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**Working Paper**

## Subjective Well-being and Peaceful Uprisings

Tinbergen Institute Discussion Paper, No. TI 2018-074/VII

**Provided in Cooperation with:**

Tinbergen Institute, Amsterdam and Rotterdam

*Suggested Citation:* Witte, Caroline T.; Burger, Martijn J.; Ianchoichina, Elena (2018) : Subjective Well-being and Peaceful Uprisings, Tinbergen Institute Discussion Paper, No. TI 2018-074/VII, Tinbergen Institute, Amsterdam and Rotterdam

This Version is available at:

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TI 2018-074/VII  
Tinbergen Institute Discussion Paper



# Subjective Well-being and Peaceful Uprisings

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## *Subjective Well-being and Peaceful Uprisings*

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*Caroline T. Witte,<sup>♦</sup> Martijn J. Burger,<sup>\*</sup> and Elena Ianchovichina<sup>§</sup>*

### **Abstract**

This study analyzes whether subjective well-being measures can explain variation in peaceful uprisings, in addition to the objective measures typically used in analyses of uprisings. Using a database combining data on uprisings and subjective well-being for 118 countries over the period 2007 to 2014, we find evidence of a positive effect of life dissatisfaction on the incidence of peaceful uprising, but not its violent counterpart. This effect does not depend on the type of political regime, nor the stage of development and reflects, to a large extent, changes to perceived satisfaction with living standards and the ability to have a purposeful and meaningful life.

**Keywords:** Civil Resistance, Civil Uprisings, Subjective Well-being, Happiness, Political Economy, Grievances, Political conflict

**JEL codes:** D74, I31

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We thank Carlos Vegh, Guillermo Vuletin, Daniel Riera-Crichton, Maria Marta Ferreyra and other participants in a seminar organized by the Chief Economist Office of Latin America and the Caribbean Region of the World Bank for their useful comments on a previous draft of this paper. We also thank participants of the ISQOLS Annual Conference in Seoul and the International conference on Policies for Happiness and Health in Siena for their useful feedback.

## **1. Introduction**

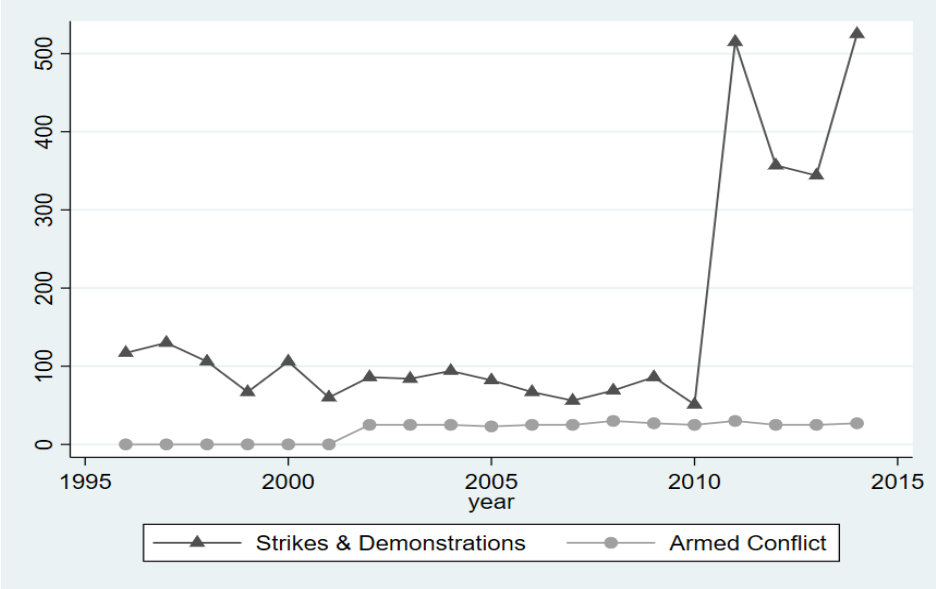
Can a decrease in subjective well-being (SWB) explain nonviolent uprisings? We hypothesize that a widespread perception of a deterioration of well-being promotes peaceful mass mobilization against the government, particularly when citizens hold the government responsible for their growing hardship. The relationship between subjective well-being and nonviolent uprisings has not been extensively analyzed before, but the idea that personal hardship increases the likelihood of uprisings is not new. Gurr (1970) argued that feelings of relative deprivation, defined as the gap between expectations and achievement, increase the likelihood of rebellion. Gurr's theory of relative deprivation has inspired numerous empirical cross-country studies on the effect of grievances on conflict. These studies focus on the effect of grievances, proxied by objective indicators including GDP growth and ethnic tensions, on armed conflict and find mixed results (Buhaug, Cederman & Gleditsch, 2014; Ciccone, 2011; Collier & Hoeffler, 2004; Collier, Hoeffler & Rohner, 2009; Esteban & Ray, 2008; Fearon & Laitin, 2003; Garcia-Montalvo & Reynal-Querol, 2004; Hegre & Sambanis, 2006; Miguel, Satyanath, & Sergenti, 2004).

At the same time, little is known about the relationship between grievances and civil uprisings, the nonviolent counterpart of armed political conflict. This is surprising, as in recent years nonviolent conflict has become increasingly prevalent (Figure 1) and their consequences have been momentous. During the Arab Spring nonviolent uprisings led to regime change, prolonged periods of political instability and, in some cases, civil and regional armed conflicts. Recent studies confirm the substantial consequences of uprisings, as they limit rent-seeking behavior by elites and increase the chance of a successful transition to democracy (Acemoglu, Hassan & Tahoun, 2017; Chenoweth & Stephan, 2011).

In the literature on civil resistance, violent and nonviolent conflicts are often considered to be very different phenomena, despite the accounts of close links between the two types of

phenomena in the literature on armed conflict (Regan and Norton, 2005).<sup>1</sup> Following Sharp (1973, 2005) and Chenoweth and Ulfelder (2017), we define nonviolent uprisings as campaigns which are typically organized by “activists, public figures and civilians, who attempt to change the status quo by coercing the opponent through disruption and pressure”, ultimately eroding public support for the regime. The relationship between grievances and uprisings is expected to be stronger in the case of peaceful than violent uprisings because the participation in peaceful civil uprisings is associated with a lower risk of violent government retaliation than participation in armed conflict. Furthermore, participation in civil resistance does not require the legitimization of the use of violence, nor the resources to buy weaponry. Hence, barriers to participation in peaceful events are lower than those in armed conflicts and as a result, success expectations are likely to play a smaller role (Klandermans, 1996).

*Figure 1 The number of demonstrations (CNTS, 2015) relative to the number of armed conflicts (Pettersson & Wallensteen, 2015) between 1995 and 2015*



Chenoweth and Ulfelder (2017) provide a first systematic examination of the extent to which grievances can explain nonviolent uprisings. They find that poverty can explain only a marginal amount of the variance in nonviolent uprisings, whereas political discrimination and

<sup>1</sup> For instance, when nonviolent resistance fails, opposition groups often use this as a justification to escalate to civil war (Regan and Norton, 2005).

repression have no predictive power. Nevertheless, they argue that overall neither grievance-based models, nor models based on other explanations, including modernization,<sup>2</sup> resource mobilization,<sup>3</sup> and political opportunity,<sup>4</sup> provide reliable predictions of nonviolent uprisings. Recognizing that the modest performance of extant theories “*may be partly a function of the limitations of available data*” (p. 318), they conclude that there is little evidence that structural models are informative on the causes of popular uprisings.

We argue in this paper that the objective indicators used in Chenoweth and Ulfelder (2017) are unlikely to adequately capture popular grievances and human suffering. Grievances refer to a perception of deprivation or unfair treatment, resulting from a discrepancy between the goods and conditions of life that people consider themselves rightfully entitled to, and those they perceive they can obtain and maintain (Gurr, 1970). As grievances refer to perceptions rather than objective circumstances, they are inherently subjective. Hence, measures of subjective well-being are more likely to track accurately grievances than objective indicators.

There are two main reasons why progress on so-called ‘objective measures of grievances’, like GDP growth and poverty measures, does not necessarily translate to a decrease in perceived hardship (Diener & Biswas-Diener, 2002; Easterlin, 1976; Oswald, 1997). First, objective indicators merely indicate the conditions for a good life, whereas measures of subjective well-being provide information on whether these conditions have also translated into a good life (Veenhoven, 2000). The effect of improvements in objective indicators on subjective well-being most likely varies across individuals, countries, and time (Deaton et al., 2009;

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<sup>2</sup> The modernization theory assumes that the natural evolution of the state is toward more liberal economic and political environments. Yet, developments in some countries, including China and Russia, question the soundness of the modernization theory.

<sup>3</sup> The resource-mobilization theory emphasizes the importance of human, financial, and informational resources, along with the presence of organizational capacity with which to mobilize the population. Mobilization potential matters particularly for nonviolent uprisings (Lichbach, 1995), whose success depend on broad-based participation (Chenoweth & Stephan, 2011; DeNardo, 1985).

<sup>4</sup> The political opportunity theory argues that rebellions are most likely where mobilization costs are low and the probability of success is high. This happens in countries whose governments allow mobilization, are undergoing transitions and do not have strong institutions to suppress dissent (McAdam 1999; Fearon and Laitin 2003).

Radcliff, 2001). Whilst for some individuals or groups in a society a lack of civil liberties is a key source of grievances, others might put more weight on poverty-related issues. Hence, because grievances are broadly-defined and essentially value- and preference-based, subjective measures might be more relevant and valid than objective indicators for predicting uprisings.

