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From the web to the streets: internet and protests under authoritarian regimes

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ABSTRACT

This article systematically investigates the relationship between internet use and protests in authoritarian states and democracies. It argues that unlike in democracies, internet use has facilitated the occurrence of protests in authoritarian regimes, developing a theoretical rationale for this claim and substantiating it with robust empirical evidence. The article argues that whereas information could already flow relatively freely in democracies, the use of the internet has increased access to information in authoritarian regimes despite authoritarian attempts to control cyberspace. The article suggests this increased access to information positively affects protesting in authoritarian states via four complementary causal pathways: (1) by reducing the communication costs for oppositional movements; (2) by instigating attitudinal change; (3) decreasing the informational uncertainty for potential protesters; and (4) through the mobilizing effect of the spread of dramatic videos and images. These causal pathways are illustrated using anecdotal evidence from the Tunisian revolution (2010–2011). The general claim that internet use has facilitated the occurrence of protests under authoritarian rule is systematically tested in a global quantitative study using country-year data from 1990 to 2013. Internet use increases the expected number of protests in authoritarian states as hypothesized. This effect remains robust across a number of model specifications.

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Introduction

On 17 December 2010, the Tunisian street vendor Mohammed Bouazizi burned himself in an act of desperation. Earlier that day Bouazizi had been harassed and humiliated by security officials and his fruit cart had been confiscated. Frustrated by the cruel treatment he received from the police and the lack of opportunities to make a living, Bouazizi set himself alight and died in a hospital shortly thereafter. Within days, Bouazizi became a symbol of the Tunisian resistance and President Ben Ali was under heavy pressure, facing nationwide protests. How could this self-immolation turn into a massive protest within days in a repressive authoritarian state like Tunisia? According to many scholars, the internet made the news about Bouazizi's death travel fast and

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helped to spread the protests.¹ Tunisians realized that they shared similar grievances through online media and YouTube videos, and subsequently used the internet to organize protests on a national scale.²

Although most scholars acknowledge that the internet, and particularly Facebook, played a facilitative role in the Tunisian uprising, few authors have moved beyond Tunisia and the Arab uprisings to examine how the internet more generally affects authoritarian rule. The presence of the internet in many authoritarian states gives rise to the question: How does the internet affect political mobilization, and, ultimately, regime survival? This article is among the first to systematically assess the relationship between internet use and public protests in authoritarian regimes. The lack of academic attention to this relationship is notable given that findings from single country studies show how protests in authoritarian regimes seem to be facilitated by the internet.³ The article contributes to the existing literature (1) by providing a theoretical argument regarding how internet use affects protest dynamics in authoritarian societies; and (2) by presenting empirical findings from a global large-N study.

The article argues that internet use facilitates protests in authoritarian regimes. It supports this claim with robust statistical evidence and develops a theoretical rationale to explain this finding. Unlike in democracies, where information could already flow relatively freely before the introduction of the internet, the use of the internet has caused a major shift in citizens' access to information under authoritarian rule, despite authoritarian attempts to control cyberspace. The article suggests that this change in access to information has facilitated protests in authoritarian regimes through four mechanisms: (1) by reducing costs and risks for opposition groups; (2) by producing attitudinal change; (3) by decreasing informational uncertainty for potential protestors; and (4) through the mobilizing effect of dramatic images and videos. These causal pathways are illustrated using anecdotal evidence from the Tunisian revolution (2010–2011). The general argument of the article is systematically tested in a global quantitative study using country-year data from 1990 to 2013. As hypothesized, internet use increases the expected number of protests in authoritarian regimes and not in democracies, and this effect remains robust across a number of model specifications, including controlling for online repression.

The article starts with a review of the literature on the role of the internet in authoritarian regimes, and in particular how it affects protest. It subsequently argues that internet use facilitates protest in authoritarian regimes and not in democracies. Thereafter, the research design is presented and the final sections present and discuss the findings.

The causal link between internet use and protest

The academic literature on the effects of the internet under authoritarian rule is often presented as a debate between cyber utopians⁴ versus cyber pessimists.⁵ Although attractive in its simplicity and its high resonance with lay audiences, recent scholarly work has moved beyond this dichotomy. Rather than determining whether the internet has positive or negative effects, scholarship has become more nuanced. Moreover, more attention has been devoted to how various actors (including governments) and social contexts interact with the internet. Marc Lynch argues that the “repression versus liberation” framework has reached its limits and that research agendas should now shift to, among other areas, “analyzing the more *systemic effects* of these broad changes in the production and communication of political information”.⁶

Much scholarship has been devoted to whether and how internet use can foster political change and democratization. Some scholars find a positive effect for particular time periods,⁷ some only for countries that are already partially democratic,⁸ others find no effect at all.⁹ Scholars who argue that the internet facilitates democratization point towards how it functions as an infrastructure independent from the state where democratic discourse can flourish, thereby fostering the development of civil society, and widening and deepening public discourse and deliberation.¹⁰ However, internet use is more likely to have direct effects on mobilization than to lead directly to democratization. If we examine various countries during the Arab uprisings, the turmoil in Moldova in 2009, the Green Revolution in Iran, or the Ukrainian Orange Revolution, the internet can be seen to have been an important tool for bringing people into the streets, but not for democratizing these societies.

Many studies have examined the mobilization of discontented Arab populations in 2010–2011. The actual importance of the internet in this mobilization, compared to other factors such as satellite television, still remains subject to significant debate.¹¹ However, although many studies have thoroughly examined what media were used by whom and how regimes responded, both online and offline, they do not provide a general theoretical framework that can be transplanted to other authoritarian settings.¹² In addition, single case studies focus on instances of successful mobilization through the internet, raising concerns about selection bias.¹³ Studies looking into how regimes attempt to control cyberspace and prevent collective mobilization online suffer from similar problems. The work of Deibert et al. provides a general framework for understanding the cyber-control of different states in different time periods, but does not examine whether different authoritarian policies succeed in preventing mass mobilization via the internet.¹⁴

Other scholars have claimed that the internet does not fundamentally alter the dynamics of protest in authoritarian states. Gladwell claims that the internet only fosters weak ties that do not enable high-risk activities like protesting.¹⁵ Morozov, furthermore, suggests that many citizens living under authoritarian rule will not be politically mobilized online since they use the internet mainly for apolitical purposes.¹⁶ Although these authors present some interesting thoughts, a systematic empirical test of the arguments is absent here too.

Only two studies have systematically examined the effect of internet use on protest, but these use limited data and show inconsistent results. Fielder's dissertation shows some evidence for a positive effect of the use of the internet on protest in authoritarian regimes, but it also finds that the effect decreases once a certain threshold of internet use is reached.¹⁷ In contrast, a thesis by Meier finds no significant effect of internet use on protest under authoritarian rule.¹⁸ Both authors look exclusively at authoritarian regimes, making it impossible to establish whether patterns differ across regime type.

This article provides a theoretical argument to understand how internet use affects protest in authoritarian regimes. It furthermore systematically examines the relationship with new data and improved methods, and compares the impact of internet use across different regime types.

Why does internet use facilitate protests under authoritarian regimes?

This article argues that the internet changes the dynamics of protest in authoritarian regimes by giving citizens access to more information, despite authoritarian attempts

to control cyberspace. This increased access to information is likely, in turn, to facilitate protests.

