The technocratic side of populist attitudes: evidence from the Spanish case

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Online Appendix

Survey Items tapping technocratic attitudes:

The ten items included in our survey were first validated from Bertsou and Caramani (2020). We translated the original wording into Spanish. The question wording for all of them has the following heading:

¿Cuál es tu grado de acuerdo con cada una de las siguientes frases? Utiliza una escala de 0 a 10, donde 0 significa "Totalmente en desacuerdo" y 10 "Totalmente de acuerdo" [What is your degree of agreement with each of the following sentences? Use a scale from 0 to 10, where 0 means "totally disagree" and 10 "totally agree"]

The text of each of the items reads as follows:

Elitism

1. *La gente común no sabe qué políticas son buenas para ellos/as mismos/as [Ordinary people don't know what policies are good for them]*
2. *Los líderes políticos deben tomar decisiones de acuerdo con su opinión, no con la voluntad del pueblo [Political leaders should make decisions according to their best judgment, not the will of the people]*

Expertise

3. *Los políticos deben ser como gerentes y arreglar lo que no funciona en la sociedad [Politicians should be like managers and fix what does not work in society]*
4. *Los líderes políticos deben tener mayor nivel educativo y estar más capacitados que los/as ciudadanos/as comunes [The leaders of my country should be more educated and skilled than ordinary citizens]*
5. *Los problemas sociales deben abordarse teniendo en cuenta la evidencia científica, no las preferencias ideológicas [Social problems should be addressed based on scientific evidence, not ideological preferences]*
6. *Los problemas que enfrenta el país requieren de expertos/as para resolverlos [The problems facing my country require experts to solve them]*

Anti-politics

7. *Las mejores decisiones políticas son las tomadas por expertos/as que no son políticos [The best political decisions are taken by experts who are not politicians]*
8. *Los partidos políticos en vez de ayudar perjudican a la sociedad [Political parties do more harm than good to society]*
9. *Los políticos solo quieren promover los intereses de quienes los votan y no los intereses de todo el país [Politicians just want to promote the interests of those who vote for them and not the interest of the whole country]*
10. *Los políticos dedican todo su tiempo a buscar ser reelegidos en lugar de solucionar problemas [Politicians spend all their time seeking re-election instead of fixing problems]*

Table A.1: Summary statistics

	N	Mean	SD	Min	Max
EL1	2036	5.39	3.02	0	10
EL2	2036	2.28	2.75	0	10
EXP1	2036	8.20	2.09	0	10
EXP2	2036	8.11	2.40	0	10
EXP3	2036	8.08	2.21	0	10
EXP4	2036	8.51	1.96	0	10
AP1	2036	7.40	2.35	0	10
AP2	2036	6.79	2.60	0	10
AP3	2036	7.29	2.58	0	10
AP4	2036	8.09	2.30	0	10
POP1	2036	6.99	2.42	0	10
POP2	2036	5.84	2.80	0	10
POP3	2036	6.23	2.69	0	10
POP4	2036	7.74	2.28	0	10
POP5	2036	7.55	2.24	0	10
POP6	2036	4.79	3.16	0	10
Populist attitudes index	2036	6.52	1.67	0	10
Sex	2036	0.51	0.50	0	1
Age	2036	49.88	16.00	19	92
Ideology	1856	4.12	2.72	0	10
Political interest	2036	2.55	0.85	1	4
Interpersonal trust	2036	4.48	2.59	0	10
Trust in political parties	2036	2.67	2.43	0	10
Current economic situation	2036	3.14	1.26	1	7
Territorial preferences	2036	3.14	1.64	1	6

Table A.2: Correlation matrix between populist and technocratic attitudes.

	Populist Index	**EL1**	**EL2**	**EXP1**	**EXP2**	**EXP3**	**EX4**	**AP1**	**AP2**	**AP3**	**AP4**
Populist Index	1										
EL1	0.092*	1									
EL2	-0.106*	0.122*	1								
EXP1	0.282*	0.099*	-0.165*	1							
EXP2	0.177*	0.166*	-0.072*	0.380*	1						
EXP3	0.222*	0.110*	-0.119*	0.410*	0.363*	1					
EXP4	0.242*	0.098*	-0.164*	0.475*	0.433*	0.487*	1				
AP1	0.325*	0.159*	-0.063*	0.408*	0.378*	0.443*	0.507*	1			
AP2	0.386*	0.143*	-0.079*	0.288*	0.260*	0.280*	0.299*	0.412*	1		
AP3	0.289*	0.132*	-0.056*	0.297*	0.321*	0.311*	0.355*	0.387*	0.422*	1	
AP4	0.324*	0.115*	-0.144*	0.364*	0.373*	0.387*	0.425*	0.445*	0.535*	0.498*	1

Table A.3: Summary statistics for the three principal components

	Obs	Mean	Std. Dev.	Min	Max
Factor 1	2036	-2.62E-09	1	-5.267	1.552
Factor 2	2036	-2.17E-09	1	-3.985	1.559
Factor 3	2036	5.62E-10	1	-2.628	3.054

Table A.4: Three dimensions of technocracy as correlates of populist attitudes (index). OLS regression results. Model *with* and *without* control variables.

Dependent Variable: Populist attitudes (index)		
Factor 1 (Pro-Expert)	0.241*** (0.041)	0.211*** (0.043)
Factor 2 (Anti-Politics)	0.578*** (0.041)	0.607*** (0.049)
Factor 3 (Elitism)	-0.048 (0.037)	-0.058 (0.039)
Sex		0.028 (0.07)
Age		0.007*** (0.003)
Ideology		-0.039** (0.019)
Political interest		0.003 (0.048)
Interpersonal trust		0.043*** (0.015)
Trust in parties		-0.001 (0.02)
Personal eco. situation		0.011 (0.032)
Territorial preferences		0.018 (0.025)
Level of education		-0.176*** (0.027)
Constant	6.524*** (0.033)	6.574*** (0.359)
Controls for vote 2019	Yes	Yes
Obs.	2,036	1,856
R-squared	0.191	0.228

Latent Class Analysis. Predicting membership in the remaining latent groups

Predicting membership in Group 3 - "Technocratic Citizens"

Here we explore the factors that predict membership into the latent class of "Technocratic citizens" (group 3). To do so, we replicate the same strategy we employed in the main text to study the factors that predict being in group 6 "technopopulist citizens." The outcome variable is the predicted probability of being in Group 3 for each respondent.

