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Empowering activists or autocrats? The Internet in authoritarian regimes

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Abstract

The reported role of social media in recent popular uprisings against Arab autocrats has fueled the notion of 'liberation technology', namely that information and communication technology (ICT) facilitates organization of anti-government movements in autocracies. Less optimistic observers, on the other hand, contend that ICT is a tool of repression in the hands of autocrats, imposing further restrictions on political and social liberties. We investigate whether the liberation- or the repression-technology perspective can better explain empirically observed patterns. To this end, we analyze two outcomes. First, we look at which autocracies are more likely to adopt and expand the Internet. In line with the repression technology expectation, we find that regimes aiming to prevent any independent public sphere are *more* likely to introduce the Internet. Second, we study the effects of the Internet on changes towards democracy. This analysis reveals no effect of the Internet on political institutions. These findings provide moderate support for the 'repression technology' perspective, and suggest that the Internet has not – at least in its first two decades of existence – contributed to a global shift towards democracy.

Keywords

autocracies, ICT, regime change

Introduction

Every year in the spring, *TIME Magazine* selects the 100 most influential people in the world. In 2011, one of these people was Wael Ghonim, an Internet activist who, during the Arab Spring, used Facebook to mobilize people for political protest. According to Mohamed El-Baradei, 'he quickly grasped that social media, notably Facebook, were emerging as the most powerful communication tools to mobilize and develop ideas' (El-Baradei, 2011). Statements of this kind abound in the popular discourse about the political effects of modern communication technology. It seems to be a widely accepted view that the Internet and cell phones change things for the better or, in other words, constitute an instance of 'Liberation Technology' – 'any form of information and communication technology (ICT) that can expand political, social, and economic freedom' (Diamond, 2010: 70). In contrast to this optimistic view, others have cautioned against a purely beneficial assessment of modern ICT. Among the most prominent pessimists is Evgeny Morozov (2011), who argues that these technologies can serve much more sinister goals in the hands of autocrats. Before the presidential election in Uzbekistan in 2007 for example, the *BBC* (2007) reported that access to websites carrying information independent of the regime was becoming increasingly restricted, even when using proxy servers. Similar claims were made during the Iranian presidential election in 2009. Moreover, Internet connectivity can facilitate the identification of individuals propagating or even seeking out material that is critical of the

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political power holders. The numerous arrests of bloggers in Vietnam provide one such example. Finally, digital censorship is not limited to filtering out regime-critical content and identifying dissidents; it can also be used to spread messages in favor of a regime, thus increasing pro-government mobilization and support. An example of this is Hugo Chávez's promotion of 'Bolivarianism' on social media.

Optimists or pessimists: who is right? There has been little systematic research to back up the claims made by either side, as research on the political effects of ICT is only just beginning to emerge (see e.g. Pierskalla & Hollenbach, 2013). Some research has examined the relationship between Internet and democratization (Groshek, 2009), or Internet and governance (Khazaeli & Stockemer, 2013), finding positive correlations between the Internet and the quality of political institutions. These results, however, may simply be due to the fact that democracies are (not surprisingly) much more open to introducing digital communication (Milner, 2006), and may thus not indicate a causal effect. Previous research notwithstanding, little existing research has focused on variation in Internet coverage across autocratic countries, and the effects of the technology on these regimes (notable exceptions include Corrales & Westhoff, 2006; Kalathil & Boas, 2003). If the Internet fosters public dissent and ultimately leads to more democracy, its introduction should be a threat to dictators and negatively affect the survival of authoritarian regimes. However, authoritarian longevity cannot be addressed without taking into account why regimes would allow access to the Internet in the first place, an aspect that is largely ignored in the popular discourse. Since the Internet may give rise to a new, digital public sphere that could be much more difficult to control than the one based on more traditional media, regimes will carefully consider the potential consequences resulting from its introduction. Therefore, much in line with Milner (2006) and Corrales & Westhoff (2006), we first have to think about which regimes connect their countries to the Internet, and under what circumstances they do so.

In doing so, we distinguish regimes that worry about public opinion and those that do so to a lesser extent. If the former are more likely to expand, this should be due to the fact that modern communication technology, in particular the Internet, is not immune to government interference. Rather, as illustrated in the examples above, autocratic regimes benefit from these technologies through ample opportunities to censor and influence public opinion and to track members of the opposition. Our first empirical analysis confirms this suspicion: regimes that are concerned about public opinion – and go to great lengths to censor it – are more likely to expand the Internet. In our second analysis, we turn to the question of how Internet expansion affects changes towards democracy. Here, we fail to find any evidence that the Internet is linked to positive changes in democracy scores. When looking more closely at democratic and autocratic changes from 2006 to 2010, the data indicate that movements toward democracy are more frequent in countries with *low* Internet penetration. No country in the low penetration group experienced autocratic change in this period, while six countries in the high penetration group did. Our findings shed considerable doubt on the frequently held assumption that the Internet universally, and unconditionally, fosters freedom and democracy. Autocrats are likely aware of the tremendous potential this technology has for creating and maintaining a tightly controlled sphere of public opinion. Looking back at mankind's first two decades of experience with Internet technology, our results suggest that in the wrong hands, Internet, cell phones, and other modern means of communication can serve evil purposes.

Below, we first elaborate on the role of traditional media in authoritarian politics, the notions of 'liberation technology' and 'repression technology', and the hypotheses resulting from these perspectives. Second, we devise a research design, test the theoretical expectations in a large-N analysis, and look more closely at instances of democratic and autocratic shifts after the introduction of Web 2.0. Finally, using Saudi Arabia as a case example, we illustrate how the Internet can be controlled and shaped in favor of power holders.

Old and new media in authoritarian politics

The literature on authoritarian survival distinguishes broadly between threats arising from within the country's elite and those resulting from popular opposition. Consequently, in order to stay in power, a dictator has to solve the two fundamental 'problems of authoritarian rule' (Svolik, 2012: 3): the problem of power-sharing by making (policy or resource) concessions to regime elites, and the problem of mass control to prevent the rise of popular opposition leaders and uprisings. The bulk of the literature focuses on the former (e.g. Bueno de Mesquita et al., 2004; Magaloni, 2008, 2010; Reuter & Gandhi, 2011), while research on the latter is more sparse. The role of media – both traditional and ICT – directly concerns the latter challenge to authoritarian rule: dealing with political opposition from outside the regime. If the political opposition is allowed to freely circulate ideas that are at odds with the regime and recruit followers, the position of current power holders would be compromised.

