

Beyond Divide and Rule: Sparking Civil War to Hold on Power

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Abstract

We propose a model where an autocrat rules over an ethnically divided society. The dictator carefully selects the tax rate over the subjects' production and the nation's natural resources to maximize his rent under the threat of a revolution. We show that it may be in the interest of a weak ruler to foster civil strife to enhance his taxing capacity. By exacerbating existing group antagonisms the leader weakens potential opposition, thereby allowing him to increase fiscal pressure. Important stocks of natural resources and an unequal distribution of these resources across ethnic groups makes this strategy more profitable for the ruler.

“While Two Dispute, the Third Enjoys”.
Popular Italian proverb.

1 Introduction

In many countries around the world, autocrats impose highly rapacious policies on their population and yet manage to remain in power for long periods of time. Surprisingly, this has equally been observed in countries plagued by internal civil strife, which at least theoretically would be expected to destabilize the status-quo. The weakly institutionalized setting, characterizing these societies, implies an absence of functioning democratic instruments to balance the ruling elites' power: parliamentaries and interest groups are typically co-opted by the ruling elites, and, as a consequence, elections do not fulfil their role of disciplining ill-performing leaders. Robert Bates' study (1981) sheds light on the functioning of such de-facto dictatorships, describing the web of personal ties and transfers which guarantee the stability of the elites. Extending this reasoning Acemoglu, Robinson and Verdier (2004) explicitly model one of the strategies - which they term *Divide-and-Rule* - adopted by rulers to implement their kleptocratic policies. In these authors' words, “[T]he logic of the divide-and-rule strategy is to enable the ruler to bribe politically pivotal groups off the equilibrium path, ensuring that he can remain in power despite widespread discontent among his subjects. To remove a ruler from power requires the cooperation of distinct social groups which is made difficult by

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the collective action problem” (ARV 2004: 164). In Acemoglu et al. (2004) the ruler can be overthrown only if a sufficiently large opposition is mobilized. By providing selective incentives the ruler exacerbates the collective action problem, thereby making it impossible for a successful challenging coalition to emerge.

A more recent study by Padro-i-Miquel (2007) addresses the same puzzle of the longevity of inefficient dictatorships. His analysis is more explicitly linked to the ethnic dimension of these societies: at equilibrium the ruler holds on to power while extracting significant amounts of wealth from his own ethnic group and even larger amounts from the rest of the population. The intriguing explanation proposed by the author rests on what he defines *The Politics of Fear*, i.e. “[T]he fear to fall under an equally inefficient and venal ruler that favours another group is sufficient to discipline supporters” (Padro-i-Miquel 2007: 1260). In other words, by dampening the livelihood of the other ethnic groups, the ruler obtains support from his own group despite the exploitation they are subject to. The latter’s obedience is rooted in the fear of receiving a worse treatment under the rule of a leader from an other ethnic group.

As in Padro-i-Miquel (2007) we propose a model where an autocrat rules over an ethnically divided society. The revenue of the dictator comes from taxing his subjects’ income, and natural resources which are both spread in the country. The ruler selects the tax rates that maximize his personal rents under the threat of a revolution.

Following the recent literature on the political economy of dictatorships, we model specific features of weakly institutionalized settings. While the ruler is not accountable to his subjects through elections, a rebellion would challenge his power. Accordingly, the ruler loses his tax revenue if a rebellion takes place.

We show that under some conditions it is in the interest of the ruler to foster ethnic violence in the country. This weakens the potential opposition thereby allowing the ruler to increase the fiscal pressure without provoking a rebellion. The incentives for a ruler to foster a civil conflict have already been addressed elsewhere in the literature. According to Snyder and Ballentine (1996) and Snyder (2000), in the same spirit as in Padro-i-Miquel (2007), political elites exploit the nationalistic argument in newly democratizing countries as a way to preserve their dominant position. By overemphasizing the importance of the ethnic characteristic, the elites are able to marginalize not only the ethnic minorities and the political opponents, but they are also creating an environment of fear enabling the exploitation of the society as a whole. Glaeser (2005) proposes a theory with many similarities to the above-mentioned explanations of instrumented ethnicity and the associated civil disorder. His argument is that political leaders dig existing societal cleavages by conveying messages that exacerbate hate between groups (that may be defined along different dimensions) in an ultimate goal of fostering electoral support for particular policies.

The most dramatic form of clashes along ethnic lines is the genocide which aims at extinguishing a particular ethnic group. The recent Rwandan tragedy has attracted a renewed interest in the reasons pushing common people perpetrating such bestial acts. André and Platteau (1998) provide empirical evidence that these orchestrated mass killings came as a response to rising inequalities on an increasingly scarce resource, land. They indeed show that the 1994 tragic events that came after a period of rapid population growth, were characterized by large landholders being disproportionately targeted, thus signalling the genuine underlying cause of the uprising. The instrumentalization of ethnicity in the Rwandan genocide is widely acknowledged by scholars, and in a recent paper Yanagizawa (2009) shows the central role played by the Radio station *Radio RTLM* in successfully conveying messages inciting the slaughter of Tutsi ethnics. Esteban et al. (2010) construct a theoretical background that helps explain the empirical results of André and Platteau (1998), and of Yanagizawa (2009). Their model assumes that ethnic groups compete through a political process for the control of the valuable resources (natural resources and income), and they show that mass killings may be perpetrated by an ethnic group to improve the odds of being in power, and therefore to improve their material well-being. Their theoretical contribution constitutes indeed a convincing argument for explaining incidents of massive ethnic violence.

The present paper aims at providing a novel explanation for strategically designed ethnic clashes, without necessarily focusing on genocidal acts. A fundamental point of departure from Esteban et al. (2010) is that the latter neglect the central role played by ruling elites in provoking ethnic strife for personal ends. More precisely, whereas Esteban et al. (2010) assume the mass killings serve the interest of ethnic groups as a whole, we look more thoroughly in the ruling elite’s incentives to turn their subjects against each other despite the associated efficiency losses of conflict. In Esteban et al. (2010), mass-killing a share of the society entails a cost in terms of tax base reduction, but allows the perpetrators to appropriate a larger share of the country’s resources. As in their model, by starting ethnic violence the ruler in our model destroys part of his tax base. If the ruler’s bargaining power vis-a-vis his subjects is sufficiently increased by provoking civil strife, he recovers the above-mentioned losses by increasing the tax rates on the remaining productive population and by appropriating more natural resources. In particular, we show that it may be in the interest of relatively weak rulers to foster civil strife, exacerbating existing group antagonisms.

Countries that are generously endowed in natural resources are shown to be more prone to implement this strategy. Indeed, in the extreme case where most of the ruler’s income is derived from taxing natural resources, the cost of sparking ethnic violence, which amounts to foregone production, is relatively low. The gains are instead considerable since in the face of weakened subjects the ruler can capture a larger share of natural resources without triggering a revolution.

One obvious prediction of our analysis is that we should observe more ethnic conflicts in countries abundant in natural resources. There exists empirical evidence supporting this correlation, although it is not conclusive yet (Collier and Hoeffler 1998, 2004, Reynal-Querol 2002, Ross 2004, Hodler 2006). Given the complexity of the roots and causes of ethnic conflicts, disentangling the mechanisms underlying these patterns is a complicated task. Interestingly, Mehlum et al. (2006) find that natural resources abundance is associated with lower growth rates (“resource curse”) in weakly institutionalized settings alone. These findings do not contradict the predictions of our model. In this paper we do not claim that the strategy we identify underlies most of natural resources related conflicts. We rather posit that this technique has been implemented by some rulers and that it has been widely disregarded by scholars. To back our analysis we present three cases drawing from the recent African history in which rulers actively engaged in exacerbating the ethnic antagonisms for private ends, namely Congo, Kenya, and Nigeria.

The rest of the paper is organized as follows. We lay out our theoretical model in the next section. The discussion on the African cases is presented in section 3. Section 4 concludes.

2 The Model

2.1 The Setting

We consider a country populated by two equally-sized ethnic groups respectively designated by A and B , and a ruler L . Each group i is composed of n agents who control the natural resources located on their own territory such that group i owns a share φ_i of the country’s total resources R . Each ethnic group decides on the manpower to allocate to productive, w_i , and fighting, f_i , activities. The production technology is assumed to be linear, thus implying that the total income of group i equals $\varphi_i R + w_i$. The ruler can tax all the nation’s income by applying group-specific taxes, τ_A and τ_B .¹ If group i decides to constitute a group of fighters, f_i , this force may serve two purposes. An ethnic group may use this militia to loot the resources of the other

¹Modifying this assumption and constraining the leader to impose a unique tax rate in the whole country reduces the leader’s utility at equilibrium. All main results of the analysis are however robust to such a change. An alternative reading of our story would be to interpret τ^i as the net tax rate on group i , i.e. the real burden supported by group i when also accounting for the group-specific transfers and favours.

ethnic group in which case we have an ethnic conflict, while this same militia may serve to mount a rebellion against the ruler. The latter use of the fighters occurs when the rebelling ethnic group is unwilling to pay the taxes demanded by the ruler. In that event, the ruler's army fights the rebels and the ruler collects no income. The ruler controls the army of force a , and has to decide how to allocate his soldiers given that they can either guard the palace against a potential rebellion, a_P , or be deployed in the country to deter potential civil conflicts from arising, a_D .

