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A Cultural Theory of Limited Uprising

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Abstract: Commitment failures and asymmetric information have long been recognized as major causes of violent conflict in rationalist models of war. More traditional political scientists have rather emphasized cultural characteristics as a key factor. The present model offers a partial reconciliation of these two viewpoints by showing how some culturally-determined parameters might give rise to equilibrium uprising in a game-theoretic approach.

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1. Introduction

Popular uprisings usually involve only a fraction of the disgruntled population, and this fact is sometimes described by reference to some “vanguard”. The rebels or the rioters would thus stand out as a group of different people, may be “superior” in some sense to those that they are supposed to fight for. In Belgrade in October 2000, the crowd that took Milosevic out of office was largely comprised of urban middle class people. In Abidjan, about one month later, the rioters who confronted the police and pushed General Gueï to flee were also urbanites, involving a lot of students and educated people. President Gbagbo benefited from that uprising and took over, but he was in turn confronted to a large rebellion nearly two years later, in September 2002. The “New Forces”, as they came to be known, were a mixed group of military personnel and civilians of different social background (Soro, 2005). The common point was that they mostly belonged to the northern ethnic groups, mainly Mandé and Senufo. However, in these three cases, many people with the same characteristics stayed at home, so that some other factor is probably at work in determining who goes out for fighting the government and who does not. Ethnic background or educational status do not seem to be sufficient for addressing this issue. Similarly, the Iraqi people who are attacking the government and their foreign allies since the fall of Saddam Hussein’s regime are predominantly coming from the Sunni community. The members of the Shi’a and the Kurd communities are rather supportive of the efforts made for establishing a democratic government. However, many more Sunni people are staying out of the fighting than those actively involved. These examples raise two questions: (i) who decides to stand up and confront the ruler’s army (or police) in these circumstances, and (ii) if any rule governs this decision, why does the ruler not use it to prevent the uprising that might destabilize him or even throw him out eventually?

Various theories explain why some people rebel while others don’t by different factors, involving usually some assumed heterogeneity among the potential rebels. A fairly common assumption is that people are different in some simple characteristic, so that some clear cut-off line can be drawn between those who would confront the government and those

who would not. For example, Azam and Mesnard (2003) assume that people are allocated exogenously into two groups, defined by ethnicity or religion, while these groups have some internal organizing principle, so that they behave like unitary agents. This refers for example to the traditional political organization of the ethnic groups, with a well defined aristocracy, in some cases, or a paramount chief, in other cases. Then some equilibrium might exist where one group actually rebels, with a view to topple the government, if they are not offered a good enough deal in case of restraint. However, this does not accommodate explicitly the observed fact that not all people from the groups concerned are actually enrolled in the fighting. Azam (2002) and Azam and Hoeffler (2002) endogenize the allocation of the group members between fighting, raiding civilians, and producing output by assuming that a centralized leadership is controlling each ethnic group. This assumption clearly exaggerates the power of traditional authorities to control their ethnic group members or of religious authorities to control the believers.

A different line is followed by Acemoglu and Robinson (2006), who underplay the importance of ethnicity and internal organization of the groups. They rank the potential rebels by income, and then explain why either the rich, or the poor, or some other coalition, would rebel against the government if some conditions were not met. They do not assume that any institution exists for organizing the uprising, and focus on why some agents would have any incentive to rebel. They only pay lip service to the collective action problems that might be involved in organizing an insurrection, while we know since Olson (1965) that free-riding problems might prevent some groups from taking any action that might be in their interest to perform. However, in most of their models, the government is able to avoid the uprising, by using either repression or democratization, so that political violence remains an off-equilibrium outcome that only helps sustaining the peaceful equilibrium. Similarly, Esteban and Ray (1999) present a model where the polarized income distribution provides the key to explaining how groups would form in case of conflict, without explaining what would trigger the violence. However, political violence and popular uprisings are actually observed quite frequently in the real world. Then, any theory of conflict where violence remains in all cases on the “off-equilibrium” path is bound to be deficient in some key respect.

Azam (2005) analyses also a model where the fighters are not organized by any central authority, in his analysis of terrorism, but violence may erupt in that model's equilibrium. In that setting, each potential terrorist has to decide on her own whether to engage in the fight or not, while being faced with a common enemy. In some cases, a number of players choose to perform some attacks against that enemy, with a hope of producing some public good for the next generation (national independence, control over some resources, etc.). In that model, the equilibrium selection among potential terrorists of those who become active and those who don't is based on a personal characteristic, namely the degree of altruism towards the next generation. That paper suggests that the latter is influenced by education, and thus by some inherently cultural characteristic. In the real world, the distinction between terrorism, guerrilla warfare, and regular warfare is getting blurred, mainly since the Nazi air force bombed the republican Spanish city of Guernica. Thanks to Picasso's masterpiece, that city epitomizes the central role played nowadays by violence against civilians in armed conflict. Consequently, the decentralized decision model can also be applied to other types of open conflict, not necessarily conforming to the usual view of terrorism. During World War 2, many individuals decided independently to join the Resistance in several European countries, while many others remained quiet. The model presented below shows that the mechanism determining that equilibrium selection among potential terrorists is liable to play a part in whether war or peace prevails in equilibrium.

In the recent developments of the rationalist theory of conflicts, two main factors have been invoked for explaining why wasteful violence may arise under some conditions. Azam and Mesnard (2003) show how conflict may become violent as a response to either commitment failure, on the part of the government, or to asymmetric information. The role of commitment problems in triggering violence had been pointed out before in the conflict literature by Azam (1995), about civil wars, and by Fearon (1995), regarding international conflicts. Asymmetric information was analyzed also by Fearon (1995), in the case of international conflict. The classic reference on the role of commitment in conflict is Schelling (1960). Powell (2006) has recently shown that what is sometimes regarded as a third possible cause of open conflict, namely bargaining indivisibilities really boils down to a commitment

problem. For example, assume that there are two pretenders to become king. They could agree to toss a coin every year to determine who would reign for the next 12 months. However, the chances are that the first one to win the toss will have the other one killed pretty soon.

However, these two assumptions do not exhaust the possible causes of equilibrium violence in game-theoretic conflict models. Fearon (1995) is careful to note that his restrictive list of two causes of war is only valid for “rational unitary actor explanations” (p.379). Other rationalist explanations are possible by extending the analysis to other settings. Ballo and Rocco (2006) present a model of popular uprising with a continuum of agents where each individual decides on her own whether to join the rebellion or not, in a decentralized way. Then, they work out an equilibrium outcome where the government chooses to trigger a popular uprising rather than to remain in a peaceful equilibrium, because the latter is offering an inferior payoff. They then develop a theory of provocation, in order to explain how the ruler will proceed for triggering such a desired uprising. Like in Azam and Mesnard (2003), it is the government that decides ultimately whether war or peace will prevail in equilibrium in that model. Then, Ballo and Rocco (2006) emphasize repression and provocation as the trigger, while Azam and Mesnard (2003) emphasize the failure to offer an acceptable social contract, promising credibly to deliver some welfare improvement to the non-ruling group. However, the key contribution in Ballo and Rocco (2006) is to bring out a cause of open conflict that involves neither commitment failure, nor asymmetric information.

