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# Political Behavior in the Arab World

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# Signaling Dissent:
# Political Behavior in the Arab World*

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## Abstract

What explains the variety of political behavior observed across the Arab world in recent years? We model political participation as a continuum from non-violent to violent activities where the chief purpose of political action is to signal discontent. The credibility of those signals, however, depends on the personal cost of political engagement, with the result being that individuals from both extreme high-cost and low-cost groups may self-exclude even when highly discontent. We show, further, that political violence constitutes a credible alternative for those for whom peaceful protest carries little signaling value. Using data from three nationally-representative surveys of the Middle East and North Africa conducted over the past decade we find that socioeconomic status is generally, positively associated with non-violent political behavior of all types. Semi-parametric analysis reveals that political action, in keeping with our signaling framework, exhibits strong non-linear properties: the likelihood of participation in peaceful protests and strikes is highest among the upper-middle class, while support for violence is concentrated among the lower-middle class.

**Keywords:** political behavior; Arab world; signaling models

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Why do citizens facing similar conditions—marginalization, exclusion, deteriorating public services, corrupt government, and inequality—rely on different behaviors to express political sentiments? In the years since Zine el-Abidine Ben Ali was removed from power in Tunisia's "Jasmine Revolution" in 2011, Tunisian citizens and activists have signed petitions, marched, and held demonstrations to demand greater transparency in constitution drafting, to protest unemployment, to oppose efforts to weaken anti-corruption laws, and more recently, to oppose austerity measures.[1] Yet during the same period, between 6,000 and 7,000 Tunisians joined the Islamic State in Iraq and Syria—the most of any country in the world (The Soufan Group 2015; Mishali-Ram 2017).

Despite almost four decades of investigation into the micro-foundations of political behavior, we still know comparatively little about how individuals choose from the spectrum of political action, and why they escalate from non-violence to violence. Studies of conventional political participation typically do not investigate political violence, or *vice versa*. Conflict studies rarely focus on how ordinary political activities lead to what Mueller referred to as "aggressive" participation (1979). Moreover, micro-analyses of political violence—with some notable exceptions—tend to focus disproportionately on those who actually commit acts of terrorism or engage in militancy, while ignoring the far larger group of individuals who simply lend their tacit approval to violent movements. Understanding the gradations between non-violence and violence requires an appreciation not only of the processes that transform some individuals into terrorists and insurgents, but how non-violent citizens come to lend support, protection, and comfort to violent anti-regime groups—how they become the water the fish inhabit, in Mao's famous dictum on guerilla warfare.

We develop an explanation for political activism as a continuum spanning non-violent, routine actions to more episodic, violent forms of behavior rather than as discrete modes of mobilization. We consider all political acts to be costly signals of discontent in an environment of incomplete information, with conventional political activities being low-cost

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[1]See, e.g., Gluck and Brandt (2015), Saleh (2016), Aliriza and Chettaoui (2017), and Blaise (2018).

behavior and with political violence representing costlier forms of participation. In this framing, individual costs associated with any particular action determine the credibility of those signals for regime authorities. Actions are credible, however, only when the individuals who undertake those actions bear some personal cost or risk.

Consequently, groups will exclude themselves from ordinary politics not merely because they are poorly informed but because conventional, low-cost political actions constitute weak signals for anti-regime sentiments. Those same groups may support or engage in violence not because they are more aggrieved than others, but because the conventional alternatives are not credible. More importantly, the costs of identical political actions can vary across socioeconomic groups. For younger, less-educated citizens, or for those with lower labor productivity, the costs of non-violent participation may be low, but that low cost means that those actions send little information to authorities regarding their true level of discontent.[2] By contrast, non-violent activities by wealthier citizens who face higher costs of participation will send stronger signals.

Accordingly, our signaling model predicts certain non-linear relationships between socioeconomic status and the likelihood of different forms of political participation. We hypothesize that dissent through non-violent political behavior will provide credible signals in the hands of better-off citizens, while lower-income groups, perceiving a lack of credible influence through peaceful means, are more likely to resort to costlier forms of action, including by their support for (and use of) violence for political purposes. Personal costs are high at both the highest and lowest ends of the income distribution: for the richest due to the individual risks of anti-regime behaviors; for the poorest, because subsistence consumption requirements are expected to raise the opportunity cost of participation. Thus our model predicts that: (i) those who undertake anti-regime, non-violent actions will be concentrated

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[2]In models of political protests using information cascades or network effects, for example, the credibility of individual signals of discontent may also vary between "extreme activists" and "moderate activists," if the former receive some intrinsic benefit from political engagement (see, e.g. Lohmann 1994 and Steinert-Threlkeld 2017).

among the upper-middle class, as participation is expected to rise in socioeconomic status, but decline for the wealthiest; and (ii) the strongest support for political violence will be concentrated among the lower-middle classes whose income is above subsistence but insufficient to ensure the credibility of non-violent political signals.

The Arab world affords us an opportunity to examine the determinants of a wide range of political behaviors. Although Arab societies have generally been characterized by their low levels of political mobilization[3], Arab political behavior in recent years provides a valuable source of information on the political motivations of citizens for three reasons. First, the predominantly non-democratic lineage of most Arab states allows us to eschew voting as a principal form of political participation and to look at other types of behavior aimed at signaling to authorities. Second, recent expressions of political discontent among Arab citizens—culminating in the Arab Spring protests of 2010-2011—have incorporated a wide-ranging coalition drawn from all segments of society, including the middle class, but also the working poor, the young and old, men and women (Gunning and Baron 2013). Third, the methods used to express discontent have encompassed all forms of political behavior from direct non-violent action to individual and collective political violence. There are few other such regions in the world in which, in such a brief period of time, political expression has taken such diverse forms.

We test our argument using nationally-representative surveys of citizens in the countries of the Middle East and North Africa conducted since 1999 (the majority of which have been implemented between 2009 and 2014) containing information about respondents' participation in several types of political activities. We find that non-violent participation is increasing in various measures of well-being from the 1$^{st}$ (lowest) to the 4$^{th}$ quintiles, then declines thereafter. The same is true with anti-regime actions such as participation in demonstrations or general strikes. This pattern does not hold, however, with respect to

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[3]Bellin, e.g., notes that, while strikes and protests were common to most Arab countries following independence, "[N]one had seen the massive, sustained, cross-class, political mobilization of the sort that forced regime change in South Korea, Eastern Europe, Latin America, or sub-Saharan Africa" (2012, p. 135).

citizen support for violence against regime incumbents. As hypothesized, the relationship between individual wealth and support for political violence rises sharply between the $1^{st}$ and $2^{nd}$ quintiles, falling thereafter for individuals in the upper quintiles.

Our model moves beyond grievance- and resource-based theories to explain why different groups engage in different forms of political behavior, and how previously non-violent actors may become violent. It explains the forces that lead individuals towards extremism, and how different socioeconomic cohorts may be forced to rely on different "repertoires of contention," in Tilly's phrase (1977). The mechanism in our model is also consistent with recent findings that deteriorating economic conditions can expand the scope for terrorist recruitment (e.g. Bueno de Mesquita 2005; 2013; Benmelech, *et al.* 2012). Our argument, finally, highlights the global phenomenon of the "vulnerable" middle class, and accounts for the observation that middle class and lower-middle class cohorts—not the poorest—are more likely to support violence in conflict-affected countries (Blair, *et al.* 2013; World Bank 2016).

# Political Action: Theories and Evidence

Several scholars have noted the difficulties in specifying the processes that lead from non-violence to political violence. As Tarrow has noted: "[T]his goal is ambitious enough for civil war *onset*. But identifying the operative mechanisms is even more daunting when we turn to the process of *escalation*, for example, how and when non-violent protest and low levels of violence escalate into civil war" (2007).[4] What, then, determines how individuals choose to express their political opinions? In particular, what drives certain groups to engage in actions such as boycotts, demonstrations and petitions, and what makes others willing to engage in even more personally costly actions such as rioting or violence? At the micro level, scholars have typically associated individual activism with either the presence of grievances, or with access to resources.

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[4]Emphasis is in the original.

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## Grievances

Grievance-based explanations, despite their differences, generally hold strong assumptions that shared frustrations and beliefs about the causes of those frustrations are important preconditions for the emergence of social and political movements (Opp 1988; Cederman, Weidmann, and Gleditsch 2011). Group identity is central to such grievances, since individuals' utilities are considered relative to the position of the group in broader social strata (Akerlof and Kranton 2000).

Grievance theories see material deprivation as instrumental to political mobilization (Useem 1998; Buechler 2004). To the extent that the depth of individual discontent inspires non-violent political activism, grievances should prompt individuals to mobilize even when the chances to influence politics seem slim. These effects appear in models of "expressive" voting by which citizens vote as a means of signaling their preferences rather than expecting to influence an outcome (Brennan and Hamlin 1998; Feddersen, Gailmard, and Sandroni 2009). They are also considered to be at the heart of political actions in support of extremist political parties, anti-immigrant groups, or other behaviors in which a group perceives its condition to be deteriorating in relative terms (Fesnic and Vilman-Miller 2009; Jetten, Mols, and Postmes 2015).

In analyses of violent mobilization, grievance-based arguments feature prominently in "relative-deprivation" theories in which failed material expectations tend to produce violence through psychological mechanisms (Gurr 1970). The disparity between aspiration and achievement produces frustration with the existing political system, skepticism towards the ability to initiate change from within, and sympathy for activities that challenge the legitimacy of the current political order. Thus, although more schooling and wage growth may raise the aspirations of youth, they may become frustrated if unemployed or if their occupational status is not commensurate with their education, occasionally venting their feelings in collective acts of political violence. Grievances can also appear due to vertical

(class- or status-based) or horizontal (tribal or ethnolinguistic) inequities (Montalvo and Reynal-Querol 2005; Stewart 2008).[5]

The few analyses of the effects of attitudinal considerations on non-violent mobilization are inconclusive. Recent evidence from Western Europe finds a positive relationship between deprivation and political participation and civic activism in Western Europe (Kern, Marien, and Hooghe 2015). A study of protests in EU countries following the economic crisis that began in 2008, for example, finds that "individual subjective feelings of deprivation" have a positive effect on the propensity to protest (Grasso and Guigni 2016). These findings are supported by analyses of protests in Greece (Rüdig and Karyotis 2014) and in Iceland (Bernburg 2015), both of which conclude that perceived losses of status and wealth relative the past or relative to others is a predictor of protest. Others, however, have found that grievances related to perceived inequality between groups does not affect political participation, and in fact, has a demobilizing effect on the tendency to join associations (Karakoc 2013) or participate in protests (Solt 2015).[6]

Evidence for a connection between grievances and violence, or for the argument that the relative deprivation of a group is conflictual, is even more inconsistent (see, e.g., Lichbach 1989; Brush 1996; Collier and Hoeffler 2004). Nor is there strong evidence that inequality, religious, or ethnic resentments increase *individual* propensities to support or engage in violence, even as countries characterized by inequality, religious and ethno-linguistic fragmentation may be more prone to violence (Buhaug, Cederman, and Gleditsch 2014; Basedau, *et al.* 2017).

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[5]The distinction between "grievances" and "mobilization opportunities" is crucial since that which determines attitudes may not motivate action against regimes (Hirshleifer 1994). Anti-governmental political actions—which are generally risky—do not necessarily follow discontent. First, grievances and perceived inequities alone, of course, are unlikely to destabilize or threaten governments. Second, evidence from studies of regime durability and transition shows the myriad ways in which groups that are more likely to act upon their discontent can be selectively pacified (Bueno de Mesquita, *et al.* 2005).

[6]Relative deprivation—having less than others have—is seen as a factor prompting greater political engagement. Because higher levels of economic inequality mean that poorer individuals are even more worse off compared to their prosperous fellow citizens, more inequality should prompt greater non-violent activism (Solt 2008).

## Resources

As empirical studies found increasing evidence for grievance-based theories to be lacking, critiques became far more common than supportive studies, and grievance-based arguments came to be challenged by alternative explanations focusing on the material incentives of participants. Resource-based perspectives generally suggest that individuals who engage in non-violent political behavior are more likely to have access to assets such as time, income, information, and relevant skills than those who do not. Therefore, the politically engaged are expected to have greater socioeconomic status than the population average. As political activities are costly, individuals will consider both how much they care about the outcome and the likelihood that their participation will influence the result (that is, be pivotal).[7] A central tenet of political behavior, then, is that high-status individuals are more likely to participate because they face lower resource barriers to civic engagement than low-status individuals (Key 1949; Campbell, *et al.* 1960; Verba and Nie 1972). Resource-based theories also posit that individuals' choices about whether to support (or join) terrorist groups, revolutionary organizations, or insurgencies depend on the tradeoffs between the likelihood of successful rebellion (regime overthrow followed by the appropriation of old-regime resources) and the opportunity costs of participating in violence (Collier and Hoeffler 1998; Skaperdas 2002). In this regard, the calculus of whether to participate in political violence is analogous to rational-choice models of criminal activities—collective political violence being a form of theft writ large (Murshed and Tadjoeddin 2009). From a resource-based perspective, individual wealth should be negatively correlated with support for political violence. Just as criminal behavior is negatively associated with wealth, individuals facing poverty and exclusion are more likely to support anti-state actors who aim to overthrow the existing order, and are more likely to respond to inducements in the form of money, prestige, and other spoils (Scott 1976; Paige 1978; Kalyvas 2006).