Given the above description of the agents' actions, we now turn to the associated payoffs. In the absence of a *civil war* and of a *rebellion*, the country is at peace (superscript P), and ethnic group i 's payoff is given by:

$$U_i^P = (1 - \tau_i)(\varphi_i R + w_i) \quad (1)$$

The ruler's income equals to the total tax proceeds:

$$U_L^P = \sum_i \tau_i (\varphi_i R + w_i) \quad (2)$$

If one of the groups, say group i , decides to mount a rebellion in the absence of a civil conflict (superscript PR), its payoff equals:

$$U_i^{PR} = \frac{f_i}{a_P + f_i} (\varphi_i R + w_i) \quad (3)$$

If, however, ethnic group i initiates a civil war, it obtains:

$$U_i^C = (1 - \tau_i) \frac{f_i}{a_D + f_i + f_{-i}} (R + w_i) \quad (4)$$

Two important elements in (4) should be stressed. First, ethnic conflicts are seen as contests over the control of natural resources. In reality, many individuals actively engaging in this sort of internal violence are often more motivated by ethnic hatred than by a rational economic calculus. The driving reasons are nevertheless often linked to wealth distribution issues. As a consequence, we assume that each ethnic group fights to appropriate the natural resources of the other group, and to protect its land. Secondly, if an ethnic group attacks the other group, the share of the army deployed by the leader, a_D , will intervene in favor of the targeted group. In other words, the leader has a powerful tool to influence the groups' fighting incentives.

The attacked ethnic group's payoff is then given by:

$$U_{-i}^C = (1 - \tau_{-i}) \frac{a_D + f_{-i}}{a_D + f_i + f_{-i}} (R + w_{-i}) \quad (5)$$

As for the ruler, he taxes the conflicting parties and therefore obtains (if group i attacks group i):

$$U_L^C = \tau_i \frac{f_i}{a_D + f_i + f_{-i}} (R + w_i) + \tau_{-i} \frac{f_{-i} + a_D}{a_D + f_i + f_{-i}} (R + w_{-i}) \quad (6)$$

Lastly, when both a civil war and rebellion occurs (denoted by superscript CR), the rebelling group's payoff equals:

$$U_i^{CR} = \frac{f_i}{a + f_i + f_{-i}} (R + w_i) \quad (7)$$

The timing of the actions is the following. In the game's first stage the leader decides the pair of tax rates $\tau = \{\tau_A, \tau_B\}$, and the optimal allocation of the army between protecting the palace a_P and deterring

civil conflicts a_D . In the second stage of the game, the two ethnic groups simultaneously decide whether to attack each other or not. If either group initiates hostilities, civil war ensues. In the game's last stage, the ethnic groups individually decide whether to mount a rebellion against the ruler.

We focus on the game's Subgame Perfect Equilibria and thus solve it backwardsly.

2.2 Analysis

Stage 3:

Provided the country has not experienced a civil war (stage 2), if group i rebels the group's leadership optimally allocates the n individuals between the productive activity and rebellion. The maximization problem of group i therefore reads as:

$$\max_{f_i} \left\{ \frac{f_i}{a_P + f_i} (\varphi_i R + n - f_i) \right\} \quad (8)$$

Optimizing gives the following interior solution:

$$f_i^{PR} = (a_P (a_P + n + \varphi_i R))^{1/2} - a_P \quad (9)$$

Replacing this value in (3) gives:

$$U_i^{PR} = \left[(a_P + n + \varphi_i R)^{1/2} - a_P^{1/2} \right]^2 \quad (10)$$

On the other hand, not rebelling and allocating all the manpower to the productive activity gives ethnic group i the following payoff:

$$U_i^P = (1 - \tau_i) (\varphi_i R + n) \quad (11)$$

Ethnic group i thus decides to mount a revolution if $U_i^{PR} > U_i^P$. Rearranging this condition, we can isolate the tax rate τ_i^P above which group i would opt for rebellion:

$$\tau_i^P = 1 - \frac{\left[(a_P + n + \varphi_i R)^{1/2} - a_P^{1/2} \right]^2}{\varphi_i R + n} \quad (12)$$

If the country is under civil war, denote by f_i^C the number of fighters allocated by group i to this conflict in stage 2. In stage 3, if group i decides to rebel, it adjusts the number of fighters to optimize the following problem:

$$\max_{f_i} \left\{ \frac{f_i}{a + f_{-i}^C + f_i} (R + n - f_i) \right\} \quad (13)$$

Starting a rebellion would mean facing the entire army (both the share deployed to guard peace and the share protecting the ruler) and the other group's army. On the other hand, no taxes are paid to the ruler.

The interior solution to this problem is given by (decided in stage 2):

$$f_i^{CR} = \left((a + f_{-i}^C) (a + f_{-i}^C + n + R) \right)^{1/2} - (a + f_{-i}^C) \quad (14)$$

Thus implying that group i 's utility of rebelling equals:

$$U_i^{CR} = \left[(a + f_{-i}^C + n + R)^{1/2} - (a + f_{-i}^C)^{1/2} \right]^2 \quad (15)$$

Not rebelling, on the other hand, implies that group i gets taxed at some group specific rate τ_i^C where superscript C designates the fact that the two groups are at conflict. Group i therefore obtains:

$$U_i^C = (1 - \tau_i^C) \frac{f_i^C}{a_D + f_{-i}^C + f_i^C} (R + n - f_i^C) \quad (16)$$

where a_D is the share of the army deployed by the ruler to guard peace in the country in the first stage of the game. This in turn allows us to compute the threshold tax rate τ_i^C above which group i would rebel, by equalizing equation (15) to equation (16):

$$\tau_i^C = 1 - \frac{U_i^{CR}}{U_i^C} \quad (17)$$

Stage 2:

Having fully described the third stage's decisions, we solve for the two groups' optimal allocation of manpower between production and fighting activities in stage 2 where players choose whether or not to initiate a civil conflict. Notice that for presentation reasons we do not describe the optimization *off the equilibrium path*, though whenever relevant we shall equally refer to these results. In other words, we do not present the situation where the ethnic groups anticipate a rebellion in the game's last stage since at equilibrium the leader always selects a tax rates' vector that averts rebellion. Any different choice would lead the leader to be ousted with a consequent nil payoff. From ethnic group i 's perspective, provided it is profitable for either group to provoke a civil war, the problem consists in maximizing (4) with a_D set to zero since *at equilibrium* a ruler will never reduce the palace defenses by deploying part of the army across the country if civil war can not be prevented. The optimal strength to deploy in a civil war from groups' A and B perspective when both expect civil war to occur can be shown to equal:

$$f_A^C = f_B^C = \frac{n + R}{3} \quad (18)$$

The utility derived by group i if an ethnic conflict occurs, and if no rebellion is mounted is therefore given by:

$$U_i^C = (1 - \tau_i^C) \frac{n + R}{3} \quad (19)$$

To determine whether these groups expect a civil conflict to occur, it is necessary to derive the payoff an ethnic group would obtain if it was to deviate from a peaceful situation. This in turn will allow us to deduce whether any group has incentives to deviate from a peaceful equilibrium. In other words, we need to determine the optimal size of a militia for group i , when the other ethnic group ($-i$) has allocated all its manpower to the productive activity, and given the forces a_D deployed by the leader to guard peace. From group i 's perspective, the problem consists in maximizing (4) for $f_{-i} = 0$. The utility obtained by group i if it was to deviate from peace would equal:

$$U_i^C = (1 - \tau_i) \left[(a_D + n + R)^{1/2} - a_D^{1/2} \right]^2 \quad (20)$$

Stage 1:

Since we have derived the ethnic groups' best responses to the ruler's tax rates and optimal army deployment, we can solve the game's first stage. In order to reap a maximum of wealth from its citizens, the leader uses two tools: the tax rates and the army deployment.

Let us first consider the latter tool. The ruler decides the amount of troops a_D that will be deployed across the country to deter the ethnic groups from clashing each other. For deterrence to be successful, it is necessary that *both* ethnic groups are unwilling to initiate hostilities *given that* the other group is unprepared for fighting. Since both groups are endowed with the same fighting technology and face the same opportunity cost of mobilizing fighters, the ethnic group whose resources endowment is the lowest has the highest incentives to start a conflict. Without any loss of generality assume $\varphi_A > 1/2$. If the deterrent force is to be effective, therefore, the following condition should be satisfied: $U_B^C \leq U_B^P$. Using equations (11) and (20) for group B , we can easily determine the minimal amount of troops the ruler needs to deploy for the deterrent strategy to be effective, \bar{a}_D :

$$\bar{a}_D = \frac{(\varphi_A R)^2}{4(n + \varphi_B R)} \quad (21)$$

A leader with an army $a < \bar{a}_D$ is unable to deter a civil war. For such weak rulers deploying part of the army across the country instead of using it to protect the palace would be suboptimal. Indeed, the lighter the defense of the palace, the easier it is to mount a coup, which eventually translates into a lower optimal tax rate. Similarly, any $a_D > \bar{a}_D$ would unnecessarily reduce the palace's defense. We thus conclude that $a_D = \{0, \bar{a}_D\}$. In other words, the ruler will either just deter a conflict to occur or abstain entirely from any deterrence policy.