Figure A.1 presents the results of this analysis. It displays the coefficients and confidence intervals of the linear regression analysis. This figure follows the same logic as **Figure 6** in the main text, only referring to membership into the group of "technocratic citizens" instead of that of "technopopulists." As the figure shows, the respondent's sex does not help predict membership into the group of technocrats. Age, on the other hand, does, albeit only with a $p<0.1$ significance level. The older the respondent, the lower the likelihood of being a technocrat (see left-hand plot in **Figure A.2**). Interestingly, education indicators do not predict being a technocrat, and neither does political interest. On the other hand, trust variables are negatively associated with being a technocratic citizen: the higher the level of either interpersonal or political trust, the lower the probability of being part of latent class 3 "technocratic citizens".

The coefficients for ideology and ideology squared are not statistically significant, but their joint effect is. As the right-hand plot in **Figure A.2** shows, the more right-wing the respondent, the higher the probability of being a technocrat. The individual's economic situation, however, does not correlate with being a technocrat. Lastly, preferences over federalism in Spain help predict whether respondents have technocratic leanings or not. The baseline category of these dummy variables is the current statu quo. Those individuals who want to move the statu quo in the direction of stronger regional powers -or even to make secession legal- are less likely to be technocrats. Those that want weaker regional powers, in contrast, are *more* likely to be technocratic. This does not extend to those who want to remove regional powers altogether: Their technocratic attitudes do not seem to differ from that of supporters of the statu quo.

Figure A.1. Predicting membership into latent-class *"Technocratic citizens"*. Regression coefficients and 95% confidence intervals

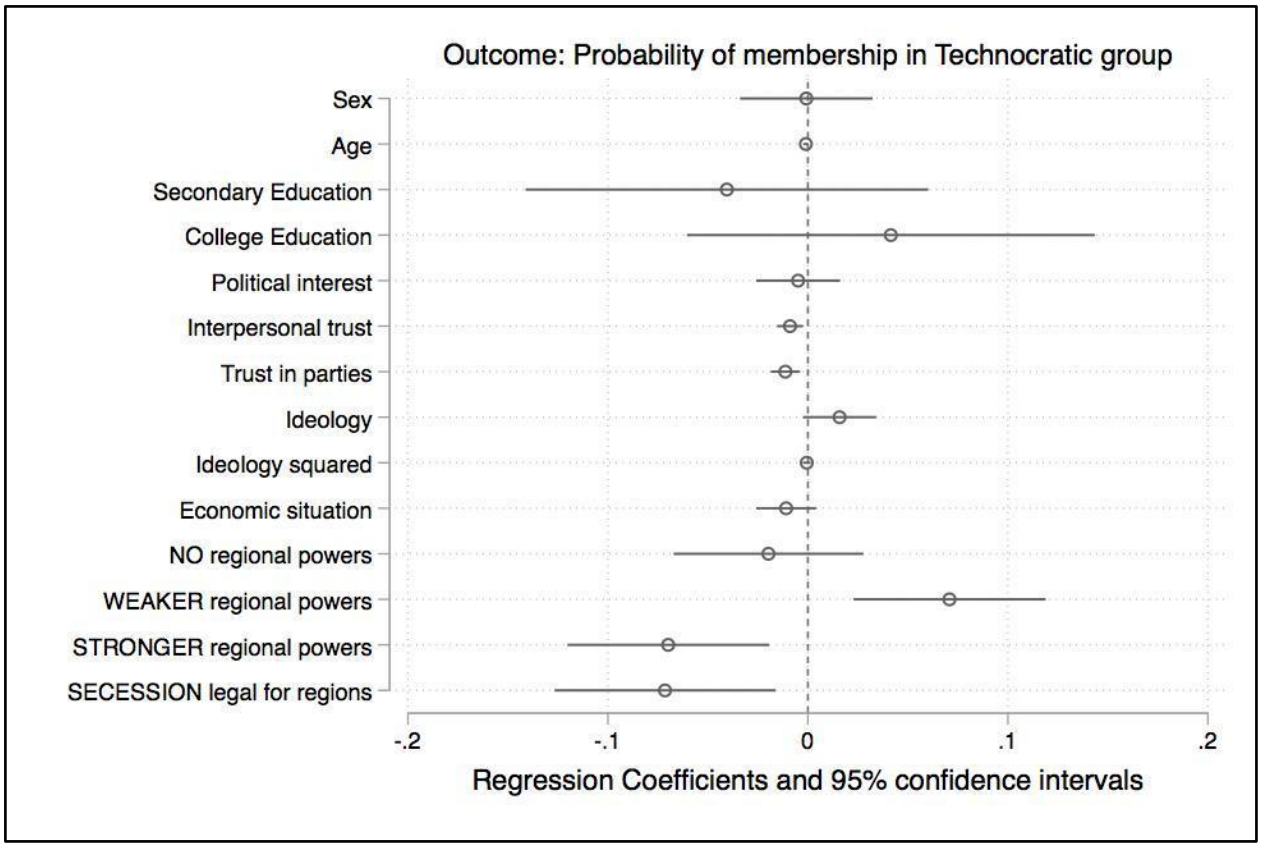
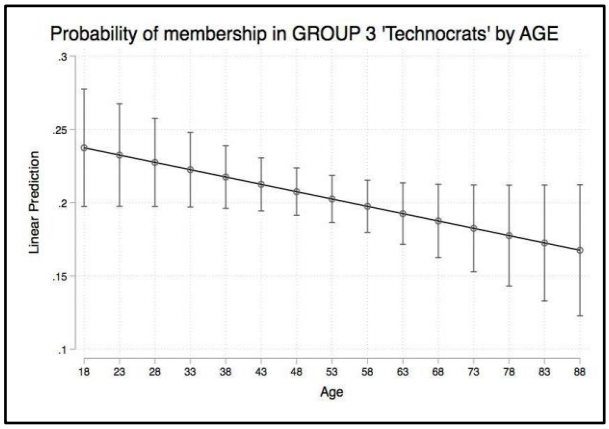
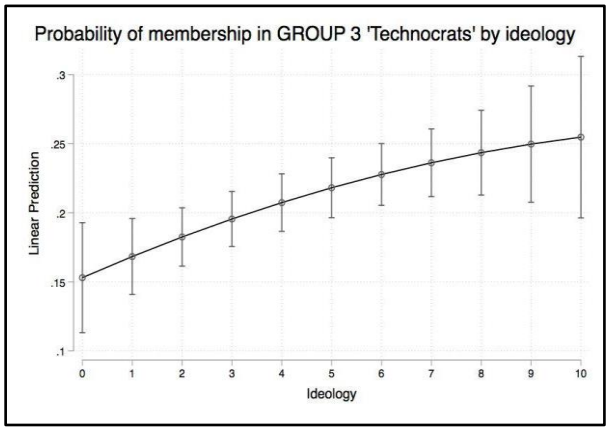


Figure A.2. The effect of age and ideology on the probability of membership in the *Technocratic* group.