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[7]In classic voting models, the benefit is in having one's preferred candidate win, implying that turnout will depend on the likelihood of casting a decisive vote (Downs 1957; Riker and Ordeshook 1968; Levine and Palfrey 2007).

A consistent finding in OECD countries is that those more generally engaged in the political process tend to be wealthier and better-educated than the population average (Verba, Schlozman, and Brady 1995; Lijphart 1999).[8] Yet in several countries outside of the OECD, the opposite relationship holds. In India, not only are the poor more likely to participate in the political process, and to campaign and canvass for candidates, they are also more likely to "value" democracy than the rich (Krishna 2008; Ahuja and Chhibber 2012). In Mubarak's Egypt, illiterate voters typically turned out in greater proportions than literates (Blaydes 2010). In several Sub-Saharan African countries, the poor were found to be more politically engaged than the non-poor (Bratton 2006). In Central America, Mexico, and Colombia, turnout appears to be unrelated to income (Booth and Seligson 2008).

In explaining support for collective violence, low per-capita income is one of the more robust cross-national determinants of the risk of internal conflict (Collier and Hoeffler 1998; Elbadawi and Sambanis 2002; Rice 2006). Yet sub-national, household, and individual-level evidence of the connection between poverty and political violence is often mixed, or at odds with cross-national evidence. District-level evidence, for example, shows a positive connection between community poverty and the likelihood of conflict in Uganda (Deininger 2003) and in the Philippines (Malapit, Clemente, and Yunzal 2010). Evidence from Colombia (Sanchez and Chacon 2005) and from Indonesia (Barron, Kaiser, and Pradhan 2009), however, show no such connection. An events-analysis of Indonesia finds an inverted-U shaped relationship between income levels and political violence, with rising incomes increasing the likelihood of violence but lowering the likelihood as communities increase income levels beyond a certain threshold (Tadjoeddin and Murshed 2007). Krueger and Malečková (2003) conclude that violence is not decreasing in income or education with respect to support for attacks against Israeli targets in the West Bank and Gaza. Palestinians who commit acts of terrorism are largely from the educated middle class (Berrebi 2007). A study of anti-colonial

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[8]In advanced, industrialized nations, electoral turnout is considered a proxy for the political mobilization of the poor (Boix 2003; Kenworthy and Pontusson 2005; Mahler 2008).

violence in Bengal in the early 20<sup>th</sup> century finds that non-violent and violent activists alike tended to be wealthier and higher-caste than the population average, but could not be considered the "elite" (Lee 2011). The strongest support for Pakistan's militants, similarly, is to be found not among the poorest or wealthiest, but among middle-class citizens (Blair, *et al.* 2013; Fair, *et al.* 2016).

## From Voice to Violence: Towards an Explanation

Resource- and grievance-based theories generate differing hypotheses regarding political behaviors. Non-violent activism is expected to be increasing with higher socioeconomic status, while supporters of political violence should have lower socioeconomic status. Meanwhile those engaged in non-violent activities and those who support violent actions are both expected to be more frustrated than those who do not participate. The evidence for these claims, as we have seen, is decidedly mixed.

Three gaps hinder better theorizing about how non-violent and violent actions are linked. First, the practice of treating non-violent and violent political behaviors as dichotomous fails to consider "why violence sometimes replaces non-violent strategies of contestation" (Chenoweth and Lawrence 2010). Yet, actors not only switch back and forth between violent and non-violent forms of behavior, they also use them in unique combinations (Bosi and Malthaner 2015). As the events since the Arab Spring of 2011 show, non-violent actions can also escalate.

Second, the focus on the militants and terrorists ignores those who may sympathize with the violent pursuit of a particular cause, but who do not undertake any violent actions themselves. Understanding the motivation of adherents, rather than that of a relatively small groups of participants, is an important topic. In any given setting, the number of sympathizers usually outweighs the number of participants by several-hundred fold and,

from a policy-making standpoint, conflating the two can vastly overestimate the problem.[9] More importantly, as combatants are constrained by how much support and cooperation they receive from non-combatants, understanding the motivations of the sympathizers is critical.

Third, with few exceptions, relationships between grievances or access to resources, on the one hand, and the propensity to engage in different political activities is generally assumed to be linear. However, several empirical investigations shed doubt on this, locating the greatest likelihood of non-violent participation as well as political violence among the middle class.

Squaring this evidence with theoretical perspectives on political participation requires us to allow for the possibility that different groups of citizens face different cost schedules for different types of political behaviors. In the next section we derive an equilibrium in which groups most likely to engage in non-violent action are not necessarily most likely to take other, more extreme forms of action. Doing so allows us to identify those groups that are more likely to radicalize—that is, support political violence—even where they are no more discontent than other groups.

# A Model of Political Action as Costly Signals

We formalize an environment in which a ruler faces a constant but latent challenge. The likelihood of regime change depends on: (i) an external process that captures the credibility of the challenge to the regime; and (ii) citizen dissatisfaction with the status quo. Although the ruler has imperfect information about public discontent, citizens can send costly signals of discontent by engaging in anti-regime political behaviors, with violent actions incurring the highest personal cost.

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[9]The U.S. Government, for example, defines "violent extremists" as "individuals who *support or commit* ideologically-motivated violence to further political ends" (The White House 2011, p. 1). See McCauley and Moskalenko (2017).

Our aim is to illustrate how members of different socioeconomic groups, if they manage to come together to take action to signal discontent, may find different types of political action more or less effective, and ultimately, why some groups may resort to violence. We therefore abstract from intra-group aspects of political mobilization found in other models—such as the problems of free riding or coordination—to simplify our analysis and to highlight the signaling mechanism. We consider only two groups of citizens: one group of potential participants in the political process, and another group consisting of the rest of (largely passive) society.

A polity with a continuum of citizens of measure $N$ is ruled by an incumbent who, in response to perceived discontent, faces a binary decision to reform $\gamma \in \{0, 1\}$ where 0 implies policy change, and 1 represents stasis. Reform can potentially increase popular support and thereby mitigate the risk of losing power, but also imposes a personal cost upon the ruler, $C_p \in \mathbb{R}^{++}$. The ruler's expected utility is:

$$Pr(Survival) \times \varphi - (1 - \gamma)C_p \tag{1}$$

where $\varphi$ is the private benefit from holding office.

Citizens are either political participants (group 1 of size $N_1$) or non-participants (group 2 of size $N_2 = N - N_1$). The sequence of actions is as follows: group 1 individuals jointly determine whether to take political action $\rho \in \{0, 1\}$, where 1 signifies action, after which the ruler updates beliefs about the level of discontent and makes the reform decision. Both groups then decide whether to support the regime; the credibility of the political challenge to incumbency is realized, and regime change occurs if support falls below a certain threshold.

## Regime Survival

Popular support for incumbents will depend on: (i) welfare losses due to the status quo; and (ii) citizen affinity to the current regime. First, we define perceived welfare losses in the absence of reform as $\Delta^j \sim U[0, \bar{\Delta}^j]$, where $j \in \{1, 2\}$ is a representative member of group $j$ and $U$ signifies a uniform distribution. $\Delta^j = 0$ if the regime reforms (that is, if $\gamma = 0$). Second, support will depend on overall affinity to the current regime based on a number of factors (political ideology, ethno-linguistic or tribal identity, leader charisma, etc.) that cannot be changed in the short run but that affect regime popularity. We model these affinities as individual-specific valence characteristics signifying the relative popularity of the current ruler given by a uniform distribution $f^j(\beta_i)$ with support between $[-\varepsilon, \varepsilon]$. This distribution of relative popularity, however, is exposed to shocks as the credibility of an alternative to the current regime can suddenly change. This perceived credibility is parameterized by $z$, and is drawn from a uniform distribution with support between $[-1, 1]$. Importantly, the ruler does not know the result of the draw of $z$ when deciding whether to reform. It follows that the mapping between the reform decision and regime survival is not deterministic (see, e.g., Lindbeck and Weibull 1987).

Taken together we can define the condition under which individual $i$ from group $j$ supports the ruler as

$$\beta_i^j - \gamma \Delta^j \geq z. \tag{2}$$

From equation (2) we can calculate the ruler's expected survival probability, and determine how that probability depends on the reform decision. Relying on the distributional assumptions above and the notation $E\left[\Delta | \rho\right] \equiv \widehat{\Delta}$ to adjust for the fact that discontent is private information, the expected share of individuals in group $j$ supporting the regime will be

$$\frac{\varepsilon - \gamma \widehat{\Delta}^j - z}{2\varepsilon}, \tag{3}$$

which yields the total expected support as

$$\frac{N(\varepsilon - z) - \gamma\left(N_1\widehat{\Delta}^1 + N_2\widehat{\Delta}^2\right)}{2N\varepsilon}. \tag{4}$$

Regime survival is the likelihood that expected support will exceed a threshold $\bar{z}$. Solving for $z$ from this condition yields:

$$z \leq \varepsilon(1 - 2\bar{z}) - \frac{\gamma}{N}\left(N_1\widehat{\Delta}^1 + N_2\widehat{\Delta}^2\right). \tag{5}$$

Given the distribution of $z$, the expected probability of staying in power can now be written as

$$\frac{1}{2} + \frac{\varepsilon N(1 - 2\bar{z}) - \gamma\left(N_1\widehat{\Delta}^1 + N_2\widehat{\Delta}^2\right)}{2N}. \tag{6}$$

## Non-Violent Activism

The purpose of political action (among group 1) is to signal discontent such that the regime, concerned about survival, changes policy. However, the informativeness of that signal will depend fundamentally on the personal cost of the action among citizens; the higher the personal risk or opportunity cost, the stronger the signal of discontent.

We assume that the personal cost of peaceful political protest depends on the direct utility loss from spending time protesting (the opportunity cost of time) and the expected future risks to income flows. For the former the income loss of spending time protesting should be monotonically increasing with labor productivity, whereas the utility loss from foregoing a given income stream is decreasing with productivity (because of the decreasing marginal utility of consumption). For most of the income distribution the former effect dominates, but below a certain income threshold subsistence consumption will crowd out any effort devoted to political activity (see, e.g., Lee 2011). Thus the direct utility loss falls as income declines, but below a certain threshold, rises again. The expected future risk to

income flows is likely to be monotonically increasing with income, as the risk to reputation and future income is greater with higher socioeconomic status. In total we assume that the cost of peaceful actions is falling with income at the very lowest levels of wealth, but increases throughout the remainder of the income distribution. Formally, we can define the individual cost of action as $c(\rho, \theta)$ where $\theta$ is expected lifetime earnings, $c(\cdot) = 0$ for $\rho = 0$, and $c(1, \cdot)$ is decreasing in $\theta$ at the lowest part of the distribution, increasing thereafter.

## Equilibrium

There exists a perfect-Bayesian equilibrium (PBE) with the following set of strategies and beliefs:

(i) Citizens support the ruler if and only if

$$\beta_i^j - \gamma \Delta^j \geq z.$$

(ii) The ruler chooses to reform ($\gamma = 0$) if those reforms increase expected utility:

$$\gamma = \begin{cases} 0 & \text{if } \left(N_1 \widehat{\Delta}^1 + N_2 \widehat{\Delta}^2\right)\varphi \geq C_p \\ 1 & \text{otherwise} \end{cases}$$

(iii) The ruler updates beliefs according to

$$\widehat{\Delta}^j = \begin{cases} \frac{c(\theta) + \bar{\Delta}^j}{2} & \text{if } \rho = 1 \\ \frac{\bar{\Delta}^j}{2} & \text{if } \rho = 0 \end{cases}$$

(iv) Members of group 1 take political action if and only if it increases their utility:

$$\rho = \begin{cases} 1 & \text{if } \Delta^1 > c(\theta) > 2\left(\frac{C_p - \varphi N_2 \widehat{\Delta}^2}{N_1 \varphi}\right) - \Delta^1 \\ 0 & \text{otherwise} \end{cases}$$

In equilibrium, note that in (ii) the regime is only better off changing policy if the improved survival probability outweighs the cost of reform. From (iv), it will only be in the interest of members of group 1 to take action if the cost of political action is lower than the level of discontent, and if political action sends a signal of discontent strong enough to induce reform. Finally, as shown in (iii), in case of political action the ruler updates beliefs, and all levels of discontent lower than the utility cost of action are assigned zero probability.[10]

Intuitively one might expect marginalized groups to have stronger participatory incentives due to their lower opportunity costs. However, as political behavior is meant to signal discontent, this lower cost also means that participation is a less informative—and therefore weaker—signal. Consequently, these marginalized groups are more likely to exclude themselves from conventional political activities. By contrast, dissatisfied groups whose opportunity costs are higher can signal support for political change through normal civic engagement. Technically, the ruler believes that no manifestations of discontent below the cost of action will occur; the prior distribution is truncated to the left. It follows that the ruler's updated expected valuation increases with the cost of political action, and with a higher expected valuation the ruler has more to gain from undertaking reform.