Hence, the main incentive for autocrats to control the information environment is due to old and new media's potential role as a tool of mass communication (and potentially, mass mobilization).

The view of the media in authoritarian politics has long been that they are key to strengthening the rule of dictators. Classic work on totalitarian regimes asserts that through mass communication, totalitarian rulers attempt to assert control over the population (Friedrich & Brzezinski, 1965: 22). In contemporary authoritarian environments, mass media have been shown to serve government purposes as propaganda devices, and scholarly work points to the advantage that constitutes for the people in power. Stockmann & Gallagher (2011), for example, find that exposure to mass media in China makes citizens less critical of the political system. Geddes & Zaller (1989) find the same relationship in their study of the military dictatorship in Brazil, but argue that the effect of propaganda crucially depends on political awareness. Kern & Hainmueller (2009), however, find no effect of outside, uncensored media as compared to domestic ones. Finally, under certain circumstances, and despite the potential perils of free media, autocrats may even permit limited freedom of the press, in order to enable an outside check on the effectiveness of their bureaucracy (Egorov, Guriev & Sonin, 2009).

In sum, there is scholarly agreement that when a regime is able and willing to exercise control, and when news outlets are used to perpetuate regime-friendly messages, the people in power are likely to fend off potential opposition and stay in power (Edmond, 2011). This perspective is largely based on the media as a broadcasting device, where central agencies such as newspapers or TV stations send out messages to the broad population. Once a regime controls these central nodes, it can use them to its own benefit. 'Liberation technology' arguments now assume that modern communication, most importantly the Internet, change this fundamentally. First, the Internet can bring about an increased influx of foreign information and ideas. Citizens in a dictatorship can learn about conditions abroad and in turn develop aspirations for domestic change (Lynch, 2011). For example, writing about the Arab Spring, Mohamed El-Baradei argues that the Internet played a key role for the protests in Egypt because it gave young Egyptians an idea 'of the freedoms and opportunities they lack' (El-Baradei, 2011). Furthermore, recent research highlights the importance of a 'linkage to the West' – also in terms of information flows – in bringing about democratic change (Levitsky & Way, 2010). The second effect of Internet-transmitted information flows in dictatorships is domestic. Information communicated online can be sent to like-minded citizens at home and facilitate the organization of local opposition and protest (Lynch, 2011). Here, the argument is that through increased information transfer, it becomes more likely for domestic dissidents to recruit followers and overcome the collective action problem (Diamond, 2010; Pierskalla & Hollenbach, 2013). The Internet can in these situations be a powerful tool for opposition elites seeking to spread their political agenda and/or organize anti-regime demonstrations. In these accounts, the Internet should increase both international and domestic flows of information and thus make it more difficult for the dictator to solve the problem of authoritarian control.

In short, according to 'liberation technology' proponents, the Internet should bring about two effects: first, it should make the control of broadcasting mechanisms more difficult as compared to traditional media. Second, and more importantly, it introduces a fast and effective 'peer-to-peer' communication channel that facilitates mobilization of the opposition. However, these are by no means necessary consequences. Scholars emphasizing 'repression technology' contend that the Internet, similar to traditional media, is not free from government interference (Boas, 2006). In particular, sophisticated technology for tracking users and filtering content puts governments in a position to block unwanted opposition activity on the Web and to use the Internet in their favor. Internet technology also makes it possible to track suppliers and consumers of information. Conveniently for autocrats, online services are often provided by state-run telecommunication agencies (e.g. in Belarus, Iran). These agencies link individual PCs with the larger Internet backbone, meaning that they can monitor all the traffic generated by these computers and also have information on subscribers. However, even when the suppliers of Internet connections are privately owned, they are often obliged to comply with government requests. After the May 2014 coup in Thailand, for example, the Norwegian telecommunications company Telenor censored content on orders from the military junta (Winsnes, 2014).

For the broadcasting mechanism, this means that the Internet – similar to traditional media – may be prone to censorship. Sophisticated technologies exist for filtering unwanted content, for example by selectively removing search results or by shutting down traffic to certain websites.[1] As the example of China shows, sophisticated suppression of certain types of content can tilt reporting

[1] See https://opennet.net/about-filtering for an overview of content filtering.

clearly in the government's favor and eliminate dangerous seeds of discontent (MacKinnon, 2011; King, Pan & Roberts, 2013). However, although often referred to, China is not the only regime that openly censors online content. In 28 out of the 34 autocratic regimes investigated by the OpenNet Initiative, some form of political or social censoring on the Internet was uncovered, indicating that digital censorship is by no means limited to a few wealthy autocratic regimes (data from OpenNet Initiative, 2013). Note that Internet censorship need not be complete, in the sense that no content not sanctioned by the regime can be accessed by users, or constant, in the sense that a website is blocked permanently in order to have the desired effect. Indeed, simply signaling presence on the Web may be equally effective in deterring consumption of certain information. For example, a user met by a block page is being made aware that (1) the government does not approve of the content the user is seeking access to, and (2) the government is paying attention to online activity. That being said, there is evidence that the Internet is gradually being 'balkanized', and that 'instead of a World Wide Web [. . .] it is more accurate to say that we have a Saudi Wide Web, an Uzbek Wide Web, a Pakistani Wide Web, a Thai Wide Web, and so forth' (Deibert et al., 2008: 31). The most extreme example of this is mirrored in the statements made by Iran's head of economic affairs in 2011, revealing that the Iranian government is developing an 'Islamic Internet' that is planned to ultimately replace the World Wide Web (Noman, 2011).

In addition to eliminating unwanted content, governments also actively provide information that favors them. Morozov (2011) describes the apt use of Twitter by Hugo Chávez, which he used to boast support for his socialist vision. Another example is the hiring of regime-friendly bloggers by the Chinese government. In the latter scenario, it certainly helps that the Internet is often perceived as less biased than other media; hence, a blog report praising, for example, the success of a government housing project will be much more convincing as compared to an article in a national newspaper (Edmond, 2011). Thus, rephrasing Mussolini, the Internet may be the modern version of the capillary through which the blood of the dictatorship diffuses through society (see Gandhi & Przeworski, 2007: 1283).