The present paper is very much walking in their footsteps, for explaining why a fraction of some oppressed group would spontaneously go for a violent confrontation with the government, but in a much simpler setting. The model developed below brings out the key role played by a parameter capturing some cultural characteristics of the group of potential rebels. It shows how this cultural parameter interacts with some economic and institutional factors, like the political risk perceived by the ruler and the stakes involved in the control of power, for determining the government’s decision to trigger violence. Hence, the main contribution of the theoretical analysis presented below is to build a game-theoretic model where equilibrium violence may exist without any commitment failure or asymmetric information, while involving only a fraction of a group of otherwise identical people.

Although the proposed explanation for violence involves a culturally-determined parameter, the approach remains rationalistic. It thus offers only a partial reconciliation with some of the critics of the rationalistic approach to violence, like the social constructivists, for example. In particular, it takes the assumed cultural parameter as an exogenous characteristic of the potential rebels' group, and does not attempt to explain its formation endogenously.

Compared to the rationalist explanations based on commitment failure or asymmetric information, the cultural theory presented below offers some additional insights for understanding the real world. In particular, it offers a natural explanation for why actual conflicts often oppose well-defined ethnic groups, or ethno-religious groups, while opening the black box of how "ethnicity", or more generally cultural identity, is affecting its members' propensity to rebel. In contrast to an impression coming out from Azam (2002) and Azam and Mesnard (2003), the model presented below suggests that it is not necessarily because ethnic groups have some traditional political structure of power that participants in many insurgencies organize along ethnic lines. In order to make that point clear, the model presented below involves no central authority controlling the potential rebels, as in Acemoglu and Robinson (2006), Azam (2005) and Ballo and Rocco (2006) mentioned above. Here, each individual is assumed to decide independently whether to join the rebellion or not. Then, it is the cultural parameter brought out by the model that must be determinant. Of course, this assumption of fully decentralized decisions to enroll exaggerates the level of autonomy left to individuals by ethnicity or religious affiliation in many real world cases. In the real world, examples of forced recruitment abound. This affects in particular children, who are sometimes abducted and forced to join the rebellion. Herbst (2000), Richards (2005) and Singer (2006) have described the coercive methods used by some guerrilla groups in Africa for getting forced recruits. We show below what changes this entails for the main proposition of the paper. Nevertheless, the extreme assumption of autonomous decision helps making the point about the role of ethnic, religious, or other cultural identity.

The model presented below is thus shedding some light on the debate about ethnic or religious identity and political violence, which has recently attracted a lot of attention. Sen (2006) offers a thoughtful discussion of this issue, and rejects the view that human beings

could be led inexorably to political violence by the sheer force of their ethnic or religious identity. He forcefully argues that there are political institutions that can prevent this outcome, and help people live in peace despite their cultural or ethnic differences. Similarly, the model presented below does not predict that any given cultural characteristic would condemn some people to choose either political violence or social peace under any circumstances. Instead, it brings out how the government is making the final decision and can trigger political violence for furthering its own objectives. However, the culturally-determined parameter brought out below does affect the government's choice in a crucial way. Like in Bates (2001), this ethnic or religious characteristic will not necessarily result in conflict, but it can be used by the state in determining the eruption of violence.

The paper describes the simple model used for structuring the discussion under two different specifications. In the first case, presented in the next two sections, the fighters aim at taking over some private goods, while in the second one they want to get access to a public good. Then, section 3 analyzes why the government will choose to trigger an uprising or not, as a function of some political and economic parameters, in the case where the stake of the fighting is the sharing of a private good. The next three sections are devoted to various extensions, which bring out that the core model's main predictions are qualitatively robust. Section 4 extends the model by looking at the issue of collateral damage, which may affect those who do not join the rebellion. Another form of curse that is often inflicted on civilians during civil wars is forced recruitment, especially of teenagers. This is also analyzed in section 4. Section 5 makes these predictions more precise by introducing some heterogeneity among the potential rebels, showing that it is the expected value of the culturally-determined parameter that really matters for triggering limited uprisings. Then, section 6 analyzes the same problem as in section 2 and 3, in the case where the rebels are fighting for a public good. More precisely this section assumes that the rebels are fighting for getting access to a club good, which is otherwise denied to them by the ruler. Section 7 provides some concluding comments and discusses some examples.

2. The Model

There is a continuum of individuals $i \in [0,1]$, who have to decide whether they join a rebellion or not. They are thus referred to below as “potential rebels”. If none of them joins the rebellion, then peace obviously prevails, while insurgency occurs as soon as a non empty subset of potential rebels joins the rebellion. An individual that does not join the rebellion gets a utility level:

$$U^N = y - \theta, \tag{1}$$

where y is an exogenous endowment of income and θ is a tax levied by the government. Both variables are assumed identical for all the potential rebel group members. This simplifying assumption is relaxed in section 4 below. Ballo and Rocco (2006) have a more general setting, where the government may reduce the individual’s welfare by other means, like repression or some forms of exclusion. It would be straightforward to extend the present model in that direction, but the tax interpretation is kept all along, for the sake of simplicity. Hence, the present model belongs to the line of conflict models initiated by Grossman (1991), where the cause of the conflict is an excessive level of taxation levied on producers by the government. The latter is facing a large number of producers, in an asymmetric game setting. This line of models differs from the more traditional approach that models conflict as an extension of bargaining models involving two opponents treated symmetrically, as in Schelling (1960) and Hirschleifer (1991). Here, the government is playing first, fixing the tax level θ irrevocably. Hence, this model excludes at the outset any kind of commitment failure, as discussed in the introduction.

Now, the individual might also choose to join the rebellion, if this decision yields a higher payoff. The latter depends on the probability of gaining something in case of victory. The technology of fighting is described by a probability function that maps the relative forces of the government and the rebellion into a probability of victory for the insurgents. For the sake of simplicity, the government’s forces are not modeled explicitly here, and are treated

parametrically. Then, the probability of the rebels toppling the ruler if they engage a level R of forces in the insurgency is denoted $p(R)$, $p'(R) > 0$.

Individuals choose in the present model to join or not the rebellion in a decentralized way, without any operational leadership¹. It is thus important to model also the sharing rule which they apply in case of victory for allocating their gains among themselves, which determines their personal payoff in case of victory. In the real world, the rewards going to the fighters may be of two kinds. There are first some private benefits accruing to the former rebels in case of victory, like prominent positions in government or parastatals, and various other personal rewards often linked to clientelism, or even simply to looting (diamonds, etc.). However, there are also some public goods like national independence, freedom, etc. that often play a more important role in determining the choice of potential rebels to become active. This type of public goods is characterized by the possibility of exclusion of some individuals or groups from its benefit, and is thus more precisely called club goods in the literature. Sandler and Tschirhart (1997) have recently produced a very comprehensive survey of this literature. A frequent cause of conflict in the real world is the exclusion of some specific groups from the benefit of this type of club goods. Overthrowing a dictator is for example a way of opening access to democratic freedom, and thus of opening access to a public good for nearly all the citizens; however, the deposed dictator is often excluded *ex post*, finishing his life in jail or worse. The public good assumed below is of that kind, with access denied either to the members of the group of potential rebels, or to the ruler if the latter loses out on the uprising. For the sake of clarity, the analysis below deals separately with the two extreme cases of pure private rewards and public good. The latter case is analyzed in section 6 and the former case is analyzed first in the present section and the next two ones.

