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DO INTERNET PENETRATION AND ONLINE CENSORSHIP LEVELS AFFECT LONG-TERM REPRESSION SUCCESS IN STREET PROTEST PREVENTION?

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Abstract. This research paper aims at learning whether Internet penetration and online censorship affect repression against civil society organization (CSO) capacity to prevent street protest events and/or reduce protest participant numbers in the long term. Although there is a large corpus of studies on the consequences of the Internet and social media development for street protest mobilization, there is little empirical research on whether offline CSO repression works in the age of the Internet and whether this new repression impact is modified by attempts to organize online censorship. I tried to solve this problem with large-N cross-national datasets on protest participation, CSO repression and online censorship as well as on the share of Internet users from 1990 to 2018. I propose a set of hypotheses claiming that repression has a negative unconditional effect on street protest probability and protester numbers, that the Internet penetration makes repression effect less negative or more positive, and that online censorship transforms repression impact into more negative and less positive. I test these hypotheses with pooled linear and logistic regressions weighted

ВЛИЯЮТ ЛИ ПРОНИКНОВЕНИЕ ИНТЕРНЕТА И ОНЛАЙН-ЦЕНЗУРА НА УСПЕШНОСТЬ РЕПРЕССИЙ В ПРОТИВОДЕЙСТВИИ УЛИЧНОЙ ПРОТЕСТНОЙ АКТИВНОСТИ В ДОЛГОСРОЧНОЙ ПЕРСПЕКТИВЕ?

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Аннотация. Цель статьи — выяснить, влияют ли проникновение интернета и онлайн-цензура на способность репрессий против организаций гражданского общества предотвращать уличные протесты или сокращать их численность в долгосрочной перспективе. Существует большой корпус научной литературы о последствиях развития интернета для мобилизации уличных протестов, тем не менее эмпирических исследований особенностей влияния офлайн-репрессий на протесты при высоком уровне проникновения интернета явно недостаточно. Кроме того, не хватает исследований воздействия цензурирования онлайн-среды на эффективность репрессий.

Я попытался внести вклад в решение этих вопросов с помощью регрессионного анализа данных об участии населения в протестных акциях, а также о репрессиях против организаций гражданского общества и цензуре в интернете по 161 стране мира за период с 1990 по 2018 г. С помощью логистических и линейных регрессий, взвешенных по обратной вероятности выбывания наблюдений, я проверил гипотезы о том, что репрес-

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by inverse probability of loss to follow-up. The results demonstrate that when the repression effect exists, an uncensored Internet makes the weak repression effect positive and transforms highly severe repression effects from negative to null. Online censorship at a high level of Internet use only removes the positive effect of weak repression.

сии оказывают отрицательный безусловный эффект на вероятность возникновения уличных протестных акций и их численность, что проникновение интернета уменьшает отрицательный эффект репрессий и увеличивает положительный, а также что онлайн-цензура усиливает отрицательное влияние репрессий и ослабляет положительное. Результаты показывают, что если эффект репрессий в принципе существует, то при низком уровне онлайн-цензуры рост проникновения интернета делает влияние слабых репрессий положительным, а отрицательное влияние сильных репрессий ослабляет до уровня, статистически неотличимого от нуля. Онлайн-цензура при высокой доле пользователей интернета в населении страны позволяет лишь устранить положительный эффект слабых репрессий.

Keywords: online censorship, Internet penetration, repression, civil society organizations, street protest activity

Ключевые слова: онлайн-цензура, проникновение интернета, репрессии, организации гражданского общества, уличная протестная активность

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Introduction

The development of the Internet has stimulated research interest in its probable effects on street protests[1] [Rujigrok, 2017] and political regime stability [Rød, Weidmann, 2015]. The Internet and social media allegedly facilitated some waves of large-scale protests such as the Arab Spring and Occupy Wall Street. The high visibility of the Internet in these and other processes provoked scientists to engage in more systematic research on its role in the organization of street protests. These studies demonstrated that social media boost protest activity through decreasing the costs for mobilization of potential protesters and the coordination of their actions [Anduiza, Cristancho, Sabucedo 2014; Clarke, Kocak, 2020] even without strong formal organizational

[1] In this paper I neither support nor condemn anti-government street protests. I study them as a phenomenon that exists in empirical reality.

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structures. These findings reflect the logic of connective action, which implies that even ordinary people can co-produce and share content necessary for protest mobilization and protest with other people [Bennett, Segerberg, 2012].

However, political activists frequently face offline repression, which affects the stimuli for protest participation [Pierskalla, 2010; Aytaç, Schiumerini, Stokes, 2018]. Thus, the key drawback of existing studies of the ICT[2] effect on street protest is that they focus only on direct effects without attention to its influence on offline repression[3]. In this article, I present and test a theoretical argument that explains why the Internet might condition the long-term effect[4] of repression against groups of political activists (that is civil society organizations — CSOs). I show how the idea that the negative effect of CSO repression diminishes in magnitude or even becomes positive in contexts with higher Internet penetration can be inferred from resource mobilization theory [Tilly, 1977; McCarthy, Zald, 1977; McAdam, Tarrow, Tilly, 2001; Tilly, Tarrow, 2015, Rudolfsen, 2021]. Although repression may deprive organizations of the resources necessary for protest mobilization or even destroy them, this strategy may be inefficient as protest mobilization in contexts with high Internet penetration may not require such organizations in the first place.

Moreover, though there are many studies on mechanisms of Internet censorship (see [Roberts, 2020]), there is a deficit of empirical research on whether it deprives protest organizers of opportunities provided by the Internet development. The role of online censorship is worth studying as the ability to share mobilizing information is critical for protest initiation and coordination [Tilly, Tarrow, 2015; Clarke, Kocak, 2020; Little, 2016]. Thus, I hypothesize that Internet censorship will make the long-term CSO repression effect negative again as it limits the opportunities provided by the Internet.

I test all hypotheses on cross-national datasets on protest (Mass Mobilization Project Database 3.0 [Clark, Regan, 2016]), CSO repression, Internet censorship (both are from Varieties of Democracy Project Dataset V11 [Coppedge et al., 2021; Pemstein et al., 2021]) and Internet penetration[5] as well on other control variables. To estimate the direct and conditional repression effects, I use pooled logistic and linear regression models with year fixed effects and cluster-robust standard errors which account for lack of independence in observations with the same state leader. All regression models are weighted by the inverse probability of censoring (loss to follow-up) to account for the fact that for some observations it was impossible to measure the outcome variable.

The paper is structured in the following way. The first section provides a review of the literature on the unconditional long-term repression effect. In this section, I also present my theoretical argument and discuss probable alternatives concerning the

[2] ICT — information and communication technologies.

[3] In this paper I do not aim to evaluate state actions from moral or legal point of view by labeling them as "repression" or "repressive". I concentrate on estimating empirical regularities between punishment (negative sanctions) of autonomous civil society organizations (CSO repression) and subsequent protest activity in order to better understand political regimes' dynamics. In this article, I neither support nor condemn any specific states and/or governments for using or not using repression. The goal of my paper is not to give advice to state leaders on how they should deal with street protests and civil society organizations. I do not call for human rights violations by repression and/or censorship use.

[4] At the conceptual level, by long-term effect I mean the effect that is observed after the street protest, active at the moment of repression, or after the street protest wave that was an immediate response to repression.

[5] Individuals using the Internet (% of population). *The World Bank*. URL: https://data.worldbank.org/indicator/IT.NET.USER.ZS (accessed: 02.03.2021).