The peer-to-peer mechanism may be equally prone to government interference. The fact that Internet services are often provided by government agencies gives the regime even better information about opposition dynamics than they had before. Identification of key opposition players can become easier with the help of the Internet, since computers can be employed to monitor traffic and identify suspects. Provided that governments have the capabilities to track suppliers and consumers of information, this argument implies that autocrats will *always* benefit from the introduction of Internet, because the societal elites that are likely political challengers are almost certainly part of the intellectual, urbanized population that is allowed access in the first place. This means that autocratic governments can reap the benefits of the new technology even with very limited coverage, as it exists for many of these countries today.[2] Given the relatively low Internet penetration in autocracies, the peer-to-peer mechanism might be more salient than the broadcasting mechanism, at least in the early years. Moreover, analogous to the signaling effect of a block page described above, arresting a 'cyber-dissident' sends a strong signal of government presence and policing of online activity, aimed at deterring similar activity in the future. This encourages self-censorship, either by not voicing against the regime online or even by compelling moderators of newspapers, forums, blogs, etc. to remove content posted by users that could lead either to censorship of the website or to the arrest of its maintainer.

Given the potential risks and advantages of digital technology, should an autocratic government strive to implement and expand Internet coverage? To be sure, the Internet is not imposed on a particular country from the outside; rather, its introduction relies critically on the permission and support of the domestic government (Milner, 2006). In other words, autocratic leaders are ultimately in charge of the decision to implement or not. Moreover, regimes vary greatly in the extent to which they tolerate independent and potentially regime-critical public opinion. With the Internet's potential to influence exactly that, studying the relationship between an independent public sphere and a government's decision to implement and expand the Internet can tell us about the underlying motivation for the latter. In order to gauge the regime's tolerance of an independent public sphere, we look at press censorship as an indicator. While press censorship is generally higher in autocracies than in democracies, there is still considerable variation in the extent to which dictators censor and curtail the media (Freedom House, 2011a; Egorov, Guriev & Sonin, 2009). High levels of press censorship indicate that a regime is wary of public opinion and actively shapes

[2] There are only very few autocratic countries today in which the majority of the population can use the Internet (Malaysia, Oman, Singapore, and the United Arab Emirates).

domestic information flow. If the Internet can serve governments through the broadcasting or peer-to-peer mechanisms, it should be the regimes with high levels of press censorship that are most eager to implement this technology. Thus, if the repression technology proponents are right, we should see that:

Hypothesis 1a (repression technology): Authoritarian regimes with *high* levels of press censorship are more likely to adopt and expand the Internet.

On the other hand, it could be that regimes less concerned with keeping a tight grip on information are less reluctant to implement the new technology, and happily reap the economic benefits of being connected. This would allow for a more open, uncensored online environment that could be used to promote benign political change. According to this perspective, we should expect that:

Hypothesis 1b (liberation technology): Authoritarian regimes with *low* levels of press censorship are more likely to adopt and expand the Internet.

While studying the implementation of the Internet can serve as a first test of the repression vs. liberation technology argument, the real test is to analyze the effect of the Internet on democratic (institutional) change. Again, what direction of effect we predict depends on whether we subscribe to a repression technology or liberation technology perspective. If the Internet serves as the dictator's tool to track (potential) dissidents or control and manipulate public opinion, this should ultimately strengthen authoritarian rule and make shifts towards democracy less likely. Therefore, one hypothesis is that:

Hypothesis 2a (repression technology): Internet coverage in autocratic regimes *decreases* the likelihood of democratic change.

However, liberation technology proponents would disagree, and point to the Internet as a tool to strengthen civil society and foster political opposition. Counter to the previous hypothesis, we should then expect that:

Hypothesis 2b (liberation technology): Internet coverage in autocratic regimes *increases* the likelihood of democratic change.

In sum, analyzing both Internet implementation and its effect on democratic change should help us distinguish empirically between repression technology and liberation technology arguments. If the repression technology perspective is closer to reality, we should see that strongly censoring regimes should be among the most eager adopters, and that Internet coverage has a negative effect on democratic change. For there to be evidence of liberation technology, on the other hand, more open regimes should adopt and expand the Internet and, in turn, the largely untouched online sphere should positively impact the likelihood of a democratic change. In the following, we describe our attempts to operationalize and test these hypotheses.

Empirical approach

In order to investigate the theoretical propositions detailed above, we conduct large-N analyses on authoritarian country years 1993–2010. We focus on the period after 1990 since this is when the Internet started to slowly expand and became a technology accessible to a broader audience. Furthermore, we delimit our sample of autocracies using data from Geddes, Wright & Franz (2012, 2014: first introduced in Geddes, 1999).

As described in the theoretical section, it could be that autocratic regimes that are wary of public opinion will expand the Internet (Hypothesis 1a). This allows them to use the Internet as another means to shape public opinion and to identify threats in society. On the other hand, it could also be that the Internet is expanded by regimes that are more tolerant of independent information flow (Hypothesis 1b). This would allow for a more open, uncensored online environment that could be used to promote benign political change. Second, we investigate whether Internet penetration serves to stabilize autocracies (Hypothesis 2a) or whether it increases the chances of democratic shifts (Hypothesis 2b).

First, to explain variation in Internet adoption, country fixed effects OLS models are estimated on two different dependent variables: % *Internet penetration* and *Change* (Δ) *in Internet penetration from one year to the next*. The values of the variables indicate the percentage (and increase in percentage) of individuals in a country using the Internet, approximated using a variety of sources, among them telecommunications companies, as well as international and state agencies (International Telecommunication Union, 2012). The models estimated on *Change in Internet penetration* produce a first difference model, making sure that our results are not driven by correlated variable trends. In the 1993–2010 period, the mean percentage of Internet penetration in autocracies increases monotonically from zero to 20%. Other variables of interest exhibit similar trends, increasing the risk of spurious relationships.

