Appendix

Additional details on the coding procedure of the main indicator of restrictions of freedom of expression

Our aggregated indicator intends to captures broad political restrictions of the freedom of expression of different types. It captures both legal and non-legal (policy, administrative, executive) restrictions. It also includes systematic repression of journalist, insofar as it is not just an isolated case but sustained. To code the presence of pandemic related restrictions of freedom of expression. We used reports from ICNL's COVID-19 Civic Freedom Tracker (ICNL 2021) and qualitative data provided International IDEA's Global Monitor of COVID-19's impact on Democracy and Human Rights (International IDEA 2021b).

From ICNL we considered all reports concerning the issues of "Press Freedom" and "Expression" and from IDEA's Global Monitor, we used reports about "Freedom of Expression" and "Media Integrity". From both sources, we only used reports about events that occurred in 2020. As a first step, we coded the presence of pandemic-related restriction of freedom of expression for all countries, where both ICNL and IDEA report respective issues. We coded the absence of pandemic related restriction of freedom of expression for all countries for which neither ICNL nor IDEA reported any issues. For the remaining cases were ICNL and IDEA disagree in their judgement, we checked the primary sources and evidence they used to resolve disputed coding. In cases of doubt, we also considered additional sources (e.g., PanDem country reports).

Note that our main indicator considers restrictions of freedom of expression as binary classification, i.e., we either observe substantial restrictions or not. Accordingly, we do not capture different degrees of restrictions. We opted for a binary classification for conceptual reasons. During the Covid-19 pandemic, different types of restrictions came about in multiple ways, e.g., as laws, policies, administrative order, or executive decree, and targeted different aspects of freedom of expression. Given our data sources described above, we were confident of distinguishing cases where substantial restrictions occurred from those where they did not occur. However, we were not able to determine a rank order for the severity of the different types of restrictions that would allow us to measure degrees of restrictions in a systematic way. We suggest that theoretical work on the conceptual and practical relevance of different forms of restrictions of freedom of expression to be a promising area for further research.

Descriptive statistics

Table A1: Summary statistics for covariates

Variable	Obs	Mean	Std. Dev.	Min	Max
Liberal Democracy Index	175	0.41	0.26	0.01	0.88
GDP per capita, (log)	171	8.6	1.48	4.66	11.65
Covid-19 Cases per mil. (log)	171	8.03	2.23	1.4	11.24
Populist Rule	175	0.1	0.3	0	1

Table A2: Summary statistics for Media Attacks, count measure

Variable	Obs	Mean	Std. Dev.	Min	Max
Media Attacks	175	1.554	4.037	0	37

Table A3: Frequency of any Media Attack, binary

	Freq.	Percent
No Media Attack	103	58.86
At least one Media Attack	72	41.14
Total	175	100

Table A4: Frequency of Mass-Mobilization

Pro-Democracy Mobilization	Freq.	Percent
None: Virtually no events	20	11.43
Low: Several small-scale events	40	22.86
Medium: Many small-scale events	30	17.14
High: Several large-scale and small-scale events	51	29.14
Very High: Many large-scale and small-scale events.	34	19.43
Total	175	100

Analysis of Media Attacks (IPI)

