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The Paradox of Power Reconsidered: A Theory of Political Regimes in Africa

by

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Abstract : A typical pattern of wealth redistribution seems to prevail in some African countries, between rich and poor ethno-regional groups. A contract-theoretic model is presented for shedding some light on this phenomenon. The government promises a transfer to its potential opponent in return for not engaging in a civil war. The latter may break out because of the imperfect credibility of the government's commitment. This increases the cost of the required transfer of wealth, and may make it unfeasible. The model determines whether a military regime or a redistributive state prevails in a peaceful equilibrium. This depends on two parameters: (i) the relative fighting efficiency and (ii) the relative productivity of the two groups. The social cost of the different regimes is then compared, and their implications for aid policy are discussed.

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1. Introduction

The type of governments ruling in West Africa seems to show a striking pattern. In most of the countries of this area, there is a sharp contrast between a relatively affluent south and a poorer north. For instance, in Chad, the southerners produce cotton, while the northerners are poor nomadic herdsmen. In Côte d'Ivoire, the northerners produce also cotton, but there, it is a poorer crop than the coffee and cocoa produced by the southerners. In Nigeria, the giant country of Africa, the northerners rely on a typical Sahelian agriculture, with cotton and millet, while oil dominates the southern economy. In these countries, a typical pattern emerges: a military regime often prevails when the northerners are in power, while civilian rule seems to be the dominant mode of government when the southerners are in power. Tombalbaye in Chad and Houphouët-Boigny in Côte d'Ivoire were from the south of their countries, and ran civilian governments. The Hausa generals from northern Nigeria came to power time and again, while the southerner Obasanjo led the return to civilian rule in this country (see Zartman *et al.*, 1997). The model presented below provides some clues about why this pattern seems to emerge, despite several exceptions.

Sometimes, a more complex pattern emerges, like in Ghana, where the rich cocoa growers have poorer neighbours both in the north and in the south. Nevertheless, a related pattern emerges, as the civilian leader Busia, for example, was coming from the richest Akan group, while the different military rulers were predominantly coming from poorer groups. In East Africa, the pattern is slightly different, with an east-west division, corresponding mostly to altitude. The rich crops grow mainly in the hills above 3000 feet, while herdsmen are found mostly below this level. In all these cases, these geographical differences give rise to some form of ethnic rent, as migrations from the poorer areas to the richer ones is largely precluded by the rules of land ownership. A fairly tight mapping thus exists between ethnicity and the regional location of the groups. Then, politics in these countries is to a large extent devoted to the redistribution of these rents across groups. Sometimes, a civil war breaks out between them. For example, in Chad in the late 1970s or in Nigeria a few years

earlier, the civil wars opposed the rich groups to the poorer ones. In other cases, peace prevails despite this type of inequality across groups.

As proved by the later events starting in September 2002, Côte d'Ivoire was clearly exposed to such a risk. The north-south divide there involves both ethnic and religious aspects. The Djula and the Senufo in the north are Muslim, and grow cotton and millet. In fact, the land of the Djula is so poor that they are mainly found in trade, rather than in agriculture. The Akan and the Kru in the south are Christian or animists and they grow cocoa and coffee, as well as palm oil and exportable vegetables. However, peace was there purchased by redistribution for several decades. Houphouët-Boigny, the late president of Côte d'Ivoire, tried explicitly to build national unity by taxing his own ethnic group, the Akan cocoa and coffee growers, in order to fund visible public investments in infrastructure in the other regions and some other redistributive public expenditures, like health and education. He was evidently successful until his death. After the latter, in 1993, his successors have changed the general orientation of this country's public expenditures strategy, keeping the northerners out of the game. There was a coup d'Etat in 1999, which brought General Gueï to power for a year. He was a western Mandé, a group related to the northern ones. Later on, a mutiny split the country into two parts in 2002, the northern one falling under the mutineers' control. This type of redistributive policies, which Houphouët-Boigny used consistently from the 1970s to his death, is captured in the model below by the theoretical concept of transfer. However, Houphouët-Boigny's virtuous redistributive policy was not in fact exclusive of more traditional down-to-earth patronage and corruption. Hence, the word transfer used in the model below must not be understood literally, and is meant to capture all the expenditures that benefit the excluded group, which comprises the potential insurgents. Azam *et al.* (1996) find a significant negative impact of public expenditures with a strong redistributive content, like education and health, on the probability of the outbreak of political violence, using African data.