Predicted values of the outcome variable and 95% confidence intervals.

Predicting membership in Group 3 - "Technopol Citizens"

We now replicate the analysis above to study the factors that predict membership into the category of "technopol citizens", those that refrain from anti-politics views but at the same time endorse pro-expertise attitudes (Joignant 2011; Alexiadou 2020).

Figure A.3 plots the regression coefficients and their confidence intervals. To ease the interpretation of the effect of Age and Ideology on the probability of being a "technopol", **figure A.4** presents the marginal effects of these two variables. Results show that being a woman correlates negatively with being a "technopol", although the coefficient barely reaches statistical significance: $p= 0.07$. The same applies to age: technopol citizens tend to be older, but the coefficient is only statistically significant at the $p<0.1$ level. The left-hand side plot of **Figure A.4** presents the predicted marginal effect of age. Educational achievement indicators, in turn, appear to be unrelated to the probability of being a technopol. The same goes for political interest and interpersonal trust.

A key result which confirms our intuition that this latent class can be called "technopol citizens" is that trust in political parties has a strong positive effect on the probability of being in the group. In other words, "technopols" have a higher-than-average level of trust in parties. The relationship between ideology and the likelihood of being a technopol is also very relevant. The right-hand side image in **Figure A.4** shows that leftist citizens are the ones with the highest probability of being in the group. The probability drops continuously and is lowest among right-wing citizens. None of the remaining variables is relevant to predict whether the respondent can be classified as a technopol, whether it is the individual's economic situation or her preferences on federalism in Spain.

Figure A.3. Predicting membership into latent-class *"Technopol citizens"*. Regression coefficients and 95% confidence intervals

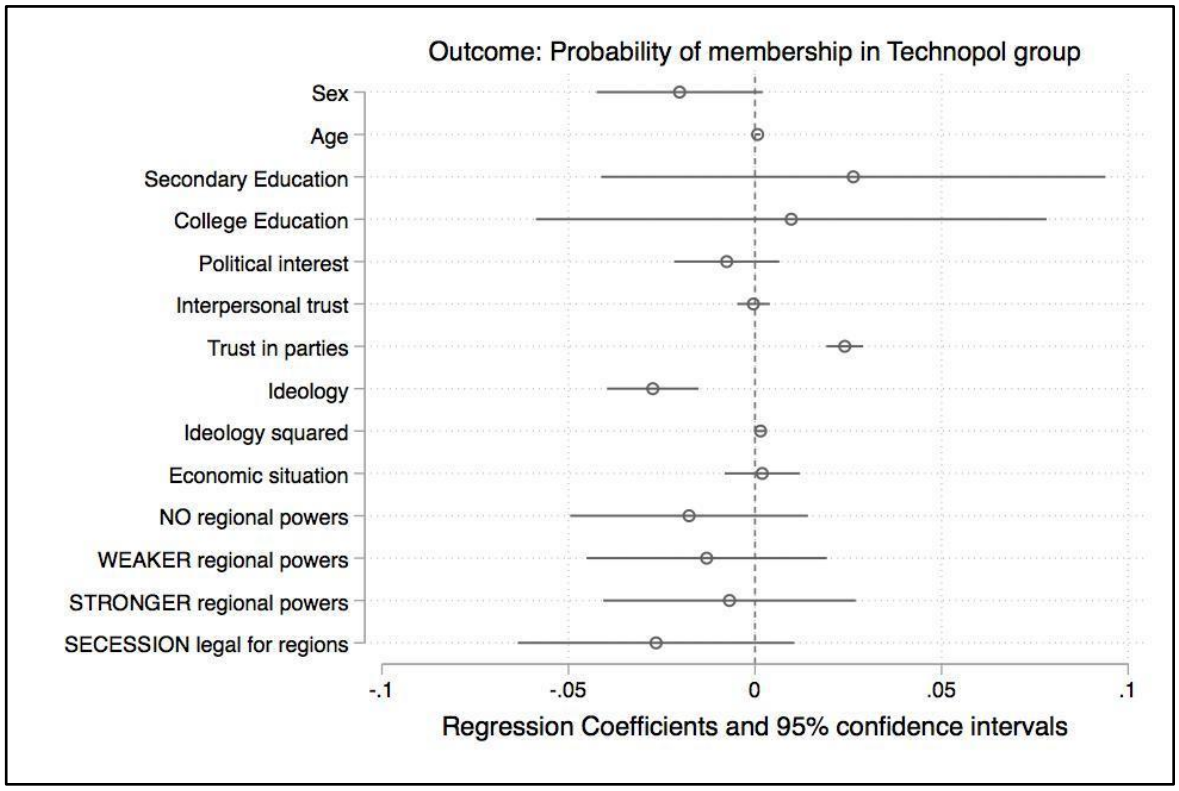
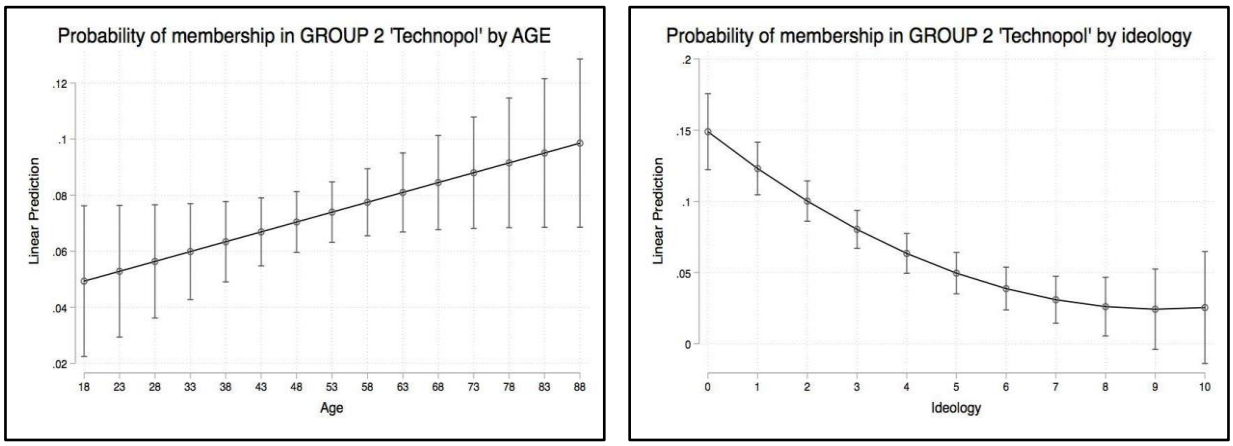


Figure A.4. The effect of age and ideology on the probability of membership in the *Technopol* group.



