Call for Power

Mobile phones as facilitators of political activism

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Abstract

This thesis examines how mobile phones affect political activity. In a number of cases, the mobile phone as a uniquely easy-to-use and personal communication device has been a key tool to facilitate mobilization and collective action, such as during the impeachment process of President Estrada of the Philippines in 2001. Taking some of these case studies as a starting point, I find a plausible theoretical framework for analysis in the literature on collective action theory, mobilization and diffusion theory, and network society theory, which I develop further to include the novel aspect of mobile telecommunications. Mobile teledensity data and three political activism indicators in 191 countries are then tested with negative binomial Poisson and ordinal logistic regression over a period of 16 years. The results do not confirm the observations of the earlier case studies; I find no significant relationship between mobile teledensity and anti-government protests, riots, or major government crises.

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Preface

I would like to thank all those who have in some way or another helped to bring about this thesis. I wish to thank in particular my thesis supervisor during 2008, Håvard Hegre, who is Associate Professor at the University of Oslo and Adjunct Research Professor at the Centre for the Study of Civil War, International Peace Research Institute, Oslo (CSCW/PRIO). I am very grateful to have been able to benefit from his experience and his competent critique throughout the emergence of this work.

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The work on this thesis has also been greatly facilitated by the University of Oslo's superb facilities and the International Peace Research Institute of Oslo (PRIO) that provided me with essential data. Skype Technologies deserves my compliments for their highly useful and free communication software which made it very easy and safe to get in touch with my interview partners.

[1] My earlier papers that touch the topic of mobile phones and society can be found on www.miard.ch/papers/academic.html.

Finally, I would like to express my gratitude to my fiancée, Kadri Tammur for her critical comments on my thesis, for her contacts to the Estonian Parliament that made one of the interviews possible, and for her patience and moral support. Without her, this thesis would never have been written. Sven-Hendrik Gehnen deserves my gratitude for his support and helpful comments on my work; some of the credit for my M.A. degree will be his. I also wish to thank Livia Schubiger and Claude Meier for teaching me how to improve my research and formal writing skills during my time at the University of Zurich, and Neelima Khan for editing my English in this thesis. For making it possible for me to study and work in Norway, I wish to thank my family, Stefan Kehl, Claude Stofer, the Norwegian Research Council, and the Department of Political Science at the University of Oslo.

1. Introduction: A New Tool for Civil Society?

> *"Mobile communication is said to enhance the autonomy of individuals, enabling them to set up their own connections, bypassing the mass media and the channels of communication controlled by institutions and organizations"* (Castells et al. 2007:1).

In 2001, the elected President of the Philippines, Joseph Estrada, had to step down after weeks of demonstrations in Manila, the capital. The protesters who demanded his impeachment were mobilized via their mobile phones, mainly by waves of text messages calling for participation in street protests.

Some authors give mobile phones and networks a lot of credit for shaping outcomes such as the one in Manila, calling these mobile-phone enhanced protesters *smart mobs* (Rheingold 2002). But how much does the mobile phone really affect the outcome? Are a few calls or text messages enough to challenge the power of the state? The events in the Philippines and elsewhere were quite a sensation and have led a variety of scholars to embrace the issue and do research on the social and political impact of mobile phones. However, little systematic research beyond loose collections of case studies has been done so far. I wish to fill this gap by presenting a comprehensive theoretical discussion and extending the analysis to a larger number of cases using quantitative methods.

What role does the mobile phone have in social movements, and how does it work? I will start with presenting the Filipino event and illustrate the process with two further cases. In addition, I will include two interviews I performed with insiders of opposition movements, to further elaborate on the impact of mobile phones.

Next, I will look at what the theoretical literature has to contribute to the analysis of such events. What theories are capable of explaining the phenomenon in question? This section will be followedn by a hypothesis on possible political effects of mobile telecommunications, one that I will test with statistical methods.

The results of the regressions are discussed thereafter, followed by some concluding remarks and an outlook for future research.

1.1 Relevance of the study: A world connected

> *"[A researcher from Tufts University] interviewed me a while ago, but he was only interested in the Internet. I didn't have much to say about that, I would have rather talked about cell phones. Now there's finally someone interested in phones!"* (Ivan Marovic 2008[interview]).

Mobile phones have, other than the Internet[2], only recently received increased attention by political scientists (cf. Castells et al. 2007; Meier forthcoming). Unfortunately, research on mobile phones in this field and in other social sciences is often being lumped together with research on the Internet, usually under the umbrella term *Information and Communication Technologies* (ICT). These studies often fail to capture the distinct properties of mobile telecommunications because when they claim to analyze ICT, they do, in fact, largely deal with the Internet only (cf. Walker 2006:9-10; Nicholson 2005). This raises some doubts whether ICT can be useful as a concept in the social sciences.

> *"[T]echnology is a famously broad notion that is clarified not at all by having 'information' and 'communication' hanging off the front of it"* (Walker 2006:9).

Walker's remark nicely subsumes the problem with ICT: it is a fuzzy concept.[3] Where research on modern communication technologies is done, the reference to ICT is often a cover-up for poor conceptualization. Measuring the impact of ICT on society surely is not limited to the effects of the Internet only. Yet, this is what one often encounters: ICT is first defined to include mobile phones, but then left out in the actual measurement. This causes validity problems due to a mismatch between the concept and indicator level (cf. Adcock and Collier 2001). Moreover, as we will see in the next chapter, the Internet appears to be of little significance outside of industrialized nations due to a lack of availability and high social thresholds for its use. As a consequence, little meaningful research on the Internet, particularly of the statistical kind, can be done beyond this limited group of countries. Lumping mobile

[2] 'Internet' and 'the Web' are used interchangeably in this thesis.
[3] The World Bank (2008) defines ICT as "the hardware, software, networks, and media for the collection, storage, processing, transmission and presentation of information (voice, data, text, images), as well as related services".

communications together with Internet research has other limitations too: it completely ignores distinct inherent capacities of mobile phones and networks[4], treating them as if they were "a natural extension of the Internet, rather than an entirely distinct system with its own rules, a separate user base, and a completely different network structure" (Walker 2006:10). This is clearly unsatisfactory from an analytical perspective, especially in light of the worldwide trend that shows rapid growth of mobile phone penetration.

There has long been a thriving body of academic literature describing the virtues of the Internet, being such a powerful and liberating tool for civil society[5] and its activists (cf. Drezner 2006; Deibert et al. 2008; Fisher et al. 2005), while there is no such resource to draw from in the case of mobile telecommunications, despite some promising works that will be introduced below. This lack of research is partly due to the Internet's earlier emergence compared with mobile telephony, at least with regard to its mass deployment. But again, meaningful Internet research is largely contained

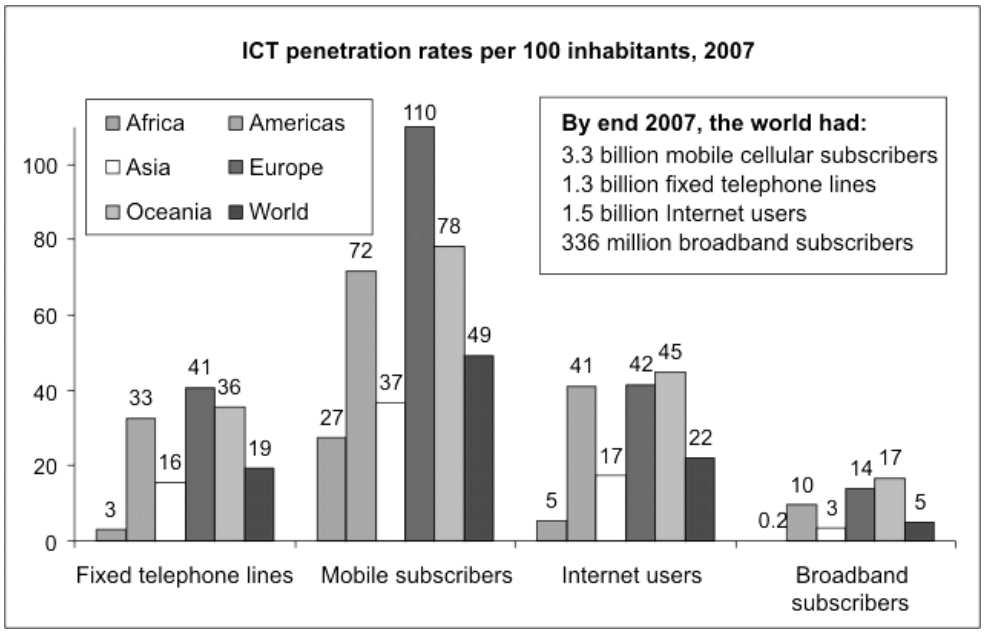

Fig. 1.1 ICT penetration rates, global comparison
Source: ITU 2007

[4] 'Mobile phone networks' and 'mobile networks' are used interchangeably in this thesis.
[5] Civil society throughout this work commonly refers to value-based movements in the arena of uncoerced collective action. It is defined according to the Center for Civil Society at the London School of Economics and Political Science. See LSE (2004) for a more detailed definition.

to developed countries that are connected to the Web, while mobile phones are much less affected by these restrictions as figure 1.1 indicates.[6]

Mobile phone networks are growing nearly everywhere. The use of mobile handsets faces almost no restriction bar affordability, and even the latter is not an impossible barrier, as the massive growth rates outside of Europe and North America indicate. As some of the case studies presented later will show, mobile phones can be a powerful tool for civil society that offer possibilities the Internet cannot provide. Some of the mobile phone's functionalities deserve increased attention and research efforts by political scientists along the example of earlier Internet research. Take for example the process of political mobilization; mobile phones can facilitate its emergence by virtue of three important factors: mobility, personalization and multimodality. Mobility adds a spontaneity factor to potential mobilization, because users can react instantly and emotionally to events. Personalization is given through the typically person-to-person and social type of contact. Finally, the mobile phone is multimodal because it can transmit voice, images, and sounds, making it a tool for live transmission of events to be shared on the network with the implications that follow from such 'broadcasting' (Castells et al. 2007:211). These aspects can potentially turn mobile phones into indispensable tactical and organizational tools for any group or organization that wishes to mobilize people around a common cause. At the same time, systematic governmental countermeasures against this type of use do not appear to be common and of little concern compared to the large economic benefits of mobile telecommunications (cf. Miard 2008). The case studies and interviews in Ch. 2 present a forceful body of evidence that further research should be done.

This paper is meant to shed light on the mobile phones capability as a facilitator. As the reader will notice further below, the view that this device has the potential to,

[6] The state of disconnection is not always a matter of poverty and thus demand; in the case of East Africa, for example, it is a technical and infrastructural problem. The absence of a land-based fiber-optic backbone access to the world's data grid requires expensive and bandwidth-weak satellite connections (cf. Tusubira et al. 2005:166-168). While Western Africa already has an undersea fiber-optic cable, one along the East African coast remains an unfinished project. See www.eassy.org for more details.

among other things, facilitate collective action or the mobilization of large masses of people for political aims will be the leitmotif of this work.

1.2 The state of mobile telecommunications in the world

In the last decade, the world has witnessed very high telecommunications investments in almost every country. More than half of these global investments in 2004 were made outside of the OECD (ITU 2006:9). Why is this happening? Universal demand, falling costs and a profitable, competitive market appear to be the driving forces behind this phenomenon. In fact, as *The Economist* (2006a) notes, foreign and home-grown mobile network operators have "worked out how to earn princely sums in the

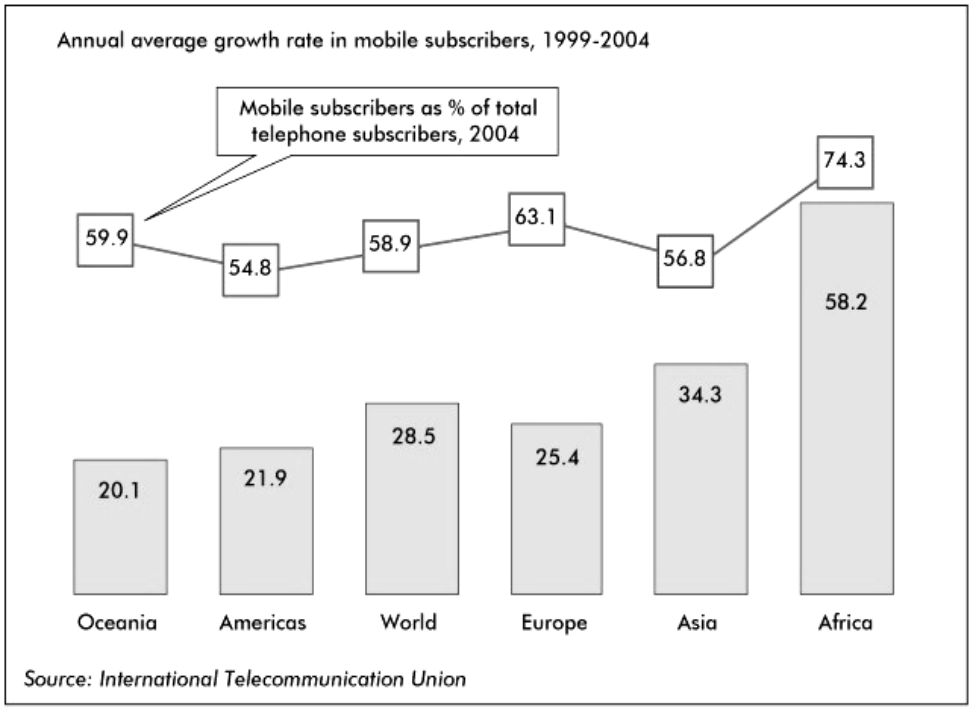

Fig. 1.2 Global comparison of mobile phone growth
Source: ITU 2007

world's poorest places" and are fiercely competing for market share, pouring in large sums of investment in many countries. Mobile telephony on a worldwide scale belongs to the most competitive sectors in business (ITU 2006:5).

After swift growth throughout Europe, and to a lesser degree in North America, mobile phone networks have recently been growing at very fast rates in the developing world, with Africa as the front-runner (cf. Vodafone 2005). As figure 1.2

indicates, the annual rate of deployment has been phenomenal. At the same time, due to technical and structural reasons, the use of the Internet and computers in general is still very limited in many less developed parts of this world (see table G.1 in the appendix). Mobile technology, owing to its unique characteristics, is able to bypass the structural problems that inhibit the Internet in less developed countries.

> *The mobile phone is […] a wonderful example of a 'leapfrog' technology: it has enabled developing countries to skip the fixed-line technology of the 20th century and move straight to the mobile technology of the 21st"* (Economist 2008a).

This is an exception; most new technologies – the Internet and PCs are good examples – depend on existing infrastructure such as roads, electricity and fixed

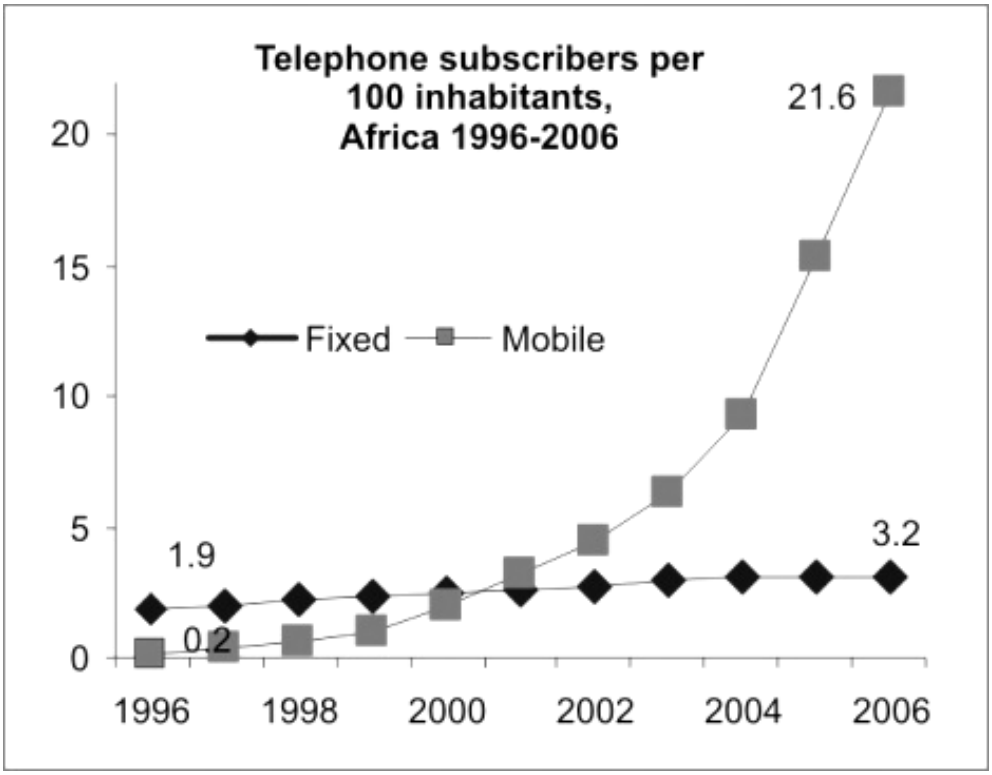

Fig. 1.3 Comparing subscription type in Africa
Source: ITU 2007

phone lines in order to work. In other words, "to go high-tech, you need to have gone medium-tech first" (Economist 2008a). If there is no reliable source of electricity, there is no point in having a computer or a fridge. A mobile phone, however, does not need a steady, local source of electricity but can instead be recharged occasionally. Neither is it dependent on existing fixed phone lines as the Internet is. The threshold for its use is also lower by other terms: phones can be operated by users with no or

minimal levels of literacy. The same cannot be said about computers (Dholakia and Kshetri 2003:248). This is an important factor in less developed countries with high illiteracy levels, and together with other factors, it explains mobile phone technology's swift success in connecting people. This happens also in very isolated places where no one would have even dreamed of these new possibilities a few years ago. The case of Africa is a good example for this. Infamous for extremely low penetration of telecommunication services, it has recently been able to greatly profit from the mobile phone's unique 'leapfrogging' abilities. Fig. 1.3 illustrates Africa's immense mobile telephony breakthrough compared to traditional fixed telephony.

More importantly, civil society in developing countries is making use of the new tool, particularly its cheap and practical text messaging function. Although most mobile phone activity remains within, and relates to, the circle of family, friends, and business associates, it is at times being used more strategically for mass mobilization. An example is the call for nation-wide boycotts that is mass-transmitted via SMS[7], a phenomenon that, for example, has taken place in Nigeria (Obadare 2006) and China (NZZ 2008b). And as the following chapters will show, the combination of quick communication and large, angry masses of people can have consequences political leaders should be wary of.

1.3 Research question and approach

The bottom-line question of this thesis is to find out what the proliferation of mobile phones, a trend observable in almost every country, means for the political sphere. Can a few calls and text messages really challenge the established powers? Will it be easier to mobilize a large number of people for street protests and other forms of what can be called political activism? Will civil society become better organized and more effective vis-à-vis the state? *Can mobile network growth be associated with increased political activism?* Is there really any effect at all? I pose these questions because of the phenomenon of rapid growth of mobile phone usage worldwide in conjunction with a number of events where, perhaps too enthusiastically, the use of mobile

[7] Short Message Service, a communications protocol to exchange text messages between mobile phones.

phones has been given credit for the outcomes of protest activities that were directed against governments.

I will tackle this question through three avenues: First, I will review and discuss three case studies which describe the phenomenon I intend to study (Ch. 2). For further illustration, I will add two interviews I conducted with key informants. Next, I will look into the theoretical literature (Ch. 3). Are there any models with explanatory claims in the field that are of interest here? Out of this I will develop a proper hypothesis that is to be tested with statistical methods in what consists of the third part (Ch. 4 and 5).

Tackling the question in this manner evidently requires the use of two different methodological approaches, a qualitative and a quantitative one.[8] This combined procedure is increasingly recognized in the social sciences, and often applied in cooperative research where specialists in either field work together. Combining the two has great potential for true and comprehensive analysis, as they complement one another (Read and Marsh 2002; George and Bennett 2005:34-35). Consider the procedure to deal with the general question in this paper, which can be formulated as follows: "Do mobile phones have an effect on political activism?" According to Mahoney and Goertz (2006), a qualitative researcher, in line with the norms of his or her academic tradition, would reformulate this into: "Did mobile phones have an effect on political activism in one or more particular cases?" A quantitative researcher, on the other hand, would translate the question into: "What is the average effect of mobile phones on political activism?" Both approaches are of high value and ideally, an "explanation of an outcome in one or a small number of cases leads one to wonder if the same factors are at work when a broader understanding of scope is adopted, stimulating a larger-N analysis in which the goal is less to explain particular cases and more to estimate the average effects" (Mahoney and Goertz 2006:231). Using qualitative studies and extending the analysis to a larger number of countries is precisely the purpose of this thesis.

[8] Bennett (2002) prefers to distinguish between *case studies*, *formal modeling*, and *statistics* rather than between approaches termed 'qualitative' and 'quantitative'. The collective action literature I partly use to develop my hypothesis (Ch. 3.4) could be characterized as a formal model.

2. Smart Mobs and the State: Some Examples

Why have I come to study the issue of mobile phones' impact on society? For one, I have repeatedly noticed reports of a rather anecdotal value in a range of news outlets.[9] This has led me to study this question from various angles and along this I have come across a number of remarkable case studies. A very illustrative case is the so-called *People Power II* revolution in the Philippines in 2001. After a few introductory remarks, it will be briefly described below.

As Castells et al. (2007:185) note, mobile communication networks can be formed and reformed instantly, and messages are often received by a known source, enhancing their credibility. At the same time, such networks provide a powerful platform for political autonomy on the basis of independent channels of autonomous person-to-person communication.

> *"The networking logic of the communication process makes [the mobile phone] a high-volume communication channel, but with a considerable degree of personalization and interactivity [while] the wide availability of individually controlled [mobile] communication effectively bypasses the mass-media system as a source of information"* (Castells et al. 2007:185).

In their book *Mobile Communication and Society* (Castells et al. 2007), the authors observe a growing tendency for people to use mobile communication to voice their discontent with their country's authorities and to mobilize protesters by inducing 'flash mobilizations'.[10] Such mobilizations are thought to have "made a considerable impact on formal politics and government decisions" in a number of instances (2007:185). In this paper, I will repeatedly draw from this qualitative study that was initiated by the Annenberg Research Network on International Communication at the

[9] *The Economist* has been a particularly reliable news source, often enthusiastically heralding the social and economical effects of mobile phones. Searching www.economist.com with the keyword mobile telecommunications produces a plethora of articles.

[10] 'Flash mobs' originally consisted of a large group of people who assembled suddenly in a public place performed an unusual action for a brief time and then quickly dispersed. Some authors seem to be using this term in the wider sense of large demonstrations that rely on communication technology, and are not necessarily very short in duration. For such events, the term 'smart mobs' may be more adequate (cf. Nicholson 2005; Rheingold 2002).

University of Southern California. It is to my knowledge the most comprehensive and up-to-date work on the social impact of mobile phones available.

2.1 Philippines, 2001: Impeachment

This event is probably the most famous example of civil society action relying on the use of mobile phones; its fame is partly due to Howard Rheingold's book *Smart Mobs* (2002) and an article by Rafael Vicente in 2003.[11] It is often, but probably incorrectly, considered the first time in history that the mobile phone played an instrumental role in removing the ruling president of a state (Castells et al. 2007:186).[12]

Joseph Estrada, a former senator and movie star, was sworn in as president of the Republic of the Philippines in 1998. By 2000, he had become increasingly unpopular outside of his core constituency that mostly consisted of low-income farmers and people from the poorest strata of Filipino society. Estrada became subject to numerous allegations of corruption and mismanagement, and in October 2000, opposition groups finally filed an impeachment complaint with the House of Representatives against him. By December, the Senate impeachment trial had formally begun. However, at a critical meeting in January 2001, senators voted 11-10 against opening an envelope that was believed to contain records of Estrada's secret transactions. Within hours enraged residents of the capital, Manila, gathered in the streets to protest against what was perceived as injustice. Many of the protesters followed 'instructions' received via their mobile phones (Castells et al. 2007:186-187).

The massive demonstrations of 'People Power II', as this demonstration was dubbed, lasted for four days, from January 16 to 20.[13] Growing street pressure led most key

[11] Rheingold set up a website collecting news on the smart use of ICT, see www.smartmobs.org.
[12] My interview with Ivan Marovic (2008) suggests that an earlier event of this type may have happened in Serbia in 2000.
[13] Following the original 'People Power' movement that overthrew Ferdinand Marcos in 1986 (Castells et al. 2007:268; cf. Rafael 2003:399).

cabinet members to abandon their posts. Eventually, the army sided with the protesters and Estrada was removed from office. By the end of the same day, the Supreme Court declared the presidency vacant, and the new president, Gloria Arroyo, was sworn in. People Power II concluded on a triumphant note (2007:187).

News coverage invariably highlighted the role of new communication technologies, particularly SMS and the web, in facilitating and enabling the protests. Indeed, it was texting that made the swift gathering of tens of thousands possible immediately after the crucial vote of the senate. The demonstrators were using SMS so actively that during the week of the protests it "caused serious strain on the networks" that covered the protest area: Globe Telecom, an operator, reported a massive increase of SMS traffic: The numbers nearly doubled from on average of 25 million per day to 45 million. (2007:188).

2.2 Spain, 2004: Election hazard

On March 11, 2004, an Al-Qaeda cell killed 192 commuters in Madrid by blowing up bombs inside three trains. The attack took place just four days prior to Spain's national elections. Incidentally, these elections were dominated by the debate about Spain participating in the Iraq War. Despite broad opposition to the war, the ruling Conservative Party (PP) was expected to win the elections based on its economic record and its widely accepted tough stand on Basque terrorism (Castells et al. 2007:198).

Immediately after the terror attack, the PP stated that Basque terrorists were to blame. Subsequently, it became clear that Al-Qaeda was more likely to be responsible. However, the PP kept blaming ETA, the Basque terror organization. This was perfectly rational:

> *"In political terms, making the Basque terrorists responsible would favor the PP in the elections, while acknowledging the action to be that of Islamic terrorists would indicate to Spaniards the high price they were paying for their government's policy in Iraq, thus potentially inciting them to vote against the government"* (Castells et al. 2007:198-199)

An inquiry commission later produced evidence that the PP had, at the very least, deliberately delayed information and presented as proof some elements that were still under scrutiny (2007:199). Regardless of the true extent of deception, thousands of Spaniards were convinced that the government was manipulating facts, and they started to disseminate their views to other citizens. At the same time, the major TV channels, all of them directly or indirectly controlled by the government, and most radio stations supported the Basque terrorist hypothesis. The print media followed suit, after the Prime Minister had personally called editors of the main press publications to reassure them (2007:199).

