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Center for Interdisciplinary Economics
Discussion Paper

1/2015

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Regime Change under the Pressure of Rebellions

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Center for Interdisciplinary Economics
Discussion Paper Series

**Center for Interdisciplinary Economics
Discussion Paper
1/2015**

February 2015

ISSN 2191-4419

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Abstract We hypothesize that, in certain regime types, winning coalitions have an incentive for helping a deprived population solving the collective action problem that may otherwise restrain them in revolting against an incumbent. Recent selectorate literature holds that members of a winning coalition may find themselves in a loyalty trap after having realized a bad character of an incumbent. According to our hypothesis, the winning coalition's members can find a way out of the loyalty trap by influencing expectations within the population in a way as to spark a public rebellion. A thus induced rebellion raises the chance of each of the winning coalition's members for preserving their position in a newly formed winning coalition following a regime change. Hence, the very regime structure that makes a loyalty trap more probably is identical to a regime structure under which we should expect a higher vulnerability to public rebellions.

JEL-Codes: D02, D74, H11

http://www.wiwi.uni-muenster.de/ciw/forschen/downloads/DP-CIW_01_2011.pdf

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1 Introduction

During the last decades, the world has witnessed a considerable number of public revolts against incumbent governments. Some of these revolts ended in a change in governments or regimes, while others did not. In any case, though, rebellious activities by a more general public were at least associated with major challenges of the respective incumbent's political survival. This observation notwithstanding, the social sciences face severe difficulties in explaining public revolts in a consistent manner. At least, their occurrence cannot simply be attributed to the individual participants' desire for a new regime or government, since the latter is a public good the provision of which is plagued by collective-action problems (see Kurrild-Klitgaard, 2004; Lichbach, 1998). In his seminal article on the economic theory of revolutions, Tullock (1971) held that most of what appeared to be a public revolution was in fact more of a coup d'état. While the logic of Tullock's approach is hardly disputable, we have seen many public revolts that hardly fit into Tullock's theoretical picture. This applies not only to the revolts against the communist regimes at the end of the 1980s but also to those around the so called Arab rebellion, and we have seen further public revolts in Thailand, Iran and the Ukraine, to name but a few.

The different branches on the literature have found ways to deal with the collective-action problem of public revolts, but as yet, none of these are fully convincing. For example, the general equilibrium approach to insurgencies by Grossman (1991; 1999) can do without bypassing the collective-action problem. However, Grossman's approach is not exactly applicable to the – at least seemingly – spontaneous outbreak of public revolts but rather to the formation of groups like *Hamas* or *Hizbullah*, that is with company-like organizations based on a longer time perspective. By contrast, although the deprivation literature, as founded by Gurr (1970), attracted considerable attention (see, *inter alia*, Bloch, 1986; Boix, 2003), it ignores the problem

or at least assumes the potentially revolting groups to somehow find ways for solving their collective-action problem (Acemoglu and Robinson, 2006, pp. 126-128).

The more recent literature on selectorates does not even consider the general public to have the potential for being decisive for the survival of a government in office. Rather, a subgroup of what this literature defines as the selectorate, namely the winning coalition, decides as to whether it wants the government to stay in office or not (see Bueno de Mesquita, Smith, et al., 2005; Bueno de Mesquita and Smith, 2010; Besley, 2007; Besley and Kudamatsu, 2008). The selectorate literature leaves it open as to what the precise mechanisms may be that can lead to an ousting of a government. The same applies to possible procedures for the appointment of a new government. It does therefore leave scope for a certain role of public revolts, as long as the winning coalition remains the decisive actor. However, with one exception so far (namely Li and Gilli, 2014), selectorate theory itself does not fill the open space that it leaves for the role of public revolts.

Threshold models of collective behavior (see Yin, 1998) are able to strictly explain public revolts on the basis of individually rational decision-making by the revolting group's members, assuming the rebels to exhibit expressive behavior in much the same way as in Brennan and Lomasky (1993). Nevertheless, even with this approach one cannot explain how a government can ever be ousted as a result of a public rebellion. This is at least true from the perspective of the selectorate literature, since from this literature the following questions immediately arise: Why should an incumbent resign "only" because there are public protests or even violent rebellions as long as the government is backed by the winning coalition on which all its power rests after all? And why should a winning coalition quit backing the incumbent "only" because there are subgroups of the population that rebel against the government?

If, by contrast, we assume the winning coalition itself to be disappointed from the government's policy and that it does indeed plan to oust the incumbent; and if we furthermore consider the winning coalition's option to exploit potential grievances within the non-privileged part of the population and to assist this group in solving the collective-action problem of a revolt; then this raises the following question: Why should the winning coalition even consider doing that, given that it is defined by its ability to oust the government at will any time without the need of any public support? Obviously, assuming that winning coalitions make use of such an option appears to contradict basic assumptions of the selectorate theory. Nevertheless, anecdotal evidence at least suggests that they do precisely that, and they do so in order to force incumbents to step down.

Summing up, while the deprivation literature explains public revolts by assuming the collective-action problem away, the selectorate theory defines the part of the population that is not part of the winning coalition as being powerless and thus not playing any role for the survival of an incumbent in office. While the latter makes sense theoretically, it leaves open the question as to why we nevertheless observe public revolts, why they are at least associated with changes in governments and regimes and why we frequently observe representatives of the prevailing winning coalition to become prominent leaders in public revolts.

This paper aims at helping to solve these puzzles by providing a link between the power of the winning coalition in the selectorate theory and the empirical observations as described above. Our central hypothesis is that the members of the winning coalition do indeed always have the power to oust a government, and independently of any support from a revolting general public. However, certain combinations of the size of the selectorate and the winning coalitions force the latter into a loyalty trap, although they may be disappointed with everything the incumbent did so far. We will show that inducing a general public to revolt against the incumbent can be an instru-

ment of the winning coalition for escaping this loyalty trap. For doing so, we present a simple threshold model of insurrections (Granovetter, 1978, Kuran, 1989) in which it is demonstrated that grievances against a government can be a necessary but never a sufficient condition for sparking the flame of a revolt. In threshold models, some exogenous shock is necessary for turning a latent potential of grievance into a manifest revolt. With our approach we endogenize such shocks and, at the same time, provide for the missing link between empirical observations and the logic of both the selectorate theory and the collective-action approach to public revolts.

The paper is organized as follows. In section 2, we define all groups and subgroups on which our analysis rests throughout the paper. In section 3, we lay out a very simply expressive-behavior model of rebellion and demonstrate that grievance or deprivation, while being necessary, can in itself never be sufficient for rebellious activities for being sparked. Section 4 develops our own approach within a simple agency setting. It will be demonstrated that the winning coalition's option of first investing in a public revolt and only then proceeding to oust an incumbent government may either lead to an effective revolt or to the adaptation of the incumbent's behavior to the wishes of the winning coalition. Section five discusses our central findings and identifies the key empirical implications of our model. Section 6 concludes.