We collected data from IPI's COVID-19 Press Freedom Tracker, which is monitoring attacks on journalists and the press worldwide linked to the pandemic. Using this data, we created a count measure, *media attacks*, which captures the number of pandemic-related media attacks that occurred in 2020. Note that we excluded reports about attacks on journalists where the perpetrator was a non-state actor, e.g., ordinary citizens or members of a CSO. We also created an alternative binary measure, which takes the value of 1 if at least one media attack occurred and the value of 0 otherwise. Now Table A5 reports the results of the analysis of the number of media attacks reported by the IPI using a negative binomial estimator for count data.
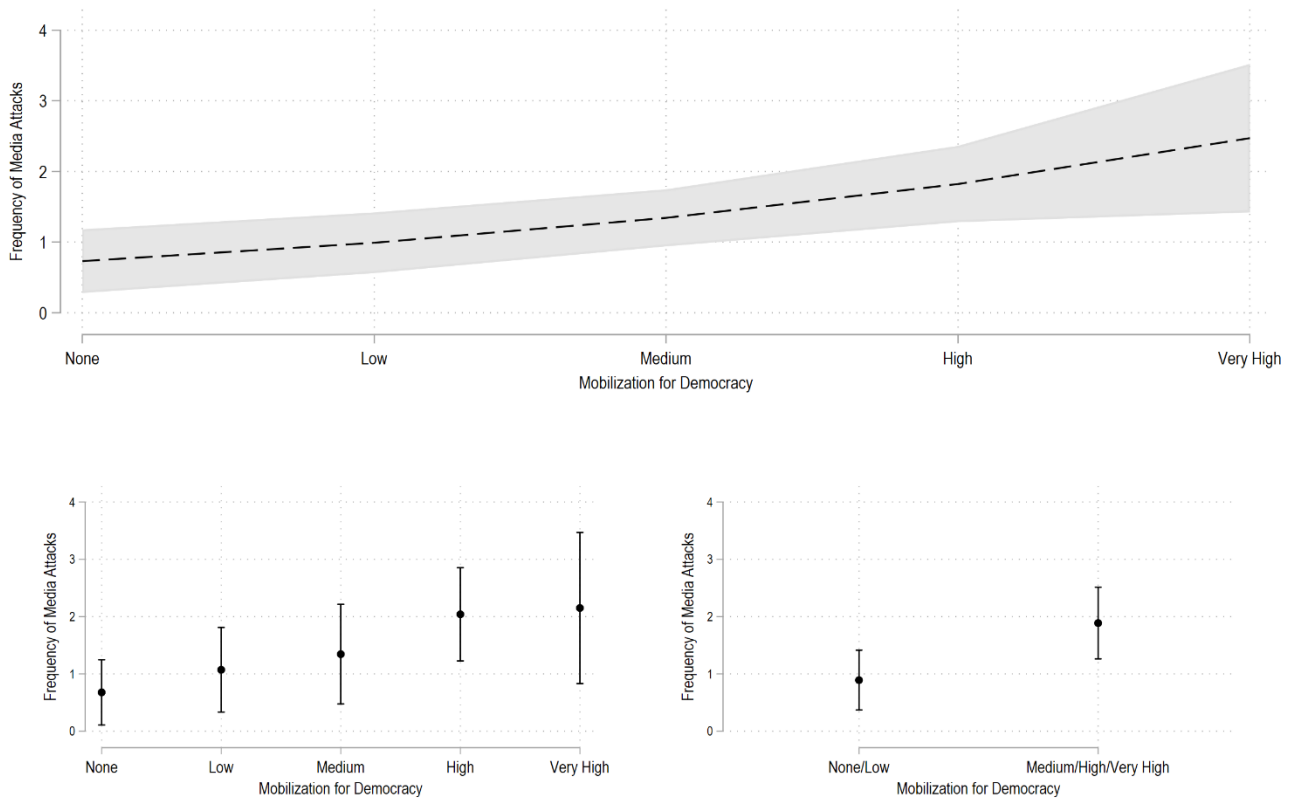
As shown in Table A5, the indicators of pro-democracy mobilization have a positive effect on the frequency of media attacks. All estimated coefficients are positive. The estimates for the continuous and the binary measure are statistically significant. For the categorical measure only the estimate for the very high mobilization category is statistically significant. To further explore the effect sizes of the measures of democracy mobilization, we plot marginal effect estimates in figure A1.

Table A5: Regression Results, Media Attacks(IPI), Count Data

	1	2	3
Liberal Democracy Index	-2.20**	-2.20**	-2.15**
	(0.67)	(0.64)	(0.68)
GDP per capita, (log)	-0.05	-0.04	-0.08
	(0.16)	(0.17)	(0.16)
Covid-19 Cases per mil. (log)	0.03	0.02	0.03
	(0.09)	(0.09)	(0.09)
Populist rule	1.31**	1.39**	1.48**
	(0.36)	(0.38)	(0.39)
Democracy Mobilization (continuous)	0.30**		
	(0.11)		
Low Democracy Mobilization (cat.)		0.46	
		(0.52)	
Medium Democracy Mobilization (cat.)		0.69	
		(0.52)	
High Democracy Mobilization (cat.)		1.10**	
		(0.46)	
Very High Democracy Mobilization (cat.)		1.16**	
		(0.52)	
Democracy Mobilization (binary)			0.75**
			(0.33)
Constant	0.45	0.33	0.82
	(0.92)	(1.09)	(0.91)
Lnalpha	0.63**	0.63**	0.67**
	(0.21)	(0.21)	(0.20)
Observations	168	168	168
Pseudo R2	0.088	0.089	0.085
AIC	495.85	501.36	497.45
BIC	517.72	532.60	519.32

Robust standard errors in parentheses, * $p < 0.1$, ** $p < 0.05$

Figure A1: The effect of pro-democracy mobilization on the frequency of media attacks