Predicted values of the outcome variable and 95% confidence intervals.

Predicting membership in Group 1- "(strong) Party Democrats"

We now replicate the analysis above to study the factors that predict membership into the category of "(strong) party democrats", those that eschew populism and (almost all) technocratic attitudes.

Figure A.5 presents the evidence. It plots the regression coefficients and their confidence intervals. To facilitate the interpretation of the effect of Age and Ideology on the probability of being a (strong) *Party Democrat*, we plot the marginal effects of these variables in **Figure A.6**. The evidence points to the fact that being a woman might correlate negatively with being in this group, although the effect is not statistically significant. The effect of age, as seen on the left-hand side of **Figure A.6**, is null. The correlation between secondary or college education with membership in the group is also negative, although the effect is not statistically distinguishable from zero. The same occurs with interpersonal trust. However, there is a clear pattern with respect to political interest and trust in parties: (strong) party democrats tend to have lower levels of interest in politics but higher trust in political parties. In terms of ideology, the right-hand plot of **Figure A.6** shows that the lowest probability of being a (strong) party democrat occurs among centrist citizens. It increases towards the extreme, particularly towards the left of the spectrum. Lastly, none of the dichotomous variables regarding the preferences about federalism seem to be relevant to predict whether the individual is a party democrat or not.

Figure A.5. Predicting membership into latent-class *"(strong) Party Democratic citizens"*. Regression coefficients and 95% confidence intervals.

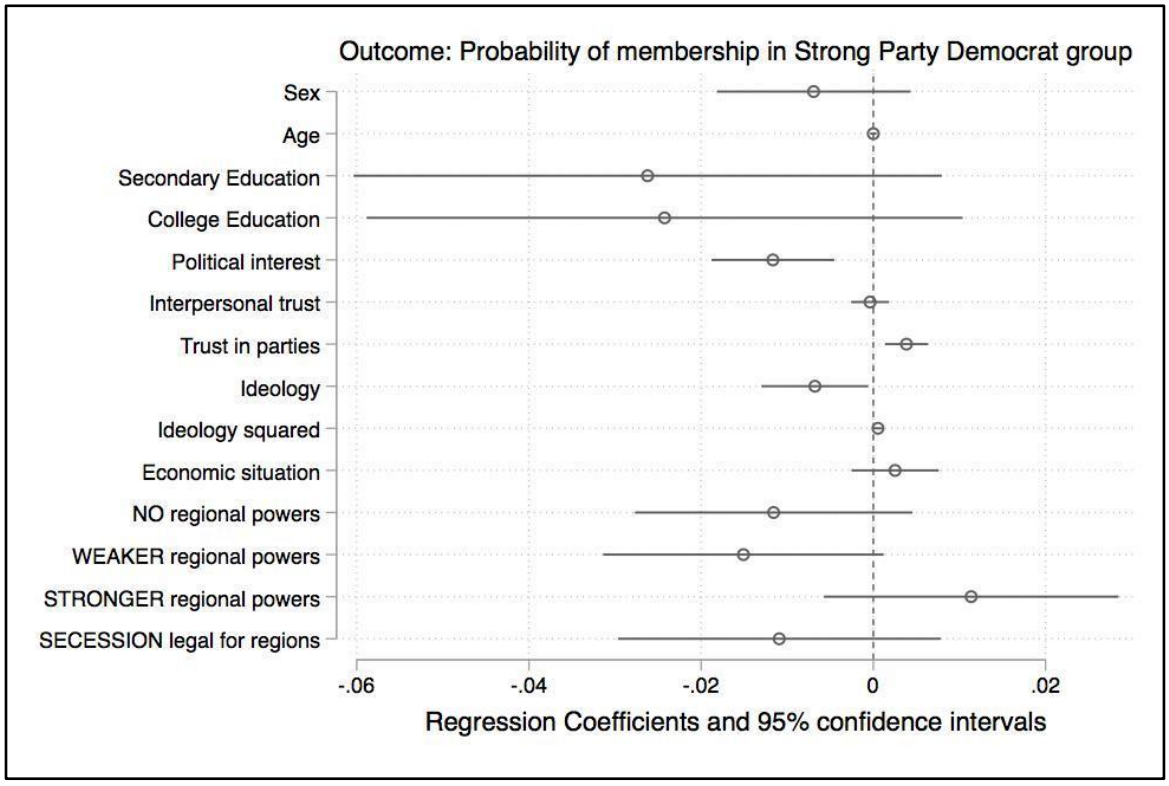
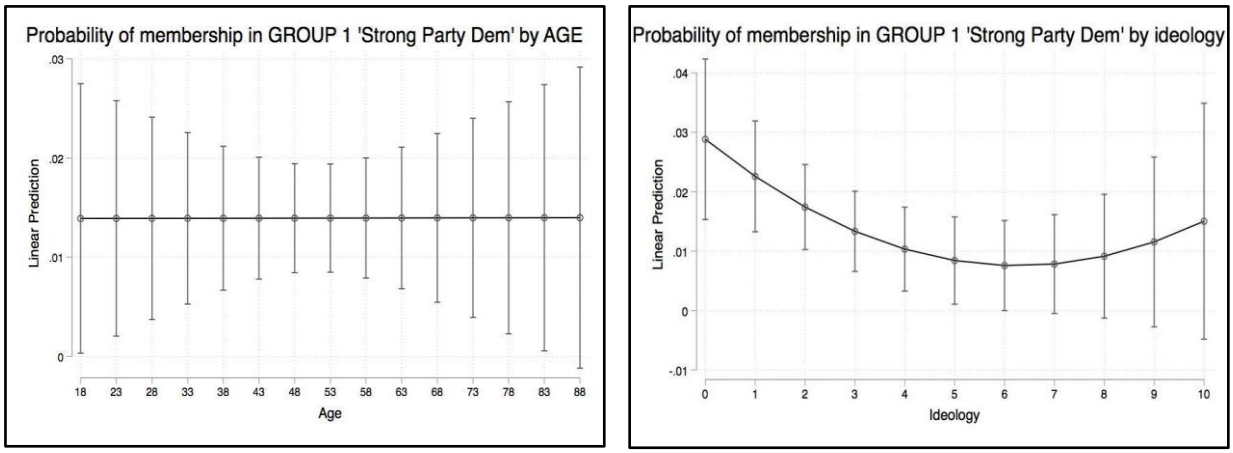


Figure A.6. The effect of age and ideology on the probability of membership in the *Strong Party Democrat* group.