2 Structure of the Society from a Selectorate Perspective

We lean on selectorate approaches in the definition of the groups and subgroups we consider in our model society (see Bueno de Mesquita, Smith, et al., 2005; Besley and Kudamatsu, 2008). First of all, we have the total population P , consisting of all domestic inhabitants. A subgroup $S \subset P$ is

referred to as the selectorate. This group is formally or informally endowed with the right to appoint the government. In a full-fledged democracy, for example, S would consist of the more or less entire adult population, in an aristocracy, it would consist of the nobles, and in a military regime, it would consist of high-ranking military officials (Bueno de Mesquita, Smith, et al., 2005, pp. 41 - 51).

Note, however, that only a subgroup of the selectorate is indeed decisive with respect to the recruitment of the government, and this applies to all sorts of political regimes, including democracies. As in Bueno de Mesquita, Smith, et al. (2005, pp. 51 - 55), we refer to this subgroup as the winning coalition $W \subset S$. In a full-fledged democracy, the winning coalition is some sort of a majority of the members of the selectorate, and in an aristocracy or in a military regime, it consists of those members of the nobles or the military officials who are powerful enough to dominate the rest of the respective selectorate. By contrast, in a rigged democracy like the former communist regimes and their one-party systems in Middle and Eastern Europe, the winning coalition consists of an inner circle within, for example, a party bureaucracy.

Another subgroup of the total population consists of either those who do not belong to the selectorate or of those who belong to the selectorate but not to the members of the winning coalition. With reference to a famous article by Vaclav Havel (Havel, 1985), we call this group the *powerless* $I \in \{P \setminus W\}$. As far as members of group I belong to the selectorate, they have been overruled in a broad sense of the word by the members of the winning coalition. Finally, we have the government R_k which comes as either good (G) or bad (B), so that $k \in \{G, B\}$. The government is recruited from the winning coalition and we assume, for simplicity, that it consist of only a single person.

The constituting element of the selectorate theory, as laid out by Bueno de Mesquita, Smith, et al. (2005), is that it allows for defining practically all sorts of political regimes with the help of only the two ratios S/P and

W/S .¹ For our purposes, the crucial ratio is W/S since it indicates the probability of members of an existing winning coalition to also become part of a new winning coalition in the case that the existing government had been ousted. This is so since a new government will be appointed by a new winning coalition that needs to be established prior to the appointment of a new government, and the chance for any member of the selectorate S to become a member of any newly established winning coalition is precisely W/S . This forces members of winning coalitions in regimes with low W/S into a particularly loyal habit toward the government. For regimes with high W/S , the force into loyalism is much weaker, which applies e.g. to full-fledged democracies with both high W/S and high S/P as well as to elitist systems with both low W/S and low S/P .

3 Sparking Public Revolts

As a basis for our further consideration, we first present a simple threshold model of public revolts. Threshold models have been widely used for explaining contagion effects that spark explosive types of uncontrolled collective action (see Schelling, 1978, pp. 102-110, Granovetter, 1978, Yin, 1998, Oliver and Marwell, 2001). Kuran (1989, 1991, 1995) applies threshold models for explaining unexpected public mass protests and revolts by assuming preference falsification on the side of the protesters. In particular, they weigh the utility from revealing true private preference against the utility from revealing preferences that correspond to some popular view within some sort of a peer group. The more individuals display the popular view, the higher

¹In formal democracies, S would typically comprise the entire adult population, which implies $S/P = 1$. In full-fledged democracies, the winning coalition W would comprise a majority of the voters, typically implying $W/S = 0.5$, while the winning coalition in a rigged democracy is much smaller than this, implying a rather small W/S . Elitist systems like military regimes or aristocracies exhibit both small S/P and small W/S . See Bueno de Mesquita, Smith, et al. (2005) for an extensive description.

is the utility from switching to that view for each individual. Once an individual crosses a certain individual threshold, it will switch to the popular view and, in effect, move another individual beyond its threshold. Whenever a certain critical mass is reached, this will spark a domino effect, ending in a mass revolt.

For the sake of a simple notation, we assume the total population to be of size P , the selectorate of size S , the winning coalition of size W , and the powerless of size I . Let $g_R = G_R/T$ with $g_R \in [0, 1]$ be the expenditure ratio chosen by the incumbent, i.e. expenditures G_R for public goods in terms of a given level of tax revenues T . We normalize the tax revenues to $T = 1$ and assume all excess tax revenues $1 - g_R$ to be either spend as transfers paid to the members of the winning coalition or to be retained and used for concealed private consumption by the government officials. Independently from the government's choice g_R , each member $i \in \{I\}$ has a private view about a public expenditure ratio $g_i \geq g_R$ that the individual finds appropriate, given his or her evaluation of agency costs and possibly also some accepted degree of governmental slack. Given the difference in g_i and g_R , we follow the deprivation literature (Gurr, 1970; Bloch, 1986) and define a degree γ_i of relative deprivation of the following form:

$$\gamma_i := \frac{g_i - g_R}{1 - g_R} \quad (1)$$

We assume each individual member of group I to exhibit an either obedient or a disobedient habit toward the government. A share $z \in [0, 1]$ of group I is disobedient, so that the share $1 - z$ is obedient. Disobedience can take a range of different forms: It may be limited to statements or comments among friends or, within a more general public, it may imply the attendance in peaceful demonstrations; but it may as well go as far as to the participation in violent rebellious activities or even terrorism. In any case, however, the character of these individual activities is purely expressive in Brennan and

Lomasky's sense (Brennan and Lomasky, 1993) that they do, from the point of view of the individual, not aim at raising the probability of an overturn of the government – although they may effectively contribute to precisely that. The latter is important in light of the collective-action character of a revolution. Since I is by definition a large group in Olson's sense (Olson, 1965), no member of that group has an incentive to deliberately participate in rebellious activity with the aim of raising the probability of a successful revolution (Tullock, 1971). Hence, rebellious action on the part of the members of I is explained by the utility derived from expressive behavior alone.

The share z of disobedient members of group I cannot directly be observed. We hence need a variable z^e that measures the expected value of z . As Kuran (1989) argues, it will usually be difficult to even indirectly evaluate this share, and particularly so in a dictatorship. These difficulties account for the fact that public mass protests, even those that most significantly impacted on the distribution of political power, sometimes came totally unexpected by politicians and external observers alike (see 1991).