## Political Violence

The foregoing suggests that ordinary political participation is an ineffective way for low-cost individuals to signal discontent and instigate policy change. We therefore introduce

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[10]With different specifications of beliefs, it is possible to define a pooling equilibrium in which all types chose the same strategy for all parameter values. For example, if the ruler believes that no political action is consistent with any type of group, whereas political action implies a zero-cost type, then the ruler will never respond by changing policy in response to political action. It follows that group 1 members will never take political action so strategies and beliefs are consistent in equilibrium. Such an equilibrium, however, relies on implausible out-of-equilibrium beliefs. The intuitive criterion can be used to rule out an equilibrium in which a player of type $\theta$ can do better by deviating from the equilibrium as long as other players in the game assign zero probability to such a deviation coming from types for which the deviation is equilibrium dominated. In this case, taking political action is equilibrium dominated for those with $\Delta^1 < c(\theta)$, and as we have seen above, if the ruler believes political action implies that $\Delta^1 > c(\theta)$ then those types indeed are better off deviating and taking costly political action, as long as $c(\theta) \geq 2\left(\frac{C_p - \varphi N_2 \widehat{\Delta}^2}{N_1 \varphi}\right) - \Delta^1$. Hence, as is common in signaling games, we can rule out completely pooling equilibria using the intuitive criterion and instead focus attention on the more plausible equilibrium specified above.

an additional, uniformly high-cost means of signaling discontent in which participants face significant risks of reprisal. Redefine group 1's strategy as $\rho \in \{0, 1, 2\}$, where $\forall \theta : c_2(2, \theta) > c_1(1, \theta)$. The equilibrium of this extended game differs from that of the previous sub-section only in terms of beliefs and in group 1 political actions:

$$
\widehat{\Delta}^j = \begin{cases} \frac{c_2(\theta) + \bar{\Delta}^j}{2} & \text{if } \rho = 2 \\ \frac{c_1(\theta) + \bar{\Delta}^j}{2} & \text{if } \rho = 1 \\ \frac{\bar{\Delta}^j}{2} & \text{if } \rho = 0 \end{cases} \tag{7}
$$

and

$$
\rho = \begin{cases} 2 & \text{if } \Delta^1 > c_2(\theta) \geq 2\left(\frac{C_p - \varphi N_2 \widehat{\Delta}^2}{N_1 \varphi}\right) - \bar{\Delta}^1 > c_1(\theta) \\ 1 & \text{if } \Delta^1 > c_1(\theta) \geq 2\left(\frac{C_p - \varphi N_2 \widehat{\Delta}^2}{N_1 \varphi}\right) - \bar{\Delta}^1 \\ 0 & \text{otherwise} \end{cases} \tag{8}
$$

Those with higher opportunity costs will have little incentive to adopt this costly signal since ordinary, non-violent actions are sufficiently credible. This is not the case, however, with those for whom non-violent political activity represents a low-cost signal. Consequently, those most likely to turn to violent protests will be those lower-cost cohorts who value reform highly.

# Data and Variables

Our model illustrates a stylized mechanism by which rational individuals from different socioeconomic groups select from a repertoire of political behaviors. In probabilistic terms, the likelihood of non-violent political action is increasing in status over most of the distribution with the exception of the tails. For the poorest, subsistence-consumption requirements (in terms of effort and resources) will raise the opportunity costs of political participation, making participation a more credible signal of discontent the poorer the in-

dividual. For the richest, the risks to wealth and status from involvement in anti-regime actions will be high enough to deter participation, even though such actions may be credible signals. The likelihood of political violence, on the other hand, increases sharply in socioeconomic status at the lowest end of the distribution and then falls over the remainder. Recall that violence is an alternative to non-violence when non-violent politics is a weak signal of discontent. Thus, at the lower end of the status distribution, the propensities to engage in violence *vs.* non-violence are mirror images. At the highest status levels, by contrast, incentives for any form of political engagement—non-violent or violent—will fall since the personal cost of political action exceeds any benefit from policy change.

Our approach yields two inter-related hypotheses concerning specific non-linear relationships between socioeconomic status and participation depending on the form that participation takes. Non-violent political action will be concentrated among the upper-middle of the income/wealth distribution since non-violence constitutes a credible signal of discontent. The likelihood of political violence, by contrast, will be highest among the lower-middle of the distribution as alternative ordinary politics carries little credibility.

We rely on three nationally-representative surveys of the Arab world: the Gallup World Poll (GWP); the World Values Survey (WVS); and the Arab Democracy Barometer (ADB). Coverage for the GWP and the WVS—each of which spans over 100 countries—are restricted to the Middle East and North Africa for our purposes. The GWP was undertaken annually between 2009 and 2012 in 20 countries in the region. Sample sizes were fixed at 2,000 (in 2009, 2010, and 2011 in most countries), and 1,000 (in 2012) per country. The WVS covers 13 Arab countries and Iran between the 4th, 5th, and 6th waves of the survey (1999–2004; 2005–2009; and 2010–2014, respectively). Sample sizes range from 1,000 to 3,000 per country-wave, with the majority of Arab countries only being surveyed in the 6th wave.[11] Finally, the ADB has been implemented in 13 Arab countries over two rounds in 2010–2011

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[11]Note that only five countries in the region were surveyed over more than one wave: Algeria, Egypt, Iran, Iraq, and Jordan, all of which were surveyed twice.

and 2012–2014. Sample sizes are between 1,000 and 1,200 individuals per country-round. [12]
Sample sizes and country-year coverage of these surveys are shown in Table 1.

## Participation

We examine three principal forms of political participation that are characterized by increasing cost: (i) civic engagement; (ii) anti-regime protest and participation in general strikes; and (iii) political violence, which carries a uniformly high cost. The first two categories can be measured without significant concern for non-response or sensitivity. The same, naturally, cannot be said about a respondent's involvement in political violence. We can rely on survey questions that ask if a respondent has engaged in civic activities, or whether they have participated (or would participate) in protests or demonstrations. For political violence we must use questions in the surveys that ask, in varying ways, the extent to which a person thinks violence for political purposes is "justified."

The GWP asks whether an individual has made personal contact with a public official (political voice). Similarly, the WVS and ADB ask respondents whether they have signed petitions (WVS and ADB) or participated in boycotts (WVS). Additionally, from the ADB we have data on whether respondents have participated in political meetings.

The WVS and ADB also ask respondents about their involvement in a range of other political activities: public demonstrations or protests and whether they have participated in general strikes. The ADB, further, asks subjects whether they participated in "Arab Spring" demonstrations and rallies in 2011.[13] All questions in the GWP and ADB being yes/no, we code responses as 1 if the individual has participated, 0 otherwise. In the WVS, for petition-signing, boycotts, demonstrations, strikes, and occupations, in addition to "has

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[12] A the first wave of the Arab Democracy Barometer was conducted in 2006-2007. However, this survey did not calculate population weights, did not identify primary sampling units, and lacked many of the questions of political behavior needed for our analysis. Therefore, we drop the first wave.

[13] Concurrent protests in support of the Arab Spring occurred in all 10 countries covered by the 3rd round of the ADB.

participated" there is an additional "would participate" response allowed; both are coded 1, 0 otherwise.

Regarding violence, the GWP and WVS each include different versions of the same question regarding support for political violence. In the GWP the question is posed as follows:

> *Some people think that, for an individual person or a small group of persons to target and kill civilians is sometimes justified, while others think that kind of violence is never justified. Which is your opinion?*

Possible responses are: "never justified," "sometimes justified," or "it depends." In the WVS the question is stated slightly differently:

> *Here's one more statement: how strongly do you agree or disagree with it? Using violence to pursue political goals is never justified?*

Responses are coded 1( strongly agree) to 4 (strongly disagree). Because of the different scales, we code both questions in the extreme, that is, 1 if the answer was "sometimes justified"(GWP) or "strongly disagree" (WVS), 0 otherwise.

## Income and Well-Being

We use available measures of income: a respondent's household income (GWP), individual income (ADB), or income decile (WVS). Household and individual income are converted into (constant) US dollars per month. Incorporating both earnings-based and quantile-based indicators of income allows us to measure the effect of absolute as well as relative indicators of wealth on political behavior. Keeping in mind the drawbacks with relying on self-reported income, however, it is important to utilize an alternative measure of status. We rely, therefore, on different versions of the Cantril "self-anchoring" scale, which asks respondents to place themselves in a particular continuum, from best to worst, that evaluates their "life satisfaction" (Cantril 1965). The Cantril Scale is used on the premise that measurement of status is multi-dimensional and that respondents evaluate their well-being

according to multiple criteria (Diener, Kahneman, Tov, and Arora, 2009). Cross-national evidence, moreover, shows strong correlations between the Cantril Scale and income at both the individual and national levels (Deaton 2008). The GWP derives the Cantril Scale from responses to the following:

> *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?*

In the WVS the question is stated as follows:

> *All things considered, how satisfied are you with your life as a whole these days? Using this card on which 1 means you are "completely dissatisfied" and 10 means you are "completely satisfied" where would you put your satisfaction with your life as a whole?*

## Controls

In all estimations we include, as controls, the following variables: a measure of relative deprivation, indicators employment and self-employment, age, education, gender, marital status, urban/rural location, and religiosity.

In measuring relative deprivation, two problems must be addressed. First, it is important to use some indicator of expectations not in isolation but with respect to actual status—that is, perception of the magnitude of difference between one's own situation relative to a "standard." The Cantril Scale does not measure discrepancies between individuals' expectations as to what they deserve and their current situation, and therefore does not adequately capture the crucially important affective component (Smith and Pettigrew 2015).

Second, the problems of comparability when respondents are asked to use subjective response categories, moreover, must be addressed. Different respondents may interpret subjective questions in different ways based on unobservable characteristics. Ordinal scales may mean different things to different respondents based on idiosyncratic factors such as mood or overall optimism. Individual-level perceptions would similarly be affected by measurement error where identical individuals may have unequal probabilities of answering questions

about their own well-being in the same way. Additionally, measurement error in subjective responses may be correlated with a wide variety of individual characteristics and behaviors (Bertrand and Mullainathan 2001; King and Wand 2007). "Anchoring vignettes" or other hypothetical questions to establish baselines that could normally correct survey responses for inter-personal incomparability, however, are not included in the three surveys.

Consequently, we attempt to correct our specifications in the following manner: in all estimations, we include a "deprivation" proxy, which we derive by regressing a "financial well-being" response variable (typically from "dissatisfied" to "satisfied") against personal or household income, along with country and year effects, taking into account weights and primary sampling-unit clusters. The residuals from this equation reasonably approximate relative deprivation, i.e., the deviation in perceived financial well-being from that which should be correlated with level of wealth within the population. We then rescale the result such that positive values indicate that expected well-being (predicted on the basis of income) exceeds actual (observed) well-being, i.e., that individuals feel deprived relative to the level of well-being that should be associated with their wealth.[14] This term, when included in estimations, can also correct for individual-specific, systemic bias in that those for whom the gap between observed (perceived) and predicted (expected) well-being is large may also hold systemic biases that affect other responses.

The problems of labor markets in the Middle East and North Africa, including the high and persistent rates of unemployment (particularly among youth) are well-known and require little summary (see, e,g., Dhillon and Yousef 2007; Amin *et al.* 2011). In the Arab world, of course, public sector employment—the mainstay of labor markets for much of the post-independence era—has been typically curtailed by reducing or freezing new hiring and relying mostly on attrition. The share of new entrants to the public-sector labor force— especially of educated, young professionals—has fallen dramatically over the past two decades

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[14]We reverse the calculation of the residual $d$, such that $d = \widehat{FWB} - FWB$ (instead of $FWB - \widehat{FWB}$), for $\widehat{FWB} = \hat{\alpha}_0 + \hat{\alpha}_1 y_i$, where $y_i$ is income, and $FWB$ is the subjective measure of financial well-being.

(Assaad 2008; Wahba 2009). Meanwhile the small size of the formal private sector, combined with slow job creation, means that larger numbers of job seekers have been stranded in low-skill jobs in the informal economy. It is reasonable, therefore, to associate discontent and alienation with unemployment, which is a preferable indicator to more subjective indices such as respondent ratings of governmental or economic performance. We include an indicator of employment status (coded 1 if not in full-time employment, 0 otherwise) as well as, wherever possible (in analyses of the GWP and WVS surveys) an indicator of whether the respondent is "self employed."