Second, to estimate the effect of Internet penetration on changes in democracy, we fit random effects logistic regressions using two dependent variables, derived from

Polity IV scores (Marshall, 2014) and Geddes, Wright & Franz (2012, 2014), respectively. The first dependent variable, *Democratic change (Polity IV)*, is a dichotomous variable taking the value 1 if a regime moves in a democratic direction, 0 otherwise. For example, when Gabon changed from –4 to 3 in 2009, *Democratic change (Polity IV)* takes the value 1. The second dependent variable, *Democratization (GWF)*, is a dichotomous variable indicating transitions to democracy as operationalized by Geddes, Wright & Franz (2012, 2014).

We identify the degree to which regimes are concerned with controlling and shaping public opinion using *Press censorship* from Freedom House (2011a). The index is a continuous indicator of media freedom composed of assessments of the legal environment for domestic media, political influences on reporting, and economic factors that can affect information access. Values range from 0 (no censorship) to 100 (complete censorship). We also estimate models where we lag *Press censorship* three years, to provide further evidence for the direction of causality.

To reiterate, in the Internet adoption OLS estimations, we expect press censorship to be either positively or negatively associated with the expansion of Internet coverage (Hypotheses 1a and 1b). Furthermore, in the regime change models the 'repression technology' argument would predict Internet penetration to be negatively associated with democratic changes (Hypothesis 2a). If, on the other hand, there is evidence for the 'liberation technology' hypothesis, we would expect that as Internet penetration increases, so does the probability of democratic shifts (Hypothesis 2b).

Alternative explanations

We include a number of control variables in our models to account for alternative explanations. In the following we expand on four prominent alternative explanations, namely (1) financial capabilities, incentives, and wealth, (2) ongoing domestic unrest, (3) regime type, and (4) size and composition of population.

The financial capabilities and incentives story is perhaps the most prominent alternative argument for growth in Internet penetration. Advocates emphasize that Internet expansion is driven by economic capabilities and prospects for economic growth. Wealth generated by the new technology (e.g. through increased trade or increased efficiency in the public and private sectors) would arguably increase the rents available to elites and could help bolster the repressive apparatus, including the ability for press censorship. Moreover, Internet-provided services can help boost the domestic economy, but are also key drivers of international economic linkages. For domestic enterprises, marketing their products and services online can mean huge increases in profit (Unwin, 2009; Corrales & Westhoff, 2006). International trade also requires up-to-date communication technology in order to facilitate the flow of information (Freund & Weinhold, 2004). According to this view, the expansion of the Internet as well as the degree of media censorship would be driven by financial capabilities and the economic benefits directly related to new technology rather than concerns about public opinion or regime longevity. It could also be that access to non-digital news is higher in wealthy countries with more capable citizens, prompting the regime to censor more. We partial out these effects as much as possible by including lagged values of GDP per capita, GDP per capita growth, oil/gas income, and trade openness (percentage of GDP) in our models (World Bank, 2012; Heston, Summers & Aten, 2012; Ross, 2001, 2009).

Second, ongoing domestic unrest can potentially affect both attempts to control the domestic media and attempts to expand the Internet. In countries ridden with civil war for example, the conflict may deter expansion of the Internet, weaken the government's ability to control the domestic media, or even provide a reason to increase censorship. One line of argument would perhaps even suggest that autocratic governments challenged by rebel groups would intentionally avoid expansion for fear that the rebels can utilize the new technology for organization and recruitment (Pierskalla & Hollenbach, 2013). Moreover, one could argue that many countries challenged by rebel groups are weakened by years of conflict and may not have the capacity for expanding Internet penetration, much less the capacity to utilize the Internet in their favor. These governments may also be particularly prone to regime change. In order to take the ongoing domestic unrest story into account, we include the (logged) duration of a regime (Geddes, Wright & Franz, 2012) and a dummy for ongoing civil war (Themnér & Wallensteen, 2014; Gleditsch et al., 2002) in our models.

Third, one could assert that regime type matters for our variables of interest. The literature has identified patterns regarding the survival potential of different regimes. For example, military dictatorships are prone to breakdown, and institutionalized parties are beneficial to survival (Geddes, 1999; Svolik, 2012; Gandhi, 2008; Teorell, 2010). Similarly, it could be that regimes also pursue different strategies with regard to Internet implementation and press freedom. Personalist leaders, whose survival in office is often attributed to the loyalty of a small group of friends and relatives, could for instance be less likely to implement the Internet beyond a small group of people and be less concerned with controlling

Table I. The implementation of the Internet in authoritarian regimes

	(1) % Internet penetration	(2) % Internet penetration	(3) Δ Internet penetration	(4) Δ Internet penetration
Press censorship$_{t-1}$	0.033*** (0.010)		0.038*** (0.010)	
Press censorship$_{t-3}$		0.029* (0.011)		0.035** (0.011)
ln(GDP pc)$_{t-1}$	3.276*** (0.399)	3.817*** (0.461)	3.771*** (0.394)	4.203*** (0.452)
GDP pc growth$_{t-1}$	–3.09f** (1.124)	–4.941*** (1.405)	–3.502** (1.138)	–5.131*** (1.414)
ln(Trade openness)$_{t-1}$	–0.018 (0.326)	0.066 (0.401)	–0.005 (0.331)	0.117 (0.403)
Ongoing civil war	–0.162 (0.261)	–0.130 (0.303)	–0.070 (0.264)	–0.057 (0.305)
ln(Regime duration)$_{t-1}$	0.225 (0.137)	0.195 (0.169)	0.212 (0.139)	0.163 (0.170)
Polity$_{t-1}$	0.060 (0.040)	0.066 (0.050)	0.047 (0.041)	0.057 (0.051)
% Rural population$_{t-1}$	4.909 (3.698)	5.927 (4.626)	4.737 (3.753)	5.280 (4.657)
ln(Total population)$_{t-1}$	0.386 (0.856)	0.189 (1.040)	2.202** (0.798)	1.750 (0.953)
% Internet penetration$_{t-1}$	1.058*** (0.011)	1.046*** (0.013)		
Constant	–32.793* (15.099)	–33.613 (18.345)	–65.754*** (14.000)	–61.621*** (16.745)
Observations	1,027	901	1,027	901
No. of countries	81	76	81	76
Country fixed effect	Yes	Yes	Yes	Yes

Standard errors in parentheses. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

public opinion. Party regimes and monarchies, on the other hand, may have stronger incentives to control public opinion because of the strong ideological or religious roots of the regime. In order to take regime-specific explanations into account, we include regime type dummies from Geddes, Wright & Franz (2012) and the PolityIV score (Marshall, 2014) in our models.