With most of the traditional media sticking to one version, oppositional views had to turn to alternative communication channels to spread their version of the truth. The use of such channels led to mobilizations against the Conservative Party on the day prior to Election Day, when political demonstrations are, in fact, prohibited according to Spanish law. This apparently made an impact – more young voters participated and about one million voters switched sides to punish the PP for its perceived manipulation of information and its policy in Iraq. The Socialist Party then clearly beat the PP in the polls (Castells et al. 2007:199). The crucial aspect was the youth's participation. Usually characterized by high abstention rates, they became politicized by these events. Indeed, "individuals without political affiliation, and independent of mainstream parties, began to circulate text messages to the addresses programmed into their cell phones" (2007:200), calling for a demonstration for the truth in front of the PP building in Madrid and in other cities. In the meantime, Spanish TV stuck to the Basque terrorism version. On the evening before election, in a rather clearly biased move, one major TV station even changed the regular program to broadcast a documentary about the assassination of a politician by Basque terrorists (2007:200).

SMS traffic increased by 20 percent over the average on Saturday, and by 40 percent on Sunday, an all-time record. As Castells et al. (2007:201) note, the critical point was that the senders were known to the receivers, making the network of diffusion increase exponentially while retaining proximity to the source. Major television

channels and newspapers were soon ignored as reliable sources, but the major private radio network SER eventually started to look for the alternative Al-Qaeda explanation. Consequently, many activists referred to the SER when calling or texting their friends (2007:201).

The critical event was the Saturday demonstration, a typical 'smart mob' (cf. Rheingold 2002) phenomenon of mobile-phone enhanced protesters "prompted by a massive network of SMS that increased the effect of communication exponentially through interpersonal channels" (Castells et al. 2007:202). The authors conclude that in the end, this contributed to altering the outcome of the national elections in Spain.

2.3 China, 2003: Epidemic

The SARS[14] outbreak in China in 2003 illustrates a case of civil society's use of mobile phones that was unsuccessful in terms of mobilization. At the beginning of the epidemic, no news media or Internet outlets reported on the event. Victims and their friends and families, however, began to send SMSes regarding this strange, deadly disease. The 'word of mouth' spread quickly in Guangdong's urban areas and then outside the province. At that point, the Chinese public hygiene and propaganda authorities launched a mass-media campaign to counter these 'rumors'. In the campaign, they downplayed the severity of the disease, claiming that it was just a variant of pneumonia. They also declared that everything was under control, and that the public and partly SMS-induced panic was groundless (2007:207).

Castells et al. (2007:207) note that in contrast to the Spanish case, traditional media seems to have effectively undermined the earlier information dispersed by mobile phones "because SMS was perceived to be a medium of lower credibility and there was no other source of information". Most people, Chinese and foreigners alike,

[14] Severe Acute Respiratory Syndrome.

"chose to believe the official version, only to witness the SARS epidemic in full swing within weeks" (2007:207).[15]

2.4 Discussion

It is clear that the outcomes of the events presented above were strongly shaped by context, and that the mobile phones' facilitating aspect worked most likely in conjunction with many other factors. Castells and his co-authors do not deny this, and neither is it my point to give mobile phones too much credit for what happened. What is of interest here is a certain pattern, where mobile phones repeatedly showed their potential in shaping and facilitating the development of mass events. At the same time, the true effect of the mobile phone alone remains unclear and further analysis is needed to clarify this question; quantitative analysis may be able to do this.

Events similar to the ones above are being reported from all over the world and they usually fall into two categories: mobile phones are either used for monitoring or reporting; or they are used for mobilization and collective action. In the former, it usually takes place at polling stations: voting results are transmitted to radio stations at once, making the opportunity to rig results considerably more difficult (Economist 2008b). Countries where such monitoring has taken place are for example, Senegal (Abel 2000) and more recently, Zimbabwe (Global Voices 2008; Martz 2008). For the second category, where mobile phones have been used for mobilization and collective action, we have already seen some examples above. My analyses will focus on this, as it will be subsequently shown.

[15] Castells et al. are very pessimistic with regard to the mobile phone's impact in China due to the unparalleled levels of resources and skills the Chinese government is supposedly using to deal with this type of activity, and because China has an authoritarian political system which is "fundamentally at odds with grassroots mobilization" (Castells et al. 2007:207). This may be an underestimation of Chinese activists and the developments of civil society in China in recent years. The use of Twitter may serve as an example: Twitter is a popular public instant-messaging feed that delivers information faster than censors can block it. This new combined use of the Internet and mobile phones seems to give Chinese authorities a headache (cf. Wall Street Journal 2008; Aftenposten 2008). Twitter functions like a public blog, but contents are posted via SMS. See www.twitter.com.

2.5 Interviews with key informants

For the purpose of this paper I did go beyond just reproducing the works from other scholars and news reports. To gain additional insight in the practical use, or 'street use' of mobile phones, I interviewed two key informants. The first, Ivan Marovic, is a former leading member of *Otpor*, a Serbian opposition movement, who now lives and works in Washington DC. The other, Pavel Marozau, is a Belarusian dissident, currently living in exile for his media activism and involvement in an opposition movement called *Third Way* (2008).[16] I will summarize some key insights from the interviews below. The complete interviews are available in the appendix.

2.5.1 Otpor and Serbia, 2000: Bringing down Milosevic

> *"[T]he most important [situation] was the march from Novi Sad to Belgrade on April 14th, 2000. That was a demo[nstration] 100 percent operated through mobile phones"* (Marovic 2008 [interview]).

Originally a student movement, Otpor, which means 'resistance', turned political after the NATO bombings in Serbia in 1998, waging a political campaign against Slobodan Milosevic. The campaign eventually led to a successful outcome, Milosevic stepped down and was later extradited to The Hague for trial. Otpor's use of cell phones in their activities was reported by Radio Free Europe (2005) in response to the Orange Revolution in the Ukraine. Ukrainian activists were said to follow a path "already forged by the Serbian youth movement Otpor, whose members used coded short-text messaging on cell phones to coordinate their actions" (Radio Free Europe 2005). There is little material on this otherwise (cf. Walker 2006:18-19).

In the interview, Ivan Marovic, responsible for press and PR at Otpor during the events in 2000, and one of the founding members, unequivocally confirmed the importance of mobile phones in this movement. A particularly interesting aspect that surfaced in the interview was the fact that the Internet played a rather limited role

[16] Due to frequent hacker attacks, the website (see reference chapter) may not be always available.

because the Web was slow and not used a lot in Serbia in 2000.[17] Mobile phones, on the other hand, where very common according to Marovic: "[By] 2000, almost everybody had a mobile". While the Internet was used for strategic communication – news, documents, etc. – the mobile phone was crucial for operational and tactical communication. For example, in order to transport small packages from one place to another, they would ask bus drivers to deliver these and immediately text or call the receiving party in the other town to pick up the deliveries. Marovic stated that cell phones were crucial for such operations.

Marovic also gave an example of mobile use where changing tasks in real time was critical: in a long march from Novi Sad to Belgrade in April 2000, the organizers had to coordinate tasks while walking. Food had to be delivered, supplied by volunteers from different towns. They also had to organize buses for those who could not walk anymore (the distance between those two large Serbian cities is 80km). Last but not least, the welcome rally and press releases upon arrival in Belgrade needed to be prepared and coordinated. Marovic used up three cell phone batteries that night.

Ivan Marovic confirmed some of my assumptions with regard to the relevance of mobile phones in immediate street action and mass mobilization. He also managed to highlight the aspect of logistics and how it can rely on mobile phone usage, which was partly novel to me. Otpor's heydays now date a few years back and communication technologies have undergone rapid changes since 2000. To gain insight into a more recent situation, an additional interview was performed with a media activist from Belarus, a country that has yet to experience freedom of speech.

[17] In fact, Marovic later told me that he had feared too many questions about the Internet, only to discover, to his delight, that someone was finally interested in mobile phones. Earlier scholars had interviewed him with a focus on the role of the Internet, which he had little to say about.

2.5.2 Third Way and Belarus, 2008: Lukashenka's police state

> *"[M]obilization is not only about political conversations. It is about normal communications with people, involving them in activities"* (Marozau 2008 [interview]).

Two years ago, Pavel Marozau left Belarus to evade his own arrest by Belarusian authorities. The activists behind *Third Way*, an independent youth group, had just been charged with 'insulting' the president. In Belarus, this automatically means a guilty verdict, as President Lukashenka[18] heads a Soviet-style police state. Pavel Marozau, who is in charge of the publication of anti-Lukashenka cartoons, was one of the last Third Way activists to still be in the country; all others had already left earlier. He has now found asylum in Estonia (Charter'97 2006). Third Way is much more than just a cartoonist's website; their goal is nothing less than reforming and modernizing Belarusian society (Third Way 2008). Mission objectives are listed on their website, where one can also find specified tactical priorities such as *up-to-date and safe communication* and *effective mobilization*, two aspects that relate to my work. It is Third Way's active use of the newest communication technologies in a hostile environment that prompted me to interview Pavel Marozau in the first place.

Government surveillance appears to be an overall issue in the case of Belarus, as is the need for safe communication. Pavel Marozau agrees that mobile phones are very important for his organization's activities. However, he also adds that where possible, the use of mobile phones is being avoided for 'serious things'. Mobile communication can be very unsafe; interception by state authorities is especially common in the run-up phase to state elections. All Belarusian mobile network operators are under state control; no private company can own more than 49 percent of the shares (this has, however, been relaxed recently). It is very difficult, if not impossible, for mobile network operators to refuse to comply with requests for sensitive personal information by Belarusian authorities, such as calls, SMSes, etc.

> *"[M]obiles are good during opposition actions for operative coordination and reporting to media and say[ing] for example that you've been arrested"* (Marozau 2008 [interview]).

[18] I use the Belarusian transliteration here. The often used 'Lukashenko' is a Russian transliteration.

Third Way has been using mobile phones to contact potential new recruits, but also for operative coordination, or media reporting — for example upon having been arrested. In the case of operative coordination, it is important to use coded language or not name places while talking on a mobile phone. Marozau describes a situation where he accidentally slipped the name of a public square while talking to an activist on his mobile phone. The consequence was swift: his fellow activist was arrested within 15 minutes.

Another tactical strategy is to use reconnaissance activists in street demonstrations who report police movement, especially the crowd-control units called OMON. To do this, the reconnaissance activists use 'clean' mobile phones with SIM[19] cards and phone IDs that have not yet been registered by the surveillance apparatus.[20]

Mass SMS sending has also been used to mobilize Belarusians, with messages such as "People, come to October Square on 1st of September. Zhive Belarus!"[21] Public expression of political opinion is, however, very difficult in Belarus. Police forces and secret service units usually quickly quash such attempts. Youth groups even revert to unusual ideas to gain attention while making it difficult for the government to justify counteraction, as for example in a 'flash mob' of young people doing nothing else than gathering publicly to eat ice cream (Rheingold 2006).

The Belarusian authorities are, of course, not foolish. Marozau explained in the interview how they are well aware of the power of mass SMS and have made use of it themselves, especially prior to the presidential elections or the 2004 referendum. They routinely modify the opposition's messages, or just spread the opposite message. The Belarusian government has also created its own, well-funded youth

[19] SIM stands for *Subscriber Identity Module*; these small smart cards are used to identify subscribers to mobile and data networks.

[20] In order to do this, neutral people (as far away from the opposition activists) are asked to subscribe to up to 5 or 10 mobile phone contracts, providing them with the equal number of 'fresh' SIM cards. Only recently have pre-paid cards been introduced in Belarus, somewhat simplifying this process. Phone identification numbers (IDs) can also be registered; Marozau pointed out that activists therefore occasionally reload their handsets' software using illegal Russian hacker software.

[21] According to Marozau, the mobile phone numbers of around 1 million subscribers of the Belarusian operator Velcom were put on the web by hackers – twice so within a short period of time. This certainly helped for mass-sending SMS, but it was due to exceptional circumstances. Sending mass SMSes to random numbers would be another feasible strategy; Marozau did, however, dismiss it as being too expensive.

organization called BRSM. It also uses mass SMSes and other communication strategies, thus copying the opposition movement's tactics.

When asking Pavel Marozau about mobile phones as facilitators of logistics, he concurred that it could sometimes be useful, but that Third Way limited their use for safety reasons. In addition to tapped phone calls, there is also the risk of *localization*; with today's technology, it is possible to localize the position of a mobile phone and thus its user even when the handset is not being used. The accuracy is 50-100 meters, according to Marozau. It has become common to simply switch off the phone or even remove the battery to be on the safe side.

Interview conclusions

While only a limited comparison with the Serbian case was attempted, one noticeable change between the two seems to be safety concerns. Although Ivan Marovic briefly mentioned some concern in the interview – for example, taking the battery out of mobile phones was already an issue for some Otpor activists – it did not appear to be such a major concern compared to today's activists in Belarus. They seem to be much more concerned about safety than the young activists in Serbia were a few years earlier. It appears that government agencies have stepped up their know-how in dealing with mobile telecommunications as a security risk, both technically and tactically. Today's activists appear to be reluctant to rely too much on this single technology; on the other hand, with the evolution of the Internet including cheap, encrypted Internet telephony (Voice over IP, such as Skype), they have also more alternatives than Ivan Marovic and his fellow activists had in 2000, when access to the Internet was rare in Serbia and still relied on slow dial-up connections. The Belarusian setting seems to reflect the situation in more developed nations, while Serbia in 2000 may rather resemble today's less developed countries with limited Internet access availability as discussed in the introduction chapter above.

3. The Theoretical Framework

Up to this point, I have discussed empirical findings by other researchers as well as the results of my own interviews. I conclude that there is clearly some evidence to suggest a connection between political activism and the use of mobile phones by activists. I now turn to the theoretical framework. Are there any theories that can be used to explain such a connection? A number of potentially useful theories in this matter deal with collective action and mobilization, and more particularly with social movement issues. It seems that there are theories that would explain the impact of mobile phones and other telecommunication devices implicitly, while it is still too new a field to find explicit models that deal directly and more than just tentatively with mobile phone technology and its impact on political activism. This can be contrasted with more advanced research on the Internet (Garrett 2006:203). I therefore need to introduce mobile telecommunication technology within existing theory and further develop it. Leading sociologists such as Manuel Castells have recognized the importance of this question:

> *"Because communication is at the heart of human activity in all spheres of life, the advent of [mobile telecommunication] technology, allowing multimodal communication from anywhere to anywhere where there is appropriate infrastructure, raises a wide range of fundamental questions"* (Castells et al. 2007:1).

Mobile connectivity can be said to both reflect and intensify social ties: without social ties, the mobile phone, predominantly used for social contact with friends and family members, is of little use. At the same time, it is a powerful tool to manage or 'microcoordinate' one's social life and keep in touch with one's social network, and one that can be used to strengthen and expand social ties (cf. Ling 2004; Livesay 2003:196).

The concept of social ties and how mobile telecommunications is affecting these will be a recurrent theme below. In order to understand how this aspect can be incorporated into existing theory, I will first introduce a variant of collective action theory (Ch. 3.1.1). This will mainly highlight individual motives to participate the activities and movements of interest here. Next, I will draw from mobilization and

diffusion theory to further emphasize structural aspects of how political and social movements are generated. These are partly implied in the section on collective action, but are in need of further elaboration (Ch. 3.1.2). Finally, network society theory will link the previous theories to technology both conceptually (Castells 2000a and 2000b) and more conclusively where the theory is used in connection with mobile telecommunications (Castells et al. 2007). This will be further developed into my argument in Chapter 3.3 and 3.4 where a hypothesis based on the theoretical and empirical findings (see Ch. 2) will be formulated.

3.1 Networks, social ties and collective action

In the study of social movements in general and collective action in particular, networks and the way they connect and empower actors play an important role. The literature is vast (see for example: Snow et al. 2004 or Melucci 1996), and consequently, I draw from manifold different sources in this chapter. Altogether, I base my approach most notably on the collective action and network theory rationales introduced by Gould (1993) and Castells (2000a and 2000b), completing it with some aspects from mobilization and diffusion theory.

3.1.1 Collective Action

Roger Gould (1993 and 1995) attempts to introduce the element of social ties into collective action theory in a formal way. His reasoning resonates well with the point of my argument. Gould (1993) states that if at least one actor has already made a contribution to a cause, other actors have two reasons to make contributions of their own. One is *instrumental*, i.e. based on how one perceives the efficacy of a cause. The other is *normative*, i.e. based on how one fears, or wishes, to be perceived by others. Neither reason accomplishes much by itself: Normative pressure to contribute to collective action will have little impact if elicited contributions are completely wasted, while increasing marginal returns will only reinforce the waiting game and encourage free-riding in the absence of fairness norms (Gould 1993:182).

Social ties, as he argues, "occupy a central role in explanations of how groups overcome the free-rider problem" (Gould 1993:182). The role that networks of social relations plays in recruitment and mobilization, as opposed to the idea of 'random contagion', has been recognized in the respective literature (cf. Soule 1997 and 2004). Underlying this is the recognition that "social ties make individual's decisions about participating in collective action *interdependent*" (Gould 1993:182; emphasis added; see also Kim and Bearman 1997). A basic tenet of Mancur Olson's (1965, cited in Gould 1993:182) characterization of the free-rider problem is that "a rational actor will abstain from contributing to a public good if his or her contribution has a negligible impact on the total amount of the good produced and consequently a negligible impact on his or her consumption of the good". But if these decisions are *not* independent, i.e. if one actor's contribution makes another actor's contribution more likely, the total benefit resulting from an individual's decision to contribute may be considerably greater than his or her cost of contributing (Gould 1993:182). Introducing a normative element makes sense because as Gould states, "few social scientists believe that individuals are pure rational egoists, particularly since collective action occurs more frequently than the rational choice framework would predict" (1993:183).

By relaxing the rational-choice assumption that individuals are pure utility maximizers, it is possible to account for the event of collective action in the absence of formal sanctioning mechanisms (e.g. punishment) while introducing *fairness norms* and *efficacy expectations* as central contributors to the production of collective goods. Both aspects are important: "People may be perfectly willing to contribute something to a collective good, but unless they are reasonably sure their contributions will not be wasted, they will wait and see what others do" (Gould 1993:183-184). If some individuals take the initiative, it will increase the motivation of others to join in because the initiators have increased the marginal returns to the group that would arise from further contributions.[22] Any utility maximizer would still try to get a free

[22] Gould uses 'Maple Street', a fictitious neighborhood, to illustrate this point. The public good in question is overall cleanliness: If one person has already picked up some trash littering the street, the marginal return from

ride here; however, in the presence of norms of fairness, everyone with social ties to the initiators now has a reason to match the initiators' contribution. "As much as people dislike being exploited, they do not want to be perceived, and potentially ostracized, as exploitative" (1993:184). Stated more positively, "seeing others contribute should motivate actors to contribute their share" (1993:184).[23]

In general, one can say that the degree to which contributions are *visible* affects the level of normative social pressure non-contributors may be subjected to, thus altering their behavior (Gould 1993:184). This aspect of *visibility* needs to be emphasized at this point, because I will argue for enhanced visibility through mobile phone usage. From a theoretical point of view the concept of visibility in my context represents the collective, public demonstration of activists confronting political authority on specific grounds (Livesay 2003:197; Melucci 1994:127). Visible action such as the waves of mass SMSes described in Chapter 2 "strengthens the hidden networks, boosts solidarity, creates further groups, and recruits new militants who, attracted by the movement's public action, join its hidden networks" (Melucci 1994:127).[24] Those hidden networks are the overlapping networks of small groups submerged in daily life. They make visible action possible because they provide the solidarity resources needed and the framework within which mobilization takes place (Melucci 1994:127; Livesay 2003:197), a factor that was also pointed out by Marozau (2008[interview]). I will return to this aspect later, tying this conceptually to mobile phones, assumed to be the carriers of increased and faster-spreading visibility.

further cleaning increases because "every single discarded object now represents a greater percentage of the total remaining" (1993:184).

[23] Gould's formal model also includes some boundary conditions not discussed here; see Gould (1993:185). The question of 'centrality' and 'network flow' can also be important; these issues relate to the position of nodes (e.g. a person) within a network as well the way any type of 'traffic' flows through the network. For example, a mass-SMS forwarded by an opposition movement leader (a central node) may have a different effect than an identical SMS passed on by a newly recruited street activist. Information diffusion can also be affected by how a movement and the underlying social network are organized structurally. For further consideration of these particular questions, see Borgatti (2005) and Gould (1993:194).

[24] Gould (1991, cited in Livesay 2003:196) makes a similar point by saying that "mobilization does not just depend on social ties; it also creates them."

3.1.2 Mobilization and Diffusion

Mobilization theory and *diffusion theory* appear to be two close relatives to Gould's approach, and a fertile ground for my work because they further emphasize structural aspects that facilitate mobilization for collective action. Mobilization theorists' recognition of the need for a 'multifactored' approach to the problem of movement formation is particularly relevant (cf. Jenkins 1983; Buechler 2008). The idea of thresholds is critical; resources, organization, opportunity and grievances must be present[25] simultaneously at their threshold levels before a movement emerges, though deficits in some dimensions may be offset by surpluses in others (Jenkins 1983:532). This latter argument is particularly useful in the present case, as one can argue that mobile phones may create a surplus in, say, organization and resources. They do this not necessarily through the total amount of skill or resources available, but rather through more efficient use of these factors.[26] For instance, the real-time aspect of mobile communication means that people, supplies, and money can be reallocated or redirected while a process is under way (Townsend 2000:98; Kwan 2007:437-438). This can be particularly effective in protest movements, e.g. in street demonstrations where protesters can quickly adapt to police movement, arrests and blockades by spreading information about them and immediately acting on it (cf. Rheingold 2002:158; Castells et al. 2007:203-204). Indeed, the increase in reallocatable discretionary resources such as time and money is absolutely central to the expansion of a social movement (Livesay 2003:199-200). Gould's normative argument is also reflected in Robert Putnam's concept of social capital, or 'networks of civic engagement' that can encourage and facilitate collective action "through the production of trust and norms of generalized reciprocity" (Putnam 1993, cited in Livesay 2003:195; cf. also Diani 2004).

Furthermore, within mobilization theory, the subcategory of *micromobilization* relates to the concept of Melucci's hidden networks mentioned earlier.

[25] Buechler (2008:8) also suggests that the combined effects of organization and grievances, i.e. strong social ties and the event of breakdown of everyday routines, respectively, may be most likely to promote collective action. This perspective can be related to information cascade theory (cf. Chapter 3.2) and to Kuran (1989).
[26] For a useful graphic overview of social movement dimensions and factors, see Norris (2002:20).

Micromobilization is defined as "that small group setting in which processes of collective attribution are combined with rudimentary forms of organization to produce mobilization for collective action" (McAdam 1988, cited in Livesay 2003:200). It can be provided by non-political and informal groups such as friendship networks. Such contexts can be generative of social movements for a variety of reasons. Such dense social networks increase 'structural proximity', the proximity of more people to movement activity. Members of such networks are more likely to come in contact with movement activists and their flows of information. More importantly, this structural availability can operate both at the individual and group level. 'Bloc recruitment', i.e. on group rather than individual basis, thus becomes possible (Livesay 2003:200). Such 'blocs' can, in turn, increase group solidarity. Equally important is that micromobilization contexts make certain psychological processes[27] that facilitate movement participation more likely. These are for example, as Livesay (2003:201) notes, the "delegitimation of hegemonic ideologies, the attribution of the causes of experienced grievances to structural rather than to individual factors, and the development of the perception of the efficacy of movement participation." Social ties to movement supporters should increase the likelihood of one's recruitment. Lastly, micromobilization contexts provide the rudiments of organization: Livesay (2003:201) mentions for example leaders and communication technologies. They are needed to translate contributions into concrete action.

The two most facilitating features of pre-existing networks seem to be dense lateral ties, i.e. social integration, within the population of potential recruits as well as multiple bridging ties that link network clusters together (Livesay 2003:202). This insight is also shared by proponents of *diffusion theory*. This field focuses on the flows of information and ideas through various kinds of channels. As Soule (1997:860) notes, definitions of diffusion "almost always include the notion of connectedness" and in relational models of diffusion, information is said to be

[27] Timur Kuran (1989) has published some noteworthy models on psychological processes relevant to the onset of revolutions that elaborate on this aspect. It is related to the information cascades mentioned in Chapter 3.2.

flowing between actors through their direct network relations.[28] This is an argument that seems to fit into this thesis, and Sarah Soule (2004) indeed repeatedly stresses the importance of networks to diffusion processes. Likewise, models used by network analysts reflect this in their claim that "ideas diffuse more rapidly when individuals are in direct and frequent contact", i.e. where the interaction rate is high (Soule 2004:295). Such an observation is certainly likely to be made among users of mobile phones, where texting and calling takes very little effort and time and can be done anywhere.

3.1.3 Network Society Theory and Technology

To incorporate the technological side of my enquiry, it is useful to consider the much-cited works of Manuel Castells and his *network society theory* (Castells 2000a and 2000b). He advocates a new 'informational paradigm' in society that rests upon information and communication technologies.[29] Technology is not characterized as a determinist[30] factor in Castells' works; information and communication technologies are not portrayed as the cause of the transformations that initiated this new informational age, but they are an *indispensable medium*. Without computers and mobile phones, the workings of today's social and economic sphere would probably look quite different. Furthermore, in this new informational age "all processes are enacted by organizational forms that are built upon networks" and particularly upon "information networks" (2000b:14-15).

> *"While networks are old forms of social organization, they are now* empowered *by new information [and] communication technologies, so that they become able to cope at the same time with flexible decentralization, and with focused decision-making"* (Castells 2000b:5; emphasis added).

Technology is, as he writes, a "specific layer of the social structure, following an old tradition in human ecology" (2000b:9) with which he implies that technology is

[28] She also points out certain types of diffusion that are observed between unconnected actors. Such non-relational connections are referred to as 'cultural linkages'. They are not further discussed here. For more on this, see Soule (1997:860-861; 2004:297-299).

[29] The new paradigm supposedly replaces the earlier industrial paradigm based on energy technology (Castells 2000b:9).