Second, objective indicators of growth also tend to raise expectations and aspirations (Tocqueville, 1856), which, if unmet, can decrease well-being. The ‘tunnel effect’ describes this phenomenon using the parable of a traffic congestion in a tunnel (Hirschman, 1973). If one of the lanes starts moving while the other lanes are still jammed, those who are stuck initially experience hope as the end of the traffic jam seems to be in sight, but unless they start moving forward, their hope will give way to envy and frustration. The tunnel effect ties in with the modernization theory (Inglehart & Welzel, 2005; Lipset, 1959), which posits that income growth leads to changes in values and fosters expectations of political and civil freedoms. When these expectations are unmet, this can lead to feelings of great disappointment and resentment, which can in turn mobilize citizens to demand changes within the political system (Gurr, 1970). In these cases, objective indicators reveal signs of optimism, whereas subjective indicators could indicate that anti-government sentiments are on the rise. This mechanism was at work during the Arab Spring, which was preceded by a period of ‘unhappy development’ in many Arab countries, especially the ones where the uprisings were most intense (Arampatzi et al., forthcoming).

This paper tests whether subjective well-being data can explain variation in nonviolent conflict going beyond what is captured by the typical objective measures. We propose a hybrid model, which captures the main features of the grievance, resource-mobilization, and political-opportunity theories of conflict, and in which we include additional subjective-well-being indicators of grievances. We also use additional specifications of this model to explore the role of context-specific factors enabling or hampering mobilization. Consistent with the grievance-



based approach to rebellion, we find that a decrease in subjective well-being – and particularly an increase in the percentage of self-reported *suffering* people in a country – positively affects nonviolent uprisings, proxied by the number of demonstrations and strikes. A one-percentage point increase in suffering increases nonviolent conflict events by 2.1%. The magnitude of this effect is similar to that of a percentage point decrease in GDP growth.

We address endogeneity concerns by instrumenting our subjective well-being measure with the ratio of deaths due to infectious diseases, complemented by a lag structure in a system GMM model. We also test and confirm the robustness of our results using a more inclusive measure of nonviolent uprisings than the one based on anti-government protests and strikes. This measure includes government boycotts, sit-ins and nonviolent takeovers of buildings that involve mass mobilization. Further exploration of the ways dissatisfaction with different life domains affects nonviolent resistance reveals that changes in the perceived ability to lead a purposeful and meaningful life and changes in the perceived standards of living to a large extent explains the effect of subjective well-being on nonviolent uprisings. In addition, our results suggest that the effect of grievances on peaceful conflict does not depend on context-specific factors – a finding which provides empirical support for the grievance-based theory of peaceful protest. While we find evidence of an effect of well-being on nonviolent civil conflict, we do not find a similar effect on its violent counterpart. This result provides support to the notion that the determinants of violent and nonviolent conflict differ and that grievances in and of themselves might not necessarily legitimize the use of violence.

Our findings contribute to the political economy literature on subjective well-being and political dissent (e.g. Di Tella & MacCulloch, 2005; Flavin & Keane, 2012; Frey, 2012; Liberini, Redoano & Proto, 2017) and the literature on nonviolent conflict (Chenoweth & Ulfelder, 2017). Although economists have traditionally been reluctant to include subjective well-being in econometric analyses (e.g. Olken, 2009; Banerjee, Hanna & Mullainathan, 2012),

recent studies provide growing evidence that these measures are suitable proxies for experienced utility (Blanchflower & Oswald, 2008; Diener & Chan, 2011; Steptoe & Wardle, 2005). This study expands this emerging literature by showing how subjective well-being affects popular dissent. Our findings suggest that both objective and subjective indicators influence nonviolent uprising and both must be included as regressors in econometric models of uprisings. In addition, our results indicate the need for initiatives to integrate measures of subjective well-being with standard economic measures to track progress and make informed policies.

Moreover, to the best of our knowledge, we are the first to analyze directly the effect of subjective well-being indicators on civil uprisings, and peaceful protests and strikes in particular. Our findings contrast previous work on (nonviolent) political conflict, which finds little evidence for a grievance-based approach to nonviolent uprisings nor for any other structural model (Chenoweth & Ulfelder, 2017). We find support for structural grievance-based explanations for nonviolent uprisings, although not for armed political conflict. This is particularly important in the context of post-2010 political conflicts in the Arab countries, which started as acts of nonviolent resistance and which could not be explained with objective data alone (Ianchovichina, 2018).

The remainder of this paper is organized in the following way. Section 2 presents the data and methodology for this study. This section also provides some descriptive statistics on our measures of subjective well-being and how they correlate with objective indicators of grievances. In Section 3, we discuss the baseline results followed by extensive robustness analyses, including a 2SLS and a system GMM model. Section 4 discusses sensitivity analyses, including the robustness of our results to alternative measures of nonviolent uprisings, changes in the definition of uprisings, and country heterogeneity. Section 5 looks at the drivers of the

relationship between subjective well-being and nonviolent uprisings. The last section presents concluding remarks and a discussion on limitations and future research.

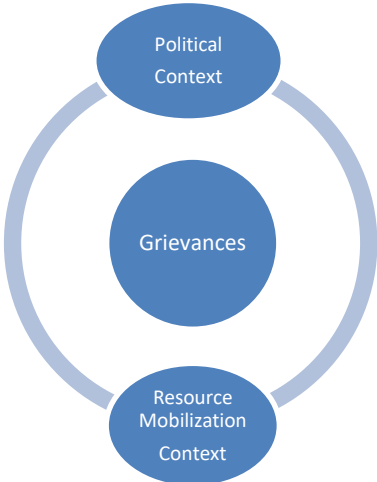
## 2. Methodology and Data

We analyze the relationship between subjective well-being and uprisings by estimating the following country-year regression model:

$$Nonviolent\ Uprisings_{it} = \beta_0 + \beta_1 SWB_{it} + \beta_2 X_{it} + \mu_i + \mu_t + \varepsilon_{it}, \quad (1)$$

The model links the number of nonviolent resistance events in country  $i$  and year  $t$  to our subjective-well-being indices  $SWB_{it}$  for country  $i$  in year  $t$ ; a set of control variables  $X_{it}$  which capture the most salient features of the grievance, resource-mobilization, and political opportunity theories of conflict; a set of country dummies for time-invariant country characteristics  $\mu_i$  and a vector of time dummies  $\mu_t$  for global shocks. In the baseline regressions, our sample includes 118 countries over the period 2006 to 2014.

**Figure 2. Grievances and Context**



Our regression model is a hybrid model that allows us to capture in a parsimonious way the main factors associated with civil conflicts and to minimize the shortcomings of each individual theory. Figure 2 presents the key components of the hybrid model and the features

we add to the model to reflect more accurately the interplay between context and grievances. The figure differentiates between grievance-based factors, which could be economic, social or political in nature and represent demand-side reasons for protest, and context-specific factors, which could be viewed as supply-side factors enabling or deterring conflict, including political opportunities and resource mobilization.

The political-opportunity theory underscores the importance of the costs of mobilization and the probability that an uprising will be successful (Meyer, 2004). Whilst this approach emphasizes the relationship between the willingness to participate in an uprising and more mainstream institutional politics, it has been criticized for focusing on factors that are often static (e.g. regime type) or are the result of an uprising (e.g. political terror) (Ackerman, 2007). The resource-mobilization theory emphasizes the importance of human, financial, and informational resources and organization capacity that can be used to mobilize the population. It assumes that people will mobilize whenever they have the means to do so, but it does not factor in the government's ability to create opportunities for and constraints to collective action (McAdam 1999). The rest of the section provides details on the variables in the regressions and the data used to proxy them.

### **Dependent variable: nonviolent uprisings**

Reliable and comparable cross-country time series data on uprisings are hard to come by. Preferably, we would have a panel with data on subjective well-being and civil resistance at the individual level, allowing us to study the relationship between an individuals' propensity to engage in nonviolent conflict and their level of life satisfaction. However, asking individuals about their engagement in conflict is problematic, as respondents in many countries run the risk of being prosecuted for their engagement in these types of activities. Additionally, by asking respondents about their participation in nonviolent conflict retrospectively, we would have to

make the assumption that the level of subjective well-being is constant in the period between the participation date and the survey date. Finally, it is likely that the effect of a reduction of subjective well-being on civil conflict does not only come from the increased propensity of ‘suffering’ civilians to participate in uprisings, but also from the fact that civilians that might not ‘take to the streets’ themselves, can support and legitimize an uprising. Therefore, we use as our dependent variable the number of events of civil resistance within a country in a year using data from the CNTS (2015). We calculate the number of such civil resistance events as the sum of strikes and demonstrations and transform it using the hyperbolic inverse sine. This transformation resembles a normal logarithmic transformation and can be interpreted as such, but it can take zeros into account.

The CNTS data has been collected through New York Times newspaper articles since 1815 and is used in several other studies to measure strikes and demonstrations (e.g. Braha, 2012; Collier & Rohner, 2008; Schatzman, 2005). Demonstrations are included in the CNTS dataset if they are (1) peaceful public gatherings, (2) with at least 100 participants, (3) whose primary purpose is to display or voice opposition to government policies or authority, (4) and do not have a distinctly anti-foreign nature such as anti-globalization protests. Strikes are included if (1) 1,000 or more industrial or service workers participate, (2) involve more than one employer and (3) are aimed at national government policies or authority. Whilst the average total number of demonstrations and strikes over the period of analysis (2006-2014) is 16 per country, there is considerable cross-country variation, from none in for example Finland, Bahrain and the United Arab Emirates, to 121 in Egypt, 129 in China and 209 in the United States. Any differences in the number of non-conflict events reported due to biases in the U.S. press coverage are absorbed by the country-fixed effect.