While it is incorrect to claim that it was not possible for a public sphere to exist under an authoritarian regime prior to the advent of the internet, it was extremely difficult for social movements and activists to find a space removed from government control in which to meet like-minded people and to mobilize for collective action.¹⁹ Mass communication channels like newspapers, television, or radio have traditionally been controlled by governments, who have used a mix of censorship and intimidation to prevent any negative information about their performance or calls for oppositional collective action from reaching a larger public.²⁰

In contrast to earlier communication technologies, internet use allows for real-time many-to-many communication without centralized control. Internet users are no longer just passive recipients: They can actively share information with large groups of people. This helps to empower citizens in regard to governments since citizen access to (alternative) information is dramatically increased. This increased access to information has substantial consequences for public protest. Within a short time, people in different geographical locations now have access to information that can trigger them to join a protest.

Admittedly, the internet in itself does not lead to protests. For any protest to emerge, there need to be problems in a society, and subjective perceptions about the intolerability of these problems (grievances).²¹ Moreover, a “trigger” event oftentimes functions as the immediate cause for protests to come into action. However, grievances and triggers are everywhere and in many instances are not enough to start collective political action. They are necessary but not sufficient conditions for a protest to erupt.²²

It is by increasing access to information that the internet makes it more likely that grievances and a trigger event will lead to protests. This increased access to information is likely to facilitate protests in authoritarian regimes via four causal mechanisms:

1. Decreased costs and risks for opposition groups

Protests become more likely because internet use makes it easier for opposition groups to successfully organize a public outcry in the streets. The internet decreases the costs of communication and enables activists to reach a critical mass of people within seconds. Both the announcement of a protest as well as instructions in terms of coordination are now no longer hampered by spatial or temporal barriers.

The costs of communication have decreased both in democracies and authoritarian regimes. However, the two differ in how the internet affects the risk of getting arrested while mobilizing. Whereas prior to the internet activists in democracies could mobilize relatively undisturbed, for example distributing pamphlets, in authoritarian regimes the risk of getting arrested while carrying out this time-consuming process was immense. Therefore, the internet has enabled activists to successfully reach out to large crowds, especially in authoritarian regimes.

2. Attitudinal change

Increased information is not only accessible during a protest but also in the years before. The internet allows people to absorb (political) views that are distinct from the official government narrative over a longer period of time. As citizens are increasingly exposed

to government failures, civic debates, and alternative ideas, a more fertile ground for mobilization is likely to be created, due to changing attitudes. Even in China, where the internet is heavily censored, the interactive features of the internet facilitate slow, attitudinal change through user-participative alternative framing of official frames provided by state propaganda.²³ In democracies, the availability of alternative information has also increased thanks to the internet. However, this is unlikely to lead to similar attitudinal change because – although it was less – citizens already had access to alternative information through other media.

3. More complete information

Increased access to information can also instigate “informational cascades” and thereby reduce citizens’ fears.²⁴ One of the key challenges for protest formation under authoritarian rule is that potential protestors will only take to the streets if they are convinced that many others will do the same.²⁵ In the opaque information environment of an authoritarian state, however, it is very difficult to know the scope of discontent, let alone how many would join a protest. It is through the amplification of existing information that the internet can make a difference in this regard. By giving potential protestors information about how many others dislike the regime, the number of people who have shown up in the streets, or how many intend to join, the informational problem that would normally keep many aggrieved citizens at home can now be overcome. Moreover, increased access to information can also help citizens to overcome their fears because it allows communication about the severity, location, and type of state repression. Hence, protesters can strategically adapt to this repression and have a greater chance to evade it. This mechanism is unique to authoritarian regimes: First, because the level of fear and repression in democracies is not comparable; second, because the private preferences of citizens are not secret in democracies, but are publicly available, through opinion polls and other means.

4. More dramatic information

The use of the internet also gives citizens access to dramatic images and videos that can have a mobilizing effect. Cognitive psychologists argue that people are not wholly rational in their decision-making, and so the third mechanism, having more complete information, is not the only one that matters. Rather than making a rational cost-benefit analysis, people are believed to rely on “inferential shortcuts” in their decision-making, especially in circumstances of uncertainty and where there is limited information.²⁶ One inferential shortcut, the heuristic of availability, is likely to be important in regard to the decision to go out and protest. This heuristic shapes attention and memory recall, and is disproportionately affected by “dramatic, striking, vivid, directly witnessed events”.²⁷ Consequently, “equally relevant information that is less stunning is neglected”.²⁸ For example, car drivers tend to slow their speed after seeing an accident despite the fact that a single accident should not alter their cost-benefit calculations about the risk of speeding.²⁹

In recent years, images and videos (in comparison to articles, news items, or blogs) carrying content that is dramatic, striking, and vivid have increasingly been distributed online. Such dramatic information is likely to play an important role in the decision-making process prior to a protest. Although the effect of videos or images is not

predetermined, it is likely that when visual materials go viral during protests this pushes people into action. For instance, videos and photos of chanting crowds, officials being caught red-handed committing crimes of corruption, or human rights violations by the state can incite reactive emotions such as anger and moral outrage that have been shown to mobilize people.³⁰ In democracies, citizens also increasingly share dramatic information online. However, this is unlikely to have similar effects because prior to the internet newspapers and television channels already gave citizens in democracies access to this kind of information.

The four causal mechanisms are specific to authoritarian regimes or are expected to have a stronger impact than in democracies. Prior to the use of the internet, other mass communication channels could already be effectively used in democracies, both to announce a protest, to coordinate it, as well as to expose citizens to (dramatic) alternative information. Moreover, the fear factor that the internet helps to overcome in authoritarian regimes is simply not (or is less) present in democracies. The internet has made communication easier in democracies as well and has broadened the content available to the public, but it has not fundamentally changed the sort of information that is accessible to people.

In partial democracies or “hybrid” regimes³¹ the situation is more ambiguous. The wide diversity in terms of control over information in this category makes it difficult to theorize about the impact of internet use. Sometimes communication channels other than the internet are strictly controlled by incumbent regimes, as is the case in partial democracies like Malaysia or Armenia. In other partial democracies, like Papua New Guinea and Moldova, traditional media are relatively free and can sometimes be used effectively by challengers of the status quo.³² In some partial democracies like Mexico, however, there is even a huge diversity within a single country, with some states resembling the situation in democratic countries and others resembling the most repressive authoritarian regimes. Therefore, in contrast to democracies and authoritarian regimes, I do not hypothesize the effect of the internet in partial democracies.