Assume first that the (private) gains are shared only among the active rebels, the non-participants being excluded from the benefits. Noh (1999) discusses the role of such a sharing rule in a conflict model and its impact on the equilibrium level of forces engaged by the rebellion, and analyzes its welfare properties. The simplest assumption to make in this respect

¹ This assumption is made in this extreme form for the sake of clarity. In the real world, rebel organizations are often using coercion for recruiting fighters, as illustrated in particular by Herbst (2000) and Richards (2005). This point is taken into account in an extension presented below.

is to posit an egalitarian allocation rule. If b denotes the aggregate gain for the rebels in case of victory, and R the number of rebels, then each one of them gains b/R in case of victory. Assume also that engaging in the rebellion has a cost, denoted $\omega > 0$.

Therefore, the expected utility of the individual engaged in the rebellion is:

$$U^R = p(R)b/R + y - \omega. \quad (2)$$

This expression (2) assumes, quite naturally, that rebels do not pay taxes. Notice that (2) entails that the game modeled here has the structure of a participation game, as the payoff of each potential rebel depends on the total number of individuals joining in the rebellion R . Kuran (1989) has presented the classic analysis of popular uprising as a participation game. In his model, players decide sequentially whether to join or not. A bandwagon effect results, as more players join in the insurgency as they discover that a large enough number of other players have joined in for yielding a large enough chance of succeeding. In the present model, the individuals decide simultaneously in full information, and the total number of rebels is determined in the Nash equilibrium of the game. However, in Kuran (1989) the government has a fairly passive role, while it is playing the part of a Stackelberg leader in the present model, by setting irrevocably the tax level upfront, at a level that may or may not trigger a popular uprising. Then, all the potential rebels make their decision to join or not in the second stage of the game, whose Nash equilibrium determines how many potential rebels actually join the rebel movement, given the tax level. The game is then solved by backward induction, as the government will in fact determine the tax level while taking into account the equilibrium response of the rebels' forces.

For the sake of simplicity, assume now that $p(R) = \pi R$, $0 < \pi < 1$. As $R \in [0, 1]$, this assumption does not entail much loss of generality. Then²:

$$p(R)b/R = \pi b. \quad (3)$$

² This assumption simplifies drastically the participation game, making it almost trivial. However, the qualitative results are quite robust and nothing much is lost with this simplifying assumption. For example, assuming that $p(R) = \pi R^2$ would make $p(R)b/R = \pi b R$, which is formally equivalent to the case of the club good analyzed in section 6. Only details would be changed in the calculations by using this specification here.

Now, given these assumptions about payoffs, there is one additional assumption to make regarding the individual's decision rule. Let us introduce a cultural factor into the analysis by making the following assumption.

Decision Rule: The potential rebel

- (i) stays out of the rebellion with probability 1 if $U^N > U^R$,
- (ii) joins in with probability 1 if $U^N < U^R$, and
- (iii) joins in with probability $0 < \lambda < 1$ (and stays out with the complementary probability) if $U^N = U^R$.

The probability λ may be interpreted as a culturally-determined propensity to join in a rebellion, which is identical for all the individuals belonging to the same group. Hence, a more “rebellious” group will be characterized by a larger λ . Notice that this parameter is just introduced here for breaking the tie when the individual is indifferent between staying out and joining in. Any such tie-breaking assumption contains some element of arbitrariness. Azam and Mesnard (2003) assume that the same tie is broken by a “peace bias”, i.e. that when the two outcomes are yielding the same payoff, then the potential rebel opts systematically for the peaceful behavior. This is equivalent in the present notation to $\lambda = 0$. However, in that case, the individual is never truly indifferent between the two options, and always chooses to abstain from participating in the rebellion unless the latter is strictly preferred to staying out. This is clearly an arbitrary assumption. The tie-breaking assumption made here is less arbitrary in that it is more flexible and less extreme than the one made by Azam and Mesnard (2003). Hence, it is more encompassing, and can accommodate different assumptions.

It seems natural to allow for the fact that some groups are more rebellious than others, and that culture matters in this respect. In her broad history of religion and philosophy in the “Axial Age”, Armstrong (2006) emphasizes how the issue of war and peace has always been looming large over the cultural and spiritual developments of a large fraction of human kind. *Indra* and *Varuna*, respectively the gods of war and peace in the ancient Aryan pantheon, were the center of the ultimate attention. Armstrong traces the development of religion and philosophy over more than a millennium before the Common Era through the attempts made

by various thinkers or spiritual leaders to make human society more peaceful. Her historical analysis includes ancient China, Greece, India and Israel. Hence, the foundations of most of the different “civilizations” of the contemporary world would be rooted in the different approaches to inculcating a peaceful attitude among the people involved. The same can probably be said at a more disaggregated level (e.g. Sunni *v.* Shi’a, Protestant *v.* Catholic, Kru *v.* Akan, etc.) The assumed unique value of this parameter λ for all the members of the group of potential rebels squares well with its interpretation as a culturally-determined parameter. It may differ across groups, but is common to all the members of the same group. If we rule out a racist assumption that would view such a common degree of rebelliousness as some innate characteristics of the group members, then it is natural to interpret it as a culturally-determined phenomenon. This probability λ could be used as a means for introducing some heterogeneity among individuals in the model, by assuming that each of them has a different value of λ . Such an analysis is sketched below as an extension of the base model.

Given the assumptions spelt out above, the three cases described in (i) through (iii) in the decision rule presented above can be expressed more operationally as follows.

Proposition 1: The potential rebel

- (i) stays out of the rebellion with probability 1 if $\theta < \omega - \pi b$,
- (ii) joins in with probability 1 if $\theta > \omega - \pi b$, and
- (iii) joins in with probability $0 < \lambda < 1$ (and stays out with the complementary probability) if $\theta = \omega - \pi b$.

Proof: The expressions used in proposition 1 are derived from the decision rule described above by substituting for U^N and U^R , using (1) through (3).

In order to maintain the interpretation of θ as a tax, we assume $\omega > \pi b$. Proposition 1 brings out clearly that the government facing the assumed group of potential rebels chooses between peace and rebellion by choosing the tax rate θ , given its level of defense treated parametrically. Notice that the cut-off line depends on two characteristics of the fighting technology, namely the cost of participating in the war ω and the probability of victory π . It

also depends on the stakes of the fighting, namely the gain for the victorious rebels b . Quite naturally, proposition 1 shows that the maximum level of the tax that the ruler can levy without triggering an uprising is increasing with the cost of war, as the latter determines in fact the cost of not paying the tax. It is also naturally decreasing with the expected gain from the uprising πb , which determines the benefit that can be obtained by not paying the tax and going along with the rebellion.

The next step is to show that the culturally-determined probability λ plays a crucial role in determining the equilibrium outcome of this game.