[30] For an excellent theoretical discussion on technological determinism and different views on the 'nature' of technology, see Martin (2001:91-95).

omnipresent in our everyday lives. This is particularly true with mobile phones, which are highly personalized technological artifacts. Moreover, technology represents a "fundamental ingredient of human action – an action that ultimately produces and modifies social structure" (2000b:9). Mobile telecommunications technology can modify our social structure by creating what Cooper (2002:21) calls the "transparency of the world" where communication is possible anytime and anywhere, virtually eradicating "communication-free pockets". The structural argument presented earlier can be encountered again here: In the sense that technology can enhance visibility, or transparency, one can also expect it to facilitate participation boosts in the political sphere, for example through feedback loops that intensify recruitment to political and social movements.

The views of Castells and his colleagues on the specific impact of mobile telecommunication are of particular interest. Mobile telecommunications technology "critically affects spatiotemporal change" (Castells et al. 2007:171), i.e. the structural dimensions that otherwise restrain human action in both distance and time. The space of social interaction becomes redefined because mobile telecommunication changes the location reference – people are "here and there, in multiple heres and theres, in a relentless combination of places" (2007:172). The temporal dimension becomes redefined because individuals now do "midcourse adjustments" as they "walk or travel toward their destination while deciding which destination it is going to be. [They do this] on the basis of instant communication in which they are engaged" (Kwan 2007:437). This may be just as true in everyday life as in a street demonstration. Places now exist as "points of convergence in communication networks created and recreated by people's purposes" (Castells et al. 2007:172; cf. also Kwan 2007:437-438; Ling 2004:69-75). This is exactly the effect I expect to work in favor of demonstrators. Communication technology is now shifting the possibilities from place-to-place towards person-to-person connectivity. Computers and telephones are traditionally tied to a fixed location; mobile telephones are not. Due to this phenomenon, it becomes increasingly difficult to pinpoint when and where an activity begins (Kwan 2007:440-441). To relate this to an example: it is

harder to crack down on demonstrators who change plans and destinations on-the-go (Rheingold 2002:158).[31]

The effects of technology are decisive in many realms, as it is a fundamental ingredient of human action with the ability to ultimately produce and modify social structure through power, production, family relationships and other means (Castells 2000b:9). Certain innovations in weaponry, manufacturing, contraceptives and communication technology would be examples for this. The economical sphere can be particularly affected by technological change, and especially so if it touches network phenomena. Emily Chamlee-Wright for example, drawing from the works of Friedrich A. Hayek (1973, 1988, cited in Chamlee-Wright 2005:7-10), links such network phenomena, which she calls connectivity[32], to mobile communications. New technologies allow people to make effective use of knowledge embedded within their local contexts because connectivity facilitates information dispersion and can thereby raise productivity and make business easier. This reflects the earlier diffusion theory arguments, along with Castell's view that mobile technology empowers its users' decision-making processes.[33]

3.2 Conclusions and alternative approaches

The theoretical arguments laid out in the previous chapter are concerned with issues of collective action and networking and seem to relate to the material presented in the empirical section. An example is the recruitment and mobilization for political causes by means of mass-SMS waves that call for protest participation. There are, of course, many other theories that can be used to frame these questions (cf. Norris 2002:19-25). However, in conjunction with the technological argument, the theories discussed above are considered the most relevant for the chosen research focus.

[31] Police may listen in and use spies to join the network that is exchanging such crucial information. The Battle of Seattle (cf. for example Rheingold 2002:158) is widely seen as an example where the police was unprepared. By 2004, however, they seem to have learned their lesson, dealing much more effectively with the same protest tactics at the Republican Party Convention in New York City. Part of their countertactics included eavesdropping on the messaging and web posting of the demonstrators (Castells et al. 2007:202-205).
[32] 'Connectivity' will be used to describe the background concept underlying mobile phone usage (cf. Ch. 4.2).
[33] A famous example of this is the case of Indian fishermen who use mobile phones to find out where current demand and price for their fish is highest and, consequently, where to dock and sell their catch (Jensen 2007).

Two important issues, *monitoring* and *logistics*, were briefly discussed in Chapter 2.4 and also clearly made apparent in the interviews in Chapter 2.5; such monitoring has also been reported in the Economist (2008b). These issues are, however, not really reflected in the theoretical literature discussed. This may be because they belong to strands of theories that are conceptually distinct from the ones used above, and covering them would be beyond the scope of this work. Nevertheless, I would like to briefly address these two aspects for the sake of future research in this novel field, and also indicate some relevant alternative theories.

Mobile phones and monitoring

The aspect of *monitoring* could be covered by what Garret (2006:209) calls a "reversal of the Foucauldian panopticon". In the traditional state, the elite controls power by surveillance techniques – a central mechanism that is to generate disciplinary self-regulation by the population. This is what Foucault (1977 and 1979, both cited in Garrett 2006 and Green 2002) describes with his panopticon. Modern information technologies can somewhat reverse this in today's world. The public eye, enhanced by information technologies, can thus force the elite into self-regulated behavior. The cruder kinds of electoral fraud such as the stuffing of ballot boxes often rely on poor communications between the center and the periphery.[34] They have now become much harder to carry out, because monitoring has become so cheap and effective that it can now more easily produce considerable embarrassment for fraudulent leaders.[35] Foucault's ideas and related works may provide a fruitful ground for conceptual and theoretical analysis of the monitoring issue raised above.

Mobile phones and logistics

Mobile phone utilization for logistical purposes relates to efficiency in a more economic sense as shortly introduced in the section on Chamlee-Wright's work above. In this sense, technology reduces transaction costs of a certain activity, opening up new options and facilitating existing ones. One may argue that it does the

[34] There is often a time span between the casting of ballots and the publication of results, particularly when ballot boxes are first transported to a central office for counting. This is often used as an opportunity to manipulate results in favor of the incumbent rulers.

[35] "Even with minimal resources, monitors can count the voters and conduct exit polls – and then phone [or text] their findings to a radio station before the authorities stuff the ballot boxes" (Economist 2006b).

same in collective action. However, in collective action as in the variant introduced earlier, psychological and social processes are much more in focus than practical problems that may relate more to transaction costs. Examples are the clandestine shipping of packages from A to B, food delivery to marching demonstrators, or the cheap and efficient transmission of polling station results to a broadcasting station. The question of logistics may be better approached by strands of economic theory, and transaction cost issues may be useful to analyze the particularly restrictive conditions under which oppositionist movement operate.

Information cascades

An entirely different approach to decision-making that presents a useful alternative explanatory model for the topic of this work is the concept of *information cascades*. An information cascade takes place "when individuals acting in conditions of uncertainty strongly condition their choices on what others have done previously" (Drezner 2005:9). In repressive societies, such information cascades tend to reinforce acquiescent behavior by citizens. However, this cascade can be reversed by strong exogenous shocks that trigger acts of protest. It is not difficult to imagine what the omnipresence of mobile phones can do to boost such cascades. To understand how this theory can be used, see Drezner's (2005) work on Internet usage in repressive societies. For the theoretical literature on information cascades, see Bikhchandani et al. (2007).

The impact of technology in general

Gould's (1993 and 1995) approach takes into account networks and social ties to explain collective action. He does this in a logically stringent manner. However, as a stand-alone framework for analysis of the chosen topic, Gould's work would be incomplete.[36] Some of the important structural questions needed further elaboration, and incorporating more recent theoretical work on network effects and mobile phone technology as a factor in collective action issues makes, in my opinion, a great deal of sense. This is especially important because mobile networks are expected to have a

[36] Despite the rather abstract character of his model, it is in fact, based on empirical findings, but these relate to 19th century Paris (later published in a book, cf. Gould 1995) and thus remain a bit distant to 21st century issues.

considerable structural effect by facilitating the work and possibilities of activists. Generally, the true impact of technologies of all sorts on political activity seems to be a controversial issue (Martin 2001; Wilson 2004). However, my conviction that communication technology embodies, at the very least, a field that needs further analysis, is shared by other scholars (for an overview, see Garrett 2006). In the literature, some of the mechanisms claimed to link technology to political activity are the reduction of participation costs, the promotion of collective identity, and the creation of community (Garrett 2006:204). I will draw from these and other ideas in modeling my own approach in the next section.

3.3 Bringing in the mobile phone

As noted earlier, it is increasingly becoming clear that mobile phone networks, in addition to other means of communication, are key means of social exchange. A number of studies show the importance – even the essential function – of mobile phones for teenagers, mothers, working business people, civil society actors, as well as other individuals and communities, in micromanaging daily lives, nurturing friendships and family ties, and engaging in civil action (cf. Campbell and Park 2008; Castells et al. 2007:77-100; Ling 2004; Kwan 2007; Economist 2008b). This is undoubtedly most pervasive in more developed countries, but as shown previously, other countries are catching up fast (cf. Chapter 1.2). Moreover, the need to incorporate new communication technologies has found its way on the agenda of social movement research:

> *"It is widely recognized that the spread of new forms of communication is likely to affect social organization in depth, and that this requires a reformulation of sociological concepts, including that of social relations* (Diani 2004:352).

The previously discussed theories indicate that there is already much to be found in the theoretical literature that can advance my research process. This is most obvious with Castells' information age paradigm. However, the impact of mobile communications in particular still represents a novelty, calling for further analysis to scrutinize its relevance as a factor in collective action, mobilization and network society theory. Diani (2004:352) confirms this by stating that "research on networks

and participation will have to explore the impact of virtual links". In the following section, I plan to do just that, formulating my hypothesis which I base on the previous chapters and which will lay the foundation for the subsequent quantitative analyses.

3.4 Developing a testable hypothesis

As we will see further below, the hypothesis that is to be tested in this paper boils down to the question whether the developments in the amount of mobile phone users can be associated with anti-government demonstrations, riots, or major government crises. In this chapter, I will outline how this hypothesis could be developed based on the earlier empirical and theoretical findings.

For simplicity, let us declare that the public good in question is, for example, *political freedom*.[37] Any attempt by a government to curb or withhold this freedom is to be perceived as an encroachment by those affected. The presumed way to achieve the desired state of freedom is to engage in some action against the government. Contribution can for example be defined as physical participation in protest activities. If some people initiate protests, they will motivate their peers to join in. However, in line with Gould (Ch. 3.1.1), it can be argued that these peers will make their decision to contribute to protest dependent on their expectations of efficacy. If they are not convinced, they will stay home. How can they me made to contribute? The degree in which contributions are *visible* can expected to be the key element to both the efficacy and normative argument here. The more visible a protest movement, the more likely is an individual's decision to join because due to the apparent increase of contributors, he or she will assume increasing marginal returns.[38] However, unless there are personal friends among the protesters, the non-contributor may decide to wait and see how things develop because the normative social 'pressure' is not sufficiently given.

[37] Of course, it could be another public good of concern, including some that may not intuitively fall into the field of a political scientist. However, where public collective action is concerned (as it is here), it is reasonable to assume that when a public good is at stance, chances that public claims will be somewhat 'political' are high.
[38] To stay with Gould's 'Maple Street' analogy: every single non-contributing citizen now represents a greater percentage of the total remaining citizens that could join in the protest and bring about change.

Now, with mobile networks present, the situation can be expected to change in favor of both the fairness and efficacy aspects because more mobile phones increase structural effects as described in the network theory section above. Drawing from mobilization and diffusion theory, it is plausible to predict that 'structural proximity' and higher interaction rates through multiple bridging ties could cause faster information diffusion through dense networks of individuals directly connected to each other, and this could be expected to increase overall and interpersonal visibility of any actions planned or being taken. This, in turn, can be expected to result in more effective mobilization where mobile networks are more pervasive. How the efficacy and fairness aspects are supposed to be positively altered is discussed in the following section.

Efficacy effect amplification

The more members there are in a network, the higher the expected potential mobilization feedback loop or the 'chain reaction' that can amplify any message spread within a network.[39] Every individual is for example, more likely to be the recipient of information spread via text messages or a call. As a consequence, individual expectations of marginal returns are assumed to increase because the more information and feedback one receives about a protest movement, i.e. the more 'visible' the joining in of others becomes, the more likely one will be inclined to believe in its success. Due to the mobile phone's ability to enhance the autonomy of individuals and to bypass mass-media (Castells et al. 2007:1), visibility of an issue or activity even increases when the media are not reporting it (as illustrated by the aforementioned examples of Spain and, initially, China).

Fairness effect amplification

The more users there are in a network, the stronger the expected potential fairness impact on mobilization. Fairness norms are expected to have an increased effect because the mobile phone is such a personal device (cf. Campbell and Park 2008:372;

[39] Mei-Po Kwan (2007:442) compares this network to hypertext as known from websites; every individual is linked to many others just as every website is linked to many others through hypertext. Sending a text message to one person can trigger messages to many other users, thus reaching a non-linear, multiplicative effect, or sudden jumps and shifts.

Ling 2004). It is assumed that nobody likes to be seen as a free-rider by friends and relatives; they will on the contrary be more likely to enjoy engaging in cooperative action with friends. As mobile telecommunication increasingly gains importance for an individual's social ties, any message or call received is with great likelihood assumed to originate from a friend, a work colleague, a family member, a fellow student, a friend of a friend, etc. – in other words, from those overlapping 'hidden networks' that form trusted circuits of exchanges for information and new ideas (Melucci 1994:127). The sense of community or collective identity is thus promoted (Garrett 2006:205), and fairness norms are assumed to play out their potential here. Individuals can therefore be expected to be more motivated to contribute to the protest activities rather than to abstain.

Hypothesis

I have outlined a plausible advancement of existing theoretical explanations above. Against this backdrop, it could be anticipated that an increase in mobile network users can lead to increased effectiveness of mobilization due to improved outreach, speed and response. An increase in overall mobile connectivity among a country's population can thus be thought to increase political protest activity in this country. This expected association can be reformulated into the following hypothesis:

An increase in mobile connectivity in a country is followed by an increase in political activism in the same country.

Mobile connectivity will be used as a concept that reflects interpersonal linkages enhanced by mobile telecommunication technology, while political activism is to contain protest activity (see Ch. 4.1). In the analysis in Chapter 5, I attempt to identify the effect of mobile connectivity, controlling for some plausible other factors while keeping the model parsimonious. Admittedly, developing such a hypothesis bears the risk of somewhat stretching the argumentative logic found in the theoretical literature. There is, however, a good deal of plausible reasons in both the empirical and theoretical literature to formulate and test a relationship as presented above. Some caveats will be considered in the next section.

3.5 Counterarguments

> *"We should not define ICT as a deus ex machina but as a neutral enabling tool that may enhance social actors' capabilities"* (Wilson 2004:22).

While the null hypothesis would state that there is no relation whatsoever between mobile connectivity and political activism, a possible alternative hypothesis could state the opposite effect – that increased mobile connectivity decreases political activism. What would be plausible arguments for these alternatives?

Mobile connectivity subordinate to human agency

Much of the hypothesis developed in the previous section rests on the assumption that facilitation, provided by increased mobile connectivity, can lead to increased activism. While there is a good deal of empirical evidence indicating that this is a subsistent scenario, it may not always work that way. Some authors caution against giving too much credit to technology: "[ICT technologies] influence, contextualize, facilitate, permit or inhibit courses of action, but not as first-order dynamics that change, transform, foster, impose or shape a course of action" (Mansell and Wehn 1998, cited in Wilson 2004:22-23).[40] Such a second-order argument would create a distinction between potential and actual effects of mobile connectivity where the potential depends on first-order dynamics to unfold its impact. The tilt in the outcomes is provided by individuals' and organizations' choices when and how to use mobile phones, not by the device itself. It is thus important not to assume any automatisms or to jump to monocausal conclusions (Wilson 2004:22). For instance, increasing visibility may not automatically result in increasing response. A wave of SMSes asking the receivers to join a demonstration may for example fail to trigger a response for a number of known or unknown reasons that cannot be offset by individual efficacy and fairness considerations. And even when the necessary structural and psychological requisites are in place, if the principal variable that is to trigger human agency does not operate, or if other variables neutralize its workings, no measurable effect will be noticed (cf. Wilson 2004).

[40] ICT in Mansell and Wehn's usage refers first and foremost to the Internet, but the argument can be a valid one within the context of mobile telephony as well.

Rapid governmental adaptation

The dynamic perspective taken on society whereas the state as a factor remains conceptually somewhat static could result in a potential logical flaw. Governments make use of technological progress for their own purposes. The examples shown in Chapter 2 allowed us to observe rapid technological adaptation of civil society actors. That government actors do not adapt to technological progress or that they do so at a slower pace than civil society actors is highly doubtful. The development of the Internet gives an indication of the ingenious ways in which governing elites are able to adapt to technologies that challenge their established power. Many countries have imposed restrictions on free Internet access. Such measures have been implemented despite the Internet's structural properties that were precisely designed to exacerbate censorship and other content interferences (cf. Deibert et al. 2008). The same is happening with mobile telecommunications. My interview with Pavel Marozau indicates that the state increasingly asserts its power in this area as well. Finding empirical evidence of such control is more difficult due to the secrecy typically surrounding such measures, and the less open architecture of mobile telecommunication systems compared to the Internet. Marozau (2008[interview]) highlighted the more subtle workings of such governmental countermeasures. Castells et al. (2007:202-205) report a case where the police simply tapped into the flows of SMSes between activists during a demonstration in New York and then took action based on that information. This can of course be prevented through codes, but this restricts the potential for mass mobilization. There are also more forthright variants of censorship where mobile networks are simply shut off, either in selected areas or altogether. Recent examples are Tibet during the riots prior to the 2008 Olympic Games in Beijing or Ethiopia during the violent election protests in 2005 (NZZ 2008a; BBC 2007).[41] In both cases, the authorities presumably shut down mobile networks in an attempt to prevent their use by journalists and anti-government activists. Such crude measures are no doubt highly effective, and together with other tactical adaptation by governments, may offset the advantages gained by civil society

[41] SMS services remained unavailable for two years in Ethiopia which has only one mobile network operator. See also Ethioblog (2007).

actors (cf. Meier forthcoming). Two possible implications of this are that increased mobile connectivity would not result in an increase in political activism, or that it may even cause a decrease if states should adapt faster to the technological progress than civil society. This is plausible if taking into consideration that new and public, omnipresent communication technologies can actually promote the state's surveillance capacities.

Reverse effects of mobile connectivity

The same effect that could lead to increased political activism may also lead to its decrease (cf. Townsend 2000; Kwan 2007). Mobile phones may facilitate not only mobilization, but also demobilization. Protests may be called off just as quickly and efficiently as they are initiated due to 'midcourse adjustments' and feedback loops that work in the opposite direction.

Socio-economic trends

Changes in mobile connectivity may be part of a larger socio-economic change that may alter civil society's interaction with the government in many ways, for example a transition to more stable forms of political activity.[42] The development of political activism variables (see Fig. 4.2, B.1 and B.2) over the past 16 years may be an indication of this. With too much 'noise' created by socio-economic variables it may be difficult to identify and isolate the expected effect of mobile connectivity on political activism.[43]

As the results of the statistical analysis will show, the counterarguments discussed here may have to be centerpieces of future research. I will return to this in the conclusion.

[42] Such a relationship is suggested in Gates et al. (2006:901-902). They have found that the higher a country's GDP, the longer its survival rate, which can be an indication of stability.
[43] This argument could be offset if mobile connectivity should increase faster than economic development. A correlation test to see whether this could be the case did not produce conclusive results.

4. Research Design

4.1 Concept systematization

The clarification and refinement of concepts is a fundamental task in political science, and in turn, a major prerequisite for meaningful discussions of measurement validity (cf. Adcock and Collier 2001). The two key concepts in this paper are *mobile connectivity* and *political activism*. Mobile connectivity can be understood as a specific, systematized concept within the larger conceptual background of connectivity. The background concept includes other relevant factors such as Internet connectivity, urbanization, transportation, cultural linkages and so forth, all elements that can be useful in clarifying connectivity. Discussing all these would go beyond the scope of this thesis. For the purpose of my research question, I will focus on the novel factor of mobile phones; the systematized concept is denoted as 'mobile connectivity'. This term is meant to describe interpersonal linkages via mobile telecommunication technology. Political activism, on the other hand, may draw from the underlying background concept of political participation and related ideas. I systematize this concept for my purposes by restricting 'political activism' to the public expression of political discontent by members of civil society.[44]

4.2 Operationalization

For the purpose of this analysis, I decided to use the proliferation of mobile phone subscriptions in a country to measure mobile connectivity. Mobile teledensity data, as it is called (see below for definitions), is considered the best available proxy to this concept. There is no other mobile phone data as comprehensive, accessible, and fit for per-country comparison I would be aware of. Better still would be traffic data, which can measure the amount and location of mobile network usage; Castells et al. (2007) seem to have in parts been able to get access to some SMS traffic data, but it

[44] As mentioned earlier, civil society throughout this work commonly refers to value-based movements in the arena of uncoerced collective action. It is defined according to the Center for Civil Society at the London School of Economics and Political Science. See LSE (2004) for a more detailed definition.

is not generally available to the public and much less so on a national or comparative global level in the way mobile teledensity data is. In order to measure political activism, three different variables are each tested separately: anti-government demonstrations, riots, and major government crises. They were deemed good proxies for civil society's political activism. I deliberately kept out variables that would include the measurement of violence beyond riots (guerilla warfare, armed rebellion, purges, etc.). The units of measurement are country-years; therefore all definitions used below apply to such. A more comprehensive discussion of the validity as well as the reasons for including each variable is given in Chapter 4.3.

4.2.1 The independent variable *Mobile Teledensity*

To measure mobile connectivity, an indicator called mobile teledensity is used; it is defined as *mobile cellular subscribers per 100 population*. It refers to the use of cellular-technology portable telephones subscribing to a public mobile telephone service that relies on either analogue and digital cellular systems.[45] Both postpaid and prepaid subscriptions are included.[46] The data is collected by the ITU[47] and provided by the United Nations Millennium Development Goals website (MDG 2008). For more details on this data and its preparation, see the appendix. In the database, the scores are multiplied by a factor of 100.[48] I additionally time-lagged (t-1) them in relation to the values of the dependent variable, thereby always measuring the previous year's score. This strategy is used to control for reverse causality (cf. Smelser 1973:49-51). The mobile teledensity scores were log-transformed because of the effect of a unit increase which is expected to be larger for a country with a low level on the variable than for a country with a high level. The log-transformation also reduces the skewness of the variable (cf. Hegre et al. 2001:37).

[45] Third-generation cellular technology, so-called 3G services are also covered, while public mobile data and radio paging services are not (MDG 2008).
[46] *Prepaid* means that one buys a fixed amount of airtime, SMS or other services in advance, while *postpaid* means that one uses the mobile phone and gets invoiced accordingly, usually on a monthly basis.
[47] The International Telecommunication Union, a UN subsidiary in Geneva, Switzerland. See www.itu.int.
[48] The multiplication was performed by the data provider. On the MDG (2008) website, the tables show the correct values, while the downloadable Excel files have values multiplied by 100. It is not explained, but I concluded that the purpose was to eliminate decimals. In any case, this does not affect the regression analysis, as a quick test run with values divided by 100 confirmed.

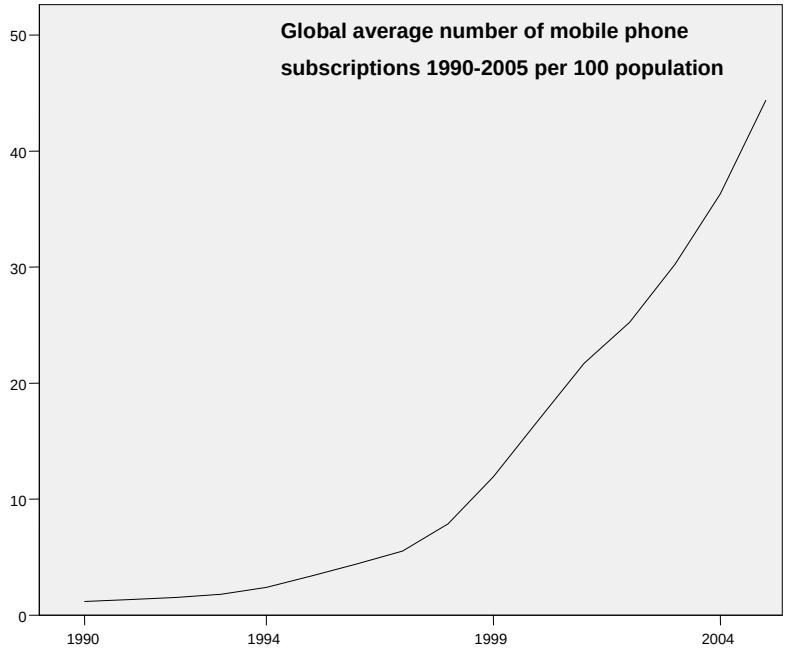

Fig. 4.1 Mobile Teledensity Growth
Source: MDG 2008

4.2.2 The dependent variable *Anti-government Demonstrations*

Anti-government demonstration is used to measure political activism. It is defined as *"[a]ny peaceful public gathering of at least 100 people for the primary purpose of displaying or voicing their opposition to government policies or authority, excluding demonstrations of a distinctly anti-foreign nature"* (CNTS 2007). The data is provided by the Cross-National Time-Series Data Archive (CNTS 2007), a proprietary database.[49] According to CNTS, most of the data are derived from *The New York Times*. The variable definitions are adopted from 'Dimensions of Conflict Behavior Within and Between Nations' (Rummel 1963:5). For more details on this data and its preparation, see the appendix.

[49] Earlier works often quote the database's founder and former chairman Arthur S. Banks rather than CNTS.

