Modulation of Democracy: Partisan Communication during and after Election Campaigns

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A Models including the UK

For results in the main paper we have dropped observations from British MPs. The reasons are that we focus on EU member states and, while the UK was part of the EU for part of the data collection, Brexit was already underway and determined much of the political discourse in the country, in particular when it came to the European elections – British MPs were being voted in knowing they would not serve term of more than a few months. In Tables A.1 and A.2 we show the results from the paper including MPs from the UK. All substantive results hold, and coefficients get even more pronounced.

Table A.1: Sentiment on Tweets between 2018 and 2020 including UK MPs

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	−.71 (.09)***	−.73 (.09)***	−.74 (.09)***	−.48 (.11)***	−.81 (.10)***
Time	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Campaign	.05 (.01)***	.26 (.06)***	.26 (.06)***	.33 (.07)***	.20 (.06)***
Junior partner	.21 (.02)***	.22 (.02)***	.21 (.03)***	.22 (.02)***	.21 (.02)***
PM party	.30 (.02)***	.33 (.02)***	.35 (.02)***	.33 (.02)***	.33 (.02)***
Positive polling trend	.03 (.01)**	.03 (.01)***	.05 (.01)***	.03 (.01)**	.03 (.01)***
Left-right	.22 (.04)***	.22 (.04)***	.23 (.04)***	.19 (.04)***	.17 (.04)***
Left-right squared	−.02 (.00)***	−.02 (.00)***	−.02 (.00)***	−.02 (.00)***	−.01 (.00)**
Campaign * Junior partner		−.06 (.05)	−.00 (.06)	−.06 (.05)	−.08 (.05)
Campaign * PM party		−.26 (.02)***	−.27 (.03)***	−.26 (.02)***	−.22 (.03)***
Campaign * Positive polling		−.05 (.02)*	−.05 (.03)	−.05 (.02)*	−.06 (.02)**
Campaign * Left-right		−.04 (.03)	−.04 (.03)	−.05 (.03)	−.09 (.03)**
Campaign * Left-right squared		.00 (.00)	.00 (.00)	.00 (.00)	.01 (.00)**
Positive polling * Junior partner			.01 (.03)		
Positive polling * PM party			−.06 (.02)**		
Positive polling * Junior partner * Campaign			−.19 (.11)		
Positive polling * PM party * Campaign			.02 (.04)		
Populism				−.04 (.01)***	
Populism * Campaign				−.01 (.01)	
EU position					.03 (.01)*
EU position * campaign					.03 (.01)***
AIC	264528.72	264417.38	264431.16	264417.94	264415.74
BIC	264709.54	264645.77	264697.61	264665.37	264663.16
Log Likelihood	−132245.36	−132184.69	−132187.58	−132182.97	−132181.87
Num. obs.	100353	100353	100353	100353	100353
Num. groups: user_id	3410	3410	3410	3410	3410
Num. groups: group	135	135	135	135	135
Num. groups: country	18	18	18	18	18

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

Table A.2: Sentiment on Tweets between 2018 and 2020 including UK MPs – European Campaign

	Model 1	Model 2	Model 3
Intercept	$-.92$ $(.09)^{***}$	$-.93$ $(.09)^{***}$	$-.90$ $(.09)^{***}$
Time	.00 (.00)	.00 (.00)	.00 (.00)
EU Campaign	.01 (.01)	.06 $(.01)^{***}$	$-.10$ $(.03)^{***}$
Junior partner	.21 $(.02)^{***}$	.22 $(.02)^{***}$	.23 $(.02)^{***}$
PM party	.31 $(.02)^{***}$	.33 $(.02)^{***}$	.33 $(.02)^{***}$
Positive polling trend	.02 $(.01)^{*}$	.02 $(.01)^{*}$	.02 (.01)
EU Position	.05 $(.01)^{***}$	.05 $(.01)^{***}$	.05 $(.01)^{**}$
Left-right	.18 $(.04)^{***}$	.18 $(.04)^{***}$	.18 $(.04)^{***}$
Left-right squared	$-.01$ $(.00)^{***}$	$-.01$ $(.00)^{***}$	$-.01$ $(.00)^{***}$
EU Campaign * Junior partner		$-.06$ $(.02)^{**}$	$-.08$ $(.02)^{***}$
EU Campaign * PM party		$-.14$ $(.02)^{***}$	$-.10$ $(.02)^{***}$
EU Campaign * EU position			.03 $(.00)^{***}$
AIC	357547.68	357500.40	357466.68
BIC	357744.09	357716.45	357692.54
Log Likelihood	-178753.84	-178728.20	-178710.34
Num. obs.	135990	135990	135990
Num. groups: user_id	4352	4352	4352
Num. groups: group	188	188	188
Num. groups: country	28	28	28