### **Independent variable: Subjective well-being indices**

Several recent empirical studies show that measures of subjective well-being complement financial and social indicators as independent variables in research on human development (e.g. Helliwell, Layard & Sachs, 2017; Graham & Nikolova, 2015; Manski, 2004; Oswald & Wu, 2010). We define subjective well-being, also known as happiness or life satisfaction, as the degree to which individuals judge the overall quality of their lives as favorable (Veenhoven, 1984). Biologically, high levels of subjective well-being are a signal that we are thriving and indicate the presence of good life chances in society, such as income, education, access to infrastructure, and high-quality institutions. When our basic human needs are satisfied and there is a good fit between opportunities in a society and our capacities, this will translate into higher levels of subjective well-being (Veenhoven, 2000). Thus defined, subjective well-being is something on one's mind that can be measured using surveys.

In this paper, we measure subjective well-being using the life evaluation index developed by the Gallup World Poll, which surveyed a nationally representative sample of individuals in more than 160 countries from 2006 onwards.<sup>5</sup> In most high-income countries, the interviews are conducted over the phone, whereas in low- and middle-income countries the surveys are administered face-to-face. The sample size is typically 1,000 respondents per country-year and 2,000 for larger countries such as China, India and Russia. In the case of small island states such as Haiti, Trinidad and Tobago, Iceland and Malta, the sample size is between 500 and 1,000. The life evaluation index is based on the Cantril ladder, which measures an individual's evaluation of their life as a whole, both now and in the future. This indicator contrasts indicators of the pleasantness of people's emotional lives, which are often measured using *experiential* questions about smiling a lot or feeling happy (Diener, Kahneman, Arora,

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<sup>5</sup> Samples are not representative at the national level in cases where the safety of the interviewing staff is threatened or in the case of scarcely populated islands (which are omitted in some countries). For Cuba, Chad, the Central African Republic, the DR Congo, Madagascar and Sudan, the excluded regions account for more than 15% of the population.

Harter & Tov, 2009). The life evaluation index is constructed from the answers to the following two questions:

(1) *Please imagine a ladder with steps numbered from zero at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?*

(2) *On which step do you think you will stand about five years from now?*

Accordingly, the average life evaluation index is a two-item ordinal scale (Cronbach's alpha of .91), accounting for both current and expected future life evaluation. The current and expected life satisfaction scores are combined, as it is reasonable to expect that not only current evaluations, but also expectations for the future indicate grievances. This is in line with the modernization theory which posits that improvements in living standards raises people's expectations about their future well-being. As the answers to the Cantril Ladder questions are ordinal, and hence cannot be treated as continuous, we group respondents into three categories and calculate the percentage of people in each category. *Suffering*<sup>6</sup> individuals are those with current and future life satisfaction scores that are equal or less than 4. Individuals are considered *struggling* when their current life satisfaction scores are 5 or 6 and their future life satisfaction scores are equal or greater than 5 and less than or equal to 7. *Thriving* individuals are those with current life satisfaction scores of 7 or above and future life satisfaction scores of 8 or above.

The country-level SWB index used as a variable in the regression model represents the share of respondents that reports to be *suffering*. Country-level weights are applied to this calculation and a respondent must have answered both questions to be included in the calculation.<sup>7</sup> People who identify themselves as *suffering* are likely to lack the capabilities that

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<sup>6</sup> We also refer to these individuals as the unhappy or dissatisfied people.

<sup>7</sup> To ensure that the results are not driven by the way the Gallup World Poll categorizes responses into *suffering* and *struggling*, we rerun our baseline model with the average life evaluation as obtained with the Cantril Ladder and we confirm the results reported here.

allow them to make autonomous decisions and to pursue a fulfilling life (Graham & Nikolova, 2015). The percentage of *suffering* individuals is negatively correlated with GDP per capita ( $\rho = -0.46$ ), GDP growth ( $\rho = -0.10$ ) and child mortality ( $\rho = -0.24$ ). Hence, we expect that the percentage of *suffering* individuals is closely related to perceived hardship and grievances and hence has a direct effect on nonviolent resistance. In the regressions, we control for the percentage of people who report to be *struggling* and therefore may also be experiencing considerable hardship.

*Table 1 Countries with the lowest and highest percentage of citizens that report to be 'suffering' according to the Gallup World Poll (2005-2015).*

Countries with lowest incidence of suffering		Countries with highest incidence of suffering	
Country	Suffering	Country	Suffering
Norway	1.2	Bulgaria	39.1
Denmark	1.3	Afghanistan	34.9
Canada	1.6	Burundi	34.5
Netherlands	1.7	Haiti	32.5
United Arab Emirates	1.8	South Sudan	32.5
New Zealand	1.8	Armenia	29.2
Switzerland	1.8	Tanzania	29.0
Sweden	1.8	Yemen	28.5
Oman	2.0	Hungary	26.7
Luxembourg	2.0	Georgia	26.7
Australia	2.1	Serbia	25.9
Brazil	2.3	Ukraine	25.8

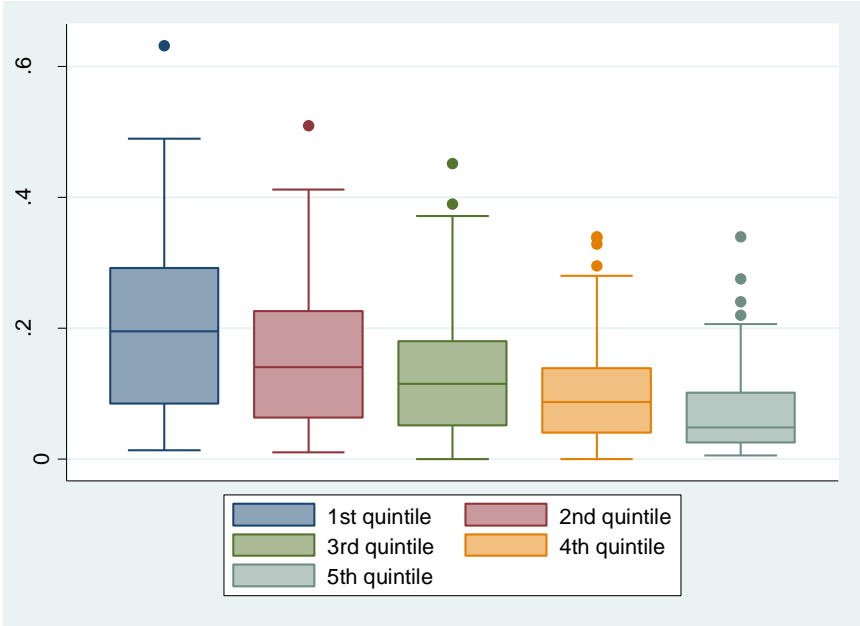
Table 1 lists those countries with the lowest and highest percentages of suffering people. Not surprisingly, most of the countries with the lowest percentage of *suffering* individuals are high-income economies, whereas those with the highest percentage of *suffering* individuals are low-income economies, most of which are fragile countries. Bulgaria and, to a lesser extent, Serbia stand out among the group of countries with the highest percentage of suffering people.



Both countries report a very high percentage of *suffering* individuals, which is difficult to explain using objective economic indicators alone.<sup>8</sup>

Figure 3 shows how the percentage of suffering depends critically on the income quintile in which respondents are located. Income quintiles are based on self-reported income in the Gallup World Poll and are calculated at the country level. A median of 18% for the bottom 20% of society report to be *suffering*, whereas for the richest 20% *suffering* has a median of only 5%. This suggests that there is a positive relationship between welfare and well-being, at least at the within-country level.

*Figure 3 Distribution of the share of respondents categorized as suffering by income quintile over the period 2007-2014*



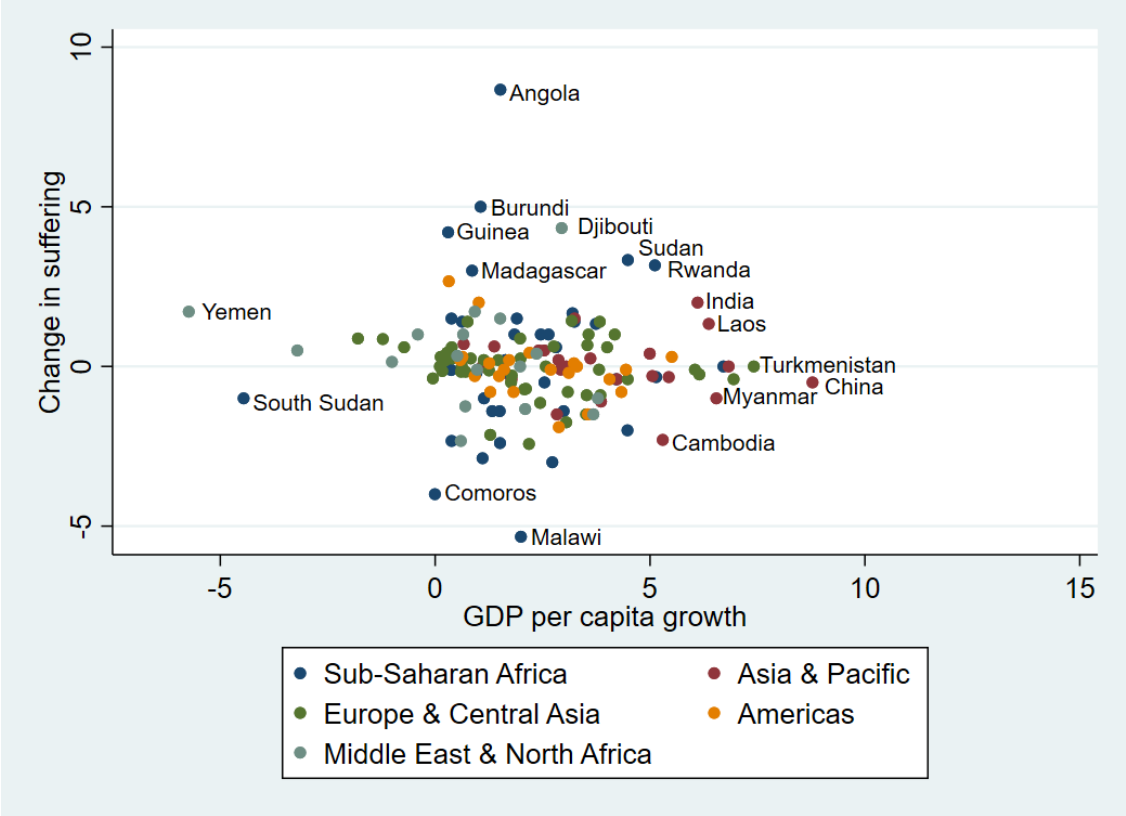
Note: Dots indicate outliers as defined by Tukey (1977).