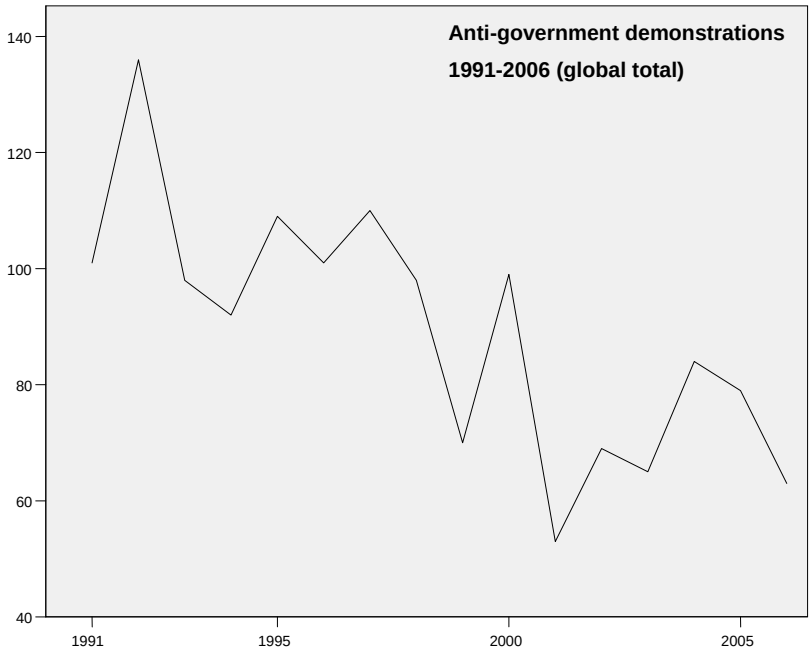

Fig. 4.2 Anti-government demonstrations
Source: CNTS 2007

In order to approach the concept of political activism more thoroughly, two additional indicators, *Riots* and *Major Government Crises*, were tested with the data (graphs are available in Appendix B). They are also taken from the CNTS database and have the same qualities and characteristics (see appendix). Riots are defined as *"[a]ny violent demonstration or clash of more than 100 citizens involving the use of physical force"* and Major Government Crises as *"[a]ny rapidly developing situation that threatens to bring the downfall of the present regime - excluding situations of revolt aimed at such overthrow"* (CNTS 2007).

4.2.3 Control variables *GDP*, *population*, and *time*

GDP per capita is defined as g*ross domestic product per capita based on purchasing power parity (PPP) in constant 2005 international dollars* and is provided by the World Bank Group's *World Development Indicators* website (WDI 2007). An international dollar has the same purchasing power over GDP as the US dollar has in the United States. GDP at the purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions

for depreciation of fabricated assets or for depletion and degradation of natural resources (WDI 2007).[50] For the same reasons as the mobile teledensity data, the WDI scores were time-lagged (t-1) and log-transformed.

Population is defined as the total population in a country divided by 1000. This indicator is available in the CNTS database. Again, the scores were time-lagged (t-1) and log-transformed for the abovementioned reasons. There was some indication that the density of population also correlated with the main other indicators (see appendix), but I decided not to use it as it remained insignificant in the regression analyses. Using just one control variable for population was deemed sufficient. For a more detailed definition of both variants of population variables, see the appendix.

Finally, time, measured in years, was included as a dummy variable to control for trend effects. The reasons for each variable's inclusion are discussed below.

4.2.4 Validity

Mobile Teledensity

Using mobile teledensity as a proxy to mobile connectivity was deemed straightforward and reasonably sufficient to cover the concept within the framework of this paper. Teledensity data is collected by the ITU and is considered very accurate and very reliable data (cf. MDG 2008). However, some validity issues did arise and are discussed below.

Tab. 4.1 Mobile teledensity range

	N	Minimum	Maximum
Mobile teledensity	2096	0.05	154.83
Valid N (listwise)	2096		

Note: Scores in the original dataset are multiplied by a factor of 100

The registered mobile teledensity levels ranged from 0.05 to 154.83 per 100 inhabitants (table 4.1) over the whole time period of 16 years. Zero mobile teledensity is technically a possible value, but hardly to be found after the late nineties, when mobile networks finally spread to virtually every country (reaching

[50] I would like to thank Beatriz Prieto-Oramas of the World Bank for confirming the detailed definition in an email to me.

even the most unlikely places). The dataset does not distinguish between a complete absence of networks (and hence subscribers) and missing values. In contrast, mobile teledensity of 100 percent and more can be found in a number of countries, suggesting that everyone there has one or more subscriptions. This is, of course, misleading, as there will always be individuals that are too young, too old or too disabled to use a phone, and those who cannot afford one, choose not to have one, or are not allowed to own one, e.g. in prisons and asylums (Sutherland 2008).

This leads us to a central validity issue, namely that *some users own several subscriptions, while others share one*. For example, the current global number of 4 billion mobile phone subscriptions does not entirely correspond to 4 billion individuals with a subscription (NZZ 2008c). Moreover, the per-country measurement raises the issue of subscribers that are not residents of the country or countries where they are counted, and that may have further subscriptions in other countries. Mobile network operators may also have an incentive to report large numbers of subscribers, and thus deliberately inflate their customer base, especially when negotiating contracts with governments.[51] This does, on the other hand, reduce the average revenue per user, a factor that can disappoint financial analysts and hence the value of the operator. In theory, this should restrain operators from overzealous reporting of large numbers of customers (Sutherland 2008).

Why would certain individuals have several SIM cards? On one hand, wireless technology has created a proliferation of SIM cards. They can now be found in laptop computers, cars and many other devices.[52] This is an example of wealthier customers, and some of those SIM cards may not be included in the ITU's measurement by definition (see 4.2.1). The phenomenon called 'SIM switching' is more relevant: less wealthy users may also have several SIM cards to take advantage of changing tariffs. Ewan Sutherland (2008) sums up the reasons for such ownership of more than one SIM card:

[51] A possible strategy to manipulate the size of the customer base is the expiration date of unused SIM cards, i.e. how long an operator waits before deactivating idle SIM cards.

[52] They are now even used in remote activation and safety control systems. In Norway, for example, the heating at a mountain cabin can be activated by SMS prior to the owner's arrival. The same cabin can be connected to a burglar alarm control center via a SIM-card device (see for example http://www.hyttetorget.no/).

- *Overcoming patchy or poor network coverage*
- *Avoiding network congestion*
- *Saving money by making on-net calls [same operator]*
- *Benefiting from discounted or bundled tariffs for voice or for data*
- *Receiving calls or voicemail [or SMS] to an older number*

The importance of such issues varies from country to country, and makes it difficult to estimate how inflated the numbers of users truly are; also, it does not allow for a more than approximate per-capita definition of subscriptions (Sutherland 2008). With some reservations following from this discussion, the measurement is still expected to be reasonably accurate for the purpose of this analysis.

Anti-government Demonstrations

Using anti-government demonstrations to measure the concept of political activism as described above seems accurate. It measures the mobilization and collective action aspect I am interested in – the one that supposedly leads to protest directed against the ruling government. It excludes mobilizations "of distinctly anti-foreign nature" (CNTS 2007). Clearly, data collected through newspapers can never be truly comprehensive. CNTS acknowledges this, and also raises the issue of possible geographical bias. This means that events are being seen through the eyes of the US-based media. Moreover, certain events may not be of a clear domestic nature, as for example the Palestinian-Israeli conflict, somewhat blurring the typology used. The data provider thus advises to use the data with caution and, in general, "only for macroanalytic purposes" (CNTS 2007). As this is the case in my paper, I expect this indicator to reasonably cover the underlying concept.

The CNTS (2007) dataset offers a range of other domestic event variables. Two of them seem to be able to cover the concept of political activism to a certain degree; I therefore decided to test them as well.

Additional indicators Riots and Major Government Crises

Riots were considered to be a likely addition to anti-government demonstrations, insofar as these may turn violent.[53] The dimension of non-military violence is an

[53] The significant and fairly strong correlation between riots and anti-government demonstrations seems to confirm this view (see table D.2 in the appendix).

acceptable addition to the already considered peaceful dimension to cover the concept of political activism. However, the data provider's definition is very sparse and it remains somewhat unclear what type of event that is being measured and whether the use of 'citizen' is intentional (with the implications that may follow from this). The concept of political activism requires the indicators to have a minimal political connotation. Here the indicator may, in principle, also include criminal (e.g. gang fights) or apolitical (e.g. a hooligan brawl) activities, although the threshold of 100 people may be able to somewhat reduce that problem since this seems a fairly high and unlikely number for apolitical riots. With regard to bias and comprehensiveness, the same reservations as for anti-government demonstrations apply.

Major Government Crises as an indicator was thought to cover some aspects of the concept as well, particularly the 'rapidly developing' situation which could be associated with mobile phone enhanced protests and the speed and magnitude of response it can facilitate. What the causes of the rapidly developing crises are and whether popular pressure (where mobile phones could play a role) or some other reason caused the downfall remains somewhat unclear, but it is reasonable enough to see it if not as a sign, then at least as a consequence of political activism, and therefore the indicator is included in the analysis. Otherwise, the same measurement reservations as above with regard to newspaper bias and comprehensiveness apply.

GDP per capita

The underlying concept here can be expressed as the (economic) development level of a country, which I intend to cover with the chosen indicator GDP per capita. Measuring economic strength with GDP is common in the social sciences; there should be little validity and reliability concerns. The choice of real (as opposed to nominal) i.e. inflation-adjusted dollars, which also account for purchase-power parity, should produce a valid measurement.

Why include this variable? There are two reasons. The first is the relationship between mobile teledensity and economic development; the second is a possible effect of economic development on political stability.

Earlier research has found that teledensity is closely interrelated with economic growth (Röller and Waverman 2001; Wilson 2004:30-32).[54] In other words, it is unlikely to observe one potential causal factor without the other. Finding teledensity changes and simultaneously observing economic changes can therefore be expected, i.e. there may exist a certain collinearity between the two. Omitting this control variable might bias the results for the independent variable (cf. Hegre et al. 2001:37).

The effects of economic development on political stability have been at the center of many studies (cf. Feng 1997; Przeworski and Limongi 1997; Londregan and Poole 1990), some of them linking this effect to the benefits of fewer disruptions, or more democracy. Gates et al. (2006) show that economic development has a positive effect on regime survival, which can be understood as an estimate of its stability. The evidence seems to be mixed: Camilla Gjerde (2005:231), using an earlier version of the CNTS dataset, found a somewhat opposite effect that suggests wealthier countries experience on average about one more anti-government demonstration, general strike, or riot per year than poorer countries (but not of major government crises), a result that seems to be more in line with my argument. A correlation test (see table D.1 and D.2 in the appendix) show that GDP significantly correlates with variables used in the model.

As Röller and Waverman's research relates to pre-1990 data prior to the ascent of mobile telephony, it is unclear to what degree their results can be applied to mobile teledensity. Research based on more recent data (cf. Wilson 2004:30-36) states an association between economic growth and ICT growth, but again, despite being part of the concept definition no mobile phone indicators are used to measure ICT (telephone landlines and Internet connections are used instead). Despite these caveats, GDP seems a plausible factor and will be included in the model.

[54] Interestingly, the question has long been whether telecommunication infrastructure generates economic growth or whether economic growth creates demand for upgraded infrastructure. In a study, Röller and Waverman (2001; see also Waverman et al. 2005) concluded that the causality is in fact two-way: telecommunication infrastructure and economic growth catalyze one another.

Population

As the teledensity variable has values relative to population, I need to control for this to avoid picking up a spurious effect that relates to population rather than mobile teledensity levels.

Time

While the aim of the analysis is to test causal effects of variables varying in time, it is necessary to control for trends in the data by including a time dummy variable (Gujarati 2003:643-644). Trends in that sense mean that both the independent and dependent variable(s) evolve over time, and that it is possible to predict subsequently observed values based on their previous values. Due to this, completely unrelated factors can be strongly correlated over time simply because they have a similar temporal pattern (Skog 2004:325). Figures 4.1 and 4.2 (see above) seem to imply that this is the case here. Hendry (1980, cited in Skog 1988:568) has for example demonstrated that one can predict inflation by measuring rainfall. A more familiar example may be the so-called *sunspot* problem: activity registered on the sun's surface has been repeatedly used to 'demonstrate' the impact on variables such as drug abuse or emigration (Skog 1988:570). Common to these examples is that they usually represent relative short time periods, substantially increasing the risk that large correlations will be found between unrelated variables (1988:572). In order to control for this trend effect, a time dummy variable was introduced which can account for unobserved heterogeneity over time (cf. Gujarati 2003:640-651; Beck et al. 1998).

Lagged dependent variable

A lagged version of the dependent variable can be included as an independent variable that measures the previous year's value (Y_{t-1}). By this measure, which is also called autoregressive model, it is possible to control for the possible effect that the previous year's incidence of political activism can have on the following year's incidence, a common procedure in time-series analysis (cf. Gujarati 2003:656).

4.3 Panel data analysis

The units of analysis are country-years, thus combining cross-section and time-series analysis into so-called panel data analysis (Gujarati 2003:636-638).[55] The CNTS (2007) databank comprises of more than 200 countries.[56] Countries not represented in all three data sources were excluded from the analysis altogether. The remaining countries (N = 191) were repeatedly observed over a period of 16 years, from 1991-2006. The scores for the dependent variables always represent the given year, while the scores for the independent variables are from the previous year (t-1) to control for reverse causality (cf. Smelser 1973:49-51).

Panel data sets offer advantages over pure cross-section or pure time-series datasets. The number of observations is typically much larger; rather than just analyzing 191 units or 16 years of the same unit, I combined both. This is likely to generate more reliable estimates and allows one to detect effects that cannot be identified with pure cross-section or time-series data. This also makes more sophisticated models available and may alleviate multicollinearity issues because when independent variables vary in two dimensions, they are less likely to be highly correlated (Gujarati 2003:636-638; Mátyás and Sevestre 1995:26). The estimation of panel data regression models depends on the assumptions one makes about the constant term. One way to take account of the 'individuality' of each country is to let the constant vary freely over time for each country. This model, known as a fixed-effects regression model, was used in this analysis. It is where one adds for example time dummies to check for unobserved heterogeneity over time. It is called 'fixed effects' to distinguish it from 'random effects' which would not be appropriate here.[57] This procedure is a test of whether observations are temporally independent, thus correcting for observations that are temporally dependent (cf. Gujarati 2003:640-651; Cameron and Trivedi 1998:276; Beck et al. 1998:1260-1261).

[55] A few countries were excluded and country-years with missing data, see the appendix.
[56] Some of the entities termed 'country' may not be entirely sovereign or fully recognized, but as long as data is available for all indicators, they will be included in the analysis. In the appendix, a list of excluded countries and missing data on specific country-years is available. Unit validity may be slightly affected in some cases due to territorial changes (e.g. Indonesia, Ethiopia or Yugoslavia) but was considered negligible.
[57] See Gujarati (2003:650) for an explanation and further references.

4.4 Regression analysis with categorical data

The dependent variable determines what type of regression is adequate to analyze a given set of data. The dependent data at hand is considered to be categorical. In theory, any number of anti-government demonstrations, riots or major government crises are possible per year and per country. In practice, only a limited number of such events occur (see Appendix C). Continuous variables on the contrary can, in principle, assume an infinite number of values (Powers and Xie 2000:2-4). While the scores are repeated in a significant portion of the cases, only a limited number of demonstrations, riots and crises can be observed. The limit in the data seems to be no more than 24 anti-government demonstrations per country in any given year; for the other indicators, it is even less (Appendix C). They thus belong to the group of *discrete* variables, which have a finite number of non-negative integer values only, i.e. natural numbers starting from zero and with no decimals. Such variables are defined as categorical (Powers and Xie 2002:2-3).

Categorical data analysis requires special statistical methods such as logistic regression rather than the linear variant. One cannot assume a linear function with categorical variables (cf. Powers and Xie 2000:4; Liao 1994:1). Logistic regression is commonly applied to analysis where the dependent variable is binary, while the independent variables are continuous, or both continuous and categorical (Field 2005:780; Powers and Xie 2000:39).[58] When the outcome is not binary, as in my case, alternatives are the ordinal logistic and multinomial logistic regression for ordered or nominal values, respectively. For the special case of event count data Poisson regression should be considered. My dependent variable seems to have the properties of so-called count data, or rare event data, because the number of anti-government demonstrations, riots, or major government crises are counted on a per-year basis. Due to the data properties a variant of Poisson seems most adequate and is discussed in the next section.

[58] Where both the dependent and independent variables are categorical, log linear analysis can be used (Field 2005:780; Powers and Xie 2000:39).

4.5 Poisson and negative binomial Poisson regression

Event count data such as the number of car accidents in a city per month is a typical example of data that can have a Poisson distribution. Count data regression is useful in studying the occurrence rate per unit of time conditional on some independent variables.[59] The Poisson model requires so-called equidispersion, i.e. the event counts in the dependent variable should be evenly distributed so that the distribution's variance is equal to its mean. Failure of this has similar qualitative consequences to failure of the assumption of homoskedasticity in the linear regression model. Since equidispersion cannot be assumed here – scoring the dependent variable predominantly results in zeroes and ones – a variant of Poisson called *negative binomial Poisson regression* can instead be applied. It accounts for so-called overdispersion, i.e. more observed variance than the Poisson model would predict (Liao 1994:70 and 72; Norušis 2008:270-271; Cameron and Trivedi 1998:71 and 77; Gujarati 2003:620-622). Random events will more often than not remain unobserved, making zero event counts dominant and as a result, the distribution will be skewed. Negative binomial Poisson regression can account for this by adding an extra parameter (Cameron and Trivedi 1998:11 and 15-16).[60]

The rationale of Poisson distribution is that events are independent from each other.[61] In the case of domestic protest events, this condition may not be given, i.e. events in one year may correlate with those in the following year. Such occurrence dependence can result in overdispersed distributions and is common in time-series analysis (Cameron and Trivedi 1998:16 and 97; Norušis 2008:270). Negative binomial Poisson regression can account for part of the overdispersion. In addition, a lagged version of the dependent variable (Y_{t-1}) will be tested in model to account for this possible effect and give a better model specification.

[59] Incidentally, Cameron and Trivedi (1998:275) state that "[a] political science example is the number of protests in each of several different countries over many years". Other examples are the number of vacations taken by a family a year, or rare events such as the number of people that get hit by a lightning in week (Gujarati 2003:620).

[60] Due to restrictions in the statistical package used the so-called zero-inflated Poisson regression could not be tested (cf. Cameron and Trivedi 1998:123-127).

[61] For example, when taking probes of pond water with a bucket, if no other reason affects the distribution the chance of getting a certain amount of algae per bucketful should be roughly the same (and not interdependent).

5. Regression Analysis

5.1 Negative binomial Poisson model

The results of the negative binomial Poisson analysis[62] presented below indicate that mobile density has no significant effect on anti-government demonstrations when the control variables are included (table 5.1). The same is true when using riots or major government crises as dependent variables (model 2 and 3). GDP per capita is small and insignificant except for riots, where it has a significant negative effect. Population has an effect on all three variants of political activism variables.[63] The significant effects can be interpreted as follows: for a one unit change in the predictor variable, the incidence of the political activism variable is expected to increase or decrease multiplicatively by the antilog of the coefficient (cf. UCLA 2008).[64] The interpretation for each dependent variable is specified below.

Anti-government demonstrations (model 1)

Both mobile teledensity and GDP are insignificant. A one-unit increase in log population is expected to increase the incidence of anti-government demonstration by 40.1 percent, when the other predictor variables are included in the model.[65] Similarly, a one-unit increase of anti-government demonstration in the previous year (labeled as 'lagged dependent variable' in table 5.1) increases the incidence of the same event in the following year by 39.6 percent. The time variable coefficients are negative and roughly increasing in magnitude as the year variable increases; the overall significance is at the $p<0.01$ level (see Appendix E), reflecting the decrease in the frequency of demonstrations shown in figure 4.2.

[62] The Poisson model was dismissed after testing whether the overdispersion parameter in the negative binomial Poisson model was equal to zero, the special case where it is identical with the Poisson model. See Appendix E for the calculations.

[63] I tested also a variant without the lagged event variable. The results differed only slightly and this significant variable was therefore kept in the model. For the results without it, see the appendix.

[64] The estimated coefficient (B) indicates whether the change is an increase (positive sign) or a decrease (negative sign). The antilogarithms (exp(B)) are provided in Appendix E. For example, the antilog of 0.337 is exp(0.337) = 1.401. This means an increase of 1.4 or 40 percent per one-unit increase of the predictor.

[65] A 'one-unit increase in log population' can also be formulated as 'an increase in population by the factor 2.718' (Euler's constant).

Tab. 5.1 Predictors of political activism 1991-2006. Negative binomial Poisson regression

Variables	Model 1 anti-gov demo	Model 2 riots	Model 3 major gov crises
Mobile teledensity (log)	-.006 (.0482)	.092 (.0671)	-.018 (.0781)
GDP per capita (log)	-.090 (.0748)	-.318** (.1035)	-.066 (.1276)
Population (log)	.337** (.0260)	.316** (.0362)	.216** (.0415)
Lagged dependent variable[b]	.334** (.0303)	.448** (.0549)	.963** (.1056)
[year=2006]	-.749 (.4201)	-1.838** (.5156)	-.504 (.8423)
[year=2005]	-.563 (.4068)	-1.872** (.4983)	.138 (.7915)
[year=2004]	-.489 (.3969)	-1.937** (.4889)	-.186 (.7903)
[year=2003]	-.630 (.3911)	-2.250** (.4928)	.071 (.7663)
[year=2002]	-.578 (.3805)	-2.347** (.4794)	.551 (.7387)
[year=2001]	-.964 (.3810)	-2.160** (.4599)	.322 (.7327)
[year=2000]	-.120 (.3556)	-1.695** (.4249)	.392 (.7169)
[year=1999]	-.624 (.3559)	-1.877** (.4274)	.100 (.7107)
[year=1998]	-.222 (.3381)	-1.913** (.4157)	.362 (.6906)
[year=1997]	.063 (.3314)	-.981** (.3726)	1.076 (.6711)
[year=1996]	-.044 (.3376)	-1.083** (.3866)	.123 (.7201)
[year=1995]	.243 (.3332)	-.718 (.3710)	.244 (.7119)
[year=1994]	-.397 (.3647)	-1.293** (.4319)	.299 (.7189)
[year=1993]	-.304 (.3830)	-1.582** (.4951)	.493 (.7319)
[year=1992]	.065 (.3708)	-1.098* (.4475)	1.181 (.6955)
[year=1991]	0[a] (.)	0[a] (.)	0[a] (.)
Intercept	-3.011** (.6981)	-.967 (.9302)	-4.023* (1.2633)
Log likelihood	-1537.286	-856.620	-642.952
Chi-square likelihood ratio	535.269	302.938	179.832
N	1913	1914	1914

Note: Estimated coefficients are unstandardized negative binomial coefficients. Standard errors in parentheses. All independent variables except the time dummy (year) have scores lagged by one year (t-1). SPSS 16.0 for Mac was used.
*Significant at the 0.05 level and ** at the 0.01 level
[a] Set to zero because this parameter is redundant.
[b] Y_{t-1}; scores the previous year's anti-government demonstrations, riots or major government crises, respectively.

Riots (model 2)

Mobile teledensity has no significant effect. Log GDP is significant here, and is estimated to decrease the incidence of riots by 27.3 percent, when the other predictor variables are included in the model. A one-unit change in log population increases the incidence by 37.2 percent and a one-unit change of riots in the previous year (lagged

dependent variable) increases the incidence of the same event in the following year by 56.5 percent, with all variables included in the model. The time variable coefficients are negative and roughly increasing in magnitude as the year variable increases; the overall significance is at the $p<0.01$ level (see Appendix E).

Major government crises (model 3)

Both mobile teledensity and GDP are insignificant. A one-unit increase in log population is estimated to increase the incidence of major government crises by 24.1 percent, when the other predictor variables are included in the model. Similarly, a one-unit change of major government crises in the previous year (lagged dependent variable) is expected to increase its incidence in the following year by 162.1 percent. The time variable is not significant (see Appendix E).

The same model was also tested with some modifications. A model with aggregated counts was tested but the results didn't change the results in a critical way.[66] This was done because when there are many counts or few observations for a given count then some aggregation of count data may be necessary (Cameron and Trivedi 1998:88). I tested also a model that excluded the lagged dependent variable, but including this significant variable was considered a better specification and the difference was small (see Appendix E for results without this variable). The insignificant results for mobile teledensity[67] led to the question whether this could be caused by a violation of assumptions made about the distribution (see Ch. 4.5). In such cases, it is common to consider other parametric distributions, i.e. models that could accommodate features of data that are inconsistent with specific assumptions of the negative binomial Poisson model (Cameron and Trivedi 1998:96-97). Ordinal regression can be adequate in this case, as it accounts for the natural order of count data while assumptions of the previously tested model are relaxed.[68] The next chapter will give

[66] For example, where there are few counts above 3 one can recode the data into the categories 0,1,2,3 or more.
[67] I tested also a model with sequential inclusion of the variables. Interestingly, mobile teledensity has a small but significant negative effect on political activism variables but this effect is lost when including the time dummy (but not with GDP). For the reasons explained in Ch. 4 and the significant correlations (Appendix D) between the predictors such a reduced model was not considered a good specification.
[68] The multinomial logistic model is inappropriate for count data for which the outcome, the number of occurrences of an event, is naturally ordered. Multinomial logistic regression is useful with nominal data.

an indication of whether this can have an effect on the significance of mobile teledensity coefficients.

5.2 Alternative regression models

5.2.1 Ordinal logistic regression

In this variant of logistic regression, the number of events are treated as an ordinal variable. Because there are such few counts on the higher end of the scale the scores were recoded for antigovernment demonstrations and riots, reducing the categories to 5 and 4 counts, respectively.[69] The variable major government crises has only 5 possible counts and was left that way. For the ordinal logistic regression, the typically applied logit link function was not deemed appropriate as it presupposes evenly distributed categories. Due to the high number of zeros and lower scores, another link function called negative log-log was preferred; it presupposes a distribution where lower categories are more probable (Norušis 2008:84). A standard interpretation of ordinal logistic regression would be as follows: for a one- unit increase in the predictor variable, the log odds of the dependent variable to fall into category 1 or higher, rather than in category 0, increases or decreases by the coefficient. Note that the log odds for being in category 2 or higher rather than in category 1 (or lower) etc. increases by the same ratio (Norušis 2008:80; UCLA 2008).[70]

The results did not lead to significant changes compared to the previous regression model; mobile teledensity remains insignificant, while both population and the lagged dependent variable have a significant and positive effect. GDP has a significant and negative effect on riots.

[69] For the former, the scores 5-24 were collapsed into 5 and the variable renamed into demo6b; for the latter, the scores 4-14 and higher were collapsed into 4 and renamed into riot5b (see appendix). Other variants with more or fewer categories were tested as well, but the results changed only slightly.

[70] To calculate the odds ratios of the predictors, the estimate can be exponentiated analogous to the exp(B) procedure as shown in the negative binomial Poisson section above.

Anti-government demonstrations (model 1)

Both mobile teledensity and GDP are insignificant. For a one-unit change in log population, the odds of anti-government demonstration to occur 1 or more times, rather than 0, increases by 34.2 percent, given that the other predictor variables are included in the model (the same applies for the odds of anti-government demonstrations occurring 2 times or more, rather than just once or less, etc.). Similarly, a one-unit change of anti-government demonstration in the previous year (lagged dependent variable) increases the odds of being on the next higher incidence level or above compared to the next lower level or below the following year by 41.6 percent.

