Perceptions, Contagion, and Civil Unrest

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Abstract

This paper investigates the empirical relationship between citizens' perceptions of economic and political conditions and the incidence of nonviolent uprisings. Perceptions are measured by aggregating individual-level data from regional barometer surveys. The main results show that negative perceptions of political conditions – proxied by the share of the population that is generally dissatisfied with the way democracy works – have a significant positive effect on the number of protests and strikes. Negative perceptions of economic conditions do not seem to be significantly related to the latter. This generally holds across a large sample of countries and is particularly the case for Western and Central European countries as well as high-income countries. In developing economies, however, social protests appear to be driven by dissatisfaction with both economic and political conditions. The heterogeneous effects of perceptions on uprisings across geography and income groups, however, are not robust and susceptible to changes in estimators and model specification. In particular, the international contagion of protests eliminates this international heterogeneity, implying that the incidence of uprisings in nearby countries tends to generate protests at home through its effect on perceptions related to political conditions in high-income countries. Overall, the effect of perceptions about political conditions, along with protest contagion, is robust to the inclusion of numerous control variables that capture actual economic conditions and the quality of governance across countries. The results are also robust to the use of seemingly valid instrumental variables, alternative count-data estimators, and sample composition.

Keywords: Citizen Perceptions, Civil Resistance, Nonviolent Uprisings

JEL Codes: D74, D60

I. Introduction

Nonviolent protests have been making headlines. The last decade alone witnessed a significant global spike in peaceful uprisings and street mobilizations against established regimes and governments (Arezki et al., 2020a). The existing literature on civil resistance has already made the case that nonviolent methods yield better results than violent confrontations most notably because of the former's ability to garner more domestic and international legitimacy, support and sympathy, and the latter's reduced ability to justify violent repressions of nonviolent mobilizations (Chenoweth and Stephan, 2008).

In parallel, an emerging literature has explored the determinants of nonviolent protests (Chenoweth and Ulfelder, 2017; Witte et al., 2020; Arezki et al., 2020a). A pertinent question concerns the role of a populace's perceptions in generating nonviolent conflict. Weak economic conditions and deficient institutions may fuel negative perceptions of the economy and democracy (lack of voice), which then translate into nonviolent protests. However, there may be situations where perceptions can lead to unrest despite stable or improving economic or institutional conditions. For instance, a government can engage in reforms that require time to have any material effects. Furthermore, economies suffering from weak transparency may have limited avenues through which governments can communicate reforms or economic progress to their citizens. Worse, non-transparent governments may have fundamentally lost the trust of their citizens, and thus may find it difficult to alter perceptions despite implementing reforms and improving economic conditions (Arezki et al., 2020b). The central point is that perceptions may matter, sometimes independent of the realities on the ground.

Over the past two decades, research institutions and analytics companies have facilitated access to reliable data to add quantitative rigor to public opinion research and contribute policymaking. Such opinion surveys inherently capture citizens' perceptions and concerns – including what makes them angry or dissatisfied.

In this paper, we investigate the relationship between citizen perceptions and the incidence of nonviolent protests and strikes using regional public-opinion barometer surveys. Following existing literature, we hypothesize that negative perceptions of the state of the economy and the perceived lack of voice in the political system in a country translate into street protests and civil mobilization. Indeed, Figure 1 shows that higher terciles of negative political and economic condition perceptions are correlated with higher levels of protests. This unconditional relationship varies depending on whether it is within or outside European economies covered in the sample. In addition, for the sample of countries outside of Europe, the relationship between perceptions about the state of the economy appear to be uncorrelated with the incidence of civil unrest. The paper explores the robustness of these relationships as we add control variables and experiment with various econometric estimators.

Figure 1: Political and Economic Perceptions and Civil Unrest
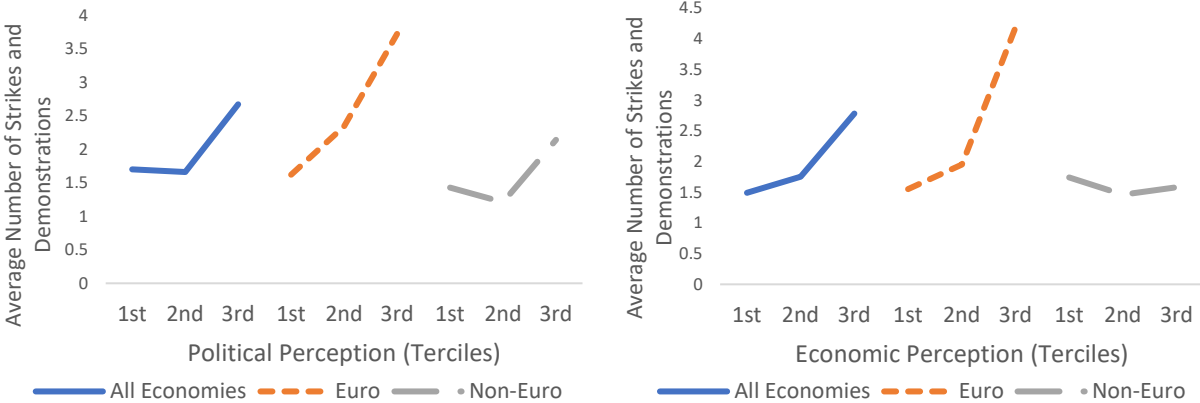
Note: Perception data is obtained from the barometer surveys. Protest data is obtained from the National Domestic Conflict Database. The x-axis presents terciles of perceptions. The data covers 742 country-year observations. Appendix 2C provides details on the sample.

We find that at the global level, after accounting for a host of factors, the perceived lack of voice in the political system, as measured by a general dissatisfaction with the way democracy works, materializes in anti-government demonstrations and strikes. Negative perceptions of the state of the economy on average do not seem to influence the incidence of such events. Some evidence suggests that this finding is particularly the case for Western and Central European and high-income countries. In contrast, nonviolent civil resistance in non-European countries is related to a general dissatisfaction with current economic conditions, and in developing economies it is driven by a dissatisfaction with both economic and political conditions. However, controlling for international contagion of protests appears to eliminate this international heterogeneity, implying that the incidence of uprisings in nearby countries tends to generate protests at home through its effect on perceptions of political conditions in high-income countries. Overall, these findings shed new light on the different perceptions that motivate citizens to take to the streets in different regions and income groups.

The main findings are robust to a plethora of factors and estimation models. We address concerns of simultaneity bias using an Instrumental Variables (IV) approach. Lagged economic growth, economic perceptions, and political perceptions as instruments appear to be statistically valid IVs, thus suggesting that the build-up of negative perceptions as well as poor economic performance are likely to result in social protests. We also experiment with economic and political perceptions contagion from other countries.

This paper complements the literature about the underlying causes of conflict. The analytical and empirical approach to analyzing nonviolent civil resistance re-emerged in the second half of the 2000s (Chenoweth & Cunningham, 2013). Multiple factors, ranging from outrage over dictatorial rule, polarization, and restrictions on basic liberties to food and commodity price increases are some of the factors that have been studied as drivers of social unrest (Abu-Bader and Ianchovichina, 2019; Cammett & Diwan, 2013; Arezki & Bruckner, 2011). Other more subtle drivers include contagion and social diffusion effects as well as spillovers facilitated by social media penetration in both source and destination countries (Braha, 2012; Arezki et al., 2020a).

Our study builds on Witte et al. (2020) and Arezki et al (2020a). The former explores the effects of subjective well-being on both violent and nonviolent uprisings using the Gallup World Poll; the latter studies contagious protests with data from both protest counts and news media articles. Witte et al. (2020) find that an increase in the percentage of self-reported suffering is positively related to nonviolent protests, but not their violent counterparts. Their measure of subjective well-being is based on individuals' ratings of their current and anticipated future life satisfaction. We improve on this general measure by honing into specific perceptions regarding the state of the economy and political conditions. We assess individuals' perceptions of economic and political conditions as indicators of subjective well-being associated with the health of the economy and of institutions. Differentiating perceptions by economic or political conditions yield different findings. In turn, this paper studies the robustness of the role of public perceptions as determinants of the frequency of protests to the inclusion of variables that capture the contagion of protests across international borders.