3. The Government's Choice of Triggering the Rebellion

In order to make the model applicable to a wide variety of political settings, let us assume that the government is not necessarily certain to remain in power even in case of peace. There might be a successful coup d'état, from within the ruling group, or the government might get beaten at some regular elections, run either within the ruling group or otherwise. A simple way to capture this possibility of being ousted even if there is no rebellion is to assume that the government is discounting its gains by a factor $0 \leq \delta \leq 1$. This may be interpreted as the probability of staying in power, and thus $1 - \delta$ may be interpreted as an index of political risk. Thus, if the government decides in favor of maintaining peace, with $R = 0$, its payoff is then:

$$V^P = \max_{\theta} \delta(b + \theta) \text{ s.t. } \theta < \omega - \pi b, \quad (4)$$

It is natural to assume that those who choose to join the rebellion are not paying the tax, as rebelling is precisely aimed at evading it in the current setting. Then, if the government chooses to trigger a full rebellion with $R = 1$, its payoff is:

$$V^R = (1 - \pi)b. \quad (5)$$

This expression assumes that the government gets nothing if the rebels win the fight, while it keeps the benefit of the endowment b if the rebellion is successfully repressed. Then,

the fighting technology determines the probability of the government staying in power in case of full rebellion $1 - \pi$, so that (5) describes the expected gain by the government.

In the case of limited rebellion, where the individuals are indifferent between joining the rebellion or staying out, assume that those who join are not paying the tax, while those who stay out are indeed paying θ . Assume also that the Law of Large Numbers can be applied, because we have a continuum of individuals, so that $R = \lambda$ in the case of an equilibrium outcome with limited rebellion. Then, the government's payoff is:

$$V^L = (1 - \pi \lambda)b + (1 - \lambda)\theta. \quad (6)$$

This expression assumes that the ruler is better protected, in particular against losing elections, in case of even a limited rebellion than in times of peace, so that no discount factor is used. In many cases, the presence of a rebellion is used as an excuse for not organizing elections at the normal date. This is in particular the case in Ivory Coast, where President Gbagbo is making disarmament a condition for organizing the elections, while the rebels obviously do not trust him enough for disarming while he is still in power. Then, the stalemate is in fact protecting his hold on power while disarmament would allow for elections that would throw him out with a high probability. Similar comments could be made about Yoweri Museveni's hold on power in Uganda. The rebellion in the north gives him a good cover for running a non democratic government³. In these examples, the outbreak of a limited uprising is a blessing for the ruler, as it reduces his chances of being defeated⁴. Moreover, even if elections are actually organized while the civil war is on, it is highly likely that the voters will be less inclined to change the ruler than in peace time. This kind of calculation explains for example why no US presidents have ever been beaten when seeking a second

³ The multi-party elections run in February 2006 for the first time in 25 years arouse some reservations by the EU. The opposition leader had been freed on bail from jail one month before the vote and many cases of fraud and intimidation have been reported.

⁴ Although this assumption of no discounting of tax revenues in case of limited rebellion, or more generally of a lower discount rate in this case, is quite natural, it does not play a crucial role in determining qualitatively the results. The key assumption is that the expected gains from fighting are not discounted. Ultimately, this means that the probabilities of losing power through the fight or by other means are different. This is natural, as the former is endogenous and the latter exogenous, in this model.

mandate while the country was at war (foreign war in this case). As a stepping stone to the main proposition let us establish the following lemma.

Lemma 1: Limited rebellion is always preferred to full rebellion by the government.

Proof: $V^L > V^R$ because:

$$(1 - \pi \lambda)b + (1 - \lambda)\theta > (1 - \pi R)b, \forall R \geq \lambda.$$

This proposition is pretty obvious, as a limited rebellion is less threatening than a full-blown one, while it allows in addition some fiscal revenues to be collected. Notice that this result holds even if we assume that the people who do not join in the rebellion do not pay any tax, as soon as $R > \lambda$. The government's preference for limited rebellion is thus predicated on the lower probability of losing power in that case, and not on the better rate of tax collection. Given Lemma 1, we only need now to compare the government's payoffs under peace and under limited rebellion, respectively, to determine which outcome the government will choose. The crucial role of the cultural factor is brought out in the following proposition.

Proposition 2: The government chooses limited rebellion rather than peace if:

$$\lambda \leq (1 - \delta) \frac{(1 - \pi)b + \omega}{\omega}. \quad (7)$$

Proof: If (7) holds, then we can prove that the following chain of inequalities holds:

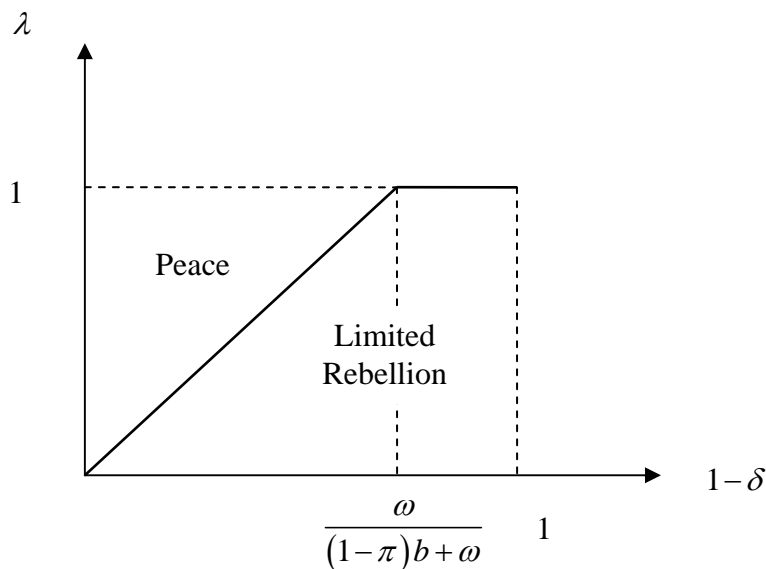
$$V^L = (1 - \pi \lambda)b + (1 - \lambda)(\omega - \pi b) \geq \delta((1 - \pi)b + \omega) > V^P. \quad (8)$$

The latter implies (7) by re-arranging the terms.

Condition (7) in proposition (2) shows that the ruler will choose to trigger a limited uprising first if the potential rebels are not "too" rebellious. The intuition for this result is that when the potential rebels are too rebellious, in the sense implied by (7), a large fraction of them will join the rebellion, making the probability of overthrowing the government too high for the latter to take a chance. In that case, the government will choose the highest tax level

consistent with peace (see (1)), and will thus avoid the rebellion. Correlatively, this result entails that one should only observe in the real world actual rebellions run by the cultural groups with a low degree of rebelliousness, *ceteris paribus*. The latter result might seem counter-intuitive at first sight. It implies that we should observe limited rebellion in the real world coming from groups having a low level of rebelliousness, while more rebellious groups would not be challenged by the government, given the level of political risk. They would thus never be observed rebelling. However, this “paradox of rebellion” makes in fact perfectly good sense. If the potential rebels’ group is characterized by a low level of rebelliousness, then only a small fraction of its membership will join the rebellion in case of challenge. Then it might be worth the government’s while to put out such a challenge, by fixing the tax level high enough for triggering the limited uprising. By contrast, if the potential rebels are characterized by a high level of rebelliousness, then it is more dangerous to challenge them, as the rebels’ forces would become quite large as a response. Then, the risk involved in triggering the rebellion might become too high for the government to take such a chance. In that case, the latter will choose a low enough tax level for maintaining peace.