We include age as a control variable. Few other groups have borne the costs of economic adjustment as much as those under 30 in Arab economies. While older age cohorts have typically had long-term employment contracts, subsidies, and other benefits grandfathered, younger job-market entrants have not (Assaad, *et al.* 2010). In Arab States before 2010, grievances among youth did not generally translate into political action.[15] Young citizens, however, played an important role in the Arab Spring uprisings, although since the end of the Ben Ali and Mubarak governments in Tunisia and Egypt, youth involvement in ordinary politics has not increased.[16]

All estimations also include the following, standard additional covariates: gender (male = 1), marital status (single = 1), and location[17] (urban = 1, non-urban = 0). We also include education, on the assumption that education is one of the best individual-level predictors of political behavior across the continuum. In the Arab World, moreover, education

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[15]A lack of trust in (mostly rigged) elections pushed the citizens further away from voting, while severe restrictions on universities across the region limited the normal route to politics among youth, i.e., campus activism. Although some (mostly middle- or lower-middle class) youth may have been mobilized into Islamic movements in countries such as Egypt in the 1980s with varying degrees of success, this rarely spread to other political arenas (Bayat 2010).

[16]Prior to Tunisian parliamentary elections in 2011, only 17 percent of eligible youth were registered to vote (McCurdy, 2011, p. 17). Only 38 percent of Tunisian youth aged 18-24 correctly identified the purpose of the election, i.e., to choose an assembly to write the constitution (IFES 2011). In Egypt, parliamentary and presidential elections in 2011 – 2012, as well as a constitutional referendum in 2014, have all seen low (and declining) voter turnout (Hashem 2014).

[17]Indicators for urban location are in GWP and ADB surveys only.

can be another indicator of relative deprivation. While the Arab World has experienced a remarkable expansion of educational attainment in recent decades, stagnant labor market conditions have often meant that individual's education and the economic opportunities they face are mismatched (Courbage and Todd 2007; Noland and Pack 2007). Cross-national evidence suggests that increased schooling combined with rising unemployment increases the likelihood of regime change (Campante and Chor 2012).

Finally, across the Arab World and beyond, discussions surrounding political behavior have often focused on the role of religion. On the one hand, the secularization thesis holds that, with modernization should come less religiosity. On the other, evidence in the region points to an important role played by Islamic movements in political activity. Arguably the most influential Islamic political movement in the world today is the Muslim Brotherhood and its affiliated political parties, which won the first post-Arab Spring elections in both Tunisia and Egypt (Brown 2017). Moreover, Islamist political groups in Jordan, Kuwait, and Morocco all began as social movements, but now vie for access and representation in policymaking (Wickham 2015). With respect to more violent forms of political activity, the prospective role of Islam has been debated extensively, with the evidence of the precise effect of religion being somewhat unclear (see, e.g., Ginges, Hansen, and Norenzayan 2009; Sidanius, *et al.* 2016). In our estimations, however, we include an indicator of the importance of *religion* (though not specifically Islam) in the respondent's life for two reasons. First, only the WVS includes a question on religious affiliation, and this question was not asked in all countries in the region. Second, there are reasons to believe that, in the countries in our sample with sizeable Christian minorities—Bahrain, Egypt, Iraq, Jordan, Lebanon, the Palestinian Territories, Syria, and Tunisia—religiosity, regardless of denomination, may be associated with political activism (Canetti *et al.* 2010).

# Methods and Results

Our basic specifications regresses the particular measure of political participation on income or the Cantril scale along with covariates. We look at several different types of political action, on a scale from less to more costly and risky. We expect that the relationship to income will change as cost and risk changes. All specifications take account of population weights and strata-fixed (country- and year-fixed) effects. We cluster errors by the primary sampling unit for each survey—districts in the GWP, sub-regions in the WVS and ADB. All dependent variables being binary, we initially use logit regression with bootstrapped standard errors to identify general patterns in a fully parametric framework in order to relate our findings to existing theories of the role of socioeconomic status in political participation. We then turn to a more direct test of our empirical predictions identifying the ranges of the socioeconomic status distribution most likely to engage in various political acts using flexible-parametric and semi-parametric methods.

## Civic Engagement

We posit that basic civic engagement will be increasing in income, and that the marginalized are more likely to self-exclude due to their lower opportunity cost of political participation. Table 2 examines the determinants of non-violent forms of political behavior, including contacting public officials, petition-signing, and attendance of political meetings. As expected, all forms of political engagement are significantly increasing both in income and the Cantril Scale. Meanwhile, the employed and self-employed are also more likely to engage civically. As expected, all forms of participation are strongly and uniformly increasing in education levels. With a few exceptions, younger individuals are also more likely to self-exclude. The likelihood of all types of participation are greater for urban-dwelling, older, better-educated, working, married men.

Recall that our deprivation measure is the difference between the individual's "expected" and observed well-being, with deprivation implying that the former exceeds the latter, and with the former being predicted on the basis of income. A common view, as mentioned, would suggest that perceived, individual relative deprivation translates into increased political participation. By contrast, we find that relative deprivation decreases the likelihood of engagement in all forms of ordinary political action, from civic participation to political meetings.

Contrary to expectations that religious groups have spillover effects to political behavior, moreover, respondents who identify as religious are less likely to engage their government or community through activism, voice, petition-signing or boycotts. Religious persons, however do seem more likely to participate in political meetings.

## Protest

The costs and risks of attending political meetings and volunteering time are likely to be relatively small. In Table 3, then, we turn to non-violent direct actions that are more explicitly and visibly anti-regime in nature: participation in demonstrations or protests, general strikes, or occupations of public buildings or spaces. The pattern we discerned from Table 2 is repeated here—participation in protests and in strikes are increasing in income levels, although the effect is weaker in the ADB survey.[18] Deprivation appears inconsistent depending on the survey, as does religion. It is still the case that the educated, employed males are more likely to be involved in these activities. However, the signs have switched on age; where it is the young who are more likely to self-exclude from civic engagement, it is also the young who are more likely to demonstrate against the government.

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[18]Here we only report income decile (WVS) or income (ADB). The Cantril Scale—which is not available for ADB data—also shows weak or non-existent effects on protest.

## Support for Violence

As indicated previously, we consider violence against the state to be at the end of a continuum of various forms of political engagement. Unlike the others, however, violence imposes a uniformly high risk to all participants regardless of their opportunity costs. Our framework also points to the potential of vicious cycles of marginalization—whereby low socioeconomic status leads to self-exclusion, limiting the representation and access of these groups in policy making, resulting in government policies that do not resolve these groups' grievances, eventually breeding a deep-rooted sense of alienation. Moreover, our framework predicts that members of different socioeconomic groups express discontent in different ways. The relatively well-off trust they can influence policies through non-violent action, and therefore find it worthwhile to contact politicians, attend meetings, sign petitions, perhaps partake in an occasional demonstration or general strike. By contrast, marginalized groups, perceiving a lack of voice to influence decision makers, resort to actions that carry a higher personal cost in order to signal their discontent more credibly. In Table 4 we replicate our benchmark specifications. Support for violence, similar to protesting but in marked contrast to other forms of political inclusion, is the domain of young men in non-urban areas. All other influences, however, are undetectable or not consistent across different surveys. Socioconomic status enters the specification as a positive effect when income decile is used but switches signs with the use of the Cantril Scale. We see weakly significant effects (in opposite directions) of income and well-being on support for violence in the WVS data, but not elsewhere. Employment, education, and marital status have no effect in any iteration.

## Semi-Parametric Analysis

Incentives to engage in higher-cost political action depend on two factors: (1) the ability to send credible signals of discontent through peaceful means; and (2) the level of discontent with the current regime. At the lower end of the distribution, the most vulnerable may experience high levels of frustration and discontent, but their support is also relatively

inexpensive to "buy" through redistributive policies or other pro-poor programs that target marginalized groups. Under these conditions, beneficiaries at the lowest end of the income scale will perceive less discontent with the incumbent regime than those who, while still struggling, are slightly better off. Moreover, the credibility of peaceful actions in our model depends on the opportunity cost of time, which may not necessarily be decreasing with lower income at the lowest end of the distribution, as the poorest are more likely to require time and effort to secure necessities for their own survival. At the highest level of the distribution, on the other hand, those benefitting from the current regime are more likely to be concentrated so the level of discontent may be relatively low. Furthermore, as suggested by the model, with top incomes the level of discontent necessary to motivate any type of costly political behavior is very high. In other words, the model predicts that there is a strong possibility of a non-linear relationship between socioeconomic status and political behavior, and that the gradients of these non-linearities may be different for peaceful relative to violent political action: peaceful political participation will be concentrated in the upper (but not the highest) percentiles of the distribution, while support for violence will be concentrated in the lower (but not the bottom) percentiles.

These non-linearities are also suggested by a rather large body of empirical literature on the income/happiness nexus (e.g., Blanchflower and Oswald 2004; Di Tella et al. 2003; Graham 2002; Luttmer 2005; Ferrer-i-Carbonell 2005). Studies of happiness have long identified a group of "frustrated achievers" for whom increases in income do not affect their perceived well-being. Additional evidence suggests that it is the workers who are integrated into the formal economy but whose wages tend to be pro-cyclical—not the poorest—that are most vulnerable to falling into poverty (Graham and Pettinato 2002). For these lower-middle income groups in the Middle East and North Africa, income, employment, and consumption are highly dependent on a number of factors over which they have little control, including commodity price shocks, business cycles, climatic factors, external and internal conflicts, or economic mismanagement (El-Said and Harrigan 2014; Devarajan and Ianchovichina 2017).

Given the extensive queuing for formal, public-sector jobs in the Arab world, this is precisely the group for whom informal employment has increasingly become a permanent status, as well as the group for whom returns to education are the lowest across the population (Salehi-Isfahani 2013). For those languishing in low-pay, informal employment with little prospect of mobility to the formal sector, peaceful political actions would normally constitute low-cost signals of discontent. Our framework would lead us to expect that the preference to employ higher-cost political actions would be concentrated among these members of the vulnerable working classes.

To examine these hypothesized relationships more rigorously, we explore these outcomes using semi-parametric and flexible-parametric methods. We rely on approaches that allow for good fits to the data with minimal restriction on functional form. The first is the generalized additive model (GAM), which models a dependent variable as an additive combination of unknown, univariate smooth functions of independent variables (Royston and Ambler 2002). The second is the multivariable fractional polynomial (MFP), a flexible method to reveal non-linear associations (Royston and Sauerbrei 2008).[19] Both methods avoid the over-fitting of local regressions, while being considered superior to smoothing splines and other global semi-parametric methods (Beck and Jackman 1998; Moore *et al.* 2011).

First, in Table 5, we examine the benefits from semi-parametric and flexible-parametric modeling of income/decile/subjective well-being in our benchmark specifications (age and deprivation are also modeled non-linearly) examining the determinants of civic engagement, petition-signing, participation in protests and general strikes, and support for violence.[20]

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[19]With the GAM, a link function is used to relate the conditional mean of the response variable to the predictors. The dependent variable is adjusted by a local weighting or "scoring" algorithm based on partial residuals; a second algorithm then smoothes the partial residuals as functions of the independent variables (see Hastie and Tibshirani 1990). MFPs ascertain whether model fit would be improved by using a polynomial form. Fractional polynomial regressions fit the best second-order fractional polynomial (FP2) and test it against the null model (excluding the predictor). If significant, the best-fit FP2 is tested against a linear fit (test of non-linearity). If this is, in turn, significant then the best-fit FP2 is tested against the a best-fit first-order fractional polynomial (FP1) (see Royston and Altman 1997).

[20]One of the concerns with local, nonparametric techniques is the possibility of both under- or over-fitting, which would either inefficiently account for existing non-linear relationships or account for too much noise.

We report the gains from non-linearity as the changes in deviance (worsening of fit) between the GAM or MFP for the predictor (income, decile, or the Cantril Scale) and the binary logit regression, along with $p$-values from significance tests of these gains. Total gains show differences between the untransformed models and these semi-parametric specifications for the entire regression (that is, entering income/Cantril, age, and bias with four degrees of freedom). The ratio of the gain from the socioeconomic status measure to the overall gain, therefore, is an indicator of the improvement in fit from the semi-parametric modeling of this specific indicator. We see large gains in non-linearity for income/decile and the Cantril scale as predictors (results not reported also show significant gains for deprivation) over the whole range of actions.[21] Between 10 and 60 percent of overall gains, moreover, comes from the local modeling of the socioeconomic status variable, suggesting that linearity assumptions may be violated for these outcomes.

Second, in Figures 3 and 4 we graphically depict the partial effects based on the specifications in Table 5. Figure 3 shows the partial effects of income and the Cantril Scale on the likelihood of attending protests and participate in strikes, with confidence intervals. All partial-residual plots show non-linear relationships between socioeconomic status and political behavior that are largely in line with the model predictions. In particular, in almost all cases partial effects increase in size starting from the second quintile and reach a peak somewhere within the 4th quintile and then taper off. In a few cases the effect is falling in size in the lowest range, but not consistently. This is in line with the predictions of the model, where the tendency towards non-violent action is increasing in income and life satisfaction up until the point when the cost of action exceeds the benefits of initiating change.