It is important to emphasize that the four mechanisms are not mutually exclusive. We do not have to choose between thinking of protests as purely instigated by oppositional movements, as a set of rational choices made by individuals, or as a process whereby the same individuals are swayed by dramatic content. Instead, it is likely that these mechanisms occur simultaneously and can reinforce one another. For instance, dramatic content has the potential to strongly reinforce the effects of the decreased communication costs since content that evokes strong positive (“awe”) and negative (anger or anxiety) emotions has the biggest chance to go viral and to mobilize protesters.³³

Of course, authoritarian regimes are not passively waiting for the internet to challenge their rule. Instead, they actively try to prevent the internet from facilitating mobilization, and strategically adapt to changing circumstances. King et al., for instance, note how Chinese internet censorship policy targets specifically online content that hints at collective action.³⁴ Moreover, regimes increasingly use “just-in-time” blockings which are typically scheduled before important political events, such as demonstrations.³⁵ Many regimes furthermore monitor their populations extensively and can therefore effectively target leaders of oppositional groups with both digital and non-digital attacks. In addition, regimes themselves try to influence public opinion on the internet. Through the distribution of information online they try to bolster the legitimacy of the regime and discredit the opposition, especially during times of crisis.³⁶ Deibert even

claims that authoritarian regimes grow smarter over time, revealing a considerable degree of learning about how to cope with cyberspace effectively.³⁷

Such authoritarian attempts to control cyberspace matter and may sometimes impede or prevent mobilization through the internet. All four mechanisms can be manipulated by interventions by the state. Yet, as my empirical analysis will show, these authoritarian attempts or interventions ultimately do not outweigh the positive effects as described in the four causal mechanisms. To put it simply, so far authoritarian regimes have not succeeded in controlling online information flows in ways that make mobilization through the internet impossible. Moreover, staying disconnected from the internet altogether is not an attractive, realistic alternative for authoritarian regimes given the economic costs involved, as well as the dissatisfaction this might provoke among its population.

The empirical implication derived from the discussion above is that greater access to the internet leads to an increase in the number of protests. Moreover, the argument hypothesizes that this effect only holds in authoritarian regimes and not in democracies. Since there is less theoretical guidance on how the relationship between internet use and protests manifests itself in partial democracies, no hypothesis is formulated a priori for these.

H1: Increasing internet use increases the likelihood of public protests in authoritarian regimes, but has no effect on the probability of protests in democracies.

The Tunisian protests (2010–2011)

The four causal pathways through which increased access to information can lead to protests despite intensive authoritarian attempts to control cyberspace will be illustrated using anecdotal evidence from the Tunisian protests in 2010–2011. The Tunisian protests have been the subject of some thorough case study research, facilitated by the subsequent regime change. To illustrate the four mechanisms this research draws upon these studies.³⁸

Ben Ali's Tunisia was a strictly authoritarian state. Civil and political liberties were restricted, protests against the government were not allowed and traditional media were under the strict control of the government.³⁹ The regime was also aware of the threat posed by the internet and actively tried to control cyberspace. Tunisia was the first Arab country to utilize the internet for repression and invested heavily in cyber-control, creating "a multilayered censorship apparatus that was among the world's most sophisticated".⁴⁰ This control went beyond simply blocking websites: it consisted of extensive surveillance and the persecution and punishment of online critics. In 2010, just before the revolution, the government dramatically increased its attempts to stifle online discourse.⁴¹ During the protests the regime harvested protestors' Gmail, Yahoo, and Facebook login credentials and blocked Facebook pages about the unrest, as well as foreign online articles. Yet, despite these intensive efforts, anecdotal accounts illustrate how the internet facilitated protests via the four proposed mechanisms.

- (1) *Decreased costs and risks for opposition groups*: During the protests, the internet played an important role in mobilizing Tunisians.⁴² With an estimated 36.6% of the population online, it provided citizens with access to information about the protests.⁴³ Various networks ran special online features covering the ongoing

demonstrations and international broadcasters were able to pick up the online news and “re-import” it back into Tunisia via satellite television.⁴⁴ The internet moreover enabled a connection between activists in central Tunisia and the middle-class youth across the nation.⁴⁵ This connection was crucial in transforming the protests from a local and regional into a national phenomenon.

- (2) *Attitudinal change:* Prior to the outbreak of the protests in 2010, the internet was the channel through which alternative discourses were formulated and solidarities formed.⁴⁶ Websites containing critical content on the Ben Ali regime appeared as early as 1998.⁴⁷ This online information was crucial in informing citizens about the human rights violations and the blatant corruption of Ben Ali and his family.⁴⁸
- (3) *More complete information:* Breuer et al. conducted a (non-random) survey among higher educated, digitally literate Tunisians and found evidence that confirmed the idea that more complete information about the scope of discontent pushes people into action. They show that more than 73% of their respondents used social networks to get information about what was going on. 74% learned online that a large number of people had signed up for a demonstration in their town, city, or municipality.⁴⁹ Around 80% even stated that, based on what they saw online, they came to believe that the protests would achieve their goal of toppling Ben Ali, and that the number of people involved in the protests outnumbered those who supported the regime.⁵⁰ Although we do not know for sure, it is likely that access to this information helped Tunisians to overcome their fears and pushed some of them into action. As one Tunisian cyber activist strikingly put it: “Facebook allowed us to overcome our fear of the regime. With Facebook, I knew before going to a protest that I would not be alone.”⁵¹
- (4) *More dramatic information:* Many images and videos with mobilizing potential went viral during the protests. Videos of protests in central Tunisia spread quickly to the larger cities on the coast and a video portraying the Tunisian presidential airplane on runways near European shopping destinations with on-screen graphics asking who was using the aircraft (the suggestion being that it was Ben Ali’s extravagant wife) was shared fanatically.⁵² Results from the same (non-random) survey show evidence that many Tunisians felt angry and sad after seeing videos and pictures of state repression.⁵³ Influential bloggers stated that these videos had a mobilizing effect.⁵⁴ One internet activist claimed: “Videos like this are very shocking, but that’s what good about them. Because many Tunisians did not have a problem with Ben Ali. They said: ‘we’re ok, we are not poor we have food, we have hotels, we have beaches ... it’s ok. Where is the problem!?’ But when you show them stuff like this they radically change their point of view about the system.”⁵⁵

The Tunisian protests thus demonstrate how increased access to information facilitated protests via the four mechanisms set out above, despite the attempts by Ben Ali’s regime to control cyberspace. It also shows that the mechanisms worked simultaneously and reinforced each other. Because of the reduced costs of communication, Tunisians received reports of the massive demonstrations elsewhere in the country, which helped them to overcome their fears.⁵⁶ Likewise, the low communication costs enabled the spread of dramatic videos showing state atrocities, which caused anger among an already discontented population.

Research design

To test the general argument, I conduct a time-series cross-national analysis using annual data. Available data on internet use restrict the sample to the period 1990–2013.⁵⁷ The four mechanisms are not tested separately in the quantitative design because data for distinguishing the four causal pathways are not available when using aggregate data. However, since the mechanisms are likely to work simultaneously and to reinforce each other a general test of the effect of internet use on protest in authoritarian regimes can confirm whether general patterns are consistent with the mechanisms.