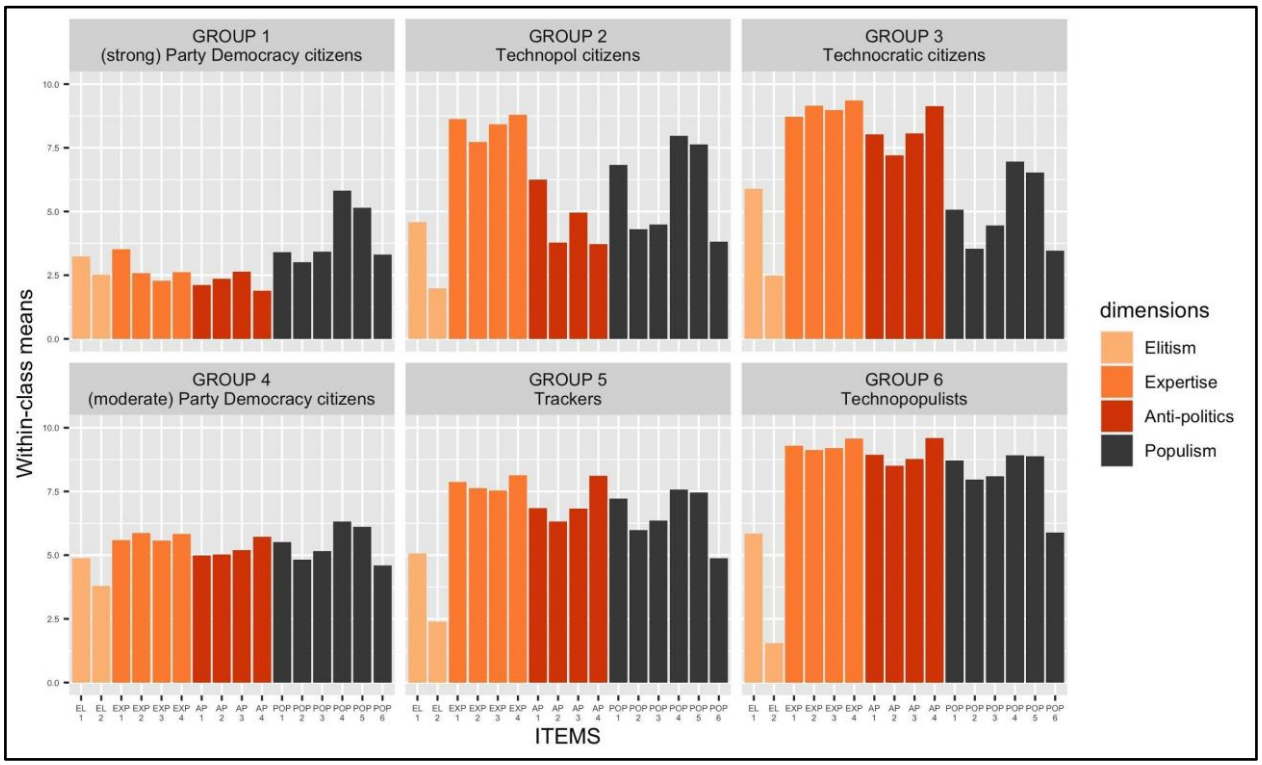
Predicted values of the outcome variable and 95% confidence intervals

Latent-Class Analysis. Additional evidence

In order to describe the pattern of responses within each latent group, **Figure 5** in the main text presented the difference between the within-group average and the global average for each survey item. That approach allows identifying how the group deviates from the opinions of the sample as a whole. For the sake of completeness, the following plot (**Figure A.7**) presents just the within group averages without considering the difference with the full sample mean.

The plots in **Figure A.7** confirm the evidence in the main text. Both groups of "Party Democracy citizens", particularly the "strong" one, present low levels of anti-politics and pro-expertise sentiments. Compared to the other groups, they are also less favourable of populist statements. In terms of elitism, they are somewhat more sceptical than the rest of the latent classes. The "trackers", Group 5, essentially replicate the average responses to each question. Group 2, "the technopols" distinguish themselves with their strong pro-expertise views without endorsing anti-party statements. They are also somewhat sceptical of populism and of elitism. Compared to this group, "The technocrats" -Group 3- are significantly more critical of politics and political parties as shown in their strong support for the anti-politics statements. Lastly, "technopopulists" -Group 6- present very supportive views of expertise, anti-politics, and populism, although they are not fully onboard with elitism views.

Figure A.7. Latent-Class Analysis. Within-class averages for each of the sixteen survey items.



The figure includes six plots, one for each of the latent-classes of respondents identified. Bars represent the within-class average for each survey item. Colours represent the three dimensions of technocratic attitudes,

elitism, expertise, and anti-politics, as well as populism. The title of each plot indicates the group number and the "name" we have given to it, based on the pattern of responses.

Table A.5 presents the full regression output of the model that predicts membership into latent group 6, the so-called "technopopulist citizens." The model uses the respondent-specific probability of being part of that group. Thus, the outcome of interest ranges from 0 to 1. The results of the regression model are presented graphically in the main text in **Figure 6**.

Table A.5. Predicting membership in latent class GROUP 6 "Technopopulist citizens". OLS regression. Continuous Outcome: Predicted probability of belonging to the group.

	OUTCOME: Probability of membership into GROUP 6 "Technopopulist citizens"
Sex	-0.01
	(0.02)
Age	0.00***
	(0.00)
EDUCATION (baseline cat: primary education)	
Secondary education	0.06
	(0.06)
College education	0.03
	(0.06)
Political interest	-0.01
	(0.01)
Interpersonal trust	0.00
	(0.00)
Trust in parties	-0.06***
	(0.00)
Ideology	-0.04***
	(0.01)

Ideology squared	0.01***
	(0.00)
Economic situation	-0.00
	(0.01)
PREFERENCES REGIONAL DEVOLUTION: (baseline category: favor status quo)	
NO regional powers	0.17***
	(0.03)
LOWER regional powers	0.05*
	(0.03)
HIGHER regional powers	0.09***
	(0.03)
SECESSION is allowed	0.09***
	(0.03)
Constant	0.33***
	(0.09)
Observations	1,685
R-squared	0.19

Ordinary Least Squares Regression. Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Predicting membership in latent group 6 "Technopopulist citizens". Alternative Approach.