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

B Models with raw sentiment values as dependent variable

Table A.3: Sentiment on Tweets between 2018 and 2020 - Raw sentiment values as dependent variable

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	−.39 (.10)***	−.40 (.10)***	−.42 (.10)***	−.15 (.11)	−.49 (.10)***
Time	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Campaign	.06 (.01)***	.11 (.06)	.12 (.06)*	.08 (.07)	.14 (.06)*
Junior partner	.18 (.02)***	.18 (.02)***	.17 (.02)***	.19 (.02)***	.18 (.02)***
PM party	.24 (.02)***	.25 (.02)***	.27 (.02)***	.25 (.02)***	.26 (.02)***
Positive polling trend	.02 (.01)*	.02 (.01)**	.04 (.01)***	.02 (.01)**	.02 (.01)**
Left-right	.23 (.03)***	.23 (.03)***	.24 (.03)***	.18 (.03)***	.14 (.04)**
Left-right squared	−.02 (.00)***	−.02 (.00)***	−.02 (.00)***	−.02 (.00)***	−.01 (.00)**
Campaign * Junior partner		−.05 (.04)	−.00 (.05)	−.05 (.04)	−.05 (.04)
Campaign * PM party		−.11 (.02)***	−.13 (.03)***	−.11 (.02)***	−.12 (.02)***
Campaign * Positive polling		−.03 (.02)	−.03 (.03)	−.03 (.02)	−.04 (.02)
Campaign * Left-right		−.01 (.02)	−.02 (.02)	−.01 (.03)	.00 (.03)
Campaign * Left-right squared		.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Positive polling * Junior partner			.01 (.03)		
Positive polling * PM party			−.07 (.02)**		
Positive polling * Junior partner * Campaign			−.17 (.09)		
Positive polling * PM party * Campaign			.03 (.04)		
Populism				−.03 (.01)***	
Populism * Campaign				.00 (.01)	
EU position					.05 (.02)**
EU position * campaign					−.01 (.01)
AIC	169393.96	169402.16	169414.05	169408.72	169410.74
BIC	169569.12	169623.41	169672.16	169648.40	169650.42
Log Likelihood	−84677.98	−84677.08	−84679.02	−84678.36	−84679.37
Num. obs.	74517	74517	74517	74517	74517
Num. groups: user_id	2719	2719	2719	2719	2719
Num. groups: group	125	125	125	125	125
Num. groups: country	17	17	17	17	17

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table A.4: Sentiment on Tweets between 2018 and 2020 – Raw sentiment values as dependent variable

	Model 1	Model 2	Model 3
Intercept	$-.46$ $(.09)^{***}$	$-.46$ $(.09)^{***}$	$-.45$ $(.09)^{***}$
Time	.00 (.00)	.00 (.00)	.00 (.00)
EU Campaign	.03 $(.01)^{***}$	.07 $(.01)^{***}$	$-.02$ (.02)
Junior partner	.18 $(.02)^{***}$	.19 $(.02)^{***}$	.19 $(.02)^{***}$
PM party	.25 $(.02)^{***}$	.27 $(.02)^{***}$	.27 $(.02)^{***}$
Positive polling trend	.01 $(.01)^{*}$	.01 $(.01)^{*}$	.01 (.01)
EU Position	.06 $(.01)^{***}$	.06 $(.01)^{***}$	.06 $(.01)^{***}$
Left-right	.13 $(.04)^{**}$	.13 $(.04)^{**}$	.13 $(.04)^{**}$
Left-right squared	$-.01$ $(.00)^{*}$	$-.01$ $(.00)^{*}$	$-.01$ $(.00)^{*}$
EU Campaign * Junior partner		$-.07$ $(.02)^{***}$	$-.08$ $(.02)^{***}$
EU Campaign * PM party		$-.11$ $(.02)^{***}$	$-.10$ $(.02)^{***}$
EU Campaign * EU Position			.02 $(.00)^{***}$
AIC	240991.12	240956.72	240952.78
BIC	241183.31	241168.13	241173.80
Log Likelihood	-120475.56	-120456.36	-120453.39
Num. obs.	110154	110154	110154
Num. groups: user_id	3661	3661	3661
Num. groups: group	178	178	178
Num. groups: country	27	27	27