Conceptualization and operationalization

My conceptualization of authoritarianism distinguishes between states where information flows are strictly controlled by the regime and states where they can flow freely. Whether elections are being held or not is less consequential for the empirical implications of the argument and a procedural definition of democracy is therefore not sufficient. What is important regarding freedom of information is the existence of a set of civil liberties. Therefore, I use the definition of democracy offered by Dahl, which is operationalized as a tripartite scale by Freedom House, which distinguishes between free democracies, semi-free partial democracies, and non-free authoritarian regimes.⁵⁸ However, Freedom House also captures the freedom of association and the freedom of information in its categorization of regimes. Although this is likely to lead to an under- rather than an overestimation of the effect of the internet on protests in authoritarian regimes, Polity IV will be used as an alternative operationalization of regime type. Weidman and Rød have shown that regime type does not determine internet adoption rates so there is no reason to worry about an overlap between internet use and regime type.⁵⁹

Regime type

Regime type (FH): Freedom House data are used to create a categorical measure in which democracies receive a 0, partial democracies a 1, and authoritarian countries a 2.⁶⁰

Regime type (PIV): Polity IV data are used as an alternative categorization of regimes. Again, a tripartite distinction is made, whereby democracies score a 0, partial democracies a 1, and authoritarian countries a 2.⁶¹

Dependent variable

To ensure that my results are not affected by using one particular measure of protests, I use two operationalizations. Similar to work by Fielder and Meier, I use Bank's Cross-National Time-Series (CNTS) Data Archive. However, I use the Social Conflict Analysis Database (SCAD) as a second operationalization.

Protests (CNTS): Bank's CNTS Data Archive provides data on anti-government protests and distinguishes these from strikes and riots.⁶² The variable counts the number of anti-government demonstrations in each country-year. Anti-government demonstrations are defined as "any peaceful public gathering of at least 100 people for the primary purpose of displaying or voicing their opposition to government policies or authority, excluding demonstrations of a distinctly anti-foreign nature".⁶³ The data

derive from coding newspaper articles from the *New York Times* and have a broad temporal and geographical coverage to capture political conflict.

Protests (SCAD): An advantage of SCAD over CNTS is that it relies on newswires from two agencies, the Associated Press (AP) and Agence France Presse (AFP), instead of those from a single newspaper. It therefore covers more protests than CNTS. A disadvantage is that it only has data on Africa, Mexico, Central America, and the Caribbean.⁶⁴ SCAD has detailed event reports on demonstrations. However, since data for the key explanatory variable are only available in a country-year format, the event reports are aggregated to count the yearly number of demonstrations in each country-year. The variable includes organized and spontaneous demonstrations and excludes pro-government protests.

Independent variable

Internet use: Data from the International Telecommunication Union (ITU) measuring the percentage of the population using the internet (1990–2013) are used.⁶⁵ This indicator includes internet use from all devices, including mobile phones, in the last 12 months. An increasing number of countries are measuring internet use with data from household surveys from the ITU. In situations where surveys are not available, ITU estimates are based on the number of internet subscriptions.

Interaction variable

*Internet use*regime type*: To assess whether the effect of the internet is dependent on regime type, as hypothesized, the variable internet use is interacted separately with the two variables capturing regime type, using democracies as the reference category.

Control variables

A major concern for measurement error with regard to data on protests from newspapers and newswires is that only a small portion of protests makes it into the foreign press.⁶⁶ Even more problematic is the fact that measurement error is not constant across countries, since developing countries receive “significantly less coverage the greater their geographical and cultural distance from the centres of political power in the global North”.⁶⁷ To overcome this bias, I include a variable to account for the over- and under-reporting of events in particular countries in newspaper sources. The variable is created using Lexis Nexis and counts how many times per year the name of a country appeared in the headline of the *New York Times*. For instance, if 38 articles appeared in 2004 in the *New York Times* with Syria in the headline, Syria will score a 38 in 2004 on this variable. In order to ensure this highly skewed variable is more normally distributed, the natural log is used.

Additional variables suggested in previous research account for the state of the economy, elections, education,⁶⁸ population size, a youth bulge, and urbanization as important determinants for contentious political action. Poor economic performance is likely to increase the willingness of people to protest and also might be correlated with internet use.⁶⁹ To measure the state of the economy, unemployment,⁷⁰ the inflation rate,⁷¹ and gross national income (GNI) per capita⁷² are included as control variables. Protests might also correlate with the occurrence of presidential or parliamentary

elections since elections are often contentious moments that activists use as focal points for coordinating collective action.⁷³ Data from the Database of Political Institutions are used to create a dummy variable coded 1 if an executive or legislative election were held in a country-year, 0 otherwise.⁷⁴ In addition, regimes with large populations face more problems in regard to controlling their citizens than regimes governing smaller populations.⁷⁵ I therefore include the logged value of the population size for each country-year.⁷⁶ Furthermore, the variables measuring the youth bulge and urbanization are included as controls. Various studies have indicated that a youth bulge positively affects different forms of contentious politics, and that overcrowded urban centres not only cause but also exacerbate problems and inequalities in societies.⁷⁷ To control for these two possible confounders, World Bank data measuring the percentage of the total population between the ages of 15 and 24, and the percentage of the population living in urban areas, are included.

Lastly, the literature indicates that authoritarian regimes do a lot to control cyberspace and that this might affect the extent to which the internet can be used for mobilization. Unfortunately, the existing data do not cover the complete period under investigation. The most comprehensive, comparative data project is the Freedom House Freedom of the Net data.⁷⁸ These data capture the freedom citizens enjoy online, looking at obstacles to access, limits to content, and violations to user rights for the period 2007–2013. Over the years, more countries have been included in the database: increasing from 15 in 2007 to 65 in 2013. Countries get a score between 0 (free internet) and 100 (no free internet). This variable will be added as a control in a separate model (Table 1, model 4).

Figure 1 shows the average internet use and the number of protests in different types of regimes (using Freedom House) over time. Internet use has risen over time in all types of regime. Democracies have the highest percentage of internet users, and there is a large peak in the number of protests in both democracies and authoritarian states around the year 2011. This peak stems from the uprisings in many Arab countries around 2011. The countries facing the highest number of protests in a year (2011) were Bahrain (33), Egypt (46), and Yemen (55) (using the CNTS data). High values are also reported for the United States (US) in 2011, 2012, and 2013, which is unsurprising given the *New York Times* is the data source and the Occupy movement was very active in the US in these years. Other democracies that faced a high number of protests in 2011 were Greece and Spain.

Estimation technique

Since the dependent variable is a count variable, ordinary least squares (OLS) estimators can be biased, inconsistent, and inefficient.⁷⁹ However, using a Poisson regression model (a model appropriate for count variables) is only appropriate when the mean is roughly equal to the variance. Since both dependent variables are overdispersed (see Table 2 for means and standard deviations), a negative binomial model seems to be the best estimator and test statistics confirmed the use of a negative binomial regression model over the Poisson regression model.⁸⁰ Specification tests also recommended a zero-inflated model, but this model would only be appropriate if a different theoretical process drives the zeros.⁸¹ There are few reasons to believe such distinct processes are justified in the country-year observations of protests.⁸² To reduce concerns regarding reverse causality, independent variables are lagged by one year. To

Table 1. Descriptive statistics.

	Observations	Mean	Std. dev.	Min	Max
Protests (CNTS)	2723	0.73	2.84	0	55
Protests (SCAD)	900	4.24	13.93	0	311
Internet use	2723	17.17	23.96	0	96.21
Regime type (FH)	2723	0.76	0.78	0	2
Regime type (PIV)	2723	0.52	0.71	0	2
Freedom of internet	184	44.55	19.48	6	91
Total number of articles (logged)	2723	2.55	1.57	0	6.96
Unemployment	2723	8.71	6.07	0.3	38.7
Inflation	2723	19.61	166.87	-18.11	4734.92
GNI per capita (/1000)	2723	12.94	15.20	0.25	123.28
Elections	2723	0.28	0.45	0	1
Population size (logged)	2723	16.02	1.70	12.24	21.02
Youth bulge	2723	0.18	0.04	0.06	0.28
Urbanization	2723	55.40	23.03	6.46	100

take into account the serial correlation, a one-year lag of the dependent variable is included in all models. Furthermore, standard errors are clustered on countries.