In summary, our study contributes to the literature by exploring the relationship between economic and political perceptions and nonviolent protests using regional barometer surveys. Generally speaking, negative perceptions of political conditions – or perceived lack of voice – seem to increase the incidence of strikes and anti-demonstrations, but not negative perceptions of economic conditions. This may be flipped for non-European countries where perceptions of economic conditions matter, but not those of political conditions. In developing economies, including those from Eastern Europe, both political and economic perceptions seem to play a role in generating nonviolent conflict.

The rest of the paper is organized as follows. Section II provides an overview of the data. Section III presents the estimation framework and main regression results. Section IV presents

robustness checks including count data models and instrumental variable regressions. Section V concludes.

II. Data

Data on nonviolent uprisings is available from the National Domestic Conflict Database through the Cross-National Time-Series (CNTS) Data Archive (Banks and Wilson, 2020). The dataset has been used widely in the literature primarily because of the extent of both its geographic coverage of 200 plus countries and time coverage since 1815 (Witte et al., 2020; Chenoweth & Ulfelder, 2017; Davenport, 1995).[2] We define nonviolent uprisings (also interchangeably referred to as civil resistance or civil unrest) as the sum of strikes and anti-government demonstrations in a country (Witte et al., 2020).

Perceptions data on economic and political conditions are obtained from six regional barometer surveys. These include the Arab Barometer, the Afrobarometer, Latinobarómetro, the Eurobarometer, the Asian Barometer and the South Asian Barometer. [3] We harmonized and aggregated individual-level data for two perceptions variables that had ample coverage across the barometers and were pertinent to the analysis.

For perceptions of economic conditions, we use data from answers to the following question: *"How would you describe (evaluate) the present economic conditions (situation) of your country?"* For perceptions of political conditions, we use answers to the following question: *"How satisfied are you with the way democracy works in your country?"* [4] This question captures the perceived lack of voice in the political system.[5] The share of the population that thinks that current economic conditions are either bad or very bad constitutes our variable of interest for the perception of economic conditions. Similarly, the share of the population that is either quite dissatisfied or

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[2] We also considered other popular conflict databases such the Armed Conflict Location & Event Data (ACLED) Project but proceed with the CNTS database because of ACLED's exclusion of Western European countries and its limited sample size prior to 2010 (Arezki et al., 2020a).

[3] The Eurasian Barometer – a regional barometer covering countries in Eastern Europe, the Caucasus and Central Asia – is not included because of lack of access to the data. Only one wave of the Eurasian Barometer data is publicly available and comes from the Global Barometer Survey data. That wave ends up being dropped nevertheless because of singleton observations for these countries and the resulting impact of country fixed effects.

[4] The Arab Barometer does not cover this exact question and is therefore excluded from the main results. As a robustness check in section IV, we include Arab Barometer data by leveraging a comparable question: *"How would you evaluate the state of democracy and human rights in your country?"*. This approach was used in the Global Barometer Survey where the aforementioned question was used as a proxy to the satisfaction with democracy variable we use in our main regression.

[5] An alternative interpretation could be that this question captures whether one considers a democratic system less favorable than an authoritarian one, but this seems unlikely.

totally dissatisfied with the way democracy works constitutes our variable of interest for the perception of political conditions.

We harmonize the data by adjusting inverted answer scales (e.g., from 1-4 to 4-1) and apply weights when available. Some of the barometers allow for neutral answer choices (i.e., 'neither good nor bad', 'neither satisfied nor dissatisfied') for the two perceptions questions while others do not. In our main estimation, we include the sample with all responses (i.e., positive, neutral and negative answer choices). As robustness checks, we re-estimate the baseline models by including non-neutral answers only (i.e., positive and negative answer choices only) as well as unweighted responses.

Other data on GDP per capita, GDP per capita growth, total population, inflation, unemployment, oil rents, infant mortality, cellular subscriptions, and urban population come from the World Bank's World Development Indicators. We account for institutional variables from the Polity5 dataset, the Political Terror Scale (PTS) dataset, and the World Governance Indicators. From Polity5, we use the institutionalized autocracy score which is derived from an-eleven point additively constructed autocracy scale measuring political characteristics of authoritarian regimes. From PTS, we use an average score of the three indicators of political terror as defined by Amnesty International, Human Rights Watch, and the US Department of State. From the World Governance Indicators, we use an average score of the six governance sub-indexes: voice and accountability, political stability and absence of violence and terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption. It is worth noting that none of these indicators are based on popular perceptions.

Our estimation sample consists of an unbalanced panel of 742 country-year observations from 1996 to 2017 and spanning 88 countries. Descriptions and summary statistics of all variables are provided in Appendix 1A and Appendix 1B respectively. A covariate pairwise correlation table is presented in Appendix 1C for the baseline regression sample.

Appendix 2A, Appendix 2B, and Appendix 2C detail the number and distribution of sample observations per year, barometer, and country-year respectively.

III. Estimation Framework and Results

A. Estimation Model

The regression model to investigate the relationship between nonviolent uprisings and citizens' perceptions of economic and political conditions for country i in year t can be written as:

$$Nonviolent\ Uprisings_{it} = \beta_0 + \beta_1 PEC_{it} + \beta_2 PPC_{it} + \beta_x X_{it} + FE_i + FE_t + \mu_{it} \qquad (1)$$

In the baseline OLS estimations of equation (1) nonviolent uprisings (or civil resistance) is measured as the sum of strikes and anti-government demonstrations transformed using the hyperbolic inverse sine as in Witte et al. (2020).

PEC_{it} and PPC_{it} are proxies for the perception of economic conditions and perception of political conditions respectively. PEC refers to the share of the population in country i at time t that thinks that the current economic conditions are either bad or very bad. PPC refers to the share of that same population that perceives that there is a lack of voice in the political system as proxied by whether they are either quite dissatisfied or very dissatisfied with the current state of democracy.

X_{it} is a vector of control variables. The latter can be grouped into four main categories. The first category consists of major economic indicators that reflect economic conditions. It includes the log of GDP per capita, GDP per capita growth, inflation, and unemployment rates. The second category consists of demographic indicators such as the log of total population and infant mortality rates per 1,000 live births. The third category takes into account the structure and level of development of the domestic economy and includes oil rents, the urban population percentage as a share of total population as well as the number of mobile cellular subscriptions per 100 people. The fourth and final category focuses on institutional development and includes the institutionalized autocracy score, the average political terror scale indicators as well as the average world governance indicators. FE_i and FE_t are country and year fixed effects. For all baseline estimations, robust standard errors are presented clustered at the country-level.

The OLS estimates could be biased because of the transformation of the underlying counts of protests before taking logs, with the resulting sample distribution violating the OLS assumption of a normal distribution. Consequently, we also estimate equation (1) using three alternative count-data estimators: a conditional-mean Poisson regression with fixed effects captured by the country mean of the dependent variable, a conditional-mean negative binomial regression, and a negative binomial regression with country dummy variables (instead of country means of the dependent variable to control for country fixed effects). These estimators are discussed in detail in the count data models section IV-A. We use the untransformed count data (i.e., incidence of strikes and anti-government demonstrations) for

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estimations using these count data models. We also conduct a series of robustness checks to address concerns related to specification, sample composition, and survey harmonization (section IV-B).

The estimation equation (1) is arguably subject to endogeneity concerns due to omitted variable bias and simultaneity bias. We account for the former by including a comprehensive array of control variables in the main specification. Since protests could influence perceptions, we account for the potential of reverse causality by implementing an Instrumental Variables (IV) approach. We use the lagged levels of economic growth, economic perceptions, and institutional perceptions as instruments, under the assumption that that the build-up of negative perceptions and poor economic conditions could result in worsening perception and thus in social protests. We also use economic and political perceptions contagion from other countries given existing evidence of contagious protests whereby dissatisfaction with economic and political conditions in nearby countries may also influence popular perceptions at home. These instruments are discussed in detail in section IV-C.