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

C Models without caretaker government periods

Table A.5: Sentiment on Tweets between 2018 and 2020 excluding periods of caretaker governments

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	−.72 (.10)***	−.73 (.10)***	−.74 (.10)***	−.46 (.12)***	−.87 (.10)***
Time	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Campaign	.07 (.01)***	.13 (.08)	.14 (.08)	.14 (.10)	.14 (.08)
Junior partner	.22 (.02)***	.22 (.02)***	.21 (.03)***	.23 (.02)***	.23 (.02)***
PM party	.32 (.02)***	.34 (.02)***	.35 (.02)***	.33 (.02)***	.34 (.02)***
Positive polling trend	.02 (.01)*	.03 (.01)*	.03 (.01)*	.03 (.01)*	.03 (.01)*
Left-right	.22 (.04)***	.23 (.04)***	.23 (.04)***	.18 (.04)***	.13 (.05)**
Left-right squared	−.02 (.00)***	−.02 (.00)***	−.02 (.00)***	−.02 (.00)***	−.01 (.00)*
Campaign * Junior partner		−.12 (.05)*	−.07 (.06)	−.13 (.05)*	−.12 (.05)*
Campaign * PM party		−.15 (.03)***	−.17 (.05)***	−.15 (.03)***	−.15 (.03)***
Campaign * Positive polling		−.04 (.03)	−.04 (.04)	−.04 (.03)	−.04 (.03)
Campaign * Left-right		−.00 (.03)	−.01 (.03)	−.01 (.04)	.00 (.04)
Campaign * Left-right squared		.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Positive polling * Junior partner			.02 (.03)		
Positive polling * PM party			−.03 (.03)		
Positive polling * Junior partner * Campaign			−.17 (.11)		
Positive polling * PM party * Campaign			.04 (.06)		
Populism				−.04 (.01)***	
Populism * Campaign				−.00 (.01)	
EU position					.06 (.02)***
EU position * campaign					−.01 (.01)
AIC	180571.64	180582.86	180603.22	180587.17	180587.82
BIC	180744.90	180801.72	180858.55	180824.26	180824.92
Log Likelihood	−90266.82	−90267.43	−90273.61	−90267.58	−90267.91
Num. obs.	67449	67449	67449	67449	67449
Num. groups: user_id	2697	2697	2697	2697	2697
Num. groups: group	125	125	125	125	125
Num. groups: country	17	17	17	17	17

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

D Models with alternative error covariance structures

Table A.6: Sentiment on Tweets between 2018 and 2020 - Linear Error Covariance Structure

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	−.70 (.10)***	−.71 (.10)***	−.73 (.10)***	−.44 (.12)***	−.86 (.10)***
Time	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Campaign	.07 (.01)***	.12 (.07)	.13 (.07)	.11 (.09)	.14 (.08)
Junior partner	.21 (.02)***	.22 (.02)***	.21 (.03)***	.22 (.02)***	.22 (.02)***
PM party	.29 (.02)***	.31 (.02)***	.34 (.02)***	.31 (.02)***	.32 (.02)***
Positive polling trend	.03 (.01)**	.03 (.01)**	.05 (.01)***	.03 (.01)**	.03 (.01)**
Left-right	.23 (.04)***	.23 (.04)***	.24 (.04)***	.19 (.04)***	.13 (.04)**
Left-right squared	−.02 (.00)***	−.02 (.00)***	−.02 (.00)***	−.02 (.00)***	−.01 (.00)*
Campaign * Junior partner		−.06 (.05)	−.01 (.06)	−.07 (.05)	−.06 (.05)
Campaign * PM party		−.15 (.03)***	−.17 (.04)***	−.15 (.03)***	−.15 (.03)***
Campaign * Positive polling		−.04 (.02)	−.04 (.03)	−.04 (.02)	−.04 (.02)
Campaign * Left-right		−.01 (.03)	−.02 (.03)	−.01 (.03)	−.00 (.03)
Campaign * Left-right squared		.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Positive polling * Junior partner			.01 (.03)		
Positive polling * PM party			−.07 (.02)**		
Positive polling * Junior partner * Campaign			−.20 (.11)		
Positive polling * PM party * Campaign			.03 (.06)		
Populism				−.04 (.01)***	
Populism * Campaign				.00 (.01)	
EU position					.06 (.02)***
EU position * campaign					−.01 (.01)
AIC	200038.37	200037.03	200049.60	200042.51	200040.45
BIC	200213.53	200258.28	200307.72	200282.20	200280.13
Log Likelihood	−100000.19	−99994.52	−99996.80	−99995.26	−99994.23
Num. obs.	74517	74517	74517	74517	74517
Num. groups: user_id	2719	2719	2719	2719	2719
Num. groups: group	125	125	125	125	125
Num. groups: country	17	17	17	17	17