Riots (model 2)

Mobile teledensity is insignificant. For a one-unit change in log population, the odds of riots to occur more often compared to less often increases by 32.7 percent, when the other predictor variables in the model are included in the model. Similarly, a one-unit change of riots in the previous year (lagged dependent variable) increases the odds for more riots compared to less riots the following year by 87.2 percent. Again, log GDP seems to be significant and decreases the odds of higher counts compared to lower counts of riots by 32.3 percent.

Major government crises (model 3)

Both mobile teledensity and GDP are insignificant. For a one-unit change in log population, the odds of major government crises to occur more often compared to less often increases by 23.6 percent, given that the other predictor variables in the model are held constant. Similarly, a one-unit change of major government crises in the previous year (lagged dependent variable) increases the odds of more events compared to less events the following year by 160.9 percent.

Tab. 5.2 Predictors of political activism 1991-2006. Ordinal logistic regression.

Variables		Model 1 anti-gov demo	Model 2 riots	Model 3 major gov crises
Location	Mobile teledensity (log)	.027	.088	-.042
		(.053)	(.076)	(.078)
	GDP (log)	-.034	-.280*	-.078
		(.082)	(.114)	(.128)
	Population (log)	.294**	.283**	.212**
		(.029)	(.039)	(.041)
	Lagged dependent variable[b]	.348**	.627**	.959**
		(.033)	(.063)	(.093)
	[year=1991]	.375	.628	.396
		(.504)	(.669)	(.825)
	[year=1992]	.779	-.212	.912
		(.433)	(.707)	(.708)
	[year=1993]	.389	.571	.606
		(.431)	(.585)	(.681)
	[year=1994]	.579	.659	.567
		(.398)	(.546)	(.652)
	[year=1995]	1.045**	.696	.867
		(.353)	(.502)	(.593)
	[year=1996]	.851**	.678	.434
		(.332)	(.454)	(.608)
	[year=1997]	.469	.276	1.407**
		(.329)	(.454)	(.517)
	[year=1998]	.378	-.013	.810
		(.311)	(.440)	(.507)
	[year=1999]	.336	.264	.609
		(.299)	(.400)	(.502)
	[year=2000]	.439	.113	.593
		(.281)	(.380)	(.489)
	[year=2001]	-.213	-.425	.663
		(.293)	(.392)	(.464)
	[year=2002]	.445	-.278	.834
		(.259)	(.368)	(.439)
	[year=2003]	.299	-.374	.159
		(.257)	(.367)	(.477)
	[year=2004]	.315	.183	.215
		(.253)	(.311)	(.479)
	[year=2005]	.174	.093	.463
		(.256)	(.309)	(.461)
	[year=2006]	0[a]	0[a]	0[a]
		(.)	(.)	(.)
Threshold[c]	[event = 0]	4.544**	3.189**	4.201**
		(.544)	(.724)	(.897)
	[event = 1]	5.375**	4.311**	5.895**
		(.548)	(.732)	(.882)
	[event = 2]	5.915**	5.150**	7.505**
		(.552)	(.744)	(.937)
	[event = 3]	6.637**	5.867**	8.899**
		(.559)	(.764)	(1.120)
	[event = 4]	7.107**	–	9.595**
		(.567)		(1.325)
Log likelihood		2828.379	1556.768	1266.735
Chi-square likelihood ratio		331.004	181.449	171.335
Pseudo R^2 (McFadden)		.105	.104	.119
N		1913	1914	1914

Note: Estimated coefficients are unstandardized negative log-log coefficients. Standard errors in parentheses. All independent variables except the time dummy (year) have scores lagged by one year (t-1). SPSS 14.0 for Windows was used.
*Significant at the 0.05 level and ** at the 0.01 level
[a] Set to zero because this parameter is redundant.
[b] Y_{t-1}; scores the previous year's anti-government demonstrations, riots or major government crises, respectively.
[c] Intercept-equivalent term. The last category doesn't have an odds associated (cf. Norušis 2008:71-73).

5.2.2 Logistic regression

Considering that ordinal logistic regression did not improve the results of mobile teledensity, I decide to relax the model assumptions a bit further and test logistic regression with a dichotomous outcome. With few possible outcomes of values a dichotomy of event vs. non-event is a possible solution to deal wit the data. However, the logistic regression confirmed the results of the previous regression models but did not contribute with new insights. The results for a test with anti-government variable can be found at the end of Appendix E.

5.3 Discussion

One clear conclusion of my analysis is that mobile teledensity consistently remains non-significant throughout all types of models. At the same time, I find that population levels have a fairly strong effect on all political activism variables. Occurrence of one political activism event in the previous year appears to be a likely predictor of the same event in the following year, thus indicating that occurrence independence is not given. Economic level measured by GDP seems to be negatively associated with riots. The null hypothesis stating no association between mobile connectivity and political activism cannot be rejected with 95 certainty. This conclusion is considered robust due to the variety of models tested with the data, which did not produce notably different results.

Why are the results for mobile teledensity not significant? Although this indicator significantly correlates with the political activism variables (Appendix D), no significant effect can be found in a regression model that includes the control variables GDP, population, and time. This suggests that the development of political activism is not dependent on developments in mobile telephony over the years in any measurable way. Running the analysis with mobile teledensity as the only predictor produced small but significant results, but these disappeared when including time and population as control variables in the model. The non-significant results of GDP are somewhat counterintuitive. Gjerde’s (2005:231) conclusion countries with higher

GDP experience more anti-government demonstrations and riots are not confirmed by my results; riots even showed a contrary result. The analysis suggests that increasing GDP reduces the probability of violent (riots), but not peaceful protest (anti-government demonstrations). Major government crises are not affected by economic levels according to my results, either.

6. Conclusion

The case studies and interviews in Ch. 2 indicate that mobile phones may have potentially gained a central function as facilitators in mobilization and collective action processes in the political sphere. Furthermore, the theoretical literature in the social sciences offers many different and productive approaches to explain these processes, and the potential function of communications technology is recognized but not very well-explored. The theoretical base seems broad enough develop a hypothesis on possible associations between mobile phone-enhanced social linkages and political activism. However, the results of my regression analyses imply that mobile connectivity can neither negatively, nor positively be associated with political activism. Overall, time trends, population levels and the previous incidence of political activism appear to be better predictors of the occurrence of political activism than mobile connectivity and economic levels. It seems thus that impressions given by some of the cases presented in Ch. 2 are overrated and that generalization by means of a global comparative analysis is not possible in the way conducted in this thesis. The effect of mobile phones is either inexistent, too weak to be measureable, or offset by other factors. The simple assumption that mobile phones alone will create a measurable impact on political activism cannot be sustained with the methods and data used in this thesis. I will in the following suggest some amendments and outline some future work that should be done.

Outlook

One of the main counterarguments to the hypothesis mentioned at the end of chapter 3 was the issue of monocausality. Although mobile phones were not treated as causes of political activism, network society theory still claimed this communication technology (together with the Internet) to be an ‘indispensable medium’ in the workings of 21st century society. From the results achieved, one can conclude that if mobile communication truly is a necessary condition, it may not be a sufficient one for the effects stated. What other variables could be relevant? Castells et al. (2007) repeatedly highlight their view that mobile phones, while powerful and important in the context of 21st century political activism, must interact with a particular media

environment to unleash their potential in the sense discussed in this thesis. Including media freedom[71] or other media variables into the analysis may be a possible avenue to tackle this aspect. In some of the examples observed, the Internet seems to have played an important role as a backup information and dissemination source on which users of mobile phones were able to rely. It may be worthwhile to analyze the combined impact of mobile phones and the Internet, in addition to (more traditional) media variables, although the very low Internet penetration rates (cf. Ch. 1.2) in many non-Western countries may cause difficulties in extracting useful information from such data. In countries with low Internet accessibility, other media such as the radio may substitute for the Internet, a factor that can be accounted for. Broadening the set of variables included as predictors of political activism may, interestingly, return the debate to the background concept of connectivity I briefly mentioned in Ch. 4.1. This could imply that mobile connectivity is only one link in a chain of factors that amounts to connectivity effects. After all, even highly motivated would-be protesters need travel infrastructure (roads, railways, etc.) to join a demonstration, and their motivation will depend on a variety of information sources such as websites, TV channels or radio stations and perhaps an urban setting that provides spatial proximity to enough other potential protesters.

These connectivity issues relate to my next point, namely lack of systematic research with regard to relevant context variables. There seems to be no scholarly work trying to identify the main variables in important cases where mobile phone activity was deemed crucial. This is problematic because 'context' is often named as an important factor, while little reference is made to what kind of context variables besides media and Internet access are considered important. There is clearly a need for more research to identify these variables, perhaps through comparative case studies. Large-N analysis could greatly profit from this in order to formulate models that can control for the relevant context factors.

[71] It is unclear though how cases such as Spain, which is not usually a country associated with state-controlled media, would fit into model that includes media freedom. The mobile phone's impact at the 2004 elections was precisely due to the fact that established media outlets of Spain were not capable to fulfill the responsibility they supposedly have in such a free and democratic society (cf. Ch. 2.2).

In future analyses similar to this one, it may be worthwhile to expand the definition of agents in political activism to capture additional moments of collective action and mobilization. There is often a certain bias when describing activists; demonstrators are usually pictured as benign actors, as fighters for a good cause and exponents of 'civil society' (cf. LSE 2004). This does not imply that mobile networks may never be used for malign purposes, that the "power of grassroots mobilization cannot be subjected to the perils of demagogy" (Castells et al. 2007:256) or that there will only be "uniformly benevolent outcomes" (Rheingold 2002:163). Little seems to be known of such examples[72], but further inquiries may be able to advance the research efforts on where mobile connectivity plays a role.

Furthermore, I would also like to mention the rapid adaptation, or the potential 'arms race' between civil society and governing elites as mentioned in Ch. 3.5. It seems plausible to argue that the situation under democratic and the one under oppressive regimes cannot be compared in terms of how communications technology is being used. For those more concerned with authoritarian governments' dealing with citizens empowered with mobile phones, a possible way to control for this would be to separate the analysis by regime type and check whether the mobile phone has a larger impact in freer societies compared to oppressed ones. It may also be important to keep in mind that governments, whether autocratic or not, have varying capacities in terms of resources, such as technical equipment and skilled specialists. It may be much easier to deal with an opposition newspaper than with a technically advanced communication network that everybody in a country, not just opposition groups, use. To further develop this approach a distinction by regime strength may be fruitful – weak governments may be less capable of coping with 'smart mobs' than stronger ones.

[72] Pavel Marozau (2008[interview]) gave an example, describing the large state-sponsored youth organization BDSM in Belarus which uses the same mobile phone tactics as the opposition movement. Similar organizations exist in Russia and elsewhere.

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Appendix A: Summary of tables and figures

Appendix B: Variable definitions and characteristics

The independent variable Mobile Teledensity

Definition: *Mobile cellular subscribers per 100 population [per country]*.

Mobile cellular subscriber refers to the use of cellular-technology portable telephones subscribing to a public mobile telephone service. Analogue and digital cellular systems up to third-generation technology (3G) are covered. Public mobile data and radio paging services are excluded. Both postpaid and prepaid subscriptions (i.e. invoice-based vs. pre-purchase-based) are included. In the database, the values are multiplied by a factor of 100, presumably to eliminate decimals (MDG 2008).

Origin: United Nations Millennium Development Goals website (MDG 2008). The data is collected by the International Telecommunication Union (ITU), a UN subsidiary.

Preparation: The data can be downloaded in various formats. Excel was used in this case. The data structure had to be manipulated before it was possible to import this indicator into SPSS. To keep control, the country codes from the CNTS (2007) data were paired with the respective country in this database. Countries represented in the mobile teledensity database but not in the CNTS database were removed. Once imported into SPSS. Double-checking the country codes immediately reveals discrepancies thus giving maximum safety with this data handling. The scores for this indicator are time-lagged in relation to the dependent variable values, i.e. from the previous year (t-1). This strategy is used to control for reverse causality (cf. Smelser 1973:49-51).

Characteristics: Continuous, non-normal. The variable was log-transformed because of the effect of a unit increase which is expected to be larger for a country with a low level on the variable than for a country with a high level. The log-transformation also reduces the skewness of the variable (cf. Hegre et al. 2001:37).

The dependent variable Anti-government Demonstration

Definition: *Any peaceful public gathering of at least 100 people [in a country] for the primary purpose of displaying or voicing their opposition to government policies or authority, excluding demonstrations of a distinctly anti-foreign nature.*

Origin: The data is available in the Cross-National Time-Series Data Archive (CNTS 2007) by Databanks International, a proprietary database. According to CNTS, most of the data are derived from *The New York*

Times. The variable definitions are adopted from 'Dimensions of Conflict Behavior Within and Between Nations' (Rummel 1963:5).

Preparation: The data is available in Excel format and can easily be imported into SPSS. Each country is already assigned a code from a range between 10 and 1300. This is helpful, if not necessary, to handle large datasets, and therefore the CNTS dataset determined the structure and was used as a base to which all other imported data were adapted to.

Characteristics: Discrete, non-negative integer values that count events per country-year.

For the variables *Riots* and *Major Government Crises*, the same information as above applies. The definitions go as follows:

Riots *Any violent demonstration or clash of more than 100 citizens [in a country] involving the use of physical force.*

Major Government Crises *Any rapidly developing situation that threatens to bring the downfall of the present regime [in a country] - excluding situations of revolt aimed at such overthrow.*

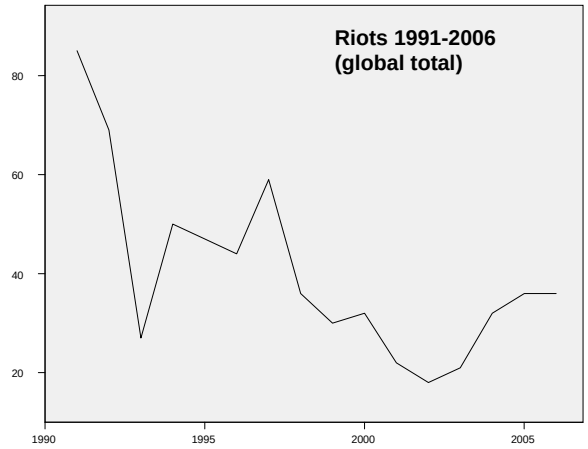

Fig. B.1 Riots 1991-2006
Source: CNTS 2007

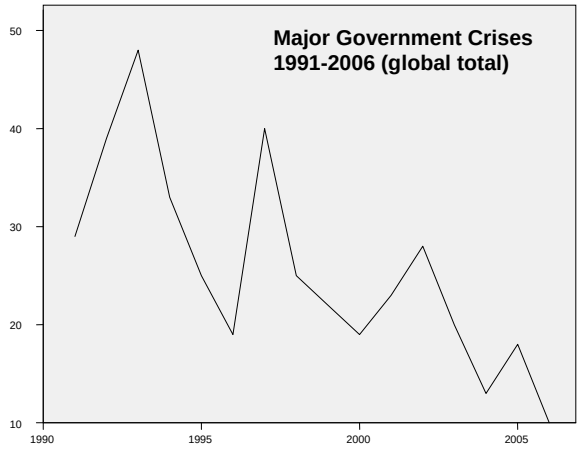

Fig. B.2 Major Government Crises 1991-2006
Source: CNTS 2007

The control variable GDP per capita

Definition: *Gross domestic product per capita [in a country] based on purchasing power parity (PPP) in constant 2005 international dollars.*

An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources (WDI 2007).

Origin: The World Bank Group's World Development Indicators (WDI) website (WDI 2007).

Preparation: The WDI website has a very user-friendly à la carte approach; one can choose countries, time periods and indicators and the desired data can then be downloaded in Excel format. Again, the data had to be manipulated in the same manner as the original mobile teledensity data (see above) before it was possible to import it into SPSS. The same procedure as with teledensity data was used to achieve the t-1 time lag.

Characteristics: Continuous, non-normally distributed variable. It was log-transformed because of the effect of a unit increase which is expected to be larger for a country with a low level on the variable than for a country with a high level. The log-transformation also reduces the skewness of the variable (see analogous procedure with mobile teledensity data above).

The control variable Population

Definition: *[A country's human] population divided by 1000.*

This term is not described any further in the database, but a quick check indicates that it refers to the number of residents in a country.

Origin: *Cross-National Time-Series Data Archive* (CNTS 2007). According to CNTS, the number of individually consulted sources was unusually large and therefore no bibliographic references were provided. I double-checked some values I am familiar with, which were correct. I assume that the data is trustworthy. Some references such as 'The Statesman's Yearbook' and the 'Journal of the Royal Statistical Society' are mentioned, but refer to earlier years in the dataset.

Preparation: This indicator was included for the relevant time period 1990-2006 in the CNTS database. All that was needed to be done was to make sure that the time lag of t-1 was applied.

Characteristics: Continuous, non-normally distributed. It was log-transformed to reduce the skewness of the variable (see analogous procedure with mobile teledensity data above).

The control variable Population Density (not used in the final analysis)

Definition: *[A country's human] population per square mile.*

The values are directly calculated from two other variables in the CNTS (2007) database, namely *Area in Square Miles* and *Population*, and then multiplied by 10.

Origin, preparation and characteristics are identical to the population variable.

The control variable Time

Definition: *Year of measurement.*
Origin: CNTS (2007).
Preparation: None.
Characteristics: Continuous. It is used as a categorical dummy variable in the analysis.

The lagged dependent variable as a control variable

Definition: See *anti-government demonstrations*, *riots*, or *major government crises*.
Origin: CNTS (2007).
Preparation: Time-lagged by one year (t-1).
Characteristics: Discrete, non-negative integer values that count events per country-year. Used as a continuous variable in the model.

Appendix C: Descriptive Statistics

Dependent variable (incl. riots and major government crises)

Tab. C.1 Valid and missing cases

		Anti-gov Demo	Riots	Major Gov Crises
N	Valid	3012	3013	3013
	Missing	44	43	43

Tab. C.2 Anti-government Demonstration frequencies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	2370	77,6	78,7	78,7
	1	314	10,3	10,4	89,1
	2	134	4,4	4,4	93,6
	3	97	3,2	3,2	96,8
	4	34	1,1	1,1	97,9
	5	26	,9	,9	98,8
	6	13	,4	,4	99,2
	7	10	,3	,3	99,5
	8	6	,2	,2	99,7
	9	4	,1	,1	99,9
	10	2	,1	,1	99,9
	12	1	,0	,0	100,0
	24	1	,0	,0	100,0
	Total	3012	98,6	100,0	
Missing	System	44	1,4		
Total		3056	100,0		

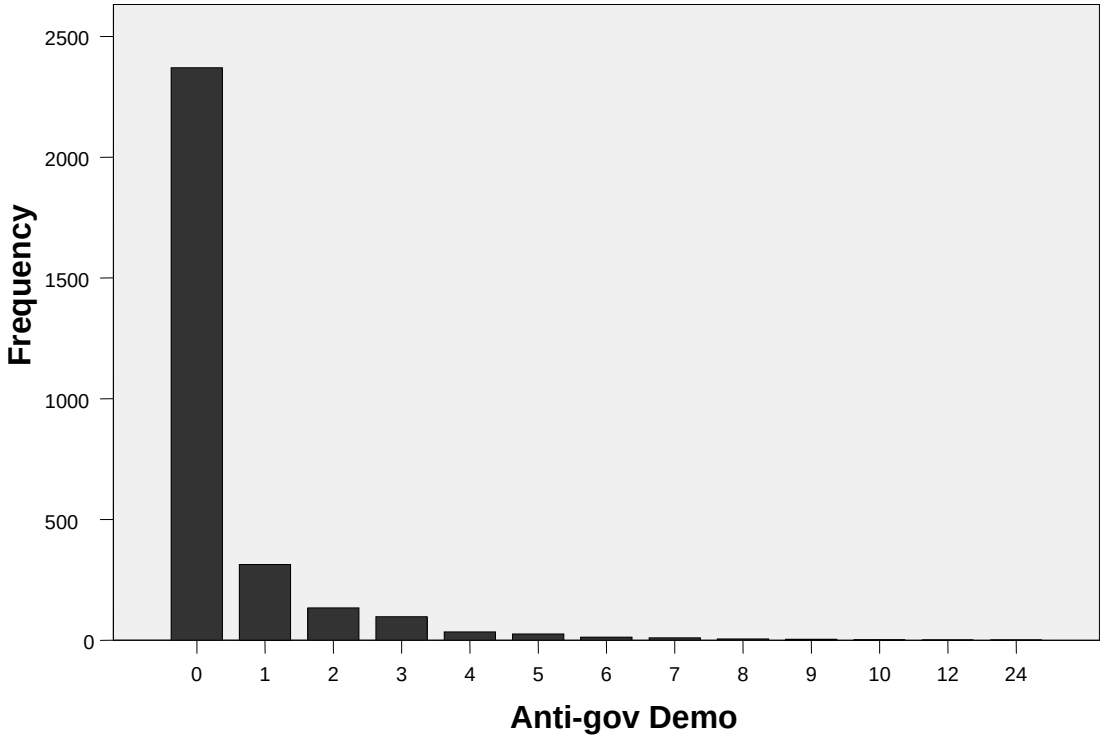

Fig. C.1 Anti-government Demonstration frequencies

Tab. C.3 Riots frequencies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	2671	87,4	88,6	88,6
	1	202	6,6	6,7	95,4
	2	75	2,5	2,5	97,8
	3	31	1,0	1,0	98,9
	4	17	,6	,6	99,4
	5	4	,1	,1	99,6
	6	6	,2	,2	99,8
	7	1	,0	,0	99,8
	8	1	,0	,0	99,8
	11	2	,1	,1	99,9
	12	2	,1	,1	100,0
	14	1	,0	,0	100,0
	Total	3013	98,6	100,0	
Missing	System	43	1,4		
Total		3056	100,0		

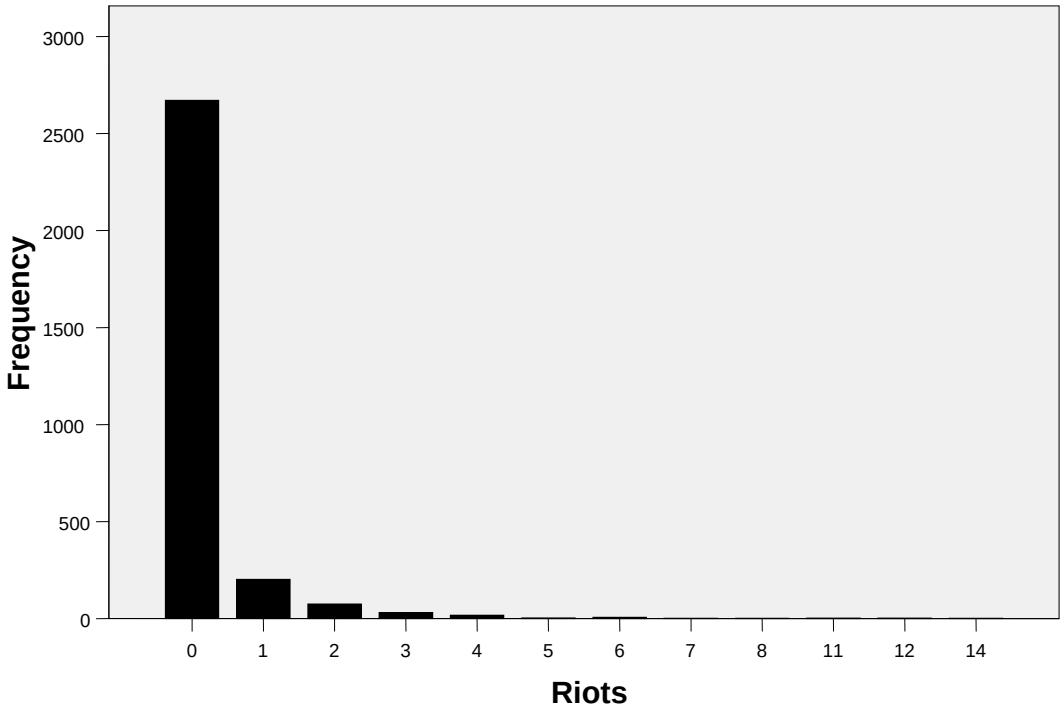

Fig. C.2 Riots frequencies

Tab. C.4 Major Gov Crises frequencies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	2678	87,6	88,9	88,9
	1	272	8,9	9,0	97,9
	2	53	1,7	1,8	99,7
	3	8	,3	,3	99,9
	4	1	,0	,0	100,0
	5	1	,0	,0	100,0
	Total	3013	98,6	100,0	
Missing	System	43	1,4		
Total		3056	100,0		

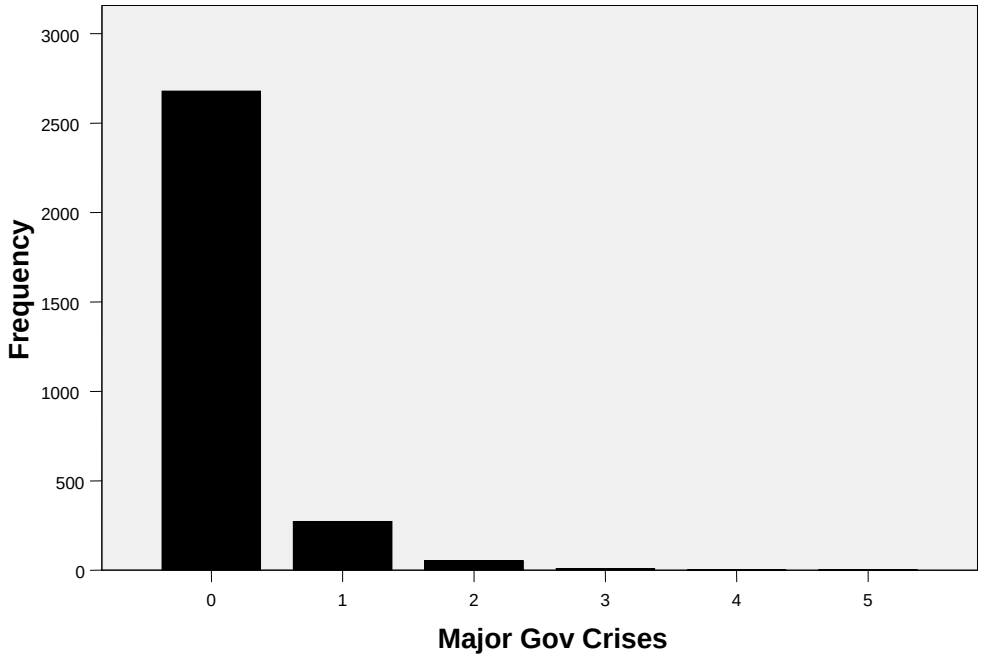

Fig. C.3 Major Government Crises frequencies

Independent variables Teledensity, GDP, and Population

Tab. C.5 Valid and missing cases

		Mob Density t-1	GDP t-1	Population t-1
N	Valid	2096	2735	3020
	Missing	960	321	36

