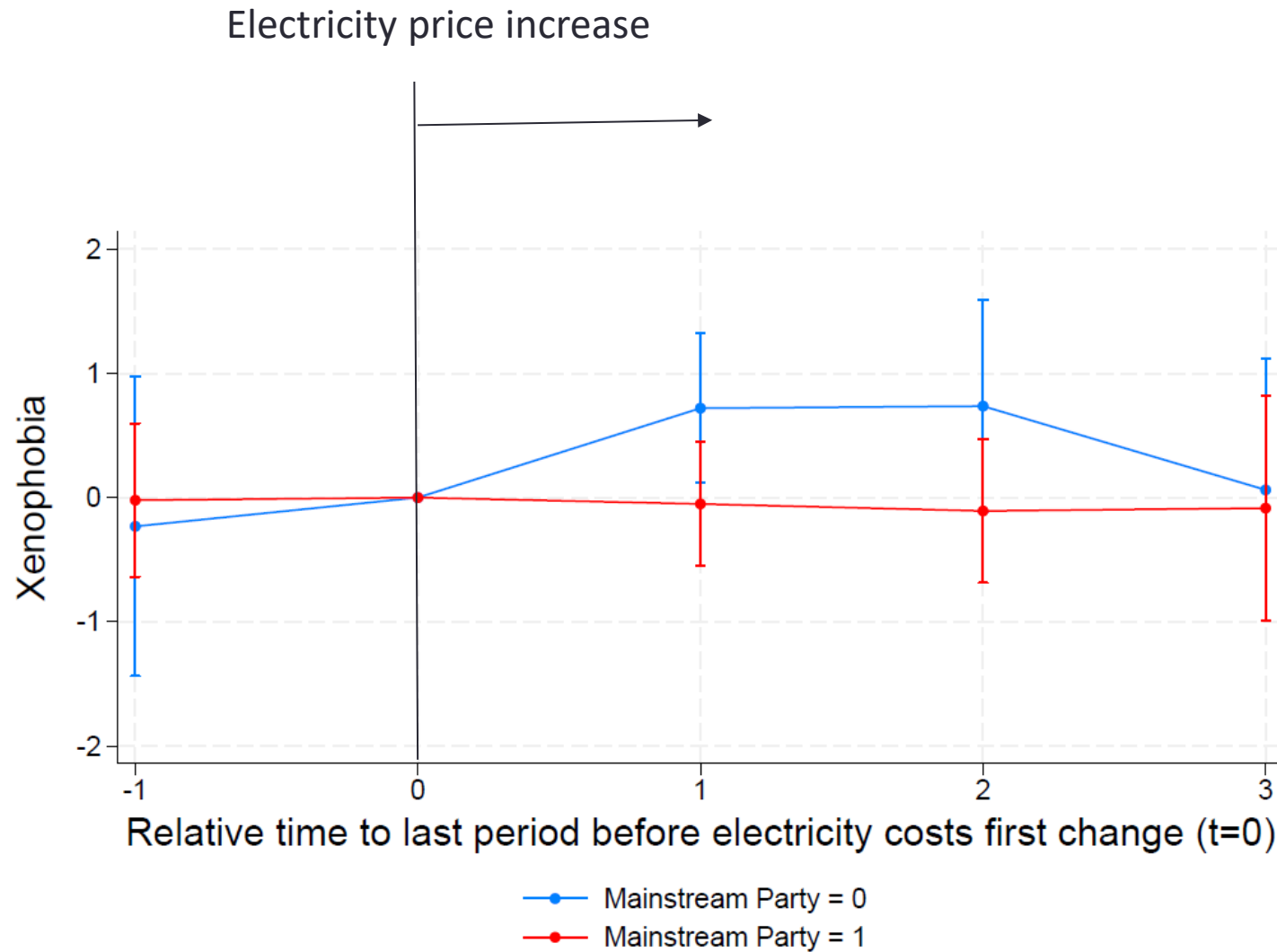Stronger effect for people who think that tax money is wasted (not shown).