Figure 4 shows the correlation between the average GDP growth per capita rate between 2006 and 2014 and the average change in the percentage of *suffering* over the same period. Surprisingly, there is no significant correlation between these variables ( $\rho = -0.07$ ). Hence, at the between-country level there is little evidence of a relationship between GDP growth and

<sup>8</sup> Sardamov (2007) argues that the level of suffering in Bulgaria can largely be explained by unrealistically high expectations for development and a general distrust in public institutions.

subjective well-being. In several countries with an average GDP growth rate of more than 4%, most notably Sudan, Rwanda and India, there was a substantial increase in the percentage of people *suffering*, consistent with the existence of the so-called “unhappy development” paradox (Arampatzi et al., forthcoming). Angola also stands out, with a 7% increase in *suffering* despite a positive GDP growth rate.

Figure 4 Scatterplot of average GDP growth per capita and the percentage point change in suffering over the period 2006/2007 to 2014



**Control variables**

The model includes a set of control variables that are standard to the conflict literature and capture the most salient features of the grievance, resource-mobilization, and political-opportunity theories. The addition of control variables in our model allows us to test whether suffering can explain variance beyond what is captured by the main narratives in the literature on the topic. In selecting the controls, we face a trade-off between maximizing the number of control variables and taking full advantage of the number of countries for which the Gallup World Poll’s subjective well-being data are available. For many of the low-income countries

data are scarce; excluding these economies would not only significantly reduce statistical power, it would most likely also lead to sample selection bias. Therefore, data on income inequality, unemployment and literacy rates are not included. In our short time period, these variables as well as those on horizontal inequities (e.g. ethnic or religious polarization), population, and geographical features can be regarded as time-invariant and are therefore part of our country fixed effects and are not included as controls. In the following paragraph, we discuss the control variables that capture aspects of the grievance, resource-mobilization and political-opportunity theories.

Grievance-based approaches to uprisings underscore the role of injustices resulting from for example the distribution of power and resources in a society (Cederman, Weidmann, & Gleditsch, 2011; Gurr 1970). Poverty is often regarded as the most important source of economic grievances; yet, poverty data is insufficiently available for most low-income countries. Therefore, we follow Chenoweth and Ulfelder (2017) and use *infant mortality* per 1,000 live births (World Bank) as a proxy. In line with most grievance-based models of resistance, our regression model also includes financial control variables that capture the *income level (GDP (ln))*, *economic growth (GDP growth)*, *oil rents (% of GDP)* and *inflation*.<sup>9</sup>

The effects of *GDP* and *GDP growth* are theoretically ambiguous. On the one hand, an increase in *GDP* tends to imply an increase in living standards and hence, a decrease in grievances and accordingly anti-government sentiments. On the other hand, increases in *GDP* might also set off modernization to the extent that citizens who are no longer preoccupied with addressing their basic needs take to the streets to demand more civil liberties. Periods of slow economic growth may create anger among citizens affected directly through reduced employment and investment opportunities and indirectly through eroded capacity to finance

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<sup>9</sup> The inflation variable contains several outliers. Therefore, we winsorized it at the 1<sup>st</sup> and 99<sup>th</sup> percentile. We also estimated regressions with a non-winsorized inflation coefficient, which shows very similar results for the suffering variable. However, in these models the inflation coefficient is unrealistically large.

social safety nets. However, periods of fast economic growth may leave some segments of the population behind, creating anger about lack of opportunities as illustrated by the ‘tunnel effect’.

The effect of oil rents is also theoretically uncertain, as rents not only increase the government’s capacity to provide public services, but also increase citizens’ expectations of the amount and quality of available public goods and services. Inflation is expected to increase nonviolent uprisings, because increases in food and energy are generally regarded as an important source of dissatisfaction with regimes (Chenoweth & Ulfelder, 2017). We also include a measure tracking the views of informed public opinion experts and business people of corruption in the public sector from Transparency International. Widespread government-related corruption has been identified as a major source of dissatisfaction with the regime, including more recently by Arab Spring protestors (Arampatzi et al., forthcoming). However, the individual grievances inflicted by corruption might be more accurately captured by the subjective well-being variable.

In our regression models we control for political-opportunity factors by including a measure of the extent to which a country is an institutionalized autocracy. Autocracies tend to be less tolerant to public dissent, which increases the cost of mobilization whilst simultaneously reducing the probability that they will be successful (Chenowetz & Ulfelder, 2017). On the other hand, the tendency of autocracies to restrict civil rights and use repression might also motivate people to take to the streets. Our measure of democracy is derived from the Polity dataset and ranges from 0 to 10, where 0 indicates that there are no autocratic policies in place, whereas a 10 indicates that a regime is a formal autocracy (Marshall & Jaggers, 2002). Because we include country fixed effects in our regression models, the autocracy variable merely captures variation in autocratic policies over time rather than variation between countries.

In addition, the degree of repression and state-inflicted political terror increases the perceived costs and decreases the probability of success of uprisings, and it may accordingly discourage participation in such events (Carey 2006; Davenport 2007; Francisco 2004). Therefore, we include a measure of state-inflicted *political terror* derived from the political-terror scale in Gibney et al. (2015). The scale ranges from 1 to 5, where a 5 indicates that terror (e.g. murders, disappearances, and torture) has expanded to the whole population. Although political terror might deter civil resistance, it also increases perceived injustices and might thus facilitate mass mobilization.

Following the resource-mobilization theory, we control for the effect of information technologies and infrastructure by including the number of *mobile phones* per 1,000 inhabitants reported by the World Bank. The ease of mobilization is controlled for by including a variable reflecting the extent of urbanization, proxied by the percentage of the population in urban areas. A correlation matrix for the variables included in the hybrid model 1 is provided in Appendix 1.

### **3. Estimation results**

To examine the relationship between subjective well-being and nonviolent conflict, we estimate an Ordinary Least Squares (OLS) regression on the number of nonviolent conflict events. Standard errors are robust and clustered at the country level. We also estimate a Poisson model and obtain qualitatively similar results, reported in Appendix 2 (Column 1-2). In this section, we report the results of the more parsimonious OLS regression here. Although the Hausman test supports the use of the more efficient random-effects model, we report the results of the model including country-fixed effects in the main text while those of the random-effects model are reported in Appendix 2 (Column 3-4). We do so because there are some concerns regarding the comparability of subjective-well-being scores across countries due to linguistic and cultural differences (e.g., Argyle, 2001; Kahneman & Riis, 2005). In addition, the fixed-effects

coefficients can be more easily compared with those obtained with the GMM estimators in the robustness checks.

### **Baseline Results**

Table 2 shows the results of the OLS estimations including country and year fixed-effects regressions with the annual number of strikes and demonstrations as the dependent variable. In the first column, we show the baseline results of a model (1) in which we have only the covariates of the hybrid conflict model. In this regression, only GDP growth is significant at the 5% level, confirming the negative relationship between growth and uprisings, found by Chenoweth and Ulfelder (2017). The effect of oil rents is positive and significant at the 10% level. A one-percentage point increase in oil rents increases nonviolent conflict with 2.5%. This finding contrasts the one by Costello, Jenkins and Hassan (2015) who found that oil rents were negatively associated with the Arab Spring protests, although they do not control for GDP or include country-fixed effects. Yet, it is in line with the literature on violent conflict, which has found some evidence for a so-called resource-conflict curse (Collier & Hoeffler, 2004). None of the other control variables is significantly different from zero.

In the second column, we regress the *suffering* and *struggling* variables on the number of nonviolent conflicts. The effect of *suffering* on the number of nonviolent conflicts is highly significant. A one-percentage point increase in the percentage of people suffering leads to a 3.5% increase in the number of nonviolent conflict events. The effect of *struggling* - i.e. those that have moderate views of their life situation - also has a positive and significant effect on the number of nonviolent conflict events, although this effect is considerably smaller than the effect of the percentage of *suffering*. A one-percentage point increase in the percentage of struggling people increases events of nonviolent resistance by 1.8%.