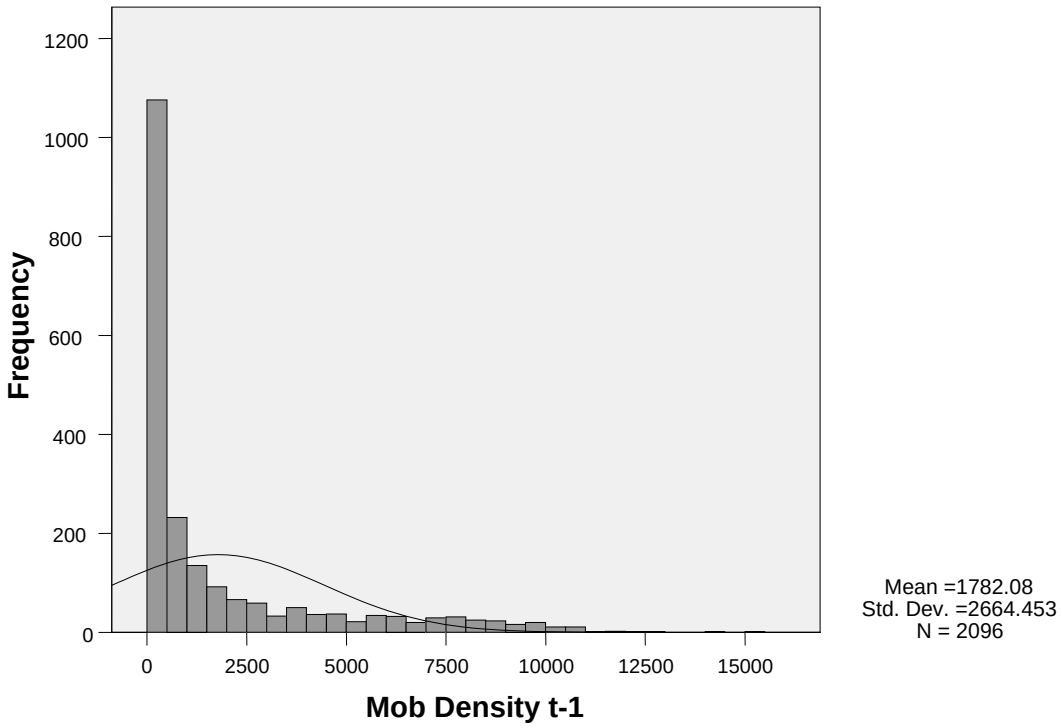

Fig. C.4 Mobile Teledensity (scores are multplied by 100)

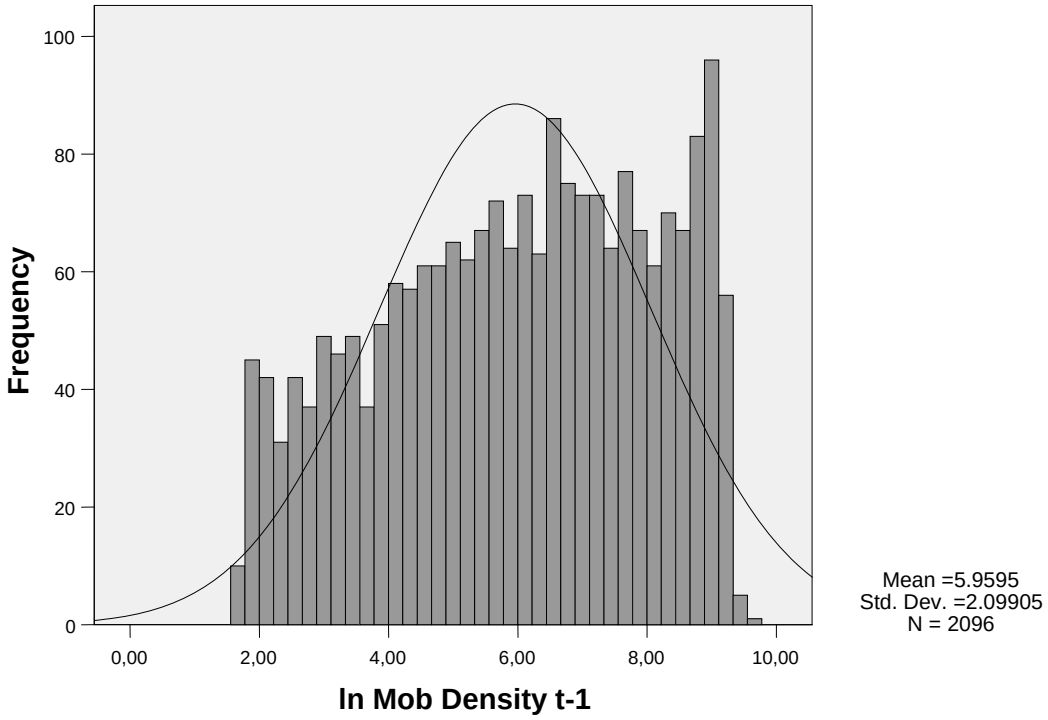

Fig. C.5 Mobile Teledensity log-transformed

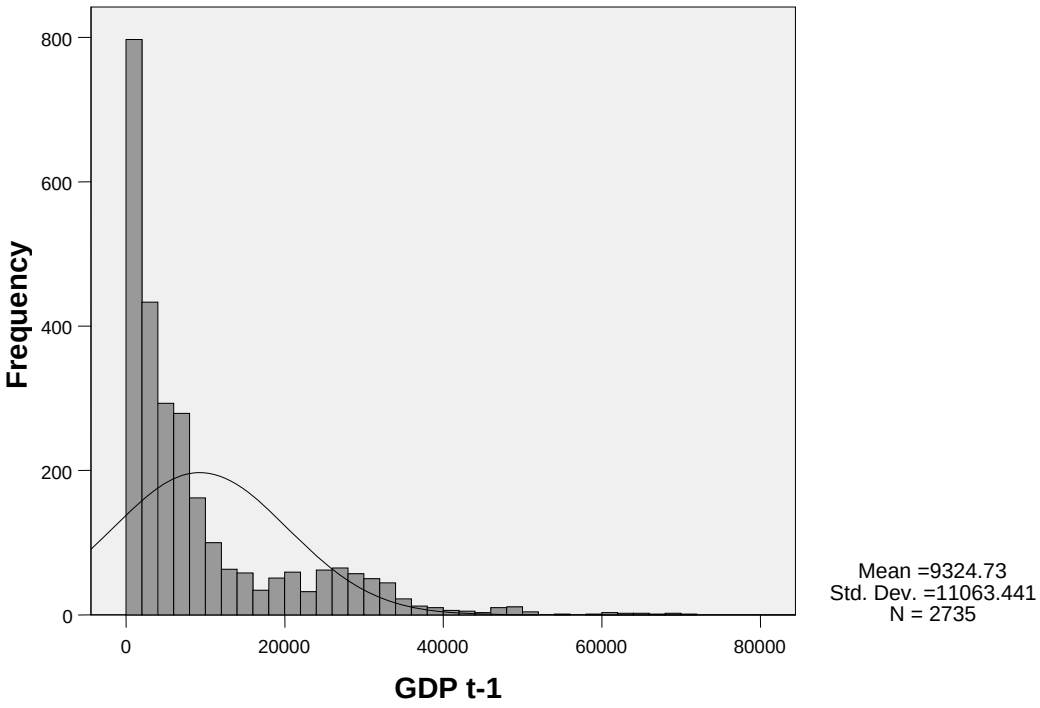

Fig. C.6 GDP per capita PPP in 2005 international dollars

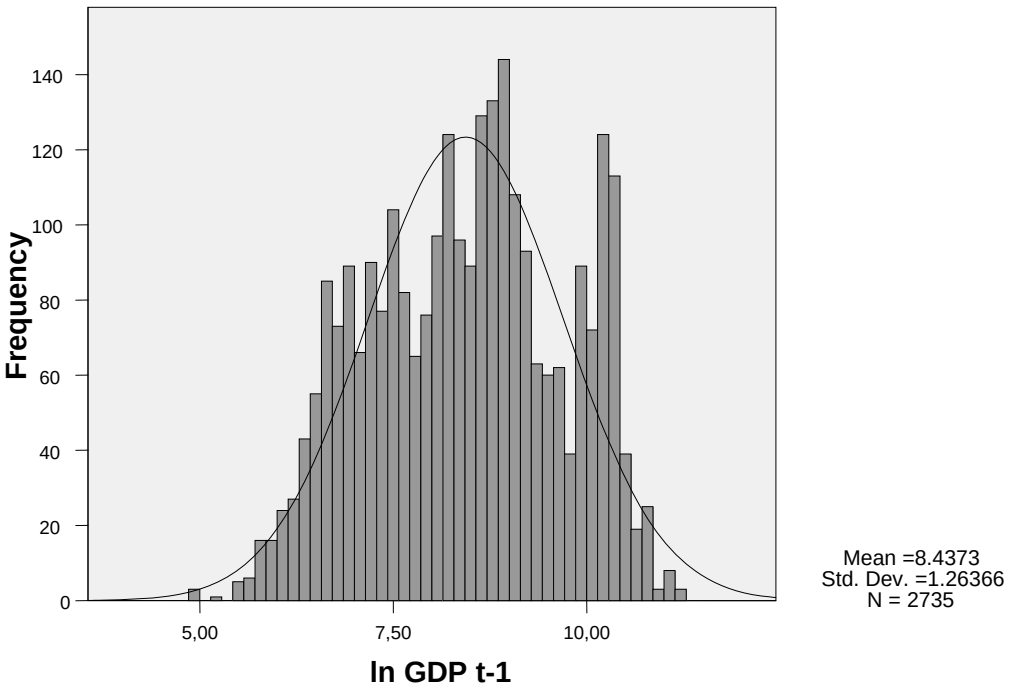

Fig. C.7 GDP per capita log-transformed

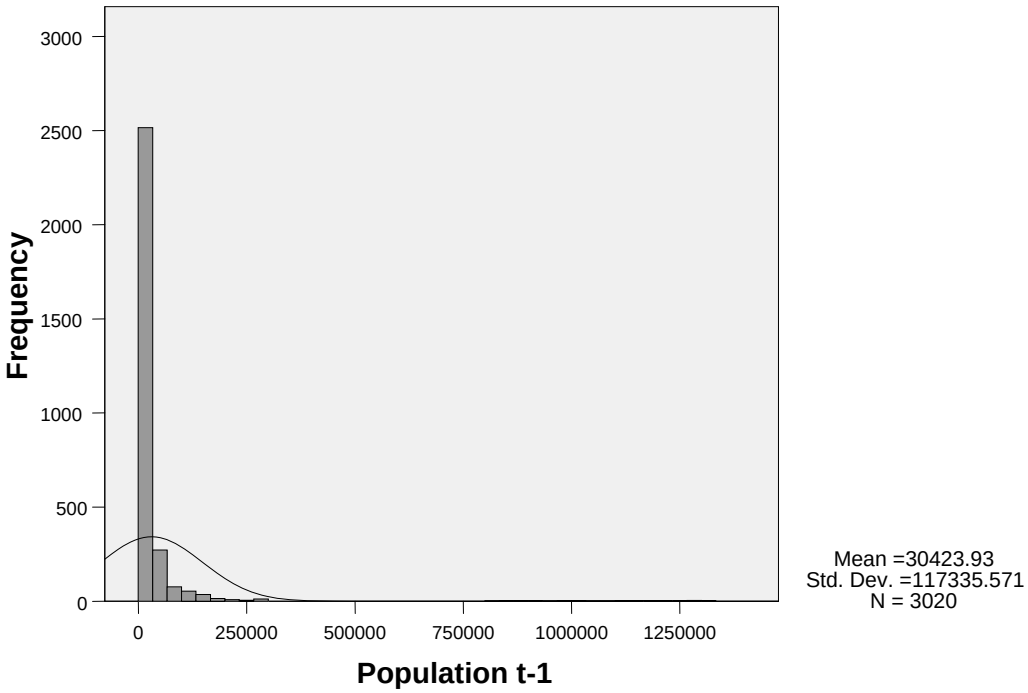

Fig. C.8 Population (scores are divided by 1000)

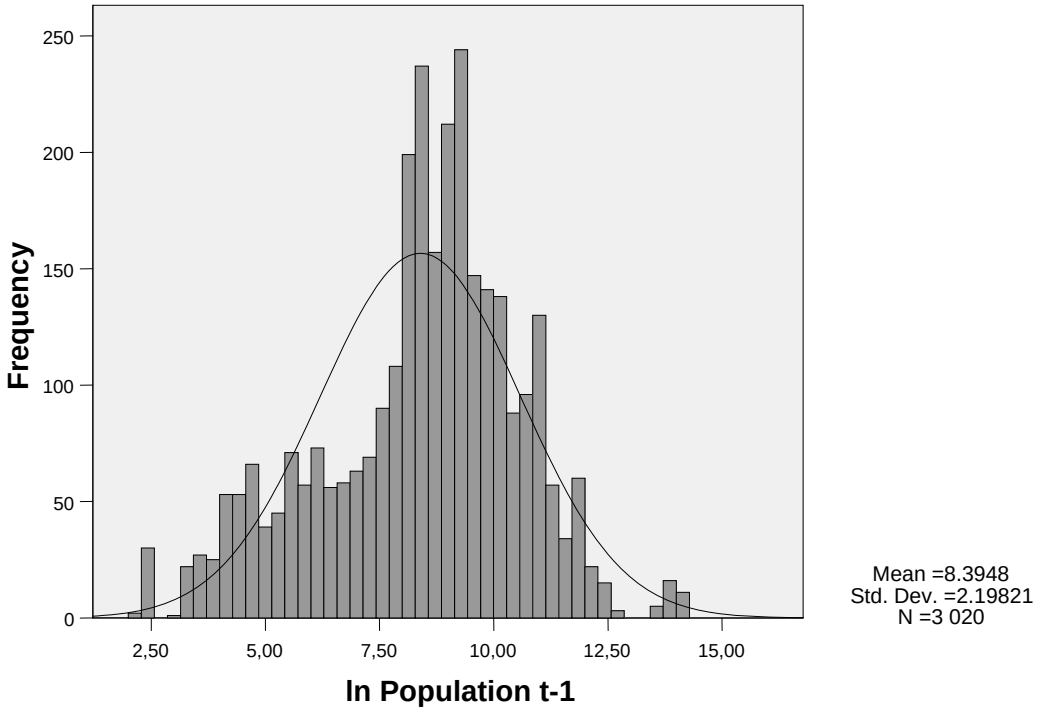

Fig. C.9 Population log-transformed

Appendix D: Bivariate Correlations

Tab. D.1 Bivariate Correlations

		Mob Density	GDP	Population	Pop Density	Anti-gov Demo	Riots	Major Gov Crises
Mob	Pearson Corr.	1						
Density	Sig. (2-tailed)							
	N	2096						
GDP	Pearson Corr.	,548(**)	1					
	Sig. (2-tailed)	,000						
	N	1928	2735					
Population	Pearson Corr.	-,040	-,044(*)	1				
	Sig. (2-tailed)	,065	,022					
	N	2093	2708	3020				
Pop	Pearson Corr.	,092(**)	,196(**)	-,015	1			
Density	Sig. (2-tailed)	,000	,000	,399				
	N	2094	2709	3020	3021			
Anti-gov	Pearson Corr.	-,082(**)	-,053(**)	,220(**)	-,037(*)	1		
	Sig. (2-tailed)	,000	,006	,000	,043			
	N	2085	2701	3005	3006	3012		
Riots	Pearson Corr.	-,070(**)	-,064(**)	,153(**)	-,019	,558(**)	1	
	Sig. (2-tailed)	,001	,001	,000	,300	,000		
	N	2085	2702	3006	3007	3012	3013	
Major Gov	Pearson Corr.	-,072(**)	-,062(**)	,083(**)	-,031	,343(**)	,232(**)	1
Crises	Sig. (2-tailed)	,001	,001	,000	,084	,000	,000	
	N	2085	2702	3006	3007	3012	3013	3013

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
Note: Mob Density, GDP, Population, and Pop Density are lagged by one year (t-1)

Tab. D.2 Bivariate Correlations with log-transformed independent variables

		ln Mob Density	ln GDP	ln Population	ln Pop Density	Anti-gov Demo	Riots	Major Gov Crises
ln Mob	Pearson Corr.	1						
Density	Sig. (2-tailed)							
	N	2096						
ln GDP	Pearson Corr.	,516(**)	1					
	Sig. (2-tailed)	,000						
	N	1928	2735					
ln	Pearson Corr.	-,065(**)	-,111(**)	1				
Population	Sig. (2-tailed)	,003	,000					
	N	2093	2708	3020				
ln Pop	Pearson Corr.	,133(**)	,127(**)	-,157(**)	1			
Density	Sig. (2-tailed)	,000	,000	,000				
	N	2094	2709	3020	3021			
Anti-gov	Pearson Corr.	-,074(**)	-,012	,258(**)	,024	1		
	Sig. (2-tailed)	,001	,520	,000	,196			
	N	2085	2701	3005	3006	3012		
Riots	Pearson Corr.	-,072(**)	-,060(**)	,202(**)	,052(**)	,558(**)	1	
	Sig. (2-tailed)	,001	,002	,000	,005	,000		
	N	2085	2702	3006	3007	3012	3013	
Major Gov	Pearson Corr.	-,068(**)	-,039(*)	,141(**)	,020	,343(**)	,232(**)	1
Crises	Sig. (2-tailed)	,002	,045	,000	,285	,000	,000	
	N	2085	2702	3006	3007	3012	3013	3013

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
Note: ln Mob Density, ln GDP, ln Population, and ln Pop Density are lagged by one year (t-1)

Appendix E: SPSS Outputs

The Poisson model was dismissed after performing the following log likelihood (LL) test:

-2(LL(Poisson)-LL(NegBinPoisson)) > 0

Poisson is the special case of the negative binomial Poisson where this parameter is 0. The LL(Poisson) with anti-government demonstration is -1828.615, with riots -974.843, and with major government crises -657.396 (see below). The LL(NegBinPoisson) values can be found in table 5.1 above. The results were all greater than zero (582.658, 236.446 and 28.888, respectively).

E.1 Negative binomial Poisson regression with anti-gov demo

Tab. E.1.1 Case Processing summary

	N	Percent
Included	1913	62.6%
Excluded	1143	37.4%
Total	3056	100.0%

Tab. E.1.2 Continuous Variable Information

		N	Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	Anti-gov Demo	1913	0	24	.49	1.298
Covariate	ln Mob Density t-1	1913	1.61	9.65	5.9319	2.11187
	ln GDP t-1	1913	5.49	11.17	8.8069	1.18744
	ln Population t-1	1913	3.76	14.09	8.7310	1.98453
	Anti-gov Demo lagged t-1	1913	0	24	.50	1.323

Tab. E.1.3 Goodness of Fit[b]

	Value	df	Value/df
Deviance	1523.309	1893	.805
Scaled Deviance	1523.309	1893	
Pearson Chi-Square	2681.464	1893	1.417
Scaled Pearson Chi-Square	2681.464	1893	
Log Likelihood[a]	-1537.286		
Akaike's Information Criterion (AIC)	3114.572		
Finite Sample Corrected AIC (AICC)	3115.016		
Bayesian Information Criterion (BIC)	3225.701		
Consistent AIC (CAIC)	3245.701		

Dependent Variable: Anti-gov Demo
Model: (Intercept), ln_t1mobdens, ln_t1gdp, ln_t1pop, demolagged, year

a. The full log likelihood function is displayed and used in computing information criteria.

b. Information criteria are in small-is-better form.

Note: The ratio of the deviance to its degrees of freedom should be close to 1 to indicate a good model fit (Norušis 2008:255-259).

Tab. E.1.4 Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
535.269	19	.000

Dependent Variable: Anti-gov Demo
Model: (Intercept), ln_t1mobdens, ln_t1gdp, ln_t1pop, demolagged, year

a. Compares the fitted model against the intercept-only model.

Tab. E.1.5 Tests of Model Effects

Source	Type III		
	Likelihood Ratio Chi-Square	df	Sig.
(Intercept)	40.011	1	.000
ln_t1mobdens	.016	1	.898
ln_t1gdp	1.448	1	.229
ln_t1pop	192.182	1	.000
demolagged	144.543	1	.000
year	33.636	15	.004

Dependent Variable: Anti-gov Demo
Model: (Intercept), ln_t1mobdens, ln_t1gdp, ln_t1pop, demolagged, year

Tab. E.1.6 Parameter estimates of the negative binomial Poisson regression including the lagged dependent variable (demolagged).

Parameter	B	Std. Error	Sig.	Exp(B)
(Intercept)	-3.011	.6981	.000	.049
ln_t1mobdens	-.006	.0482	.898	.994
ln_t1gdp	-.090	.0748	.229	.914
ln_t1pop	.337	.0260	.000	1.401
demolagged	.334	.0303	.000	1.396
[year=2006]	-.749	.4201	.075	.473
[year=2005]	-.563	.4068	.167	.570
[year=2004]	-.489	.3969	.218	.613
[year=2003]	-.630	.3911	.107	.533
[year=2002]	-.578	.3805	.129	.561
[year=2001]	-.964	.3810	.011	.381
[year=2000]	-.120	.3556	.735	.887
[year=1999]	-.624	.3559	.079	.536
[year=1998]	-.222	.3381	.511	.801
[year=1997]	.063	.3314	.850	1.065
[year=1996]	-.044	.3376	.897	.957
[year=1995]	.243	.3332	.465	1.275
[year=1994]	-.397	.3647	.276	.672
[year=1993]	-.304	.3830	.428	.738
[year=1992]	.065	.3708	.862	1.067
[year=1991]	0[a]	.	.	1
(Scale)	1[b]			
(Negative binomial)	1			

Dependent Variable: Anti-gov Demo
Model: (Intercept), ln_t1mobdens, ln_t1gdp, ln_t1pop, demolagged, year

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Tab. E.1.7 Parameter estimates of the negative binomial Poisson regression excluding the lagged dependent variable (~~demolagged~~).

Parameter	B	Std. Error	Sig.	Exp(B)
(Intercept)	-3.356	.6801	.000	.035
ln_t1mobdens	.025	.0469	.599	1.025
ln_t1gdp	-.125	.0722	.083	.882
ln_t1pop	.407	.0249	.000	1.502
[year=2006]	-.753	.4155	.070	.471
[year=2005]	-.416	.4008	.299	.659
[year=2004]	-.440	.3930	.263	.644
[year=2003]	-.593	.3874	.126	.553
[year=2002]	-.555	.3773	.141	.574
[year=2001]	-.728	.3735	.051	.483
[year=2000]	-.034	.3531	.923	.967
[year=1999]	-.458	.3513	.193	.633
[year=1998]	-.015	.3365	.965	.985
[year=1997]	.211	.3312	.523	1.235
[year=1996]	.208	.3363	.537	1.231
[year=1995]	.415	.3323	.212	1.514
[year=1994]	-.191	.3634	.600	.826
[year=1993]	-.120	.3771	.751	.887
[year=1992]	.205	.3667	.576	1.228
[year=1991]	0[a]	.	.	1
(Scale)	1[b]			
(Negative binomial)	1			

Dependent Variable: Anti-gov Demo
Model: (Intercept), ln_t1mobdens, ln_t1gdp, ln_t1pop, demolagged, year

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

E.2 Negative binomial Poisson regression with riots

Note: Only outputs with new information are included below. N = 1914.

Tab. E.2.1 Goodness of Fit[b]

	Value	df	Value/df
Deviance	1016.933	1894	.537
Scaled Deviance	1016.933	1894	
Pearson Chi-Square	3089.603	1894	1.631
Scaled Pearson Chi-Square	3089.603	1894	
Log Likelihood[a]	-856.620		
Akaike's Information Criterion (AIC)	1753.240		
Finite Sample Corrected AIC (AICC)	1753.683		
Bayesian Information Criterion (BIC)	1864.379		
Consistent AIC (CAIC)	1884.379		

Dependent Variable: Riots
Model: (Intercept), ln_t1mobdens, ln_t1gdp, ln_t1pop, riotlagged, year

a. The full log likelihood function is displayed and used in computing information criteria.

b. Information criteria are in small-is-better form.

Tab. E.2.2 Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
302.938	19	.000

Dependent Variable: Riots
Model: (Intercept), ln_t1mobdens, ln_t1gdp, ln_t1pop, riotlagged, year

a. Compares the fitted model against the intercept-only model.

Tab. E.2.3 Tests of Model Effects

Source	Type III		
	Likelihood Ratio Chi-Square	df	Sig.
(Intercept)	11.449	1	.001
ln_t1mobdens	1.889	1	.169
ln_t1gdp	9.599	1	.002
ln_t1pop	84.006	1	.000
riotlagged	88.556	1	.000
year	47.459	15	.000

Dependent Variable: Riots
Model: (Intercept), ln_t1mobdens, ln_t1gdp, ln_t1pop, riotlagged, year

Tab. E.2.4 Parameter estimates of the negative binomial Poisson regression including the lagged dependent variable (riotlagged).

Parameter	B	Std. Error	Sig.	Exp(B)
(Intercept)	-.967	.9302	.299	.380
ln_t1mobdens	.092	.0671	.172	1.096
ln_t1gdp	-.318	.1035	.002	.727
ln_t1pop	.316	.0362	.000	1.372
riotlagged	.448	.0549	.000	1.565
[year=2006]	-1.838	.5156	.000	.159
[year=2005]	-1.872	.4983	.000	.154
[year=2004]	-1.937	.4889	.000	.144
[year=2003]	-2.250	.4928	.000	.105
[year=2002]	-2.347	.4794	.000	.096
[year=2001]	-2.160	.4599	.000	.115
[year=2000]	-1.695	.4249	.000	.184
[year=1999]	-1.877	.4274	.000	.153
[year=1998]	-1.913	.4157	.000	.148
[year=1997]	-.981	.3726	.008	.375
[year=1996]	-1.083	.3866	.005	.339
[year=1995]	-.718	.3710	.053	.488
[year=1994]	-1.293	.4319	.003	.275
[year=1993]	-1.582	.4951	.001	.206
[year=1992]	-1.098	.4475	.014	.334
[year=1991]	0[a]	.	.	1
(Scale)	1[b]			
(Negative binomial)	1			

Dependent Variable: Riots
Model: (Intercept), ln_t1mobdens, ln_t1gdp, ln_t1pop, riotlagged, year

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Tab. E.2.5 Parameter estimates of the negative binomial Poisson regression excluding the lagged dependent variable (~~riotlagged~~).