B. Main Results

Table 1 reports the OLS results with country and year fixed effects across the full sample with the stepwise addition of control variables as we move to the right of the table. The effect of the perception of political conditions on the incidence of nonviolent civil resistance is positive and statistically significant at the 1% level. Taking the full-model specification in column 13, a one percentage-point increase in the percentage of people who are either quite dissatisfied or very dissatisfied with how democracy works in their country leads to a 1.9% increase in the number of nonviolent civil resistance events. Regarding the economic magnitude of this coefficient estimate, a one standard deviation increase in the percentage of the population that is generally dissatisfied with democracy leads to a 0.38% increase in the number of nonviolent civil resistance events. The coefficient of the economic condition perception variable is not statistically significant and switches signs across specifications.

Of the control variables, only the coefficient of the inflation rate is statistically significant (at the 5% or 1% significance level) with a positive sign across all specifications. Using the full specification in column 13, we find that a one-percentage point rise in inflation is associated with a 0.9% increase in the incidence of nonviolent civil resistance events. The magnitude of this coefficient implies that a one standard-deviation shock to inflation (6.1 p.p.) is associated with a 5.5% increase in the number of protests. Hence it is plausible that inflation is a powerful driver of protests, perhaps even to a greater extent than perceptions. This finding is consistent with the results reported by Arezki and Bruckner (2011) on the role of the food price inflation. However, it remains an open question whether the estimated effect of inflation on civil unrest is robust to changes in samples, the inclusion of the protest-contagion variable, and alternative count-data estimators.

Table 1 – OLS with Country and Year Fixed Effects Regression Results (Full Sample)

Model	OLS with Country and Year Fixed Effects (Full Sample)												
Outcome Variable	Civil Resistance (Transformed at the Hyperbolic Inverse Sine) *Consists of the Number of Strikes and Anti-Government Demonstrations*												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
% of Citizens Thinking Current Economic Conditions Are Bad or Very Bad	0.147	0.138	0.097	0.133	0.079	-0.034	-0.034	0.017	-0.013	-0.009	-0.017	-0.021	-0.142
	(0.342)	(0.364)	(0.378)	(0.369)	(0.388)	(0.396)	(0.407)	(0.418)	(0.439)	(0.441)	(0.446)	(0.448)	(0.467)
% of Citizens Generally Not Satisfied with Democracy in Their Country	1.613***	1.545***	1.537***	1.642***	1.668***	1.820***	1.775***	1.793***	1.829***	1.805***	1.814***	1.897***	1.923***
	(0.534)	(0.535)	(0.532)	(0.526)	(0.554)	(0.497)	(0.530)	(0.533)	(0.547)	(0.547)	(0.550)	(0.565)	(0.572)
Log of GDP per Capita (Constant 2010 US$)		-0.412	-0.414	-0.335	-0.325	-0.464	-0.522	-0.405	-0.435	-0.414	-0.358	-0.305	-0.340
		(0.456)	(0.460)	(0.446)	(0.508)	(0.494)	(0.548)	(0.574)	(0.610)	(0.617)	(0.629)	(0.653)	(0.771)
GDP Per Capita Growth (Annual %)			-0.006	-0.007	0.002	-0.001	0.005	0.004	0.004	0.004	0.003	0.004	0.001
			(0.013)	(0.013)	(0.013)	(0.013)	(0.012)	(0.012)	(0.013)	(0.013)	(0.012)	(0.012)	(0.013)
Log of Total Population				-1.468*	-1.558*	-1.766**	-1.906**	-1.311	-1.036	-1.075	-1.016	-0.881	-0.672
				(0.789)	(0.806)	(0.791)	(0.794)	(0.999)	(0.982)	(0.997)	(1.027)	(1.051)	(1.233)
Inflation (CPI) (Annual %)					0.013***	0.013***	0.012***	0.011***	0.013***	0.013***	0.013***	0.013***	0.009**
					(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Unemployment, Total (% of Total Labor Force)						-0.001	0.003	0.001	0.003	0.003	0.002	0.004	0.002
						(0.018)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.021)
Oil Rents (% of GDP)							-0.013	-0.013	-0.006	-0.006	-0.006	-0.008	-0.006
							(0.020)	(0.021)	(0.021)	(0.020)	(0.020)	(0.021)	(0.026)
Infant Mortality Rate (Per 1,000 Live Births)								0.013	0.015	0.015	0.016	0.015	0.016
								(0.011)	(0.012)	(0.012)	(0.012)	(0.012)	(0.016)
Polity5 - Institutionalized Autocracy Score									0.047	0.038	0.039	0.041	-0.003
									(0.084)	(0.085)	(0.085)	(0.084)	(0.101)
Political Terror Scale (Average)										0.050	0.052	0.066	0.046
										(0.083)	(0.083)	(0.084)	(0.096)
Mobile Cellular Subscriptions (Per 100 People)											-0.001	-0.000	-0.001
											(0.002)	(0.002)	(0.002)
Urban population (% of total population)												-0.025	-0.032
												(0.024)	(0.024)
World Governance Indicators (Average of Sub-Indexes)													-0.237
													(0.389)
Constant	0.381	3.412	3.476	26.206**	27.309**	31.985**	35.216***	24.147	19.948	20.264	18.811	17.579	14.759
	(0.248)	(4.002)	(4.048)	(12.241)	(12.601)	(12.174)	(12.981)	(17.155)	(17.287)	(17.340)	(18.057)	(18.304)	(22.489)
Country Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of observations	975	939	939	939	892	879	824	824	784	784	784	784	742
R2	0.526	0.450	0.450	0.455	0.463	0.477	0.397	0.399	0.401	0.401	0.401	0.403	0.405
Adjusted R2	0.513	0.434	0.434	0.438	0.445	0.458	0.374	0.375	0.375	0.375	0.374	0.375	0.378

note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Robust Standard Errors Reported, clustered at the country level

It is also possible that the average effects estimated for the full sample of countries mask international heterogeneity. More specifically, we investigate differences in geography and levels of development. For geography, we find interesting differences between Eurobarometer (i.e., Western and Central Europe) and non-Eurobarometer countries. For levels of development, we find differences between high-income countries and countries with upper-middle, lower-middle and low income.

Our Western and Central European subsample includes some of the most advanced economies in our sample and is obtained from the Eurobarometer surveys. Results are reported in Table 2, which replicates the specification in column (13) of Table 1. Column (1) includes the full sample. Column (2) singles out Eurobarometer data, while column (3) looks at all barometer countries except those from the Eurobarometer (i.e., sample (1) = sample (2) + sample (3)).

A closer look at Eurobarometer data only (Table 2, Column 2) reveals similar but notably larger coefficient estimates of the political perception variable. A one-percentage point increase in the percentage of people who are generally dissatisfied with democracy leads to a 3.35% increase in the incidence of nonviolent uprisings. Inflation, a key economic factor in the full sample, is no longer significant. For Western and Central European countries, this may signal a stronger drive for citizens to protest when they feel less satisfied with the state of democracy rather than with the state of the economy. This interpretation seems further supported by the negative and statistically significant (at the 10% level) coefficient of the World Governance Indicators control variable.

Column (3) of Table 2 showcases the regression results for non-Eurobarometer countries. For this subset of the data, the coefficient of the perception of economic conditions becomes significant at the 5% level. A one-percentage point increase in the percentage of people thinking economic conditions are either bad or very bad corresponds to a comparable 1.028% increase in the number of strikes and protests. In contrast with European countries, the perception of political conditions is not significant. Inflation is significant at the 10% level indicating that a one-percentage point increase in inflation is associated with a 0.7% increase in civil resistance events. A potential interpretation of this statistically significant and positive coefficient is that reduced purchasing power could be a main driver of nonviolent uprisings in the sampled non-Eurobarometer countries.