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magnitude and direction of the unconditional long-term repression effect. This knowledge about the unconditional effects of repression is necessary for further deliberation on their possible modifications under various Internet-related contexts. The second section focuses on the ways that Internet penetration and Internet censorship might modify CSO repression effects. In that part of the paper, I discuss theoretical and empirical works related to the impact of the Internet on repression and protest and propose theoretical justifications for several hypotheses. The third section outlines the selection, conceptualization, and operationalization of the independent, dependent and control variables. I also describe the data sources and explain the reasons for their selection. The fourth section focuses on methodological issues related to regression model specifications and provides results on both direct and conditional effects. In the final section, I interpret the results and discuss their relevance for scientific knowledge concerning the impact of repression on protests and the effects of Internet technology on these phenomena.

The Unconditional CSO Repression Effect: Literature Review and Theory

The ideas about the magnitude and direction of the long-term effect of repression against CSOs can be inferred from the literature on political opportunity structure and resource mobilization theories [Tilly, 1977; McCarthy, Zald, 1977; Olson, 1965; Tilly, Tarrow, 2015; Brockett, 2005; Almeida, 2003]. They imply that repression is likely to decrease the scale of street protest events as they deprive CSOs of the resources and infrastructure necessary for potential protester mobilization. According to these theories, it is difficult to realize protest mobilization without resourceful organizations. As Tilly and Tarrow argued, organizations (as well as networks, participants, and cultural artifacts) are necessary to create and sustain social movements as non-violent forms of contentious politics [Tilly, Tarrow, 2015], of which street protest is one of the activities. Thus, social movement infrastructure affects the capacity to organize protest events. It is thus reasonable to suggest that the severity of CSO repression is negatively related to the scale of anti-government street protest activity[6].

The role of organizations can be explained in rationalist terms. People who dislike government policies are ready to participate in protest events if their expected benefits are higher than their expected costs. Benefits result from protester demand satisfaction, informal approval in the local social environment [Opp, Roehl, 1990], and the growth of self-esteem [Opp, Roehl, 1990; Ayanian, Tausch, 2016]. The costs may have multiple origins, but some are related to the need to spend time to get information about the time and place of protest events as well as about methods of participation. CSOs can decrease these costs by organizing propaganda campaigns while helping to raise expectations of protest success. Moreover, some formal CSOs (for example, trade unions) are able to motivate people via selective stimuli (provision of private goods or imposition of individualized penalties) [Olson, 1965]. Thus, CSOs need to possess financial, material, and human resources that are ready for these purposes.

Resource mobilization theory claims that the state can affect collective protest actions (such as rallies and demonstrations) not only by reacting to them but also

[6] By “anti-government” I do not mean that protests are targeted against the government as an executive body. Instead, this word signifies protests targeted against higher authorities and their policies in general.

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by promoting or preventing resource allocation [Tilly, 1977]. According to this theory, when state repression targets people who participate in certain forms of collective action, these attempts lead to the switch to other forms of collective protest. However, when repression aims at blocking resource allocation and use, it is likely to decrease the overall amount of protest activity [ibidem]. States can do this by constraining communication between CSO activists and between CSOs and wider society. There are multiple theoretically grounded ways to achieve this goal. The first is the physical isolation of leaders and activists of oppositional CSOs, which has historically been realized through long-term imprisonment and killings of CSO leaders and activists. When these forms of repression are used on a mass scale against all members of oppositional CSOs and combined with legalized bans on their activities, they may even destroy repressed CSOs. Complete destruction eliminates any communication between destroyed CSOs and the overall society.

However, states can also weaken the capacity of organizations to conduct propaganda campaigns in favor of their political objectives by depriving them of the material resources necessary to hire specialists in political campaign organization, produce and distribute texts advocating their ideas[7], and recruit and sustain permanent apparatus. Fines and other material sanctions exemplify these forms of repression. A probable weakness of this repression type in comparison to more severe types is that civil society organizations can arrange new funding and new material facilities if they have a sufficient base of supporters. Thus, I expect that the effect of the destruction of organizations and the imprisonment and of their leaders as well as physical violence against them on the number of protesters is more negative.

Finally, according to political opportunity structure theory, repression is a threat [Tilly, Tarrow, 2015] that can deter CSO participants from continuing their activities, as it increases the costs of participation in repressed organizations. If an organization does not face repression itself, but others do, it will be likely to take into account the risks associated with any anti-government activity, protests included. As the complete destruction of the CSO and the imprisonment of leaders and activists are more dangerous, I expect that the deterrence effect is also more negative for these harsh forms of repression.

But why are these effects more likely to happen in the long-term, and not earlier? The effect of repression during the first quarter or even year since the repressive act might not be negative due to an emotional reaction of anger [Aytaç et al., 2018; Ayanian, Tausch, 2016], new information about low government quality [Lohmann, 1994] and cascade effects [Kuran, 1995]. This process might overcompensate negative effects in the short term (within a protest campaign wave)[8]. Moreover, CSOs that expect that they will be repressed in the near future may mobilize their supporters for protest actions to deter authorities from conducting repression. After the passage of a quarter of a year, or at most a year, the above-mentioned within-wave effects are likely to be less relevant as protest waves are likely to end and emotions are likely to become less

[7] Huge amount of financial, material, and human resources is more important for organizing field propaganda campaigns and for conducting propaganda campaigns through traditional print and broadcast mass media.

[8] In the very short term (several days) repression is shown to increase protest intensity (see [Carey, 2006]).

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sharp. However, the lack of strong CSOs remains. The discussion above allows me to propose several hypotheses.

(H1) The higher the repression severity against CSOs in year *t*, the lower the maximum number of anti-government street protest event participants in the year *t+2* in the same country under the same chief of executive power[9].

However, propositions about the negative linear long-term effect of repression can be contested by competing theories. Ideas about the positive or non-linear association between repression and anti-government protest in the long term can be inferred from micromobilization [Opp, Roehl, 1990] and relative deprivation theories [Gurr, 1970]. The first suggests that repression causes positive informal sanctions toward protesters in their local social environment, which motivates them to protest further [Opp, Roehl, 1990]. The second implies that weak repression increases collective violence, but harsh repression decreases the magnitude of collective violence [Gurr, 1970] (collective violence can become manifest in the form of street protest events). Moreover, past repression history increases protest activity if repression severity decreases in the present [ibidem]. Finally, as Kuran claimed, repression decreases the legitimacy of the authority and causes preference falsification [Kuran, 1995]. The loss of legitimacy increases the likelihood of unexpected revolution [ibidem], that is mass street protests.

Empirical research on long-term CSO repression effects primarily consists of case studies. For instance, Almeida concluded that the liberalization of the regime in El Salvador in the 1960s led to a growth in the number of CSOs and the subsequent wave of mass non-violent street protests [Almeida, 2003]. The closure of political opportunity structures in the 1970s (including the growth in repression frequency and severity) led to a wave of violent protests which resulted in civil war. Doubts about the results remain as, in this paper, the repression effects were not separated from other changes in the political opportunity structure. A case study of modern China (a highly repressive context) revealed that CSOs refrain from collective mass street protest due to the high risk of repressive reaction [Fu, 2017]. However, these results have low generalizability.