Results

Table 1 shows the results of four negative binomial regression models. Table A1 in the appendix presents the incident rate ratios (IRR). In the first model, internet use is included as an independent variable in the model, without interacting it with regime type. As can be seen in the model, internet use has a positive direct effect on the number of public protests, and is significant using a 99% confidence interval. However, this finding does not tell us whether the effect of the internet on protests is the same across different regime types. In the second model, internet use is interacted with regime type to examine the hypothesized conditional effect. Supporting the hypothesis, the positive and significant coefficient shows that the internet indeed facilitates protests under authoritarian rule compared to democratic countries (the reference category) and partial democracies. Since interaction terms with continuous variables are difficult to interpret, Figure 2 shows the marginal effects (based on Model 2) of the interaction between internet use in democratic and authoritarian regimes. Whereas the effect of increasing internet use on protests is insignificant in democracies, the predicted number of protests increases substantially when internet use increases in authoritarian regimes. Holding all variables at their means, an authoritarian country that goes from 0% of the population using the internet to 50% faces almost four instead of zero protests. It is important to note that the confidence intervals become wider with increasing internet use because these values are empirically rare, as illustrated by the kernel density plot of internet use presented in the figure (the dashed line). From 50% internet use onward, the confidence intervals for authoritarian and democratic regimes overlap.

The third model uses the Polity IV categorization instead of the Freedom House categorization but the results remain similar. Increasing internet use facilitates protests in authoritarian countries compared to democracies. There is no significant difference in the effect of internet use in authoritarian regimes and in partial democracies when using Polity IV data.⁸³ In the fourth model state control over cyberspace is taken into account by controlling for the freedom of the internet. By including this variable, the sample drops from 2723 to only 184 observations. The effect of the internet on protests in

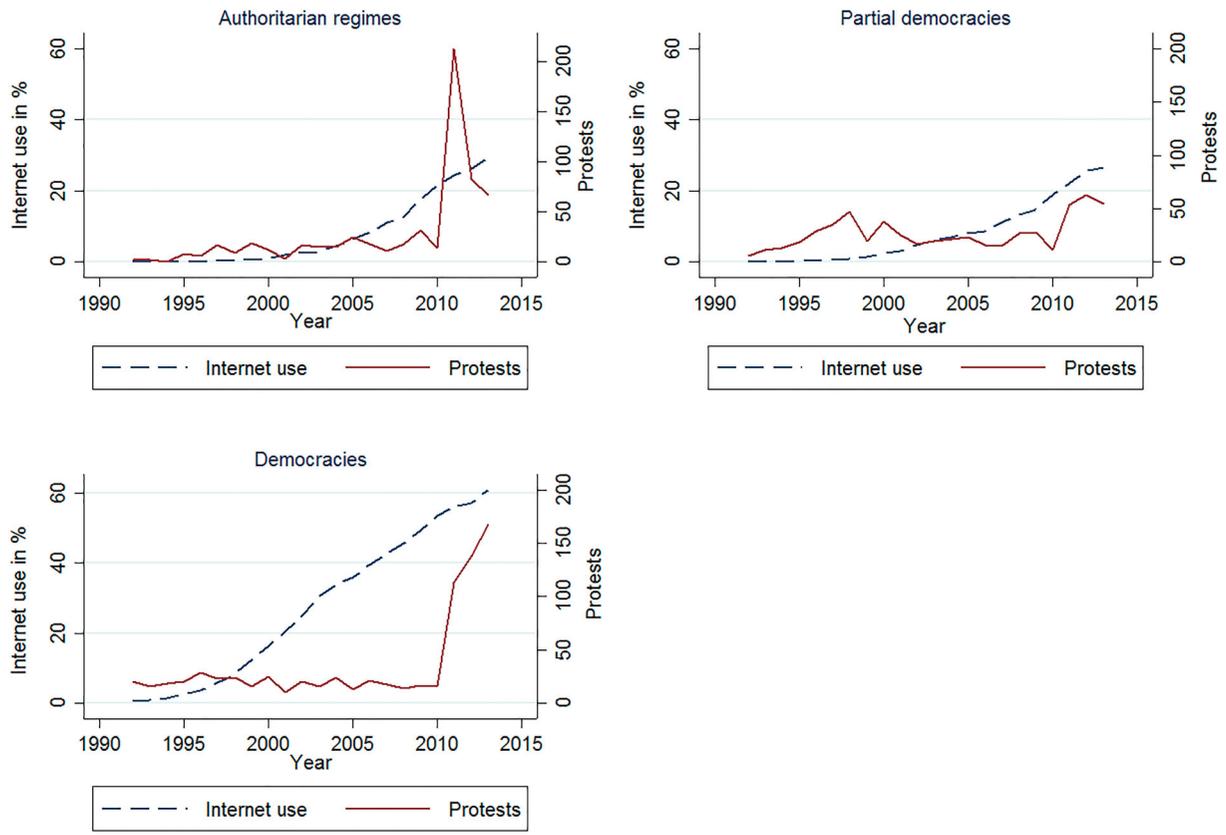


Figure 1. Internet use and protests.

Table 2. Negative binomial regression models (1–4).

	1. Model without interaction Regime type: FH Dep. var.: Protests (CNTS)	2. Model with interaction Regime type: FH Dep. var.: Protests (CNTS)	3. Polity IV model Regime type: PIV Dep. var.: Protests (CNTS)	4. Model with freedom of internet Regime type: FH Dep. var.: Protests (CNTS)
Protests (CNTS) ($t-1$)	0.153*** (0.0407)	0.129*** (0.0415)	0.135*** (0.0419)	0.044*** (0.0158)
Internet use ($t-1$)	0.0105*** (0.0037)	0.186 (0.1770)	0.008** (0.0033)	-0.016 (0.0121)
Authoritarian regime ($t-1$)		0.045*** (0.0110)	0.046*** (0.0104)	0.028* (0.0142)
*Internet use ($t-1$)				
Partly democratic regime ($t-1$)		0.008 (0.0061)	0.025* (0.0131)	0.028* (0.0142)
*Internet use ($t-1$)				
Authoritarian regime ($t-1$)		0.007* (0.0037)	-0.288 (0.2780)	-0.269 (0.785)
Partly democratic regime ($t-1$)		-0.014 (0.2550)	0.083 (0.1850)	-0.440 (0.705)
Total number of articles (logged) ($t-1$)	0.302*** (0.0805)	0.362*** (0.071)	0.363*** (0.0729)	0.107 (0.120)
Unemployment ($t-1$)	0.013 (0.0143)	0.013 (0.0135)	0.015 (0.0133)	0.093** (0.0472)
Inflation ($t-1$)	-0.000* (0.0001)	-0.000 (0.0002)	-0.000* (0.0002)	-0.053*** (0.0170)
GNI per capita(/1000) ($t-1$)	-0.013* (0.0073)	-0.021** (0.010)	-0.027*** (0.0087)	0.0398** (0.0190)
Elections ($t-1$)	0.300** (0.1460)	0.222* (0.1190)	0.241** (0.1210)	0.814*** (0.248)
Population size ($t-1$)	0.237*** (0.066)	0.226*** (0.0582)	0.236*** (0.0600)	0.356*** (0.121)
Youth bulge ($t-1$)	5.505* -2.933	2.087 -2.8390	2.595 -2.5140	0.771 -4.479
Urbanization ($t-1$)	0.008* (0.0045)	0.0066 (0.0047)	0.007 (0.0044)	-0.004 (0.0097)
Freedom internet				0.0121 (0.009)
Constant	-7.198*** -1.372	-6.547*** -1.132	-6.718*** -1.152	-7.371*** -2.333
Observations	2723	2723	2723	184

Note: Robust standard errors in parentheses, statistical significance reported as: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

authoritarian regimes is still positive and significant (now using a 90% confidence interval), although it is weaker compared to the previous models. Model 4 thus provides evidence that even when state control over cyberspace is held constant, the internet has a larger impact on mobilization in authoritarian regimes than in democracies.