As shown in the upper panel of figure A1 the continuous measure indicates a linear increasing number of media attacks with higher levels of democracy mobilization. Without any democracy mobilization, the average number of attacks is estimated as 0.73. With rising levels, the average number of attacks increases up until it reaches 2.5 at very high democracy mobilization. The estimates for the categorical measurement of democracy mobilization, shown in the bottom-left panel, reveal that the linear additive effect is plausible, although in the category of very high democracy mobilization confidence intervals are very large, which indicates inconsistency in the estimation. The results for the binary measure, reported in the bottom-right panel of figure A1, suggest that at no or low levels of democracy mobilization the average number of attacks on media is about 0.9 and with medium or higher levels we observe 1.9 attacks on average. The effect size is substantial and the difference between categories is statistically significant. Among the other covariates described in table A5, only the liberal democracy index and populist rule are significant. We find that the more democratic a country is the less media attacks were observed during the pandemic. Moreover, populist governments more frequently engaged in attacks on the media in response to the pandemic. Next, we report the results for a binary measure indicating if any attacks on media occurred in a country in response to the pandemic or not using logistic regression in Table A6.
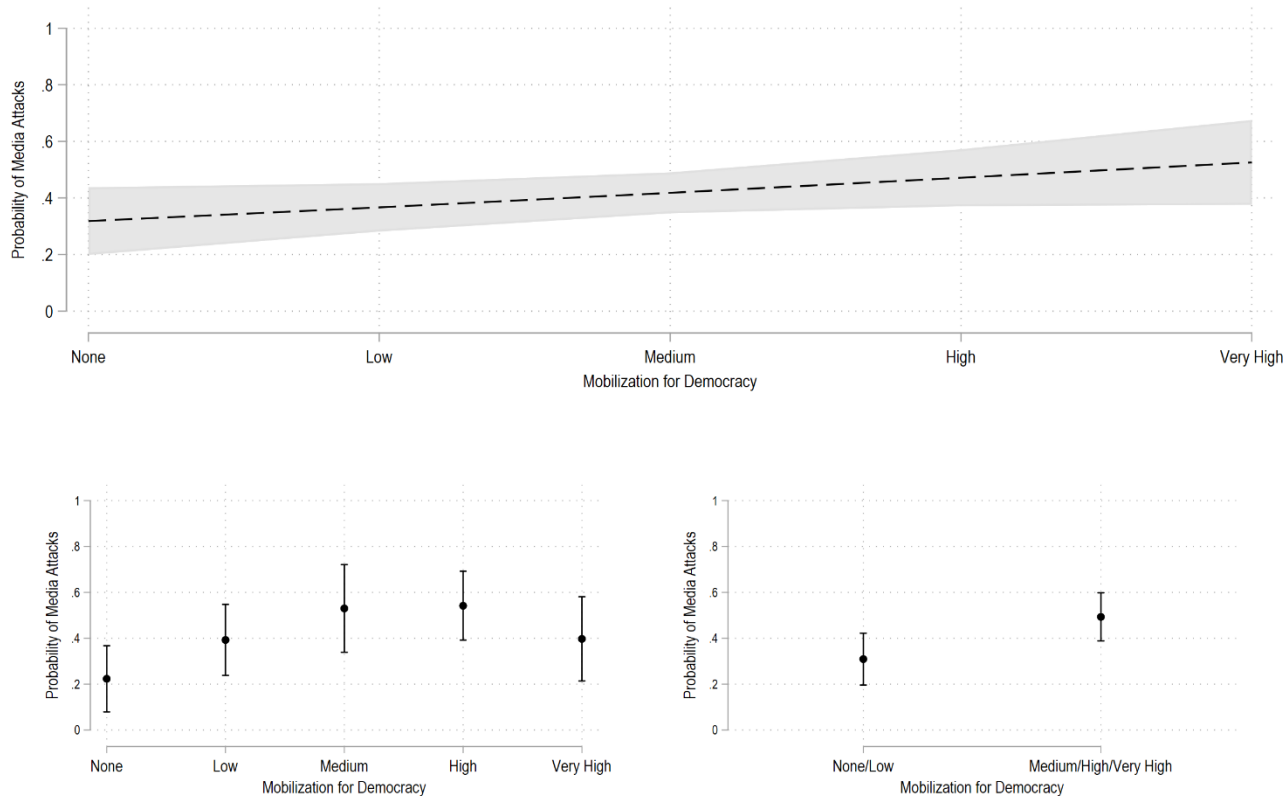
Table A6: Regression Results, Media Attacks(IPI), binary data

	1	2	3
Liberal Democracy Index	-2.03**	-2.32**	-2.10**
	(0.81)	(0.83)	(0.81)
GDP per capita, (log)	-0.16	-0.04	-0.12
	(0.20)	(0.21)	(0.20)
Covid-19 Cases per mil. (log)	0.18	0.14	0.17
	(0.12)	(0.12)	(0.12)
Populist rule	1.74**	1.56**	1.60**
	(0.69)	(0.73)	(0.70)
Democracy Mobilization (continuous)	0.25*		
	(0.14)		
Low Democracy Mobilization (cat.)		0.92	
		(0.59)	
Medium Democracy Mobilization (cat.)		1.55**	
		(0.65)	
High Democracy Mobilization (cat.)		1.60**	
		(0.60)	
Very High Democracy Mobilization (cat.)		0.94	
		(0.67)	
Democracy Mobilization (binary)			0.88**
			(0.40)
Constant	-0.33	-1.39	-0.51
	(1.27)	(1.39)	(1.28)
Observations	168	168	168
Pseudo R2	0.135	0.160	0.143
AIC	209.40	209.59	207.68
BIC	228.15	237.70	226.43

*Robust standard errors in parentheses, * p < 0.1, ** p < 0.05*

As shown in table A6, all measures of pro-democracy mobilization are positively related to the probability of media attacks and most estimates are statistically significant. We illustrate the size of the effects of these measures in figure A2.