The optimal vector of taxes from the ruler's perspective is such that it extracts the maximum wealth from the two groups without causing a rebellion. Stated otherwise, the ruler will set the taxes such that the subjects are *exactly* indifferent between rebelling and not. Therefore, if the ruler deploys a deterrent contingent a_D , the optimal tax rate is given by (12), whereas if civil conflict is anticipated, the optimal tax rate is given by (17).

The discussion around the optimal level of a_D yields a first result.

Proposition 1. *Ethnic conflicts always occur if the ruler is too weak.*

A leader with an army of size $a < \bar{a}_D$ cannot deter a civil war. Indeed, attacking the other group when $a_D < \bar{a}_D$ always yields a larger payoff to A than under peace. The claim in proposition 1 follows directly.

The utility of a ruler with an army $a \geq \bar{a}_D$ who chooses to deter civil conflict is given by (2), which after substituting for the optimal tax rates yields:²

$$U_L^P = 2n + R - \sum_{i=A,B} \left[((a - \bar{a}_D) + n + \varphi_i R)^{1/2} - (a - \bar{a}_D)^{1/2} \right]^2 \quad (22)$$

If the ruler, however, does not deploy a deterrent contingent, the ethnic groups always deviate from the peaceful situation. Thus, whenever $a_D = 0$, a civil conflict will occur. The utility of the ruler is then given by equation (6) after replacing f_A^C and f_B^C by their equilibrium value (18), and after setting the tax rates to their optimal (conflict) value τ_i^C . This yields:

$$U_L^C = \frac{2}{3} \left[n + R - \left[(4(n + R) + 3a)^{1/2} - (n + R + 3a)^{1/2} \right]^2 \right] \quad (23)$$

²Notice that U_L^P is not defined for $a < \bar{a}_D$, as the ruler would not have enough power to deter an ethnic conflict.

The ruler therefore decides whether or not to deploy the deterrent forces by comparing (22) to (23). Averting a civil conflict grants the ruler the largest tax base. Indeed, when the ethnic groups enter into an armed struggle, potentially productive resources are diverted to fighting activities. On the other hand, despite the partial reduction of the ruler's tax base, civil conflict reduces the contestants' capacity of rebellion, thereby increasing the tax rates the ruler can impose. In the context of an on-going ethnic conflict, the ethnic group willing to mount a rebellion will have to fight *both* the other ethnic group and the ruler's army. A very interesting exercise to which we now turn is to analyze this trade-off between the tax-base versus the tax rate when varying the model's key parameters.

The following proposition describes how the ruler's strength as measured by the size of his army will influence the equilibrium:

Proposition 2. *A weak ruler always fosters a civil conflict, while a strong ruler always preserves peace.*

A formal proof is provided in Appendix A.1.

The results from propositions 1 and 2 deserve a brief discussion. These results jointly suggest that a country with natural resources ruled by a weak dictator is expected to experience internal conflicts. Indeed, very weak dictators ($a < \bar{a}_D$) do not have the sufficient strength to deter the most motivated group in the society from starting a conflict over natural resources. Unless the initial resource distribution is very unequal, the conflict makes both groups worse-off. Interestingly, countries ruled by relatively weak dictators (who nevertheless control an army $a > \bar{a}_D$) are expected to experience civil conflicts. Unlike in the previous case, this is the result of a rational calculus by the ruler: by concentrating all his forces a to protect himself from a potential rebellion he can impose larger tax rates. Refraining from deploying a peace-keeping force results in a civil war which destroys part of the tax base. The gains from larger tax rates, however, exceed the loss in terms of tax base. An intriguing consequence of this finding is that a negative shock on the personal power of a strong autocratic ruler can be conducive to civil conflict, either because the leader is no longer able to support peace (if the shock affects the leader strength such that his resulting army $a < \bar{a}_D$), or else because it is no longer in his interest to do so.

The second parameter of particular interest in this analysis is R , the amount of natural resources. The next proposition summarizes our findings on the effect of natural resources:

Proposition 3. *If natural resources are relatively abundant the ruler will always foster a civil conflict, while if natural resources are relatively scarce the ruler will always preserve peace.*

A formal proof is provided in Appendix A.2.

Like in proposition 2, the intuition behind this result lies in the effect of natural resources on the ruler's taxing behavior under the two scenarios. Indeed, increasing the amount of natural resources has two effects. On the one hand, a larger stock of natural resources increases the tax bases in both scenarios. Interestingly, the tax base increment under peace is larger than under conflict as in the latter scenario more natural resources being at stake in the conflict also imply that more labor is diverted from agricultural production.

On the other hand, however, increasing natural resources also inflates the cost for the ruler to preserve peace in terms of soldiers to deploy (\bar{a}_D) to deter a civil conflict. As a consequence, larger resource stocks reduce the forces dedicated to directly protecting the central regime from a potential rebellion, thereby pushing downwards the tax rate that can be imposed under the peace scenario. For large resource stocks this last force prevails. Indeed, in resource abundant polities, rulers should devote the entire army to police the ethnic groups, for deterrence to be successful. This, however, makes the ruler powerless vis-a-vis the potentially rebellious ethnic groups. As a consequence the ruler's payoff is nil. When the presence of abundant resources makes the country very unstable, the ruler finds it more profitable not to avert a civil

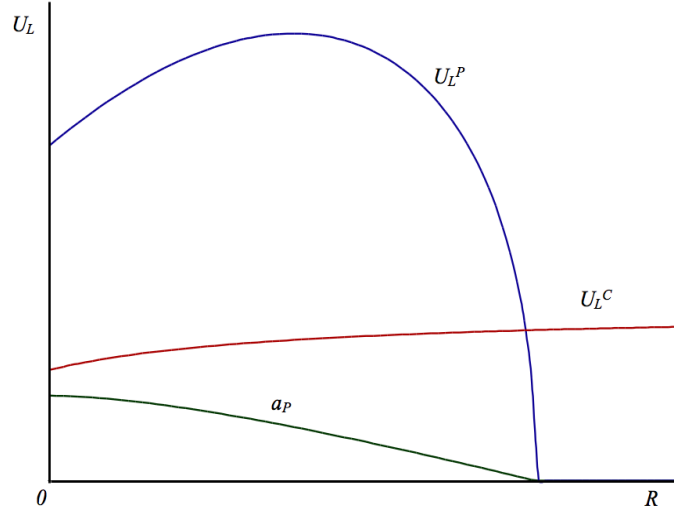


Figure 1: The effect of natural resources.

conflict and to profit from it (i.e. imposing larger tax rates), instead of devoting a large share of his army to maintain peace.

In figure 1 we plot the result of a simulation to help visualize the result of proposition 3. On the horizontal axis we represent the level of natural resources in the country, whereas on the vertical axis the utility of the ruler is measured. The red curve describes the utility of the ruler under conflict. The blue curve instead represents the utility of the ruler if he decided to maintain peace in the country. For small resource stocks, marginal increments of resources increase both U_L^P and U_L^C . The increase of U_L^C , however, is partially offset by the loss due to some extra labor diverted to fighting.

The green curve depicts a_P , i.e. the strength of the army chosen by the ruler to protect the palace against a potential rebellion after deploying the necessary forces \bar{a}_D to deter the outbreak of a conflict. Larger amounts of a_P lead to higher tax rates under peace, which implies that under peace U_L^P is equally higher. For low stocks of natural resource, peace can be preserved with a relatively small army. As a consequence, the increase of the tax base due to an incremental increase of natural resources prevails over the reduction of the tax rates. The interplay of these forces determines the slope of U_L^P which is therefore positive for low resource stocks in figure 1. For larger stocks of natural resource, securing peace leaves the ruler with relatively little forces to face a potential rebellion. As a consequence the effect of additional increments of resources on the tax rates under peace becomes increasingly important and eventually exactly offsets the increase in the tax base. This occurs for the level of resources in which the blue curve reaches its maximum. For any larger stocks of natural resources, the tax base expansion does not compensate for the reduction in the tax rates. The negative slope of U_L^P for large resource stocks in figure 1 captures these forces. Finally, when the level of resource is so high that the entire army of the ruler needs to be deployed to preserve peace (the green curve crosses the horizontal axis), the tax rates under peace, and hence U_L^P , are nil.

The last comparative statics exercise concerns the role of inequality, i.e. whether and how the initial distribution of natural resources across the two ethnic groups influences the ruler's policy decisions. The next proposition addresses this issue.