*Table 2: OLS regression with the number of anti-government demonstrations and strikes (transformed using the inverse hyperbolic sine transformation as the dependent variable)<sup>10</sup>*

	(1)	(2)	(3)
Suffering (%)		0.035*** (0.009)	0.032*** (0.009)
Struggling (%)		0.018* (0.008)	0.017* (0.007)
GDP (ln)	-0.364 (0.333)		-0.078 (0.306)
GDP Growth (%)	-0.034** (0.011)		-0.028** (0.010)
Inflation (%)	0.001 (0.009)		-0.005 (0.009)
Oil Rents (% of GDP)	0.025+ (0.013)		0.029* (0.013)
Infant Mortality	0.004 (0.023)		0.006 (0.022)
Autocracy	0.034 (0.071)		0.046 (0.069)
Corruption	-0.012 (0.010)		-0.009 (0.009)
Political Terror Scale	0.136 (0.084)		0.154 <sup>†</sup> (0.080)
Mobile phones	0.000 (0.003)		0.000 (0.003)
Urban population (% of total)	0.035 (0.044)		0.036 (0.043)
Constant	2.406 (4.628)	-1.129* (0.561)	-2.558 (4.484)
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	862	862	862
Number of Countries	118	118	118
R <sup>2</sup> overall	0.003	0.096	0.068
R <sup>2</sup> within	0.258	0.260	0.285
R <sup>2</sup> between	0.009	0.017	0.042

Robust standard errors in parentheses  
\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, + p<0.1

In the third column we show results for hybrid model (1) which includes the two subjective well-being variables and all controls. The effect of subjective well-being remains highly significant and the coefficients are similar to those obtained in the model without covariates. The effects of the controls also do not change meaningfully as compared to those reported in column 1. The political terror coefficient becomes significant at the 10% level,

<sup>10</sup> We also estimated regression models for strikes and demonstrations separately and the results of the two separate models are similar to each other and the results reported here.

providing some support for the idea that political terror can increase feelings of injustice, which in turn increase willingness to take anti-government actions. Our within R-squared increases meaningfully compared to the model with only the traditional covariates of conflict. This suggests that our subjective well-being measures explain another source of variation that cannot be explained by the conventional indicators. In this model, a one-percentage point increase in suffering increases the number of nonviolent conflict events by 3.2%. For comparison, this effect is slightly larger than the effect of a one-percentage point decrease in GDP growth, which increases nonviolent uprisings with 2.8%.

### **Addressing endogeneity**

An obvious concern when analyzing the relationship between suffering and nonviolent conflict is that suffering is endogenous. Nonviolent conflict cannot just be the consequence of human suffering but also the cause of it, albeit to a lesser extent than violent conflict. Therefore, we instrument suffering with the number of people dying from infectious and parasitic diseases per 1,000 inhabitants, obtained from the WHO statistics office. These diseases tend to cause considerable human suffering, as they lead to fear of contracting the disease, suffering due to the disease itself and grief caused by losing loved ones. As such, it reflects the strategy taken by Liberini et al. (2017), who instrument subjective well-being with the deaths of loved ones. In addition, these diseases tend to be difficult to manage and when controlling for GDP, poverty

In Table 3 (Column 1-2) we report the results of the 2SLS model, including robust standard errors. The coefficient on the variable for the share of *suffering* people is positive and significant at the 10% level, although the standard error is large. The coefficient is also considerably larger than the coefficient estimated with the OLS regression (Table 2). The coefficient on the variable of *struggling* people remains positive and significant at the 5% level. Yet, both the standard error and the coefficient seem to be inflated, which could be explained by a weak instrument problem. We obtained a weak identification F-statistic of 7.19, which



following the conventional rule of thumb for relevance of instruments ( $F\text{-statistic} > 10$ ) indeed indicates a weak instrument problem. Whilst this does not necessarily bias our estimates, it decreases the precision with which they are estimated.

and time-invariant factors, they are likely to be uncorrelated with the error term.

*Table 3 Robustness analyses: regression models with instrumental variables.*

	(1) 2SLS	(2) 2SLS	(3) 1-step System GMM	(4) 1-step System GMM	(5) 2-step System GMM	(6) 2-step System GMM
Suffering	0.069 <sup>+</sup> (0.041)	0.118 <sup>+</sup> (0.070)	0.019* (0.009)	0.019* (0.009)	0.021* (0.010)	0.021* (0.010)
Struggling		0.041* (0.002)		0.007 (0.008)		0.008 (0.009)
Nonviolent Conflict <sub>t-1</sub>			0.269*** (0.059)	0.263*** (0.058)	0.238*** (0.055)	0.228*** (0.056)
Constant			-3.347** (1.066)	-3.821*** (1.140)	-3.296** (1.170)	-4.015** (1.223)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Control Var	Yes	Yes	Yes	Yes	Yes	Yes
Observations	859	859	862	862	862	862
Countries	115	115	118	118	118	118
Instruments	17	17	99	107	99	107
Kleibergen-Paap LM statistic	4.505*	3.444 <sup>†</sup>				
Weak identification F-statistic	7.187	4.601				
Sargan test			90.49	96.65	90.49	96.65
Hansen J statistic			74.94	77.16	74.94	77.16
AR1 test			-6.430***	-6.393***	-4.869***	-4.853***
AR2 test			0.192	0.211	0.065	0.048

The instrument is the number of deaths due to infectious diseases (per 1.000 inhabitants), complemented with the lag of difference of the independent variables for the GMM models. Robust standard errors in parentheses.

\*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ , <sup>†</sup>  $p < 0.10$

Besides an endogeneity problem, the OLS-regression has three other limitations - none of which is solved by the 2SLS regression. First, our panel is unbalanced. Whereas for most countries data are available from 2006 to 2014, Gallup only started collecting data in later years for some others. This could lead to sample attrition bias. Second, nonviolent conflict is most likely dynamic in the sense that current values of nonviolent conflict are affected by past ones. In an OLS-regression with country fixed effects, the inclusion of a lagged dependent variable would automatically lead to a correlation between this lagged variable and the error term; a

statistical violation that has been named the Nickell bias (Nickell, 1981). This bias is more problematic in settings with a large number of countries and a small number of time periods such as in our dataset.<sup>11</sup> The system GMM estimator has been widely used to address these concerns (Arellano & Bover, 1995; Blundell & Bond, 1998; Roodman, 2009a). In addition to including deaths due to infectious diseases as an exogenous instrument, the system GMM creates instruments internally by using lagged differences of the variables. Hence, we are able to exploit the variation in a large set of instruments. Relative to the 2SLS model, the system GMM has the advantage that it can solve the weak instrument problem as efficiency increases, while also allowing the instrumentation of the *struggling* variable and our (endogenous) control variables. Moreover, the system GMM model makes it possible to test whether the set of instruments is valid using a Sargan test.

One of the problems with the system GMM is that the results are sensitive to specification decisions, particularly to the number of instruments (Roodman, 2009b). To limit this problem we use all lags (for 7 years), but minimize the number of instruments included in the estimation by collapsing the instrument count. Our time dummies reduce the probability of no correlation across individuals in the idiosyncratic disturbances (Roodman, 2009b). We include all independent variables into the instrument matrix, and apart from *oil rents*, we treat all of them as non-strictly exogenous.

We first estimate the standard one-step system GMM model with clustered robust standard errors (Table 3, Column 3-4). The variable for the share of *suffering people* continues to have a significant positive effect on the number of nonviolent conflict events and the size of the coefficient on this variable is similar to those estimated with the fixed-effects OLS regression. The coefficient of the variable for the share of *struggling people* is positive, but no longer statistically significant. The lagged dependent variable is large and highly significant,

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<sup>11</sup> In Appendix 2 we provide the results of an LSDVC model (Bun & Kiviet, 2003; Bruno, 2005) which corrects for this Nickell bias.

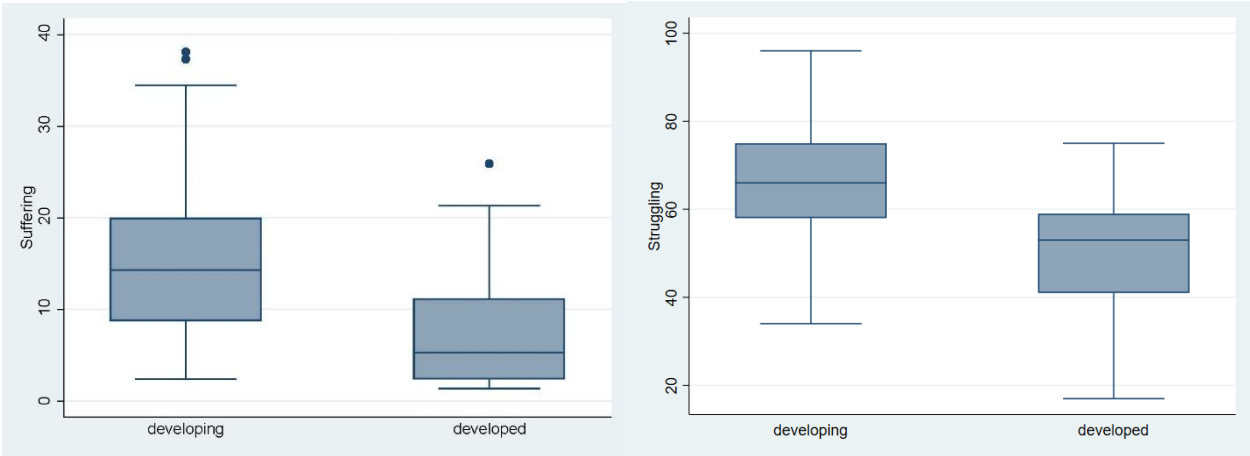
indicating that the past level of nonviolent conflict indeed influences the current level. The Sargan test is not statistically significant, indicating that overidentifying restrictions are valid and the AR2 test finds no evidence of second order autocorrelation.