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table A.7: Sentiment on Tweets between 2018 and 2020 - Compound Symmetry Error Covariance Structure

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	−.70 (.10)***	−.71 (.10)***	−.73 (.10)***	−.45 (.12)***	−.86 (.10)***
Time	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Campaign	.07 (.01)***	.12 (.07)	.13 (.07)	.12 (.08)	.14 (.07)
Junior partner	.21 (.02)***	.21 (.02)***	.20 (.03)***	.22 (.02)***	.22 (.02)***
PM party	.29 (.02)***	.31 (.02)***	.34 (.02)***	.31 (.02)***	.32 (.02)***
Positive polling trend	.03 (.01)**	.03 (.01)**	.05 (.01)***	.03 (.01)**	.03 (.01)**
Left-right	.23 (.04)***	.23 (.04)***	.24 (.04)***	.19 (.04)***	.13 (.04)**
Left-right squared	−.02 (.00)***	−.02 (.00)***	−.02 (.00)***	−.02 (.00)***	−.01 (.00)*
Campaign * Junior partner		−.06 (.05)	−.00 (.06)	−.07 (.05)	−.06 (.05)
Campaign * PM party		−.15 (.03)***	−.16 (.04)***	−.15 (.03)***	−.15 (.03)***
Campaign * Positive polling		−.03 (.02)	−.03 (.03)	−.04 (.02)	−.04 (.02)
Campaign * Left-right		−.02 (.03)	−.02 (.03)	−.02 (.03)	−.01 (.03)
Campaign * Left-right squared		.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Positive polling * Junior partner			.02 (.03)		
Positive polling * PM party			−.08 (.02)**		
Positive polling * Junior partner * Campaign			−.22 (.11)*		
Positive polling * PM party * Campaign			.02 (.05)		
Populism				−.04 (.01)***	
Populism * Campaign				.00 (.01)	
EU position					.06 (.02)***
EU position * campaign					−.01 (.01)
AIC	200217.31	200212.60	200223.42	200218.31	200216.25
BIC	200392.47	200433.85	200481.54	200457.99	200455.93
Log Likelihood	−100089.66	−100082.30	−100083.71	−100083.15	−100082.12
Num. obs.	74517	74517	74517	74517	74517
Num. groups: user_id	2719	2719	2719	2719	2719
Num. groups: group	125	125	125	125	125
Num. groups: country	17	17	17	17	17

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

E Models with alternative specifications for Populism

Table A.8: Sentiment on Tweets between 2018 and 2020 - Populist and Political Parties Expert Survey

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Intercept	−.69 (.10)***	−.70 (.10)***	−.32 (.14)*	−.35 (.14)*	−.43 (.13)***	−.31 (.14)*	−.41 (.13)**
Time	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Campaign	.07 (.01)***	.15 (.07)*	.07 (.09)	.06 (.09)	−.04 (.10)	−.03 (.10)	−.01 (.09)
Junior partner	.21 (.02)***	.22 (.02)***	.22 (.02)***	.22 (.02)***	.22 (.02)***	.22 (.02)***	.22 (.02)***
PM party	.30 (.02)***	.32 (.02)***	.32 (.02)***	.32 (.02)***	.32 (.02)***	.32 (.02)***	.32 (.02)***
Positive polling trend	.03 (.01)**	.04 (.01)**	.04 (.01)**	.04 (.01)**	.03 (.01)**	.03 (.01)**	.04 (.01)**
Left-right	.22 (.04)***	.22 (.04)***	.15 (.04)***	.13 (.05)**	.17 (.04)***	.15 (.05)**	.14 (.04)**
Left-right squared	−.02 (.00)***	−.02 (.00)***	−.01 (.00)**	−.01 (.00)*	−.01 (.00)**	−.01 (.00)*	−.01 (.00)*
Campaign * Junior partner		−.09 (.05)	−.09 (.05)	−.09 (.05)	−.06 (.05)	−.05 (.06)	−.07 (.05)
Campaign * PM party		−.15 (.03)***	−.16 (.03)***	−.16 (.03)***	−.16 (.03)***	−.16 (.03)***	−.17 (.03)***
Campaign * Positive polling		−.04 (.02)	−.04 (.02)	−.04 (.02)	−.04 (.02)	−.03 (.03)	−.05 (.02)
Campaign * Left-right		−.03 (.03)	−.01 (.03)	.00 (.04)	.02 (.04)	.02 (.04)	.03 (.04)
Campaign * Left-right squared		.00 (.00)	.00 (.00)	.00 (.00)	−.00 (.00)	−.00 (.00)	−.00 (.00)
Peoplecentrism			−.05 (.01)***			−.04 (.03)	
Peoplecentrism * Campaign			.01 (.01)			−.02 (.02)	
Antielitism				−.04 (.01)***		.00 (.03)	
Antielitism * Campaign				.01 (.01)		.01 (.02)	
Ordinary people indivisible					−.05 (.01)**	−.01 (.02)	
Ordinary people indivisible * Campaign					.03 (.01)**	.04 (.02)**	
Populism							−.04 (.01)***
Populism * Campaign							.02 (.01)**
AIC	194979.06	194978.89	194981.43	194983.36	194979.50	195005.32	194978.16
BIC	195153.74	195199.53	195220.46	195222.38	195218.52	195281.11	195217.19
Log Likelihood	−97470.53	−97465.44	−97464.72	−97465.68	−97463.75	−97472.66	−97463.08
Num. obs.	72647	72647	72647	72647	72647	72647	72647
Num. groups: user_id	2587	2587	2587	2587	2587	2587	2587
Num. groups: group	104	104	104	104	104	104	104
Num. groups: country	15	15	15	15	15	15	15