We write the net utility of disobedience for individual i simply as the difference of benefits B and expected costs C :

$$V_i = B(\gamma_i) - C(z^e) \quad \text{with} \quad B'(\gamma_i) > 0; C'(z^e) < 0. \quad (2)$$

We assume the degree of relative deprivation to be normally distributed as described by the following cumulative distribution function:

$$\gamma(z) = \frac{1}{1 + e^{\lambda(z-\bar{z})}}. \quad (3)$$

Based on this distribution, we write the cumulative distribution function of the gross benefits $B(\gamma(z))$ of disobedience as:

$$\gamma(z) = \frac{1}{1 + e^{\gamma\lambda(z-\bar{z})}}. \quad (4)$$

Publicly expressing once disobedience, however, will almost always be associated with costs. In a dictatorship, these costs will usually be significant, but they will only materialize with a certain probability of becoming punished. We assume the subjective probability of becoming punished to critically depend on the expected share z^e of other individuals who also exhibit disobedience. We account for the fact that the subjective probability of becoming punished drops in the expected share z^e once again by a normal distribution of the expected value of the costs of disobedience of the following form:

$$C(z^e) = \frac{1}{1 + e^{\lambda(z^e-\bar{z})}}. \quad (5)$$

Note that 3 to 5 are derived from basically the same distribution function. This does indeed make sense since both the costs and the benefits are both defined over the same distribution of the individuals within z or z^e . Using equations 4 and 5, we can write the generalized form of the net utility function 2:

$$V(z, z^e) = \frac{1}{1 + e^{\gamma\lambda(z-\bar{z})}} - \frac{1}{1 + e^{\lambda(z^e-\bar{z})}}. \quad (6)$$

From equation 6, we can now derive our threshold function. Whenever $V(z, z^e) = 0$, the respective individual at the margin will be indifferent between obedience and disobedience. Should V rise by a small amount from there on, the marginal individual will switch to disobedient behavior. Over the whole range of z and z^e , then, we can draw a line with combinations of z and z^e for which $V(z, z^e) = 0$. This line is our threshold function. Setting $V(z, z^e) = 0$ in equation 6, we get $e^{\gamma\lambda(z-\bar{z})} = e^{\lambda(z^e-\bar{z})}$ or:

$$z = \frac{1}{\gamma}z^e - \frac{1-\gamma}{\gamma}\bar{z}. \quad (7)$$

We define a steady-state level of the expected share z^e as the critical level $z_c^e = z^e = z$. Inserting z_c^e into equation 7 reveals that $z_c^e = \bar{z}$, that is the mean values of the distributions 4 and 5.

In figure 1, both the threshold function and the steady-state line $z = z^e$ are depicted. There is one interior equilibrium, as defined by $z(\gamma) = z^e$, namely in point A , and two corner solutions in points 0 and B , respectively. We refer to 0 as the *peace equilibrium* and to B as the *rebellion equilibrium*. Note that point A represents a non-stable equilibrium. Any exogenous shock that temporarily shifts the belief z^e to a level above or below the critical value z_c^e drives the system all the way into either point 0 or point B . For example, a rise in z^e to any point $z^e > z_c$ is associated with a move from point A to the right in figure 1. In such a point, remaining obedient would lead to utility levels below zero for newly established infra-marginal individuals. These individuals will hence adjust to the new belief by switching to disobedience which leads to a vertical move upwards to point C , where each individual is on a maximum utility level again. However, point C is not a steady state, and that induces a correction of the belief z^e , associated with a move to the right from point C on and so forth. In point D , the upper limit of z is reached. Knowing this, the individuals will adjust their belief to $z^e = 1$ so that, finally, the rebellion equilibrium is reached. A likewise dynamic is sparked by a downward adjustment of the belief below the critical value z_c^e , which is associated with a move from point A to the left and which will eventually lead into a peace equilibrium in point 0.

There are two things to be learned from this simple setting for our purposes. The first is that changes in the mean value of the distribution $\gamma(z)$ of deprivation over the members of group I of the powerless change the critical value z_c^e , since $z_c^e = \bar{z}$. With a relatively low mean level \bar{z} , even relatively low

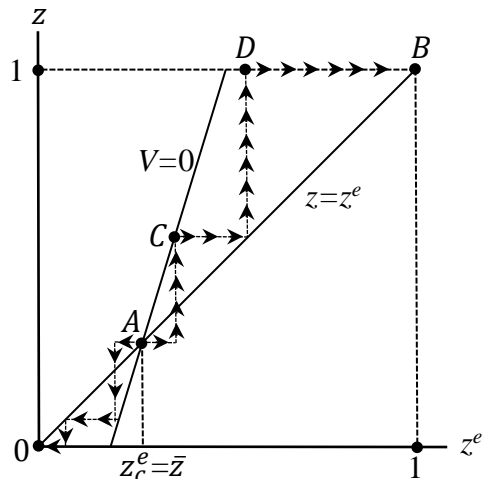


Figure 1: Dynamics of Insurrections

initial levels of z^e suffice for initiating a process into a rebellion equilibrium in point B . By contrast, for relatively high mean values \bar{z} , relatively high initial beliefs z^e are necessary for paving the way into a rebellion equilibrium in point C . Note that low mean values \bar{z} are associated with high deprivation ratios γ_i for each individual and hence with a discontented population. Note also, however, that this is not sufficient for sparking a public revolt. Rather, for any convergence process into either 0 or B to get launched it is both necessary and sufficient that a respective initial value below or above z_c^e has temporarily been established in advance.

Initial values can be established in two ways. They can be the realization of some exogenous stochastic variable, or they can be the result of deliberate action of some agent that is exogenous to subgroup I of the population. The former is what most authors who apply threshold models have in mind. It implies an important lesson, which has particularly been pushed forward by Kuran (1989), namely that a rise in dissatisfaction with the government or, for that matter, of deprivation is never sufficient for making a people rebel. What is rather needed is a temporarily established belief by the average

deprived individual that there is a sufficient number of further individuals willing to express their feeling of deprivation. However, given an equal distribution of exogenous shocks, a convergence into a rebellion equilibrium B for any randomly drawn initial value of z will be more likely in the case of a low mean value \bar{z} .

But an evolution from a relatively satisfied public to a relative dissatisfied public alone is anything but sufficient for a rebellion to occur. This is precisely what the threshold models distinguish from older Marxist and more recent deprivation-theoretical approaches (Gurr, 1970; Bloch, 1986; Acemoglu and Robinson, 2006). Whereas for the latter, deprivation is both necessary and sufficient, for the former it is at best necessary for a rebellion.²

Nevertheless, public rebellions obviously do occur, they are obviously associated with dissatisfaction, and they have obviously occurred more frequently since the end of the 1980s. This calls for an explanation. We will argue that it can, besides being the result of some stochastic shock, also be due to deliberate action by an agent that is exogenous to group I . As far as such an agent is able to shift the belief z^e beyond z_C , this agent has the capability of switching from a peace equilibrium to a rebellion equilibrium and *vice versa* (see McCormick and Owen, 1996). Since we only distinguish between three different groups in society from which one is the public and one the government, our candidate is the winning coalition. This group may, under certain circumstances, have an interest in sparking a public revolt since a revolt may help the winning coalition to oust the incumbent government at reasonable costs for the winning coalition's members.

²Note that a rebellion equilibrium can in principle even be reached with a distribution that represents hardly any deprivation at all. In this sense, particularly high degrees of relative deprivation are not even a necessary condition. Things become way more complex when distributional aspects follow multi-dimensional scales, which is all but unlikely. In such cases, negotiations on distributions are without core which would lead into endless revolution cycles, if it were not for the dynamic equilibria considered here. For a detailed analysis, (see Apolte, 2012).

The selectorate theory by Bueno de Mesquita, Smith, et al. (2005) and, in a similar fashion, by Besley and Kudamatsu (2008) holds that the cost for the winning coalitions' members of ousting the governments is reflected by the probability $1 - W/S$ of losing membership in the winning coalition. We will demonstrate that the winning coalition can reduce these costs by sparking a public revolt against the incumbent first and by only then openly turning to withdraw its support for the incumbent. This would, *inter alia*, explain the numerous public revolts that ended in ousted old and enthroned new governments behind which, time and again, we discover the same winning coalition. Naturally, however, kindling the flame of a public revolt also comes at a cost.