In Column 5 and 6 (Table 3), we provide the results of a two-step estimation process that is more asymptotically efficient than the one-step procedure. Windmeijer-corrected cluster-robust standard errors are reported (Windmeijer, 2005). These results are similar to the results obtained with the one-step procedure. Again, the diagnostic tests do not show any specification issues. Hence, these results confirm that changes to subjective well-being affect nonviolent uprisings in addition to the effect of traditional objective indicators.

**4. Sensitivity analyses**

This section discusses the robustness of the results to changes in the sample to test for country heterogeneity, alternative measures of peaceful uprisings and alternative definitions of uprisings, including testing whether our results hold in the case of violent uprisings.

*Figure 5 The average rates (%) of suffering and struggling in developing (middle and low income) and developed (high income) countries during the sample period 2006-2014*



*Note: Dots indicate outside values as defined by Tukey (1977).*

**Country heterogeneity: The importance of context**

Most developed countries experienced a very low fraction of suffering (5.3%) during the period from 2006 to 2014 (see Figure 5), as expected in countries with high standards of living and large middle classes. In addition, developed countries experience much less variation in the

percentage of the population classified as suffering than in developing countries, where the median percentage of suffering individuals is also substantially larger at 14.3% of the population. It is important to note that the majority of people in both developed and developing countries is struggling, although the percentage of struggling people is even higher in developing countries (median of 53% in developed versus 66% in developing countries). Given these differences and the considerably smaller number of developed countries in our sample, it is probable that the effect of suffering found in the previous models is purely identified from the sample of developing countries. To test this, we estimate a model in which we interact the suffering and struggling variables with a dummy variable which is one for high-income countries and zero otherwise. We report the results in Column 1 of Table 4.

The effect of *suffering* on the number of nonviolent events of civil resistance in high-income countries is not statistically different from that in low- and middle-income countries. However, the *struggling x high income* coefficient is positive and significant, indicating that an increase in the percentage of struggling has a stronger effect on nonviolent resistance in high-income nations. Yet, for low and middle-income countries, an increase in struggling does not have a significant effect. Hence, the effect of struggling found in the previous models is purely identified based on the sample of developed countries, where poverty rates and rates of suffering are low, but the rates of struggling are significant. This result is consistent with the experience in many developed countries where the middle-class squeeze became a major factor in the popular movements which emerged after the global financial and economic crisis in 2008. This finding is also consistent with the idea that well-being is a relative concept, i.e. the idea that the position of an individual's subjective well-being relative to the average level of happiness in a society influences the extent to which he/she feels aggrieved.

The effect of subjective well-being on nonviolent uprisings might also depend on other contextual factors; most notably the existence of political opportunities for uprisings and the

ease of mass mobilization (see Figure 2). In our baseline model, we control for factors associated with these theories of uprisings and find little evidence that they have a direct effect on peaceful uprisings. However, they might affect uprisings through an interaction with SWB. Suffering might create a demand for change, but whether citizens voice this demand in a peaceful uprising, depends on the cost of mobilization and the perceived probability of success. To test the importance of context for the relationship between SWB and uprisings, we add interactions with the main factors associated with the political opportunities (i.e. democracy and political terror) and the resource mobilization approach (i.e. mobile phones and urbanization) to the model.

First, we test whether the effect of subjective well-being on nonviolent uprisings depends on the level of democracy. Whereas in democracies dissatisfaction can be raised at the ballot box, in undemocratic societies it is difficult or impossible to change policies by voting, which might encourage citizens to participate in peaceful protests to voice their grievances. In Column 2, we interact the *suffering* and *struggling* variables with the polity variable, which ranges from -10 in a pure autocracy to 10 in a pure democracy. Both the *suffering* and *struggling* interactions are not statistically significant. Hence, there is no evidence that the effect of SWB on uprisings depends on the level of democracy.

Second, we explore whether political terror affects the willingness of citizens to mobilize in response to high rates of *suffering* in society. If the regime represses the population with political terror, the costs of participation in an uprising might be prohibitively high. In Column 3, we interact the *struggling* and *suffering* variables with the 5-point political terror scale (Gibney et al., 2015). Neither of the interaction terms is statistically significant. Hence, there is no evidence that repressive regimes decrease the probability that *suffering* leads to a peaceful uprising. Note that the main effect of *suffering* and *struggling* in this model is not

insightful, as the coefficients represent the effect of these variables if the political terror scale were 0, whilst the index ranges from 1 to 5.

*Table 4 The role of context: Models including the interaction between suffering and struggling and political opportunities and mobilization variables.*

	(1) High income interaction	(2) Polity score interaction	(3) Political terror interaction	(4) Mobile interaction	(5) Urbanization interaction
Suffering (%)	0.022** (0.010)	0.029*** (0.009)	0.008 (0.026)	0.030** (0.013)	0.019 (0.028)
Suffering x High Income	0.014 (0.028)				
Suffering x Polity score		0.001 (0.001)			
Suffering x Political terror			0.008 (0.008)		
Suffering x Mobile phones				0.000 (0.000)	
Suffering x Urbanization					0.000 (0.000)
Struggling (%)	-0.002 (0.010)	0.016* (0.008)	0.024* (0.013)	0.019 (0.014)	-0.014 (0.027)
Struggling x High income	0.039*** (0.014)				
Struggling x Polity index		-0.000 (0.001)			
Struggling x Political terror			-0.002 (0.005)		
Struggling x Mobile phones				-0.000 (0.000)	
Struggling x Urbanization					0.000 (0.000)
Constant	-1.876 (4.241)	-2.419 (4.370)	-2.096 (4.376)	-2.585 (4.587)	-0.148 (4.982)
Observations	882	882	882	882	882
Number of countries	119	119	119	119	119
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Control Var	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup> overall	0.0720	0.0935	0.0781	0.0981	0.0852
R <sup>2</sup> within	0.289	0.279	0.281	0.279	0.281
R <sup>2</sup> between	0.0562	0.0563	0.0439	0.0604	0.0502

Note: R-squared refers to pseudo R-squared for the logit models in Column 3-4. Estimates are obtained with an OLS model. Cluster robust standard errors in parentheses. \*\*\* p<0.001, \*\* p<0.01, \* p<0.05, † p<0.10

Third, we look at the ease with which citizens can organize an uprising. *Suffering* might only lead to an uprising, when it is possible to assemble the human, financial, and informational resources necessary to mobilize a wider population for the cause (Chenoweth & Ulfeder, 2017).

We proxy the ease with which these resources can be mobilized with the availability of mobile phones and the degree of urbanization. In Column 5 and 6, we include interactions with these variables and *suffering* and *struggling*. However, neither of these interaction terms is statistically significant. Thus, we find no evidence that the effect of subjective well-being on peaceful uprisings depends on contextual factors. It is worth noting that we focus on a select set of contextual factors that have been associated with either the political opportunities or the resource mobilization approach to uprisings. Nevertheless, this analysis suggests that *suffering* is a relatively universal basis for non-violent uprisings.

### **Alternative measures of peaceful uprising**

Our measure of nonviolent uprisings based on the CNTS dataset is collected through the New York Times and the coverage of such events is relatively limited in small, low-income countries with few ties to the U.S. Systematic time-invariant differences in coverage are filtered out by the country fixed effects, but the quality of New York Times news coverage might change over our sample period and such changes could be correlated with widespread human suffering in these countries, leading to selection bias. We therefore explore the robustness of our results using the data on nonviolent uprisings from the Major Episodes of Contention (MEC) dataset (Chenoweth, 2015; Chenoweth & Ulfelder, 2017). Because nonviolent uprisings are identified through a review of global media (i.e. Associated Press and Agence France Press news stories within Factiva and LexisNexis) selection bias should be minimized.

The MEC measure of nonviolent uprisings differs from the CNTS variable in several ways. First, it measures whether an episode (i.e. more than one event, occurring within a week of one another) is ongoing in a certain year. Hence, their variable is a dummy instead of a count variable. This is disadvantageous, because we lose considerable variation in the intensity of nonviolent uprisings. Second, in order for an event to be considered it needs to have at least

1,000 participants (instead of 100 participants for protests in the CNTS dataset), and hence they only include *mass* nonviolent uprisings. Third, for an episode to be included, an uprising should not only be anti-government, but its explicit goal should be to seek the removal of the incumbent. Hence, whereas the CNTS data also includes acts of resistance in opposition to certain policies, the MEC data only includes them if they have the maximalist aim of bringing about a regime change. Fourth, the dataset covers episodes until 2013 and hence our period of analysis was shortened by one year. Fifth, whereas the CTNS dataset only covers protests and strikes, MEC also includes all non-institutional acts of civil disobedience such as sit-ins and nonviolent occupations, as long as they include at least 1,000 participants and aim to replace the government. In 79.45% of the cases where MEC identifies an ongoing nonviolent uprising, the CNTS dataset also records at least one demonstration or strike.