My paper follows the emerging trend to analyze CSO repression effects with large-N datasets. Rudolfsen analyzed data on African countries from 1990 to 2014 and found that highly severe CSO repression decreased protest likelihood during sharp food price increases [Rudolfsen, 2021]. She also found that medium repression severity was positively related to protest likelihood. However, this paper analyzed only short-term repression effects (over one month), while I focus on the long-term effects (one year and more). Moreover, I focus not only on protest occurrence (as Rudolfsen did [ibidem]) but also on the number of participants, as Chenoweth and Stephan found that a high number of participants increases the likelihood of protest success [Chenoweth, Stephan, 2011].

[9] The time period of two years is selected because I will use country/year as a unit of analysis. If I selected the year *t+1* to measure the long-term effect, I would risk capturing the effects of repression in December of year *t* on protests in January of year *t+1*. The year *t+2* as the time period for outcome measurement allows me to see the effects of repression in the period from one year after repression use (December of the year *t* — January of the year *t+2*) up to three years afterward (January of year *t* — December of year *t+2*). I will measure the outcome variable only for cases when the real chief of executive power remained the same without interruption in the years *t, t+1,* and at least the first part of the year *t+2*. This is necessary because ruler change may imply a change in the number and composition of CSOs which are autonomous from the state and potentially oppositional to the policies of the new ruler. Thus, I will try to avoid a situation in which I measure the effects of repression against a CSO that opposes a ruler on protests against the new ruler, who was in opposition to the previous one.

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Internet Use and Online Censorship as Moderators of the Offline CSO Repression Effect: Literature Review and Theoretical Arguments

The key functions of CSOs for street protest are the mobilization (that is persuasion to participate) and coordination of those who disagree with government policies. The Internet affects CSO repression efficiency to the extent that it makes CSOs more or less important for the realization of these functions. The majority of studies that I am familiar with claim that the Internet makes formal CSOs with mass membership less relevant for street protest initiation.

Empirical research on protest events in Spain (2010) and Egypt (2011) demonstrates that social media can be used to mobilize mass protests without formal organizations with mass membership [Anduiza et al., 2014; Clarke, Kocak, 2020]. The *Indignados* protests in Spain were very different from previous protests, as participants were substantially less likely to be members of any organization and more likely to have found information about the upcoming street demonstration from online social media, friends, and acquaintances [Anduiza et al., 2014]. Clarke and Kocak showed how Facebook was used to recruit protesters for the large demonstration in Cairo on January 25, 2011 and how Twitter was used to coordinate their actions during protest events [Clarke, Kocak, 2020]. Social media helped to launch protest campaigns in the context of a repressive autocratic regime (Egypt under Mubarak's rule).

The idea that social media can be used to effectively organize street protests has been also shown with strict quantitative methods of causal inference. With the use of the instrumental variables technique, Enikolopov, Makarin and Petrova demonstrated that higher penetration of VKontakte in Russian cities increased the likelihood of protest events and the number of protesters during the wave of protests after the State Duma elections in December 2011 [Enikolopov, Makarin, Petrova, 2020]. At the same time, they showed that higher VKontakte penetration was associated with higher (and not lower) support for the state authorities, which indicated the prevalence of coordination channels of the social media effect on street protests.

Internet penetration also affects the probability of street protests and their number through the creation of a freer information environment, which reduces communication costs, provides more critical information about the government, and decreases uncertainty about the numbers of people who disapprove of the government [Rujigrok, 2017]. A large-N quantitative study demonstrated that the increase of Internet use was positively associated with the probability of street protest occurrence in autocracies, though there was no such association in democracies [ibidem].

The Internet makes communication between people interactive so that each person (even ordinary citizens) can quickly reach large masses of people and communicate information about protest logistics [Little, 2016]. The same is true for small groups of people. Without the Internet, protest organizers frequently cannot reach their audience as quickly. They need to promote their appeals to take part in protests and information about logistics on TV, radio, and newspapers which is not as cheap as doing so on the Internet. Moreover, traditional print and broadcast media may be inaccessible to protest organizers due to government control over media outlets. In contexts without high levels of Internet penetration, leaders of potential protests also need to have offline contact with people who are ready to go to the streets under their leadership

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and to work as canvassers motivating other people during field propaganda campaigns. Only traditional CSOs with a large membership possess contacts, command chains, and financial resources that are necessary for mass participation in protest events and for propaganda through mass media or canvassing in the streets.

The Internet allows protest mobilization and coordination even without formal organizations through so-called "connective action" [Bennett, Segerberg, 2012]. In its pure form, connective action implies that people get an opportunity to share, produce and distribute their ideas and views to a large number of people and find like-minded people. Social media enable all people to use the social technology necessary for protest initiation and protest coordination. Bennett and Segerberg argue that connective action implies inclusive and personalized action frames that allow the production of individual motivation and proposal of individual forms of action for each person and/or group of people. These benefits allow people to organize protest events without the involvement of formal organizations and are likely to result in self-organized, spontaneous protests [ibidem].

If small groups of people or even individuals can initiate the protest mobilization process instead of large offline CSOs, then it is reasonable to suggest that offline repression against CSOs should become less efficient in protest prevention. Thus, the weakening and destruction of CSOs are not likely to decrease the number of protesters in the long term if protests can be efficiently and cheaply mobilized and coordinated via the Internet and social media.

However, in multiple countries, state authorities try to make undesirable (for authorities) information on the Internet less available to citizens, which can decrease the capacity of the Internet to boost protest activity. Roberts [2020] categorized all mechanisms authorities can use:

— Fear (repression against users who try to distribute prohibited information);
— Friction ("making information more difficult to access" [ibid.: 403] via technical means) and
— Flooding (massive, pro-government propaganda in social media).

In my paper, I concentrate only on one mechanism of censorship which I consider to be a pure one — friction. Mechanism of fear implies repression, mechanism of flooding implies propaganda, while friction involves neither repression nor propaganda. Friction can be realized through complete Internet shutdowns; the blocking of particular Internet sites, pages, or even messages in social media (for example, by keywords [Bamman, O'Connor, Smith, 2012]); page order manipulation in search engines [Roberts, 2020: 403]; and Internet speed slowing. Multiple technical means can be used to achieve these goals (deep package inspection [DPI] to search for undesirable content and to block access to it and distributed denial of service [DDOS] attacks to slow or block access).

If online censorship makes information less accessible, then it is likely to lower the protest organizers' capacity to use it to mobilize potential protesters. Censorship is likely to make it harder to criticize governments and to provide information about protest events logistics. Thus, I expect that online censorship makes formal offline CSOs important again for protest mobilization. It means that in a context with high Internet penetration coupled with high online censorship, the CSO repression effect

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is likely to be lower in real numbers (more negative if it is negative and less positive if it is positive) than in contexts with the same Internet use level, but low online censorship. In other words, I expect that online censorship at high levels of Internet use complements offline CSO repression in its long-term impact on protester numbers.

I propose the following set of hypotheses about the ways in which Internet use and online censorship might modify the long-term CSO repression effect:

(H2) With low levels of online censorship, the higher the share of Internet users in the country population in year *t*, the higher in real numbers the long-term CSO repression effect on the maximum number of anti-government street protest event participants in year *t+2* in the same country under the same chief of executive power.

(H3) With high levels of online censorship, the share of Internet users in the country population in year *t* does not positively modify the long-term CSO repression effect on the maximum number of anti-government street protest event participants in year *t+2* in the same country under the same chief of executive power.

If censorship is high, then mass Internet use is not likely to weaken the negative repression effect and boost the positive effect, as positive effects of the Internet on protest mobilization are expected to be removed by censorship.