We find a similar pattern when splitting the sample into two subsamples for high-income countries (column 4) and middle- and lower-income countries (column 5). Negative perceptions of political conditions have a statistically significant effect on civil resistance for high-income countries, but negative perceptions of economic conditions do not. A one-percentage point increase in the percentage of people who are generally dissatisfied with democracy leads to a 2.9% increase in the incidence of nonviolent uprisings. However, for developing economies, negative perceptions of *both* economic and political conditions seem to increase the incidence of civil resistance events. A one-percentage point increase in the

percentage of people who are generally dissatisfied with democracy leads to a 1.06% increase in the incidence of nonviolent uprisings, while a one-percentage point increase in the percentage of people who are generally dissatisfied with economic conditions leads to a 1% increase in protests.[6]

The divergence in the statistical significance of the coefficients for each of the two perception variables could offer an explanation on what motivates citizens to take to the streets through strikes and anti-government demonstrations in different regions and income groups. In Western and Central European countries (from a geographic perspective) as well as in relatively more prosperous economies (from an income perspective), dissatisfaction with the state of democracy seems to be a main driver of street protests. On the other hand, perceptions of faltering economic conditions may be more immediate and urgent motives for protests in non-European economies. In the latter, perceptions about the health of the economy might take precedence over the lack of voice in the political system. The findings for developing economies indicate that both the perceived health of the economy and the perceived lack of voice in the political system are pressing drivers of civil resistance, along with inflation.

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[6] Do note that the Polity 5 variable drops for the Eurobarometer and high-income samples as there is no variation in the Polity 5 autocracy score for these subsamples.

Table 2 – OLS with Country and Year Fixed Effects Regression Results (Sample Splits)

Model	OLS with Country and Year Fixed Effects				
Outcome Variable	**Civil Resistance (Transformed at the Hyperbolic Inverse Sine)** *Consists of the Number of Strikes and Anti-Government Demonstrations*				
	Full Sample	**Eurobarometer Countries**	**Non-Eurobarometer Countries**	**High Income Countries**	**Upper-Middle, Lower-Middle, and Low-Income Countries**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
% of Citizens Thinking Current Economic Conditions Are Bad or Very Bad	-0.142	-0.837	1.028**	-0.833	1.002**
	(0.467)	(0.580)	(0.484)	(0.534)	(0.484)
% of Citizens Generally Not Satisfied with Democracy in Their Country	1.923***	3.353***	0.904	2.920***	1.066**
	(0.572)	(1.014)	(0.543)	(0.921)	(0.512)
Log of GDP per Capita (Constant 2010 US$)	-0.340	0.779	-0.587	-0.092	0.623
	(0.771)	(1.589)	(0.842)	(1.255)	(0.657)
GDP Per Capita Growth (Annual %)	0.001	0.000	0.010	0.004	0.005
	(0.013)	(0.023)	(0.018)	(0.022)	(0.018)
Log of Total Population	-0.672	-2.286	-0.667	-2.636	-0.409
	(1.233)	(2.718)	(1.452)	(1.712)	(1.481)
Inflation (CPI) (Annual %)	0.009**	-0.010	0.007*	-0.031	0.007*
	(0.004)	(0.051)	(0.004)	(0.023)	(0.004)
Unemployment, Total (% of Total Labor Force)	0.002	-0.011	0.000	-0.018	0.010
	(0.021)	(0.033)	(0.029)	(0.027)	(0.027)
Oil Rents (% of GDP)	-0.006	0.210	0.004	0.210	0.019
	(0.026)	(0.547)	(0.031)	(0.599)	(0.030)
Infant Mortality Rate (Per 1,000 Live Births)	0.016	0.062	0.019	0.259**	0.028*
	(0.016)	(0.135)	(0.016)	(0.103)	(0.016)
Polity5 - Institutionalized Autocracy Score	-0.003	(dropped)	0.029	(dropped)	0.039
	(0.101)		(0.107)		(0.106)
Political Terror Scale (Average)	0.046	-0.163	0.114	-0.191	0.170
	(0.096)	(0.258)	(0.105)	(0.210)	(0.116)
Mobile Cellular Subscriptions (Per 100 People)	-0.001	-0.009	-0.000	0.002	-0.002
	(0.002)	(0.008)	(0.002)	(0.005)	(0.003)
Urban population (% of total population)	-0.032	-0.046	-0.034	-0.067	-0.054*
	(0.024)	(0.072)	(0.026)	(0.062)	(0.028)
World Governance Indicators (Average of Sub-Indexes)	-0.237	-1.371*	0.339	-1.393**	0.322
	(0.389)	(0.759)	(0.469)	(0.649)	(0.453)
Constant	14.759	33.318	18.211	47.877*	4.814
	-0.142	-0.837	1.028**	-0.833	1.002**
Country Fixed Effects	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
Number of observations	742	318	424	357	385
R2	0.405	0.487	0.382	0.484	0.431
Adjusted R2	0.378	0.445	0.331	0.435	0.379

note: *** p<0.01, ** p<0.05, * p<0.1. Robust Standard Errors Reported, clustered at the country level. The Polity 5 variable drops for the Eurobarometer and high-income economies as there is no variation in the polity 5 autocracy score for these subsamples.

IV. Robustness and the Role of Contagious Protests

This section presents several robustness checks in relation to the estimation model. First, it presents results from count-data models, which are more appropriate for the dependent variable measured by the number of incidents. Second, the model specification is extended to include protest contagion across countries. Third, the results are tested to changes in sample composition and alternative survey-question harmonization. Fourth, IVs estimates are discussed at the end.

A. Count Data Estimators

Given the count nature of the civil unrest dependent variable, we build on the baseline OLS model by running a Poisson regression with fixed effects. To factor in potential overdispersion and the inherent limitation of a constant error variance over the mean that is assumed by the Poisson model, we also run a conditional-mean negative binomial regression (with fixed effects). We finally run a negative binomial regression with country dummy variables to control for the effects of country fixed effects directly on protests and indirectly through the overdispersion parameter (see Allison & Waterman, 2002). Results from these three count-data models reported in Table 3 below are qualitatively similar to the OLS estimates in terms of statistical significance, but the coefficients are notably larger than the OLS coefficients. Columns (1), (3) and (5) present regression results without any control variables and columns (2), (4) and (6) show results with the full set of controls from Table 1.

A one percentage point increase in the percentage of people who are generally dissatisfied with democracy leads to a 4.3, 2.7, and 3.4 percent increase in the number of nonviolent civil resistance events for the conditional-mean Poisson model (with country fixed effects), the conditional mean negative binomial model (with country fixed effects), and the negative binomial model with country dummy variables, respectively. These results are statistically significant at the 1% level. The magnitudes of these estimates are larger than that of the baseline OLS model with country fixed effects reported in Table 1, column 3 (1.9%). Similarly, the economic magnitudes of these estimates are larger than their OLS counterpart for the case of a one standard-deviation shock which is 0.38%. Across the count-data estimates, a one standard deviation increase in the percentage of the population that is dissatisfied with democracy leads to a 0.86 (conditional-mean Poisson), 0.54 (conditional-mean negative binomial) and 0.68 (negative binomial with country dummies) percent increase in the number of nonviolent civil resistance events. These results reveal a negative bias caused by overdispersion in the protest data. Indeed, the overdispersion parameter reported under columns 5 and 6 is statistically significant, thus indicating that overdispersion is an issue that probably biased the OLS estimates downwards. In principle, the negative binomial regression with country dummies probably yields the least biased results (see Allison & Waterman, 2002).

Although not reported in Table 3 for the sake of brevity, the coefficient for inflation is statistically insignificant for all specifications for the conditional negative binominal estimates.

For negative binomial with country fixed effects, the coefficient is not statistically significant with no controls. For the Poisson FE it is statistically significant in 2 specifications. Thus we conclude that effect of inflation on civil unrest is sensitive to model specifications and choice of econometric estimator, in contrast to the political perceptions variable.

To test for coefficient heterogeneity in the count data models, we also interact the perception variables with a dummy variable taking the value of 1 for Eurobarometer countries and 0 otherwise. The corresponding results are in Table 4 below. Likewise, interactions with a dummy variable for high-income economies are reported in Table 5.