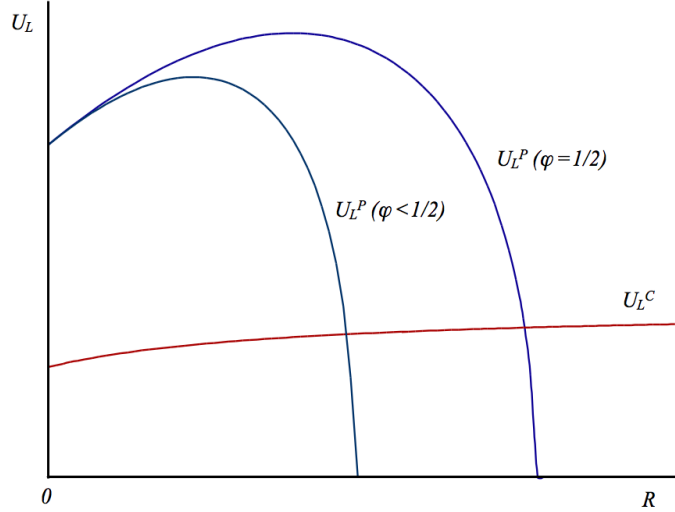


Figure 2: The effect of inequality.

Proposition 4. *Higher inequality in initial resource endowments increases the occurrence of civil conflicts.*

A formal proof is provided in Appendix A.3.

The impact of inequality on the emergence of an internal conflict has been widely investigated in the literature (e.g., Gurr 1970, Montalvo and Reynal-Querol 2005, Esteban and Ray 2008, Hidalgo et al. 2010, De Luca and Sekeris 2010).

Our contribution here is to show that a more unequal distribution of natural resources across groups in the society renders the deterrence strategy more costly because of the higher incentives for the society's poorest group to violently appropriate resources. In Figure 2 we depict the ruler's utilities under the two scenarios as in Figure 1. To better visualize the impact of the level of inequality in natural resources' endowments, we plot U_L^P for a symmetric society ($\varphi_i = 1/2$), and for a society in which resources are distributed unequally. Fixing the stock of natural resources, a higher inequality requires more forces to preserve peace, thereby reducing both tax rates, and therefore U_L^P as displayed by figure 2. As a consequence, when governing a society characterized by high inequality, a ruler may find it more profitable to foster an inefficient conflict over resources, and to exploit his subjects through higher tax rates.

We can now summarize the main findings of the model. We have shown that it may be in the interest of an autocratic ruler to foster an inefficient internal conflict in the society by foregoing the peace-keeping role of the army under his control. Such conflicts imply a partial loss of the ruler's tax base since otherwise productive labor gets diverted towards fighting. Dedicating the army to protect the ruler, on the other hand, allows the imposition of higher tax rates, which more than compensate the loss in terms of tax base. Our comparative statics predict that conflict is more likely to be fostered: (i) by a relatively weak ruler, (ii) in the presence of abundant natural resources, and (iii) in societies where natural resources are distributed less equally.

The next section provides some anecdotal evidence based on the recent history of three African countries: Congo, Kenya, and Nigeria.

3 Sparking Ethnic Conflicts: Evidence from African Recent History

3.1 Congo

A few years after independence from Belgium, Joseph-Desire Mobutu took the lead of Congo in 1965 through a coup. He used his position as chief of the army in combination with external support from Western countries to dismiss the legitimate government. A period of relative peace and stability was achieved through diffuse corruption and a complex system of wealth distribution along patron-client networks. At the end of the Cold War, the sharp reduction of outside financial support forced autocratic rulers to reconsider their strategies to remain in power. Buying off opponents as well as distributing wealth through the traditional networks gradually became a much too expensive tool.

[He] had to find a way to fragment the power of increasingly unruly strongmen while tapping new sources of wealth. [...] Mobutu left individual military units to forage on their own. [...] Competition among these groups reduced the chances of mutiny or coordinated attacks on Mobutu (Reno 1998, p.148).

Mobutu therefore provoked struggles between groups by instigating violence. He argued, both in the domestic and the international arenas, that only his personal power could avoid the dissolution of Zaire into competing factions. History shows that his claim was sufficiently convincing to attract outside support and funding (Schatzberg 1991).

Perhaps not surprisingly, this new environment made ethnicity related issues more salient. For instance, debates over who was an “authentic Zairian” led to ethnically based violence on descendants from migrants from Rwanda. The strategy aimed at provoking shocking violent acts to encourage the population to flee from fighters leaving behind their property. Raids by “local” people against immigrants of Rwandan origin occurred in Kivu (Eastern Zaire), with the involvement of Mobutu’s associates. Instigators of conflicts operate outside the framework of formal organizations, and can plausibly deny any ties with the central regime, making the involvement of the government difficult to uncover (Reno 1998, p.161).

This policy benefited Mobutu insofar as it forestalled resistance and contained challenges after the collapse of patron-client networks. [...] Mobutu realized that his best chance for survival lay in also using opposition among factions of his patronage network to neutralize the network’s threat to him (Reno 1998, p.149).

The strategy of setting violence entailed significant costs, even for Mobutu. Looting and the destruction of infrastructure due to the conflicts prompted many foreign firms to leave the country. This in turn reduced aggregate production. Nevertheless, by directly creating a threatening environment Mobutu eradicated the possibility of a united opposition or an alliance against him. This strategy proved cheap and easy to implement: it achieved stability under very inefficient kleptocratic policies by balancing contending forces without the need of a large army.

3.2 Kenya

Post-independence Kenya combined a series of features that could have dragged the country into ethnic violence. Nevertheless, despite the scarcity of valuable natural resources and wealth, and despite underpinning social unrest - as exemplified by the early 1950s Mau Mau insurrection - that took root in the colonial policies that severely grieved the grassroots, Jomo Kenyatta managed to preserve a peaceful environment. Indeed when Kenyatta endorsed the presidency of the country in 1964 land constituted the unique source of wealth

in Kenya, thus leaving the central regime in a tightly budget constrained situation. Yet, as a result of the carefully planned strategies of the central power, no significant large-scale violent incident was to be observed until the early 1990s. Over the past 20 years, however, the country has experienced recurring episodes of ethnic strife that have led to thousands of deaths and hundreds of thousands of internally displaced persons. Most analysts converge on blaming the resource- and power-greedy elites for having engineered these violent events to serve their personal interests (Kahl, 2006; Kagwanja, 2009; Rutten and Owuor, 2009). In light of the analyses of the causes of these events by various scholars³, our model provides a consistent explanation of the recent Kenyan history. Indeed, in line with the model's assumptions, Kenya can be categorized as an autocracy. For, while the country has been a *de jure* democracy during part of its post-independence period, we can fairly categorize it as a *de facto* non-democratic state for the whole period. In this authoritarian context, the explosion of ethnic strife appears to have been orchestrated by a weakened central regime which exploited existing enmities, inequalities and grievances between the country's various ethnic groups. This change in strategy in matters of coping with the underlying social unrest, we argue, occurred at the end of the Cold War era, which signified a significant reduction in the ruling elites' power. Hence, as the opposition started becoming threatening to the weakened authorities, the central power triggered ethnic clashes that would - and did eventually - allow the elites to retain the control of the country while pursuing their appropriative policies. We briefly review Kenya's recent history before explaining how our argument helps understanding the recent ethnic clashes that took place in this ethnically divided country.

Under the British colonial rule, the authorities reverted to divide-and-rule policies by proceeding to a systematic categorization of individuals into tribes and clans (Klopp, 2001). At the same time, natives belonging mostly to the Kalenjin and Maasai tribes were expelled from the most productive land in the White Highlands which were subsequently occupied until the early 1960s by European settlers. Early on in his presidency, Kenyatta implemented several policies in favour of his ethnic group, the Kikuyus. Most importantly probably was the attribution of the prosperous Rift Valley lands to (mostly) Kikuyu farmers (Kahl, 2006). And while this move was politically motivated because of the high electoral weight of that region, it exacerbated the existing inequality between the most populous Kenyan ethnic group, namely the Kikuyus who make-up roughly one fifth of the total population, and the less well-off Kalenjins and Maasai groups, among others. With the death of Kenyatta in 1978, the Kalenjins came to power under the figure of Kenyatta's vice-president, Daniel arap Moi. In 1982 the parliament enacted the amendment known as Section (2a), which basically transformed Kenya in a one-party political system. The authoritarian regime had no difficulties in fuelling its patronage networks in an environment of weak internal opposition and strong foreign support in the context of the Cold War. Indeed, to oppose the communist threat posed by neighbouring Tanzania and Ethiopia, the West poured foreign aid in Kenya and turned a blind eye on the rampant corruption and social injustices. With the end of the cold war, however, the weakened central regime needed to devise new instruments for quelling the rising demands for democratization stemming from an opposition emboldened by the social uprisings in former communist-block countries.