(H4) With a low level of Internet penetration, online censorship in year *t* does not modify the long-term CSO repression effect on the maximum number of anti-government street protest event participants in year *t+2* in the same country under the same chief of executive power. Low Internet use is likely to make online censorship levels irrelevant.

(H5) With a high level of Internet penetration, higher online censorship in year *t* will lower, in real numbers, the long-term CSO repression effect on the maximum number of anti-government street protest event participants in year *t+2* in the same country under the same chief of executive power.

However, there are some arguments in favor of alternative hypotheses. The Internet may be employed not only by single individuals or small groups of people to advance their ideas but also by traditional formal CSOs. Bennett and Segerberg, for example, also described organizationally enabled networks in connective action [Bennett, Segerberg, 2012]. CSOs generate inclusive personal action frames, provide social technologies for ordinary protesters, and moderate personal expression. Using World Values Survey data[10], Anderson demonstrated that the frequent personal Internet use effect on personal protest mobilization was higher for formal CSO members [Anderson, 2021]. She argued that people who acquired political skills and networks of trust in CSOs are better prepared to use the Internet for their political purposes.

Moreover, a CSO can choose the Internet as a new, cheap, and relatively free (in case of no or little online censorship) channel of communication with their existing supporters and in the recruitment of new ones. Thus, the Internet can make CSOs even more efficient in protest mobilization and coordination, which is likely to make offline repression against them more efficient (the effect on protester numbers becomes more negative). If this line of reasoning is correct, then online censorship is likely to make the offline CSO repression effect less negative and even positive.

[10] WVS Wave 6. (2010—2014) *World Values Survey*. URL: http://www.worldvaluessurvey.org/WVSDocumentationWV6.jsp (accessed: 19.07.2021).

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Case Selection, Variables, and Data Sources

Case selection. The idea of my research is to test the hypotheses with data on a large number of countries for long periods of time. At the first stage, I used the Mass Mobilization Project Database 3.0[11] (MMPD) [Clark, Regan, 2016] to select cases (observations). This database has the largest coverage of countries among the datasets with event-level information about street protests. It contains information about gatherings of more than 50 unarmed people with demands in 162 countries from 1990 to 2018, which approaches global coverage[12]. Given the fact that I test effects of repression in year $t+2$ after its use, the set of all probable observations at the first stage consists of all country-years from 1990 to 2016 for independent and control variables and from 1992 to 2018 for the dependent variable.

Then I used REIGN monthly data on the acting higher authorities[13] which contains information about persons who possessed executive power and conducted internal policy in each country. In the REIGN dataset, I found country-years when the chief leader of executive power was the same during the whole year, calling these treatment country-years. Then for each treatment country-year, I checked whether the leader remained the same two years after treatment. After that, I found all treatment country-years for which country leader remained the same until the second post-treatment year. This group of observations I labeled as "uncensored"[14]. The group in which the leader changed I labelled "censored". The period of time in the second post-treatment year where the leader was the same as in the corresponding treatment year is labeled as "outcome period". For a full description of the procedure for revealing treatment and outcome periods, see Supplementary Materials (section 1)[15].

Dependent variable. The dependent variable in this paper is the maximum number of participants in anti-government protest events in a country–year or the first part of the year before ruler change. Street protest is conceptualized as a non-institutional [Chenoweth, Stephan, 2011], public, collective[16] action aimed at making claims on other people or their groups [Tilly, Tarrow, 2015: 7] which happens primarily outside of buildings. In this paper, I concentrate only on anti-government protests, that is those targeted against the higher authorities of the state and/or their policies. By higher authorities, I mean the head of a body which really possesses executive power in the country as well as politicians and bureaucrats who are politically affiliated with him or her (for example, they are members of one political party). This definition is close to the understanding of the ruling coalition in the definition "ruling coalition spell" proposed by Svolik [Svolik, 2012: 21].

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[11] Now version 3.0 is not the latest one, but I started to pre-process data when it was the latest. New versions have coverage of a larger number of years.

[12] Clark D., Regan P. (2016) MM_users_manual_0515.pdf (Mass Mobilization Protest Data). *Harvard Dataverse*. V3. P. 2. https://dataverse.harvard.edu/file.xhtml?persistentId=doi:10.7910/DVN/HTTWYL/TJJZNG&version=3.0 (accessed: 26.07.2021).

[13] Bell C. (2016) The Rulers, Elections, and Irregular Governance Dataset (REIGN). Broomfield (CO): OEF Research. URL: https://www.oefresearch.org/sites/default/files/REIGN_descriptions.pdf (accessed: 26.07.2021).

[14] The labels "uncensored" and "censored" refer to the notion of "loss to follow-up". They are not related to online censorship.

[15] Supplementary Materials and data for replication (final dataset on treatment country-years and pre-processed data from MMPD 3.0 [Clark, Regan, 2016]) are available at https://monitoringjournal.ru/index.php/monitoring/publicFile/submissionFileId?fileId=10261&hash=7d97c6ab6e953ce1a30ecf48526a6ee9 (accessed: 26.11.2021).

[16] Here "collective action" means that a group of people coordinating their actions participates in an event. The phrase "collective action" is not related to the distinction between collective and connective action proposed by Bennett and Segerberg [Bennett, Segerberg, 2012].

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I use the MMPD 3.0 [Clark, Regan, 2016] as a data source for the number of protesters. According to the MMPD coding, a protest event is "a gathering of 50 or more people to make a demand of the government" (gatherings of people conducting armed attacks are not included)[17]. This definition covers anti-state protests and does not include cases of intergroup actions[18]. This allows me to treat events in the MMPD as anti-government street protests. The only problem with the definition of a protest event is that it explicitly does not cover pre-electoral rallies[19]. This limits the number of events for study and may bias estimates of all variables as these rallies may have a high participation level.

I use the variable "participants" in the MMPD [ibidem] to get information about the number of participants in each protest event. One part of the values is presented in numerical form, while the other is textual, which creates a measurement problem. To solve this, I designed rules of assigning numerical values to observations based on textual descriptions, which I present in Supplementary Materials (section 2).

After pre-processing the event participant number values, I took the maximal value for each outcome period (country-year or a part of a country-year). I include all event-years that start and finish before the end month for a country leader rule into the set of events for which the maximum number of participants was found (variable "outcome_part_num"). As values of this variable are inherently imprecise, I created a set of binary variables to indicate that the outcome number of protesters is higher than zero or equal to zero (the first binary outcome variable), lower than 100,000 or above (or equal to) 100,000 (the second binary outcome variable). This is preferable as the number of participants in events is frequently described as higher than some specific value. Thresholds indicate the presence of any protest and the occurrence of large protests[20].

Independent variable. The severity of repression against CSOs is an independent variable. On the conceptual level, by repression I mean an act of state authorities and/or its agents intended to impose costs (in terms of life, health, personal welfare, freedom of movement, and freedom from persecution) on particular individuals and groups of individuals because of their alleged participation in activities challenging authorities and/or their policies. The severity of repression is the level of costs that are imposed on those who are repressed.

As for the definition of CSO, I follow the approach proposed by the authors of the V-Dem Project (but provide a shorter definition): a CSO is a group of people who "pursue their collective *(political and civic)* interests and ideas" which "… enjoys autonomy from the state"[21].

[17] Clark D., Regan P. (2016) MM_users_manual_0515.pdf (Mass Mobilization Protest Data). *Harvard Dataverse*. V3. P. 2—4. https://dataverse.harvard.edu/file.xhtml?persistentId=doi:10.7910/DVN/HTTWYL/TJJZNG&version=3.0 (accessed: 26.07.2021).