Among controls, the lagged dependent variable and population size are significant in all models, using at least a 95% confidence interval. Some independent variables are significant ($\alpha = 0.05$) and have the expected direction in some but not all models, including GNI per capita (in Models 2, 3, 4), elections (1, 3, 4), unemployment (4), and inflation (4). The effects of the youth bulge and urbanization are not significant in any of the models using a 95% confidence interval.

Robustness checks

One could argue that 2011 was an outlier, with protests occurring in Bahrain, Benin, Egypt, Haiti, Morocco, Nicaragua, Nigeria, Russia, Cameroon, Libya, Malaysia,

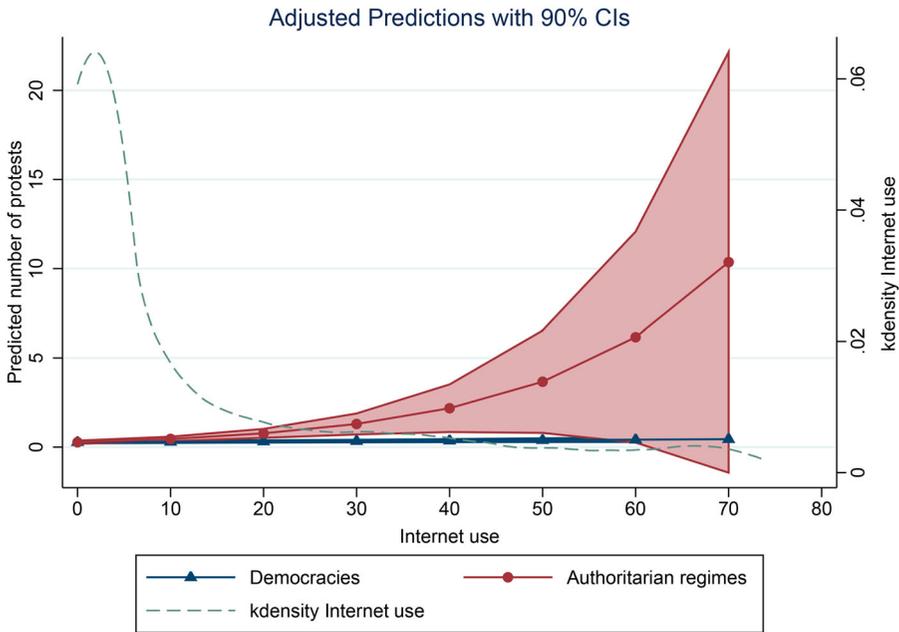


Figure 2. Predicted number of protests.

Swaziland, Syria, Tunisia, and Yemen (among others).⁸⁴ To account for this outlier, a dummy variable coded 1 for 2011 is included in the fifth model in Table 3. The dummy variable is positive and significant, but results in this model still confirm that authoritarian countries face more protests because of rising internet use than democratic and partially democratic countries. In the sixth model, the SCAD data are used as the dependent variable. The results change somewhat. Here, both the partially democratic and authoritarian countries face significantly more protests with increasing internet compared to democracies. An additional test with partial democracies as a reference category (not shown) shows moreover that there is no significant difference between the partial democracies and authoritarian countries. These slightly different findings can possibly be explained by the fact that the SCAD data draw on different newswires and therefore cover more protests than the CNTS data. Protests in partial democracies not reported in CNTS might thus be captured in SCAD. Alternatively, partial democracies in Africa and Central America can be different from partial democracies on a global scale, for instance ranking lower in state capacity and hence the ability to control or prevent protests. The ambiguity of the findings, however, reflects again the ambiguous expectations regarding partial democracies following from the theoretical argument.

In Model 7 a fixed effects model is shown. The fixed effects model accounts for the time invariant characteristics of countries, limiting the estimation to within-country effects of internet use on public protest. Again, the interaction effect of internet use in authoritarian countries (as compared to democracies) is positive and statistically significant. The eighth model includes first differences of internet use rather than levels. The model thus explores whether a *change* in the level of internet use rather than overall levels has a similar effect on protests. To be more concrete, this model captures the dynamic effect of changes in internet use rather than more slowly changing levels.

Table 3. Negative binomial regression models (5–9).

	5. Dummy 2011 model Regime type: FH Dep. var.: Protest (CNTS)	6: SCAD model Regime type: FH Dep. var.: Protest (SCAD)	7: Fixed effects model Regime type: FH Dep. var.: Protest (CNTS)	8: First differences model Regime type: FH Dep. var.: Protest (CNTS)	9. Model authoritarian only Regime type: FH Dep. var.: Protest (CNTS)
Public protests (CNTS) (<i>t</i> –1)	0.153*** (0.0391)		0.028*** (0.0072)	0.132*** (0.0398)	–0.005 (0.0349)
Public protests (SCAD) (<i>t</i> –1)		0.044** (0.0180)			
Internet use (<i>t</i> –1)	0.202 (0.174)	0.317* (0.177)	0.013*** (0.0033)		0.068*** (0.0149)
Δ Internet use (<i>t</i> –1)				–0.056** (0.0241)	
Authoritarian regime (<i>t</i> –1) *Internet use (<i>t</i> –1)	0.026*** (0.009)	0.042*** (0.0120)	0.015*** (0.0055)		
Partly democratic regime (<i>t</i> –1)*Internet use (<i>t</i> –1)	0.006 (0.0054)	0.028*** (0.0102)	0.007 (0.0057)		
Authoritarian regime (<i>t</i> –1)	0.002 (0.0034)	–0.004 (0.0073)	–0.009 (0.201)	0.440 (0.324)	
Partly democratic regime (<i>t</i> –1)	0.007 (0.253)	0.177 (0.205)	0.308* (0.159)	0.318 (0.195)	
Authoritarian regime (<i>t</i> –1) *Δ Internet use (<i>t</i> –1)				0.160*** (0.0591)	
Partly democratic regime (<i>t</i> –1)*Δ Internet use (<i>t</i> –1)				0.047 (0.0398)	
Total number of articles (logged) (<i>t</i> –1)	0.366*** (0.062)	0.166** (0.0693)	0.241*** (0.0561)	0.334*** (0.0799)	0.504*** (0.121)
Unemployment (<i>t</i> –1)	0.003 (0.0119)	0.029*** (0.0091)	–0.013 (0.0146)	0.0160 (0.0145)	0.023 (0.0264)
Inflation (<i>t</i> –1)	–0.000 (0.0002)	–0.001 (0.0005)	–0.000 (0.0002)	–0.000 (0.0002)	–0.000 (0.0006)
GNI per capita(/1000) (<i>t</i> –1)	–0.022*** (0.0086)	–0.009 (0.0163)	–0.029*** (0.0099)	–0.01 (0.007)	–0.048*** (0.0145)
Elections (<i>t</i> –1)	0.166 (0.106)	–0.221** (0.0901)	0.027 (0.0859)	0.264** (0.131)	–0.185 (0.302)
Population size (<i>t</i> –1)	0.197*** (0.0505)	0.331*** (0.0578)	0.076 (0.0606)	0.222*** (0.0628)	0.07 (0.107)
Youth bulge (<i>t</i> –1)	0.211 –2.420	–0.515 –4.397	–0.881 –2.728	–1.451 –3.370	3.841 –5.186
Urbanization (<i>t</i> –1)	0.008* (0.0047)	0.002 (0.0046)	0.01* (0.0051)	0.01** (0.0051)	0.01 (0.0092)
Protests 2011	1.364*** (0.211)				
Constant	–5.715*** 0.937	–5.353*** –1.332	–3.525*** –1.219	–5.990*** –1.236	–4.751** –2.164
Observations	2723	900	2346	2612	574
Number of countries			132		