With the intensification of pro-multi-partyism voices that compelled president Moi to repeal Section (2a) came a well designed response from the ruling authorities. A series of political rallies known as the *Majimbo* rallies - i.e. pro-federalization meetings - were organized in 1991 across the country by Kenya African National Union's (KANU), and especially so in the crucial Rift Valley that elects more than a fourth of the Kenyan parliament. The speeches of officials during these meetings conveyed particularly violent messages of hatred and intolerance towards (essentially) the Kikuyu and Luo ethnic groups. The elites accused the *madoadoa* (spots) and the *kwekwe* (blemishes) of having stolen from the Kalenjins and the Maasai their ancestral lands (Africa Watch, 1993; Kahl, 2006: 143). The KANU officials radicalized local populations

³see especially Colin H. Kahl's thesis of the *state exploitation conflicts* (Kahl, 2006), and the Africa Watch 1993 report on divide-and-rule politics in Kenya (Africa Watch, 1993).

by explicitly demanding that the *chui* (leopards) be expelled by violent means, while emphasizing the bravery and combativity of Kalenjin and Maasai “warriors” that should and would not tolerate such an usurpation (Africa Watch, 1993: 12-18, Klopp, 2001). The results of this policy of ethnic polarization were immediate and long-lasting since over the 1991-1993 period more than 1500 people got savagely killed in ethnically targeted attacks and counter-strikes while more than 300,000 people became IDPs (Africa Watch, 1993; Kahl, 2006). The authorities blamed it on external influences and on its inability to cope with the situation because of lack of resources. This official stance was quickly refuted, however, after numerous testimonies clearly revealed the active role of highly ranked political figures of the KANU in the *recruitment* of death squads in the cities’ slums (Kagwanja, 2009). Moreover, both the length of the events, and the idleness of security forces as reported by numerous witnesses clearly highlight that the ruling party was unwilling to deter ethnic clashes, irrespectively of the victims’ ethnic identity (Kahl, 2006).

Over the next 15 years, the ethnic tensions seem to have been mostly contained, with the exception of low-scale outbursts of violence during the 1997 general elections that left around 100 persons dead. In the aftermath of the December 2007 elections, the situation suddenly deteriorated when the close electoral race that led to the contested victory of the kikuyu candidate Mwai Kibaki (Kanyinga, 2007). The number of deaths, as well as the number of IDPs seem to have been more important than over the two years that followed the 1991 elections, while the economic losses of the crisis dwarfed the costs of the previous period of unrest (Kagwanja, 2009). Once again a series of clues push many scholars to suspect that the violence had been orchestrated by political elites of the defeated Odinga party, whereas police forces in most of the cases passively observed the events unfold before their eyes (Kahl, 2006; Rutten and Owuor, 2009).

The ethnic clashes Kenya experienced in 1991-1993 and in early 2008 have profound and complex roots, but the model we present in this paper may help us better understand the motivations of the ruling class to encourage, if not provoke these dramatic events. As explained above, the british colonial rule implemented a divide-and-rule strategy of ethnic polarization, coupled with a strong repressive apparatus that prevented outbursts of violence from occurring. By turning ethnic groups against each other, the colonial power aggravated the collective action problem that typically characterizes rebellion movements, thus enabling the british empire to better appropriate the country’s sole valuable resource, land. When Kenyatta took over the presidency of an independent Kenya in 1964, the Kikuyus received a privileged treatment that exacerbated the already existing inequalities. Cold war politics, however, allowed the regime’s elites to appropriate large amounts of wealth at the expense of a polarized and unorganized civil society. When Daniel arap Moi became the country’s president, the favoured group changed ethnicity, but the corrupt practices of his predecessor were replicated and pushed even further with the end of multipartyism in 1982. The strong central regime continued profiting from its privileged status of strategic ally of the West to conduct its internal politics. With the collapse of the Soviet Union that coincided with a drop in the prices of agricultural commodities (Kahl, 2006), however, the central regime lost the foreign unconditional support (Klopp, 2001) and weakened dangerously, while the opposition’s claims became increasingly vigorous. The ruling elites then decided to go beyond the typical divide-and-rule policy of polarizing the society, and to actually *provoke* ethnic clashes. The strategy which aimed at weakening and terrorizing the population in order to hold on to power without having to restrain the land appropriation practices eventually worked out pretty well. Indeed, despite strong internal opposition the ruling party under the presidency of Moi managed to cling to power until 2002. This instrumentalization of the ethnicity led, however, to a second - more violent - outburst of civil strife in January 2008. It has been claimed that the latter clashes were more spontaneous than the 1991-1993 ones, though some evidence reveals that idle youths had been instrumentalized to attack civilians with an ultimate goal of serving the personal interests of some elites (Kagwanja, 2009; Kanyinga, 2009). Overall, Kenya’s story seems to closely track two of the main findings of our paper, namely that both inequality among a country’s subjects, and a weak regime increase the ruler’s incentives not to contain

outbursts of civil strife from occurring.

3.3 Nigeria

After the Independence in 1960, the first Republic was inaugurated in Nigeria. A mixture of widespread corruption and mismanagement, due mainly to the new elite's continuation of the logic of the colonial system, led the military to seize power, under the promise of fighting corruption. Eight military coups plagued the country. The military regimes, however, far from fighting the vices of the civilian governments, adopted the same practices. As a matter of fact, corruption among the military rulers was endemic (Bolanle, 1999).

After the military regime of Babangida and a brief appearance of Chief Ernest Shonekan, in 1993 General Sani Abacha seized power as head of military. He gained power amidst an unfavorable economic situation. With the collapse of the oil prices, Nigeria was facing economic troubles: balance of payment difficulties, increasing deficits and debt burden, and large inflation rates. The population was in average poorer than before the oil boom (Bolanle, 1999). In particular, unemployment and economic hardship in the Niger Delta hit the same individuals who were generating oil wealth without benefiting from it. Feelings of deprivation, injustice and marginalization created an explosive environment (Ikelegbe, 2001). Moreover, as in Congo, old patronage politics were collapsing (Reno 1998).

Abacha dealt with these hostile conditions by adopting a mix of policies which closely resemble the strategy proposed in our theoretical framework. According to Reno:

Conflict between local factions has been manipulated in ways that have led to increased violence. [...] Abacha has retained absolute control over income from oil (Reno 1998, p.201).

The Ogonis' region, in Southern Nigeria supplies a large share of the oil production of the country. Among Ogoni people, the local ethnic group, a general dissatisfaction was mounting, due to the almost complete diversion of oil revenue out of the region into the political elite's hands. Until 1999, only 3% of oil revenue was reinvested in areas affected by oil drilling (Ikelegbe, 2001). Abacha's government, however, heavily depended on oil revenue and could not afford to give in to the requests of the Ogonis. Starting from 1993 Abacha backed a series of targeted attacks on the Ogonis area, which destabilized the region.

State violence emerged either as direct killings, rapes, and looting by the security forces against the Ogoni or as deliberate attempts to foster conflicts between the Ogoni and their neighbors. The regime constantly tagged the attacks as ethnic rivalries. The frequency, the efficiency, and the technology employed in the clashes, however, convinced some independent observers that the regular army was actively involved in these acts (Ibeanu 2000, Human Right Watch 1995).

Between July 1993 and April 1994, there were at least three conflicts between the Ogoni and their neighbors, involving the destruction of many villages, loss of life, and refugees - the Andoni in July 1993, the Okrika in December 1993, and the Ndoki in April 1994. In each case, the security forces blamed the Ogoni (Ibeanu 2000, p. 26).

Four traditional chiefs were killed during a MOSOP rally, the Movement for the Salvation of the Ogoni People, a local organization headed by Saro-Wiwa, which re-vindicated more control over the region. Abacha blamed Saro-Wiwa and eight MOSOP members for the killings and sentenced them to death in 1995 (Ifeka, 2000, Ikelegbe, 2001). As for the ethnic clashes, some evidence emerged afterwards according to which Abacha's regime was behind the murders.

Critics have suggested that armed men close to the regime killed the four chiefs. Other events such as the machine-gunning murder of as many as a hundred Ogoni ferry passengers pointed to extensive outside involvement. Officials portrayed the event as a consequence of intra-Ogoni rivalries. But, no recent history exists of bloody factional clashes in the area [...]. Other attacks, such as the machine-gun attack on the offices of Gani Fawehinmi, Saro-Wiwa's attorney, allegedly has regime backing (Reno 1998, p. 206).

The strategy proved successful and Ibeanu (2000, p. 26) laconically concludes describes the event: “[...] at that point, the implosion of MOSOP was completed and the struggle became Ogoni against Ogoni”.

A similar strategy has been adopted to instigate violence between Nembe and Kalabari ethnic groups. Two witnesses report to have seen regular army soldiers killing fourteen Nembe, whereas officials claimed it was part of a Kalabari plot to appropriate Nembe's land. Quoting Reno once more:

The militarization of local factions is an effective way to ensure that communities in oil-producing areas cannot unify to challenge the regime. This tactic effectively destroys civil society, replacing it with sets of rival ethnic organizations [...] (Reno 1998, p. 206).