[18] Ibid.: P. 3—4.

[19] Ibid.: P. 4.

[20] Unfortunately, it was impossible to use one million as a threshold as perfectly predicted values occur, which is a risk for parameter convergence.

[21] Coppedge M., Gerring J., Knutsen C., Lindberg S., Teorell J., Altman D., Bernhard M., Cornell A., Fish S., Gastaldi L., Gjerløw H., Glynn A., Hicken A., Lührmann A., Maerz S., Marquardt K., McMann K., Mechkova V., Paxton P., Pemstein D., von Römer J., Seim B., Sigman R., Skaaning S.-E., Staton J., Sundtröm A., Tzelgov E., Uberti L., Wang Y., Wig T., Ziblatt D. (2021b). V-Dem Codebook v11. *Varieties of Democracy (V-Dem) Project*. P. 53. URL: https://www.v-dem.net/dsarchive.html (accessed: 25.11.2021).

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As for the operationalization of the independent variable, I use the ordinal version of V-Dem variable "CSO repression" for this purpose. It contains information about the costs that an autonomous CSO as well as its leaders and activists pay due to government attempts to repress them during the year in the country under consideration. To give more severe repression a higher value, I reversed the scale. The reordered variable is labeled "repression_ord" (see description in Supplementary Materials).

Intervening variables. Internet penetration (Internet users share, IUS) is the share of people who have access to the Internet across the whole country population in a year. Data on its level is taken from the World Bank in the variable "Individuals using the Internet (% of population)" [22]. Information for this variable was collected by the International Telecommunication Union and covers the period from 1990 to 2019 for the majority of countries.

By online censorship, I mean attempts by the state and its agents to make access to some politically relevant information on the Internet more difficult or completely impossible through technical means. This variable is operationalized as the "Internet censorship effort" variable in the V-Dem 11 database. It is focused on types of censorship such as filtering (blocking access to websites), DDOS attacks, and shutdowns. These actions are not treated as censorship if they are targeted against classified military or intelligence material, child pornography, defamatory speech, and offense to religion [23]. I multiplied the "Internet censorship effort" variable by –1 to make observations with higher censorship have higher values. The new variable is named "IC". All intervening variables refer to the same year as the independent variable.

Control variables. I try to tackle omitted variable bias by controlling for the following set of variables. First, I control for the total population of the country, as the set of people who can protest is more numerous in more populated countries. I use the "Population" variable from the V-Dem 11 dataset [Coppedge et al., 2021], which is originally taken from World Development Indicators [24]. Second, I control for GDP per capita as a proxy for state capacity to enable repression [Fearon, Laitin, 2003] and as a proxy of the material resources that people have available to divert to political activism. I take the values of this variable from the "GDP per capita" variable in the V-Dem 11 dataset [Coppedge et al., 2021] which comes from the Maddison Project Database [25] [Bolt, van Zanden, 2014]. Moreover, I take into account the GDP per capita growth rate as it might be negatively related to protest participation (an economic downturn is likely to provoke discontent, as suggested by the literature on the economic determinants of political support [Treisman, 2011]). This variable is calculated from the values of the "GDP per capita" variable. In addition, I control for the urbanization level as mass

[22] Individuals using the Internet (% of population). *The World Bank.* URL: https://data.worldbank.org/indicator/IT.NET.USER.ZS (accessed: 02.03.2021).

[23] Coppedge M., Gerring J., Knutsen C., Lindberg S., Teorell J., Altman D., Bernhard M., Cornell A., Fish S., Gastaldi L., Gjerløw H., Glynn A., Hicken A., Lührmann A., Maerz S., Marquardt K., McMann K., Mechkova V., Paxton P., Pemstein D., von Römer J., Seim B., Sigman R., Skaaning S.-E., Staton J., Sundtröm A., Tzelgov E., Uberti L., Wang Y., Wig T., Ziblatt D. (2021b). V-Dem Codebook v11. *Varieties of Democracy (V-Dem) Project*. P. 200—201. URL: https://www.v-dem.net/dsarchive.html (accessed: 25.11.2021).

[24] The World Bank. (2019) World Development Indicators 2019. Washington: World Bank.

[25] Bolt J., van Zanden J. (2020) Maddison Style Estimates of the Evolution of the World Economy. A new 2020 update. URL: https://www.rug.nl/ggdc/historicaldevelopment/maddison/publications/wp15.pdf (accessed: 22.11.2021).

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protests are more likely in large cities and urbanization may signify the level of state development and capacity to use repression [Tilly, Tarrow, 2015]. The data source for urbanization values is the World Bank[26]. Furthermore, I included a dummy variable for civil war in a country in year *t* because it signifies the readiness of state forces to apply violent tactics and high conflict potential in a country, which can lead to greater protest participation. The data source for information on civil wars is the UCDP/PRIO Armed Conflict Dataset (version 20.1)[27] [Gleditsch, Wallensteen, Eriksson, Sollenberg, Strand, 2002; Petterson, Öberg, 2020].

In addition, I use the variable "High court independence" from V-Dem 11, which indicates the level of judicial independence in a country, because independent courts are demonstrated to be negatively associated with repression thus allowing more free environment for protest [Hill, Jones, 2014; Conrad, Ritter, 2019]. Then, I include the binary variable indicating whether there were national presidential or parliamentary elections in the country as protest participation may be higher during and after electoral campaigns. I drew information about elections from V-Dem 11 variables "Legislative or constituent assembly election" and "Presidential elections" [Coppedge et al., 2021]. Finally, I include V-Dem 11 variables "Free and fair elections" and "Government censorship effort"[28] as free and fair elections coupled with uncensored print and broadcast media might deter repression (due to fear of voter retribution and increased expected protest mobilization due to free flow of information [Tanneberg, 2020] and open opportunities for protest [Tilly, Tarrow, 2015]).

Endogeneity concerns are addressed by controlling for the maximal number of protest event participants in the treatment year, which might affect the adaptive expectations of authorities relative to the possible scale of protest activity in the longer term. With the same purpose, I include the variable "CSO participatory environment" from V-Dem 11 [Coppedge et al., 2021], as authorities might treat a high level of participation in CSOs as a sign of the high potential for future protest [Tilly, Tarrow, 2015].

Empirical Methods and Results

To find unconditional and conditional CSO repression effects, I work with two versions of the dataset. The first excludes information on Internet censorship, which allows me to include country-years without Internet users. The results that I obtained in this version are presented in the Supplementary Materials (see tables SM.3–SM.14). The second includes the Internet censorship variable, which does not allow me to use the majority of observations with null IUS. In all cases before estimation of any effect, I have to account for the fact that for some treatment country-years we do not have an outcome variable. The primary explanation for this lack of information is that the chief of executive power changed after year *t*, but before year $t+2$. To the extent that this authority change is related to CSO repression and its effects (for example, the ruler lost power due to protests erupted after attempts to repress opponents), the estimates of

[26] Urban population (% of total population). *The World Bank*. URL: https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS (accessed: 20.07.2021).

[27] Petterson T. (2020) UCDP Actor Dataset Codebook v 20.1. *Uppsala Conflict Data Program*. URL: https://ucdp.uu.se/downloads/ (accessed: 22.11.2021).

[28] This variable covers only print (newspapers) and broadcast (TV, radio) media outlets.