Parameter	B	Std. Error	Sig.	Exp(B)
(Intercept)	-1.249	.9071	.169	.287
ln_t1mobdens	.092	.0649	.156	1.097
ln_t1gdp	-.338	.1006	.001	.713
ln_t1pop	.377	.0350	.000	1.458
[year=2006]	-1.862	.5074	.000	.155
[year=2005]	-1.809	.4885	.000	.164
[year=2004]	-1.948	.4805	.000	.143
[year=2003]	-2.313	.4868	.000	.099
[year=2002]	-2.329	.4761	.000	.097
[year=2001]	-2.146	.4531	.000	.117
[year=2000]	-1.623	.4173	.000	.197
[year=1999]	-1.637	.4061	.000	.195
[year=1998]	-1.413	.3896	.000	.244
[year=1997]	-.811	.3678	.028	.444
[year=1996]	-.913	.3798	.016	.401
[year=1995]	-.697	.3713	.060	.498
[year=1994]	-1.220	.4294	.005	.295
[year=1993]	-1.250	.4616	.007	.287
[year=1992]	-.898	.4348	.039	.407
[year=1991]	0a	.	.	1
(Scale)	1b			
(Negative binomial)	1			

Dependent Variable: Riots
Model: (Intercept), ln_t1mobdens, ln_t1gdp, ln_t1pop, riotlagged, year

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

E.3 Negative binomial Poisson regression with govcrisis

Note: Only outputs with new information are included below. N = 1914.

Tab. E.3.1 Goodness of Fit[b]

	Value	df	Value/df
Deviance	736.401	1894	.389
Scaled Deviance	736.401	1894	
Pearson Chi-Square	2068.429	1894	1.092
Scaled Pearson Chi-Square	2068.429	1894	
Log Likelihood[a]	-642.952		
Akaike's Information Criterion (AIC)	1325.903		
Finite Sample Corrected AIC (AICC)	1326.347		
Bayesian Information Criterion (BIC)	1437.042		
Consistent AIC (CAIC)	1457.042		

Dependent Variable: Major Gov Crises
Model: (Intercept), ln_t1mobdens, ln_t1gdp, ln_t1pop, govcrisislagged, year

a. The full log likelihood function is displayed and used in computing information criteria.

b. Information criteria are in small-is-better form.

Tab. E.3.2 Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Sig.
179.832	19	.000

Dependent Variable: Major Gov Crises
Model: (Intercept), ln_t1mobdens, ln_t1gdp, ln_t1pop, govcrisislagged, year

a. Compares the fitted model against the intercept-only model.

Tab. E.3.3 Tests of Model Effects

Source	Type III		
	Likelihood Ratio Chi-Square	df	Sig.
(Intercept)	16.465	1	.000
ln_t1mobdens	.055	1	.815
ln_t1gdp	.272	1	.602
ln_t1pop	28.436	1	.000
govcrisislagged	83.842	1	.000
year	22.103	15	.105

Dependent Variable: Major Gov Crises
Model: (Intercept), ln_t1mobdens, ln_t1gdp, ln_t1pop, govcrisislagged, year

Tab. E.3.4 Parameter estimates of the negative binomial Poisson regression including the lagged dependent variable (govcrisislagged).

Parameter	B	Std. Error	Sig.	Exp(B)
(Intercept)	-4.023	1.2633	.001	.018
ln_t1mobdens	-.018	.0781	.814	.982
ln_t1gdp	-.066	.1276	.602	.936
ln_t1pop	.216	.0415	.000	1.241
govcrisislagged	.963	.1056	.000	2.621
[year=2006]	-.504	.8423	.550	.604
[year=2005]	.138	.7915	.862	1.148
[year=2004]	-.186	.7903	.814	.830
[year=2003]	.071	.7663	.926	1.074
[year=2002]	.551	.7387	.456	1.735
[year=2001]	.322	.7327	.661	1.379
[year=2000]	.392	.7169	.584	1.480
[year=1999]	.100	.7107	.888	1.105
[year=1998]	.362	.6906	.601	1.436
[year=1997]	1.076	.6711	.109	2.932
[year=1996]	.123	.7201	.864	1.131
[year=1995]	.244	.7119	.732	1.276
[year=1994]	.299	.7189	.677	1.349
[year=1993]	.493	.7319	.501	1.637
[year=1992]	1.181	.6955	.089	3.258
[year=1991]	0[a]	.	.	1
(Scale)	1[b]			
(Negative binomial)	1			

Dependent Variable: Major Gov Crises
Model: (Intercept), ln_t1mobdens, ln_t1gdp, ln_t1pop, govcrisislagged, year

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Tab. E.4.5 Parameter estimates of the negative binomial Poisson regression excluding the lagged dependent variable (~~govcrisislagged~~).

Parameter	B	Std. Error	Sig.	Exp(B)
(Intercept)	-5.006	1.2076	.000	.007
ln_t1mobdens	-.053	.0744	.475	.948
ln_t1gdp	-.009	.1200	.943	.991
ln_t1pop	.292	.0398	.000	1.340
[year=2006]	-.270	.8213	.742	.763
[year=2005]	.336	.7742	.664	1.400
[year=2004]	.081	.7726	.916	1.085
[year=2003]	.372	.7481	.619	1.450
[year=2002]	.928	.7197	.197	2.528
[year=2001]	.551	.7161	.442	1.734
[year=2000]	.596	.7049	.398	1.815
[year=1999]	.451	.6953	.517	1.569
[year=1998]	.770	.6760	.255	2.159
[year=1997]	1.208	.6623	.068	3.345
[year=1996]	.295	.7122	.679	1.342
[year=1995]	.488	.7004	.486	1.628
[year=1994]	.559	.7076	.429	1.750
[year=1993]	.920	.7001	.189	2.510
[year=1992]	1.186	.6901	.086	3.273
[year=1991]	0[a]	.	.	1
(Scale)	1[b]			
(Negative binomial)	1			

Dependent Variable: Major Gov Crises
Model: (Intercept), ln_t1mobdens, ln_t1gdp, ln_t1pop, year

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

E.4 Ordinal logistic regression with anti-government demonstrations

Tab. E.4.1 SPSS Warning

There are 9565 (83,3%) cells (i.e., dependent variable levels by combinations of predictor variable values) with zero frequencies.

Note: This is a common problem when continuous predictor variables are included in ordinal logistic regression models (cf. Norušis 2008).

Tab. E.4.2 Case Processing Summary

		N	Marginal Percentage
Antigov Demo 6 New	0	1489	77,8%
	1	213	11,1%
	2	81	4,2%
	3	64	3,3%
	4	24	1,3%
	5	42	2,2%
Meas Year	1991	38	2,0%
	1992	45	2,4%
	1993	54	2,8%
	1994	66	3,5%
	1995	81	4,2%
	1996	94	4,9%
	1997	112	5,9%
	1998	131	6,8%
	1999	142	7,4%
	2000	150	7,8%
	2001	158	8,3%
	2002	164	8,6%
	2003	169	8,8%
	2004	171	8,9%
	2005	172	9,0%
	2006	166	8,7%
Valid		1913	100,0%
Missing		1143	
Total		3056	

Tab. E.4.3 Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	3159,383			
Final	2828,379	331,004	19	,000

Link function: Negative Log-log.

Tab. E.4.4 Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	8082,226	9541	1,000
Deviance	2828,379	9541	1,000

Link function: Negative Log-log.
Note: These diagnostics are not reliable when continuous predictor variables are used in the model (cf. Norušis 2008:78).

Tab. 4.5 Pseudo R-Square

Cox and Snell	,159
Nagelkerke	,197
McFadden	,105

Link function: Negative Log-log.

Tab. E.4.6 Parameter estimates of the ordinal logistic regression with anti-gov demonstration.

							95% Confidence Interval	
		Estimate	Std. Error	Wald	df	Sig.	Lower Bound	Upper Bound
Threshold	[demo6b = 0]	4,544	,544	69,838	1	,000	3,478	5,610
	[demo6b = 1]	5,375	,548	96,161	1	,000	4,301	6,449
	[demo6b = 2]	5,915	,552	114,979	1	,000	4,834	6,996
	[demo6b = 3]	6,637	,559	140,983	1	,000	5,542	7,733
	[demo6b = 4]	7,107	,567	157,186	1	,000	5,996	8,218
Location	ln_t1mobdens	,027	,053	,255	1	,613	-,077	,131
	ln_t1gdp	-,034	,082	,173	1	,677	-,194	,126
	ln_t1pop	,294	,029	106,069	1	,000	,238	,350
	demo6lagged	,348	,033	111,606	1	,000	,283	,412
	[year=1991]	,375	,504	,555	1	,456	-,612	1,363
	[year=1992]	,779	,433	3,242	1	,072	-,069	1,627
	[year=1993]	,389	,431	,817	1	,366	-,455	1,233
	[year=1994]	,579	,398	2,115	1	,146	-,201	1,359
	[year=1995]	1,045	,353	8,792	1	,003	,354	1,736
	[year=1996]	,851	,332	6,564	1	,010	,200	1,502
	[year=1997]	,469	,329	2,035	1	,154	-,175	1,114
	[year=1998]	,378	,311	1,475	1	,224	-,232	,987
	[year=1999]	,336	,299	1,263	1	,261	-,250	,922
	[year=2000]	,439	,281	2,437	1	,119	-,112	,991
	[year=2001]	-,213	,293	,528	1	,467	-,786	,361
	[year=2002]	,445	,259	2,965	1	,085	-,062	,952
	[year=2003]	,299	,257	1,353	1	,245	-,205	,803
	[year=2004]	,315	,253	1,546	1	,214	-,181	,811
	[year=2005]	,174	,256	,458	1	,499	-,329	,676
	[year=2006]	0(a)	.	.	0	.	.	.

Link function: Negative Log-log.
a This parameter is set to zero because it is redundant.

E.5 Ordinal logistic regression with riots

Note: Only outputs with new information are included below. N = 1914.

Tab. E.5.1 Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	1738,217			
Final	1556,768	181,449	19	,000

Link function: Negative Log-log.

Tab. E.5.2 Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	6321,826	7633	1,000
Deviance	1556,768	7633	1,000

Link function: Negative Log-log.

Tab. E.5.3 Pseudo R-Square

Cox and Snell	,090
Nagelkerke	,152
McFadden	,104

Link function: Negative Log-log.

Tab. E.5.4 Parameter estimates of the ordinal logistic regression with riots.

							95% Confidence Interval	
		Estimate	Std. Error	Wald	df	Sig.	Lower Bound	Upper Bound
Threshold	[riot5b = 0]	3,189	,724	19,382	1	,000	1,769	4,609
	[riot5b = 1]	4,311	,732	34,687	1	,000	2,876	5,745
	[riot5b = 2]	5,150	,744	47,942	1	,000	3,692	6,608
	[riot5b = 3]	5,867	,764	58,991	1	,000	4,370	7,364
Location	ln_t1mobdens	,088	,076	1,318	1	,251	-,062	,237
	ln_t1gdp	-,280	,114	6,012	1	,014	-,504	-,056
	ln_t1pop	,283	,039	51,295	1	,000	,205	,360
	riot5lagged	,627	,063	100,095	1	,000	,504	,749
	[year=1991]	,628	,669	,881	1	,348	-,683	1,938
	[year=1992]	-,212	,707	,090	1	,764	-1,598	1,173
	[year=1993]	,571	,585	,950	1	,330	-,577	1,718
	[year=1994]	,659	,546	1,455	1	,228	-,411	1,729
	[year=1995]	,696	,502	1,923	1	,165	-,288	1,681
	[year=1996]	,678	,454	2,229	1	,135	-,212	1,569
	[year=1997]	,276	,454	,368	1	,544	-,614	1,165
	[year=1998]	-,013	,440	,001	1	,976	-,875	,849
	[year=1999]	,264	,400	,437	1	,509	-,519	1,048
	[year=2000]	,113	,380	,088	1	,766	-,632	,858
	[year=2001]	-,425	,392	1,181	1	,277	-1,193	,342
	[year=2002]	-,278	,368	,571	1	,450	-1,000	,443
	[year=2003]	-,374	,367	1,041	1	,308	-1,094	,345
	[year=2004]	,183	,311	,346	1	,557	-,427	,793
	[year=2005]	,093	,309	,090	1	,764	-,513	,698
	[year=2006]	0(a)	.	.	0	.	.	.

Link function: Negative Log-log.
a This parameter is set to zero because it is redundant.

E.6 Ordinal logistic regression with govcrisis

Note: Only outputs with new information are included below. N = 1914.

Tab. E.6.1 Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	1438,070			
Final	1266,735	171,335	19	,000

Link function: Negative Log-log.

Tab. E.6.2 Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	6873,515	9546	1,000
Deviance	1266,735	9546	1,000

Link function: Negative Log-log.

Tab. E.6.3 Pseudo R-Square

Cox and Snell	,086
Nagelkerke	,162
McFadden	,119

Link function: Negative Log-log.

Tab. E.6.4 Parameter estimates of the ordinal logistic regression with major gov crises.

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[govcrisis = 0]	4,201	,867	23,470	1	,000	2,501	5,901
	[govcrisis = 1]	5,895	,882	44,715	1	,000	4,167	7,623
	[govcrisis = 2]	7,505	,937	64,089	1	,000	5,667	9,342
	[govcrisis = 3]	8,899	1,120	63,128	1	,000	6,704	11,095
	[govcrisis = 4]	9,595	1,325	52,434	1	,000	6,998	12,192
Location	ln_t1mobdens	-,042	,078	,287	1	,592	-,195	,111
	ln_t1gdp	-,078	,128	,370	1	,543	-,328	,172
	ln_t1pop	,212	,041	26,237	1	,000	,131	,294
	govcrislagged	,959	,093	106,051	1	,000	,776	1,141
	[year=1991]	,396	,825	,231	1	,631	-1,222	2,014
	[year=1992]	,912	,708	1,662	1	,197	-,475	2,300
	[year=1993]	,606	,681	,792	1	,373	-,729	1,941
	[year=1994]	,567	,652	,757	1	,384	-,710	1,844
	[year=1995]	,867	,593	2,141	1	,143	-,295	2,029
	[year=1996]	,434	,608	,509	1	,475	-,758	1,627
	[year=1997]	1,407	,517	7,408	1	,006	,394	2,420
	[year=1998]	,810	,507	2,550	1	,110	-,184	1,804
	[year=1999]	,609	,502	1,472	1	,225	-,375	1,592
	[year=2000]	,593	,489	1,467	1	,226	-,366	1,552
	[year=2001]	,663	,464	2,040	1	,153	-,247	1,573
	[year=2002]	,834	,439	3,606	1	,058	-,027	1,694
	[year=2003]	,159	,477	,111	1	,739	-,776	1,094
	[year=2004]	,215	,479	,202	1	,653	-,723	1,154
	[year=2005]	,463	,461	1,007	1	,316	-,441	1,366
	[year=2006]	0(a)	.	.	0	.	.	.

Link function: Negative Log-log.
a This parameter is set to zero because it is redundant.

E.7 Binary logistic regression

Note: Only the relevant results with antigov demo are shown below.

Tab. E.7.1 Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	315,950	19	,000
	Block	315,950	19	,000
	Model	315,950	19	,000

Tab. E.7.2 Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1707,918(a)	,152	,233

a Estimation terminated at iteration number 5 because parameter estimates changed by less than ,001.

Tab. E.7.3 Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	13,993	8	,082

Tab. E.7.4 Parameter estimates of the logistic regression with antigov demo.

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	ln_t1mobdens	-,008	,064	,014	1	,905	,992
	ln_t1gdp	-,013	,099	,016	1	,899	,988
	ln_t1pop	,377	,037	104,151	1	,000	1,457
	demolagged	,426	,050	72,727	1	,000	1,532
	year			22,887	15	,087	
	year(1)	,167	,609	,075	1	,784	1,181
	year(2)	,821	,541	2,305	1	,129	2,273
	year(3)	,438	,525	,695	1	,405	1,549
	year(4)	,678	,483	1,971	1	,160	1,970
	year(5)	1,116	,439	6,451	1	,011	3,053
	year(6)	1,119	,412	7,362	1	,007	3,062
	year(7)	,532	,400	1,765	1	,184	1,702
	year(8)	,258	,385	,450	1	,502	1,294
	year(9)	,351	,364	,932	1	,334	1,421
	year(10)	,396	,344	1,330	1	,249	1,486
	year(11)	-,246	,352	,488	1	,485	,782
	year(12)	,521	,312	2,791	1	,095	1,684
	year(13)	,418	,307	1,850	1	,174	1,518
	year(14)	,292	,306	,911	1	,340	1,339
	year(15)	,166	,309	,290	1	,590	1,181
	Constant	-5,206	,662	61,787	1	,000	,005

a Variable(s) entered on step 1: ln_t1mobdens, ln_t1gdp, ln_t1pop, demolagged, year.

Appendix F: SPSS Logs

F.1 Negative binomial Poisson regression

```
* Generalized Linear Models.
GENLIN demo BY year (ORDER=DESCENDING) WITH ln_t1mobdens ln_t1gdp ln_t1pop
 demolagged
  /MODEL ln_t1mobdens ln_t1gdp ln_t1pop demolagged year INTERCEPT=YES
 DISTRIBUTION=NEGBIN(1) LINK=LOG
  /CRITERIA SCALE=1 COVB=MODEL PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-
012 ANALYSISTYPE=3(WALD) CILEVEL=95 CITYPE=WALD LIKELIHOOD=FULL
  /MISSING CLASSMISSING=EXCLUDE
  /PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION (EXPONENTIATED).
```

Note: the procedure with riot and govcrisis as the dependent variable was identical; demolagged was replaced with riotlagged and govcrisislagged, respectively.

F.2 Ordinal logistic regression

First the dependent variable was recoded. The procedure for riot was similar (4 categories).

```
RECODE
  demo
  (SYSMIS=SYSMIS)  (0=Copy)  (1=Copy)  (2=Copy)  (3=Copy)  (4=Copy)  (5
  thru Highest=5)  INTO  demo6b .
VARIABLE LABELS demo6b 'Antigov Demo 6 New'.
EXECUTE .

PLUM
  demo6b  BY year  WITH ln_t1mobdens ln_t1gdp ln_t1pop demolagged
  /CRITERIA = CIN(95) DELTA(0) LCONVERGE(0) MXITER(100) MXSTEP(5)
PCONVERGE
 (1.0E-6) SINGULAR(1.0E-8)
  /LINK = NLOGLOG
  /PRINT = FIT PARAMETER SUMMARY .
```

Note: the procedure with riot5b and govcrisis as the dependent variable was identical; demolagged was replaced with riotlagged and govcrisislagged, respectively.

F.3 Logistic regression

```
RECODE
  demo
  (SYSMIS=Copy)  (0=Copy)  (1 thru Highest=1)  INTO  demobin .
VARIABLE LABELS demobin 'Antigov Demo binary'.
EXECUTE .
LOGISTIC REGRESSION  demobin
  /METHOD = ENTER ln_t1mobdens ln_t1gdp ln_t1pop demolagged year
  /CONTRAST (year)=Indicator
  /PRINT = GOODFIT
  /CRITERIA = PIN(.05) POUT(.10) ITERATE(20) CUT(.5) .
```

Appendix G: Miscellaneous

Tab. G.1 World ICT statistics 1996-2006 (numbers are in millions)

	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Landlines	738	792	846	905	983	1'053	1'086	1'140	1'207	1'261	1'270
Mobile subscribers	145	215	318	490	740	955	1'166	1'414	1'766	2'221	2'685
Personal computers	275	325	375	435	500	555	615	650	775	808	n/a
Internet users	74	117	183	277	399	502	619	724	870	1'006	1'131

Source: ITU 2007

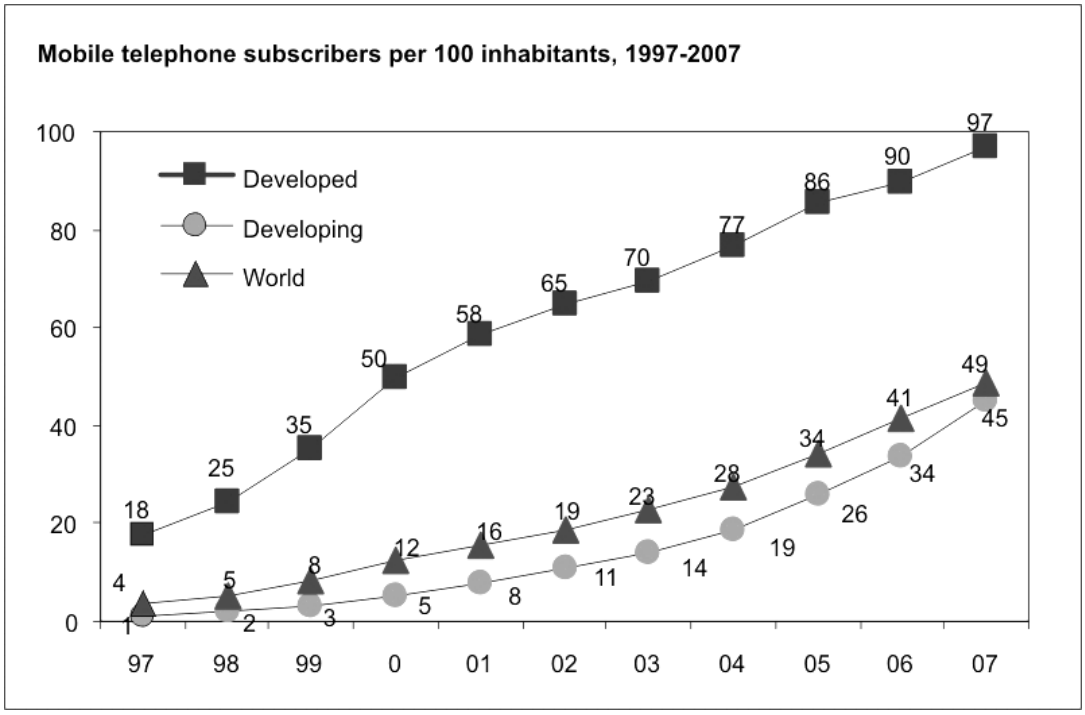

Fig. G.1 Mobile phone subscribers, global comparison
Source: ITU 2007

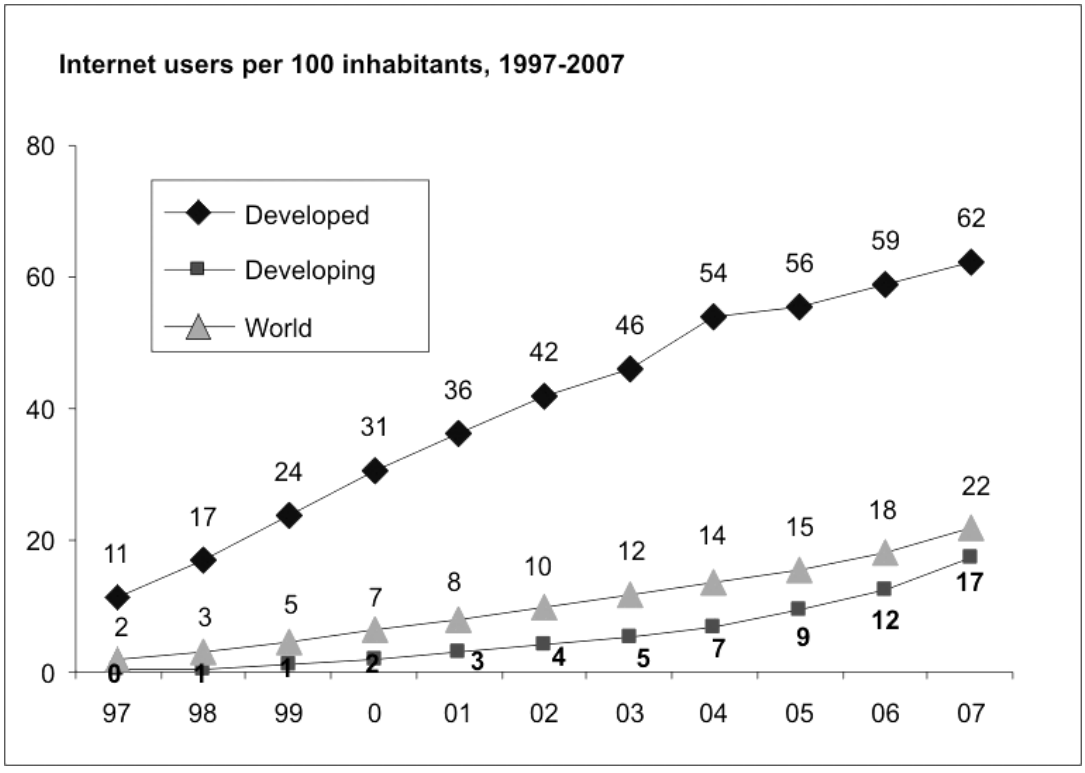

Fig. G.2 Internet users, global comparison
Source: ITU 2007

The following countries (or territories) were removed because data was only available in one or two, but not in all three data sources (MDG 2008, CNTS 2007, WDI 2007) and/or not for the entire period. Comments in parenthesis are for information only; all countries in this list are completely excluded from the analysis.

Excluded countries:

American Samoa
Anguilla
Anjouan (1997-2007, secession from Comoros)
Bermuda
Bophuthatswana (part of South Africa since 1993)
British Virgin Islands
Cayman Islands
Channel Islands
China, Hong Kong Special Administrative Region
China, Macao Special Administrative Region
Ciskei (part of South Africa since 1993)
Cook Islands
Cyprus (Greek part only)
Cyprus (Turkish part only)
Czechoslovakia (until 1992)
Faeroe Islands
Falkland Islands (Malvinas)
French Guiana
French Polynesia
Greenland
Guadeloupe
Guam
Isle of Man
Korea, People's Republic (North Korea)
Martinique
Mayotte
Montenegro (since 2006)
Montserrat
New Caledonia
Niue
Northern Mariana Islands
Palau
Puerto Rico
Reunion
Somaliland (since 1991, secession from Somalia)
Taiwan
Timor-Leste (since 2002)
Transkei (part of South Africa since 1993)
Turks and Caicos Islands
United States Virgin Islands
Vatican City
Venda (part of South Africa since 1993)

Some countries had some missing data years but were nevertheless included in the analysis. In three cases, the data was modified in the dataset.