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In all specifications, we use four degrees of freedom to avoid these possibilities, but our results are robust to the use of three to five degrees of freedom.

[21]We refer to gains from non-linearity here and throughout. Although the logit function is not, strictly speaking, a linear model, GAM/MFP significance tests compare local semi-parametric modeling of predictor variables to a generalized linear model with a logit link function and a binomial error distribution. Thus it is perhaps more accurate to refer to gains from the non-global modeling of independent variables.

The main alternative available to those to low-cost signals is to adopt high-cost behaviors, namely, anti-regime political violence through direct participation or support for armed or insurgent movements. The model predicts that effects should be increasing and peaking at the lowest end of the distribution, then falling monotonically. We thus expect the likelihood of violent political participation to be the highest among neither the most marginalized groups nor the wealthy, but rather, among the vulnerable, lower-middle class. The graphs in Figure 4 correspond to the estimations in the last row in Table 5 and show the partial effects of the socioeconomic status predictor on the propensity support violence. The symmetry between the two semi-parametric approaches is striking: whether one looks at income deciles or the Cantril Scale, support for violence rises in the bottom, peaks in the $1^{nd}$ or $2^{rd}$ quintile, and declines from there.

# Conclusion

Political actions are traditionally examined as discrete forms of behavior. Moreover, the effect of resource- and grievance-based explanations—that socioeconomic status should be positively associated with non-violent behavior but negatively associated with violent actions, and that frustration should be positively associated with both non-violent and violent forms of political engagement—have not been consistently supported by the evidence. We model political actions as signals along a continuum with varying costs—costs that determine the credibility of those signals to incumbents. The novelty of our framework is that, for any given level of discontent, rational citizens from different socioeconomic backgrounds select different forms of political action depending on the effectiveness of those behaviors.

From three large-scale, nationally-representative surveys of populations in the Middle East and North Africa we analyze the relationship between income, along with a broader subjective measure of well-being, on various forms of political participation and find support for our signaling model. Resource- and grievance-based arguments hypothesize linear

relationships. Our signaling framework, by contrast, suggests that the relationship between socioeconomic status and costly political behavior should exhibit non-linearities. Using semi-parametric and flexible-parametric methods, we find that non-violent political behavior is increasing in income through the 4th quintile, then declining. Meanwhile, costlier actions—in particular, support for political violence—is concentrated in the 2nd quintile, that is, the lower middle class.

Our results shed some light on the political lives of Arab citizens, whose behaviors have been characterized by two distinct patterns. On the one hand, there is ample evidence of the withdrawal of Arab citizens from ordinary civic and political engagement. On the other, certain groups—notably youth—played a prominent role in the recent popular uprisings that led either to the overthrow of dictators or to serious internal fracturing and contestation within regimes. We explain the discrepancy by arguing that political action, a signal of discontent, has varying degrees of credibility for different groups depending upon the opportunity costs these groups face. For those with higher socioeconomic status, ordinary political engagement is a sufficiently powerful signal of discontent. For marginalized groups, peaceful political actions constitute a much weaker signal. For these groups, for whom normal expressions of political voice are weaker signals, discontent encourages forms of political action that carry high personal cost—actions that, by definition, are more dramatic and place the participants at significant risk of reprisal.

We find evidence from survey data from the Arab World that economic and political discontent breeds both self-exclusion and radicalism. Thus we have a potentially vicious cycle of de-legitimation: alienation leads to self-exclusion, self-exclusion further marginalizes vulnerable groups from access to and representation in policymaking, disenfranchisement stacks the deck in favor of influential groups, which reinforces perceptions of inequality and political failure leading to even more radical political attitudes. It is thus the better-off who see the opportunities in non-violent efforts to initiate reforms, even if it is the less well-off and marginalized citizens who have the strongest preferences for change.

By way of conclusion, we turn to two possible extensions of our framework and results that warrants future analysis of political behavior in the Middle East and North Africa. First, our findings also imply that the effectiveness of elections may not serve as informative signals of incumbent popularity in non-democratic regimes (see, e.g., Little 2016; Egorov and Sonin 2014). If the cohorts that are the most prone to participate in violent politics also feel disenfranchised, they may self-exclude (just as they are unlikely to engage in more visible peaceful political behavior). Consequently elections may not accurately capture the underlying levels of discontent and potential regime contestation, thus undermining the information value carried in the act of holding elections.

Second, we would expect to find a relatively even distribution of discontent across socioeconomic groups in countries whose regimes were toppled as a result of Arab Spring protests, in particular, in Egypt and Tunisia. All forms of political action are more likely as the level of discontent increases. The decomposition into different socioeconomic groups highlights that the situation may be particularly explosive when discontent is rising across economic divides. Regimes often rely on support from specific key constituencies, and policies that enrage one group may favor another, creating a constituency in support of the status quo. However, when groups across socioeconomic cleavages become discontent, and as the status-quo supporters become a narrower group, regime vulnerability increases. Analyses of the effects of information and media on protest (e.g., Granovetter 1978; Lohmann 1993; Enikolopov, Makarin, and Petrova 2016) show how numbers matter for overcoming free-riding incentives in demonstrations and street protests. The spread of discontent across socioeconomic groups can thus have more than an additive effect on the overall strength of protests, and different groups may at least initially be encouraged by the political activity of others, even if those different groups choose different actions.

# References

Ahuja, Amit, and Pradeep Chhibber. 2012. "Why the Poor Vote in India: 'If I Don't Vote, I Am Dead to the State'." *Studies in Comparative International Development* 47 (4): 389-410.

Akerlof, George A., and Rachel E. Kranton. 2000. "Economics and Identity." *Quarterly Journal of Economics* 115 (3): 715-53.

Aliriza, Fadil and Ouiem Chettaoui. 2017. "Tunisias parliament just cast a vote against democracy." *Washington Post*, September 19, 2017. [Available from http://www.washingtonpost.com/news/democracy-post/wp/2017/09/19/tunisias-parliament-just-cast-a-vote-against-democracy/].

Amin, Magdi, *et al.* 2012. *After the Spring: Economic Transitions in the Arab World*. New York: Oxford University Press.

Assaad, Ragui. 2008. "Unemployment and Youth Insertion in the Labor Market in Egypt." In *The Egyptian Economy: Current Challenges and Future Prospects*, ed. Hanna Kheir El-Din. Cairo: American University in Cairo Press.

Barron, Patrick, Kai Kaiser, and Menno Pradhan. 2009. "Understanding Variations in Local Conflict: Evidence and Implications from Indonesia." *World Development* 37 (3): 698-713.

Basedau, Matthias, *et al.* 2017. "Does Discrimination Breed Grievances—and Do Grievances Breed Violence? New Evidence from an Analysis of Religious Minorities in Developing Countries." *Conflict Management and Peace Science* 34 (3): 217-39.

Bayat, Asef. 2013. *Life as Politics: How Ordinary People Change the Middle East*. Palo Alto, CA: Stanford University Press.

Beck, Nathaniel, and Simon Jackman. 1998. "Beyond Linearity by Default: Generalized Additive Models." *American Journal of Political Science* 42 (2): 596-627.

Bellin, Eva. 2012. "Reconsidering the Robustness of Authoritarianism in the Middle East: Lessons from the Arab Spring." *Comparative Politics* 44 (2): 127-149.

Benmelech, Efraim, Claude Berrebi, and Esteban F. Klor. 2012. "Economic Conditions and the Quality of Suicide Terrorism." *Journal of Politics* 74 (1): 113-28.

Bernburg, Jón Gunnar. 2015. "Economic Crisis and Popular Protest in Iceland, January 2009: The Role of Perceived Economic Loss and Political Attitudes in Protest Par-

ticipation and Support." *Mobilization* 20 (2): 231-52.

Berrebi, Claude. 2007. "Evidence About the Link between Education, Poverty and Terrorism among Palestinians." *Peace Economics, Peace Science, and Public Policy* 13 (1).

Bertrand, Marianne, and Sendhil Mullainathan. 2001. "Do People Mean What They Say? Implications for Subjective Survey Data." *American Economic Review* 91 (2): 67-72.

Blair, Graeme*, et al.* 2013. "Poverty and Support for Militant Politics: Evidence from Pakistan." *American Journal of Political Science* 57 (1): 30-48.

Blaise, Lilia. 2018. "'You Cant Survive Anymore': Tunisia Protests Rising Prices and Taxes." *New York Times*, January 10: A9.

Blanchflower, David G., and Andrew J. Oswald. 2004. "Well-Being over Time in Britain and the USA." *Journal of public economics* 88 (7): 1359-86.

Blaydes, Lisa. 2010. *Elections and Distributive Politics in Mubarak's Egypt.* New York: Cambridge University Press.

Boix, Carles. 2003. *Democracy and Redistribution.* New York: Cambridge University Press.

Booth, John A., and Mitchell A. Seligson. 2008. "Inequality and Democracy in Latin America: Individual and Contextual Effects of Wealth on Political Participation." In *Poverty, Participation, and Democracy*, ed. Anirudh Krishna. New York: Cambridge University Press.

Bosi, Lorenzo, and Stefan Malthaner. 2015. "Political Violence." In *The Oxford Handbook of Social Movements*, eds. Donatella Della Porta and Mario Diani. New York: Oxford University Press.

Brady, Henry E., Sidney Verba, and Kay Lehman Schlozman. 1995. "Beyond SES: A Resource Model of Political Participation." *American Political Science Review* 89 (2): 271-94.

Bratton, Michael. 2008. "Poor People and Democratic Citizenship in Africa." In A. Krishna, ed., *Poverty, Participation, and Democracy: A Global Perspective.* Cambridge: Cambridge University Press.

Brennan, Geoffrey, and Alan Hamlin. 1998. "Expressive Voting and Electoral Equilibrium." *Public choice* 95 (1): 149-75.

Brown, Nathan J. 2017. *Official Islam in the Arab World.* Washington, DC: Carnegie Endowment for International Peace.

Brush, Stephen G. 1996. "Dynamics of Theory Change in the Social Sciences: Relative Deprivation and Collective Violence." *Journal of Conflict Resolution* 40 (4): 523-45.

Buechler, Steven M. 2004. *The Strange Career of Strain and Breakdown Theories of Collective Action.* Oxford: Blackwell Publishing.

Bueno de Mesquita, Bruce*, et al.* 2003. *The Logic of Political Survival.* Cambridge, MA.: MIT Press.

Bueno De Mesquita, Ethan 2005. "The Quality of Terror." *American Journal of Political Science* 49 (3): 515-30.

————. 2013. "Rebel Tactics." *Journal of Political Economy* 121 (2): 323-57.

Buhaug, Halvard, Lars-Erik Cederman, and Kristian Skrede Gleditsch. 2014. "Square Pegs in Round Holes: Inequalities, Grievances, and Civil War." *International Studies Quarterly* 58 (2): 418-31.

Campante, Filipe R., and Davin Chor. 2012. "Why Was the Arab World Poised for Revolution? Schooling, Economic Opportunities, and the Arab Spring." *The Journal of Economic Perspectives* 26 (2): 167-87.

Campbell, Angus*, et al.* 1960. *The American Voter.* New York: Wiley.

Canetti, Daphna*, et al.* 2010. "Much Ado About Religion: Religiosity, Resource Loss, and Support for Political Violence." *Journal of Peace Research* 47 (5): 575-87.

Cantril, Hadley. 1965. *Pattern of Human Concerns.* New Brunswick, NJ: Rutgers University Press.

Cederman, Lars-Erik, Nils B. Weidmann, and Kristian Skrede Gleditsch. 2011. "Horizontal Inequalities and Ethnonationalist Civil War: A Global Comparison." *American Political Science Review* 105 (3): 478-95.

Chenoweth, Erica, and Adria Lawrence. 2010. *Rethinking Violence: States and Non-State Actors in Conflict.* Cambridge, MA: MIT press.

Collier, Paul, and Anke Hoeffler. 1998. "On Economic Causes of Civil War." *Oxford Economic Papers* 50 (4): 563-73.

————. 2004. "Greed and Grievance in Civil War." *Oxford Economic Papers* 56 (4): 563-95.

Courbage, Youssef, and Emmanuel Todd. 2014. *A Convergence of Civilizations: The Transformation of Muslim Societies around the World.* New York: Columbia University

Press.

Deaton, Angus. 2008. "Income, Health, and Well-Being around the World: Evidence from the Gallup World Poll." *Journal of Economic Perspectives* 22 (2): 53-72.

Deininger, Klaus. 2003. "Causes and Consequences of Civil Strife: Micro-Level Evidence from Uganda." *Oxford Economic Papers* 55 (4): 579-606.