Figure 1: The Government’s Choice in the $\{\lambda, 1-\delta\}$ Space



The right-hand side of (7) shows the various parameters that determine when the degree of “rebelliousness” is too high for the government to take a chance by triggering an

uprising. The relationship between λ and $1-\delta$ is particularly interesting, as it relates two genuinely political and cultural parameters. The latter may be interpreted as a measure of the political risk faced by the ruler. If the probability of getting ousted by a coup or an electoral defeat is rather high, then δ will be small and political risk correspondingly high. This might induce the ruler to adopt a fairly aggressive tax policy, as the returns to peace are pretty low in that case. Figure 1 helps for understanding this relationship. It shows that the ruler will choose peace if rebelliousness is high and political risk low, and vice versa; it will choose to trigger a limited uprising when political risk is high, and rebelliousness low. Hence, triggering a rebellion may be interpreted in this model as a way for the government to protect itself from the political risk involved in case of peace, if the latter is too large.

Another interesting prediction brought out by (7) is that the government will choose to trigger a limited uprising, rather than maintaining peace, if the stakes are high (as measured by b) and rebelliousness low. The intuition for this result is that when the stakes are high, political risk makes peace unattractive relative to the eruption of a limited rebellion, because the safe level of the tax is low. It might then be safer and more profitable to go for a fight, provided rebelliousness is low enough. Furthermore, the level of rebelliousness required for making open conflict preferable to peace in front of a higher cost of war ω is lower: a high cost of conflict allows the government to raise a higher tax without triggering a violent response. This makes peace more attractive, for any given λ . A lower value of the latter is then required to make limited rebellion more attractive. This is a corollary of the “paradox of rebellion” brought out above.

Lastly, the rebels’ efficiency for ousting the ruler, measured by π , also affects the cut-off value of λ . When rebels are “too” efficient at fighting, then peace becomes more attractive, unless the share of the potential rebels that actually joins in the rebellion is small enough. This entails that in the real world, we should rather observe lousy guerrilla fighters than top shots going to war, as rulers would be wary to challenge the latter. Anecdotal evidence reported for example by ‘Che’ Guevara (2000), about the guerrilla fighters in eastern Congo in the 1960s, is very much supporting this prediction. In other words, the ruler can be deterred from imposing a too high level of taxation and thus triggering a rebellion by either a

highly rebellious group, or one that is highly efficient at fighting, or some combinations of the two. Hence, rebellion and oppressive fiscal policies should be observed when the potential rebels are neither prone to rebel nor efficient at fighting. This concludes the comparative statics of the simplest version of the model.

As pointed out by Azam (2006) and Ballo and Rocco (2006), this type of comparative statics predictions can be used for discussing some commonly observed foreign interventions in conflict-prone countries. For example, foreign aid is enhancing the stakes of conflict b , by increasing the amount of resources available to whoever controls the state. Moreover, the foreign power would find it difficult to make a credible commitment to curtail aid in case of uprising. In the real world, one observes rather the opposite: aid is often increased for supporting a government facing an armed rebellion, as shown for example by the foreign intervention for restoring the Kabbah government during the war in Sierra Leone (Adebajo, 2002). Similarly, post-conflict reconstruction usually attracts a tidal wave of aid when peace is made, and this increases the expected gains from staying in power or taking over the government. Then, foreign interventions are also targeted at reducing the social cost of war as well as reducing the probability of toppling the government in many cases. For example, in the case of Ivory Coast in September 2002, the French peace-making intervention was pretty predictable, and was bound to come quite quickly, because a lot of French troops are permanently positioned in various parts of West-Africa⁵. Then, the prospect of such a foreign intervention is reducing both the rebels' cost of fighting and the probability of toppling the government, by preventing the escalation of the conflict into an all out war. Ballo and Rocco (2006) use a similar argument for concluding that in fact the prospect of French intervention thus created an incentive for the government to perpetrate a high enough level of provocation against the northern groups in Ivory Coast to trigger the civil war.

The present model generates a similar prediction insofar as an fall in ω and/or in π , which could be the result of a foreign intervention as discussed above, would make limited

⁵ France and Ivory Coast have had a defence agreement ever since 1961. Since 1990 this agreement only triggers automatically a French intervention in case of external threat, while it commits France to provide only a logistical support to the Ivorian army in case of domestic threat. France did not intervene when president Konan-Bédié was ousted by a small-scale mutiny in 1999. Nevertheless, the French intervention was predictable in 2002 because a full-blown civil war would have been threatening the large French resident population.

rebellion more attractive to the government. This provides an incentive for the government to increase taxation of the potential rebel group. Hence, these foreign interventions are predicted to be enhancing the risk of rebellion in the recipient countries. Correlatively, these predictions bring out the trade off faced by peace-loving foreign powers. Assume that the international community is unable to commit credibly to refrain from flooding a post-conflict country with foreign aid, thus enhancing the stakes of the war for all the parties involved (including foreign contractors). Then a peace-seeking policy should aim at increasing π , i.e. enhance the effectiveness at fighting of the potential rebels. One may wonder whether a calculation of this kind was not present in the mind of various French presidents when the mercenary Bob Denard was discretely present on the payroll of the French government... More transparently, an intervention aimed at maintaining peace would seek to avoid the government's army from being only staffed with members of the ruling group. Making sure that some military units are comprised of members of the potential rebels' group, and could thus be mobilized against the government in case of rebellion, would meet that objective. The Chadian president Idriss Déby did just that when he took over in 1990, and promoted the rebellion's leader General Kamougué as the president of the National Assembly (see Azam and Djimtoingar, forthcoming). Peace with the Southerners has prevailed ever since.

4. Collateral Damage and Forced Recruitment

In the core model presented above, the civilians are getting a good deal when a limited uprising breaks out. They still pay their tax, as if no rebellion was going on, but are not affected otherwise. However, in the real world, civilians are paying a heavy tribute to political violence. This point was forcefully brought out by Cairns (1997), on behalf of the Oxfam NGO. Azam (2002) and Azam and Hoeffler (2002) have pushed the analysis of this issue further in the academic literature, as did Eck and Hultman (2007) with a newly produced data set. Kalyvas (2006) has recently produced an impressive analysis of this whole issue. It is straightforward to extend the core model of the previous two sections in order to introduce such a burden of war on civilians in a simplified way. Here, this cost of war inflicted on the

civilians is assumed exogenously given, for the sake of simplicity, while a more strategic analysis could be performed, as in Azam (2002) and Azam and Hoeffler (2002). The simpler assumption analyzed here is sufficient for getting a feel for its interaction with culturally-determined rebelliousness in determining the occurrence of limited uprising. Another curse affecting civilians in war-torn countries is forced recruitment. As described by Herbst (2000) and Richards (2004), many young soldiers did not join the rebellion voluntarily, and are in fact coerced into that position. Singer (2006) devotes a book-length study to this topic, which reads like a horror story. Richards emphasizes that abducted young soldiers often become as fierce combatants as the voluntary ones, either because of indoctrination or other forms of social pressure from the group. Hence, they raise a different issue from that of the burden of war borne passively by civilians.

We now analyze these two issues separately, under the headings of collateral damage and forced recruitment, respectively.

Collateral Damage

A simple way to capture the effect of the burden of war on civilians is to replace (1) by:

$$U^N = y - \theta - D\gamma, \quad (9)$$

where $\gamma > 0$ is the burden of war on civilians, while $D = 1$ if there is a rebellion going on, and $D = 0$ otherwise.