4 Public Policy, Revolts, and Loyalty

As in the previous section, we assume the government to spend a share g of tax revenues $T = 1$ for public goods. The consumption of the public good is subject to decreasing marginal utility. These goods are not only purely public in the *Samulsonian* sense that no members of P can be excluded from consumption but also that they are not subject to any rivalry in consumption whatsoever. Apart from g , however, the government distributes a share vW of tax revenues as direct money transfers to the members of the winning coalition.

Finally, the government may retain a share $e = 1 - g - vW$ of tax revenues and use it for government purposes. Funds e are not directly consumed by the government, nor are they direct transfers. Rather, they are used as inputs for the government sector in a way as to enhance the utility derived from being in a government position. As e is no direct transfer, however, its disposability is low as compared to direct transfers, it is related to high positive externalities with respect to the incumbent's environment and, politically, allocating taxes

into e becomes *ceteris paribus* the more delicate, the higher is e . The latter is particularly true when e is compared to direct transfers that are viewed as legitimate at least by the winning coalition. All in all, the utility derived from any unit of e is lower than what can be derived from direct transfers and, most notably, it is subject to substantially decreasing marginal utility. In any case, or course, the way these funds are used is not considered legitimate by members of both group I of the powerless and the winning coalition except the government (henceforth: $W \setminus R$). What is more, it is not even considered legitimate by a *good government* R_G . Hence, a good government will not be interested in retaining the share e in the first place since this would require it to allocate it into non-legitimate channels. By contrast, a *bad government* R_B will by assumption not hesitate using funds in a way as to generate private utility from it. Whether or not a government is *good* or *bad* is not directly observable to either group I or group $W \setminus R$, but the probability π of a government for being good is common knowledge.

We catch these aspects by describing indirect utility V^j as derived by groups $j \in \{I, W, R_k\}$ in the following functional form:

$$V^j = g^\alpha (1 + v)^\phi e^\theta \text{ with } \theta = \begin{cases} \beta & \text{for } j = R_B \\ 0 & \text{for } j = I, W \setminus R, R_G, \end{cases}$$

$$\phi = \begin{cases} 0 & \text{if group } I \\ 1 & \text{otherwise} \end{cases} \quad \text{and } 0 < \alpha, \beta < 1. \quad (8)$$

The budget constraint for public expenditures is:

$$1 = g + vW + e. \quad (9)$$

The respective group members find the optimal allocation of tax revenues (g_j^*, v_j^*, e_j^*) from their respective point of view by maximizing a group member's indirect utility, subject to the budget restriction 9. Table 1 summarizes the optimal allocations from the point of view of each group.³ Note that $g_B^*(W) > 0$ and $g_W^*(W) > 0$ indicating that expenditures for public goods become more attractive to both the winning coalition and any type of a government as the size of the winning coalition rises. By the same token, $v_W^*(W) < 0$ and $v_B^*(W) < 0$ since direct transfers to the members of the winning coalition become more expensive as the size of the winning coalition rises, which makes them less attractive as compared to public goods. These results reproduce an implication from the selectorate model by Bueno de Mesquita, Smith, et al. (2005, pp. 77 - 106) as well as from Olson's encompassing-interest approach (Olson, 1993; McGuire and Olson, 1996). Both approaches imply that winning coalitions that grow in size will shift fiscal expenditure from redistribution in favor of privileged groups to the funding of public goods that are equally available to everybody.

Note that this logic does not apply to excess taxes e_B since the government does not need to share these funds with further members of the winning coalition. Hence, a rise in the size of the winning coalition makes these expenditures more attractive to a bad government, as can be seen by $e_B^*(W) > 0$, which implies that a bad government tends to reallocate more funds away from bigger as compared to smaller winning coalitions.

The rationale behind this is simply the rivalry in consumption of benefits to members of privileged groups. This rivalry implies rising fiscal costs of the privileges as the size of the winning coalition rises relative to the total population. A government in a full-fledged democracy with a winning coal-

³For the sake of brevity, we have assumed $g_B^*, v_B^*, e_B^* > 0$ as well as $g_W^*, v_W^* > 0$. Corner solutions $e_B^* = 0, v_B^* > 0$; $e_B^* > 0, v_B^* = 0$; $e_B^* = 0, v_B^* = 0$, and $g_W^* = 0, v_W^* = 0$ are possible (though not always plausible), but presenting all these cases would require lengthy considerations without adding further insights, nor would it change any of the results. A full set of Kuhn-Tucker conditions is of course available from the author.

Table 1: Optimal Tax Allocation

group	g	v	e
I	$g_I^* = 1$	$v_I^* = 0$	$e_I^* = 0$
$W \setminus R$ or R_G	$g_W^* = \frac{\alpha(1+W)}{1+\alpha}$	$v_W^* = \frac{1-\alpha W}{(1+\alpha)W}$	$e_W^* = 0$
R_B	$g_B^* = \frac{\alpha(1+W)}{1+\alpha+\beta}$	$v_B^* = \frac{1-(\alpha+\beta)W}{(1+\alpha+\beta)W}$	$e_B^* = \frac{\beta(1+W)}{1+\alpha+\beta}$

tion that comprises approximately 0.5 of the population does hence have a stronger incentive to supply public goods and to abstain from pure redistribution in favor of the winning-coalition's members. Finally, note that the winning coalition or a good government will always supply a higher level of public goods than a bad government since $g_W^* > g_B^*$. Good governments will hence not only abstain from redirecting tax revenues away from privileges of the winning coalition, but they will also provide more public goods.

In table 2 you will find the indirect utilities of group I , group $W \setminus R$ as well as R_G and R_B as they are optimal from the point of view of the respective groups. As an example, if group R_B were decisive for the allocation of g_j, v_j , and e_j , then the allocation were g_B^*, v_B^* , and e_B^* , and the resulting indirect utility of group I were $V_B^I = g_B^{*\alpha}$.

Remember that the winning coalition appoints the government and, further on, it expects the government to allocate taxes in a way as to maximize the indirect utility of a winning coalition's member. Hence, a winning coalition's member wants the government to set g_j, v_j , and e_j such that its ensuing utility turns out to be V_W^W . However, a bad government may have a different plan, but the winning coalition does not know in advance whether the government is good or bad. The powerless, in turn, would not be happy with a bad government's tax allocation either, since that implies less public goods compared to the level supplied by a good government. On top of that, a

Table 2: Optimal Utility Levels **of...** Optimal **from** the Perspective ...

of...	I	$W \setminus R, R_G$	R_B
from...			
I	$V_I^I = g_I^{*\alpha}$	$V_I^W = g_I^{*\alpha}$	$V_I^B = g_I^{*\alpha}$
$W \setminus R$ R_G	$V_W^I = g_W^{*\alpha}$	$V_W^W = g_W^{*\alpha}(1 + v_W^*)$	$V_W^B = g_W^{*\alpha}(1 + v_W^*)$
R_B	$V_B^I = g_B^{*\alpha}$	$V_B^W = g_B^{*\alpha}(1 + v_B^*)$	$V_B^B = g_B^{*\alpha}(1 + v_B^*)(1 + e_B^*)^\beta$

change in the attribution of individual members of the population P to the respective subgroups W, I , and R , which may ensue from a broader change in government or even regime, would give each of the members of the powerless a chance for becoming member of a newly constituted winning coalition. In other words: The powerless would always win from a change in the power structure.