The coefficient of the interaction between perception of economic conditions and the Euro dummy variable is negative and statistically significant across all count data models, with or without control variables. The coefficient of the interaction between perceptions of political conditions and the Euro dummy is less robust across specifications. We find similar non-robust results when interacting the perception variables with the high-income dummy variable. The interaction between perceptions of economic conditions and the high-income dummy variable is negative and statistically significant for all but one specification. However, the interaction between perceptions of political conditions and the high-income dummy variable is barely statistically significant at the 10% level for a couple of specifications. Yet in both cases, in Tables 4 and 5, the interactions with political perceptions have large and positive coefficients, whereas the interactions with economic perceptions are negative, thus mimicking the OLS estimates even if the statistical significance is not robust. That is, it appears that the magnitudes of the estimated effects of economic conditions on protests are lower in the Eurobarometer data and among high-income economies than in other countries. The reverse is true for political perceptions.

Table 3 – Count-Data Estimates: Full Sample

Outcome Variable	Civil Resistance (Count)					
	Consists of the Number of Strikes and Anti-Government Demonstrations					
Model	Conditional-Mean Poisson (Full Sample)		Conditional-Mean Negative Binomial (Full Sample)		Negative Binomial with Country Dummies (Full Sample)	
	(1)	(2)	(3)	(4)	(5)	(6)
Perceptions of Economic Conditions	-0.510	-0.301	-0.097	0.588	-0.008	0.483
	(0.604)	(0.532)	(0.293)	(0.502)	(0.403)	(0.549)
Perceptions of Political Conditions	2.957***	4.268***	2.127***	2.680***	2.929***	3.411***
	(0.788)	(0.892)	(0.419)	(0.713)	(0.566)	(0.747)
Overdispersion					-0.925***	-1.003***
					(0.123)	(0.173)
Control Variables	NO	YES	NO	YES	NO	YES
Country Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Number of observations	924	675	924	675	975	742

note: *** p<0.01, ** p<0.05, * p<0.1. Standard errors reported inside parentheses.

Table 4 – Count-Data Estimates: Full Sample with Eurobarometer Dummy Interactions

Outcome Variable	Civil Resistance (Count)					
	Consists of the Number of Strikes and Anti-Government Demonstrations					
Model	Conditional-Mean Poisson		Conditional-Mean Negative Binomial		Negative Binomial with Country Dummies	
	(1)	(2)	(3)	(4)	(5)	(6)
Perceptions of Economic Conditions	1.003*	1.623***	0.924**	1.556**	1.226**	2.225***
	(0.517)	(0.621)	(0.464)	(0.673)	(0.534)	(0.789)
Perceptions of Economic Conditions x Euro Dummy	-3.414***	-3.576***	-1.862**	-2.051**	-2.700***	-2.980***
	(1.019)	(0.847)	(0.761)	(0.946)	(0.774)	(1.000)
Perceptions of Political Conditions	2.006***	2.471***	1.432***	1.988**	1.753**	1.652*
	(0.561)	(0.847)	(0.501)	(0.812)	(0.734)	(0.998)
Perceptions of Political Conditions x Euro Dummy	1.764	2.687*	1.294	1.763	2.528**	3.462**
	(1.180)	(1.595)	(0.921)	(1.185)	(1.109)	(1.569)
Overdispersion					-0.979***	-1.070***
					(0.126)	(0.179)
Control Variables	NO	YES	NO	YES	NO	YES
Country Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Number of observations	924	675	924	675	975	742

note: *** p<0.01, ** p<0.05, * p<0.1. Standard errors reported inside parentheses.

Table 5 – Count-Data Estimates: Full Sample with High-Income Countries Dummy Interactions

Outcome Variable	Civil Resistance (Count)					
	Consists of the Number of Strikes and Anti-Government Demonstrations					
Model	**Conditional-Mean Poisson**		**Conditional-Mean Negative Binomial**		**Negative Binomial with Country Dummies**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Perceptions of Economic Conditions	1.017**	1.501**	0.668	1.181*	1.076**	1.848**
	(0.493)	(0.600)	(0.468)	(0.690)	(0.544)	(0.798)
Perceptions of Economic Conditions x High-Income Dummy	-3.136***	-3.076***	-1.195*	-1.094	-2.160***	-2.234**
	(0.940)	(0.923)	(0.682)	(0.845)	(0.731)	(0.967)
Perceptions of Political Conditions	1.923***	2.450***	1.618***	2.069**	2.022***	1.977*
	(0.531)	(0.893)	(0.506)	(0.849)	(0.739)	(1.010)
Perceptions of Political Conditions x High-Income Dummy	1.724	2.777*	0.694	1.277	1.697	2.671*
	(1.248)	(1.566)	(0.816)	(1.060)	(1.068)	(1.490)
Overdispersion					-0.974***	-1.050***
					(0.127)	(0.178)
Control Variables	NO	YES	NO	YES	NO	YES
Country Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Number of observations	924	675	924	675	975	742

note: *** p<0.01, ** p<0.05, * p<0.1.

B. Protest Contagion across Countries

Protests in a country may be influenced by protests in neighboring countries. Arezki et al., (2020a) find that distance-weighted and social-media-influenced protests spillover across countries and effect the incidence of protests per capita (Arezki et al., 2020a). The estimation of distance-weighted protests is based on weighting national protests by the inverse distance between two countries' capital cities. Thus, protests in capital cities that are geographically closer to one another will carry more weight than protests in cities that are further apart. The methodology employed is similar to Bown et al. (2017) which studied the impact of growth of nearby countries on an economy's growth path. This could potentially be an omitted variable in our estimations. We thus re-estimate our base specification (Table 1, column 13) using the measure of distance-weighted protest contagion and present our results in Table 6 for both OLS and count data models. The coefficient for perceptions of political conditions is positive and at the 5% level across all specifications. Thus, our main findings stand regardless of whether we control for distance-weighted protest contagion. However, the coefficient of the effect is lower across all models than in the specification without the protest contagion variable. Furthermore, for the count data models, the effect of economic perceptions is positive and statistically significant, which constitutes a deviation from our main findings.

We also explore the robustness of the results for the Eurobarometer interactions (Table 7) and high-income countries interactions (Table 8) when protest contagion is accounted for. For each of these tables, we estimate the base OLS regression without the contagion variable (column 1), the base OLS regression with the contagion variable (column 2), and the three count data models with the protest contagion variable (columns 3-5). The inclusion of the protest contagion variable severely weakens the interaction effects with Eurobarometer and high-income dummy variables as the coefficients are not only statistically insignificant, but the sign of the interactions is unstable across specifications. The contagion variable thus appears to capture the differential effects by geography and income.

Table 6 – OLS and Count-Data Estimates with Distance Weighted-Protest Contagion Variable

Outcome Variable	Civil Resistance (Hyperbolic Inverse Sine of the Number off Strikes and Anti-Government Demonstrations)	Civil Resistance (Count) (Consists of the Number of Strikes and Anti-Government Demonstrations)		
Model	OLS with Country and Year Fixed Effects	Conditional-Mean Poisson	Conditional-Mean Negative Binomial	Negative Binomial with Country Dummies
	(1)	(2)	(3)	(4)
Perceptions of Economic Conditions	0.236	1.101**	0.863*	1.370***
	(0.334)	(0.522)	(0.494)	(0.493)
Perceptions of Political Conditions	0.879***	1.363**	1.695**	1.357**
	(0.340)	(0.653)	(0.725)	(0.680)
Inverse Distance-Weighted Protest Contagion	0.951***	0.775***	0.791***	0.928***
	(0.116)	(0.105)	(0.072)	(0.084)
Control Variables	YES	YES	YES	YES
Country Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Number of observations	742	675	675	742

note: *** p<0.01, ** p<0.05, * p<0.1

Table 7 – OLS and Count-Data Estimates with Distance Weighted-Protest Contagion Variable and Eurobarometer Interactions