*Table 5 Alternative dependent variables*

	(1) Ongoing uprisings (MEC)	(2) Riots (CNTS)	(3) Violent conflict (UCDP/PRIO)	(4) Battle-related deaths (UCDP/PRIO)
Suffering (%)	0.125** (0.064)	0.013† (0.007)	0.025 (0.104)	-0.012 (0.011)
Struggling (%)	0.113* (0.065)	0.008 (0.006)	0.114 (0.12)	0.008 (0.008)
Constant	-122.665*** (41.705)	-0.686 (4.749)	30.467 (30.469)	9.964 (8.605)
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Control Var	Yes	Yes	Yes	Yes
R-squared	0.402	0.307	0.380	0.063
Observations	152	862	178	882
Countries	23	118	22	121

Note: R-squared refers to pseudo R-squared for the logit models in Column 1 and Column 3. Estimates are obtained with an OLS model. Cluster robust standard errors in parentheses. \*\*\* p<0.001, \*\* p<0.01, \* p<0.05, † p<0.10

We estimate a logistic regression with clustered robust standard errors because nonviolent uprisings are measured as a binary variable in the MEC dataset. In this model only those countries for which there is variation in the ongoing uprising variable, capturing either



the onset or offset of an uprising, can be included, which limits the set of countries included in the logit model to only 23. In the regression of subjective well-being on uprising, as recorded in the MEC dataset (Table 5, Column 1), the effect of *suffering* remains positive and statistically significant. On average, a one-percentage point increase in the *suffering* rate increases the probability of a large-scale nonviolent uprising with 1.3 percentage points. Also the coefficient on the *struggling* variable remains positive and significant with an average marginal effect of 1.1 percentage points. We also estimated a random effects model on the full set of observations (118 countries). The results are similar to those obtained when including country fixed effects<sup>12</sup> and are reported in Appendix 3.

### **Violent uprisings**

Can a decrease in subjective well-being also explain violent resistance? We test whether this is the case using three different measures of violent political resistance, showing the results of the regressions in Table 5 (Columns 2-4). In Column 2, the dependent variable is the number of riots obtained from the CNTS dataset. Riots are only included if they involve a clash of more than 100 citizens who use of physical force. We transform the number of riots using the inverse hyperbolic sine transformation and estimate an OLS model with country and year fixed effects. In this regression, *suffering* has a significant effect on riots, but the coefficient is only significant at the 10% level and is considerably smaller than when the dependent variable is nonviolent resistance. Whereas a percentage point increase in suffering increases nonviolent resistance by 2.1%, it only increases the number of riots by 1.3%.

To measure armed violent conflict, we use a dummy variable which is one if there is “a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least

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<sup>12</sup> A Hausman test does not find evidence of systematic differences between the fixed effects and random effects model and hence the random effects model is statistically most appropriate. For reasons discussed in our methodology section, we still have more confidence in the results obtained in the more conservative fixed effects model.

25 battle-related deaths in one calendar year” (Pettersson & Wallensteen, 2015, p. 1). We also measure the intensity of violent political conflict with the number of battle-related deaths. This variable is left censored at 25 battle-related deaths, as deaths are only recorded for recognized violent conflicts. We transform the number of battle-related deaths using the inverse hyperbolic sine transformation. Data for both violent conflict variables is derived from UCDP/PRIO (see Pettersson & Wallensteen, 2015).

Neither the *suffering rate* nor the *struggling rate* are statistically significant in the regression with the violent conflict dummy as the dependent variable (Table 5, Column 3). We obtain the same result when we use the number of battle related deaths as a dependent variable. Although no causal conclusions can be drawn from these conditional associations, our results suggest that whereas a decrease in subjective well-being can increase anti-government sentiments and produce nonviolent uprisings, it does not necessarily lead to legitimization of the use of violence to replace a government. This confirms that the relationship between grievances and conflict is stronger for nonviolent uprisings than for its violent counterpart.

These results provide evidence for the view that although grievances might be a necessary condition for (violent) conflict, they are not a sufficient one (Klandermans, 1996). Only if rebellion is perceived to be instrumental in addressing grievances, will citizens participate in conflict. The perceived benefits of participation should outweigh the expected costs. This might be true for both violent and nonviolent uprisings. However, because participation in armed conflict is more costly both in terms of the resources required to participate and the probability of death or injury, the expectations of success have to be higher to ensure participation. There are many factors that determine the expectations of success, e.g. the reluctance of the government to suppress rebellion, the regime’s military power, external interventions, and the ease of armed mobilization. It might therefore be difficult to find a direct effect of subjective well-being – or any other type of grievances - on armed conflict.

## 5. Drivers of the relation between well-being and nonviolent conflict

One of the advantages of our subjective well-being measure is that it is an aggregate measure of respondents' views on how satisfied they are with their life as a whole. Accordingly, this measure implicitly includes the assessment of several life domains (e.g. income, freedom), without putting explicit fixed weights on these domains. However, the disadvantage of such a measure is that it does not allow us to isolate the mechanism through which subjective well-being affects the willingness to participate in civil resistance campaigns. To solve this problem, we estimate models in which we include indicators for particular domains of well-being instead of the suffering and struggling rates. In Table 6, we list descriptive statistics of these variables and report the correlations the *suffering* and *struggling* variables.

We focus on three different domains of subjective well-being: (1) individual capabilities, (2) perceived standards of living, and (3) the provision of community basics. Capabilities are defined as the capacity to fulfill a purposeful and fulfilling life (Graham, 2011) and following Graham and Nikolova (2015), we measure the extent to which they are present in society with (i) the percentage of people that perceive they can *get ahead* by working hard and (ii) the percentage satisfied with their *freedom of life*. These two variables correlate negatively and strongly with *Suffering*, and to a lesser extent, *Struggling* (Table 6). When these two measures of perceived capabilities are included in a regression on nonviolent uprisings (Table 7, Column 1-2), the coefficients of both variables are negative and statistically significant, indicating that a percentage point increase in perceived capabilities, decreases the number of nonviolent resistance events with about 2 percentage points.

*Table 6 Correlation of suffering and struggling with other subjective indicators*

	Mean	S.D.	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>1 Suffering (% pop.)</b>	11.6	8.90	0	61	1							
<b>2 Struggling (% pop.)</b>	59.49	14.29	17	90	0.27	1						
<b>3 Standard of Living (SoL) (% pop.)</b>	61.10	18.53	11	95	-0.63	-0.56	1					
<b>4 SoL getting better (% pop.)</b>	0.428	0.16	0.04	0.85	-0.42	0.05	0.41	1				
<b>5 Freedom of life (% pop.)</b>	70.54	14.68	24	96	-0.58	-0.42	0.66	0.37	1			
<b>6 Get ahead (% pop)</b>	76.88	16.12	27	99	-0.39	0.07	0.37	0.61	0.46	1		
<b>7 Community Basics (CB) Index</b>	60.53	11.61	20.3	84.7	-0.41	-0.43	0.7	0.19	0.66	0.26	1	
<b>8 Food and shelter (FS) Index</b>	73.62	15.71	24.5	99	-0.44	-0.56	0.61	-0.1	0.35	-0.17	0.52	1

As established in the data section, subjective well-being is related to objective income measures, yet it correlates even more strongly with perceived materialistic benefits, proxied by the percentage of people that are satisfied with their *standards of living* (SoL). In addition, expectations for future materialistic benefits, proxied with the percentage of people agreeing that their *standard of living is getting better* correlates moderately with *suffering*, though not with *struggling* (See Table 6). Also Gallup's *food and shelter (FS) index*, a two-item indicator measuring whether people have enough money to buy food and shelter for their families (alpha=0.86, range 0-100), has a strong negative correlation with *suffering* and *struggling*, confirming the importance of being able to fulfill basic needs for an individual's subjective well-being.

In Table 7 (Column 3-5) these three measures are included in the OLS regression where the dependent variable is again the number of demonstrations and strikes. The effect of satisfaction with *standards of living* and the expectation that *standards of living are getting better* are negative and statistically significant, whereas the coefficient of the FS index is not statistically significant. This is not surprising, because individuals that live below a certain subsistence level, as indicated by a low FS index, might be unlikely to engage in civil resistance even if they are *suffering*; their first priority is to survive on a day-to-day basis.

We also include a measure of the provision of community basics. The provision of these basics is often regarded as one of the core responsibilities of the state. Hence, individuals that experience grievances due to inadequate provision of these goods can hold the state responsible by participating in nonviolent uprisings. We measure the perceived quality of community basics with the *Community Basics (CB) index* developed by the Gallup World Poll. This index combines satisfaction rates of 7 different basic goods: the public transportation system, roads and highways, quality of air, quality of water, the availability of good affordable housing, the educational system and the availability of quality healthcare (alpha= 0.90, range 0-100). When

included in the OLS model (Table 7, Column 6), the coefficient is negative but insignificant. Hence, we find no evidence that dissatisfaction with the provision of basic public goods affects nonviolent resistance.

*Table 7 The effect of other subjective indicators on the number of protests and strikes*

	(1) Incl. Freedom of life	(2) Incl. Get ahead	(3) Incl. SoL	(4) Incl. Sol getting better	(5) Incl. FS index	(6) Incl. CB index	(7) Incl. all variables
Freedom of life (%)	-0.018** (0.006)						0.003 (0.005)
Get ahead (%)		-0.017* (0.007)					-0.011 (0.007)
Standard of living (SoL) (%)			-0.016* (0.007)				-0.005 (0.008)
SoL getting better (%)				-0.013* (0.006)			-0.000 (0.006)
FS Index					0.008 (0.006)		0.018* (0.008)
CB Index						-0.016 (0.010)	-0.008 (0.010)
Suffering (%)							0.026** (0.010)
Struggling (%)							0.013+ (0.007)
Constant	4.535 (4.312)	4.380 (4.488)	1.910 (4.260)	0.526 (4.467)	4.381 (4.424)	4.898 (4.147)	1.190 (4.359)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control Var	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.270	0.267	0.266	0.258	0.258	0.259	0.293
Observations	847	855	861	788	856	847	814
Countries	118	118	118	118	118	118	118

Note: Results are estimated with an OLS model. Robust clustered standard errors in parentheses. \*\*\* p<0.001, \*\* p<0.01, \* p<0.05, + p<0.10

In the last column of Table 7 (Column 7) we include all domain specific variables and our overall subjective well-being indicators. *Suffering* remains significant at the 5% level and *struggling* at the 10% level, whereas *standard of living*, *freedom of life*, and *get ahead* cease to be significant, suggesting that our overall subjective well-being variables capture the variation

in satisfaction in the individual capabilities and perceived standard of living, which in turn affects nonviolent uprisings. Interestingly, the FS index turns significant in the model, indicating that, when overall subjective well-being is controlled for, the percentage having food and shelter actually has a positive effect on nonviolent uprisings, supporting the idea that a certain subsistence level needs to be reached before citizens are willing to take to the streets.