Results: Xenophobia

Electricity price increase

No clear results for xenophobia for the full sample, but …

Results: Xenophobia

Electricity price increase

... increase for those who do not support a mainstream party.

Note: No significant effect on other attitudinal variables

Will the effects last?

- Energy prices have come down today, still we see high support for AfD
- Voters might change their preferences after election
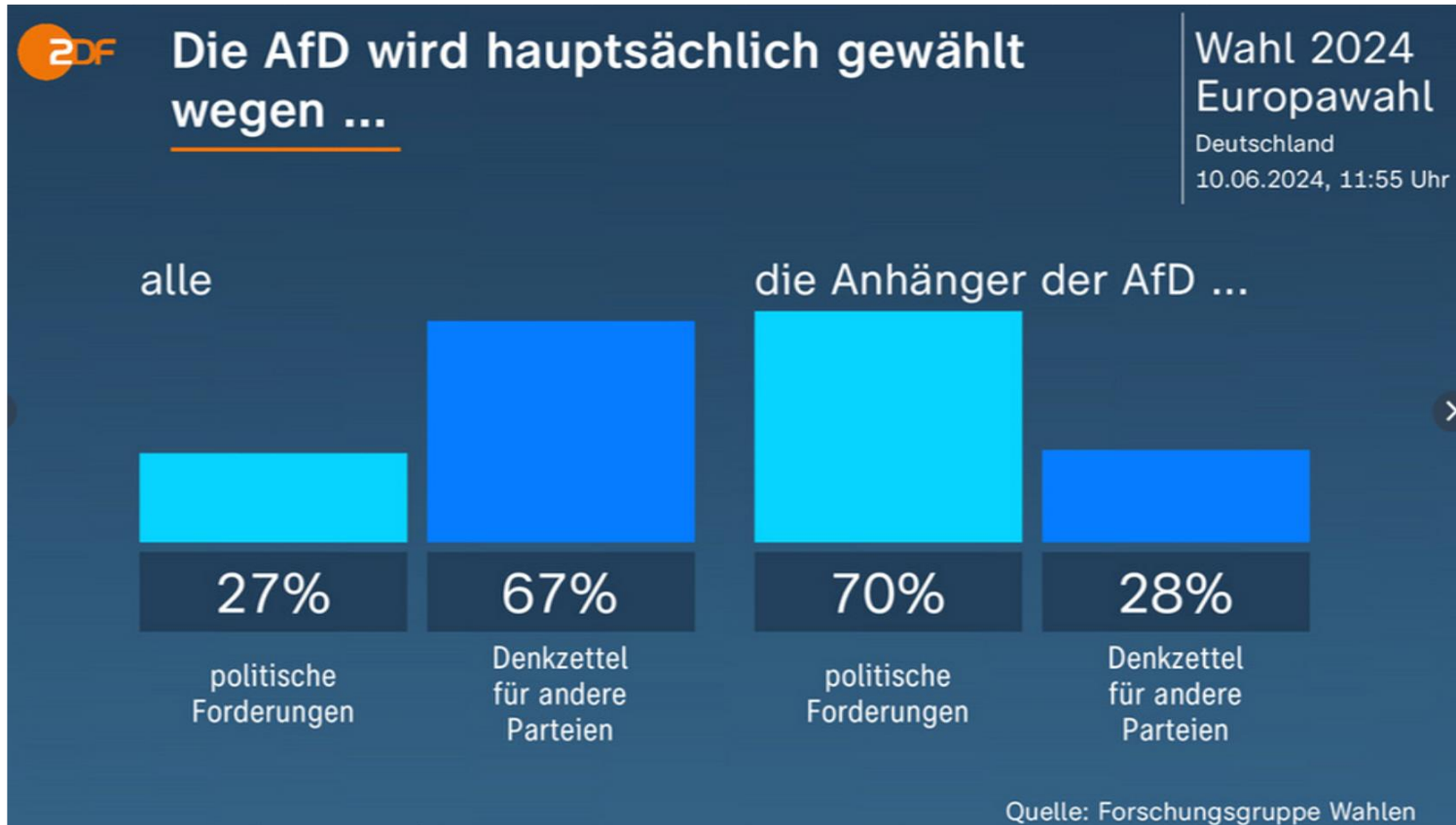 - See e.g. theoretical argument by Callander and Carbajal (2022, JPE)