Figure A2: The effect of pro-democracy mobilization on the probability of media attacks

As shown in the upper panel of figure A2, the probability of media attacks appears to be linearly increasing with rising levels of pro-democracy mobilization. Without any mobilization for democracy, the probability of attacks is estimated as 32%. It increases to about 53% at very high levels of mobilization. However, the linear effect is not entirely plausible, as indicated by the results for the effect of the categorical measure of democracy mobilization, described in the lower-left panel of figure A2. The probability of media attacks increases when moving from no to medium levels of democracy mobilization, but the trend flattens out and the probability decreases when moving to higher levels of mobilization for democracy. This pattern also explains, why the continuous measure of democracy mobilization is only statistically significant at p=0.1, as described in model 1 in table A6. The results for the binary measure, reported in the lower-right panel of figure 6, indicate that at no or low levels of democracy mobilization the probability of media attacks is about 31% and with medium or high levels we observe a probability of more than 49%. The effect size is substantial and the difference between the two categories is statistically significant.

In sum, the results for the effect pro-democracy mobilization on the frequency and probability of media attacks provide support for the pattern identified in the main analysis that governments that faced substantial contentious political challenges used the pandemic as an opportunity to restrict freedom of repression, in this case by conducting repression on journalists and media outlets.

Analysis of the effect of mass-mobilization

To explore the importance of protestors explicitly pursuing pro-democratic goals for the effect of pre-pandemic mobilization on restriction of freedom of expression, we analyze the effect mass mobilization in general. Next, we replicate the analysis from the main text using V-Dem's more general indicator for mass mobilization, which is scaled from zero (no mobilization) to four (very high mobilization). Again, we use a continuous, a categorical, and a binary measure of mobilization. The results of the regression analysis are described in table A7.
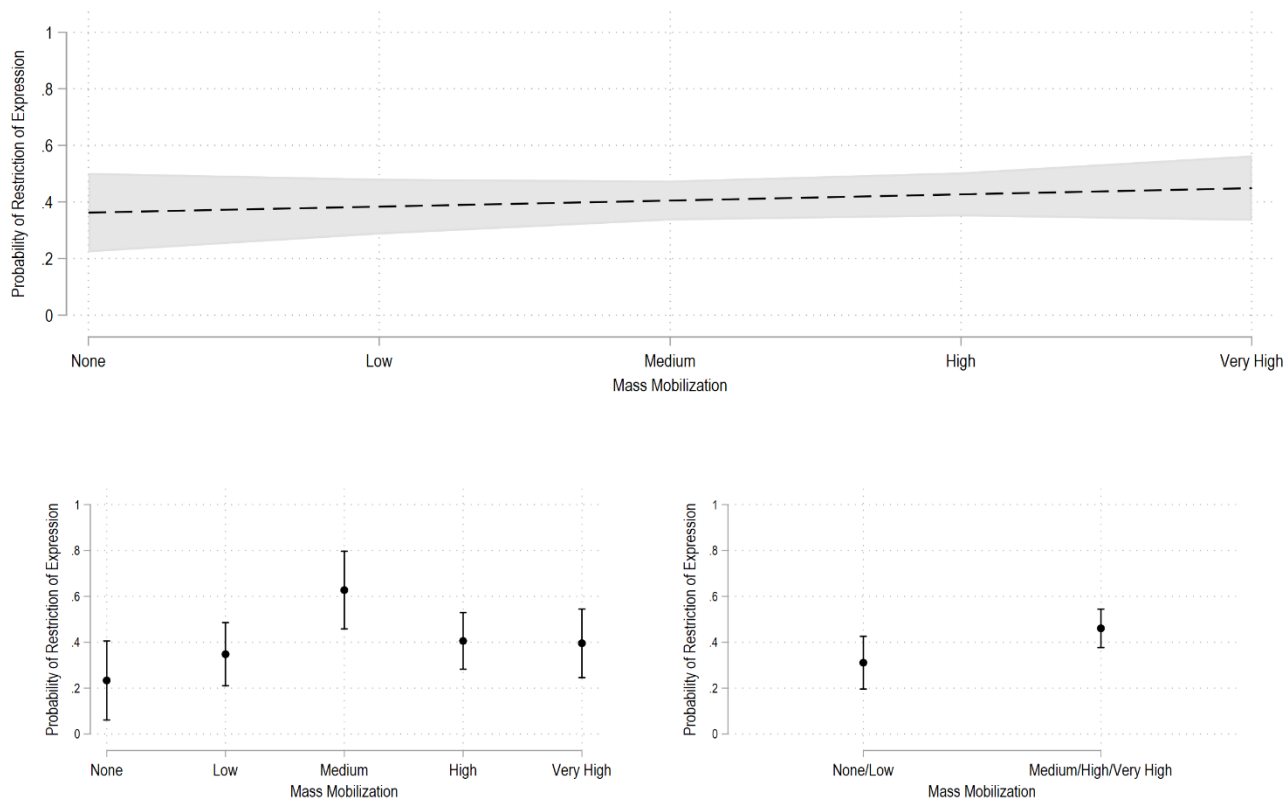
Table A7: Mass-Mobilization and Restriction of Freedom of Expression