Outcome Variable	Civil Resistance *(Hyperbolic Inverse Sine of the Number off Strikes and Anti-Government Demonstrations)*		Civil Resistance (Count) *(Consists of the Number of Strikes and Anti-Government Demonstrations)*		
	OLS with Country and Year Fixed Effects		**Conditional-Mean Poisson**	**Conditional-Mean Negative Binomial**	**Negative Binomial with Country Dummies**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Perceptions of Economic Conditions	0.926**	0.602*	1.157**	1.132*	1.568**
	(0.439)	(0.361)	(0.523)	(0.673)	(0.693)
Perceptions of Economic Conditions x Euro Dummy	-1.761***	-0.650	-0.704	-0.405	-0.612
	(0.607)	(0.553)	(0.905)	(0.958)	(0.908)
Perceptions of Political Conditions	0.953*	0.741**	2.027**	2.003**	1.454
	(0.497)	(0.317)	(0.808)	(0.886)	(0.922)
Perceptions of Political Conditions x Euro Dummy	2.332**	0.193	-1.504	-1.136	-0.406
	(1.086)	(0.711)	(1.264)	(1.210)	(1.429)
Distance-Weighted Protest Contagion Variable		0.943***	0.772***	0.803***	0.914***
		(0.117)	(0.108)	(0.074)	(0.086)
Ln of Alpha					-1.905***
					(0.277)
Control Variables	YES	YES	YES	YES	YES
Country Fixed Effects	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
Number of observations	742	742	675	675	742
Adjusted R2	0.390	0.591	-	-	0.324

note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Robust Standard Errors Reported, clustered at the country level

Table 8 – OLS and Count Data Estimates with Distance Weighted-Protest Contagion Variable and High-Income Interactions

Outcome Variable	Civil Resistance (Hyperbolic Inverse Sine of the Number off Strikes and Anti-Government Demonstrations)		Civil Resistance (Count) (Consists of the Number of Strikes and Anti-Government Demonstrations)		
	OLS with Country and Year Fixed Effects		Conditional-Mean Poisson	Conditional-Mean Negative Binomial	Negative Binomial with Country Dummies
	(1)	(2)	(3)	(4)	(5)
Perceptions of Economic Conditions	0.618	0.460	1.241***	0.862	1.447**
	(0.423)	(0.330)	(0.479)	(0.695)	(0.691)
Perceptions of Economic Conditions x High-Income Dummy	-1.212*	-0.368	-0.388	0.062	-0.235
	(0.632)	(0.488)	(0.881)	(0.869)	(0.871)
Perceptions of Political Conditions	1.198**	0.838**	1.758**	2.038**	1.498
	(0.492)	(0.327)	(0.819)	(0.908)	(0.922)
Perceptions of Political Conditions x High-Income Dummy	1.541	-0.010	-0.968	-0.837	-0.415
	(1.091)	(0.638)	(1.248)	(1.077)	(1.346)
Distance-Weighted Protest Contagion Variable		0.949***	0.763***	0.803***	0.924***
		(0.117)	(0.108)	(0.073)	(0.086)
Overdispersion (log)					-1.880***
					(0.269)
Control Variables	YES	YES	YES	YES	YES
Country Fixed Effects	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
Number of observations	742	742	675	675	742
Adjusted R2	0.383	0.590	-	-	0.323

note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Standard errors reported inside parentheses. Errors are clustered at the country level for OLS estimates.

C. Robustness Checks: Sample Coverage and Survey Harmonization

Regarding the cross-country coverage of the estimation sample, the main estimations exclude data from the Arab Barometer. The survey instrument in the Arab Barometer does not include the political condition perception question we utilize from the other barometer surveys. As a robustness check, we use a comparable question *"How would you evaluate the state of democracy and human rights in your country?"*, which is covered in waves 2 and 3 of the Arab Barometer[7]. This same question has been used before as a proxy for the satisfaction in the way democracy works in the Global Barometer Survey (a collection of regional barometers). The share of "bad" and "very bad" responses to the question are included in our measure of political perception. Our main results are unchanged.[8]

Furthermore, there are two survey harmonization issues across the barometers that may affect our findings. The first is that some of the response options for the perception questions were changed across barometers. Some versions of the surveys allowed for neutral responses (neither bad nor good; neither dissatisfied nor satisfied) while others did not. As a robustness check, we re-estimated the baseline regressions by excluding neutral responses to the perception variables and only include responses with clear positive or negative perceptions. Our main findings are unchanged.[9]

The second harmonization challenge is with regards to survey weights. For some of the surveys (South Asian barometer and Eurobarometer), weights were not available. It is also unclear if weights were estimated consistently across surveys. In our baseline regressions, the perceptions variables were computed by utilizing weights whenever available. As a robustness check, we re-estimate our baseline regressions without weights. The main results are unaffected.[10]

D. Instrumental Variables Estimations

Civil unrest can in of itself alter perceptions, giving rise to simultaneity bias. To tackle potential reverse-causality bias, we employ an instrumental variables (IV) approach. We first use the 1-year lagged economic and political perception variables as well as the 1-year lagged GDP per capita growth variable as instruments. We expect that lagged levels of GDP per capita and economic and political perceptions are correlated with contemporaneous perceptions as previous negative perceptions and economic conditions are likely to effect contemporaneous

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[7] The additional country-year observations resulting from the Arab Barometer are Algeria 2011, Egypt 2011, Iraq 2011, Iraq 2013, Jordan 2010, Jordan 2013, Kuwait 2014, Lebanon 2010, Lebanon 2013, Saudi Arabi 2011, Sudan 2010, Yemen 2011, Yemen 2013. Overlapping country-year observations between the Arab Barometer and the Afro Barometer (e.g., North African countries) were accounted for as part of the latter.

[8] Results are not reported but available upon request.

[9] Results are not reported but available upon request.

[10] Results are not reported but available upon request.

perceptions. However, protests are likely to be fueled by immediate perceptions and conditions that are a consequence of pent up frustration of previous years. Thus, the instruments are unlikely to violate the exclusion restriction criteria. Standard tests of the validity of the IVs are presented below.

In another iteration of IV regressions, we use an expanded set of instruments by also introducing economic and political perception contagion variables. These variables are inverse-distance-weighted measures of economic and political perceptions in all countries included in our baseline sample. We expect that such perceptions in both neighboring and distant countries are correlated with domestic perceptions in the home country as negative perceptions could spread across-countries (e.g., the Arab Spring). It is noteworthy that in our sample we do not find that domestic protests are directly influenced and solely fueled by perception contagion from other countries. Here again, the two additional instruments are unlikely to violate the exclusion restriction criteria.

Table 9 presents TSLS-IV estimates using both a set of three instruments and five instruments (including economic and political perception contagion). We also account for the protest contagion variable as an additional control. The findings are consistent with our main results – a perceived lack of voice in the political system leads to more protests whereas negative perceptions of economic conditions have no statistically significant effect. The instruments pass the under-identification test, indicating they are correlated with the perception variables and thus relevant. The instruments also pass the weak identification test using the Stock and Yogo thresholds, indicating they are strong instruments in the sense that they explain a large share of the sample variance of the perception variables. The instruments are also valid in the sense that they are sequentially not correlated with the regression errors, as reflected in the high p-values of the Sargan test for overidentification.

Finally, Table 10 reports IV estimates with the conditional-mean Negative Binomial estimator.[11] As discussed above, count-data estimates of the coefficient of interest tend to be larger than their OLS counterparts. This is also the case for the IV estimates. The Negative Binomial IV estimates of the elasticity of protests with respect to political perceptions is about 4.5, which is more than double the TSLS estimates reported in Table 9. The TSLS elasticity of protests with respect to protest contagion, however, a slightly larger than the count-data IV estimate (0.92 versus 0.78). Overall, political perceptions along with contagious protests tend to be robust predictors of the number of protests across countries and over time, regardless of estimator, control variables, and sample composition.

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[11] The Negative Binomial estimator with country dummies did not converge with the reduced sample of the IV specification. However, as discussed above, the conditional-mean Negative Binomial estimator tends to yield coefficient estimates that are close to the alternative estimator and both tend to be larger than OLS estimates with the transformed dependent variable of civil unrest.