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long-term effect might become biased [Nunan, Aronson, Bankhead, 2018]. To remove this bias, I weighted each observation in each model by the inverse probability of loss to follow-up (censoring) [Robins, Hernan, Brumback, 2000]. This technique allows me to make the sample of country-years for which we can measure the outcome resemble the initial set of all treatment country-years(with various treatment regimes). The probabilities of presence and loss to follow-up (in fact, propensity scores) are estimated with logistic regression models of censoring indicators on independent and control variables (including intervening variables). See formulas for weights calculation in Supplementary Materials (section 4).

I use a set of linear and logistic models to estimate the CSO repression effect on the maximum number of protesters two years after repression use. The linear model parameters are obtained via weighted least squares. The logistic model parameter estimates are obtained through the weighted maximum likelihood method. Each model contains year-fixed effects which help to control for the difference in the propensity to take part in protests across time. Moreover, year-fixed effects account for the international diffusion of protest waves (such as the Arab Spring). However, I decided not to include unit fixed effects. I am interested in the effects of between-country variation in repression — unit fixed effects keep only within-country variation, which is likely to be small [Beck, Katz, 2001]. Moreover, unit fixed effects do not allow to separately study the effects of qualitatively different forms of repression as it amounts to finding the deviation from the within-country mean repression severity.

The problem of such an approach is the lack of independence between observations with the same country leaders. I try to account for this problem by using more conservative standard errors that are robust to clustering. I use “spell_id” (time period with an uninterrupted rule of one person in one country) as a cluster. All calculations have been realized in R programming language (see Supplementary Materials).

Unconditional CSO repression effects

First, I decided to estimate the CSO repression effect on the logged outcome participant numbers with the linear model (see specification in Supplementary Materials, section 5, subsection 1).

In this and all other models, I treat repression as an ordinal variable. It allows me to estimate the effects of various qualitative levels of repression severity. When I proceed to the conditional effect, this enables me to find the conditional effects of each qualitative repression severity level.

The results do not confirm Hypothesis 1. Weak repression (such as fines and job dismissal of activists) leads to an increase in protesters two years after its use, while other forms of repression do not affect the dependent variable (see table1).

As data on participant numbers are inherently imprecise, I also estimated the set of logistic regressions. The dependent variables in these models are binary indicators showing whether the outcome number of participants is not lower than some threshold value a ($a = 1$, $a = 100{,}000$). The thresholds were selected so that they indicate boundaries for any protest (even small) and for large protests. The model specifications are presented in the Supplementary Materials (section 5, subsection 2).

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Table 1. ***Average marginal effects (AME) of CSO repression on logged outcome participant numbers (linear model; data with IC)***[29]

Factor	AME	SE	Z	P	Lower	Upper
repression_ord1[30]	0.7606	0.3194	2.3816	0.0172	0.1347	1.3866
repression_ord2	0.4525	0.3965	1.1414	0.2537	−0.3245	1.2296
repression_ord3	−0.3571	0.5572	−0.6409	0.5216	−1.4493	0.7350
repression_ord4	−0.4678	1.1194	−0.4179	0.6760	−2.6617	1.7261

The results demonstrate that weak repression increases the probability that protests will occur. Effects of other repression types on protest occurrence are not distinguishable from null in a statistical sense (see table 2).

Table 2. ***Average marginal effects (AME) of CSO repression on the probability of any protest occurrence (a = 1) (logistic model; data with IC)***

Factor	AME	SE	Z	P	Lower	Upper
repression_ord1	0.0907	0.0379	0.0166	0.0166	0.0165	0.1650
repression_ord2	0.0799	0.0459	1.7433	0.0813	−0.0099	0.1698
repression_ord3	−0.0198	0.0669	−0.2958	−0.1510	−0.1510	0.1114
repression_ord4	0.0439	0.1518	0.2888	−0.2537	−0.2537	0.3414

Table 3 shows estimates of repression effects on large protest event probability. The complete and violent destruction of organizations (repression_ord = 4) decreases the likelihood of large protests (with more than 100,000 participants). The effect of other repression types is not detected.

Table 3. ***Average marginal effects (AME) of CSO repression on the probability of protests with 100 thousand participants and more (a = 100 000) (logistic model; data with IC)***

Factor	AME	SE	Z	P	Lower	Upper
repression_ord1	0.0243	0.0176	1.3805	0.1674	−0.0102	0.0589
repression_ord2	0.0330	0.0280	1.1779	0.2388	−0.0219	0.0880
repression_ord3	0.0217	0.0422	0.5142	0.6071	−0.0609	0.1043
repression_ord4	−0.0433	0.0083	−5.2015	0.0000	−0.0596	−0.0270

The results indicate that the primary function of harsh repression is to prevent large protests, not all protests.

I cannot claim full confirmation of H1 as we have evidence in favor of a curvilinear (inverted-U) effect of CSO repression, which becomes more clear if we change the reference level of "repression_ord" from 0 to 3 (see table 4).

[29] In the article, I present only tables with average marginal effects. Information about regression parameter estimates and their significance can be found in the Supplementary Materials.

[30] "repression_ord1" — dummy variable which equals 1 when repression_ord = 1 and 0 in other cases, "repression_ord2" — dummy variable which equals 1 when repression_ord = 2 and 0 in other cases, "repression_ord3" — dummy variable which equals 1 when repression_ord = 3 and 0 in other cases, "repression_ord4" — dummy variable which equals 1 when repression_ord = 4 and 0 in other cases.

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Table 4. ***Average marginal effects (AME) of CSO repression on logged outcome participant numbers (linear model; data with IC variable; the reference level is 3)***

Factor	AME	SE	Z	P	Lower	Upper
repression_ord_3ref0 [31]	0.3571	0.5572	0.6409	0.5216	−0.7350	1.4493
repression_ord3_ref1	1.1178	0.4419	2.5293	0.0114	0.2516	1.9839
repression_ord3_ref2	0.8096	0.3692	2.1932	0.0283	0.0861	1.5332
repression_ord3_ref4	−0.1107	0.9793	−0.1131	0.9100	−2.0301	1.8087

All models except the one estimating the effect on the probability of protests with more than 100,000 people demonstrate the positive and significant difference between weak repression of levels 1 and 2 and harsh repression of level 3 (imprisonment, criminal persecution, beatings, destruction of valuable property)) (see tables SM.21–SM.26 in the Supplementary Materials).

Conditional CSO repression effects

To estimate conditional effects, I use linear and logistic regression models with triple interaction (model includes interaction terms with three and two variables). See their specifications in the Supplementary Materials (section 5, Subsection 3—4).

First, I estimate how Internet penetration modifies the CSO repression effect at low and high levels of Internet censorship (IC). The point indicating a low level of Internet censorship is quantile 0.25 for all years in the data: −1.652. The high level of Internet censorship is quantile 0.75 for all years in the data: 0.593. Low levels of Internet users share (IUS) are defined as the minimum value for the last year (2016) in my data sample (1.18% of the country population). A high level of Internet users share is the quantile 0.75 for the year 2016 which is 71.61% of the country population. 20.35% and 44.19% are quantiles 0.25 and 0.5 for the year 2016, respectively, which represent low and medium levels of Internet penetration. Let us look at the results for the test of Hypothesis 2.

The linear model with logged protesters number as the dependent variable gives the following results. At low levels of IC, the growth in IUS makes the effect of weak repression positive. The effects of other repression levels are indistinguishable from zero at all levels of IUS (see table 5).