Moreover, each member of the powerless might indeed be inclined to express his or her disapproval with a given distribution of taxes publicly and possibly even violently; but on a collective level, this inclination to translate into manifest collective action requires the powerless to get uncaged from their peace-equilibrium trap, as described in section 3. In particular, it requires a change in the mutual evaluation of the individual members' attitude toward the government, and such a change can either come by chance, that is by some random shock (which may indeed never happen) or by some deliberate action of a group that is exogenous to the powerless. The winning coalition is our candidate, and here is the reason why.

The winning coalition would continue supporting any incumbent government that chooses g_W^*, v_W^* , and e_W^* , no matter whether it is a good or a bad gov-

ernment. Should, however, the government choose an allocation g_B^*, v_B^* , and e_B^* then the winning coalitions' members had to decide: Should they accept this allocation, then their utility would fall short of what it could otherwise be. By contrast, should they decide to drop the government, then a new government would be appointed, but this new government would come along with a new winning coalition of which each of them would be a member only to the probability W/S (see Bueno de Mesquita, Smith, et al., 2005).

The winning-coalitions' members may therefore be looking out for an instrument that combines dropping the government with safeguarding their membership in the winning coalition, and they may find such an instrument by the potential of group I to rebel. We explore the implications of all this by a simple game that runs over two periods $t \in \{1, 2\}$. Players are nature (N), the period-one winning coalition except the government ($W \setminus R$), and the period-one government (R_k). The members of W are homogeneous except that individuals drawn from W as period-one or period-two governments are of either type B or G . We assume both a bad and a good government to discount period-two payoffs by a discount factor $\delta \in [0, 1]$.

At the beginning of period two, the members of the period-one winning coalition decide as to whether they support the period-one government (SG), drop the period-one government (DG), or first invest in initiating a public revolt and then drop the government (IR). In the two former cases, there will be no public revolt. In the latter case, group $W \setminus R$ invests an amount c of money into manipulating public opinion within group I . This investment has two effects. Firstly, it reduces the expected share z^e of group I members who are obedient to the period-one government in the sense of the model presented in section 3; and secondly it lays the groundwork for the public support that the period-one winning coalition needs in order to inaugurate a new government for period two. In order to be sufficient for turning a peace equilibrium into a rebellion equilibrium, the winning coalition's investment c

must exceed a level $c_z = c(z_c^e)$ with $c'(z_c^e) > 0$ in the sense of figure 1.⁴

Once a rebellion equilibrium is reached there are only two options for restoring a peace equilibrium: The first is to appoint a new government. We assume that c_z is not only sufficient for turning a peace equilibrium into a rebellion equilibrium but that it is, at the same time, sufficient for gaining as much control over the public opinion within group I as is necessary for the period-one winning coalition for calming down the rebellion by way of inaugurating a new government for period two. The second option for restoring a peace equilibrium is to once again invest into a manipulation of the level of public obedience by group I members so as to restore trust in the incumbent government of period one. We preclude this latter option, however, since it would not make any sense, nor would it be credible, for group W members to invest in disobedience on the part of group I and then to invest in obedience without having established any changes in the government.

In either case DG or IR , the government will be ousted and a new government will be appointed for period two from the period-two winning coalition. An ousted period-one government will fall back into group I of the powerless with a zero chance of becoming a member of the winning coalition in period two. In case SG , by contrast, the period-two government will be identical to the period-one government. In particular, the timing of the game is as follows:

1. Nature randomly selects a period-one winning coalition W with probability W/S of each member of P for being part of W . Nature then randomly selects a period-one government R_k of type $k \in \{G, B\}$ from group W , with probability π for $k = G$ and $1 - \pi$ for $k = B$.
2. The period-one government R_k chooses $e_1 \in \{0, e_B^*\}$ and period-one pay-

⁴For the sake of our model, we assume z_c to be exogenous, which implies a given distribution $z(\gamma)$. Note, however, that this distribution depends on the government's choice of g_R . Hence, sparking a rebellion becomes indeed more easy as the degree of relative deprivation rises.

offs are realized by groups I , $W \setminus R$, and R_k .

3. At the beginning of period 2, group $W \setminus R$ chooses among options “support government” (SG), “drop government” (DG), and “invest in revolt first, then drop government” (IR).
4. The period-two winning coalition and the period-two government are determined, depending on the choice of group $W \setminus R$ in step 3:
 - If $W \setminus R$ had chosen option SG in step 3, then the period-one winning coalition and the period two-winning coalition remain as they were in period one.
 - If $W \setminus R$ had chosen option DG in step 3, then nature randomly selects a period-two winning coalition W with probability W/S for each member of P for becoming part of period-two W . Nature then randomly selects a period-two government R_k of type $k \in \{G, B\}$ with probability π for $k = G$ and $1 - \pi$ for $k = B$ from group W .
 - If $W \setminus R$ had chosen option IR in step 3, the winning coalition remains the same as in period one but nature selects a (new) period-two government R_k of type $k \in \{G, B\}$ with probability π for $k = G$ and $1 - \pi$ for $k = B$ from group W .
5. The period-two government R_k chooses $e_2 \in \{0, e_B^*\}$ and period-two payoffs are realized.

Table A.1 in the appendix gives the payoffs of the players over the two periods. We solve for a Perfect Bayes Equilibrium (PBE). Note that a bad government will always defect in period two, that is it will always choose $e_2 = e_B^*$ whenever it has the chance to do so. Note also that group $W \setminus R$ can infer $R_k = R_B$ from having observed $e_1 = e_B^*$ since

$$Pr(R_B|e_1 = e_B^*) = \frac{Pr(e_1 = e_B^*|R_B)(1 - \pi)}{Pr(e_1 = e_B^*|R_B)(1 - \pi) + Pr(e_1 = e_B^*|R_G)\pi} \quad (10)$$

and $Pr(e_1 = e_B^*|R_G) = 0$, so that $Pr(R_B|e_1 = e_B^*) = 1$. By the latter, we also have that $Pr(R_G|e_1 = e_B^*) = 0$. Should a bad government choose $e_1 = e_B^*$, the payoffs over the two periods were: $V_B^B + \delta V_{LP}$. By contrast, should it choose $e_1 = 0$ and should group $W \setminus R$ infer the government to be of type $k = G$ with a sufficiently high probability upon having observed the government's choice, the bad government's payoffs were $V_W^B + \delta V_B^B$. Hence, a bad government would not even consider choosing $e_B^* = 0$ when defecting in the first period resulted in payoffs higher than the payoffs that resulted from the best of what would happen if it abstained from defecting in the first period, or if:

$$V_B^B + \delta V_{LP} > V_W^B + \delta V_B^B. \quad (11)$$

Condition 11 holds for a sufficiently high π and for a sufficiently low δ , that is for sufficiently high prior beliefs that a new government will be good and for a sufficiently high discount rate of the incumbent. Note that these factors are common knowledge. We refer to case S whenever condition 11 holds, because there will be a separating equilibrium in that case. By contrast, we refer to case P whenever condition 11 does not hold. We analyze case S first and then turn to case P .