This cynical approach enabled Abacha to rule over Nigeria for five years primarily for his own benefit and in favor of his associates (Bolanle, 1999). After his death on June 7, 1998, his family members were forced to give up thirty-seven residences and \$750 million. It has been estimated, however, that he managed to secure about \$5-7 billion abroad (Reno, 1999).

Interestingly enough, Ikelegbe (2001) implicitly suggest that Abacha's methods were successful in containing the outbreak of an open rebellion as the following quote testifies:

Since the more benevolent regime of Abubakar [Abacha's successor], the overall tempo of the agitation and particularly the political dimensions of the struggle have increased, with demands for federal restructuring and resource control, while the level of violence [against the central power] has risen (Ikelegbe 2001, p. 460).

4 Conclusions

In this paper we proposed a model where an autocrat rules over an ethnically divided society. The dictator selects the tax rate over the subjects' production and the nation's natural resources to maximize his rents under the threat of a potential revolution.

We show that it may be in the interest of the ruler to foster civil strife, exacerbating existing group antagonisms, to maximize his tax revenue. This strategy weakens potential opposition, thereby allowing the ruler to increase fiscal pressure. Conflict, however, entails some costs in terms of tax base loss, since otherwise productive resource are invested in fighting. We show that this cynical strategy is more likely to be adopted by weak rulers when natural resources are abundant, as well as in societies in which resources are unequally distributed.

Finally, we described some of the policies adopted by post-independence rulers in Congo, Kenya, and Nigeria which resemble closely the strategy presented in the theoretical analysis. Interestingly, and in line with the predictions of the model, both dictators, Mobutu and Abacha, were ruling over resource abundant countries and saw their personal power declining, when they actively fostered internal ethnical struggles in a strategy of going beyond simple “divide-and-rule” politics.

A Appendix

A.1 Proof of Proposition 2

We need to prove the existence and uniqueness of an army size \underline{a} such that $U_L^P < U_L^C, \forall a < \underline{a}$ and $U_L^P > U_L^C, \forall a > \underline{a}$. In order to ease the exposition, it is useful to highlight some features that will be used in the proof. Notice first that the groups' militia reaction functions are monotonically increasing in the opponents' strength. As a consequence, there always exists a level of a such that the optimal rebellion army equals n . Define \hat{a} the rulers army size such that $f_i^{PR} = n$, when $\varphi_i = 1$ (i.e. in the most unequal case yielding the lowest utility to the ruler in case of peace).

Since the utilities U_L^P and U_L^C behave differently for interior and corner solutions, we provide the proof for two subcases:

- $R < 2n$ which implies that at the conflict equilibrium, $f_i^C < n$;
- $R \geq 2n$ which implies that $f_i^C = f_i^{PR} = n$.

Case 1:

To prove the claim in the proposition it is sufficient to show:

1. $\partial U_L^P / \partial a > \partial U_L^C / \partial a > 0$
2. $U_L^C = 0$ for $a = 0$
3. $U_L^P = 0$ for $a = \bar{a}_D$
4. $\lim_{a \rightarrow \infty} U_L^C = \frac{2}{3}(n + R)$
5. $U_L^P(\hat{a}) \geq \lim_{a \rightarrow \infty} U_L^C$

To verify whether condition 1 is satisfied we compute the two partial derivatives:

$$\begin{aligned} \frac{\partial U_L^P}{\partial a} &= -4 + \left((a - \bar{a}_D + n + \varphi_A R)^{1/2} + (a - \bar{a}_D + n + \varphi_B R)^{1/2} \right) (a - \bar{a}_D)^{-1/2} \\ &\quad + \left((a - \bar{a}_D + n + \varphi_A R)^{-1/2} + (a - \bar{a}_D + n + \varphi_B R)^{-1/2} \right) (a - \bar{a}_D)^{1/2} \end{aligned} \quad (24)$$

Denote $(a - \bar{a}_D + n + \varphi_A R)$ by \bar{X}_A , $(a - \bar{a}_D + n + \varphi_B R)$ by \bar{X}_B , and $(a - \bar{a}_D)$ by \underline{X} . The last expression becomes:

$$\frac{\partial U_L^P}{\partial a} = -4 + \left(\bar{X}_A^{1/2} + \bar{X}_B^{1/2} \underline{X} \right)^{-1/2} + \left(\bar{X}_A^{-1/2} + \bar{X}_B^{-1/2} \right) \underline{X}^{1/2} \quad (25)$$

The partial derivative on U_L^C is given by:

$$\begin{aligned} \frac{\partial U_L^C}{\partial a} &= -4 + 2 \left((n + R + 3a)^{1/2} (4(n + R) + 3a)^{-1/2} \right) + \\ &\quad 2 \left((n + R + 3a)^{-1/2} (4(n + R) + 3a)^{1/2} \right) \end{aligned} \quad (26)$$

Denoting $(n + R + 3a)$ by \underline{Y} , and $(4(n + R) + 3a)$ by \bar{Y} , this expression becomes:

$$\frac{\partial U_L^C}{\partial a} = -4 + 2(\underline{Y}^{1/2}\bar{Y}^{-1/2} + \underline{Y}^{-1/2}\bar{Y}^{1/2})$$

Notice that both derivatives contains terms with the same structure, which respect the following condition:

$$\left(\frac{\alpha}{\beta}\right)^{1/2} + \left(\frac{\beta}{\alpha}\right)^{1/2} \geq 1$$

This implies that both derivatives are weakly positive.

For (24) to be larger than (26), the following condition should hold:

$$(\bar{X}_A^{1/2} + \bar{X}_B^{1/2})\underline{X}^{-1/2} + (\bar{X}_A^{-1/2} + \bar{X}_B^{-1/2})\underline{X}^{1/2} > 2(\underline{Y}^{1/2}\bar{Y}^{-1/2} + \underline{Y}^{-1/2}\bar{Y}^{1/2})$$

which is true if the following two inequalities are satisfied:

$$\begin{cases} \bar{X}_A^{1/2}\underline{X}^{-1/2} + \bar{X}_A^{-1/2}\underline{X}^{1/2} > \underline{Y}^{1/2}\bar{Y}^{-1/2} + \underline{Y}^{-1/2}\bar{Y}^{1/2} \\ \bar{X}_B^{1/2}\underline{X}^{-1/2} + \bar{X}_B^{-1/2}\underline{X}^{1/2} > \underline{Y}^{1/2}\bar{Y}^{-1/2} + \underline{Y}^{-1/2}\bar{Y}^{1/2} \end{cases}$$

The first inequality is satisfied if:

$$|\bar{X}_A - \underline{X}| < |\bar{Y} - \underline{Y}|$$

Substituting the original values of \bar{X}_A , \underline{X} , \bar{Y} and \underline{Y} , we obtain:

$$n + \varphi_A R < 3(n + R)$$

which is always true. Similarly, the second inequality is satisfied if:

$$n + \varphi_B R < 3(n + R)$$

which is always true.

To sum up, condition 1 ($\partial U_L^P/\partial a > \partial U_L^C/\partial a > 0$) is established.

Condition 2 is verified easily by setting $a = 0$ in U_L^C as given by (23). Similarly, condition 3 is verified by substituting $a = \bar{a}_D$ in (22).

Let us consider condition 4. Since $\lim_{a \rightarrow \infty} \tau_i^C = 1$, the ruler can appropriate the entire tax base, which in the interior conflict equilibrium equals $\frac{2}{3}(n + R)$.

In order to tackle condition 5, we first compute \hat{a} . This level of a should satisfy:

$$(\hat{a} - a_D)^{1/2}(\hat{a} - a_D + n + R)^{1/2} - (\hat{a} - a_D) = n \Leftrightarrow (\hat{a} - a_D)(R - n) = n^2$$

Using a_D as given by (21) with $\varphi_i = 1$ yields:

$$\hat{a} = \frac{n^2}{R - n} + \frac{R^2}{4n}$$

The utility of group i of rebelling under peace when constrained ($a \geq \hat{a}$) is given by:

$$U_i^{PR}|a \geq \hat{a} = \frac{n}{n + a - a_D} R \quad (27)$$

Combining this expression with U_i^P yields the corner tax rate from which we can obtain the utility of the leader in \hat{a} :

$$U_L^P(\hat{a}) = n + R - \frac{nR}{n + \frac{n^2}{R-n}} + \tau_{-i}n = (2 + \tau_{-i})n$$

It is straightforward to show that condition 5 holds for $R < 2n$, and $\tau_{-i} \geq 0$:

$$(2 + \tau_{-i})n \geq \frac{2}{3}(n + R)$$

Case 2:

To prove the claim in the proposition it is sufficient to show:

1. $\partial U_L^P / \partial a > \partial U_L^C / \partial a$
2. $U_L^C = 0$ for $a = 0$
3. $\lim_{a \rightarrow \infty} U_L^C < \lim_{a \rightarrow \infty} U_L^P$
4. Denote by $U_L^{\hat{P}}$ the utility of the leader under peace if the optimal rebellion for the wealthier group implies everybody rebelling. Then, $\partial U_L^{\hat{P}} / \partial a > \partial U_L^P / \partial a$.