Note: Robust standard errors in parentheses; statistical significance reported as: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Again, the interaction effect of authoritarian regimes is significant, demonstrating that it is not only the level of internet use that matters for protests, but that changes over time also have similar effects. Importantly, this model also helps address possible concerns over stationarity in internet use. In the ninth model the sample is restricted to solely authoritarian countries. As expected, internet use has a positive effect on protests and is significant at the 99% level.

An additional robustness test (not reported) examines whether the effect of internet use (interacted with regime type) declines over time. As mentioned earlier, some literature argues that contemporary authoritarian regimes are better able to respond to the challenges the internet poses compared to regimes in the 1990s and the early 2000s.⁸⁵ To check for this, three-way interactions are created between internet use, time (years), and regime type. However, these models produced no evidence that the effect of internet use varies across different time periods, or that it declines over time.

Conclusion

This article is the first systematic, global study to examine the internet's role in protests under authoritarian rule compared to other regime types. It shows that in contrast to democracies (where information could already flow relatively freely), the use of the internet in authoritarian regimes has facilitated protests, by increasing citizens' access to information. The findings on partial democracies are ambiguous, which is unsurprising given the wide diversity in this category. Using a global sample for the 1993–2010 period, empirical evidence confirms that the internet facilitates mobilization in authoritarian regimes despite authoritarian attempts to control cyberspace, and that it has no such effect in democratic states. Moreover, these findings are robust to several changes in model specification, and the effect of internet use does not decrease over time. These findings challenge authors who claim that internet use does not change the dynamics of protest under authoritarian rule, as well as those who argue that authoritarian regimes can now control cyberspace in such a way that mass mobilization through the internet is impossible.⁸⁶ Authoritarian regimes might be successful in many aspects of cyber-control, and even in mitigating the positive effect of the internet on mobilization, but the analysis shows they have not been successful in stopping the internet from being used for mobilization for protest.

Four causal mechanisms help explain how increased access to information leads to more protests in authoritarian regimes. First, the internet has lowered the costs and risks for oppositional movements facilitating the organization of collective oppositional action. Second, the internet can instigate attitudinal change by exposing citizens to alternative information. Third, the internet can push potential protestors into action by removing informational uncertainty; and, fourth, the internet mobilizes by confronting citizens with videos and pictures. Anecdotal evidence demonstrates how the four mechanisms – working simultaneously and interactively – facilitated the Tunisian protests in 2010–2011, despite attempts by Ben Ali's regime to control the internet.

While the internet helps challenge authoritarian regimes through its effect on protests, the long-term political and institutional consequences are uncertain. As Rød and Weidman have shown, increasing internet use does not necessarily lead to democratization, meaning that future scholarly work should explore possible mediating effects between protesting and democratization.⁸⁷ In addition, a more systematic, disaggregated examination of the four proposed causal mechanisms and their interplay would be another promising avenue for future research. The presented findings give reason for provisional optimism with regard to the role of the internet in authoritarian regimes and suggest the use of the internet will continue to be a challenge for authoritarian regimes in the years to come.

Notes

1. International Crisis Group, *Popular Protest*; Breuer and Groshek, "Online Media"; Breuer, Landman, and Farquhar, "Social Media and Protest."
2. Howard and Hussain, "Digital Media."
3. Among others: Ukraine 2004 (Goldstein, "Digital Networked Technologies"), Moldova 2009 (Mungiu and Munteanu, "Moldova's 'Twitter Revolution'"); Iran 2009 (Golkar, "Liberation or Suppression"), Tunisia 2010/2011 (Howard and Hussain, "Digital Media"), and Egypt 2011 (Tufekci and Wilson, "Social Media").
4. A famous cyberoptimist is Clay Shirky (*Here Comes Everybody*).
5. Well-known pessimists are Morozov, *The Net Delusion*, and Gladwell, "Small Change."
6. Lynch, "After Egypt," 303–304.
7. Best and Wade, "Internet and Democracy."
8. Groshek, "The Democratic Effects of the Internet"; Nisbet, Stoycheff, and Pearce, "Internet Use and Democratic Demands."
9. Groshek, "A Time-Series", Rød and Weidman, "Empowering Activists or Autocrats?"
10. Howard and Hussain, *Digital Origins*; Kedzie, "Communication and Democracy."
11. Alterman, "The Revolution Will Not Be Tweeted."
12. Tufekci and Wilson, "Social Media"; Breuer, Landman, and Farquhar, "Social Media and Protest"; Lotan et al., "The Revolutions Were Tweeted."
13. See note 3.
14. Deibert et al., *Access Controlled*; Deibert et al., *Access Contested*.
15. Gladwell, "Small Change."
16. Morozov, *The Net Delusion*.
17. Fielder, "Dissent in Digital."
18. Meier, "Do 'Liberation Technologies' Change?"
19. Breuer, Landman, and Farquhar, "Social Media and Protest."
20. *Ibid.*
21. Castells, *Networks of Outrage*.
22. While it may be impossible to come up with an exhaustive set of grievances and triggers, this article attempts to control for many of the former in its research design.
23. Tang and Huhe, "Alternative Framing."
24. The idea of "informational cascades" builds on the work of Kuran ("The East European Revolution of 1989").
25. Breuer, Landman, and Farquhar, "Social Media and Protest," 5.
26. Weyland, "The Diffusion of Regime Contention."
27. *Ibid.*, 401.
28. *Ibid.*
29. *Ibid.*
30. Unlike dramatic content showing corruption or mass demonstrations, however, the effect of seeing state repression could be ambiguous. Next to anger and moral outrage, seeing harsh repression could also incite (more) fear and hence make people refrain from taking any action. Van Laer, "Why People Protest," and Jasper, "Emotions and Social Movements," argue that moral shocks can have a mobilizing effect.
31. Diamond, "Thinking about Hybrid Regimes."
32. Voltmer, *The Media in Transitional Democracies*.
33. Berger and Milkman, "What Makes Online Content Viral?"
34. King, Pan, and Roberts, "Censorship in China."
35. Deibert, "Cyberspace Under Siege," 69.
36. Han, "Manufacturing Consent"; Greitens, "Authoritarianism Online."
37. Deibert, "Cyberspace Under Siege."
38. Breuer and Groshek, "Online Media"; Maher and York, "Origins of the Tunisian Internet"; Breuer, Landman, and Farquhar, "Social Media and Protest"; International Crisis Group, *Popular Protest*; Breuer, "The Role of Social Media."
39. Breuer and Groshek, "Online Media."
40. Maher and York, "Origins of the Tunisian Internet," 23; Freedom House, *Freedom on the Net 2011*.