Table 9 – OLS and TSLS Estimates with Protest Contagion Variable

Outcome Variable	Civil Resistance (Transformed)	Civil Resistance (Transformed)	Perception of Economic Conditions	Perception of Political Conditions	Civil Resistance (Transformed)	Perception of Economic Conditions	Perception of Political Conditions
	OLS Regression	Second Stage	First Stage	First Stage	Second Stage	First Stage	First Stage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Perceptions of Economic Conditions	0.303	0.164			-0.051		
	(0.473)	(0.469)			(0.364)		
Perceptions of Political Conditions	1.288**	2.377**			1.890***		
	(0.517)	(1.015)			(0.552)		
Perceptions of Economic Conditions (1-Year Lag)			0.661***	0.068*		0.406***	0.059*
			(0.040)	(0.035)		(0.038)	(0.030)
Perceptions of Political Conditions (1-Year Lag)			-0.151**	0.370***		-0.112**	0.186***
			(0.060)	(0.052)		(0.051)	(0.041)
GDP Per Capita Growth (1-Year Lag)			-0.003*	-0.001		-0.000	0.000
			(0.002)	(0.001)		(0.001)	(0.001)
Economic Condition Perception Contagion						1.357***	-0.204**
						(0.111)	(0.088)
Political Condition Perception Contagion						-0.129	1.574***
						(0.126)	(0.100)
Distance-Weighted Protest Contagion	0.934***	0.905***	0.002	0.022***	0.915***	-0.010	0.009
	(0.150)	(0.065)	(0.008)	(0.007)	(0.060)	(0.007)	(0.005)
Controls	YES	YES	YES	YES	YES	YES	YES
Number of observations	468	468	468	468	468	468	468
Under-Identification Test (p-value)		0.0000			0.0000		
Weak Identification Test (Cragg-Donald Wald F Statistic)		26.225			91.820		
Stock-Yogo weak ID test critical values:							
10% maximal IV size		13.43			19.45		
15% maximal IV size		8.18			11.22		
20% maximal IV size		6.40			8.38		
25% maximal IV size		5.45			6.89		
Over-Identification Test (Chi-Square p-value for Sargan Statistic)		0.348			0.292		
R2	0.645	0.762			0.765		
Adjusted R2	0.619	0.715			0.718		

note: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors reported.

Table 10 -- IV Conditional-Mean Negative Binomial Estimates with Protest Contagion Variable

Outcome Variable	Civil Resistance (counts)	Perceptions of Economic Conditions	Perceptions of Political Conditions
	Second Stage	First Stage	First Stage
	(1)	(2)	(3)
Predicted Perceptions of Economic Conditions	0.795		
	(1.013)		
Predicted Perceptions of Political Conditions	4.547**		
	(2.176)		
Distance-Weighted Protest Contagion	0.781***	-0.003	0.022***
	(0.102)	(0.010)	(0.006)
Perceptions of Economic Conditions (1-Year Lag)		0.619***	0.068*
		(0.043)	(0.038)
Perceptions of Political Conditions (1-Year Lag)		-0.129**	0.370***
		(0.060)	(0.058)
GDP Per Capita Growth (1-Year Lag)		-0.003**	-0.001
		(0.002)	(0.002)
Year Fixed Effects	YES	YES	YES
Country Fixed Effects	YES	YES	YES
Number of observations	450	499	468
F Stat (First Stage)		155	211

note: *** p<0.01, ** p<0.05, * p<0.1

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V. Conclusions

This paper established a robust partial correlation between citizens' perceptions of political conditions and the incidence of strikes and anti-government demonstrations. More specifically, the evidence indicates that a perceived lack of voice in the political system in a country translates into nonviolent uprisings on the ground. That is not necessarily the case for negative perceptions of economic conditions. Furthermore, the international contagion of protests is a strong predictor of civil unrest. These findings hold across several estimation models and robustness checks.

A regional perspective shows that although these results hold holistically, they are flipped for countries outside Western and Central Europe: adverse economic circumstances are more pressing than the perceived lack of voice in the political system and are a driver of nonviolent uprisings. On the other hand, a look at subsamples by levels of income showed that civil unrest in high-income countries is driven by adverse perceptions of political conditions only. In developing economies, both negative economic and political condition perceptions seem to be drivers of such unrest. However, these findings of heterogeneous coefficients are not robust to changes in estimation models and specifications. That is, after controlling for international contagion of civil unrest, the statistical significance of this international heterogeneity disappears whereas the impact of dissatisfaction with lack of voice in the political system appears to be a robust central tendency in the data. One could speculate that in high-income economies and Europe, where information is transmitted freely, the effects of international contagion of protests may dominate. However, even for the whole sample, accounting for the international contagion of protests reduces the size of the estimated elasticity of civil unrest with respect to political perceptions.

These results provide insights on citizen motivations to take to the streets in times when protests and uprisings are commonplace. Indeed, the introduction of opinion surveys and subjective perception metrics to the analysis of civil uprisings allow for a better understanding of the perceptions that may shape them. This has important implications for governments. Reforming policies that can improve economic conditions might be insufficient to quell civil unrest. Communicating such reforms to the public and enhancing transparency may be critical in shaping perceptions, which in turn may influence the incidence and likelihood of protests. An area for future research would therefore consist of exploring which factors influence the gaps between citizen perceptions and reality, particularly with respect to the extent of democratic governance.

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Appendix

Appendix 1A – Variables Definitions and Sources

Name	Definition	Source
Civil Resistance (Transformed)	Civil Resistance Measured as the Sum of Strikes and Anti-Government Demonstrations Transformed Using the Hyperbolic Inverse Sine	Computed Using Cross-National Time-Series Data Archive on National Domestic Conflict (2020)
Perception of Economic Conditions	Perception of Economic Conditions Defined as the Percentage of Non-Neutral Citizens Who Think Current Economic Conditions Are Bad or Very Bad	Computed Using Perception Data from Regional Barometers
Perception of Political Conditions	Perception of Political Conditions Defined as the Percentage of Non-Neutral Citizens Who Are Dissatisfied or Very Dissatisfied with Democracy in Their Countries	Computed Using Perception Data from Regional Barometers
Log of GDP per Capita	Ln of GDP per Capita (Constant 2010 US$)	Computed Using World Development Indicators
GDP per Capita Growth	GDP Per Capita Growth (Annual %)	World Development Indicators
Log of Total Population	Ln of Total Population	World Development Indicators
Inflation	Inflation (CPI) (Annual %)	World Development Indicators
Unemployment Rate	Total Unemployment (% of Total Labor Force) (Modeled ILO Estimate)	World Development Indicators
Oil Rents	Oil Rents (% of GDP)	World Development Indicators
Infant Mortality Rate	Infant Mortality Rate (Per 1,000 Live Births)	World Development Indicators
Cellular Subscription	Mobile Cellular Subscriptions (Per 100 People)	World Development Indicators
Urban Population	Urban Population (% of Total Population)	World Development Indicators
Autocracy Metric	Institutionalized Autocracy Score	Center for Systemic Peace Data (Polity5 Project)
Political Terror Scale Metric	Average of the Three Indicators of Political Terror (Amnesty International, Human Rights Watch, US Department of State)	Computed Using Data from the Political Terror Scale
World Governance Indicators Metric	Average of the Six World Governance Indicators Sub-Indexes (Voice and Accountability, Political Stability and Absence of Violence and Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption)	Computed Using Data from the World Governance Indicators