	1	2	3
Liberal Democracy Index	-3.52**	-4.01**	-3.68**
	(0.84)	(0.92)	(0.84)
GDP per capita, (log)	0.08	0.21	0.16
	(0.19)	(0.20)	(0.19)
Covid-19 Cases per mil. (log)	-0.13	-0.18*	-0.17
	(0.11)	(0.11)	(0.11)
Populist rule	1.03**	1.14**	0.98*
	(0.51)	(0.52)	(0.51)
Mass-Mobilization (continuous)	0.11		
	(0.14)		
Low Mass-Mobilization (cat.)		0.68	
		(0.69)	
Medium Mass-Mobilization (cat.)		2.13**	
		(0.78)	
High Mass-Mobilization (cat.)		0.99	
		(0.68)	
Very High Mass-Mobilization (cat.)		0.94	
		(0.73)	
Mass-Mobilization (binary)			0.78*
			(0.40)
Constant	1.08	-0.22	0.48
	(1.27)	(1.45)	(1.24)
Observations	168	168	168
Pseudo R2	0.146	0.188	0.160
AIC	206.27	202.67	203.17
BIC	225.01	230.79	221.91

*Robust standard errors in parentheses, * $p < 0.1$, ** $p < 0.05$*

As shown in Table A7, mass-mobilization has a positive effect on the occurrence of restrictions of freedom of expression. To interpret the results, we report marginal effects in figure A3.

Figure A3: The effect of mass-mobilization on the probability of restrictions

As shown in the upper panel of figure A3, there appears to be no linear relationship between increasing levels of mass mobilization and the probability of restrictions. As indicated by the rather flat slope of the trend line, moving from none to very high mobilization only marginally increases the probability of restriction. This result can be explained by looking at the predicted probability of restrictions across different categories of mass-mobilization, as reported in the lower-left panel of figure A3. The probability of restrictions is estimated as 23% for countries without mass mobilization. The probability increases to 35% and 63% respectively for countries with low or medium mass mobilization. However, moving to high and very high levels of mobilization the probability of restriction does not increase further but decreases to about 40% respectively. The results for the binary measure of mass mobilization are reported in the lower-right panel of figure A3. The estimated effect is substantial, but only statistically significant at p=0.1 and as described above mainly driven by the high probability of restrictions for the category of medium mobilization.

Interaction effects

In this section, we analyze potential interaction effects, which either relate to factors that may moderate the main effect of pro-democracy protests on restrictions of freedom of expression during the Covid-19 pandemic or concern plausible alternative explanations for the occurrence of restriction of freedom of expression.

The effect of pro-democracy protests across populist and non-populist governments

We are not able to provide conclusive evidence on a potential interaction effect between democracy mobilization and populist rule due to a lack of empirical variation. Table A8 shows the distribution of the variable measuring democracy mobilization for populist and non-populist regimes.

Table A8: Variation of democracy mobilization across populist and non-populist regimes
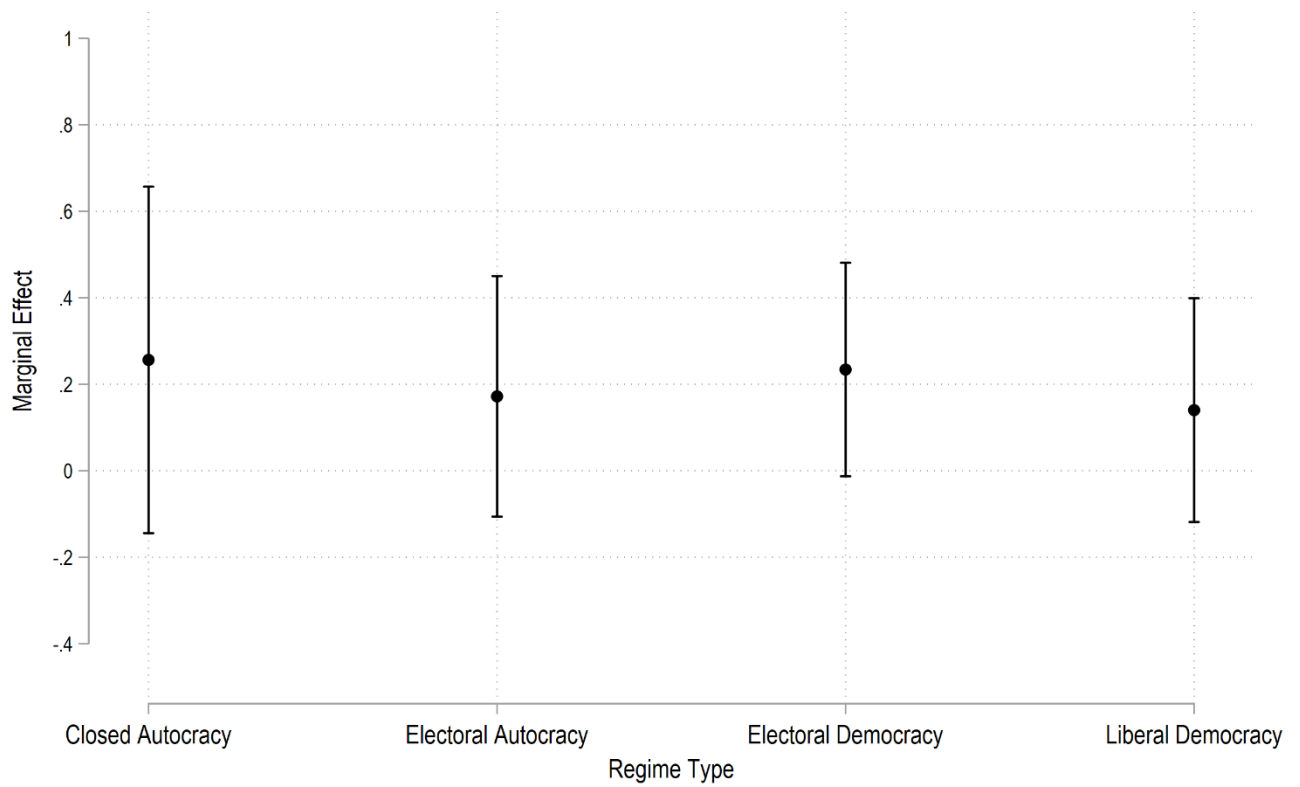
Pro-Democracy Mobilization	Non-populist	Populist	Total
None	44	0	44
Low	33	0	33
Medium	21	5	26
High	38	8	46
Very High	22	4	26
Total	158	17	175