Here we replicate the analysis of the individual-level factors that predict membership in Group 6, that of "Technopopulist citizens". We apply an alternative approach to the one presented in the main text. Whereas the main manuscript uses the individual-level continuous probability of membership in that group, here we use a dummy variable that takes the value of 1 if the individual's probability of belonging to the group of "Technopopulist citizens" is higher than that of any of the other five latent classes. The model we estimate with this dichotomous outcome is a linear probability model.

Table A.6 presents the full regression results and **Figure A.8** graphically displays the evidence by plotting the point estimates and their 95% confidence intervals. Both the table and the figure show that this alternative estimation approach yields substantially the same results as the one employed in the main text. Gender does not appear to have any effect on membership. Age, on the other hand, correlates positively and significantly with being a "Technopopulist." In line with the evidence in the main text, education achievement indicators do not predict being in the latent class. The same applies to political interest and interpersonal trust. Trust in parties, however, is strongly (and negatively) correlated with being a *technopopulist*. The effect of ideology is very similar in this dichotomous outcome model as in the continuous model of the main text. The coefficient for ideology is negative and the coefficient for its squared term is positive. Both are statistically significant. Also consistent with the results of the main text are the results for the respondent's economic situation and her views on federalism in Spain. The pocketbook economic evaluation is not associated with being a "technopopulist". On the other hand, preferences over federalism are associated: supporters of the current statu quo are the ones that are least likely to be "technopopulists". Conversely, favoring a change of the federalism arrangement in Spain -in either direction- correlates positively with being in the "technopopulist" latent group.

Figure A.8. Predicting membership into latent-class *"Technopopulist citizens"*. Regression coefficients and 95% confidence intervals. **Outcome: Dummy variable**. Linear probability model.

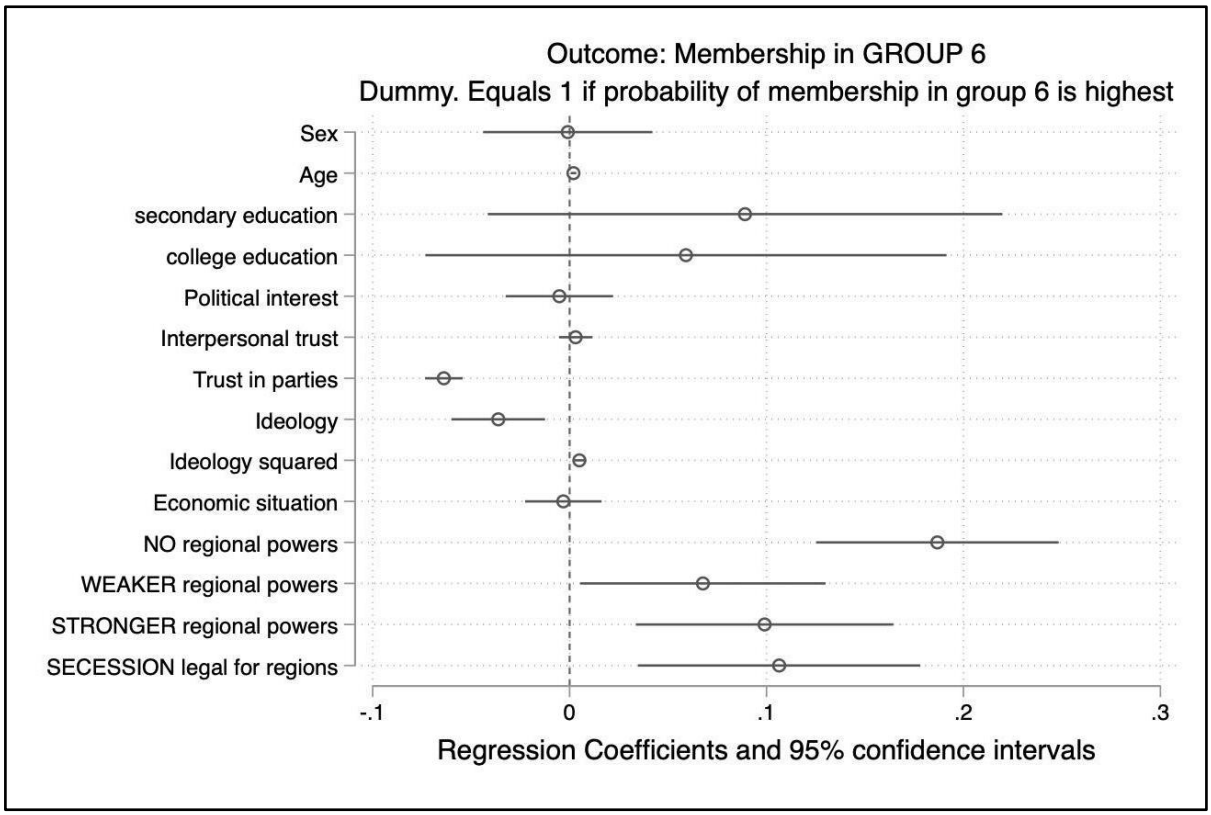


Table A.6. Predicting membership in latent class "Technopopulist citizens". Linear probability model. Outcome as **dichotomous variable**: whether GROUP 6 is the latent-class the individual has the highest probability of belonging to.