Included countries with missing data years:

Slovakia and the Czech Republic (former Czechoslovakia) have missing data prior to 1993.
Eritrea (formerly part of Ethiopia) has missing data prior to 1993.
Palestine (Occupied Territories) has missing data prior to 1994.
Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan (all 15 former Soviet Republics) have missing data prior to 1992.
Bosnia-Herzegovina, Croatia, Macedonia, Serbia, and Slovenia have missing data prior to 1992.

Modifications in the dataset:

The country-year Algeria 2005 and Serbia-Montenegro 2004 were missing in the CNTS dataset.
The missing scores were later supplied from the data provider on my request.[73]
Serbia-Montenegro ceases to exist under the country-code 1290 in 2006. The code 1292 for Serbia 2007 was changed back to 1290 to retain continuity in the dataset, but some of Serbia's scores for 2007 are affected by loss of territory.

[73] Kent Wilson from Databanks International (CNTS 2007) was so kind to email the missing values to me.

Appendix H: Interviews

Interview with Ivan Marovic from Otpor, Serbia.

Wednesday, 5th of June 2008.[74]

As you may have understood I am very much interested in the use of mobile phones in protest activities. How common were mobile phones in Serbia, back in 2000? Did you own one?

Ivan Marovic: As you may remember in the late nineties cell phones were still rare and expensive, especially for young people. During the 96-97 protests only a few people had mobile phones. But in 2000 almost everybody had a mobile. The turning point was the [NATO] bombing in 1999.

How so?

Well, lots of parents were worried about their children. If they go out are they going to be safe etc.

So they bought their kids mobile phones?

Indeed, the hit was nokia 5110 or something. I bought my first cell phone in 1998, but by the summer of '99 everybody had a cell phone.

That is quite early even by European standards. This is actually a very interesting aspect. But let's turn to some questions about the Otpor movement now. I believe Otpor was quite a decentralized organization. Is this correct? What was your role in this movement?

I was one of the founders of Otpor, and my responsibilities were the press and PR, but also relations with political parties and domestic NGOs. Otpor was decentralized in its structure. It was the model that we adopted very early, based on the lessons learned from student protests in 96-97.

In an interview with Christophe Chiclet[75], a French journalist, Ana Vuksanovic, a member of Otpor, says "What got me excited was that there weren't any leaders, so there was no risk of being betrayed" Were there really no leaders?

Exactly. That was lesson one from the previous protest. No leaders – no disappointment.

[74] Interview performed from 4 p.m. to ca. 6 p.m. (GMT+1 time) via the chat and voice function of Skype. The interviewer was in located in Oslo, Norway, the interviewee in New York, USA. Some parts were reviewed a few days later via email exchange.

[75] See http://www.unesco.org/courier/2001_03/uk/droits.htm

How practical was that? Or were there leaders in function but not in name?

The leadership was hidden. On the surface we had a mantra – there are no leaders, we are all activists. In reality we had some sort of hierarchy.

Tell me more about it.

Because we didn't have titles the authority had to be based on personal initiative. And our people couldn't say "do this because I tell you so". They had to invent reasons and motivate people. The idea was the following: 11 people started Otpor, and we had some authority based on that when other people started to join. They initiated different actions and got reputation in their communities. This is how new leadership emerged. Since the strategy was frontloaded, i.e. we made the plan when we were still 11 people, there was no need to make a decision. Later, we didn't change the plan much. This was the reason for our collapse after Milosevic was overthrown.

I see. If you don't mind let's turn to some practical aspects of your organization. How did you keep in touch with the others? How did they keep in touch with you? Did the mobile phone play any role in this?

There were two means of communication: the Internet and the mobile phone. We used the Internet between offices (laptops were still expensive) and mobile phones because of their abundant availability. In the beginning SMS [text messages] were still free. Later they started charging for the service but it was still cheap.

Which one was more important, and in what ways?

The Internet was important for strategic communication. The website with the information about the movement, news, documents and recruitment forms. On the other hand, cell phones were crucial for operational and tactical communication. At the Belgrade office, we had two landlines. One was taken for the dial-up (yes, that was the Stone Age of the Internet). So there was really only one landline.

What did you use that one for?

We left that one open for people to call us. We totally depended on cell phones.

Where calls with mobile phones expensive?

Very expensive. But we used SMS a lot. For instance, to invite people to a meeting we had a program that would send SMS to the listed numbers.

You did that through a website? Was it free of charge?

Yes. In those days there was still some free stuff around. Even the SMS service itself was free in the beginning. I remember when I had a Nokia 1611, that phone didn't have a clock, so whenever I wanted to know the time, I would send myself an SMS – since it was free.

Who operated the website in question?

The website was operated by several activists, but Braca Andjelkovic and Igor Jeremic were operating it in 1999 and 2000.

In an interview with Wired[76]*, you once said that "if you march on the capital without proper controls, things may turn violent, which will harm your cause". What kind of controls did you refer to?*

Control meaning organization like in the phrase "everything is under control".

How did you do that practically? How did you have things under control as events were evolving? Did you have any real-time oversight of the unraveling developments for example in Belgrade? How did you retain control in such a dynamic process?

There are three components: First, there's preparation. We prepared people for what they should do and what they should expect. This was the reason for the ten days before the October fifth [the day Milosevic was forced to resign]. In those ten days people were prepared through the local actions they were doing.

What kind of local actions are you referring to?

Blocking a local road, or a strike in the local factory. This is the momentum build-up. But also training for the big one. Then, when the big one happens, there is the second component: keeping activists busy. This means that if you give them a task, they will not turn violent, or at least that will be less likely. So everybody had to have a task to perform.

Sort of channeling the energy to constructive things.

Exactly. And the third component is… luck. But the overall idea is that there should be enough people that can make a decision if something happens, and react accordingly. Leaders are dispersed throughout the crowd. And they are in horizontal communication.

Speaking of communication, and to return to what you said above: Was Braca Andjelkovic some kind of "information minister" with his website?

[Laughs] I thought I was.

With this I mean, was his SMS website crucial for your tactical purposes?

Braca wasn't responsible for the content, he was like a webmaster. Strategic communication was mostly connected to press and PR. Most of the communication was tactical and operational. These were more logistical issues

I am very interested in the logistical part as well... at least where mobile phones played out.

The logistical part was based on circles of trust. I didn't know the details of the distribution of our material. I knew that they had a garage, but I didn't know where it was. They would

[76] See http://www.wired.com/gaming/gamingreviews/news/2005/10/69372

organize the shipping with cars, for larger quantities. Smaller packages would go by bus. That was impossible to intercept. Cell phones were crucial for those operations.

How so?

Because these operations were happening in real time. For instance, I go to the bus station and ask a bus driver to deliver a package and give him some money, too. Then I call or SMS the person in the other town with the info. Shipping by bus was the cheapest and most reliable form of transport.

Speaking of real time, can you give me an example how you would use SMS to change a demonstration or other task in real time, while it was happening?

Let me think [pauses]. Well, the most important was the march from Novi Sad to Belgrade on April 14th, 2000. That's some 80km, 24 hours on foot. We had to coordinate things while walking. For example, the food waiting for us in different towns. Also, buses for those who couldn't walk anymore. Then the welcoming rally in Belgrade, and finally, to inform the press. I used up three [cell phone] batteries that night.

You had extra batteries with you?

Yes, I had one extra. And then I had to take another one from somebody else.

You recharged them somewhere, in a car maybe?

No, I thought that two would be enough. So I didn't bother recharging the first one.
But anyway, to answer your question: That was a demo 100% operated through mobile phones.

No websites at work?

There was a functioning website. But on the road we didn't have much use of it.

From a practical and technical perspective, would you say that the mobile phone system was more advanced than the Internet, in Serbia, at that time?

Yes indeed. More people were using it. Internet was still dial-up. There was some 1-2% ISDN [faster, digital connections]. Those were the days of web 1.0, static web sites. On the other hand, mobile phones were not like today. Only speech and SMS. No photos, no MP3, radio or GPRS [fast data transfer]. But you could carry them.

Would those things have made a difference?

Yes. We had four laptops and four digital cameras to record police brutality. Imagine if we had had phones with cameras. Like last year in Burma.

Or in Tibet, I believe some of the pictures of the Lhasa riots slipped out of China via MMS [picture SMS]. How about MP3 and GPRS?

I don't know about MP3, how that would help. But GPRS would be helpful.

How so?

Well, just the fact that you can access the Internet on your cell phone. I'm sure that would be helpful. I just haven't thought of an actual application yet [pauses to think]. Oh, I can think of one application: For instance, it is not wise to have your contacts in your phone, if you are arrested. But if there is an intraportal and you can access it. I'm not sure, but something like that.

It totally makes sense to me. This actually leads me to the next question: What happened after such arrests? Did they use your network contacts?

I don't know exactly. But they did take away our cell phones. And everybody was arrested. But I cannot confirm that they found them through the address book. They could easily find them just through surveillance.

Did you ever experience action by the state authorities directed against your mobile phone connection? Such as unexpected shut-offs or other interferences? Did you ever suspect eavesdropping?

I don't remember the first or the second, but we would always shut off our cell phones and take out the batteries when we wanted to discuss some important issues. We simply assumed to be under surveillance. Because we probably were.

Was it a coincidence that they started charging for SMS, or do you suspect it was related to Otpor's extensive use of it?

No, I believe that was just business reasoning. Too much SMS traffic.

Thank you, Ivan, we can stop here, I know you have to leave soon. This interview has been extremely useful. It confirms my assumptions more than I ever imagined it would.

[Surprised] Really? Actually, there is this guy at Tufts, Rusty or something, I can give you his contacts – he interviewed me a while ago, but he was only interested in the Internet. I didn't have much to say about that, I would have rather talked about cell phones. Now there's finally someone interested in phones! [laughs]

I was actually a bit afraid of the opposite. That you would only want to talk about the web…

Really? [Laughs] Ok, I have to go now. Let's take this up again on Friday.

Ok. Thank you very much again.

Interview with Pavel Marozau from Third Way, Belarus.

July 28th, 2008. [77]

Unfortunately, Western media cover very little Belarusian politics. Can you tell me a little bit about Belarus in general and the opposition movement in particular? What is your role in it?

Pavel Marozau: Belarus is a post-soviet state between Russia and Poland, very industrialized, very denationalized [due to cultural russification], and situated on the main energy transit routes from Russia to EU. Belarus gained independence in 1991. After that, we had several years of more or less democratic government. After 1996 the government under first president Lukashenka (elected 1994) turned into a dictatorship. He and his people successfully suppressed all main opponents, took control over the media, big business, the armed forces, the law system, parliament and other key institutions.

I see. Can you say a bit more about the opposition movement, and your role?

Yes. Sure. The opposition began in 1995-1996 with good start positions. Still in parliament, and with a lot of allies in the state machine. But opposition couldn't find an effective way of competition with Lukashenka and lost referendums in 1996 and 2004 as well as the presidential elections in 2001 and 2006.

The key problems are the opposition's fragmentation into several groups, the big influence of Belarusian secret services, a lack of charismatic leaders, limited access to media and, finally, the lack of resources as well as the atmosphere of total control in the country.

Now the opposition has the following key groups: United Opposition Forces (coalition of several political parties), Za svobodu movement and allies (2006 presidential candidate Milinkevich's group of support), independent youth groups. There is also the Christian Democratic Party BPF under Zenon Poznyak, the principal ideological opposition.

Are you a member of any of those?

Our organization can be located among the independent youth groups. Now we're building a new network. We're trying to unite these youth groups. Youth leaders and the Belarusian Diaspora abroad in one cooperation network called 'Congress of New Belarusian Diaspora of Europe and the US". The 1st Congress was held in Tallinn in March 2008

How does Third Way [Pavel's own organization[78]*] belong into this network?*

The Third Way's specialization is to be a mediator and coordinator for others. Because of our HR policy, we're oriented on talented and experienced persons in our recruiting. Young professionals, one could say. We use modern IT and media technologies for best results.

[77] Interview performed from 11.20 a.m. to 2.00 p.m. (GMT+1 time), using the Skype chat function. The interviewer was located in Oslo, Norway, the interviewee in Tallinn, Estonia. Some parts were reviewed upon a personal meeting in Tallinn on August 1st 2008.

[78] See belarus.3way.org.

From the outside, we support activity groups inside Belarus with advice, educational possibilities and some resources and services.

As you surely know by know, my research focus is on the use of mobile phones in antigovernment activity. How common are mobile phones among Belarusians? Can most people afford one?

So, about mobile market in Belarus…

Yes, if you don't mind me interrupting.

Ok. Look at these figures: In 2001, there were around 130’000 users of mobiles in Belarus. At the end of 2007, there were 7,129 million. Belarus has a total population of 10 million.

Impressive!

We can now say that mobiles are very common in Belarus.

Among young people as well?

Sure, they are drivers of these techs.

Are calls or SMS expensive?

I can't say so, but it’s affordable. Neither cheap nor expensive.

How many rubles is one sms?

There’s no cost for incoming calls. One SMS cost 110 rubles, MMS 450 rubles (Velcom operator). We have 4 operators, Velcom and MTS are bigger, while Dialog/Belcel and BEST are the smaller ones.

One SMS is then ca. 0.03 Euros. Is that [110.- BYR] a lot of money for an average student?

It is ok. Students usually have budgets of around 100 USD a month, some have more.

Basically all [telephone]operators are directly or indirectly under state control.

That’s interesting. How are they controlled?

Historically, the first operator Belcel/Dialog opened in the 90s in cooperation with a Western company, from the US or NL if remember right. But with a control pack of shares by Byeltech Export, a state company which sells weapons, and BelTeleCom, another state company, I can say there is a state monopoly on landlines and the Internet.

After 2000, such a scheme was also used for the operator Velcom (some percentage went to Syrian investors, others to BelTeleCom and another arms dealer). Later, the Russian player MTS came in, but also received only 49% of the shares, 51% went to the state. But recently, there has been a change. Now an Austrian telecoms company owns part of those 51%, giving the state a minority share.

Let us go to the next question now.

Yes?

On Third Way's website[79], you state a number of 'tactical priorities'. Third Way is to be an independent third-party network organization of civil activists. Among the responsibilities mentioned, there is 'up-to-date and safe communication'. I suppose the Internet plays an important role here, but how about the mobile phone?

This is an interesting question. We have, I can say, a several-layers communication scheme. Because we operate in 9 countries, and need to coordinate all these activities, we need to mix our ways of communication.

In Belarus, we use mobiles only for usual, not serious things. The problem is that, especially in periods of elections or so, all mobiles conversations are easily being intercepted by the authorities.

They just need to select person and declare that it is politically sensitive and any mobile operator will cooperate with them.

That is scary.

We widely use Skype for our main communications because it is more or less secure and easy to use. We use skype2mobile communications in some cases when we need to remain anonymous.

Also for secure sites, emails, forums, social networks... Outside Belarus, there are much more mobiles and Skype is also cheaper.

Is skype2mobile safe?

If we call to one of our activists who are under control [surveillance], no. But in some cases when we need to make anonymous calls to some institutions, it is ok.

Among those tactical priorities, you also mention 'effective mobilization'. Can you say a bit more about this? Are mobile phones an important tool in mobilization?

Let me first tell you a few things about SORM[80]. It is an integrated system of communications control founded in the USSR but updated in Russia and is now being used in Russia, Belarus, and possibly in the Ukraine by police and KGB [intelligence services] to search for criminals and political targets.

It works with normal landlines, mobiles and internet. Very advanced. Some versions can even trace person on base his or her voice.

Now about mobilization. Yes, I think so [that it is an important tool in this]. Because mobilization is not only about political conversations. It is about normal communications with people, involving them in activities. Because of this, mobiles are very essential in such cases. So I think mobiles play an important role.

[79] http://belarus.3way.org/about
[80] http://en.wikipedia.org/wiki/SORM

Can you give me examples?

Yes. For example, a new person finds our website and sends an email 'I want to know more' and 'I want to cooperate'. We can ask 'give me your mobile number' and then call to him to say 'hello, can we meet somewhere, drink coffee and I can tell you more about us'...

Excellent example.

Also, mobiles are good during opposition actions for operative coordination and reporting to media and say for example that you've been arrested...

Do you remember situations where you or your friends did use it that way?

Just a sec. My mother's calling - also on the mobile [smiles].

Ok, I'm back. My mother went to my investigator at the Prosecutor's office. He said "oh he [Pavel] went from us, it is such a pity. We really haven't got any plans to arrest him, no no" [smiles]. Very nice.

Unbelievable. I hope you feel safe in Tallinn.

The idea - now for them a key thing, is to return me to Belarus. Abroad they can't control and can't have any influence on me. And my activity becomes more and more problematic for them.

But let's return to our questions.

Yes, an example of real use by opposition activists

So, a few real examples of mobilization and several funny and unfunny examples from mobile communications.

Yes, please.

1. Funny: 2005, Cartoon crisis.

I went to Kiev [Ukraine] by train. At night, I was stopped by border guards on the Belarusian side. They said 'you can't pass on to Ukraine'. Ok, I then sat there. But my friends tried to call me on my mobile. Ok, they get a connection and some person says "Hello, who do you need? Pavel? Ok. Who are you? ... I will ask him now..." and then silence (they just intercept calls, especially international ones, and try to find out who is calling. Since then, a big media scandal [Russian TV exposing Belarusian police state behavior, subjecting the authorities to ridicule] has somewhat put a limit to this).

After that my friends began to play games with them: 'Hello, Mossad, or CIA calling, where is Pavel?' To be sure, they used Skype or Ukrainian mobiles for those jokes because Belarusian ones can easily be traced.

2. Not Funny: 2005, Minsk, the day before important actions together with partners in Gomel [Belarus' second largest city].

We planned a humoristic street action in Minsk on 1st of May [Labor Day]. We were not so experienced and because of this our partner from Gomel needed to come in Minsk and assist us. He was under control from Gomel authorities; the police prevented him several times from taking the train. He went to Minsk by microbus. He switched off his mobile, but in Minsk he decided to call me to select a meeting place. In normal secure mode, we need to use “ok, we’ll meet at the same place like before” (and we know where it is). But this time I was crazy because of all this event organizing and did a stupid thing: I asked my colleague from Gomel - during this mobile conversation - “this place, you mean this (and named this place)?”

Within 15 minutes at this place he was arrested by the police and they took him to the police office. He was detained for 2 days, until the state celebrations were over.

Oh dear.

After that, he always gives me a good kick whenever we drink vodka for this case.

[Laugh]I guess you deserved it.

Just a small mistake - and they can intercept key information, especially when there are 1 or 2 persons in conversations already under surveillance.

Yes, this was a very good example, thank you!

3. We organized an action of memory for people who were killed by the regime, 16th of November, 2005.

We knew in advance that the whole center of Minsk was under control of OMON (police that deals with street actions), but we decided to do this anyway. So we found several people with clean mobiles and send them like recons to locate possible police cars (they usually used hidden places to wait). These recon people report OMON movements to us a little in advance, so we have a chance to stay 15-20 min. on one of the main streets before OMON show up. This is a tactical example.

4. More advanced group using mobiles during elections, March 2006

We organized a pool of volunteers. Part of them stayed on Oktyabrskaya Square in downtown Minsk where the main opposition actions were happening, tent camps included. We equipped them with clean SIM cards, and created lists of this mobile numbers.

We also organized groups of volunteers with computers and Internet at home and gave them a list of these numbers. And finally, we had 2 site administrators who could post infos from the square to the web in real time.

So the scheme worked like this: a volunteer from streets calls one of the PC volunteers, or reversed scheme; the PC volunteer types messages of what happened on the square and sends it via the net, via Skype, to administrators and they in turn post it on our sites.

This is very effective in situations where authorities try to limit using traditional media and major opposition sites for such purposes.

I see.

After that we used this scheme again in several cases.

Did they never find a way to block it?

This is very difficult in practice. Such volunteers are usually new people, not under surveillance like opposition activists. We use new SIM cards. And there is not just one person, but group of independent observers in a field. Same with the PCs.

Another question, about these 'clean' mobiles and SIM cards - are these newly bought pre-paid cards? Not fixed subscriptions?

At that moment we didn't have pre-paid cards, the authorities would not give permission for such products to the operators. But they exist now.

OK! That is an important detail. How do you proceed then?

We use standard contracts with mobile operators using really neutral people. As far away from opposition members as possible. We register 5-10 numbers on them.

So it is possible to have several contracts per person without raising suspicion?

Some people even use so-called BOMJ - very, very poor people - for registering such stuff. But we do not use them. As you remember, it was a time of boom in subscriptions.

S we were more or less ok with this, even on 1 person, because if they have family it is ok [it doesn't raise suspicion]. Maybe not 10, but till 5 is ok. And 10 in really rare cases, when urgent situation

It is not risky for them to help you with this?

They can always say 'I gave this phone to my friend and can't control the use of it'.

Also, I remember during big opposition events, some other organizations were using mass SMS sending.

Tell me more.

Just something like: 'People, come 1st of September at 19.00 to October Square. Zhive Belarus!'

Where did these SMS originate from? From a server or single phone, or from many phones?

It was possible using foreign SMS services. Professional, I can say.

Is it still possible?

Yes, but (1) if we use a paid foreign service, it costs a lot. And (2) if we use a phone+PC scheme or several phones+PC it is also possible but not for a wider audience, and it can easily be blocked. Good for us that a database with mobile numbers of around 1 million of Velcom users was posted on the Internet several years ago, by pirates.

Are you serious? Wow, those pirates should get a Nobel prize [laugh].

Yes, it was a huge scandal for the operator. It actually happened even twice. They did it again and, as I remember, no traces.

Nice piece of work.

The thing is, without such things it is only possible to send infos to a limited numbers of your opposition friends who usually already know about such events.

I see. Are mobile phone numbers not available on your whitepages-type phone catalogue?

I think no, it is closed information. Usual phones, yes.

It is like that in Switzerland, too. But here in Norway you can find many mobile numbers by searching someone's name and address.

Have you ever tried mass SMS sending to random numbers? Some of them will exist.

We are not, not enough [financial] resources and our specialists highly advised using only foreign SMS services for better results. Self-made schemes in Belarus were not very effective.

Also, after the authorities understood how important it can be, on some key events like presidential elections and something like the referendum in 2004, they used their own SMS sendings or fake SMS sendings with changed message or just the opposite message.

With 'they', you mean the state authorities?

Yes, and the pro-government youth organization BRSM. It's like the former Soviet Komsomol.

Or the new Nashi now in Russia...

Yes, it looks like Nashi. They have a 6 million USD budget per year, full access to youth, around 350'000 so-called members. They are also using these things [mass SMS].They have their own media. This is BRSM. The main goal is to just control the active youth and avoid any inclusion of them in opposition movements.

Amazing.

From the logistical sphere I can't find good examples because the logic of logistics (transportation) materials in Belarus shows us: as little as possible mobile conversations are better. Chances to deliver products are bigger. But usually it looks like person 1 or 2 with a car pre-agree with the person who's in charge of storage or print works, and with the recipient. After they switch phones off and do it: pick up products from the storage man and deliver it to the recipient. Less clever people use mobiles but even without mobiles, if we're talking big amounts, the risk of interception by the police and KGB is very high. Because information can leak beforehand. So it's important to be quick.

In Belarus, but not only here, it is possible not only hear mobile conversations but also to see where this person (like GPS but on base of your mobile signal) is located. I think accuracy is at 50-100 meters.

So you basically turn off your phone in critical situations like this?

Yes. Some people take out the battery, some do not, it depends on their belief - the idea of whether it works with the battery in or not. I mean some people think mobiles are only fully inoperative without battery. Some do not.

The police and KGB use this technology to locate opposition activists when necessary. For example, when we, in August 2005, tried to avoid them locating us. We switched off phones in an area with a lot of small houses and try to “disappear”.

I've heard that too. Ivan from Serbia told me that in important meetings, everybody would put his or her mobile on the table and take the battery out .

Yes, but it also depends on model of phone. But return to our case - they were most certainly in that area and tried to locate us, but in that case we managed to “disappear” successfully.

A, one more: search, locating and hearing concrete people is not only possible by the SIM card but also by the phone ID. So smart people reload from time to time ‘pereproshivka’, a Russian mobile software.

Now I understand that you used both the term "clean mobile" and "clean SIM" - those are two different things.

Yes. To get a clean mobile, put in a new SIM card and reload software.

What does that software do? Is it illegal?

BIOS [software that runs a device] is a better way to call it. Harder in new phones, easy to do in old ones.

How come it is from Russia? I would think that Russian authorities would not allow such programs.

Yes, but see, Russia, the Ukraine and Belarus have a similar Soviet history. Because of this, we have:

- one criminal world

- one hackers mafia

- one market of such technologies

In these things, we’re still very integrated. And the KGB, or FSB [in Russia], or the police can just limit but not eliminate this.

Funny that the underworld is better integrated than the official sphere.

Oh yes, much better. Examples are hackers and specialists in special techs. Creators of bugs and similar thinks.

Russia has some world-class software engineers.

They’re usually under a KGB or police umbrella.

As in the case of the attack on Estonia[81], maybe?

Yes, it's very possible in the Estonian case.

They are allowed to work in limited areas, and they also work in interests of this structures. Plus big money and corruption. All together.

In the case of Belarus, would you say that you can take advantage of the "underworld" for your purposes?

It's not really an underworld because they try to be as much outside as they can from politics. Authorities do not tolerate political interference.

But some good techniques helps from time to time. And they can be connected with different people.

You buy software from them.

Not software, because in Belarus the pirate market dominates and anything you want is very easy and legally to be found. It is a pity, but a fact.

But some equipment may have to be bought, some services, for example changing BIOS on mobile.

Ok, so you get free copies. But does that still imply that you need contacts to such people?

Yes, sure. But usually this is personal contacts some activists. It only works on the basis of trust.

Thank you so much for cooperating, Pavel. I am really looking forward to meeting you.

[81] The main Internet infrastructure of Estonia was attacked by Russian-based hackers in 2007: "Hackers take down the most wired country in Europe", WIRED magazine, 15.09.2007.