Let us start by computing U_L^C and U_L^P for $R > 2n$. Since for $R \geq 2n$ in the conflict scenario all agents are fighters, in case of rebellion and conflict all agents would be fighters as well (because $f_i^C R$ is increasing in the opponents' strength). The equilibrium conflict tax rate and U_L^C are thus given by:

$$(1 - \tau_i^C) \frac{R}{2} = \frac{n}{2n+a} R \Leftrightarrow \tau_i^C = \frac{a}{2n+a} \quad \text{and} \quad U_L^C = \frac{a}{2n+a} R \quad (28)$$

Given the construction of the proof, in the peace scenario, we concentrate on the most unequal case, which yields the lowest utility to the leader. It can be shown that \bar{a}_D as given by (21) would be unnecessarily high for $R > 2n$, as $f_i^C(\bar{a}_D) > n$. The adjusted \bar{a}_D which deters the group with no resources from attacking the other group is instead given by:

$$(1 - \tau^P)n = (1 - \tau^P) \frac{n}{n + \hat{a}_D} R \Rightarrow \hat{a}_D = R - n$$

For any $a < R - n$, U_L^P is not defined, and conflict is the only equilibrium. Like for Case 1, there exists a value of a that we denote by \hat{a} such that $\forall a \geq \hat{a}$, $f_i^{PR} = n$. If $a < \hat{a}$ then U_L^P is given by (22) with $\hat{a}_D = R - n$.

We can now consider condition 1. Notice that $\partial U_L^P / \partial a$ is given by (25) with $\bar{a}_D = R - n$. We still need to compute $\partial U_L^C / \partial a$:

$$\frac{\partial U_L^C}{\partial a} = \frac{2n}{(2n+a)^2} R$$

Imposing condition 1:

$$\begin{aligned} & \left(\frac{a - R + 2n}{a - R + n} \right)^{1/2} + \left(\frac{a + 2n}{a - R + n} \right)^{1/2} + \left(\frac{a - R + n}{a - R + 2n} \right)^{1/2} + \\ & \left(\frac{a - R + n}{a + 2n} \right)^{1/2} - 4 > \frac{2nR}{(2n+a)^2} \end{aligned}$$

Notice first that since $(a + 2n) - (a - R + n) > (a - R + n) - (a - R + n)$, then:

$$\left(\frac{a + 2n}{a - R + n}\right)^{1/2} + \left(\frac{a - R + n}{a + 2n}\right)^{1/2} > \left(\frac{a - R + 2n}{a - R + n}\right)^{1/2} + \left(\frac{a - R + n}{a - R + 2n}\right)^{1/2} > 2$$

Therefore, denoting $\lambda = \frac{nR}{(2n+a)^2}$, it is therefore sufficient to show:

$$\begin{aligned} & \left(\frac{a + 2n}{a - R + n}\right)^{1/2} + \left(\frac{a - R + n}{a + 2n}\right)^{1/2} > 2(1 + \lambda) \\ \Leftrightarrow & \frac{a + 2n + a - R + n}{2} > (1 + \lambda)(a + 2n)^{1/2}(a - R + n)^{1/2} \\ \Leftrightarrow & \left(a + \frac{3}{2}n - \frac{1}{2}R\right)^2 > (1 + \lambda)(a + 2n)(a - R + n) \\ \Leftrightarrow & a^2 + \frac{9}{4}n^2 + \frac{1}{4}R^2 + 3an - aR - \frac{3}{2}Rn > (1 + \lambda)(a^2 - aR + 3an - 2Rn + 2n^2) \\ \Leftrightarrow & \left(\frac{n + R}{2}\right)^2 > \lambda(a + 2n)(a - R + n) \end{aligned}$$

Replacing for λ we obtain:

$$\begin{aligned} (a + 2n)\left(\frac{n + R}{2}\right)^2 & > nR(a - R + n) \\ \Leftrightarrow a(n - R)^2 + 2n(n^2 + 3R^2) & > 0 \end{aligned}$$

which is necessarily verified for positive R and n .

Condition 2 can be simply verified by setting $a = 0$ in (28).

It can be shown that $\lim_{a \rightarrow \infty} U_L^C = R$ whereas $\lim_{a \rightarrow \infty} U_L^P = R + 2n$ as both tax rates tend to unity, which implies that condition 3 is also verified.

To tackle condition 4, observe first that U_L^P can be re-written implicitly under the following form:

$$U_L^P = 2n + R - \sum_i \frac{f_i^{PR}}{f_i^{PR} + a - \bar{a}_D} (n - f_i^{PR} + \varphi_i R)$$

Taking the derivative with respect to a yields:

$$\begin{aligned} \partial U_L^P / \partial a &= - \sum_i \frac{\partial \frac{f_i^{PR}}{f_i^{PR} + a - \bar{a}_D} (n - f_i^{PR} + \varphi_i R)}{\partial a} \\ \Leftrightarrow \sum_i & - \left(\frac{f_i^{PR'} (f_i^{PR} + a - \bar{a}_D) - f_i^{PR} (f_i^{PR'} + 1)}{(f_i^{PR} + a - \bar{a}_D)^2} (n - f_i^{PR} + \varphi_i R) \right) + \\ & f_i^{PR'} \frac{f_i^{PR}}{f_i^{PR} + a - \bar{a}_D} \end{aligned}$$

$$\Leftrightarrow \sum_i f_i^{PR} \left(-\frac{(a - \bar{a}_D)(n - f_i^{PR} + \varphi_i R)}{(f_i^{PR} + a - \bar{a}_D)^2} + \frac{f_i^{PR}}{f_i^{PR} + a - \bar{a}_D} \right) + \frac{f_i^{PR}}{(f_i^{PR} + a - \bar{a}_D)^2} (n - f_i^{PR} + \varphi_i R)$$

Recall that the FOC for group i , when deciding on f_i^{PR} requires in the interior:

$$\frac{f_i^{PR}}{f_i^{PR} + a - \bar{a}_D} = \frac{(a - \bar{a}_D)(n - f_i^{PR} + \varphi_i R)}{(f_i^{PR} + a - \bar{a}_D)^2}$$

If, however, group i is constrained to n when choosing f_i^{PR} , then it would fail to optimally adjust to further increases in a . This in turn, implies a larger increase of U_L^P for further increases in a .

A.2 Proof of Proposition 3

The variable of interest being R , the utilities are expressed as a function of R . To prove Proposition 3 we sequentially establish the following results:

1. $U_L^P(0) > U_L^C(0)$
2. $\frac{\partial U_L^C(R)}{\partial R} > 0$
3. $\exists R = \hat{R} > 0$ such that $\partial U_L^C(R)/\partial R$ is constant $\forall R \geq \hat{R}$
4. $U_L^P(0) > U_L^C(\hat{R})$
5. $\frac{\partial^2 U_L^C(R)}{\partial R^2} < 0$
6. $\exists R = \bar{R}$ such that $U_L^P(\bar{R}) = 0$

Before dealing with each condition in isolation, we briefly explain the intuition of the general proof. By establishing that U_L^P is larger than U_L^C in $R = 0$ (Condition 1), and that the opposite holds true for some \bar{R} (Conditions 2 and 6), we show that there exists at least one switching value of R in the vicinity of which the deterrent strategy is preferable for $R < \bar{R}$ and the conflict strategy is preferred for $R > \bar{R}$. The remaining conditions ensure the unicity of this threshold. Indeed, Conditions 2, 4 and 5 guarantee that if the crossing between U_L^P and U_L^C occurs for $R < \bar{R}$, then $\partial U_L^P/\partial R < 0$, thus necessarily implying that $\partial U_L^C/\partial R > \partial U_L^P/\partial R$ for all $R \geq \bar{R}$ because of conditions 2 and 5. On the other hand, condition 3 ensures us that if the crossing between U_L^P and U_L^C occurs for $R \geq \bar{R}$, then the linearity of U_L^C together with the concavity of U_L^P secures the unicity result.

1. Regarding the first point, notice that if $R = 0$, then $a_D = 0$, as no army is needed to deter a war over resources. Condition 1 is therefore verified if the following inequality holds:

$$U_L^P(0) = 2n - 2 \left[((a+n)^{1/2} - (a)^{1/2})^2 \right] > \frac{2}{3} \left[n - \left[(4n+3a)^{1/2} - (n+3a)^{1/2} \right]^2 \right] = U_L^C(0)$$

After some algebraic manipulation this expression reduces to:

$$2(a^2 + an)^{1/2} > a \quad (29)$$

And this is always true.

2. Computing next the partial derivative of Condition 2 gives us:

$$\frac{\partial U_L^C(R)}{\partial R} = \frac{2}{3} \left(4 \left(\frac{n+R+3a}{4(n+R)+3a} \right)^{1/2} + \left(\frac{4(n+R)+3a}{n+R+3a} \right)^{1/2} - 1 \right)$$

Using the notation $X = \frac{n+R+3a}{4(n+R)+3a}$, this term is positive if:

$$4X^{1/2} + X^{-1/2} > 1$$

Which is necessarily true $\forall X > 0$.