This change in assumption only affects the analysis of the case where a limited rebellion occurs. Then, if $U^N = U^R$, so that $R = \lambda$, the potential rebel's decision is made by comparing $y - \theta - \gamma$ to $\pi b + y - \omega$. Then, the cut-off line that ensures $U^N = U^R$ becomes:

$$\theta = \omega - \pi b - \gamma. \quad (10)$$

Assume that $\omega > \pi b + \gamma$, so that θ remains a tax. Comparing this expression (10) to the cut-off line used in proposition 1 above shows that the burden of war on civilians is reducing the maximum tax level that the government can levy on those who do not join the

rebellion. This reflects the reduced cost difference between joining the rebellion and staying out implied by the additional cost inflicted on civilians.

This result sheds some unexpected light on the attitude of the international community towards violence against civilians and other forms of damage inflicted upon them in war time. For example, the Geneva Conventions have been solemnly adopted by the representatives of most governments of the world within the United Nations. These Conventions are banning violence against civilians and contain also some provisions for protecting civilians against some other negative fallout of war. Beside the obvious humanitarian concerns that the Geneva Conventions are addressing, one may wonder in view of the result presented above whether some fiscal concerns are not influencing the support that they get from most governments. Moreover, this result is also contributing some elements to the much debated issue among humanitarian NGOs of their role in war-torn countries. In the present model, (10) shows that by reducing the cost of war to civilians, NGOs are helping governments to collect more tax revenues on non combatants. Hence, they inadvertently provide some implicit support to the government, and this may raise some moral concerns when the government is a dictator or a greedy kleptocrat. However, the analysis of the change brought into the model by this assumption shows that such moral concerns are short-sighted, as the predictions of the model's equilibrium provide a strong argument in favor of humanitarian intervention.

The introduction into the model of this burden of war on civilians is increasing the range of values of λ for which the government will choose limited rebellion rather than peace. Two steps are needed to see this point. First, Lemma 1 is still holding true, as:

$$V^L = (1 - \pi \lambda)b + (1 - \lambda)\theta > V^R = (1 - \pi)b, \quad (11)$$

so that limited uprising is still preferred to full-blown rebellion.

Second, the condition for proposition 2 to hold is changed to:

$$V^L = (1 - \pi \lambda)b + (1 - \lambda)(\omega - \pi b - \gamma) \geq \delta((1 - \pi)b + \omega - \gamma). \quad (12)$$

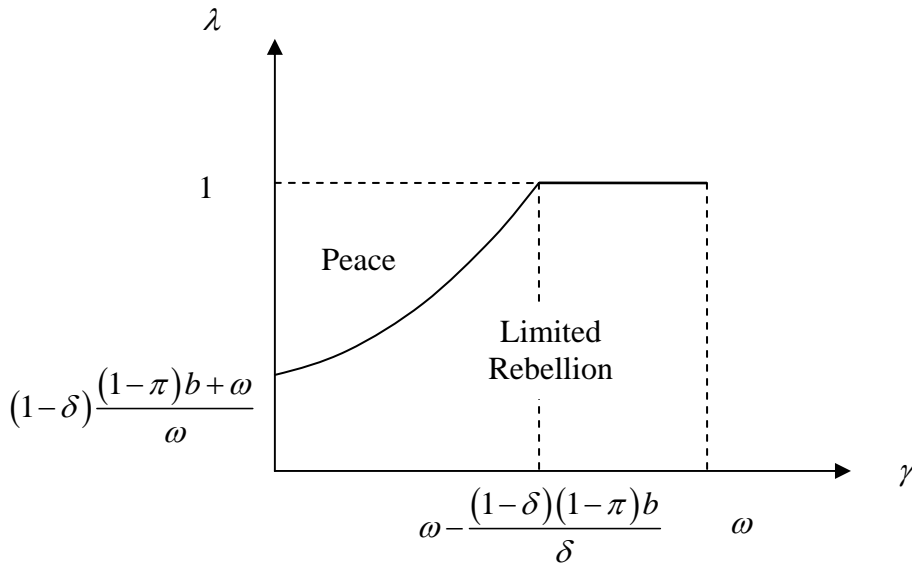
Hence, proposition 2 can be re-written by changing only the cut-off line for λ into the following:

Proposition 2': The government chooses limited rebellion rather than peace if:

$$\lambda \leq (1-\delta) \frac{(1-\pi)b + \omega - \gamma}{\omega - \gamma}. \quad (13)$$

Comparing this expression to (7) shows that the cut-off line is shifted upwards, so that the range of values of the degree or rebelliousness for which limited rebellion is preferred to peace is increased by introducing $\gamma > 0$. Figure 2 shows the change entailed by assuming a positive burden of war for civilians. The upward-sloping hyperbolic curve is depicting the cut-off line (13). Notice that its intercept is equal to the cut-off line in (7), so that one can conclude undoubtedly that the set of values of λ leading the government to choose to trigger a limited rebellion rather than maintaining peace is enlarged. The intuition for this result is that by allowing the ruler to extract less tax on the non combatants, the burden of war on civilians is making peace less attractive to the ruler.

Figure 2: The Impact of Collateral Damage



Correlatively, as announced above, one can predict that by reducing the burden of war on civilians, humanitarian NGOs are not only reducing human suffering for the victims of

violence, they are also reducing their expected number by making limited rebellion less attractive to rulers, for a high enough degree of rebelliousness. Figure 2 helps finding the conditions for a fall in γ to flip the equilibrium outcome from war to peace.

Forced Recruitment

Let us now introduce another form of violence against civilians, namely forced recruitment. As mentioned above, this phenomenon reaches phenomenal proportions in civil wars in poor countries. It concerns mainly teenagers but may involve more grown up people.

We now return to the core model, neglecting the burden of war on civilians, for extending it in another direction. Introducing forced recruitment into the model leaves unchanged the levels of utility described by (1) and (2), and we still assume that (3) holds. The ruler's choice and the cut-off value described by (7) are affected, assuming that these recruits become as efficient at fighting as the other ones.

Now, forced recruits have to be coerced, by definition, and this can only be done by existing members of the rebellion. Hence, the number of forced recruits is naturally assumed to be increasing with the size of the rebellion. Define R^V as the number of voluntary rebels and assume that they recruit μR^V additional rebels by coercion, if there are enough people in the potential rebels' group left for that. This process determines a multiplier effect such that the size of the rebellion becomes:

$$R = \min \left\{ (1+\mu)R^V, 1 \right\}. \quad (14)$$

This expression takes into account that $R \leq 1$ anyway. A limited-rebellion equilibrium prevails if $R^V = \lambda$ while $(1+\mu)\lambda < 1$, otherwise $R = 1$. We can check that this condition entails that Lemma 1 still holds, as:

$$V^L = (1-\pi(1+\mu)\lambda)b + (1-(1+\mu)\lambda)\theta > (1-\pi)b. \quad (15)$$

Because (1) through (3) are unaffected by the assumption of forced recruitment, so is the cut-off tax level $\theta = \omega - \pi b$, still assumed positive by definition of a tax. Then the condition required for making $V^L \geq \delta((1-\pi)b + \omega)$, as in proposition 2, becomes:

$$\lambda \leq (1-\delta) \frac{(1-\pi)b + \omega}{(1+\mu)\omega}. \quad (16)$$

Hence, forced recruitment is reducing the range of values of the degree of rebelliousness for which the ruler will choose limited rebellion rather than peace, compared to (7). The reason is that forced recruitment creates a multiplier for the size of the rebellion, as seen above, and thus makes it more threatening, by increasing the number of active rebels. Hence, peace becomes more attractive to the ruler under this assumption. We thus find here another kind of paradox, as the spreading of the horrible phenomenon of forced recruitment and child soldiering is predicted to reduce the incidence of limited rebellion. Hence, its effect on social welfare is ambiguous, as it deters some rulers from triggering a limited uprising, while they would do it otherwise.