Within respondents results

Dependent Variables: Model:	Pro redistribution (1) OLS	Pro climate (2) OLS	Xenophobia (3) OLS	Support for Russia (4) OLS	Anti democracy (5) OLS
Variables					
AfD dummy	-0.066	-0.536***	0.863***	1.076***	0.133
	(0.256)	(0.147)	(0.229)	(0.204)	(0.155)
Respondent FE	X	X	X	X	X
Adequate healthcare	X	X	X	X	X
Trust public broadcast	X	X	X	X	X
Perceived gov't waste	X	X	X	X	X
Fit statistics					
Observations	8,006	8,037	8,104	8,056	8,123
R^2	0.725	0.898	0.909	0.909	0.843

Clustered (Respondent FE) standard-errors in parentheses
Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

Consistent with post-election polls

After-poll interviews whether AfD is voted out of content (light blue) or out of protest (dark blue) differentiated between all respondents (left) and AfD supporters only (right).
Here: Post EU election, but similar results for recent state elections

General intuition: Voters want a party to stick to a previously announced policy. Populist parties are particularly committed, that is the expected deviation is zero (see Morelli et al. 2021)

The utility of voting a specific party is

with

Mainstream party $U_i = -\delta(b_i - q)^2 - \epsilon_i$

Populist party $U^c_i = -\delta(b_i - q^c)^2 - \epsilon_i$

b_i: voter's preferred policy (bliss point)
q: policy implemented by mainstream party (uncertain)
q^c: policy implemented by populist party (certain)
ϵ_i: external shock (unknown source)

The implemented policy is not observable: $q \sim F \equiv \mathcal{N}(\mu_i, \sigma_i^2)$

and depends on an individual's belief μ_i which policy a government implements and uncertainty about the policy implementation ("How well do I understand what they are doing?").

The expected utility for voting a mainstream party is

$$\mathbb{E}[U_i] = -\delta \mathbb{E}\left[(b_i - q)^2\right] - \mathbb{E}[\epsilon_i]$$

$$= -\delta \left(b_i^2 - 2b_i \mathbb{E}[q] + \mathbb{E}[q^2]\right) - x_i$$

$$= -\delta \left(\left(b_i - \mu_i\right)^2 + \sigma_i^2\right) - x_i$$

μ_i: Voter's subjective belief about the average policy the government implements
σ_i^2: Uncertainty in that belief
x_i: Expected shock

Voters chose the mainstream party if their expected utility with the mainstream party is larger than with populist party:

$$-\delta \left((b_i - \mu_i)^2 + \sigma_i^2\right) - x_i \geq -\delta(b_i - q_c)^2 - x_i$$