As described in table A8, there are no cases of none or low democracy mobilization under populist rule. Correspondingly, we are unable to estimate the respective effect of democracy mobilization on restrictions of freedom of expression within the regime category of populist rule.

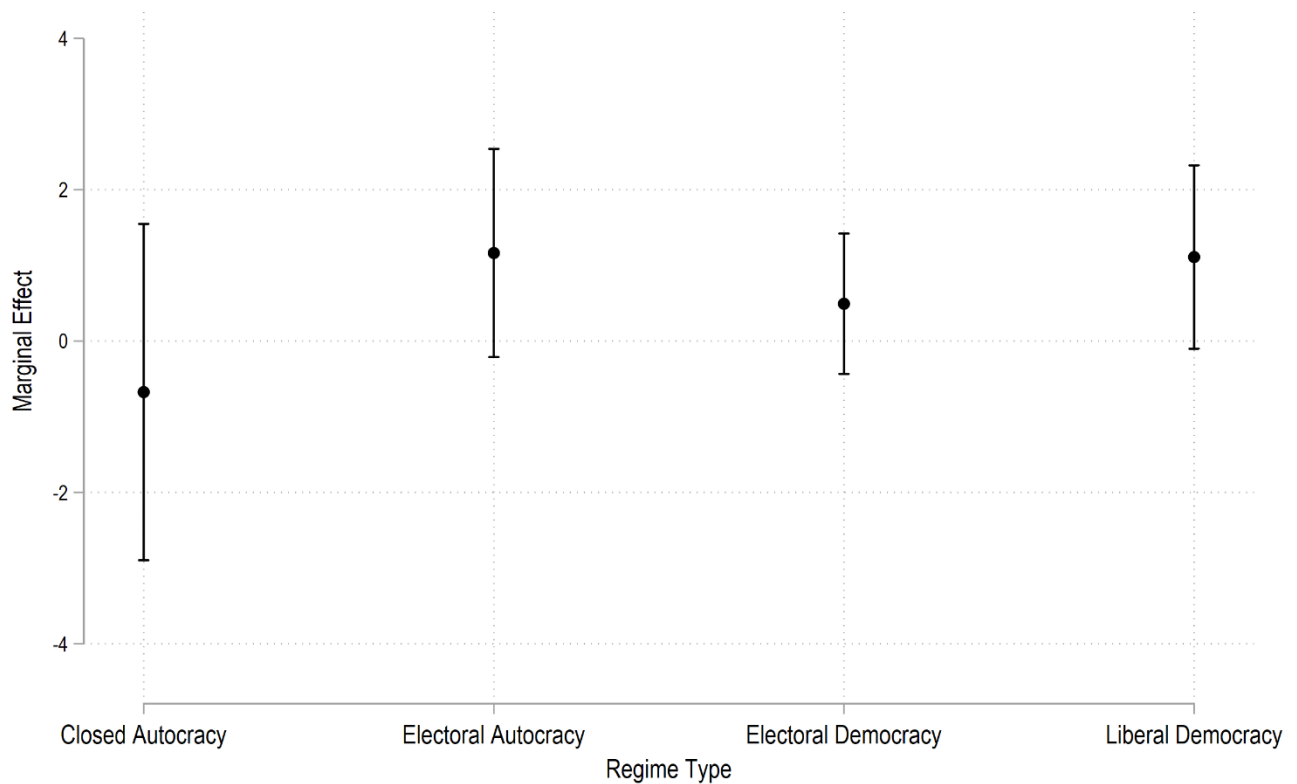*The effect of pro-democracy protests across different regime types*

Figures A4 and A5 describe the marginal effects for democracy mobilization on restrictions of freedom of expression and media attacks respectively, across different forms of autocratic and democratic regimes, using the regimes of the world classification provided by V-Dem.