Case S : $V_B^B > V_W^B + \delta(V_B^B - \delta V_{LP})$

Case S is constituent for a separating equilibrium because a bad government will always choose $e_1 = e_B^*$ when condition 11 holds and group $W \setminus R$ will infer $R_k = R_B$ from an observation $e_1 = e_B^*$. Finally, since $Pr(R_G|e_1 = 0) = 1$ in case S , group $W \setminus R$ can distinguish between good and bad governments with

certainty after having observed as to whether condition 11 holds and after having observed the government's choice on e_1 .

Hence, upon having observed $e_1 = 0$, group $W \setminus R$ knows with certainty that $R_k = R_G$ and that the government will choose $e_2 = 0$. In that case, group $W \setminus R$ compares period-two payoff V_W^W of supporting the government (SG) with either V_{DG} of dropping the government (DG) or $V_{IR} - c_z$ of initiating a public revolt first and then dropping the government (IR). Since $V_W^W > V_{DG}$ and $V_W^W > V_{IR} - c_z$ for any $c_z \geq 0$, SG is the best response of group $W \setminus R$ to $e_1 = 0$.

By contrast, should group $W \setminus R$ observe $e_1 = e_B^*$, it knows with certainty that $R_k = R_B$ and that the government will choose $e_2 = e_B^*$. It may consider DG as a response but if the winning coalition's size relative to the selectorate's size is small, the low probability W/S may drive this option unattractive, even though the members of $W \setminus R$ have been cheated by the government in period 1 and even though they know they will be cheated again in period 2. Since the period-two payoff from SG will be V_B^W because of the bad government, and since the period-two payoff from DG will be V_{DG} , a necessary condition for dropping the government to be sequentially rational in the case of $e_1 = e_B^*$ for group $W \setminus R$ is $V_{DG} > V_B^W$ or:

$$\pi \left[V_W^I + \frac{W}{S} (V_W^W - V_W^I) \right] + (1 - \pi) \left[V_B^I + \frac{W}{S} (V_B^W - V_B^I) \right] > V_B^W. \quad (12)$$

For a sufficiently low W/S , the left-hand side of condition 12 may drop below the right-hand side, so that condition 12 does not hold anymore. In such a case, the government is stuck in a loyalty trap as described by Bueno de Mesquita, Smith, et al. (2005, pp. 65-68), but only if DG were the only alternative to SG . In our setting, however, there is a second alternative, namely IR of first investing in a public revolt and then dropping the government. A necessary condition for IR to be the best response to the government's

choice $e_1 = e_B^*$ is that $V_{IR} > V_B^W$ or that $V_B^W + \pi(V_W^W - V_B^W) - c_z > V_B^W$, which reduces to:

$$\pi(V_W^W - V_B^W) > c_z. \quad (13)$$

Condition 13 is easy to interpret. For the case that DG is not an option, it says that IR pays whenever the difference in the payoffs resulting from good and bad governments times the probability π that a new government will be good must exceed the necessary investment c_z in a public revolt.

Finally, in the case that both conditions 12 and 13 hold, group $W \setminus R$ would need to compare the period-two payoffs of DG and IR . As a result, we have the following pair of sequentially rational choices for period 1:

$$s_R^* = \begin{cases} e_1 = 0 & \text{if } R_k = R_G \\ e_1 = e_B^* & \text{if } R_k = R_B, \end{cases} \quad (14)$$

$$s_W^* = \begin{cases} SG & \text{if } e_1 = 0 \\ DG & \text{if } e_1 = e_B^*, V_{DG} > V_B^W, V_{IR} - c_z \\ IR & \text{if } R_k = e_B^*, V_{IR} - c_z > V_B^W, V_{DG}. \end{cases}$$

Case P: $V_B^B \leq V_W^B + \delta(V_B^B - \delta V_{LP})$

From observing $e_1 = e_b^*$, group $W \setminus R$ can still infer with certainty that the government is of type $k = B$ since, in any case, $Pr(R_G | e_1 = e_b^*) = 0$ and hence $Pr(R_B | e_1 = e_b^*) = 1$. It would nevertheless support the government upon having observed $e_1 = e_b^*$ if:

$$V_B^W \geq \max\{V_{DG}, V_{IR} - c_z\}. \quad (15)$$

If condition 15 holds, the bad government's sequentially rational strategy implies $e_1 = e_B^*$ since it expects group $W \setminus R$ to choose SG anyway. By contrast, if condition 15 does not hold, then the bad government expects

to be ousted since group $W \setminus R$ will choose either DG or IR . Since the government's payoff of a sequence $\{e_1 = e_B^*, DG \text{ or } IR\}$ is lower than that of a sequence $\{e_1 = 0, SG, e_1 = e_B^*\}$ by the definition of case P , a bad government's sequentially rational strategy may, but does not need to, imply $e_1 = 0$. Hence, upon having observed $e_1 = 0$, group $W \setminus R$ has an interest in finding out as to whether the government is good or bad. Bayes' rule gives:

$$Pr(R_B|e_1 = 0) = \frac{Pr(e_1 = 0|R_B)(1 - \pi)}{Pr(e_1 = 0|R_B)(1 - \pi) + Pr(e_1 = 0|R_G)\pi}. \quad (16)$$

However, from $Pr(e_1 = 0|R_G) = 1$ follows that $0 \leq Pr(R_B|e_1 = 0) \leq 1$, which implies no information on top of what group $W \setminus R$ knows from the prior probability π . There is hence nothing to be learned from equation 16, neither from the government's choice $e_1 = 0$. Group $W \setminus R$ thus remains reliant on the prior probability π after having observed $Pr(e_1 = 0)$. The expected value of supporting the government will be:

$$\pi V_W^W + (1 - \pi)V_B^W. \quad (17)$$

Likewise, both the necessary and the sufficient condition for either DG or IR to be the best response to $e_1 = 0$ would be that:

$$max\{V_{DG}, V_{IR} - c_z\} > \pi V_W^W + (1 - \pi)V_B^W. \quad (18)$$

It is easily demonstrated that condition 18 never holds, so that neither DG nor IR can be a best response to $e_1 = 0$ in case P . As a result, we get the following pair of sequentially rational choices for period 1:

$$\begin{aligned}
s_R^* &= \begin{cases} e_1 = e_B^* & \text{if } R_k = R_B, V_B^W \geq \max\{V_{DG}, V_{IR} - c_z\} \\ e_1 = 0 & \text{otherwise,} \end{cases} \\
s_W^* &= \begin{cases} SG & \text{if } e_1 = 0 \\ DG & \text{if } e_1 = e_B^*, V_{DG} > V_B^W, V_B^W \geq V_{IR} - c_z \\ IR & \text{if } e_1 = e_B^*, V_{IR} - c_z > V_B^W, V_{IR} - c_z > V_{DG}. \end{cases} \tag{19}
\end{aligned}$$

Taken together, there are six different possible equilibria over the two cases S and P . They are summarized in table A.2 in the appendix.