Devarajan, Shantayanan, and Elena Ianchovichina. 2017. "A Broken Social Contract, Not High Inequality, Led to the Arab Spring." *Review of Income and Wealth.* [Published online February 2017, available from http://dx.doi.org/10.1111/roiw.12288].

Dhillon, Navtej, Paul Dyer, and Tarik Yousef. 2011. "Generation in Waiting: An Overview of School-to-Work and Family-Formation Transitions "In *Generation in Waiting: The Unfulfilled Promise of Young People in the Middle East*, ed. Navtej Dhillon and Tarik Yousef. Washington, DC: Brookings Institution Press.

Di Tella, Rafael, Robert J. MacCulloch, and Andrew J. Oswald. 2003. "The Macroeconomics of Happiness." *Review of Economics and Statistics* 85 (4): 809-27.

Diener, Ed., *et al.* 2009. "Incomes Differential Influence on Judgments of Life Versus Affective Well-Being." In *Assessing Well-Being*, Ed Diener, ed. Heidelberg: Springer.

Downs, Anthony. 1957. "An Economic Theory of Political Action in a Democracy." *Journal of Political Economy* 65 (2): 135-50.

Egorov, Georgy, and Konstantin Sonin. 2014. "Incumbency Advantage in Non-Democracies." Working Paper 20519. National Bureau of Economic Research, Cambridge, MA. [Available from http://www.nber.org/papers/w20519].

El-Said, Hamed, and Jane Harrigan. 2014. "Economic Reform, Social Welfare, and Instability: Jordan, Egypt, Morocco, and Tunisia, 1983-2004." *The Middle East Journal* 68 (1): 99-121.

Elbadawi, Ibrahim, and Nicholas Sambanis. 2002. "How Much War Will We See? Explaining the Prevalence of Civil War." *Journal of Conflict Resolution* 46 (3): 307-34.

Enikolopov, Ruben, Alexey Makarin, and Maria Petrova. 2016. "Social Media and Protest Participation: Evidence from Russia." Discussion Paper 11254, Center for Economic Policy Research, London.

Fair, C. Christine, Neil Malhotra, and Jacob N. Shapiro. 2010. "Islam, Militancy, and Politics in Pakistan: Insights from a National Sample." *Terrorism and Political Violence* 22 (4): 495-521.

Feddersen, Timothy, Sean Gailmard, and Alvaro Sandroni. 2009. "Moral Bias in Large Elections: Theory and Experimental Evidence." *American Political Science Review* 103 (2): 175-92.

Ferrer-i-Carbonell, Ada 2005. "Income and Well-Being: An Empirical Analysis of the Comparison Income Effect." *Journal of Public Economics* 89 (5): 997-1019.

Fesnic, Florin N., and Raluca Viman Miller. 2009. "Alternative Measures of Tolerance, or Tolerance v. Social Liberalism? A Cross-National Empirical Test." *Studia Universitatis Babes-Bolyai, Politica* 54.

Ginges, Jeremy, Ian Hansen, and Ara Norenzayan. 2009. "Religion and Support for Suicide Attacks." *Psychological Science* 20 (2): 224-30.

Giugni, Marco, and Maria Grasso. 2016. *Austerity and Protest: Popular Contention in Times of Economic Crisis*. London: Routledge.

Gluck, Jason, and Michele Brandt. 2015. *Participatory and Inclusive Constitution Making*. Washington, DC: United States Institute of Peace.

Graham, Carol. 2002. "Mobility, Opportunity and Vulnerability: The Dynamics of Poverty and Inequality in a Global Economy." *Journal of Human Development* 3 (1): 57-94.

Graham, Carol, and Stefano Pettinato. 2002. "Frustrated Achievers: Winners, Losers and Subjective Well-Being in New Market Economies." *Journal of Development Studies* 38 (4): 100-40.

Granovetter, Mark. 1978. "Threshold Models of Collective Behavior." *American journal of Sociology* 83 (6): 1420-43.

Gunning, Jeroen, and Ilan Zvi Baron 2013. *Why Occupy a Square: People, Protests and Movements in the Egyptian Revolution*. New York: Oxford University Press.

Gurr, Ted Robert. 1970. *Why Men Rebel*. Princeton, N.J.: Princeton University Press.

Hashem, Mostafa. 2014. "The Dangers of Alienating Egypt's Youth." Sada Journal 6. Carnegie Endowment for International Peace, Washington, DC. [Available from `http://carnegieendowment.org/sada/?fa=54793`].

Hastie, Trevor, and Robert Tibshirani. 1990. *Generalized Additive Models*. New York: Wiley.

Hirshleifer, Jack. 1994. "The Dark Side of the Force: Western Economic Association International 1993 Presidential Address." *Economic Inquiry* 32 (1): 1-10.

International Foundation for Electoral Systems 2011. "Elections in Tunisia: Steps Towards Elections in 2011." IFES, Washington, DC. [Available from http://www.ifes.org/publications/elections-tunisia-steps-towards-elections-2011].

Jetten, Jolanda, Frank Mols, and Tom Postmes. 2015. "Relative Deprivation and Relative Wealth Enhances Anti-Immigrant Sentiments: The V-Curve Re-Examined." *PloS One* 10 (10): e0139156.

Kalyvas, Stathis N. 2006. *The Logic of Violence in Civil War*. New York: Cambridge University Press.

Karakoc, Ekrem. 2013. "Economic Inequality and Its Asymmetric Effect on Civic Engagement: Evidence from Post-Communist Countries." *European Political Science Review* 5 (2): 197-223.

Kenworthy, Lane, and Jonas Pontusson. 2005. "Rising Inequality and the Politics of Redistribution in Affluent Countries." *Perspectives on Politics* 3 (3): 449-71.

Kern, Anna, Sofie Marien, and Marc Hooghe. 2015. "Economic Crisis and Levels of Political Participation in Europe 2002–2010: The Role of Resources and Grievances." *West European Politics* 38 (3): 465-90.

Key Jr., V. O. 1949. *Southern Politics in State and Nation.* New York: Alfred Knopf.

King, Gary, and Jonathan Wand. 2007. "Comparing Incomparable Survey Responses: Evaluating and Selecting Anchoring Vignettes." *Political Analysis* 15 (1): 46-66.

Krishna, Anirudh. 2008. "Poor People and Democracy." In *Poverty, Participation, and Democracy*, Anirudh Krishna, ed. New York: Cambridge University Press.

Krueger, Alan B., and Jitka Malečková. 2003. "Education, Poverty and Terrorism: Is There a Causal Connection?" *Journal of Economic Perspectives* 17 (4): 119-44.

Lee, Alexander 2011. "Who Becomes a Terrorist?: Poverty, Education, and the Origins of Political Violence." *World Politics* 63 (2): 203-45.

Levine, David K., and Thomas R Palfrey. 2007. "The Paradox of Voter Participation? A Laboratory Study." *American Political Science Review* 101 (1): 143-58.

Lichbach, Mark Irving. 1989. "An Evaluation of 'Does Economic Inequality Breed Political Conflict?' Studies." *World Politics* 41 (4): 431-70.

Lijphart, Arend. 1999. *Patterns of Democracy: Governance Forms and Performance in 36 Countries.* New Haven, CT: Yale University Press.

Lindbeck, Assar, and Jörgen W Weibull. 1987. "Balanced-Budget Redistribution as the Outcome of Political Competition." *Public Choice* 52 (3): 273-97.

Little, Andrew T. 2017. "Are Non-Competitive Elections Good for Citizens?" *Journal of Theoretical Politics* 29 (2): 214-42.

Lohmann, Susanne. 1993. "A Signaling Model of Informative and Manipulative Political Action." *American Political Science Review* 87 (2): 319-33.

—. 1994. "The Dynamics of Informational Cascades: The Monday Demonstrations in Leipzig, East Germany, 1989-91." *World Politics* 47 (1): 42-101.

Luttmer, Erzo F. P. 2005. "Neighbors as Negatives: Relative Earnings and Well-Being." *Quarterly Journal of Economics* 120 (3): 963-1002.

Mahler, Vincent A. 2008. "Electoral Turnout and Income Redistribution by the State: A Cross-National Analysis of the Developed Democracies." *European Journal of Political Research* 47 (2): 161-83.

Malapit, Hazel Jean L, Tina S. Clemente, and Cristina Yunzal. 2010. "Does Violent Conflict Make Chronic Poverty More Likely? The Mindanao Experience." *Philippine Review of Economics* 40 (2): 31-58.

McCauley, Clark, and Sophia Moskalenko. 2017. "Understanding Political Radicalization: The Two-Pyramids Model." *American Psychologist* 72 (3): 205.

McCurdy, Daphne. 2011. *A Guide to the Tunisian Elections.* Washington, DC: Project on Middle East Democracy.

Mishali-Ram, Meirav. 2017. "Foreign Fighters and Transnational Jihad in Syria." *Studies in Conflict & Terrorism.* Online version available at http://dx.doi.org/10.1080/1057610X.2017.1283198.

Montalvo, José G., and Marta Reynal-Querol. 2005. "Ethnic Polarization, Potential Conflict, and Civil Wars." *American Economic Review* 95 (3): 796-816.

Moore, Lynne, *et al.* 2011. "A Comparison of Generalized Additive Models to Other Common Modeling Strategies for Continuous Covariates: Implication for Risk Adjustment." *Journal of Biometrics and Biostatistics* 2 (1): 109-14.

Muller, Edward N. 1979. *Aggressive Political Participation.* Princeton, NJ: Princeton University Press.

Murshed, Syed Mansoob, and Mohammad Zulfan Tadjoeddin. 2009. "Revisiting the Greed and Grievance Explanations for Violent Internal Conflict." *Journal of International*

*Development* 21 (1): 87-111.

Noland, Marcus, and Howard Pack. 2007. *The Arab Economies in a Changing World.* Washington, DC: Peterson Institute for International Economics.

Opp, Karl-Dieter. 1988. "Grievances and Participation in Social Movements." *American Sociological Review* 53 (6): 853-64.

Paige, Jeffrey M. 1978. *Agrarian Revolution.* New York: Simon and Schuster.

Rice, Susan E. 2006. "The Threat of Global Poverty." *The National Interest* 83 (Spring): 76-82.

Riker, William H., and Peter C. Ordeshook. 1968. "A Theory of the Calculus of Voting." *American Political Science Review* 62 (1): 25-42.

Royston, Patrick, and Douglas G. Altman. 1997. "Approximating Statistical Functions by Using Fractional Polynomial Regression." *Journal of the Royal Statistical Society* 46 (3): 411-22.

Royston, Patrick, and Gareth Ambler. 1998. "Generalized Additive Models." *Stata Technical Bulletin* 7 (42): 38-43.

Royston, Patrick, and Willi Sauerbrei. 2008. *Multivariable Model-Building: A Pragmatic Approach to Regression Analysis Based on Fractional Polynomials for Modelling Continuous Variables.* New York: John Wiley & Sons.

Rüdig, Wolfgang, and Georgios Karyotis. 2014. "Who Protests in Greece? Mass Opposition to Austerity." *British Journal of Political Science* 44 (3): 487-513.

Saleh, Heba. 2016. "Tunisia Job Protests Echo Spark for Arab Uprising." *Financial Times*, January 20: 6. [Available at https://www.ft.com/content/5d5eaab2-bf86-11e5-a8c6-deeeb63d6d4b].

Salehi-Isfahani, Djavad. 2013. "Rethinking Human Development in the Middle East and North Africa: The Missing Dimensions." *Journal of Human Development and Capabilities* 14 (3): 341-70.

Sánchez, Fabio, and Mario Chacón. 2003. "Conflict, State and Decentralisation: From Social Progress to an Armed Dispute for Local Control, 1974-2002." Crisis States Programme Working Paper 70. London: Development Studies Institute. [Available at http://eprints.lse.ac.uk/28173/.]

Scott, James. 1976. *The Moral Economy of the Peasant: Rebellion and Subsistence in Southeast Asia.* New Haven, CT: Yale University Press.

Sidanius, Jim, *et al.* 2016. "Support for Asymmetric Violence among Arab Populations: The Clash of Cultures, Social Identity, or Counterdominance?" *Group Processes & Intergroup Relations* 19 (3): 343-59.

Skaperdas, Stergios. 2002. "Warlord Competition." *Journal of Peace Research* 39 (4): 435-46.

Smith, Heather J., and Thomas F. Pettigrew. 2015. "Advances in Relative Deprivation Theory and Research." *Social Justice Research* 28 (1): 1-6.

Solt, Frederick. 2008. "Economic Inequality and Democratic Political Engagement." *American Journal of Political Science* 52 (1): 48-60.

—————. 2015. "Economic Inequality and Nonviolent Protest." *Social Science Quarterly* 96 (5): 1314-27.

Steinert-Threlkeld, Zachary C. 2017. "Spontaneous Collective Action: Peripheral Mobilization during the Arab Spring." *American Political Science Review* 111 (2): 379-403.