Table A4: Effect of pro-democracy protests on restrictions across regime types

As show in figure A4, there appear be no substantial differences of how democracy mobilization affects the probability of restrictions across regime forms. However, confidence intervals are very wide, indicating insufficient empirical variation in the data, i.e., few cases representing mobilization across regime categories.

Table A5: Effect of pro-democracy protests on frequency of media attacks across regime types
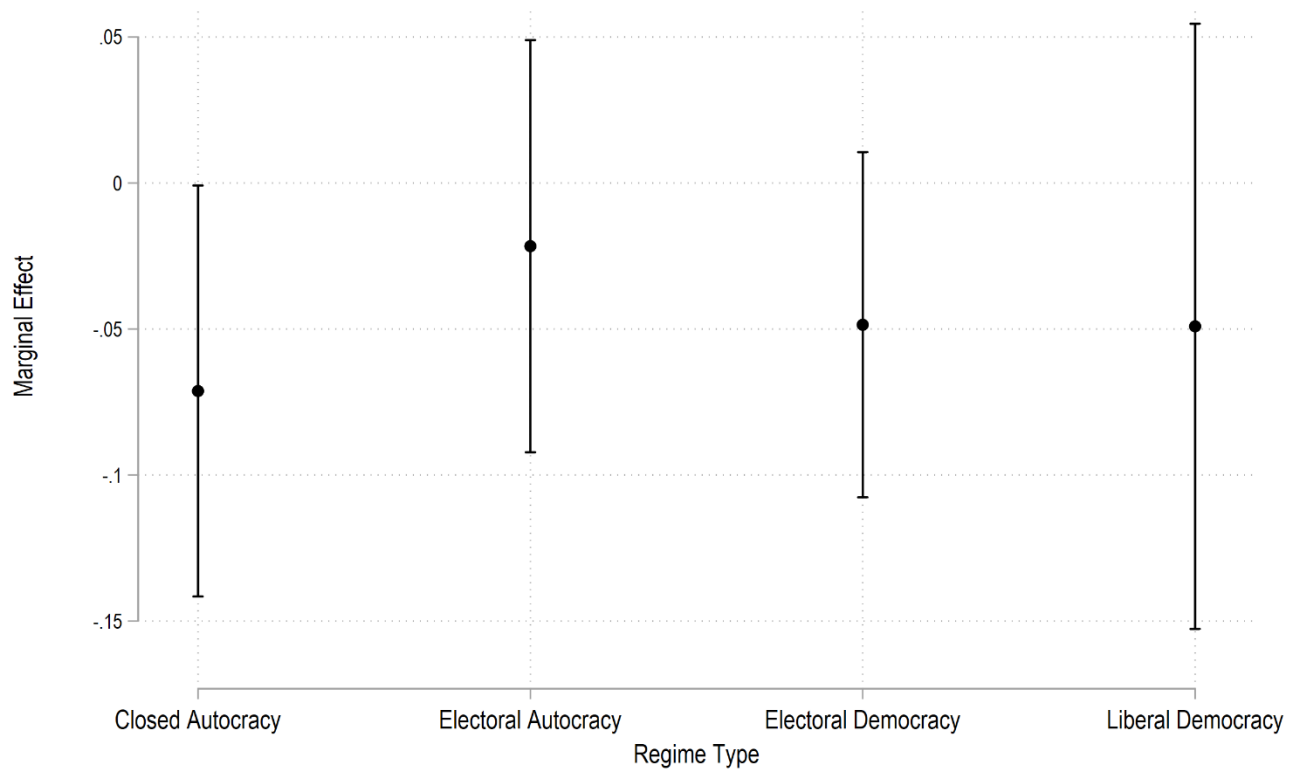

As shown in figure A5, the effect of democracy mobilization on the frequency of media attacks is unclear in closed autocracies. Confidence intervals are large due to the few observations in this regime category. Across the other regime categories, the effect appears to be similar.

In sum, we are unable to provide conclusive evidence about a potential interaction effect between democracy mobilization and different regime types on the probability of restrictions of freedom of expression. If anything, the results highlight that there appears to be no strong pattern, indicating that mobilization is more or less relevant in some kind of regime types.

The effect of exposure to the pandemic across regime types

As described in the manuscript, our results are inconclusive with regard to the general effect of exposure to the pandemic on restrictions of freedom of expression. A potential reason for the inconsistency of the effect of pandemic exposure may be that it is moderated by regime type, i.e., it was mostly autocratic governments that used Covid-cases as justification to implement restrictions of freedom of expression. To test this alternative explanation, we conducted an additional analysis estimating the effect of Covid-19 cases per mil. (log) on restrictions of freedom of expression across different regime types. The results are reported in figure A6.

Table A6: Effect of Covid-19 cases per mil. (log) on restrictions across regime types

As show in figure A6, the point estimates for Covid-19 cases are similar and confidence intervals overlap substantially across regime types. There appear be no significant differences of how Covid-19 cases affect the probability of restrictions across different types of political regimes. Confidence intervals are also very wide in general, indicating insufficient empirical variation in the data.