Governments that set $e_1 = 0$ will always survive in office, no matter whether they are good or bad. Bad governments opt for $e_1 = 0$ if and only if they do not discount future payoffs too much. By contrast, if they discount future payoffs sufficiently strong, condition 11 does not hold anymore so that $V_B^B > V_W^B + \delta(V_B^B - V_{LP})$. They are then in case S , where period-one payoffs always outweigh discounted period-two payoffs. In case S , a bad government opts for $e_1 = e_B^*$ and reveals its type by doing so. The same applies in case P when $V_B^B \leq V_W^B + \delta(V_B^B - \delta V_{LP})$ but where both options DG and IR are too expensive for group $W \setminus R$.

With respect to our question and on top of what the existing literature on the selectorate theory predicts, the winning coalition's option IR of first launching a public rebellion and only then ousting the government can have two effects: The first is a disciplining effect much in the way it is discussed in Besley and Kudamatsu (2008). This applies to one of the two variants of equilibrium 5 in table A.2, namely when $V_B^W \geq V_{DG}$ but $V_B^W < V_{IR} - c_z$. If this is the case, the threat for the government of being dropped by the winning coalition is not effective because the payoffs that group $W \setminus R$ can expect when they drop the government are below the payoffs in the case that they keep supporting the government. However, the payoffs from first

launching a public revolt and only then dropping the government exceed the payoffs from supporting the government. Since these facts are common knowledge, the government will abstain from defecting in period one and set $e_1 = 0$ instead.

The second effect from the additional option IR is implied in equilibrium 3 of table A.2. Assume the variant were we have $V_{DG} \leq V_B^W$ but $V_{IR} - c_z > V_B^W$. In such a case, the government could afford setting $e_1 = e_B^*$ without being ousted at the beginning of period two if group $W \setminus R$ had not the option IR . Since $W \setminus R$ does indeed have this option in our model, it will invest in a public revolt and only then drop the government upon having observed $e_1 = e_B^*$. The existence of option IR will, in this case, not discipline the government, but it will induce a public revolt.

5 Discussion and Empirical Implications

We have constructed our model for two reasons: First of all, we aimed at endogenizing the exogenous shocks needed in the threshold models as they represent the perhaps most convincing approach for explaining public revolts. Secondly, we aimed at supplementing the selectorate theory of governmental accountability by considering a mechanism that obviously plays a certain role in both disciplining incumbent governments and ousting those governments that cannot be disciplined. Still, our model leaves room for situations where governments are safe with regard to any threat from any group in society, no matter how much they exploit any or even all of these groups. In that respect, the scope of our model is beyond models of revolution restrictions like that used in the deprivation literature, e.g. by Boix (2003) or by Acemoglu and Robinson (2001; 2006), since these models imply that a revolt will result whenever a certain degree of exploitation has been reached. Obviously, however, there are countries with a tremendous degree of exploitation and

impoverishment in which the government nevertheless appears to be safe while we have observed public revolts in countries in which things are far better.

In this sense, selectorate theory has already demonstrated that it is not some general public that is crucial for both a government's accountability and its survival in office. Rather, it is the winning coalition. This, however, raises the puzzling question as to why so many regime changes are obviously associated with public protests or revolts by those who are defined away as members of politically influential groups in the selectorate theory. In our approach, we aim at solving this puzzle by identifying a role that the public protests or rebellions play. However, it is a more of a passive role, since the members of the winning coalition exploit the public revolt in order to safeguard their personal position in society. They do so by using option IR of first investing in a public revolt and only then ousting the government.

In particular, the existence of option IR has two effects: Firstly, in what we have defined as case P , option IR helps scaring the incumbent away from cheating the members of group $W \setminus R$. Secondly, option IR facilitates efforts for getting rid of those governments that cheat under any circumstances, that is within what we have defined as case S . It does so by reducing the expected costs incurred by group $W \setminus R$ in the case that they drop the government.

Our approach has three major empirical implications that are all associated with the size of a country's structural parameter W/S . First and foremost, a country will become more susceptible to public revolts as W/S drops. The reason is that W/S is the probability of a winning coalition's member to remain member of the winning coalition even after a change in government has occurred. If the winning coalition is small relative to the size of the selectorate, there is a large chance of the winning coalition to change its membership structure, and that forces the members of an existing winning

coalition into loyalty even to a bad government. Option IR gives the winning coalition's members an instrument for escaping this loyalty trap. Hence, rigged democracies should be more prone to public revolts than other types of regimes. By contrast, regimes the selectorate of which is drawn from a narrow military, aristocratic or theocratic elite that are naturally limited in size, should be less prone to public revolts. The reason is again straightforward: The chance for remaining a member of the winning coalition even following a change in the government are high by the very nature of these regimes, so that there is no need for members of $W \setminus R$ for making use of option IR . We should instead observe the use of option DG , that is of some sort of palace revolutions or hidden mechanisms that work within an inner circle of the winning coalition, small as it is in these settings.

Finally, full-fledged democracies should also exhibit only weak tendencies for public revolts. This again follows from our model. As demonstrated, rising values of W shrink the differences in the optimal levels of the different values of g_i^* . At the same time, rising values of W/S raise the probability for condition 12 to hold and, hence, they lower the probability of a winning coalition to get stuck in a loyalty trap.

Another conclusion can be drawn from our model: The general public or, more specifically, group I of the powerless may to some extent benefit from group $W \setminus R$'s option IR as well, since the government's expenditures for public goods do indeed rise in the case that the government has successfully been scared away from cheating group $W \setminus R$. This is the deeper reason why it is indeed true that option IR has a potential for raising the government's accountability. However, the sheer existence of option IR lowers group- I members's chances of ever becoming members of the winning coalition themselves. This is so since the very sense of option IR is to safeguard the memberships of group $W \setminus R$ members in the winning coalition even in the case of a change in government. Option IR is an option the sheer existence of which conserves inherited structures of power and wealth.

6 Conclusions

In this paper we developed a model for explaining why there are public revolts even when the aim of the revolt is a public good. It is based on the recent literature of selectorates and it adds to this literature in providing a link between the selectorate theory's implication that a privileged group called winning coalition has all the power it needs for ousting a non-beloved incumbent government but that it may nevertheless exploit public grievances in order to spark a public revolt before it finally proceeds to dropping the government. It is shown within a simple agency model that the members of the winning coalition do so in order to improve their chance of remaining part of the winning coalition even after the government has been ousted and a contest over both the future government and the future winning coalition has been initiated.

The central empirical implications of our model are that public revolts are more probable in regimes with a small winning coalition relative to the size of the selectorate, most of which are rigged democracies. Elitist systems the winning coalition's size of which is naturally limited are less prone to public revolts, and the same applies to full fledged democracies.