$$\Leftrightarrow \left((b_i - \mu_i)^2 + \sigma_i^2\right) \leq (b_i - q_c)^2$$

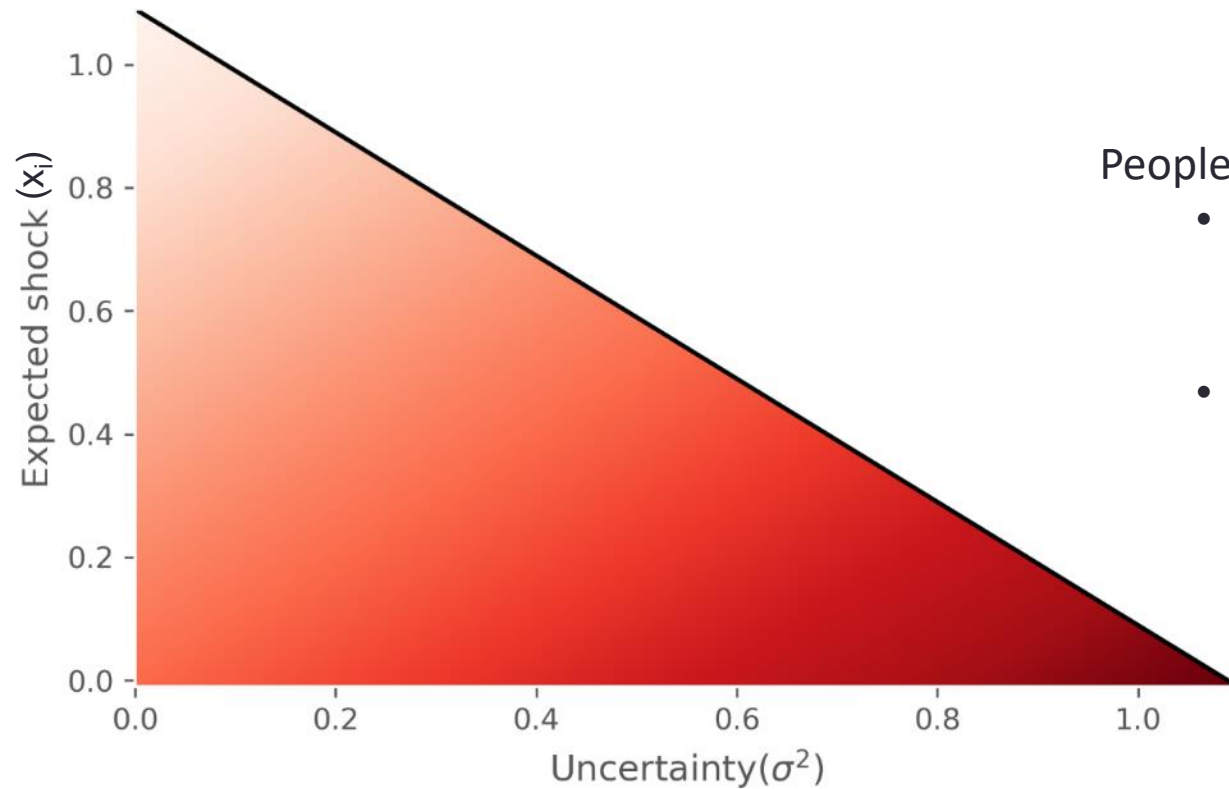**Voters update their belief about the average policy after observing a particular signal,** $V_i = -\delta(b_i - q)^2 - \epsilon_i$

People will update their beliefs if their expected utility is larger than the observed policy

$$\mathbb{E}(U_i) > V \Leftrightarrow -\delta \left((b_i - \mu_i)^2 + \sigma_i^2 \right) - x_i > V.$$

People turn to populistic parties if:
- No good prior about gov't policies, high uncertainty σ^2
  - *Empirically: less confident about the government, little trust or less informed*
- Negative surprise: Shock worse than expected (x_i low)
  - *Empirically: Did not expect an increase or did not understand compensation*

Note: Illustrative example.
Red area indicates conditions under which people turn to populist party

Key takeaways

- Electricity price shocks can increase anti-liberal and xenophobic attitudes. No effects on the other indices.

- People who think they do not benefit from government spending are more likely to support the AfD after having experienced an increase in energy costs.

- After people start supporting the AfD they adapt political preferences accordingly, in particular related to Ukraine / Russia and climate-related topics

- Because these people change part of their political preferences after they start supporting the AfD, it makes them more likely to remain AfD voters, even if their living conditions subsequently improve, or – in our case – the energy prices come down again.