The logistic model for protest event probability shows that the effect of harsh repression of level 4, which is significant and negative at the low level of IUS (given low censorship), becomes indistinguishable from zero at higher levels of IUS. Complete CSO destruction prevents protest at low levels of Internet penetration and low levels of IC. Estimates of other repression levels effects do not differ from zero from a statistical point of view (see table 6).

[31] "repression_ord_3ref0" — dummy variable which equals 1 when repression_ord = 0 and 0 in other cases, "repression_ord_3ref1" — dummy variable which equals 1 when repression_ord = 1 and 0 in other cases, "repression_ord_3ref2" — dummy variable which equals 1 when repression_ord = 2 and 0 in other cases, "repression_ord_3ref4" — dummy variable which equals 1 when repression_ord = 4 and 0 in other cases.

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Table 5. ***Average marginal conditional effects of CSO repression on logged participant numbers at quantiles 0, 0.25, 0.5 and 0.75 of IUS in 2016 (linear model; IC = –1.65)***

Factor	IUS	AME	Lower	Upper
repression_ord1	1.1771	0.2672	–0.5489	1.0833
repression_ord1	20.3525	0.7342	0.0497	1.4188
repression_ord1	44.1893	1.3148	0.4421	2.1876
repression_ord1	71.6076	1.9827	0.6273	3.3381
repression_ord2	1.1771	0.8332	–0.3926	2.0590
repression_ord2	20.3525	1.3315	–0.4881	3.1510
repression_ord2	44.1893	1.9508	–2.0357	5.9374
repression_ord2	71.6076	2.6633	–4.0098	9.3363
repression_ord3	1.1771	0.3241	–1.2785	1.9266
repression_ord3	20.3525	–0.3460	–1.9547	1.2628
repression_ord3	44.1893	–1.1788	–3.7670	1.4093
repression_ord3	71.6076	–2.1369	–6.2632	1.9895
repression_ord4	1.1771	–4.7326	–10.7496	1.2844
repression_ord4	20.3525	–3.8255	–9.6815	2.0305
repression_ord4	44.1893	–2.6979	–9.6583	4.2625
repression_ord4	71.6076	–1.4009	–10.7489	7.9472

Table 6. ***Average marginal conditional effects of CSO repression on any protest event probability at quantiles 0, 0.25, 0.5, and 0.75 of IUS in 2016 (logistic model; IC = –1.65)***

Factor	IUS	AME	Lower	Upper
repression_ord1	1.1771	0.0051	–0.0945	0.1048
repression_ord1	20.3525	0.0461	–0.0428	0.1349
repression_ord1	44.1893	0.0931	–0.0284	0.2146
repression_ord1	71.6076	0.141	–0.0293	0.3113
repression_ord2	1.1771	0.0831	–0.0526	0.2188
repression_ord2	20.3525	0.1314	–0.0157	0.2784
repression_ord2	44.1893	0.1824	–0.068	0.4328
repression_ord2	71.6076	0.2288	–0.0936	0.5513
repression_ord3	1.1771	0.0754	–0.1078	0.2586
repression_ord3	20.3525	–0.0396	–0.25	0.1709
repression_ord3	44.1893	–0.1984	–0.557	0.1603
repression_ord3	71.6076	–0.371	–0.8622	0.1202
repression_ord4	1.1771	–0.5182	–0.978	–0.0583
repression_ord4	20.3525	–0.3787	–1.0819	0.3246
repression_ord4	44.1893	–0.1265	–1.1021	0.849
repression_ord4	71.6076	0.1405	–0.7689	1.0499

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The logistic model for large protest event probability shows that the effect of weak repression of level 1 transforms from indistinguishable from zero into significantly positive. Repression of levels 2 and 3 do not have an effect, while the most severe form 4 affects protests negatively at all levels of IUS (see table 7).

Table 7. ***Average marginal conditional effects of CSO repression on large protest event probability at quantiles 0, 0.25, 0.5, and 0.75 of IUS in 2016 (logistic model; IC = –1.65)***

Factor	IUS	AME	Lower	Upper
repression_ord1	1.1771	–0.0065	–0.0511	0.0382
repression_ord1	20.3525	0.0153	–0.0245	0.0552
repression_ord1	44.1893	0.0457	0.0008	0.0906
repression_ord1	71.6076	0.0861	0.0074	0.1648
repression_ord2	1.1771	0.0496	–0.0509	0.1501
repression_ord2	20.3525	0.0082	–0.0743	0.0906
repression_ord2	44.1893	–0.017	–0.0877	0.0538
repression_ord2	71.6076	–0.0251	–0.0689	0.0187
repression_ord3	1.1771	0.0039	–0.189	0.1968
repression_ord3	20.3525	–0.0125	–0.1076	0.0827
repression_ord3	44.1893	–0.0222	–0.0897	0.0452
repression_ord3	71.6076	–0.0248	–0.0807	0.0311
repression_ord4	1.1771	–0.0568	–0.0881	–0.0255
repression_ord4	20.3525	–0.0493	–0.0688	–0.0298
repression_ord4	44.1893	–0.0411	–0.0575	–0.0248
repression_ord4	71.6076	–0.0332	–0.0557	–0.0108

Tables 5—7 do not provide full confirmation for Hypothesis 2, but the repression effect modification implied by Hypothesis is relevant for the weakest and the strongest forms of repression.

As for IUS modification of repression effects at high levels of censorship (Hypothesis 3), there is no evidence against it: growth in IUS does not lead to a statistically significant increase of the repression effect (in real numbers) in any of the models. In contrast, the weak repression effect on any protest event probability ceased to be positive at high IUS levels (see table SM.29, SM.34, and SM.39 in the Supplementary Materials).

Second, I estimate how online censorship changes the repression effect at low and high levels of Internet penetration. At high levels of Internet penetration (Hypothesis 5), the linear model estimation results show that higher online censorship makes the weak repression effect decrease such that it ceases to be significantly positive (see table 8).

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Table 8. ***Average marginal conditional effects of CSO repression on logged participant numbers at quantiles 0.25, 0.5, 0.75, 0.9, and 0.95 of IC (linear model; IUS = 71.6)***

Factor	IC	AME	Lower	Upper
repression_ord1	–1.652	1.9827	0.6273	3.3381
repression_ord1	–0.831	0.6705	–1.1838	2.5248
repression_ord1	0.593	–1.6054	–5.9384	2.7276
repression_ord1	1.826	–3.576	–10.2786	3.1266
repression_ord1	2.393	–4.4822	–12.2899	3.3254
repression_ord2	–1.652	2.6633	–4.0098	9.3363
repression_ord2	–0.831	1.5031	–3.1112	6.1174
repression_ord2	0.593	–0.5093	–4.0969	3.0783
repression_ord2	1.826	–2.2517	–8.4367	3.9333
repression_ord2	2.393	–3.053	–10.8058	4.6998
repression_ord3	–1.652	–2.1369	–6.2632	1.9895
repression_ord3	–0.831	–2.2886	–5.6307	1.0536
repression_ord3	0.593	–2.5517	–6.1509	1.0475
repression_ord3	1.826	–2.7795	–7.9503	2.3912
repression_ord3	2.393	–2.8843	–8.9578	3.1891
repression_ord4	–1.652	–1.4009	–10.7489	7.9472
repression_ord4	–0.831	–2.1591	–9.0006	4.6824
repression_ord4	0.593	–3.4741	–7.4717	0.5235
repression_ord4	1.826	–4.6128	–10.0744	0.8487
repression_ord4	2.393	–5.1364	–12.124	1.8511

However, there is no significant evidence of effect modification in the model predicting the occurrence of any protest (see table 9).