Stewart, Frances. 2008. "Horizontal Inequalities and Conflict: An Introduction and Some Hypotheses." In *Horizontal Inequalities and Conflict: Understanding Group Violence in Multiethnic Societies*, F. Steward, ed. Basingstoke: Palgrave Macmillan.

Tadjoeddin, Mohammad Zulfan, and Syed Mansoob Murshed. 2007. "Socio-Economic Determinants of Everyday Violence in Indonesia: An Empirical Investigation of Javanese Districts, 1994-2003." *Journal of Peace Research* 44 (6): 689-709.

Tarrow, Sidney. 2007. "Inside Insurgencies: Politics and Violence in an Age of Civil War." *Perspectives on Politics* 5 (3): 587-600.

The Soufan Group. 2015. *Foreign Fighters: An Updated Assessment of the Flow of Foreign Fighters into Syria and Iraq.* New York: The Soufan Group.

The White House. 2011. *Empowering Local Partners to Prevent Violent Extremism in the United States.* Washington, DC: Office of the President.

Tilly, Charles. 1977. "Repertoires of Contention in America and Britian, 1750-1830." Working Paper 151. Center for Research on Social Organization, University of Michigan, Ann Arbor. [Available at http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.1023.6384&rep=rep1&type=pdf].

———. 2010. *Regimes and Repertoires*. Chicago: University of Chicago Press.

Useem, Bert. 1998. "Breakdown Theories of Collective Action." *Annual Review of Sociology* 24 (1): 215-38.

Verba, Sidney, and Norman H. Nie. 1972. *Participation in America: Social Equality and Political Democracy*." New York: Harper & Row.

Wahba, Jackline. 2009. "An Overview of Internal and International Migration in Egypt." In *The Egyptian Labor Market Revisited*, Ragui Assaad, ed. Cairo: American University of Cairo Press.

Wickham, Carrie Rosefsky. 2015. *The Muslim Brotherhood: Evolution of an Islamist Movement*. Princeton, NJ: Princeton University Press.

World Bank. 2015. "Inequality, Uprisings, and Conflict in the Arab World." Middle East and North Africa Economic Monitor (October). World Bank, Washington, DC. [Available from http://documents.worldbank.org/curated/en/303441467992017147/Inequality-uprisings-and-conflict-in-the-Arab-World].

**Table 1: Survey Samples and Coverage**

| | Gallup World Poll | | | | World Values Survey | | | Arab Barometer | |
|---|---|---|---|---|---|---|---|---|---|
| | 2009 | 2010 | 2011 | 2012 | 1999 -2004 | 2005 -2009 | 2010 -2014 | 2010 -2011 | 2013 -2014 |
| Algeria | 2,000 | 2,001 | 2,001 | 1,005 | 1,282 | | 1,200 | 1,216 | 1,220 |
| Bahrain | | | 2,010 | | | | | | |
| Comoros | 2,000 | 2,000 | 2,000 | 1,000 | | | | | |
| Djibouti | 2,000 | 1,000 | 1,000 | | | | | | |
| Egypt | 2,112 | 2,053 | 2,126 | 1,006 | 3,000 | 3,051 | 1,523 | 1,219 | 1,196 |
| Iraq | 2,001 | 2,000 | 2,000 | 1,000 | 2,325 | 2,701 | 1,200 | 1,234 | 1,215 |
| Jordan | 2,016 | 2,000 | 2,000 | 1,000 | 1,223 | 1,200 | 1,200 | 1,188 | 1,795 |
| Kuwait | 2,002 | 2,004 | | | | | 1,303 | | |
| Lebanon | 2,010 | 2,027 | 2,007 | 1,001 | | | 1,200 | 1,387 | 1,200 |
| Libya | | | | | | | 2,131 | | 1,247 |
| Mauritania | 1,984 | 2,000 | 2,000 | 1,000 | | | | | |
| Morocco | | 2,008 | | 1,000 | 1,251 | 1,200 | 1,200 | | 1,116 |
| Palestinian Territories | 2,014 | 2,000 | 2,000 | 1,000 | | | 1,000 | | |
| Saudi Arabia | 2,052 | 2,038 | 2,022 | 1,077 | | | | 1,404 | |
| Somaliland | 2,000 | 2,000 | 2,000 | 1,000 | | | | | |
| Sudan | 2,000 | 2,000 | 2,000 | 1,000 | | | | 1,538 | 1,200 |
| Syria | 2,100 | 2,035 | 2,041 | 1,025 | | | | | |
| Tunisia | 2,014 | 2,085 | 2,034 | 1,024 | | | 1,205 | 1,196 | 1,199 |
| United Arab Emirates | 2,054 | 2,066 | 2,036 | | | | | | |
| Yemen | 2,000 | 2,000 | 2,000 | 1,000 | | | 1,000 | 1,200 | 1,200 |

**Table 2: Civic and Political Engagement, Basic Results**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Political Voice (GWP) | | Petition Signing (WVS) | | Petition Signing (ADB) | Boycott (WVS) | | Political Meetings (ADB) |
| Decile/Income (Ln) | 0.096*** (0.022) | | 0.054*** (0.008) | | 0.026*** (0.008) | 0.081*** (0.009) | | 0.052*** (0.007) |
| Cantril/Life Satisfaction | | 0.029*** (0.011) | | 0.004 (0.007) | | | -0.012 (0.007) | |
| Employed | 0.545*** (0.044) | 0.549*** (0.044) | 0.093** (0.039) | 0.103*** (0.040) | 0.174*** (0.047) | 0.047 (0.041) | 0.063 (0.040) | 0.083* (0.044) |
| Self Employed | 0.234*** (0.062) | 0.239*** (0.062) | 0.122** (0.057) | 0.144** (0.058) | | 0.008 (0.064) | 0.045 (0.063) | |
| Age | 0.005*** (0.002) | 0.006*** (0.002) | 0.001 (0.001) | 0.001 (0.001) | -0.003 (0.002) | -0.002 (0.002) | -0.001 (0.002) | 0.007*** (0.002) |
| Education | 0.486*** (0.031) | 0.510*** (0.030) | 0.052*** (0.007) | 0.063*** (0.007) | 0.155*** (0.013) | 0.049*** (0.007) | 0.067*** (0.007) | 0.090*** (0.012) |
| Male | 0.368*** (0.039) | 0.375*** (0.039) | 0.390*** (0.037) | 0.370*** (0.037) | 0.536*** (0.043) | 0.433*** (0.039) | 0.398*** (0.039) | 0.494*** (0.040) |
| Single | -0.232*** (0.052) | -0.224*** (0.052) | 0.021 (0.044) | 0.034 (0.044) | -0.131*** (0.048) | 0.074 (0.045) | 0.092** (0.045) | -0.186*** (0.047) |
| Urban | -0.015 (0.042) | -0.004 (0.042) | | | 0.012 (0.043) | | | -0.056 (0.041) |
| Religious | -0.334*** (0.067) | -0.344*** (0.067) | 0.037 (0.042) | 0.033 (0.043) | 0.025 (0.040) | -0.006 (0.046) | -0.013 (0.046) | 0.137*** (0.036) |
| Deprivation | -0.007*** (0.001) | -0.006*** (0.001) | 0.016** (0.007) | 0.018** (0.007) | 0.203*** (0.023) | -0.005 (0.007) | -0.010 (0.008) | 0.092*** (0.020) |
| $N$ | 25,104 | 25,009 | 18,827 | 18,767 | 20,524 | 18,230 | 18,176 | 22,729 |
| $R^2$ | 0.108 | 0.108 | 0.071 | 0.069 | 0.102 | 0.093 | 0.089 | 0.062 |
| $k$ | 136 | 136 | 182 | 182 | 197 | 176 | 176 | 222 |

Notes: Estimation is logit regression with bootstrap replicate weights (500 replications) taking into account country strata and clustering at primary sampling units for resampling. Logit results are weighted by survey weights and include, but do not report, country- and year-fixed effects along with intercepts. Errors are clustered by $k$ primary sampling units and are in parentheses. $R^2$ values are McFadden's pseudo-$R^2$. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$. GWP = Gallup World Poll; WVS = World Values Survey; ADB = Arab Democracy Barometer.

**Table 3: Anti-Regime Political Action**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | Protest (WVS) | | Protest (ADB) | General Strike (WVS) | | General Strike (ADB) | Arab Spring (ADB) |
| Decile/ Income (Ln) | 0.048*** (0.009) | | 0.028*** (0.010) | 0.061*** (0.011) | | -0.025** (0.010) | 0.029** (0.012) |
| Cantril/Life Satisfaction | | -0.006 (0.008) | | | -0.021** (0.010) | | |
| Employed | 0.129*** (0.041) | 0.137*** (0.040) | 0.037 (0.058) | 0.269*** (0.057) | 0.282*** (0.057) | 0.214*** (0.054) | -0.017 (0.075) |
| Self Employed | 0.125** (0.061) | 0.146** (0.061) | | 0.081 (0.080) | 0.122 (0.080) | | |
| Age | -0.007*** (0.002) | -0.007*** (0.002) | -0.011*** (0.002) | -0.006*** (0.002) | -0.006** (0.002) | 0.002 (0.002) | -0.017*** (0.003) |
| Education | 0.078*** (0.008) | 0.088*** (0.008) | 0.128*** (0.015) | 0.083*** (0.010) | 0.097*** (0.010) | -0.024 (0.015) | 0.214*** (0.021) |
| Male | 0.692*** (0.039) | 0.675*** (0.040) | 0.685*** (0.051) | 0.442*** (0.050) | 0.417*** (0.050) | 0.019 (0.048) | 0.977*** (0.067) |
| Single | 0.156*** (0.047) | 0.162*** (0.047) | 0.040 (0.056) | 0.260*** (0.059) | 0.262*** (0.059) | -0.010 (0.059) | 0.171** (0.078) |
| Urban | | | 0.109** (0.052) | | | 0.041 (0.050) | 0.281*** (0.062) |
| Religious | 0.090** (0.044) | 0.090** (0.044) | -0.052 (0.048) | -0.060 (0.050) | -0.058 (0.050) | -0.140*** (0.044) | 0.213*** (0.063) |
| Deprivation | 0.015** (0.007) | 0.011 (0.008) | 0.128*** (0.025) | 0.021** (0.010) | 0.007 (0.011) | -0.042* (0.025) | 0.094*** (0.035) |
| $N$ | 18,491 | 18,429 | 20,472 | 13,855 | 13,801 | 11,132 | 12,237 |
| $R^2$ | 0.155 | 0.153 | 0.123 | 0.190 | 0.189 | 0.140 | 0.202 |
| $k$ | 176 | 176 | 197 | 150 | 150 | 186 | 186 |

Notes: Estimation is logit regression with bootstrap replicate weights (500 replications) taking into account country strata and clustering at primary sampling units for resampling. Logit results are weighted by survey weights and include, but do not report, country- and year-fixed effects along with intercepts. Errors are clustered by $k$ clusters and are in parentheses. $R^2$ values are McFadden's pseudo-$R^2$. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$. WVS = World Values Survey; ADB = Arab Democracy Barometer.

**Table 4: Support for Violence: Logit Regressions**

|  | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
|  | Violence Justified (GWP) | Violence Justified (GWP) | Violence Justified (WVS) | Violence Justified (WVS) |
| Decile/ Income (Ln) | -0.020 (0.021) |  | 0.041*** (0.010) |  |
| Cantril/Life Satisfaction |  | -0.015 (0.012) |  | -0.039*** (0.009) |
| Employed | 0.096** (0.046) | 0.097** (0.046) | -0.021 (0.048) | -0.006 (0.048) |
| Self Employed | 0.029 (0.064) | 0.025 (0.064) | 0.047 (0.075) | 0.080 (0.075) |
| Age | -0.005*** (0.002) | -0.005*** (0.002) | -0.005*** (0.002) | -0.006*** (0.002) |
| Education | 0.047 (0.034) | 0.044 (0.034) | -0.010 (0.009) | 0.001 (0.009) |
| Male | 0.166*** (0.043) | 0.163*** (0.043) | 0.165*** (0.048) | 0.150*** (0.048) |
| Single | -0.026 (0.052) | -0.026 (0.052) | 0.035 (0.056) | 0.030 (0.056) |
| Urban | -0.126*** (0.045) | -0.129*** (0.044) |  |  |
| Religious | -0.120 (0.083) | -0.117 (0.083) | -0.438*** (0.046) | -0.432*** (0.047) |
| Deprivation | -0.002*** (0.001) | -0.003*** (0.001) | 0.017* (0.009) | -0.004 (0.010) |
| $N$ | 19,705 | 19,653 | 11,980 | 11,915 |
| $R^2$ | 0.160 | 0.160 | 0.064 | 0.064 |
| $k$ | 170 | 170 | 147 | 147 |