Finally, we also consider the size and composition of the population. One could plausibly expect that the size of the population alone would be correlated with both the ability of the government to control the domestic press and the ability to expand the Internet to a larger share of the population. Moreover, a country with a larger rural population may find it harder to provide expansive Internet coverage than an urbanized country. There are also reasons to believe that the size and composition of the population is related to regime change. Dahl & Tufte (1973) and Lijphart (1977), for instance, argue that smaller countries are better able to sustain democratic institutions, and Teorell (2010) finds evidence that small countries are more likely to democratize. Finally, a large urban population may pose a greater threat to autocratic governments (e.g. through protests or riots) than a dispersed and spatially remote rural population. In order to account for this fourth alternative explanation, we control for total population and the percentage of rural population (World Bank, 2012).

Results

This section starts with the results of regression analyses to establish the broad patterns and consequences of Internet implementation in autocracies. We subsequently take a closer look at movements towards democracy and autocracy in low and high penetration countries in the Web 2.0 era, and present Saudi Arabia as a case example that highlights the main patterns in the data.

The implementation of the Internet in authoritarian regimes

Table I presents the results of OLS country fixed effects regressions testing Hypotheses 1a and 1b. In Model 1 and 2 the dependent variable is % *Internet penetration*, while it is *Change in Internet penetration* from one year to the next in Models 3 and 4. In Models 1 and 3 we lag *Press censorship* one year, while we lag it three years in Models 2 and 4.[3]

The estimate for *Press censorship* is positive and significant in all models, indicating support for the expectation of the 'repression technology' proponents (Hypothesis 1a). Regimes with high levels of press censorship have higher predicted levels of Internet implementation. In Models 1 and 2, an increase of ten points in *Press censorship* predicts an increase of 0.29–0.33% in Internet penetration. Moreover, in Models 3 and 4, the same increase in *Press censorship* is estimated to see a yearly change in Internet penetration of 0.35–0.38%. Although the estimated increases may seem

[3] Moreover, to provide further evidence for the direction of causality we include models in Table AIII in the appendix showing that the relationship does not hold if we reverse the order of our variables of interest. Internet penetration does not impact press censorship.

small, they are quite significant considering that the mean level of Internet penetration is around 5% for the observations included in the models. For the 'liberation technology' argument, the empirical findings presented here are puzzling. If the Internet enables dissenters to both express their discontent with the regime and potentially mobilize opposition rallies, the autocratic governments that most oppose free speech should be the *least* likely to implement the Internet. For proponents of the 'repression technology' hypothesis, however, the relationship makes more sense. If the Internet can be used as a tool to solidify autocratic survival by shaping public opinion as well as identifying dissidents, then more repressive regimes should be the most interested in providing online connections. Following a theoretical argument in line with the 'repression technology' argument, then, providing the political and societal elite with Internet access in these regimes is a calculated choice aimed at increasing control over the public sphere.

We have grouped the other variables according to the alternative explanations provided above. First, there is evidence that economic resources impact Internet adoption. The estimate for GDP is positive in all models. The estimate stays positive even when we include income from natural resources in the models in Table AI (see appendix). The estimate for GDP pc growth, on the other hand, is significant and negative, indicating that booming economies have lower levels of Internet coverage and slower implementation rates. Moreover, there is no indication that trade or natural resource endowment impacts implementation of the Internet in autocracies. Second, the models do not supply much evidence in support of the ongoing domestic unrest explanation, as the estimates for both regime duration and ongoing civil war are insignificant. Third, the results also provide little evidence that regime type matters for the expansion of the Internet when taking the other explanations into account. In both Table I and Table AI the estimates for Polity, military regime, monarchy, and personalist regime are insignificant. Fourth, the estimates for the percentage of rural population and total population are also insignificant in most models, showing little support for the alternative explanation related to the size and composition of the population. Finally, the effect of Internet penetration is highly significant and positive in Models 1 and 2. Once the Internet has been implemented for a certain portion of the population, it is unlikely to be rolled back.

To summarize, the results in Table I and Table AI indicate support for the notion that the Internet is adopted by authoritarian regimes that are likely to use it in their favor. In the next section we turn to an empirical test of whether Internet implementation and expansion have an impact on regime change.

The effect of the Internet on democratic change

The results presented above imply that the introduction and expansion of the Internet is a calculated choice by dictators and should not increase the likelihood of changes towards democracy. If anything, the relationship should be in the opposite direction. In the following we make an attempt to probe such a relationship by estimating the impact of Internet expansion on democratic change. If the Internet is negatively correlated with changes towards democracy (or has no effect), this may be further evidence consistent with the 'repression technology' argument.

The results are presented in Table II. As the models show, there is little evidence of any effect of Internet penetration on democratic shifts. In other words, we cannot conclude that the implementation of the Internet promoted institutional change toward democracy in the 1993–2010 period, nor that it necessarily deterred such change. We also estimated the effect of Internet penetration in a multinomial model with separate outcomes (democratic and autocratic change using Polity IV). As Table AII in the appendix illustrates, there is no discernible effect of Internet penetration on regime change in such a model either.

At this point, some readers may object that our conclusions are based on the period 1993–2010 of global Internet expansion, because the Web has changed profoundly during and after this time. After all, recent innovations such as social media and the 'Web 2.0' were credited as accelerators of mobilization in Egypt in 2011. Can these results tell us anything about the effect of Internet today? In order to more thoroughly probe this question we take a closer look at movements towards democracy and autocracy using Polity IV data in low and high Internet penetration countries over the last five years of our time series (2006–10). These episodes of regime change are presented in Table III. Using this tabulation, we can compare the number of episodes in each group and intuitively examine the patterns of Internet penetration and regime change.