5. Introducing Some Heterogeneity

Propositions 1 and 2 above have been established by assuming that the group of potential rebels was highly homogenous, with all its members having the same income y and the same level of rebelliousness λ . The aim of the present section is to show that these homogeneity assumptions can be relaxed significantly without changing the predictions of the model. This helps identifying the precise role of the assumed cultural factor in determining the occurrence of limited uprising.

It would be straightforward to show that income heterogeneity plays no part in this model, by assuming that each individual i has an income endowment $y(i)$ such that its derivative is not zero everywhere. This would capture some income inequality, without restricting much its pattern. Nothing would change in the model unless the tax levied by the government was a function of income instead of being lump-sum. However, the threat of rebellion and civil war mainly affects poor countries, and most developing countries have in reality a deficient fiscal administration. Thus, assuming that some kind of income tax could be levied in poor countries is just wishful thinking, as this is seldom observed in the real world. However, the widespread use of indirect taxation in poor countries, falling disproportionately

on tradable goods, entails that taxation can be tailored to some characteristics of the individuals. But these characteristics are very loosely correlated with income.

Nothing much is changed either when assuming some form of heterogeneity in the level of rebelliousness across the members of the potential rebels' group. However, a minute change results from this modification, which has a useful interpretation.

The simplest assumption that can be made for introducing heterogeneity in the level of rebelliousness across the members of the potential rebels' groups is to assume now that there are two types among them. A fraction q of these individuals has a degree of rebelliousness λ_L while the fraction $1-q$ of them has a higher degree or rebelliousness $\lambda_H > \lambda_L$.

Now, define the mean degree of rebelliousness in the group as:

$$\tilde{\lambda}(q) = q\lambda_L + (1-q)\lambda_H. \quad (17)$$

Using again the Law of Large Numbers, this mean value will be used by the government as the expected value of the size of the rebellion. Then, working through the equations of the model shows that proposition 2 remains valid provided one substitutes $\tilde{\lambda}(q)$ for λ in (7). Call this the revised proposition 2.

This result allows us to refine the analysis of the role of the cultural factor in determining the choice between peace and rebellion. What matters is not really that all the group members share a common value of the degree of rebelliousness, but a common expected value of this parameter within the group is sufficient⁶. Hence, different groups of potential rebels, distinguished by ethnic or religious affiliation, would thus have different expected degree of rebelliousness, and that would be enough for triggering in some cases a different attitude of the government towards them. Then, the revised proposition 2 suggests that the groups with a low mean degree of rebelliousness would be mostly engaged in limited uprising, as governments would target them with heavier taxation. The minute effect of the present change in assumption relative to the previous specification concerns the predicted composition of the rebel group. While in the previous section the rebels were drawn at

⁶ Notice that the results would change if the ruler was able to observe each individual's degree of rebelliousness, and was able to condition the individual level of taxation on this parameter. However, it is not realistic to assume such a level of observability. They would also be affected if the government was assumed to be risk averse.

random from the group with an equal probability, this is slightly changed by the present specification. Now, the individuals with a high degree of rebelliousness would be disproportionately represented among the rebels, compared to their share in the total population of the group. This prediction does not seem to hurt common sense. It means that active rebels, who would come from a relatively less rebellious group as explained above, in the collective sense, would be on average personally more rebellious than the mean in their group of origin. This would not make testing such a prediction easy. Moreover, such a selection effect would do a lot for vindicating superficially the “vanguard” theory, alluded to in the introduction. However, the very existence of the limited uprising is explained here by the low expected level of rebelliousness of the entire group, while the individual rebelliousness of the people involved makes no difference to the outcome.

6. Fighting for a Public Good

Now, let us return to the case of a homogenous group of identical potential rebels, in order to extend the analysis in another direction. As mentioned above, one may assume that the rebels are fighting for a public good (or a club good) rather than for the sake of private rewards. This is the assumption analyzed in Azam’s model of terrorism (Azam, 2005). This assumption creates in fact an additional externality between the utility levels of the potential rebels in the case where a limited rebellion breaks out.

Whenever a potential rebel joins a rebellion, her utility level is now:

$$U^R = \pi b R + y - \omega. \quad (18)$$

Because the prize in case of victory is a public good in this section’s model, b is not divided by R . In the case of a full rebellion ($R = 1$) we find the same payoff as in the previous section, which we can rename U^{R1} . However, if the rebellion is limited ($R < 1$) the rebel’s payoff becomes:

$$U^{RL} = \pi b R + y - \omega < U^{R1}. \quad (19)$$

The main change entailed by the public good assumption concerns the potential rebels who stay out and do not join the rebellion. In case of peace, with $R = 0$, their utility level remains as specified in (1). However, when a limited rebellion occurs, these inactive potential rebels do benefit from the expected gain of the public good, were their fellow rebels to win against the government. By definition of the public good, they can't be excluded from its benefit. Then, their utility level in case of limited rebellion becomes in equilibrium, with $R = \lambda$:

$$U^{NL} = \pi b \lambda + y - \theta. \quad (20)$$

Comparing (19) to (20) now shows that the ruler may now extract more tax revenues from the potential rebels without triggering a rebellion. Now, the cut-off line between peace and full rebellion, which triggers a limited rebellion, is given by $\theta = \omega$. Hence, the government is now able to impose a higher level of taxation, because of the free-rider problem inherent in the provision of public goods. The non participants cannot be punished by exclusion from the benefit of victory in this case, and this reduces the return on the individual's investment in fighting.

However, this result does not eliminate the role of the cultural factor λ from the analysis. Under the model's assumptions, we still have $R = \lambda$ in the Nash equilibrium of the stage 2 sub-game, when $U^{NL} = U^{RL}$. Therefore, the ruler's payoff is still affected by λ , which keeps its crucial role in determining whether war or peace will be chosen by the government in equilibrium.

In case of full rebellion, the government's payoff remains given by (5) above. In case of peace, the government's payoff is slightly changed to:

$$V^{PP} = \max_{\theta} \delta(b + \theta) \text{ s.t. } \theta < \omega. \quad (21)$$

In case of limited rebellion, the government's payoff can be found by substituting $\theta = \omega$ in (6). This yields:

$$V^{LP} = (1 - \pi \lambda)b + (1 - \lambda)\omega. \quad (22)$$

It is then straightforward to prove that Lemma 1 still holds true, as $V^{LP} > V^R$ if $\lambda < 1$. Hence, the government's choice between peace and rebellion remains based on the comparison of its payoffs under limited rebellion and peace. It is straightforward to find that proposition 2 now becomes:

Proposition 2': The government chooses limited rebellion rather than peace if:

$$\lambda \leq (1 - \delta) \frac{b + \omega}{\pi b + \omega}. \quad (23)$$

Comparing (23) to (7) shows that substituting a public good to the private rewards for rebellion assumed in the previous model changes the cut-off value of λ . It increases the range of values of the degree of rebelliousness for which limited rebellion is the ruler's preferred choice. The reason for this result is that the government is now able to extract a higher tax from the non combatants than before, because of the free rider problem described above. Hence, for any given degree of rebelliousness, rebellion is less costly than before as the number of tax payers does not change, while each of them is paying more. This reduces the attraction of peace.