Latvia and Luxembourg are not part of POPPA, therefore there are 15 countries instead of the 17 in the other models. $^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

F Models with different temporal aggregations

F.1 Aggregation on a weekly basis

Table A.9: Sentiment on Tweets between 2018 and 2020 - Aggregation on weekly level

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	−.64 (.08)***	−.64 (.09)***	−.66 (.09)***	−.40 (.10)***	−.79 (.09)***
Time	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Campaign	.07 (.01)***	.10 (.05)	.11 (.05)*	.14 (.07)*	.08 (.06)
Junior partner	.20 (.02)***	.20 (.02)***	.20 (.02)***	.21 (.02)***	.20 (.02)***
PM party	.25 (.02)***	.27 (.02)***	.29 (.02)***	.27 (.02)***	.27 (.02)***
Positive polling trend	.03 (.01)***	.03 (.01)***	.05 (.01)***	.03 (.01)***	.03 (.01)***
Left-right	.21 (.03)***	.21 (.03)***	.21 (.03)***	.17 (.03)***	.12 (.04)**
Left-right squared	−.02 (.00)***	−.02 (.00)***	−.02 (.00)***	−.02 (.00)***	−.01 (.00)*
Campaign * Junior partner		−.06 (.04)	−.03 (.05)	−.06 (.04)	−.07 (.04)
Campaign * PM party		−.11 (.02)***	−.13 (.03)***	−.11 (.02)***	−.11 (.02)***
Campaign * Positive polling		−.01 (.02)	−.02 (.02)	−.02 (.02)	−.01 (.02)
Campaign * Left-right		−.02 (.02)	−.02 (.02)	−.02 (.02)	−.02 (.03)
Campaign * Left-right squared		.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Positive polling * Junior partner			.01 (.03)		
Positive polling * PM party			−.06 (.02)**		
Positive polling * Junior partner * Campaign			−.10 (.09)		
Positive polling * PM party * Campaign			.03 (.04)		
Populism				−.04 (.01)***	
Populism * Campaign				−.01 (.00)	
EU position					.06 (.01)***
EU position * campaign					.01 (.01)
AIC	351595.55	351594.57	351609.20	351597.20	351596.04
BIC	351781.26	351829.15	351882.87	351851.32	351850.16
Log Likelihood	−175778.78	−175773.29	−175776.60	−175772.60	−175772.02
Num. obs.	129835	129835	129835	129835	129835
Num. groups: user_id	2717	2717	2717	2717	2717
Num. groups: group	125	125	125	125	125
Num. groups: country	17	17	17	17	17

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table A.10: Sentiment on Tweets between 2018 and 2020 - EU27 - Aggregation on weekly level