Notes: Estimation is logit regression with bootstrap replicate weights (500 replications) taking into account country strata and clustering at primary sampling units for resampling. Logit results are weighted by survey weights and include, but do not report, country- and year-fixed effects along with intercepts. Errors are clustered by $k$ clusters and are in parentheses. $R^2$ values are McFadden's pseudo-$R^2$. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$. GWP = Gallup World Poll; WVS = World Values Survey.
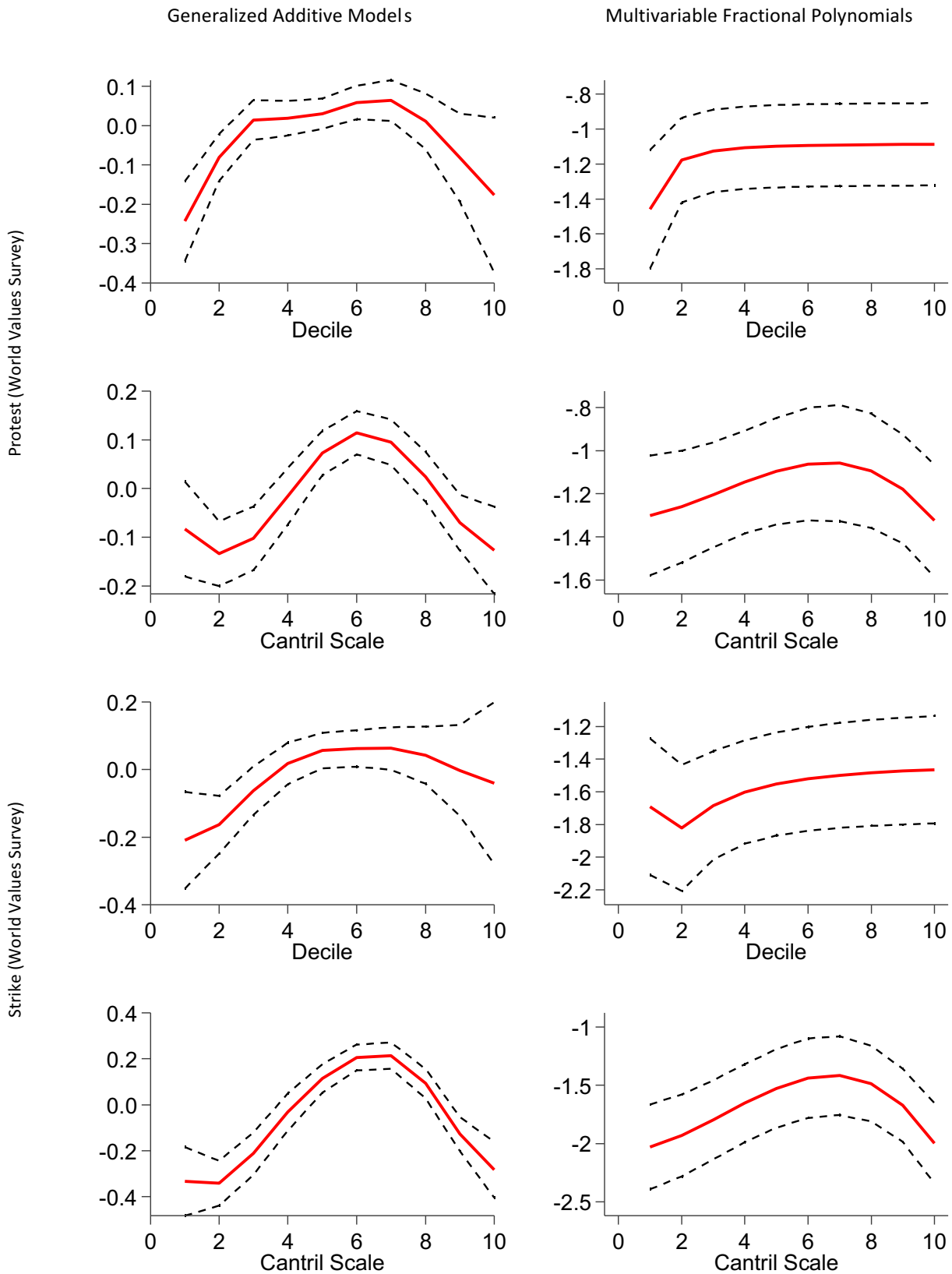
**Table 5: Support for Violence: Non-parametric Results**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gallup World Poll | | | | World Values Survey | | | | Arab Barometer | |
| | Income (Ln) | | Cantril Scale | | Income Decile | | Cantril Scale | | Income (Ln) | |
| | GAM | MFP | GAM | MFP | GAM | MFP | GAM | MFP | GAM | MFP |
| **Voice** | 3.934 (0.274) | 0.547 (0.908) | 6.844 (0.077) | 3.031 (0.387) | | | | | | |
| *Totalgain* ($p<\chi^2$) | 69.025 (0.000) | 37.474 (0.000) | 73.898 (0.000) | 35.363 (0.000) | | | | | | |
| *N* | 25,502 | | 83,298 | | | | | | | |
| **Petition Signing** | | | | | 23.670 (0.000) | 12.798 (0.005) | 87.745 (0.000) | 51.950 (0.000) | 52.005 (0.000) | 10.034 (0.018) |
| *Totalgain* ($p<\chi^2$) | | | | | 71.421 (0.000) | 43.782 (0.000) | 121.279 (0.000) | 83.770 (0.000) | 116.602 (0.000) | 46.041 (0.000) |
| *N* | | | | | 18,827 | | 18,767 | | 20,524 | |
| **Boycotts** | | | | | 28.543 (0.000) | 14.333 (0.002) | 194.394 (0.000) | 101.222 (0.000) | | |
| *Totalgain* ($p<\chi^2$) | | | | | 103.193 (0.000) | 54.079 (0.000) | 242.818 (0.000) | 148.757 (0.000) | | |
| *N* | | | | | 18,830 | | 18,176 | | | |
| **Political Meetings** | | | | | | | | | 25.220 (0.000) | 9.530 (0.023) |
| *Totalgain* ($p<\chi^2$) | | | | | | | | | 115.389 (0.000) | 58.343 (0.000) |
| *N* | | | | | | | | | 22,729 | |
| **Protests** | | | | | 29.855 (0.000) | 23.299 (0.000) | 46.987 (0.000) | 29.009 (0.000) | 54.240 (0.000) | 15.361 (0.002) |
| *Totalgain* ($p<\chi^2$) | | | | | 88.018 (0.000) | 58.885 (0.000) | 89.491 (0.000) | 70.349 (0.000) | 104.470 (0.000) | 47.038 (0.000) |
| *N* | | | | | 18,491 | | 18,429 | | 20,472 | |
| **General Strike** | | | | | 10.121 (0.008) | 10.675 (0.014) | 113.811 (0.000) | 78.672 (0.000) | 71.208 (0.000) | 65.667 (0.000) |
| *Totalgain* ($p<\chi^2$) | | | | | 151.788 (0.000) | 135.928 (0.000) | 199.359 (0.000) | 208.653 (0.000) | 168.225 (0.000) | 107.867 (0.000) |
| *N* | | | | | 13,855 | | 13,801 | | 11,132 | |

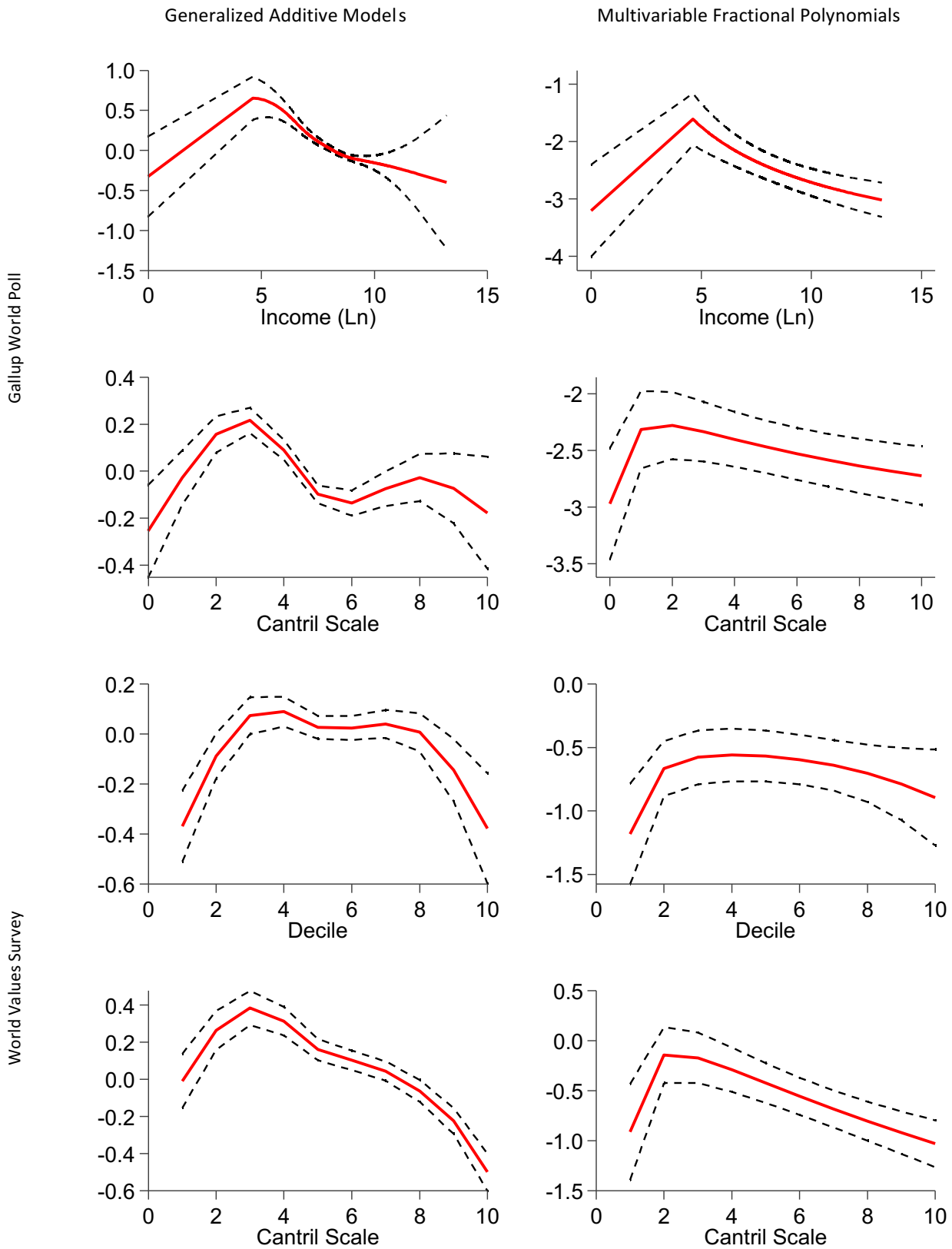| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Arab Spring** | | | | | | | 138.091 (0.000) | 142.157 (0.000) |
| *Total gain* ($p<\chi^2$) | | | | | | | 182.459 (0.000) | 153.478 (0.000) |
| *N* | | | | | | | 12,237 | |
| **Violence Justified** | 52.637 (0.000) | 40.098 (0.000) | 91.844 (0.000) | 29.947 (0.000) | 61.473 (0.000) | 50.145 (0.000) | 102.088 (0.000) | 87.025 (0.000) |
| *Total gain* ($p<\chi^2$) | 103.859 (0.000) | 70.363 (0.000) | 135.732 (0.000) | 47.225 (0.000) | 172.302 (0.000) | 149.715 (0.000) | 191.751 (0.000) | 195.103 (0.000) |
| *N* | 19,705 | | 19,653 | | 11,980 | | 11,915 | |

Notes: Results compare gains from non-linearity (increase in deviance, i.e., worsening of fit if linear terms are used) under generalized additive models (GAMs) and multivariable fractional polynomials (MFPs) with 4 degrees of freedom applied to income (Ln)/decile/Cantril scale, age, and deprivation (all continuous covariates in estimations; results for age and deprivation not reported). $P$ values for significance tests of gains are in parentheses. Total gain is difference between deviances for untransformed and non-parametric models. All other predictors (education, gender, marital status, fixed effects, and intercepts) are modeled linearly ($df = 1$). Both sets of estimations are weighted by survey weights, with errors clustered by primary sampling units, and include, but do not report, intercepts (country- and time-fixed effects are not included). MFPs report gains from last cycle before fractional polynomial fitting algorithm converges (convergence is achieved after 2 cycles in all cases, with the exception of the MFP regression for general strikes, which requires 3 cycles). GAMs use logit link functions with binomial distributions for all specifications.

**Figure 3: Protests and Strikes: Partial Residual Plots**



Notes: Generalized additive model (GAM) and multivariable fractional polynomial (MFP) plots show partial residuals for civic engagement and protest adjusted for covariates, with 95% confidence intervals.

**Figure 4: Support for Violence: Partial Residual Plots**



Notes: Generalized additive model (GAM) and multivariable fractional polynomial (MFP) plots show partial residuals for support for violence adjusted for covariates, with 95% confidence intervals.