This theoretical prediction also entails that on average one should observe in the real world larger rebellions, *ceteris paribus*, when the stakes of the war are comprised of a public good, like national independence or democratic freedom, than when what is at stake is the control over some privately appropriable resource. This should mitigate the widespread views about the "resource curse", and put "conflict diamonds" in the right perspective. Casual observation suggests that the Ethiopian civil war that ended with the overthrow of the *Derg* dictatorship and the secession of Eritrea in 1991 involved a much more sizable insurrection than, for example, the conflicts over diamonds in Liberia or Sierra Leone (see Africa Watch, 1991, Pool, 1998, Young, 1998, on Ethiopia, and Adebajo, 2002 and Reno, 1998, on Liberia and Sierra Leone). Hence, if the size of the rebellion is somewhat correlated positively to its

social cost⁷, then one should talk of the “club-good curse”, as a larger fraction of the group’s population may get involved in that case.

The bottom line of this section is that the main qualitative predictions of the base model analyzed in sections 2 and 3 are fairly robust to some changes in assumption. The cultural dimension of limited rebellion remains as important if the rebels are motivated by getting access to a public good as if they are simply seeking some private benefit. Only some details are changed between the two specifications. These qualitative predictions shed some interesting light on the experiences of rebellion in various developing countries, where most civil wars and insurgencies occur. They are briefly illustrated in the conclusion.

7. Conclusion

This paper has presented a cultural theory of limited uprising, using a simple core model and a few variants. Each potential rebel chooses independently whether to join the rebellion or not, given the tax level imposed by the government. The basic parameter founding this cultural approach is the probability of joining a rebellion when the potential rebel is indifferent between these two courses of action. The latter probability is a measure of the degree of “rebelliousness” of the individual concerned. However, what matters for determining the choice made by the government between triggering a limited insurgency by imposing a too heavy tax and maintaining peace is the expected value of this parameter for the group facing it. The theoretical value added of this exercise is that it produces a case of open warfare that is not due to commitment failure or asymmetric information, the two usual assumptions used in rationalist models of war to explain the eruption of sub-optimal violence. Here, the government imposes irrevocably the tax rate at the outset, and is fully committed to it. It fixes this levy in full information, knowing perfectly well whether the level chosen will trigger an uprising or not.

The practical value added created by the cultural theory of limited uprising presented in the previous sections should be assessed by looking at the experience of various developing

⁷ e.g. the social cost could be measured by $\eta + \omega R$, where $\eta \geq 0$ is the “ethical” cost of violence.

countries. Qualitatively, the main predictions coming out of the theoretical analysis performed above can be summarized in four statements:

- (i) Rebel groups have usually a fairly homogenous cultural composition.
- (ii) They involve only a fraction of the population of the cultural group concerned.
- (iii) Rebellion is triggered by excessive taxation, or more generally by a reduced welfare level of the potential rebels caused by government coercion.
- (iv) Rebellion is triggered when the groups involved are less “rebellious”.

Statement (i) is pretty useful when looking at most insurgencies of the recent past. These mainly concern civil wars, the most numerous type of conflict since the end of the de-colonization era. In fact, one could also argue that it applies usefully to such extra-systemic wars as well, where the colonial power was playing the same role as the government in the present model. The bottom line is that these two types of conflicts, which occur mainly in poor countries, generally involve combatants from well-defined ethnic or religious groups. This point has been observed before, but the value added of the present analysis is to reconcile this cultural view with the rationalist approach, by restricting its influence to cases where the potential rebels are indifferent between participating or not in the rebellion. It thus opens the black box of culture, ethnicity or other forms of collective identity. Unfortunately, this indifference point can be targeted as the desired outcome by a government, thus triggering a socially costly limited uprising. Statement (ii) is also pretty relevant, as the revolutionary dream of a “*levee en masse*”, so dear to the French revolutionaries of 1789, is really nothing more than a rhetorical image. Many cases can be mentioned for supporting statement (iii). For example, the case of Chad analyzed by Azam and Djimtoingar (forthcoming) fits pretty well with this prediction, as the insurgency was triggered by an incident concerning tax collection in the north of the country, while the Southerners were controlling the government in a fairly exclusive way. President Tombalbaye consciously chose to exclude many representatives of the northern groups from the government and other important positions, thus reducing their ability to resist increased taxation and other forms of increased coercion. This led inexorably to the civil war, which eventually removed the southerners from power. Similarly, the case of

Sri Lanka, analyzed in particular by Bloom (2005), shows the impact of an implicit form of taxation: the Sinhalese government was taxing the future incomes of the Tamil elites by denying them a normal access to education.

The case of Senegal illustrates nicely statement (iv). There, the main cultural group is comprised of the Wolofs, and some related allied groups. The rebelliousness of this group can be seen by the fact that it is the only one among the Sahelian groups where the traditional caste system has been deeply upset. In the course of the 19th century, the religious caste rebelled against the aristocracy, and overthrew it (Boone, 2003). Since then, the religious leaders, especially through the Sufi brotherhoods, are exerting a very strong influence on the country's political life. However, one group does not conform at all to this pattern, namely the Diola of Western Casamance. Like many other groups in that part of West Africa, in the Mano River area and its close vicinity (Guinea, Guinea-Bissau, Sierra Leone, Liberia, South-West Ivory Coast), the Diola have a completely different social culture from their Sahelian neighbors. They can be characterized by a very loose social fabric, without any noticeable traditional authority. Some anthropologists call their social structure "amorphous" or "anarchistic". Their traditional lifestyle was dominated by highly mobile small groups living in the deep forests of the coastal area. Each family tends to mind its own business, and to pay no attention to the fate of the rest of the village. Then, the Senegalese government adopted a very different approach for ruling over Casamance than over the other regions (Boone, 2003). It tried to impose a fairly rigid administrative system, instead of the more participatory approach used in the other parts of the country. The Diola were left powerless in front of the Senegalese government. This triggered a low-intensity civil war, which culminated in the mid-1990s. In fact, a similar analysis can be made of the Tubu from northern Chad, those that the Southerners' government challenged by increasing taxes and reducing their political representation, as mentioned above (Roné, 2000). Their social structure is very loose, and they are often characterized by their a-social behavior.

Nevertheless, the model presented here and its variants are too abstract for being applied directly to the real world, which also mixes certainly the other causes of conflict identified previously in the literature, like commitment failure and asymmetric information.

Moreover, the issue of rebel organizations is entirely neglected in these models, while it is obviously relevant in the real world. However, by enlarging our set of intuitions about open conflicts, these models should open the way to more perceptive analyses of real world instances of civil wars and other forms of insurgencies.

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