- (Low) Trust in government and (bad) communication important drivers of people switching to a populist party after a given shock

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Back up & references

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Backup

The likelihood of observing U_i for a given q follows the distribution of the random shock ϵ_i, with $\mathbb{E}[\epsilon_i] = x_i$:

$$\mathbb{P}(V_i|q) = g(-\delta(b_i - q)^2 - V_i) \tag{11}$$

Using Bayes rule, the updated distribution over q is:

$$f^{post}(q|V_i) = \frac{\mathbb{P}(V_i|q)f(q)}{\mathbb{P}(V_i)} \tag{12}$$

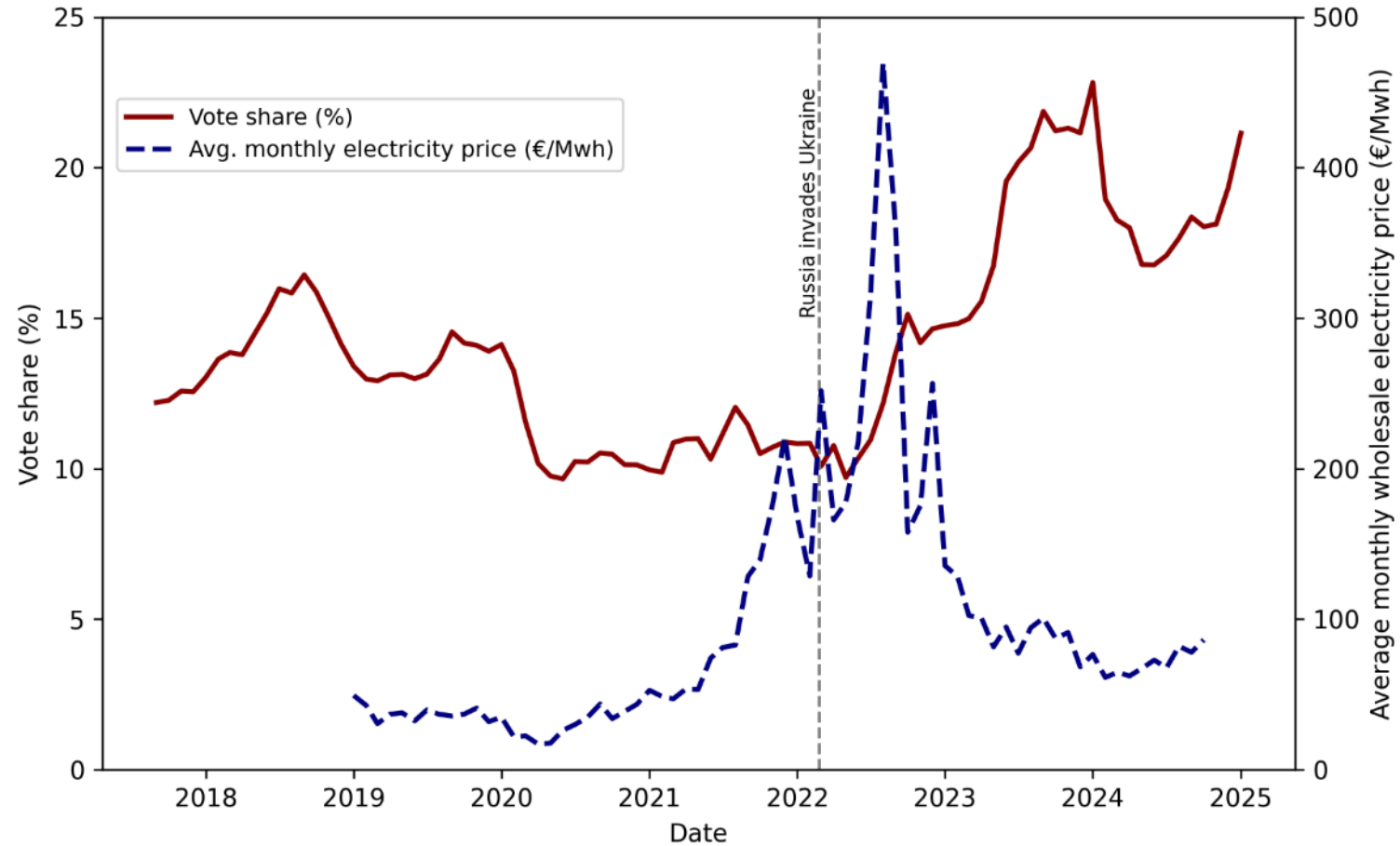$$f^{post}(q|V_i) = \frac{g\left(-\delta(b_i - q)^2 - V_i\right)f(q)}{\int_0^1 f(q)g\left(-\delta(b_i - q)^2 - V_i\right)dq} \tag{13}$$