First and foremost, within the low penetration group there are 11 movements towards democracy in nine countries and zero movements towards autocracy. This implies that there is no evidence to suggest that *not* implementing and expanding the Internet deters democratic change. In fact, the observed pattern of regime change in countries with low Internet penetration was unidirectional in the 2006–10 period, toward more democracy. Moreover, while there are no movements towards autocracy in the low penetration set of countries, there are eight episodes of autocratic regime change in six countries in the high penetration group, weighing the evidence in favor of repression technology. In addition, there are almost twice as many countries (nine vs. five) experiencing movements towards democracy

Table II. Estimated effect of Internet adoption on democratic change

	(5) Democratic change (Polity IV)	(6) Democratization (GWF)	(7) Democratic change (Polity IV)	(8) Democratization (GWF)
% Internet penetration$_{t-1}$	–0.008 (0.021)	–0.066 (0.062)		
Δ Internet penetration			–0.198 (0.138)	–0.239 (0.276)
ln(GDP pc)$_{t-1}$	–0.256 (0.231)	0.157 (0.459)	–0.204 (0.229)	0.114 (0.452)
GDP pc growth$_{t-1}$	–2.292 (1.589)	–3.435 (3.689)	–2.221 (1.605)	–3.291 (3.675)
ln(Trade openness)$_{t-1}$	0.006 (0.257)	1.162* (0.553)	0.038 (0.253)	1.042* (0.531)
ln(Oil/gas income)$_{t-1}$	–0.015 (0.015)	–0.075* (0.035)	–0.015 (0.015)	–0.069* (0.033)
Ongoing civil war	0.043 (0.271)	–0.037 (0.561)	0.032 (0.271)	–0.107 (0.561)
Military regime	1.834*** (0.379)	4.178*** (0.794)	1.856*** (0.378)	4.098*** (0.783)
Monarchy	0.121 (0.595)	–0.471 (1.211)	0.169 (0.596)	–0.475 (1.209)
Personalist regime	0.476 (0.300)	0.726 (0.742)	0.517 (0.302)	0.693 (0.739)
ln(Total population)$_{t-1}$	0.162 (0.128)	0.370 (0.269)	0.186 (0.127)	0.340 (0.264)
% Rural population$_{t-1}$	0.268 (1.250)	3.448 (2.578)	0.295 (1.257)	3.570 (2.553)
Constant	–3.388 (3.430)	–18.112* (7.083)	–4.224 (3.390)	–16.929* (6.813)
Observations	1,051	1,071	1,051	1,071
No. of countries	82	83	82	83

Standard errors in parentheses. Time since transition (as well as its squared and cubed transformation) not displayed.*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Table III. Democratic and autocratic change (Polity IV), by Internet penetration 2006–10.

	Democratic change	*Autocratic change*	*Stable*
Below median Internet penetration	*11 country-years, 9 countries*	*0 country-years, 0 countries*	*136 country-years*
	Congo/Zaire (2006) Mauritania (2006, 2007, 2009) Nepal (2006) Zambia (2008) Myanmar (2008) Gabon (2009) Guinea (2010) Sudan (2010) Togo (2010)		e.g. Angola Cambodia Turkmenistan
Above median Internet penetration	*7 country-years, 5 countries*	*8 country-years, 6 countries*	*129 country-years*
	Kyrgyzstan (2006, 2010) Pakistan (2007, 2008) Thailand (2007) Malaysia (2008) Zimbabwe (2009)	Venezuela (2006, 2009) Jordan (2007) Kyrgyzstan (2007, 2009) Russia (2007) Iran (2009) Rwanda (2010)	e.g. Cuba Saudi Arabia Uzbekistan

in the low penetration group as in the high penetration group, also speaking against the notion that the Internet will foster democratic change. However, Table III does not uniformly weigh in favor of repression technology arguments either. In fact, the numbers of episodes and countries moving towards democracy and autocracy in the high penetration group are relatively similar, with two more countries experiencing autocratic change than democratic change.

Summing up the empirical evidence provided above, there is no indication that the introduction and expansion of the Internet has induced democratic change, while the opposing, more pessimistic view finds some support. Above, we asked whether our results can tell us anything about the effect of the Internet today, but what about tomorrow? We believe they can. While ICT is now available for use in both democracies and autocracies on a scale that was unheard of

15, ten or even five years ago, technologies of control and surveillance are rapidly developing at the same time. There are even reasons to conclude that tools of 'repression technology' are relatively inexpensive and available to most governments. In the last three annual reports on Internet censorship, Freedom House concluded that although there are spotty examples of 'activist victories', Internet freedom is deteriorating (Freedom House, 2011b, 2012, 2013a). Moreover, as mentioned above, the bulk of autocracies investigated by the OpenNet Initiative employ some form of political or social Internet censorship. For example, in Uzbekistan, with lower GDP pc than the mean autocracy,[4] digital censorship of political and social content is widespread. The OpenNet Initiative (2010) reported that 'the government employs sophisticated multilayered mechanisms to exercise control over the Internet, including adopting restrictive policies, applying technological measures, and compelling self-censorship of the media'. An even more recent example is the text messages sent around to participants in the recent protests in Ukraine. The text read: 'Dear subscriber, you are registered as a participant in a mass disturbance' (Kramer, 2014). Indeed, it seems that while ICT may be continually changing, the tools of control and surveillance are not lagging far behind.

In the next section, we present Saudi Arabia as a case example illustrating the main finding of this article, that the implementation and expansion of the Internet can play out in favor of autocratic governments.

The Internet in Saudi Arabia

Our case example, Saudi Arabia, illustrates that despite the introduction and significant expansion of ICT, the regime has maintained repression levels through the broadcasting and peer-to-peer mechanisms elaborated on in the theory section. The Saudi government is highly concerned with controlling the information environment and any attempts to oppose power holders. The press censorship scores illustrate this empirically. The mean press censorship score over the 1993–2010 period was 69.1, while Saudi Arabia's was 80.3. Moreover, the country's political institutions concentrate power in the hands of the royal family, as illustrated by the Polity score (–10). Indeed, Saudi Arabia seems to defy the central outcome of liberation technology arguments: a more open society. As the case illustrates, this is because the Internet is used as a tool to signal government presence and surveillance, propagate the 'correct' values, and identify potential dissidents. Indeed, despite the expansion of Internet access to 15 million Saudi citizens (Freedom House, 2013b), no significant threats to the regime have been documented. We emphasize that this is an example of how governments control and utilize the Internet in their favor, rather than an in-depth case study such as those presented in Kalathil & Boas (2003).