Appendix 1B – Descriptive Statistics

Variable	Observations	Mean	St. Dev.	Min	Max
Civil Resistance (Transformed)	742	0.773165	1.061435	0	4.219724
Perception of Economic Conditions	742	0.523706	0.24732	0.018132	0.995003
Perception of Political Conditions	742	0.521703	0.2016	0.058116	0.931941
Ln of GDP per Capita (Constant 2010 US$)	742	8.991888	1.386575	5.475694	11.62597
GDP Per Capita Growth (Annual %)	742	2.192606	3.439248	-22.3123	23.98551
Ln of Total Population	742	16.32672	1.382145	13.05013	21.03897
Inflation (CPI) (Annual %)	742	4.781616	6.144443	-4.4781	96.09411
Total Unemployment (% of Total Labor Force)	742	8.010958	5.525565	0.393	35.268
Oil Rents (% of GDP)	742	1.034778	2.972693	0	23.81619
Infant Mortality Rate (Per 1,000 Live Births)	742	19.1779	20.74064	1.5	110.9
Institutionalized Autocracy Score	742	0.292453	1.029614	0	9
Average of Political Terror Scale Indicator	742	2.128257	0.996237	1	5
Mobile Cellular Subscriptions (Per 100 People)	742	88.80605	46.09214	0.024533	182.4573
Urban Population (% of Total Population)	742	64.0512	18.8361	11.194	97.961
Average World Governance Indicators	742	0.332027	0.836041	-1.41226	1.893856

Appendix 1C – Correlation Matrix for Baseline Sample

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Civil Resistance (Transformed)	1														
Perception of Economic Conditions	0.08**	1													
Perception of Political Conditions	0.21***	0.50***	1												
Ln of GDP per Capita	0.07***	-0.01	-0.37***	1											
GDP Per Capita Growth (Annual %)	-0.05***	-0.28***	-0.11***	0.03***	1										
Ln of Total Population	0.37***	-0.04	0.12***	-0.22***	0.01	1									
Inflation (CPI) (Annual %)	0.02*	0.04	0.13***	-0.04***	-0.05***	0.03**	1								
Total Unemployment (% of Labor Force)	-0.01	0.39***	0.16***	0.10***	-0.01	-0.17***	-0.01	1							
Oil Rents (% of GDP)	-0.08***	-0.16***	0.12***	0.11***	0.03**	0.01	-0.01	0.01	1						
Infant Mortality Rate (/1000)	-0.14***	-0.04	0.15***	-0.75***	-0.05***	0.08***	0.04***	-0.13***	0.03***	1					
Institutionalized Autocracy Score	-0.19***	-0.09***	-0.02	-0.33***	-0.02*	-0.14***	-0.01	-0.09***	0.38***	0.47***	1				
Average of Political Terror Scale Indicator	0.19***	-0.04	0.40***	-0.51***	-0.05***	0.46***	0.06***	-0.03**	0.12***	0.39***	0.29***	1			
Mobile Cellular Subscriptions (/100)	0.21***	0.00	-0.02	0.39***	0.00	0.04***	-0.05***	0.00	0.00	-0.45***	-0.28***	-0.16***	1		
Urban Population (% of Population)	0.15***	-0.16***	-0.15***	0.83***	0.00	-0.12***	-0.01	0.08***	0.15***	-0.67***	-0.29***	-0.29***	0.32***	1	
Average World Governance Indicators	-0.05***	-0.04	-0.52***	0.81***	-0.04***	-0.31***	-0.22***	0.02	0.27***	-0.67***	-0.39***	-0.74***	0.43***	0.52***	1

note: *** p<0.01, ** p<0.05, * p<0.1.

Appendix 2A – Tabulation of Sample Observations by Year

Year	Number of Obs.
1996	14
1998	14
2000	18
2002	23
2003	25
2004	15
2005	61
2006	48
2007	45
2008	33
2009	45
2010	47
2011	48
2012	41
2013	59
2014	44
2015	60
2016	44
2017	58
Total	**742**

Appendix 2B – Tabulation of Sample Observations by Barometer

Barometer	Number of Obs.
Arab Barometer	13 (Inexact match; robustness check) [12]
AfroBarometer	126
Latinobarómetro	256
Eurobarometer	318
Asian Barometer	32
South Asian Barometer	10
Total	**742**

[12] Not included in the sample size of 742 country-year observations

Appendix 2C – Tabulation of Sample Observations by Country-Year

Country	1996	1998	2000	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Algeria															X		X			2
Austria							X	X	X		X	X	X	X	X	X	X	X	X	12
Bangladesh							X								X					2
Belgium							X	X	X		X	X	X	X	X	X	X	X	X	12
Bolivia	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	17
Botswana				X			X			X					X		X		X	6
Brazil	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	17
Bulgaria							X	X	X		X	X	X	X	X	X	X	X	X	12
Burkina Faso										X					X		X		X	4
Burundi															X	X				2
Cambodia										X					X		X			3
Cameroon															X		X			2
Chile	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	17
China				X						X			X				X			4
Colombia	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	17
Costa Rica	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	17
Croatia							X	X	X		X	X			X	X	X	X	X	10
Cyprus							X	X	X		X	X	X	X	X	X	X	X	X	12
Czech Republic							X	X	X		X	X	X	X	X	X	X	X	X	12
Denmark							X	X	X		X	X	X	X	X	X	X	X	X	12
Ecuador	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	17
Egypt, Arab Rep.															X		X			2
El Salvador	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	17
Estonia							X	X	X		X	X	X	X	X	X	X	X	X	12
Eswatini															X		X			2
Finland							X	X	X		X	X	X	X	X	X	X	X	X	12
France							X	X	X		X	X	X	X	X	X	X	X	X	12
Gabon																	X		X	2
Germany							X	X	X		X	X	X	X	X	X	X	X	X	12
Ghana				X			X			X					X		X		X	6
Greece							X	X	X		X	X	X	X	X	X	X	X	X	12
Guatemala	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	17
Guinea															X		X		X	3
Honduras	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	17
Hungary							X	X	X		X	X	X	X	X	X	X	X	X	12
India							X								X					2
Indonesia								X					X					X		3
Ireland							X	X	X		X	X	X	X	X	X	X	X	X	12
Italy							X	X	X		X	X	X	X	X	X	X	X	X	12
Japan				X					X				X					X		4
Kenya				X			X			X			X			X		X		6
Korea, Rep.				X				X					X				X			4
Latvia							X	X	X		X	X	X	X	X	X	X	X	X	12
Lesotho		X		X			X			X					X	X			X	7
Liberia										X					X		X			3
Lithuania							X	X	X		X	X	X	X	X	X	X	X	X	12
Luxembourg							X	X	X		X	X	X	X	X	X	X	X	X	12

																				Total
Madagascar							X		X					X		X				4
Malawi				X			X		X				X		X				X	6
Malaysia								X				X				X				3
Mali			X				X		X					X	X				X	6
Mauritius													X		X				X	3
Mexico	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	17
Mongolia			X					X				X				X				4
Morocco														X		X				2
Mozambique							X		X				X			X				4
Namibia			X				X		X				X		X				X	6
Nepal							X							X						2
Netherlands							X	X	X		X	X	X	X	X	X	X	X	X	12
Nicaragua			X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	15
Niger														X		X				2
Nigeria			X		X		X		X					X		X			X	7
North Macedonia									X		X	X								3
Pakistan							X							X						2
Panama	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	17
Paraguay	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	17
Peru	X	X		X	X	X	X	X	X	X	X	X	X		X		X	X	X	16
Philippines			X				X					X				X				4
Poland							X	X	X		X	X	X	X	X	X	X	X	X	12
Portugal							X	X	X		X	X	X	X	X	X	X	X	X	12
Senegal			X				X		X					X	X				X	6
Sierra Leone													X			X				2
Slovak Republic							X	X	X		X	X	X	X	X	X	X	X	X	12
Slovenia							X	X	X		X	X	X	X	X	X	X	X	X	12
South Africa			X	X			X		X			X				X				6
Spain							X	X	X		X	X	X	X	X	X	X	X	X	12
Sri Lanka							X								X					2
Sweden							X	X	X		X	X	X	X	X	X	X	X	X	12
Tanzania				X			X		X				X		X				X	6
Thailand								X				X				X				3
Togo														X		X			X	3
Turkey							X	X	X		X	X								5
Uganda			X	X			X		X				X			X			X	7
United Kingdom							X	X	X		X	X	X	X	X	X	X	X	X	12
Uruguay	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	17
Venezuela, RB											X	X	X		X					4
Zambia				X			X					X		X	X				X	6
Zimbabwe														X		X			X	3
Total	14	14	18	23	25	15	61	48	45	33	45	47	48	41	59	44	60	44	58	**742**