A final implication of this paper's approach is as follows: The option of a winning coalition to spark public revolts prior to ousting a government lowers the chances of public rebels of becoming members of a future winning coalition. While rebellions are typically viewed as activities that challenge given power structures in a society, they tend, in our setting, to even conserve the historically evolved power and wealth distribution. And indeed, this fits into the picture of publicly enforced changes in the top of a government, behind the revolutionary face of which we more often than not discover the same old power elite. In this sense, the rebels considered in this paper are abused rebels.

Appendix

Table A.1: Overview of Payoffs

$e_1 = e_B^*$	IR	DG	$SG/e_2 = e_B^*$	$SG/e_2 = 0$
$W \setminus R$	$V_B^W + V_{IR} - c_z$	$V_B^W + V_{DG}$	$2V_B^W$	$V_B^W + V_W^W$
R_G	$V_B^W + \delta V_{LP}$	$V_B^W + \delta V_{LP}$	$(1 + \delta)V_B^W$	$V_B^W + \delta V_W^W$
R_B	$V_B^B + \delta V_{LP}$	$V_B^B + \delta V_{LP}$	$(1 + \delta)V_B^B$	$V_B^B + \delta V_W^B$
$e_1 = 0$	IR	DG	$SG/e_2 = e_B^*$	$SG/e_2 = 0$
$W \setminus R$	$V_W^W + V_{IR} - c_z$	$V_W^W + V_{DG}$	$V_W^W + V_B^W$	$2V_W^W$
R_G	$V_W^W + \delta V_{LP}$	$V_W^W + \delta V_{LP}$	$V_W^W + \delta V_B^W$	$(1 + \delta)V_W^W$
R_B	$V_W^B + \delta V_{LP}$	$V_W^B + \delta V_{LP}$	$V_W^B + \delta V_B^B$	$(1 + \delta)V_W^B$
$V_{LP} := V_B^I + \pi(V_W^I - V_B^I) \quad V_{IR} := V_B^W + \pi(V_W^W - V_B^W)$ $V_{DG} := \pi \left[V_W^I + \frac{W}{S}(V_W^W - V_W^I) \right] + (1 - \pi) \left[V_B^I + \frac{W}{S}(V_B^W - V_B^I) \right]$				

Table A.2: Possible Equilibria

	equilibr.	type government	case	further characteristics
1	$e_1 = 0$ $e_2 = 0$ SG	G	both	
2	$e_1 = e_B^*$ DG	B	S	$V_{DG} \geq V_B^W, V_{IR} - c_z$
3	$e_1 = e_B^*$ IR	B	S	$V_{IR} - c_z > V_B^W, V_{DG}$
4	$e_1 = e_B^*$ $e_2 = e_B^*$ SG	B	S	$V_B^W \geq \max\{V_{DG}, V_{IR} - c_z\}$
5	$e_1 = 0$ $e_2 = e_B^*$ SG	B	P	$V_B^W < \max\{V_{DG}, V_{IR} - c_z\}$
6	$e_1 = e_B^*$ $e_2 = e_B^*$ SG	B	P	$V_B^W \geq \max\{V_{DG}, V_{IR} - c_z\}$

References

- Acemoglu, D. & Robinson, J. A. (2001). A theory of political transitions. *American Economic Review*, 91(4), 938–963.
- Acemoglu, D. & Robinson, J. A. (2006). *Economic origins of dictatorship and democracy*. Cambridge University Press.
- Apolte, T. (2012). Why is there no revolution in north korea? *Public Choice*, 150(3-4), 561–578.
- Besley, T. (2007). *Principled agents?: the political economy of good government*. Oxford University Press.
- Besley, T. & Kudamatsu, M. (2008). Making autocracy work. In *Institutions and economic performance*. Cambridge Mass.: Harvard University Press.
- Bloch, P. C. (1986). The politico-economic behavior of authoritarian governments. *Public Choice*, 51(2), 117–128.
- Boix, C. (2003). *Democracy and redistribution*. Cambridge University Press.
- Brennan, G. & Lomasky, L. (1993). *Democracy and decision: the pure theory of electoral politics*. Cambridge: Cambridge University Press.
- Bueno de Mesquita, B. & Smith, A. (2010). Leader survival, revolutions, and the nature of government finance. *American Journal of Political Science*, 54(4), 936–950.
- Bueno de Mesquita, B., Smith, A., Siverson, R. M., & Morrow, J. D. (2005). *The logic of political survival*. The MIT Press.
- Granovetter, M. (1978). Threshold models of collective behavior. *American journal of sociology*, 1420–1443.
- Grossman, H. I. (1991). A general equilibrium model of insurrections. *American Economic Review*, 81(4), 912–921.
- Grossman, H. I. (1999). Kleptocracy and revolutions. *Oxford Economic Papers*, 51(2), 267–283.
- Gurr, T. R. (1970). *Why men rebel*. Princeton University Press.

- Havel, V. (1985). The power of the powerless. *International Journal of Politics*, 15(3/4), 23–96.
- Kuran, T. (1989). Sparks and prairie fires: a theory of unanticipated political revolution. *Public Choice*, 61(1), 41–74.
- Kuran, T. (1991). Now out of never: the element of surprise in the east european revolution of 1989. *World politics*, 44(01), 7–48.
- Kuran, T. (1995). The inevitability of future revolutionary surprises. *American Journal of Sociology*, 1528–1551.
- Kurrild-Klitgaard, P. (2004). The paradox of rebellion. In *The encyclopedia of public choice* (pp. 728–731). Springer.
- Li, Y. & Gilli, M. (2014). *Accountability in autocracies: the role of revolution threat* (Working Paper Series No. 2014-30). Stockholm China Economic Research Institute, Stockholm School of Economics.
- Lichbach, M. I. (1998). *The rebel's dilemma*. University of Michigan Press.
- McCormick, G. H. & Owen, G. (1996). Revolutionary origins and conditional mobilization. *European Journal of Political Economy*, 12(3), 377–402.
- McGuire, M. C. & Olson, M. (1996). The economics of autocracy and majority rule: the invisible hand and the use of force. *Journal of economic literature*, 72–96.
- Oliver, P. E. & Marwell, G. (2001). Whatever happened to critical mass theory? a retrospective and assessment. *Sociological Theory*, 19(3), 292–311.
- Olson, M. (1965). *The logic of collective action*. Harvard University Press.
- Olson, M. (1993). Dictatorship, democracy, and development. *American Political Science Review*, 87(03), 567–576.
- Schelling, T. C. (1978). Micromotives and macrobehavior. *New York: Norton* Schelling *Micromotives and Macrobehavior* 1978.
- Tullock, G. (1971). The paradox of revolution. *Public Choice*, 11(1), 89–99.
- Yin, C.-C. (1998). Equilibria of collective action in different distributions of protest thresholds. *Public Choice*, 97(4), 535–567.

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März 2014

The page features several teal-colored decorative elements: a small square in the top right corner, a horizontal bar on the right side, a long horizontal bar across the middle, a thin horizontal bar at the bottom, and a wide horizontal bar at the very bottom. The contact information is centered in the white space between the middle and bottom bars.

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