Abdullah of Saudi Arabia's power is based on heritage, and his right to rule is conditional on the public's acceptance of tradition and religious values as principles of government. In a highly secularized society for example, the religious values and acceptance of agnatic seniority as a valid form of power succession would erode, and the government is consequently very concerned with shaping the public sphere in their favor. This is reflected in the government's handling of ICT. In the evaluation of Internet censoring in Saudi Arabia, the OpenNet Initiative concludes that 'Internet filtering in Saudi Arabia mirrors broader attempts by the state to repress opposition and promote a single religious creed' (OpenNet Initiative, 2009: 5). The conclusion touches upon both the broadcasting mechanism – promoting the religious values that the king's power depends on, herein censoring unwanted content – and the peer-to-peer mechanism, identifying and repressing attempts to oppose the regime.

Regarding the broadcasting mechanism, there is evidence of both elimination of unwanted content and propagating regime-friendly information. As expected, given that the regime's legitimacy rests on sustaining certain values in the population, censoring of social content is most pervasive, but censoring of political content is also substantial (OpenNet Initiative, 2009). The online censoring regime in Saudi Arabia is as old and established as the Internet that was made available to the public in the late 1990s. Deibert et al. (2008: 32) argue that rather than introducing the Internet in its original form, 'the Saudi authorities decided to establish a system whereby they could stop their citizens from accessing certain materials produced and published from elsewhere in the world'. From the very beginning, there was only one single gateway through which Saudi citizens could access outside information. In fact, Kalathil & Boas (2003: 114) argue that public access was delayed until the government had established elaborate technological and institutional mechanisms for censorship. One feature of this filtering regime is the Saudi block page, telling the user that the content on a certain website is forbidden. The block page is not only effective in denying access to the information available, it arguably also signals that the state is present and aware of online activity. For fear of the consequences of continued attempts to access 'forbidden material', many users are deterred by such a warning from attempting to access similar content.

[4] In 2010, Uzbekistan had a ln(GDP pc) of 6.8, while the autocratic average was 7 (World Bank, 2012).

Moreover, as the Internet developed, so did the legal framework for controlling access as well as the technical sophistication of Internet filtering tools. One example of this is the latest development concerning restrictions on individuals' uploading of online material, including audio-visual content (e.g. YouTube). Citizens who want to post videos online will in the future have to get a government license containing the terms and conditions of production. Uploading videos without such a license will be made punishable by law (Noman, 2013). Other, perhaps more severe restrictions on Internet activity established in a legal framework include imprisonment for advocating or supporting terrorism, or distributing pornography or any other material that conflicts with the established societal standards in the kingdom (OpenNet Initiative, 2009). The same laws apply for providers and distributors of Internet access (e.g. cyber cafes), compelling them to keep their customers in line with the legal framework.

The recent changes to the legal framework and technical developments enable repression through the peer-to-peer mechanism. In Saudi Arabia, this is part of the larger Internet filtering regime, as individuals can be identified through their digital footprints when violating the legal framework online. The OpenNet Initiative (2009) provides examples of political and non-political cases of imprisonment for online activity. Moreover, similar to the signaling effect of a block page described above, arresting a 'cyber-criminal' sends a signal of government policing of online activity. Such a signal can be powerful, as it deters similar activity in the future and encourages self-censorship, and even censorship by providers of message forums, newspapers, blogs, etc. (Deibert et al., 2008).

These developments are by no means restricted to Saudi Arabia. The establishment of a legal framework to punish online activity, and the identification of individuals' digital footprints online is a global trend, encompassing not only autocracies, but also democracies. In fact, one of the central arguments made by Deibert et al. (2010) is that the establishment of legal restrictions on online activity in democracies paved the way for similar developments in autocracies. Attempting to control and identify users' behavior online is now the norm rather than the exception. As a result of these developments it is not surprising that the pattern of Internet expansion in Saudi Arabia also holds true in the other modern day monarchies: a continuous, rapid expansion of coverage throughout the 2000s. These regimes are often referred to as medieval in their conduct of politics, but in 2010 the remaining monarchies of the world boasted an average penetration of 45%, in direct defiance of the notion that the Internet leads to a more open society. Similar patterns of expansion, content filtering, promotion of regime-friendly material, and jailing of Internet users have also been observed in other types of autocratic regimes (e.g. China, Vietnam, Iran, Belarus, Uzbekistan, Cuba, Venezuela).

Conclusion

While previous research has established that expansion of the Internet is more likely to be implemented in democracies (Milner, 2006), this should not lead us to assume that the Internet fosters democratization. Rather, we will have to take a closer look at how non-democratic countries expand Internet coverage, under which conditions this occurs, and what effects it produces. We build on two prevalent and opposing beliefs about the implementation of the Internet in autocracies and its effects: the notions of 'liberation technology' and 'repression technology'. The former expects that the Internet will empower activists and democracy promoters, while the latter proposes that the new technology will serve to strengthen autocratic rule. We put these arguments to the test by looking at the empirical patterns of Internet implementation, expansion, and effect on regime change. Our first finding is that governments that are more concerned about controlling the domestic information environment have higher Internet expansion rates. The result directly contradicts the 'liberation technology' argument, because one would expect that such regimes would be deterred from implementing a technology that enables free information flow. From a 'repression technology' perspective, on the other hand, the finding is more intuitive. If the Internet can be used as a tool to solidify autocratic survival by shaping public opinion as well as to identify dissenters, then more repressive regimes should be the most interested in providing online connection. Since the users of ICT are likely to be members of the urbanized, intellectual, and political elite, monitoring has immediate information benefits for autocratic leaders.

Our second test, the impact of Internet penetration on regime change, is less conclusive but clearly does not produce evidence to suggest that democracy advances in autocracies that expand the Internet. If anything, the relationship is the opposite. By looking at episodes of democratic and autocratic changes in low and high penetration countries after the introduction of Web 2.0 (2006–10), we find that the frequency of democratic shifts is higher in the low than in the high penetration group. Conversely, the strengthening of autocratic rule seems to be more frequent in the group of more rapid adopters. Finally, we illustrated how the introduction of the Internet can play into the hands of autocratic governments by looking more closely at the mechanisms of

repression associated with the new technology in Saudi Arabia. In sum, the first two decades of humankind's experience with the Internet lends more support to the notion of 'repression technology' than 'liberation technology'.