	Model 1	Model 2	Model 3
Intercept	−.87 (.08)***	−.88 (.08)***	−.86 (.08)***
Time	.00 (.00)	.00 (.00)	.00 (.00)
EU Campaign	.04 (.01)***	.08 (.01)***	−.02 (.02)
Junior partner	.20 (.02)***	.22 (.02)***	.22 (.02)***
PM party	.26 (.02)***	.28 (.02)***	.28 (.02)***
Positive polling trend	.02 (.01)**	.02 (.01)**	.02 (.01)**
EU position	.07 (.01)***	.07 (.01)***	.06 (.01)***
Left-right	.13 (.04)**	.13 (.04)**	.13 (.04)**
Left-right squared	−.01 (.00)*	−.01 (.00)*	−.01 (.00)*
EU Campaign * Junior partner		−.08 (.02)***	−.09 (.02)***
EU Campaign * PM party		−.11 (.02)***	−.11 (.02)***
EU Campaign * EU position			.02 (.00)***
AIC	524647.09	524600.30	524589.83
BIC	524850.68	524824.25	524823.96
Log Likelihood	−262303.54	−262278.15	−262271.92
Num. obs.	194760	194760	194760
Num. groups: user_id	3659	3659	3659
Num. groups: group	178	178	178
Num. groups: country	27	27	27

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

F.2 Aggregation on a monthly basis

Table A.11: Sentiment on Tweets between 2018 and 2020 - Aggregation on monthly level

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	−.76 (.10)***	−.78 (.10)***	−.79 (.11)***	−.50 (.13)***	−.95 (.11)***
Time	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Campaign	.11 (.02)***	.21 (.09)*	.21 (.09)*	.23 (.10)*	.25 (.10)*
Junior partner	.22 (.02)***	.22 (.03)***	.18 (.03)***	.23 (.03)***	.23 (.03)***
PM party	.30 (.02)***	.32 (.02)***	.33 (.03)***	.32 (.02)***	.33 (.02)***
Positive polling trend	.03 (.01)*	.04 (.01)**	.04 (.02)*	.04 (.01)**	.04 (.01)**
Left-right	.25 (.04)***	.25 (.04)***	.26 (.04)***	.21 (.04)***	.14 (.05)**
Left-right squared	−.02 (.00)***	−.02 (.00)***	−.02 (.00)***	−.02 (.00)***	−.01 (.01)*
Campaign * Junior partner		−.08 (.06)	.00 (.07)	−.09 (.06)	−.08 (.06)
Campaign * PM party		−.16 (.03)***	−.15 (.05)**	−.16 (.04)***	−.16 (.03)***
Campaign * Positive polling		−.08 (.03)*	−.06 (.04)	−.08 (.03)*	−.08 (.03)**
Campaign * Left-right		−.02 (.04)	−.03 (.04)	−.02 (.04)	−.00 (.04)
Campaign * Left-right squared		.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Positive polling * Junior partner			.08 (.04)		
Positive polling * PM party			−.03 (.03)		
Positive polling * Junior partner * Campaign			−.35 (.17)*		
Positive polling * PM party * Campaign			−.02 (.07)		
Populism				−.04 (.01)***	
Populism * Campaign				−.00 (.01)	
EU position					.07 (.02)***
EU position * campaign					−.01 (.01)
AIC	112844.22	112853.38	112867.60	112859.61	112856.42
BIC	113008.55	113060.95	113109.76	113084.47	113081.29
Log Likelihood	−56403.11	−56402.69	−56405.80	−56403.80	−56402.21
Num. obs.	42156	42156	42156	42156	42156
Num. groups: user_id	2719	2719	2719	2719	2719
Num. groups: group	125	125	125	125	125
Num. groups: country	17	17	17	17	17

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table A.12: Sentiment on Tweets between 2018 and 2020 - EU27 - Aggregation on monthly level

	Model 1	Model 2	Model 3
Intercept	-1.08 (.10)***	-1.08 (.10)***	-1.06 (.10)***
Time	.00 (.00)	.00 (.00)	.00 (.00)
EU Campaign	.03 (.01)**	.10 (.01)***	$-.08$ (.04)
Junior partner	.23 (.02)***	.24 (.02)***	.25 (.02)***
PM party	.32 (.02)***	.34 (.02)***	.35 (.02)***
Positive polling trend	.02 (.01)*	.03 (.01)*	.02 (.01)
EU position	.08 (.02)***	.08 (.02)***	.08 (.02)***
Left-right	.16 (.05)**	.16 (.05)**	.16 (.05)**
Left-right squared	$-.01$ (.00)*	$-.01$ (.00)*	$-.01$ (.00)*
EU Campaign * Junior partner		$-.11$ (.03)***	$-.12$ (.03)***
EU Campaign * PM party		$-.16$ (.03)***	$-.15$ (.03)***
EU Campaign * EU position			.03 (.01)***
AIC	162050.90	162022.79	162011.90
BIC	162231.41	162221.35	162219.48
Log Likelihood	-81005.45	-80989.39	-80982.95
Num. obs.	61425	61425	61425
Num. groups: user_id	3661	3661	3661
Num. groups: group	178	178	178
Num. groups: country	27	27	27