Additional robustness tests

Two covariates in our regression models appear to be particularly prone to measurement error and issues of conceptual validity. In this section, we test the robustness of our main finding that pro-democracy mobilization foster the occurrence of restriction of freedom of expression by employing alternative measures for how much countries have been exposed to the pandemic and for the presence of populist governments respectively.

In the main analysis reported in table 3 of the manuscript, we use Covid-19 cases per mil. (log) to measure the exposure of countries to the pandemic. However, this measure may be suspect to misreporting for political reasons. To address this issue, we replicated the main results from the regression analysis reported in table 3 of the manuscript, but included a measure of Covid-19 deaths per mil. (log) instead of the variable measuring Covid-19 cases. We consider death rates to be less likely to suffer from misreporting compared to case numbers. Again, the data comes from the World Health Organization Coronavirus Dashboard. The results are reported in table A9.

Table A9: Replication with Covid-19 deaths per mil. (log)

	1	2	3
Liberal Democracy Index	-3.91[**]	-4.15[**]	-4.11[**]
	(0.88)	(0.91)	(0.91)
GDP per capita, (log)	0.01	0.06	0.07
	(0.18)	(0.19)	(0.17)
Covid-19 death per mil. (log)	0.04	0.02	0.01
	(0.13)	(0.13)	(0.12)
Populist rule	0.71	0.49	0.50
	(0.54)	(0.54)	(0.54)
Democracy Mobilization (continuous)	0.24[*]		
	(0.14)		
Low Democracy Mobilization (cat.)		-0.22	
		(0.67)	
Medium Democracy Mobilization (cat.)		1.36[**]	
		(0.61)	
High Democracy Mobilization (cat.)		0.84	
		(0.58)	
Very High Democracy Mobilization (cat.)		0.86	
		(0.64)	
Democracy Mobilization (binary)			1.10[**]
			(0.43)
Constant	0.33	-0.05	-0.20
	(1.32)	(1.46)	(1.28)
Observations	161	161	161
Pseudo R2	0.156	0.179	0.173
AIC	195.34	196.37	191.56
BIC	213.82	224.10	210.05

Robust standard errors in parentheses, * p < 0.1, ** p < 0.05

As shown in table A9, the estimated coefficients and standard errors for the main variables measuring pro-democracy mobilization appear to be not sensitive to employing an alternative measure of exposure to the pandemic. The effect sizes and end estimates of statistical significance are substantially the same as those in the original analysis reported in table 3 of the manuscript.

Next, we evaluate the robustness of our main findings with regard to alternative cases of populist governments. Due to the fact that scholars employ slightly different definitions of the concept of populism, datasets may vary in their determination of the list of countries that had a populist government at the beginning of the Covid-19 pandemic. However, we were not able to identify another dataset that provides information on populist governments in power with global coverage, besides Kyle & Meyer (2020), which we use in our main analysis. To nevertheless probe the robustness of our results, we replicated our analysis with additional cases provided by Bayerlein et al. (2021). While focusing on a smaller sample of countries, namely OECD and BRIC states, the authors code Slovakia and UK as having populist governments that came into power shortly before or at the beginning of the pandemic. These cases are not included in the data provided by Kyle & Meyer (2020). The results of the replication with the additional cases are reported in table A10.

Table A10: Replication with Slovakia and UK coded as populist governments

	1	2	3
Liberal Democracy Index	-3.73**	-3.97**	-3.93**
	(0.84)	(0.88)	(0.87)
GDP per capita, (log)	0.17	0.25	0.25
	(0.19)	(0.20)	(0.19)
Covid-19 Cases per mil. (log)	-0.17	-0.20*	-0.21*
	(0.11)	(0.11)	(0.11)
Populist rule	0.67	0.43	0.45
	(0.50)	(0.51)	(0.51)
Democracy Mobilization (continuous)	0.26*		
	(0.14)		
Low Democracy Mobilization (cat.)		-0.27	
		(0.58)	
Medium Democracy Mobilization (cat.)		1.40**	
		(0.61)	
High Democracy Mobilization (cat.)		0.89	
		(0.57)	
Very High Democracy Mobilization (cat.)		0.91	
		(0.62)	
Democracy Mobilization (binary)			1.16**
			(0.42)
Constant	0.43	0.10	-0.05
	(1.25)	(1.38)	(1.23)
Observations	168	168	168
Pseudo R2	0.155	0.179	0.174
AIC	204.24	204.69	199.96
BIC	222.98	232.81	218.70

Robust standard errors in parentheses, * p < 0.1, ** p < 0.05

The results described in table A10 suggest that our main findings are not sensitive to changes in the list of countries considered as having a populist government. The effect sizes and estimates of statistical significance are substantially the same as those in the original analysis reported in table 3 of the manuscript.

Additional references only for the appendix

Bayerlein, M., Boese, V. A., Gates, S., Kamin, K., & Murshed, S. M. (2021). Populism and COVID-19: How populist governments (mis) handle the pandemic. Journal of Political Institutions and Political Economy, 2(3), 389-428.