As we have mentioned above, the Web is changing rapidly. Recent years have seen a huge increase in the adoption of social media and 'Web 2.0' technologies, which may lead readers to question whether the results presented in this article can tell us anything about the effect of ICT on political change today or tomorrow. It is our contention that they can. While user-friendly technology is being continually developed and made available at reasonable prices, so are tools of 'repression technology'. As our results show, there is little evidence to back up the enthusiasm that has surrounded ICT development's role in bringing about benign political change. As with many other types of technology, the Internet has its dark side. If democratic governments know how to take advantage of it – as evidenced in the recently leaked NSA and GCHQ programs – it might be naive to think that autocratic governments do not.

Replication data

Replication data and code for the empirical analysis in this article can be found at http://www.prio.no/jpr/datasets.

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Appendix

Table AI. The implementation of the Internet in authoritarian regimes

	(9) % Internet penetration	(10) % Internet penetration	(11) Δ Internet penetration	(12) Δ Internet penetration
Press censorship$_{t-1}$	0.032** (0.011)		0.036*** (0.011)	
Press censorship$_{t-3}$		0.027* (0.012)		0.033** (0.012)
ln(GDP pc)$_{t-1}$	3.307*** (0.415)	3.842*** (0.480)	3.848*** (0.408)	4.282*** (0.467)
GDP pc growth$_{t-1}$	–3.056** (1.138)	–4.953*** (1.427)	–3.410** (1.153)	–5.072*** (1.438)
ln(Trade openness)$_{t-1}$	0.008 (0.332)	0.091 (0.410)	0.040 (0.337)	0.165 (0.413)
ln(Oil/gas income)$_{t-1}$	–0.004 (0.024)	–0.005 (0.028)	–0.018 (0.024)	–0.018 (0.028)
Ongoing civil war	–0.170 (0.268)	–0.138 (0.309)	–0.059 (0.271)	–0.044 (0.310)
ln(Regime duration)$_{t-1}$	0.235 (0.144)	0.214 (0.182)	0.201 (0.146)	0.153 (0.183)
Polity$_{t-1}$	0.057 (0.041)	0.062 (0.053)	0.046 (0.041)	0.055 (0.053)
Military regime	–0.025 (1.219)	0.813 (2.016)	–0.102 (1.237)	0.317 (2.026)
Monarchy	0.000 (·)	0.000 (·)	0.000 (·)	0.000 (·)
Personalist regime	0.406 (0.910)	0.506 (1.370)	0.232 (0.923)	0.202 (1.378)
% Rural population$_{t-1}$	5.456 (3.798)	6.503 (4.734)	5.381 (3.854)	5.932 (4.766)
ln(Total population)$_{t-1}$	0.361 (0.907)	0.099 (1.114)	2.350** (0.838)	1.863 (1.007)
% Internet penetration$_{t-1}$	1.058*** (0.011)	1.046*** (0.013)		
Constant	–33.035* (16.034)	–32.852 (19.649)	–68.930*** (14.745)	–64.241*** (17.726)
Observations	1,010	886	1,010	886
No. of countries	80	75	80	75
Country fixed effect	Yes	Yes	Yes	Yes

Standard errors in parentheses. *p < 0.05, **p < 0.01, ***p < 0.001.

Table AII. Estimated effect of Internet adoption on democratic and autocratic changes

	(13)	
	Democratic change (Polity IV)	*Autocratic change (Polity IV)*
% Internet penetration$_{t-1}$	–0.009 (0.027)	0.004 (0.022)
ln(GDP pc)$_{t-1}$	–0.328 (0.234)	–0.846* (0.390)
GDP pc growth$_{t-1}$	–1.840 (1.434)	–2.007 (1.780)
ln(Trade openness)$_{t-1}$	0.034 (0.239)	0.949* (0.377)
ln(Oil/gas income)$_{t-1}$	–0.026 (0.015)	–0.010 (0.018)
Ongoing civil war	0.251 (0.355)	0.242 (0.451)
Military regime	1.740*** (0.368)	–0.159 (1.166)
Monarchy	–0.038 (0.388)	–0.982 (0.552)
Personalist regime	0.248 (0.247)	0.069 (0.375)
ln(Total population)$_{t-1}$	0.176 (0.131)	0.106 (0.215)
% Rural population$_{t-1}$	–0.359 (1.024)	–5.379* (2.125)
Constant	–3.728 (3.149)	–0.570 (5.599)
Observations	1,035	1,035
No. of countries	82	82

Robust standard errors in parentheses. Time since transition (as well as its squared and cubed transformation) not displayed. ***p < 0.001, **p < 0.01, *p < 0.05.

Table AIII. Internet penetration and press censorship

	(14) *Press censorship*	(15) *Press censorship*
% Internet penetration$_{t-1}$	0.002 (0.023)	
Δ Internet penetration		0.075 (0.082)
ln(GDP pc)$_{t-1}$	1.598 (0.848)	1.461 (0.843)
GDP pc growth$_{t-1}$	–1.126 (2.394)	–1.055 (2.390)
ln(Trade openness)$_{t-1}$	–0.494 (0.693)	–0.520 (0.693)
Ongoing civil war	–0.044 (0.558)	–0.043 (0.557)
ln(Regime duration)$_{t-1}$	0.614* (0.292)	0.608* (0.292)
Polity$_{t-1}$	–0.032 (0.085)	–0.033 (0.085)
% Rural population$_{t-1}$	1.410 (7.876)	1.342 (7.873)
ln (Total population)$_{t-1}$	1.812 (1.821)	1.639 (1.693)
Press censorship$_{t-1}$	0.669*** (0.022)	0.668*** (0.022)
Constant	–17.916 (32.105)	–13.961 (29.871)
Observations	1,025	1,025
No. of countries	81	81
Country fixed effects	Yes	Yes

Standard errors in parentheses. *p < 0.05, **p < 0.01, ***p < 0.001.

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