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

G Descriptive Statistics

Table A.13: Dependent and independent variables for national campaign regressions

Statistic	N	Mean	Median	St. Dev.	Min	Max
Sentiment	74,517	0.22	0.10	0.86	−3.81	4.69
Sentiment scaled by country	74,517	0.00	−0.11	1.00	−5.07	5.33
National campaign	74,517	0.10	0	0.30	0	1
Prime minister	74,517	0.25	0	0.43	0	1
Junior partner	74,517	0.15	0	0.36	0	1
Opposition	74,517	0.60	1	0.49	0	1
Left-right	74,517	5.38	5.43	2.18	0.33	10.00
Left-right squared	74,517	33.67	29.47	23.29	0.11	100.00
EU position	74,517	5.33	5.93	1.54	1.22	6.95
Populism	74,517	4.15	3.50	2.24	0.93	9.53
Positive polling	74,517	0.50	1	0.50	0	1

Table A.14: Dependent and independent variables for EU campaign regressions

Statistic	N	Mean	Median	St. Dev.	Min	Max
Sentiment	110,154	0.32	0.25	0.84	−3.81	4.69
Sentiment scaled by country	110,154	0.00	−0.09	1.00	−6.05	5.33
EU campaign	110,154	0.14	0	0.35	0	1
Prime minister	110,154	0.23	0	0.42	0	1
Junior partner	110,154	0.24	0	0.43	0	1
Opposition	110,154	0.53	1	0.50	0	1
Left-right	110,154	5.41	5.86	2.16	0.33	10.00
Left-right squared	110,154	33.89	34.31	22.76	0.11	100.00
EU position	110,154	5.48	6.08	1.51	1.08	6.95
Populism	110,154	4.00	3.33	2.07	0.93	9.53
Positive polling	110,154	0.44	0	0.50	0	1

Note: UK not included

H Number of MPs and number of tweets

Table A.15: Number of MPs and number of tweets per country

	Country	Total number of MPs	Total number of tweets
1	Austria	86	70511
2	Belgium	183	92986
3	Bulgaria	5	914
4	Croatia	16	17907
5	Cyprus	22	23146
6	Czechia	48	23003
7	Denmark	189	135930
8	Estonia	42	14951
9	Finland	150	230304
10	France	418	598489
11	Germany	219	387848
12	Greece	163	163127
13	Hungary	3	2409
14	Ireland	160	215883
15	Italy	571	410869
16	Latvia	64	30032
17	Lithuania	17	2940
18	Luxembourg	32	9055
19	Malta	51	68110
20	Netherlands	141	246519
21	Poland	343	476945
22	Portugal	80	38090
23	Romania	5	184
24	Slovakia	12	2641
25	Slovenia	15	33016
26	Spain	344	693090
27	Sweden	282	309568
28	UK	691	1552503
	SUM	4352	5850970

I Validation of sentiment measures

The sentiment measure we use in the paper has been validated across countries by Proksch et al. (2019) using parliamentary speech data. Twitter data naturally is very different, and so it is important to test whether the measure is still capturing a meaningful concept. To do so, we have had two coders manually assess, for a sample of tweets, whether they are positive, neutral, or negative. The exact instructions given to coders are in Online Appendix J below.

The tweets were sampled for validation as follows: we included only those 17 countries that had national elections during the period of study. Since our main unit-of-analysis in the paper is the MP-period (two-weeks), we used this as the level of sampling. In each country, we randomly sampled three MP-periods from each party, once from a campaign period, once from a non-campaign period. For each MP-period, we took all tweets from that two-week time up to 20 tweets – for more active MPs, we randomly sampled 20. The resulting sample had 5944 tweets by 418 unique MPs in 123 parties.

Each tweet was coded by two coders into **positive**, **negative**, or **neutral**. Krippendorff's alpha (ordinal) is 0.63, indicating an acceptable inter-coder reliability. The confusion matrix in Table A.16 is obtained by turning the dictionary sentiment estimates for each tweet into categories, based on whether the sentiment is below 0 (negative), above 0 (positive), or exactly 0 (neutral). For the coders, tweets where both coded "positive" are categorized as positive, where both coded "negative" as negative, and the rest is "neutral". The F1 score is 0.64, indicating an acceptable accuracy.