So the updated expected value μ_i' of q is:

$$\mu_i' = \frac{\int_0^1 qg(-\delta(b_i - q)^2 - V_i)f(q)dq}{\int_0^1 f(q)g(-\delta(b_i - q)^2 - V_i)dq} \tag{14}$$

Electricity prices and AfD vote share

Link between treatment intensity and control variables

	Variation in instalment payments (%)
Expects an increase in electricity bills (lag)	-0.0672*** (0.0175)
Socio-demographics	
Female	0.0075 (0.0176)
East Germany	-0.0091 (0.0251)
Region	0.0028 (0.0021)
Age	0.0010 (0.0006)
Net monthly income of household	0.0006 (0.0028)
Electricity and heating	
Electricity from renewable sources	.00179 (0.0234)
Surface area of the dwelling	-0.0002 (0.0002)
Energy behaviour	
Reported change in energy consumption	-0.0122 (0.0081)
Reduce temperature	-0.0047 (0.0118)
Electricity savings	0.0159 (0.0135)
Invest in efficient appliances	-0.0159 (0.0099)
Invest in improved insulation	-0.0287** (0.0145)
Invest in efficient heating	0.0233* (0.0141)
Reduced car use	-0.0206** (0.0087)
Constant	0.1409** (0.0660)
R-squared	0.02

Robust standard errors in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Pre-test : Anti-liberal-democracy index

Parallel trends

	(1) Pre: $Y_2 - Y_1$	(2) Post: $Y_3 - Y_2$
Treatment group	-0.293	-0.461*
	(0.375)	(0.248)
Constant	-0.441***	0.378*
	(0.113)	(0.223)
R- squared	0.001	0.006
Observations	530	603

Robust standard errors in parentheses.

* p¡0.10, ** p¡0.05, *** p¡0.01

No anticipation

	(1) Y at $t=1$	(2) Y at $t=2$
Treated at $t+1$	0.635	-0.030
	(0.516)	(0.353)
Constant	-0.076	0.503
	(0.155)	(0.317)
R- squared	0.003	0.000
Observations	542	615

Robust standard errors in parentheses.

* p¡0.10, ** p¡0.05, *** p¡0.01

We estimate the "actual-versus-status-quo" effect of the treatment (De Chaisemartin and d'Haultfoeuille, 2024)

- ► Accounts for heterogeneous and dynamic effects. Treatments with fixed effects are biased when these effects exist (Callaway and Sant'Anna, 2021; De Chaisemartin et al., 2022)
- ► Handles staggered treatments, both binary and continuous

Parameter of interest (estimand) is $E(Y_{g,F_g-1+l} - Y_{g,F_g-1+l}(D_{g,1}, ..., D_{g,1}))$. Estimator is:

$$\text{DID}_{g,l} = Y_{g,F_g-1+l} - Y_{g,F_g-1} - \frac{1}{N_{ref}^g} \sum (Y_{g',F_g-1+l} - Y_{g',F_g-1}) \tag{1}$$