	OUTCOME: Dummy: Whether probability of membership into GROUP 6 is higher than for any other latent-class.
Sex	-0.00
	(0.02)
Age	0.00***
	-0.00
EDUCATION (baseline cat: primary education)	
Secondary education	0.09

	(0.07)
College education	0.06
	(0.07)
Political interest	-0.01
	(0.01)
Interpersonal trust	0.00
	(0.00)
Trust in parties	-0.06***
	(0.00)
Ideology	-0.04***
	(0.01)
Ideology squared	0.00***
	(0.00)
Economic situation	-0.00
	(0.01)
PREFERENCES REGIONAL DEVOLUTION: (baseline category: favor status quo)	
NO regional powers	0.19***
	(0.03)
LOWER regional powers	0.07**
	(0.03)
HIGHER regional powers	0.10***
	(0.03)
SECESSION is allowed	0.11***
	(0.04)
Constant	0.29***

	(0.10)
Observations	1,685
R-squared	0.16

Linear Probability Model. Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Robustness Check. Latent Class Analysis with 7 and 5 latent groups

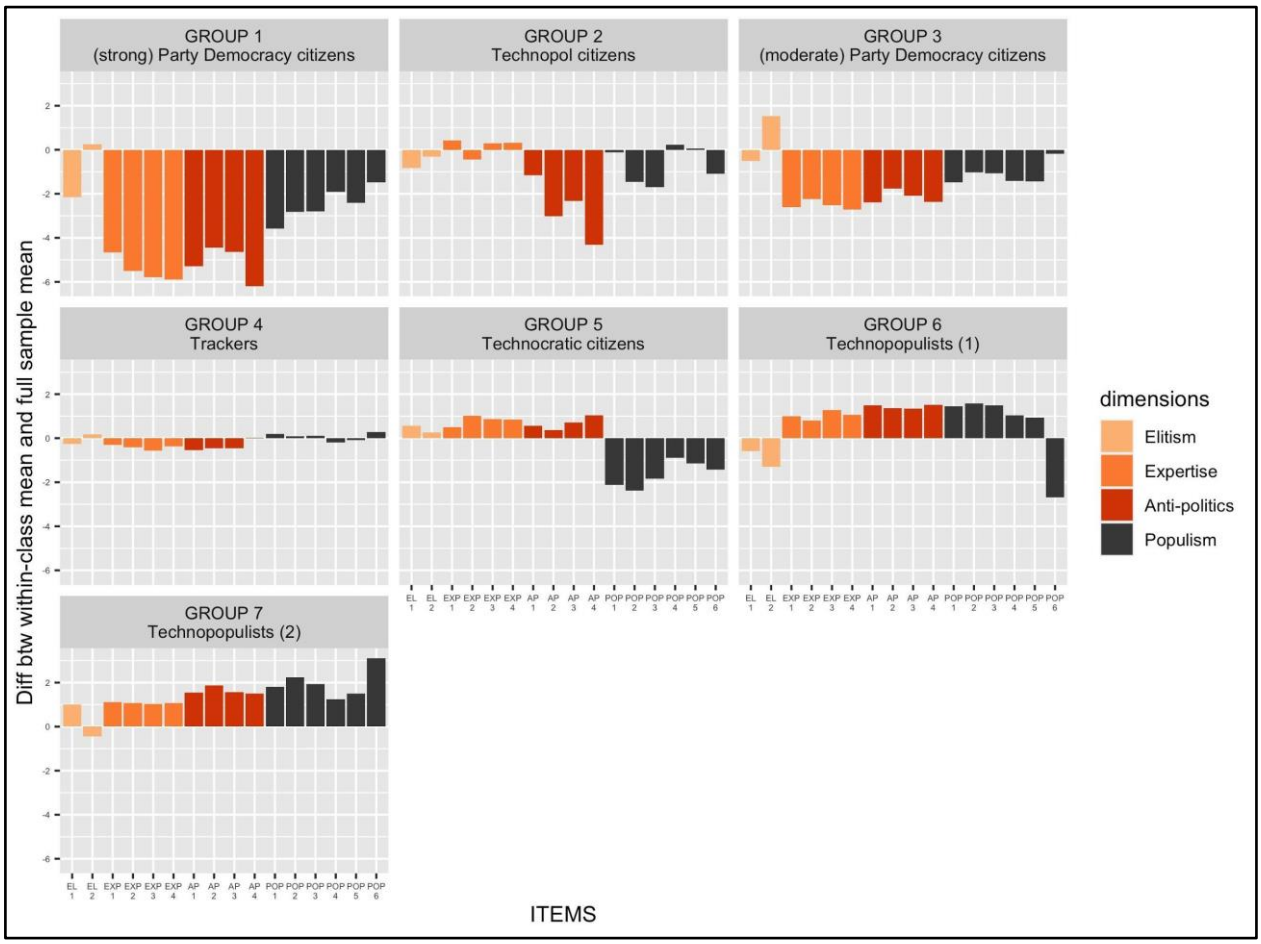
The main text presents a latent class analysis with six classes or groups. The reason for that is that the Bayesian Information criterion (BIC) for 6 classes was significantly better than for any lower number of groups, and the improvement when increasing the analysis to 7 classes was very marginal. In any case, in this section we show that our findings are robust to changing the number of latent classes. Indeed, the same qualitative findings arise when we implement either a 7-class analysis or a 5-class one.

7-groups latent class analysis

Figure A.9 presents the main results of the 7-group latent class analysis. Just like **Figure 5** in the main text, it displays the difference between the within-class average and the full-sample average for each of the 16 survey items, the 10 pertaining to technocratic attitudes and the 6 belonging to populism.

As can be seen from the pattern of responses, respondents in Group 1 and Group 3 can be characterized as "party democracy citizens". In both classes, respondents are much less favourable to expertise, anti-politics opinions, and populism than the sample as a whole. Hence, they tend to eschew (most) technocratic and populist views. The 7-class analysis also uncovers a group of "technopol citizens" (group 2), i.e. respondents who tend to reject populism, support political parties -they abstain from anti-politics opinions- but are otherwise more or less favourable towards expertise. Much like in the main-text analysis, there is also a class of respondents, "the trackers", which largely mimics the average response for each item. Group 5 can be characterized as a class of "technocratic citizens": They are strongly averse towards populism, but otherwise they support all three subdimensions of technocratic attitudes: *elitism*, *expertise*, and *anti-politics*. The last two groups, groups 6 and 7, can be defined as two versions of "technopopulists". Respondents in both classes are largely favourable towards populism but that doesn't lead them to reject technocratic statements: they have stronger-than-average levels of support for anti-politics views as well as pro-expertise statements. Despite some differences between these two groups, the qualitative similarity of their responses can justify considering both as "technopopulists."

Figure A.9. Latent-class analysis. **7-class model**. Each plot represents the difference between the within-class average and the full-sample average for each of the 16 survey items.



The figure includes seven plots, one for each of the latent classes of respondents identified. Bars represent the difference between the within-class average for the survey item and the full-sample average. Colours represent the three dimensions of technocratic attitudes, elitism, expertise, and anti-politics, as well as populism. The title of each plot indicates the group number and the "name" we have given to it, based on the pattern of responses in each group.