3. The third condition states that for any R larger to some threshold value \hat{R} , the leader's utility under conflict is linear in C . The leader's utility is linear when all individuals are fighting in the conflict scenario. This situation is therefore realized when $f_i^{C*} = n$ for both groups, which is verified when:

$$f_i^{C*} = \frac{\hat{R} + n}{3} = n \Rightarrow \hat{R} = 2n$$

The utility of the leader when $R \geq \hat{R}$ equals $\frac{R+n}{3}$ and is therefore linear in R .

4. We now turn to Condition 4 which is verified if:

$$U_L^P(0) = 4a^{1/2} \left((a+n)^{1/2} - a^{1/2} \right) > \frac{2an}{2n+a} = U_L^C(\hat{R})$$

$$2 \left((a+n)^{1/2} - a^{1/2} \right) (2n+a) > a^{1/2}n$$

$$\Leftrightarrow 4 \left(2a+n - 2(a+n)^{1/2}a^{1/2} \right) (2n+a)^2 > an^2$$

$$\Leftrightarrow 4(2a+n)(2n+a)^2 - an^2 > 2(a+n)^{1/2}a^{1/2}(2n+a)^2$$

$$\Leftrightarrow 16(2a+n)^2(2n+a)^4 + a^2n^4 - 8(2a+n)(2n+a)^2an^2 > 4(a+n)a(2n+a)^4$$

$$\Leftrightarrow 4(2n+a)^4 \left(4(2a+n)^2 - (a+n)a \right) + a^2n^4 - 8(2a+n)(2n+a)^2an^2 > 0$$

This inequality is necessarily verified if we drop the second (positive) term from the LHS, thus implying that unicity is obtained if:

$$(2n+a)^2 \left(4(2a+n)^2 - (a+n)a \right) > 4(2a+n)an^2 > 0$$

$$(2n+a)^2 \left(15a^2 + 4n^2 + 15an \right) > 4(2a+n)an^2 > 0$$

And this last expression can easily be shown to be true.

5. For Condition 3 we need to consider various cases. On the one hand, a_D may be constrained in the sense that the minimal deterrent amount of guns is inferior to $a_D(f_i^{PC})$ (where $\varphi_i \geq 1/2$). On the other hand,

$f_i^{PR}(a_D)$ may be constrained by n . We sequentially show that $U_L^P(R)$ is concave in all cases, starting with the fully unconstrained one.

The second order derivative of the unconstrained equilibrium utility function of the leader under peace, U_L^P (equation 22) is given by:

$$\begin{aligned} \frac{\partial^2 U_L^P}{\partial R^2} &= a_D''(R) \left(\frac{\partial U_L^P / \partial R}{a_D'} \right) \\ &+ \frac{a_D'}{2} \sum_{i=A,B} \left(\frac{\varphi_i(a - a_d) + a_D'(n + \varphi_i R)}{(a - a_D + n + \varphi_i R)^2} \left(\frac{a - a_D + n + \varphi_i R}{a - a_D} \right)^{1/2} \right) \\ &- \frac{a_D'}{2} \sum_{i=A,B} \left(\frac{\varphi_i(a - a_d) + a_D'(n + \varphi_i R)}{(a - a_D)^2} \left(\frac{a - a_D}{a - a_D + n + \varphi_i R} \right)^{1/2} \right) \\ &- \frac{a_D'}{2} \sum_{i=A,B} \varphi_i \left(\frac{a - a_D + n + \varphi_i R}{a - a_D} \right)^{1/2} \frac{\varphi_i(a - a_D) + a_D'(n + \varphi_i R)}{(a - a_D + n + \varphi_i)^2} \end{aligned}$$

To establish quasi-concavity, it is sufficient to show that if $\frac{\partial U_L^P}{\partial R} = 0$, then $\frac{\partial^2 U_L^P}{\partial R^2} < 0$. Assume that $\frac{\partial^2 U_L^P}{\partial R^2} = 0$. To conclude that $\frac{\partial^2 U_L^P}{\partial R^2} < 0$, it is sufficient to show that the next inequality holds true for any i :

$$\begin{aligned} &\frac{a_D'}{2} \left(\frac{\varphi_i(a - a_d) + a_D'(n + \varphi_i R)}{(a - a_D + n + \varphi_i R)^2} \left(\frac{a - a_D + n + \varphi_i R}{a - a_D} \right)^{1/2} \right) < \\ &\frac{a_D'}{2} \left(\frac{\varphi_i(a - a_d) + a_D'(n + \varphi_i R)}{(a - a_D)^2} \left(\frac{a - a_D}{a - a_D + n + \varphi_i R} \right)^{1/2} \right) \end{aligned}$$

Simplifying this expression, we obtain:

$$a_D'(n + \varphi_i R) > 0$$

And this last term is necessarily positive.

In the second case, $a_D = \frac{nR}{\varphi_i R + n} - n$, thus implying that $a_D' > 0$, and $a_D'' > 0$. By the same reasoning as in case 1, this implies that U_L^P is quasi-concave in R .

Lastly, we ought to consider the case where $f_i^{PR}(a_D) = n$. Assume that only group i is constrained (the reasoning extends straightforwardly to both groups being constrained), then U_L^P becomes:

$$U_L^P = 2n + R - \left((a - a_D + n + \varphi_i R)^{1/2} - (a - a_D)^{1/2} \right)^2 - \frac{n\varphi_i R}{n + a_D}$$

By taking the second order derivative w.r.t. R , applying an analogous reasoning to the one employed in Case 1, we can establish quasi-concavity if the following expression is verified:

$$\frac{\partial^2 \left(-\frac{n\varphi_i R}{n + a_D} \right)}{\partial R \partial R} \leq 0$$

And this can be shown to be true.

6. Condition 6 requires that $U_L^P(\bar{R}) = 0$ for some $\bar{R} > 0$. Fixing $a = a'$, it is therefore sufficient to show that there exists a \bar{R} such that $a_D(\bar{R}) = a'$. Condition 6 is therefore satisfied by the fact that $\partial a_D(R) / \partial R > 0$, whether a_D is constrained ($a_D = R - n$) or not ($a_D = (\varphi R)^2 / (4(n + (1 - \varphi)R))$).

A.3 Proof of Proposition 4

Notice first that increasing inequality, modeled as an increase of φ_i in the range $[1/2, 1]$, enters the ruler's problem only in U_L^P . As a consequence we only need to check the sign of $\frac{\partial U_L^P}{\partial \varphi_i}$ for $\varphi_i > 1/2$.

$$\begin{aligned} \frac{\partial U_L^P}{\partial \varphi_i} = & -2 \left[(a_P + n + \varphi_i R)^{\frac{1}{2}} - a_P^{\frac{1}{2}} \right] \left(\frac{a'_P + R}{2(a_P + n + \varphi_i R)^{1/2}} - \frac{a'_P}{2a_P^{1/2}} \right) \\ & - 2 \left[(a_P + n + (1 - \varphi_i) R)^{\frac{1}{2}} - a_P^{\frac{1}{2}} \right] \left(\frac{a'_P - R}{2(a_P + n + (1 - \varphi_i) R)^{1/2}} - \frac{a'_P}{2a_P^{1/2}} \right) \end{aligned}$$

where a'_P is a short notation for $\frac{\partial a_P}{\partial \varphi_i}$.

The last expression can be decomposed as:

$$\begin{aligned} & - \left[(a_P + n + \varphi_i R)^{\frac{1}{2}} - a_P^{\frac{1}{2}} \right] \left(\frac{a'_P}{(a_P + n + \varphi_i R)^{1/2}} - \frac{a'_P}{a_P^{1/2}} \right) \\ & - \left[(a_P + n + (1 - \varphi_i) R)^{\frac{1}{2}} - a_P^{\frac{1}{2}} \right] \left(\frac{a'_P}{(a_P + n + (1 - \varphi_i) R)^{1/2}} - \frac{a'_P}{a_P^{1/2}} \right) \\ & - \left[R - \frac{Ra_P^{1/2}}{(a_P + n + \varphi_i R)^{1/2}} - R + \frac{Ra_P^{1/2}}{(a_P + n + (1 - \varphi_i) R)^{1/2}} \right] \end{aligned}$$

which is always negative for $a'_P < 0$.

Notice that since $a_P = a - \bar{a}_D$. This implies:

$$\frac{\partial a_P}{\partial \varphi_i} = - \frac{\partial \bar{a}_D}{\partial \varphi_i} \quad (30)$$

Consider \bar{a}_D as defined by (21). Increasing φ_i increases the numerator and decreases the denominator. We can conclude that $\bar{a}_D' > 0 \Rightarrow a'_P < 0 \Rightarrow \frac{\partial U_L^P}{\partial \varphi_i} < 0$.

Finally, since U_L^C does not depend on φ_i , we can conclude that increasing inequality makes peace less profitable for the ruler.

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