Table A.16: Confusion matrix – tweet-level coding

		Hand-coded sentiment		
		Negative	Neutral	Positive
Dictionary sentiment	Negative	678	242	160
	Neutral	400	664	468
	Positive	249	291	1054

However, the reason for sampling at the MP-period level is that, indeed, individual tweets have a lot of noise for the sentiment analysis, due to being so short. For instance, a much larger number are classified as neutral by the automated method than by coders, due to not having an occurrence of a positive or negative word from the dictionary. This noise contained in the tweet-level sentiment estimate was also the logic for aggregating them into two-weeks periods as the unit of analysis. Checking the accuracy at this level shows a much more valid measure, as in Table A.17. The F1-score at this level of aggregation, which is what matters for the analysis, is 0.75. It indicates we can accurately capture, with the dictionary, whether the body of tweets by an MP in a given two-week period was expressing rather positive or negative sentiment.

Table A.17: Confusion matrix – MP-period-level coding

		Hand-coded sentiment		
		Negative	Neutral	Positive
Dictionary sentiment	Negative	107	9	40
	Neutral	13	10	18
	Positive	70	8	202

J Instructions for validation

Note: The instructions below were given to coders, along with a Google Docs spreadsheet that contained the anonymized text of tweets in the original languages. Coders were asked to use the automatic Google Translate function embedded in Google Sheets to translate those they didn't know into English. Each coder judged the tweets separately and independently.

Instructions:

The spreadsheet contains tweets by politicians across Europe. Our goal is to measure the tone, or sentiment politicians are expressing in those tweets. For that you should indicate, for each tweet, whether the tone or sentiment expressed is **positive, neutral,** or **negative**. What you are evaluating is the tone expressed, not content or subject.

For example, some typical **negative** tweets are criticisms of other parties:

- *"Corbyn thinks last Labour government that wrecked the economy and wrote letter saying all money gone didn't spend enough!"*
- *"The Prime Minister's Brexit negotiating strategy has been a disaster. From day one, @Theresa_ may has looked incapable of delivering a good deal for Britain"*

The criticism can also be of policy, in which case the sentiment being expressed is also **negative**:

- *"Deal is merely licence for the EU to bully and blackmail us – we must reject it"*

In other instances, tweets may be about a negative topic or event, and have a **negative sentiment** being expressed. For example:

- *"Hurling abuse at journalists is never acceptable. Their job is vital to our democracy & it is to report & scrutinise, not support any viewpoint. @BBCJamesCook is a journalist of the highest quality and a total pro - the behaviour he was subjected to last night was disgraceful"*
- *"The tragic loss of life and destruction caused by the flooding in Pakistan is heart-breaking - my thoughts go out to everyone affected. The government must now provide urgent humanitarian support, and we must take action to prevent further devastation caused by climate change."*
- *"I'd like to thank Ella for her question. People across the country are terrified of the energy bill price cap rise this winter. Labour would stop that rise and freeze energy bills, so Ella and families like hers don't pay a penny more."*

However, not every tweet about a negative situation expresses negative sentiment. See this on the Russian invasion of Ukraine, which is rather **positive**:

- *"Our thoughts are with all Ukrainians on your national day. Your courage in the face of Russian aggression has been inspirational. We stand with Ukraine and will support you for as long as it takes."*

Other tweets can be **neutral**, written in a matter-of-fact fashion:

- *"We're recruiting 20,000 more police"*

Positive tweets can also be about policy, e.g.:

- *"The relationship between the UK and the EU will change profoundly with Brexit, but I am determined that we should still have the strongest possible security partnership"*
- *"Today I launched the Public Sector Fraud Authority. I have insisted on maintaining its full range of powers, including access to elected decision-makers. This was an important point of principle and today is a victory for the British taxpayer."*

or simply excitement about announcing their daily activities or commenting on daily news:

- *"Morning folks! Fantastic coffee to start day two of our campaign"*
- *"Congratulations to all those receiving their GCSE results today! Leaving school is a huge moment, with so many exciting choices ahead. Have a great day celebrating your achievements, and enjoy your next steps."*

References

Proksch, Sven-Oliver, Will Lowe, Jens Wäckerle and Stuart Soroka. 2019. "Multilingual sentiment analysis: A new approach to measuring conflict in legislative speeches." *Legislative Studies Quarterly* 44(1):97–131.