In sum, the 7-class analysis uncovers the same types of groups with the exception that the "technopopulists" are now split into two separate groups. The proportion of respondents in each group is also consistent with the analysis in the main text (compare Table 2 and Table A.7). If the 6-class analysis indicated that "technopopulist citizens" amounted to 1/3 of the sample, in the 7-class model the sum of both "technopopulist" classes, groups 6 and 7 adds to 34% of the sample. The proportions of "technopol citizens", moreover, is identical in the 6-class and the 7-class model. Proportions are also very similar for "trackers" and for "technocrats": 29% vs 28% and 19% vs 17%. On the whole, we can thus conclude that the substantive conclusions that arise with a 7-group latent class model are fully consistent with the results of the 6-group model.

Table A.7. Proportion of respondents in each latent group. **7-class analysis**.

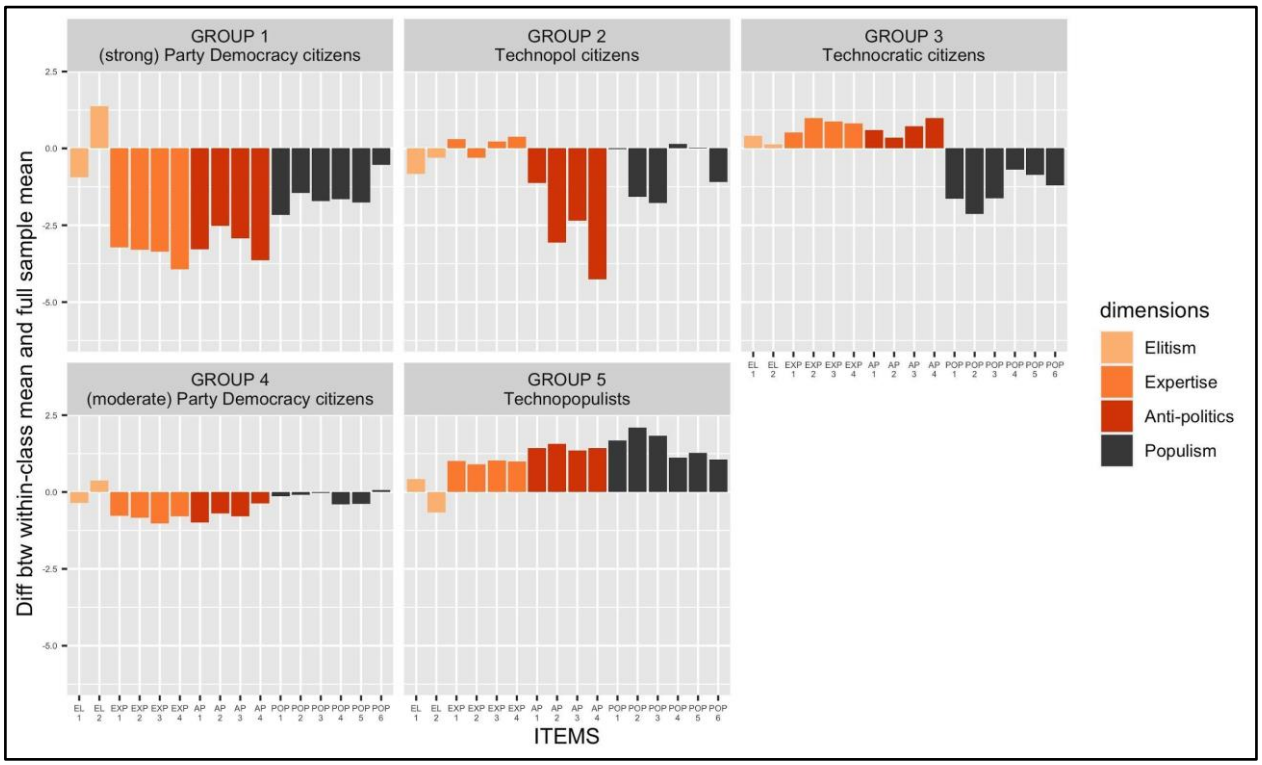
Latent Class	**Size** (as proportion of the total survey sample)
Group 1- "(strong) Party Democracy citizens"	2%
Group 2 - "Technopol citizens"	7%
Group 3 - "(moderate) Party Democracy citizens"	12%
Group 4 - "Trackers"	28%
Group 5 - "Technocratic citizens"	17%
Group 6 - "Technopopulists (1)"	13%
Group 7 - "Technopopulists (2)"	21%

5 latent-class analysis

Figure A.10 presents the main results of the 7-group latent class analysis. Just like **Figure 5** in the main text, it displays the difference between the within-class average and the full-sample average for each of the 16 survey items, the 10 pertaining to technocratic attitudes and the 6 belonging to populism.

The main difference between the 5-class analysis and the 6-class one is that the group of "trackers" disappears, and their respondents are placed in the remaining five groups. As can be seen in **Table A.8**, this increases the proportion of participants assigned to the two "party democracy citizens" groups: 37% of respondents vs 14% in the 6-class model. The shape of responses and the share of the sample for the remaining classes does not change much. There is still a group of "technopol citizens" which refrain from anti-politics views, support expertise, but are skeptical of populism. Its share is still 7% of the sample. There is also a class of "technocratic citizens" which reject populism but espouse all three dimensions of technocratic attitudes. Their share of the sample is similar to the analysis in the main text: 22%. Lastly, a large group of "technopopulist" respondents arises as well. They represent more than one third of the sample (35%) and their responses show strong support for populism views as well as for two of the three dimensions of technocracy: Expertise and anti-politics.

Figure A.10. Latent-class analysis. **5-class model**. Each plot represents the difference between the within-class average and the full-sample average for each of the 16 survey items.



The figure includes five plots, one for each of the latent classes of respondents identified. Bars represent the difference between the within-class average for the survey item and the full-sample average. Colours represent the three dimensions of technocratic attitudes, elitism, expertise, and anti-politics, as well as populism. The title of each plot indicates the group number and the "name" we have given to it, based on the pattern of responses in each group.

Table A.8. Proportion of respondents in each latent group. 5-class analysis.

Latent Class	**Size** (as proportion of the total survey sample)
Group 1- "(strong) Party Democracy citizens"	9%
Group 2 - "Technopol citizens"	7%
Group 3 - "Technocratic citizens "	22%
Group 4 - "(moderate) Party Democracy citizens"	28%
Group 5 - "Technopopulist citizens"	35%