41. Maher and York, "Origins of the Tunisian Internet," 25–26.
42. Ibid.
43. Maher and York, "Origins of the Tunisian Internet," 29.
44. Breuer, Landman, and Farquhar, "Social Media and Protest."
45. International Crisis Group, *Popular Protest*.
46. Breuer, Landman, and Farquhar, "Social Media and Protest."
47. Ibid.
48. Via the Wikileaks cables, among other sources.
49. Breuer, Landman, and Farquhar, "Social Media and Protest."
50. Ibid.
51. International Crisis Group, *Popular Protest*, 8.
52. Howard and Hussain, "Digital Media," 36.
53. Breuer, "The Role of Social Media," 21.
54. Ibid., 20–21.
55. Interview with blogger Haythem El Mekki in Breuer, "The Role of Social Media," 21.
56. Breuer, Landman, and Farquhar, "Social Media and Protest."
57. International Telecommunication Union Statistics.
58. Dahl (*Polyarchy*) includes a set of civil liberties in his definition: access to alternative sources of information, the freedom to form and join organizations, eligibility for public office, the right of political leaders to compete for support, freedom of expression, the right to vote, free and fair elections, and institutions for making government policies dependent on voter's preferences.
59. Rød and Weidman, "Empowering Activists or Autocrats?"
60. Freedom House, *Freedom in the World 2014*.
61. Using Marshall, Gurr, and Jaggers "Polity IV" (Polity score –10 to –6=2, –5 to 5=1, 6 to 10=0).
62. Banks, *Cross-National Time-Series Data Archive*.
63. Ibid., 12.
64. Salehyan et al., "Social Conflict in Africa."
65. International Telecommunication Union Statistics.
66. Herkenrath and Knoll, "Protest Events in International Press Coverage."
67. Ibid., 117.
68. Education is likely to be related to protesting but is not included in the models since it reduced the size of my sample severely (from 2723 to 2019) and was not significant, nor did it change the coefficients of other variables.
69. Brancati, "Pocketbook Protests."
70. Unemployment: percentage of the total labour force that is without work but available for and seeking employment (World Bank, "Statistics").
71. Inflation: rate at which the general level of goods and services is rising, measured using the annual change (in %) in the consumer price index (World Bank, "Statistics").
72. GNI per capita is based on purchasing power parity from the World Bank ("Statistics"). Data are in current international dollars based on the 2011 International Comparison Program round. To make the coefficient easier to interpret I divided the GNI per capita by 1000.
73. Tucker, "Enough!"
74. Beck et al., "New Tools in Comparative Political Economy."
75. Nordås and Davenport, "Fight the Youth."
76. World Bank, "Statistics."
77. Lagriffe, "The Youth Bulge in Egypt."
78. Freedom House, *Freedom on the Net*.
79. Long, *Regression Models*.
80. Tests show very strong evidence in support of using the negative binomial regression model over a Poisson model and only weak evidence for using a zero-inflated negative binomial regression model instead of a negative binomial regression model. The BIC and AIC scores of the negative binomial regression model (BIC=–16607.623; AIC=1.784) lie very close to the BIC and AIC scores of the zero inflated negative binomial regression model (BIC=–16689.322; AIC=1.731).
81. An example is the counting of fish being caught by families on a campsite: families that did not go fishing could only have a count of zero. A family that did go fishing could also have a count of zero, but these two zeroes would have very different meanings.

82. I ran a zero inflated negative binomial regression model as a robustness check, inflating both regime type and population size. However, the coefficients of interest showed similar results.
83. Possibly because many states that Freedom House sees as non-free or partially free end up in a more free category in Polity IV because of its more minimal conceptualization of democracy.
84. Brancati, "The 2011 Protests."
85. Deibert, "Cyberspace Under Siege."
86. Ibid.; Gladwell, "Small Change"; Morozov, *The Net Delusion*.
87. Rød and Weidman, "Empowering Activists or Autocrats?"

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Appendix

Table A1. Incident rate ratio's.

	Model 1		Model 2		Model 3		Model 4	
	IRR	se	IRR	se	IRR	se	IRR	se
Public protests (CNTS) ($t-1$)	1.165***	0.047	1.138***	0.047	1.145***	0.048	1.045***	0.016
Internet use ($t-1$)	1.011***	0.004	1.007*	0.004	1.009**	0.003	0.984	0.012
Authoritarian regime ($t-1$)			1.046***	0.012	1.047***	0.011	1.028*	0.015
*Internet use ($t-1$)								
Partly democratic regime ($t-1$)			1.008	0.006	1.025*	0.013	1.023**	0.012
*Internet use ($t-1$)								
Authoritarian regime ($t-1$)			0.986	0.251	-0.288	0.278	0.764	0.600

(Continued)

Table A1. Continued.

	Model 1		Model 2		Model 3		Model 4	
	IRR	se	IRR	se	IRR	se	IRR	se
Partly democratic regime ($t-1$)			1.204	0.213	1.087	0.201	0.644	0.454
Total number of articles (logged) ($t-1$)	1.353***	0.109	1.437***	0.102	1.427***	0.105	1.113	0.133
Unemployment ($t-1$)	1.013	0.014	1.013	0.014	1.015	0.013	1.098**	0.052
Inflation ($t-1$)	1.000	0.000	1.000	0.000	1.000*	0.000	0.948***	0.016
GNI per capita(/1000) ($t-1$)	0.988*	0.007	0.979**	0.010	0.973***	0.009	1.041**	0.020
Elections ($t-1$)	1.350**	0.197	1.249*	0.148	1.272**	0.153	2.257***	0.559
Population size ($t-1$)	1.267***	0.084	1.254***	0.073	1.266***	0.076	1.427***	0.172
Youth bulge ($t-1$)	245.899*	721.262	8.064	22.895	13.400	33.691	2.162	9.685
Urbanization ($t-1$)	1.008*	0.004	1.007	0.005	1.007	0.004	0.996	0.010
Freedom of Internet							1.012	0.009
Constant	0.001***	0.001	0.001***	0.002	0.001***	0.001	0.001***	0.001
Inalpha	1.146	0.143	1.047	0.111	1.071	0.114	0.391	0.175
Observations	2723		2723		2723		184	

Note: Robust standard errors in parentheses; statistical significance reported as: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. These are the estimated rate ratios. If a country were to increase on the respective independent variable by one unit, the expected number of protests would be expected to decrease by the factor listed under the IRR. So if internet use goes up one unit (1% in this case), the expected number of protest increases by factor 1.011.