Table 9. ***Average marginal conditional effects of CSO repression on any protest event occurrence probability at quantiles 0.25, 0.5, 0.75, 0.9, and 0.95 of IC (logistic model; IUS = 71.6)***

Factor	IC	AME	Lower	Upper
repression_ord1	–1.652	0.141	–0.0293	0.3113
repression_ord1	–0.831	0.0969	–0.0929	0.2866
repression_ord1	0.593	0.0263	–0.3953	0.448
repression_ord1	1.826	–0.0277	–0.6746	0.6193
repression_ord1	2.393	–0.0502	–0.8009	0.7006
repression_ord2	–1.652	0.2288	–0.0936	0.5513
repression_ord2	–0.831	0.1719	–0.082	0.4257
repression_ord2	0.593	0.0748	–0.2046	0.3542
repression_ord2	1.826	–0.0067	–0.4854	0.4721
repression_ord2	2.393	–0.0432	–0.6488	0.5624

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Factor	IC	AME	Lower	Upper
repression_ord3	–1.652	–0.371	–0.8622	0.1202
repression_ord3	–0.831	–0.304	–0.7481	0.1401
repression_ord3	0.593	–0.1648	–0.5108	0.1811
repression_ord3	1.826	–0.0567	–0.4228	0.3094
repression_ord3	2.393	–0.0184	–0.4089	0.3721
repression_ord4	–1.652	0.1405	–0.7689	1.0499
repression_ord4	–0.831	0.0278	–0.7421	0.7977
repression_ord4	0.593	–0.1885	–0.5599	0.1829
repression_ord4	1.826	–0.3809	–0.9327	0.1708
repression_ord4	2.393	–0.465	–1.2212	0.2912

Online censorship also changes the repression effect on large protest probability. Lower censorship makes the weak repression effect significantly positive which conforms to Hypothesis 5. The is no evidence of moderation for other repression severity levels (see table 10).

Table 10. ***Average marginal conditional effects of CSO repression on large protest event occurrence probability at quantiles 0.25, 0.5, 0.75, 0.9, and 0.95 of IC (logistic model; IUS = 71.6)***

Factor	IC	AME	Lower	Upper
repression_ord1	–1.652	0.0861	0.0074	0.1648
repression_ord1	–0.831	0.0265	–0.0326	0.0857
repression_ord1	0.593	–0.0213	–0.1336	0.0911
repression_ord1	1.826	–0.0348	–0.2084	0.1388
repression_ord1	2.393	–0.0378	–0.2423	0.1667
repression_ord2	–1.652	–0.0251	–0.0689	0.0187
repression_ord2	–0.831	–0.0215	–0.0816	0.0386
repression_ord2	0.593	–0.0083	–0.1278	0.1112
repression_ord2	1.826	0.0147	–0.2269	0.2564
repression_ord2	2.393	0.0305	–0.3122	0.3732
repression_ord3	–1.652	–0.0248	–0.0807	0.0311
repression_ord3	–0.831	–0.0211	–0.0974	0.0553
repression_ord3	0.593	–0.0074	–0.1356	0.1207
repression_ord3	1.826	0.0162	–0.1763	0.2087
repression_ord3	2.393	0.0323	–0.211	0.2756

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Factor	IC	AME	Lower	Upper
repression_ord4	–1.652	–0.0332	–0.0557	–0.0108
repression_ord4	–0.831	–0.0345	–0.0808	0.0118
repression_ord4	0.593	–0.0369	–0.1467	0.0729
repression_ord4	1.826	–0.0391	–0.212	0.1339
repression_ord4	2.393	–0.0401	–0.2443	0.1641

There is no full confirmation of Hypothesis 5, only the effects of the weakest repression change in conformity with this hypothesis in some specifications.

As for the impact of online censorship on the repression effect at low levels of Internet penetration (Hypothesis 4), it makes the effect of weak repression on any protest event probability significantly positive. The decrease in online censorship, on the other hand, makes the effect of complete and violent CSO destruction on both large protest event probability and any protest event probability negative (see tables SM.30, SM.35, and SM.40 in the Supplementary Materials). These results reject Hypothesis 4.

Discussion and Conclusion

The regression analysis results enable me to make preliminary conclusions about the effects of various repression types and the ways in which Internet penetration and Internet censorship modify them. First, long-term CSO repression is more efficient in large protest prevention than in the prevention of other protests. Though harsh repression reduces the likelihood of large protests, none of the repression types is demonstrated to decrease the number of protesters in general and the likelihood of a protest event with any number of participants. This result may be explained by the proposition that it is not difficult to mobilize a relatively small number of people, even in repressive contexts. The negative effects of resource depletion might be compensated by increased CSO opposition to the government that represses them and by CSO adaptation to repression. This logic is supported by the result that the weakest form of repression increases the probability of protest event occurrence and the number of participants. However, statistical analysis shows that it is difficult to mobilize a large number of protesters if CSOs are destroyed and their members are violently repressed. Other repression types do not exert a statistically significant and robust effect even on large protest probability, which might result from the inability to uncover effects due to the need to use conservative standard errors but could also signify large resilience to all repression except complete violent destruction. Unless repression violently and completely destroys CSOs, it is unable to prevent large protests.

The second important result is that the long-term repression effect on protesters number has an inverted-U form, which is close to the predictions of relative deprivation theory [Gurr, 1970]. Protest participation is reduced when weak repression forms are replaced with harsher forms, but the harsh repression does not reduce protester numbers in comparison with null repression.

As for the conditional effects, the growth of Internet users modifies the impact of offline repression on protest activity. Uncensored Internet strengthens the positive effects of weak repression and removes the negative effects of harsh repression where

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they are present. These findings corroborate theoretically grounded ideas that offline repression is inefficient in terms of protest prevention and protester number reduction in the age of the developed Internet. Furthermore, high Internet penetration is likely to strengthen the positive effect of weak repression. The findings support the literature on the Internet as "liberation technology" [Diamond, 2010]. However, the Internet can be censored. Though online censorship cannot help repression to decrease protesters numbers, it reduces the long-term backlash effect of weak repression in the cases when IUS is high. However, this is the only discernible online censorship modification effect.

I see two avenues for future research. First, it is necessary to study the CSO repression effect in longer time horizons (not in year $t+2$, but further). The check of hypotheses at the period $t+3$, $t+4$, and beyond will be a good robustness check. It is probable that the hypothesized long-term effects materialize not after one year, but later. However, these claims should be tested on this dataset and other data sources. This will also serve as a further robustness check for obtained results.

At the same time, my inability to fully confirm all hypotheses and theoretical propositions for all CSO repression levels reveals the need for theoretical work concerning the impact of particular repression types with the Internet and particular censorship methods. This work is especially needed because the repression effect does not change linearly with the growth in their severity. Moreover, the ways that CSOs adapt to various repression forms, IUS growth and online censorship must be accounted for in further theoretical work.

All the results of this paper should not be regarded as a recommendation to use repression and/or censorship. Though some repression forms may in some contexts dampen protest activity in the long term, I do not advise using them as they (especially harsh forms) are very likely[32] to constitute human rights violations[33]. Moreover, repression has negative consequences for political leaders from an instrumental point of view. First, short-term repression costs in terms of protest waves might be prohibitive. Second, reliance on force to retain power requires the creation of strong repressive state organizations which increase the risk of coup d'état [Svolik, 2012]. Third, harsh collective repression leads to a higher risk of civil war initiation [Hultquist, 2017].

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