## **6. Conclusion**

Motivated by the incapacity of existing models of grievances to predict and explain the recent wave of nonviolent uprisings (Chenoweth & Ulfelder, 2017), we test whether well-being data can explain variation in these uprisings above what is captured by traditional social and economic indicators. The aim is to contribute to the empirical literature on the effect of grievances on political conflict, by augmenting standard models of political conflict with measures of subjective well-being. Instead of focusing on armed conflict as is commonly done in the literature on grievances and conflict, we focus on nonviolent uprisings, a type of political conflict that often precedes violent conflict and can cause significant changes to a regime. We find evidence of an effect of grievances, measured using subjective well-being data, on nonviolent conflict, and a preliminary analysis suggests that this effect is not present for its violent counterpart.

The main concern when studying the relationship between subjective well-being and nonviolent resistance is reverse causality due to the possibility that nonviolent resistance affects public goods provision, which, in turn, might decrease subjective well-being. We address this in an instrumental variable analysis, where we instrument subjective well-being with deaths due to parasitic and infectious diseases. In a system GMM model, we complement this instrumental variable with the lags of our independent variables. Both the 2SLS and system GMM model confirm that a decrease in subjective well-being increases nonviolent uprisings.

In addition, we consider the interplay between subjective well-being and alternative theories of nonviolent conflict. There is no evidence that the effect of *suffering* depends on the country's stage of development, the political opportunities for rebellion or the ease of mobilization. This lack of evidence for the role of context in the relationship between *suffering* and uprisings might be the result of data limitations, but it also implies the effect of a decrease in subjective well-being on nonviolent uprisings is relatively universal. In line with the idea that what matters is the position of an individual's subjective well-being relative to average level in a country, *struggling* matters for peaceful uprisings in developed countries. Because subjective well-being encompasses individuals' evaluation of their life-as-a-whole, we also test which life domains drive the effect of subjective well-being on nonviolent uprisings. We include three different life domains: material well-being, the capabilities to live a fulfilling life, and satisfaction with public goods provision and find that a decrease in material well-being and individuals' capabilities can to some extent explain the relationship between subjective well-being and civil resistance.

Happiness scholars often emphasize that politics should expand human well-being and research on subjective well-being has focused to a large extent on how political institutions and policies might influence happiness (e.g. Radcliff, 2001). However, a relatively new strand of literature asserts that subjective well-being also has a place as an independent variable in our political economy models (Di Tella & MacCulloch, 2005; Flavin & Keane, 2012; Healy, Kosec & Hyunjung Mo, 2017; Liberini et al., 2017). Whilst Flavin and Keane (2012) show that voter turnout increases with subjective well-being and Liberini et al. (2017) demonstrate that there is a positive relation between happiness and support for the incumbent leader, we find a negative relationship between subjective well-being and civil resistance. This suggests that subjective well-being influences a wide spectrum of political actions, i.e. not only whether to support the incumbent, but also the type of political actions that are inspired by support for or opposition

to the regime. Hence, tracking subjective well-being in addition to financial indicators is not only important as to maximize human development, but it can also provide useful information about collective action and political instability.

We believe that our research has three important implications. First, our findings support the efforts taken by governments and international organizations to integrate measures of well-being with standard economic measures to track progress and create informed policies. Our results show that well-being has an effect on political actions taken by individuals and hence underscore the importance of assessing the effect of policies on subjective well-being. Second, using subjective well-being data we find evidence for a grievance-based model to nonviolent uprisings. This contradicts previous conclusions that there are no systematic models of civil resistance; our model can help not only explain, but also predict uprisings in the future. Third, whereas many analyses of the causes of conflict focus on factors that change little over time (e.g. resources, ethnic fractionalization, institutions, geography), the level of subjective well-being can change relatively quickly, which allows us to exploit short-term dynamics in conflict. Hence, we exploit the within-country variation in uprisings rather than using a cross-sectional design. Accordingly, our results shed light not only on *whether* conflicts occur, but also *when*.

This study is in part limited by data availability. Our dependent variable represents the number of peaceful protests and does not capture the intensity of these events. As a robustness check, we redo our analysis with an alternative data source only capturing major uprisings, which confirms our results. However, future research could consider the relationship between subjective well-being and the intensity of non-violent uprisings. The non-violent and violent campaigns and outcomes (NAVCO) dataset provides information on the number of protestors in these events but it currently covers less than 30 countries and good estimates of number of participants are often lacking.



Future research could analyze how the effect of subjective well-being on both nonviolent and violent rebellion depends on contextual factors not covered in this paper. A decrease in subjective well-being might be a necessary condition for conflict to occur; however, it is unlikely to be a sufficient one, as the decision to engage in rebellion depends on the benefits and the costs of doing so (Klandermans, 1996). Although this study finds no evidence that political opportunities or the ease of mobilization affect the relationship between subjective well-being and nonviolent uprisings, there might be other factors that influence the costs or benefits of rebellion and which could accordingly, affect the willingness of civilians to voice suffering on the streets. For example, high unemployment rates could lower the opportunity cost of participating in a protest and could hence strengthen the relationship between suffering and uprisings. Because we do not have information on unemployment for a sufficiently large set of countries, we were not able to include this variable in our analysis.

This study also raises questions about the different mechanisms that give rise to violent and nonviolent conflict. As taking up arms tends to be costlier than participating in civil resistance, the probability of success either needs to be relatively high or perceived costs relative to the perceived benefits need to be relatively low. Hence, contextual factors might play a larger role for violent than for nonviolent conflict. In addition, whereas widespread grievances might accommodate mass mobilization, grievances felt by only one group, could induce that group to take up arms. This might explain why we do not find evidence for a direct effect of subjective well-being on armed conflict. Further research using data on the individual level could shed more light on these mechanisms.

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## Appendix 1: Correlation table

	Mean	S.D.	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Suffering	11.66	8.914	0	61	1											
Struggling	59.44	14.13	17	90	0.26	1										
GDP	11.59	1.813	7.697	16.17	-0.35	-0.44	1									
GDP Growth	3.86	4.217	-14.8	34.5	-0.05	0.3	-0.2	1								
Inflation	5.538	5.173	-1.36	27.36	0.21	0.2	-0.19	0.16	1							
Oil rents	4.527	10.39	0	60.24	-0.02	0.11	0	0.15	0.13	1						
Infant mortality	21.75	21.37	1.6	106.8	0.23	0.61	-0.46	0.28	0.29	0.23	1					
Autocracy	1.261	2.427	0	10	0.02	0.18	-0.05	0.21	0.19	0.53	0.13	1				
Corruption	43.65	21.09	12	96	-0.43	-0.64	0.46	-0.29	-0.45	-0.25	-0.59	-0.25	1			
Political terror	2.529	1.111	1	5	0.29	0.43	-0.14	0.23	0.42	0.18	0.49	0.24	-0.73	1		
Mobile Phones	97.02	37.75	4.5	218.4	-0.21	-0.4	0.3	-0.26	-0.3	0.01	-0.62	-0.01	0.42	-0.41	1	
Urbanization	62.33	20.73	8.666	99.16	-0.36	-0.64	0.47	-0.22	-0.25	0.05	-0.64	-0.04	0.6	-0.49	0.52	1

**Appendix 2 Alternative estimation techniques: Poisson regression, random effects models, and LSDVC.**

	Poisson		Random effects		LSDVC	
	(1)	(2)	(3)	(4)	(5)	(6)
Suffering (%)	0.043*** (0.010)	0.040*** (0.009)	0.025*** (0.006)	0.027*** (0.006)	0.029*** (0.006)	0.027*** (0.006)
Struggling (%)	0.025** (0.008)	0.021** (0.008)	0.003 (0.004)	0.010** (0.004)	0.014** (0.006)	0.015** (0.006)
Nonviolent uprisings <sub>t-1</sub>					0.411*** (0.046)	0.359*** (0.046)
Country FE	Yes	Yes	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Control Var	No	Yes	No	Yes	No	Yes
Observations	764	764	862	862	862	862
Countries	98	98	118	118	118	118

Note: Dependent variable is the sum of the number of demonstrations and strikes. Robust standard errors in parentheses in Column 1-4 and bootstrapped standard errors in Column 5-6.

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05

**Appendix 3 Alternative dependent variables: A random effects model**

	(1) Ongoing uprisings	(2) Violent conflict
Suffering (%)	0.119*** (0.042)	0.035 (0.046)
Struggling (%)	0.091** (0.044)	0.042 (0.041)
Constant	-18.737*** (5.395)	-18.434*** (5.699)
Country FE	Yes	Yes
Year FE	Yes	Yes
Control Var	Yes	Yes
Observations	767	882
Countries	118	121

Note: Robust standard errors in parentheses.

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05