The present paper sheds some light on this type of behaviour, using the recent developments of the economic theory of conflict. The next section presents the relations of the analytical framework used below to the literature. The model is then presented in section 3. Section 4 describes the different types of equilibria that may prevail, depending on

parameter values. It first shows how commitment problems may entail the occurrence of war. It then shows the different types of political regimes that may prevail in peaceful equilibria, depending on the parameters of the model, together with their social cost. This typology of regimes is thus based first on whether war or peace prevails, and then on whether redistribution is used for buying the peace, or not. It thus differs from other typologies presented in the political science literature, which focus more on political institutions, like democracy or authoritarianism, for example. Section 5 draws some implications of the model for aid policy, while section 6 concludes, and compares the outcome of the present model to the original "paradox of power".

2. Relations to the Literature

Grossman (1991) is the seminal reference in the conflict literature, analysing how a government chooses the level of its military expenditures for reducing the probability of being overthrown by a potential insurrection. Hirshleifer (1991 and 1995), Grossman and Kim (1995) and Skaperdas (1992), analyse the properties of the conflict technology and their consequences for the equilibrium of the model. Hirshleifer (1995) emphasises what he calls the decisiveness parameter, which determines the impact on the probability of victory of a small increase in the forces engaged by one side. Skaperdas (1992) analyses the consequences of assuming some non convexity in the fighting technology. The model presented here embodies the main point of the latter, by assuming some scale effect. Grossman and Kim (1995) distinguish between the offensive and the defensive technologies. Neary (1997) presents a synthesis of this literature on conflict, with a comparison with rent-seeking models. Esteban and Ray (1994 and 1999) bring out the link between polarisation and conflict. They explain the formation of groups by combining the influences of "identity" and "alienation", with special reference to the polarisation affecting the distribution of income. They show that conflict is closely related with the bimodality of this distribution. This seems especially relevant in the case of the African countries briefly described above, where the inequality of income across groups is so important, while within-group inequality does not seem to play any important role.

A tension in this literature is brought out by Skaperdas (1992) who points out that the occurrence of the conflict is not really explained, as the contending parties can agree beforehand to share the resources according to the expected values of their takes from the fight. They are thus at best indifferent between the two, if one assumes quite artificially that fighting entails no resource cost. Otherwise, peace is obviously the first-best outcome. However, this issue is a bit trickier than it looks, as it allows for only two outcomes: armed conflict, or armed peace, as the weapons are first accumulated, irrespective of whether war or peace follows. It seems odd that no means is found in equilibrium for saving on the resources so accumulated, in order to use them productively. After all, the parameters that determine which side is the strongest in equilibrium are common knowledge in these models. From an African perspective, such models could may be explain the case of Chad, where the two sides where heavily armed for at least a decade before the war broke out. However, they fail to explain why Côte d'Ivoire lived through nearly thirty years of independence with a small army, and very few weapons held by civilians.

In these models, the contenders are either indifferent between fighting and sharing the resources peacefully, or prefer the latter. If the conflict implies some resource cost, which can be saved by peace, Esteban (2001) proposes a sharing rule for the surplus due to peace, "in the shadow of conflict". In this framework, the relative shares of the potential contenders in case of fighting determine the shares of the resources obtained in peacetime. A similar interpretation can in fact be given to the seminal paper by Hirshleifer (1991). In his model, the two sides split their productive resources between production proper and appropriation, i.e. fighting. Then, output is split between the two sides according to the expected take from fighting. The most striking result of this paper is the so-called "paradox of power": because its opportunity cost of labour is lower, the least productive side is able to allocate more resources to fighting, and can thus secure a higher probability of winning. Consequently, this side can also claim a larger share of output in the peaceful equilibrium. Hence, the relative efficiency of the two sides at fighting and at producing determines in fact the sharing rule. This model of Hirshleifer's thus provides a clear explanation for the possible disconnection between productivity and the distribution of income, which is quite unfamiliar to standard Neo Classical analysis. Hence, this literature provides some underpinning for the

redistribution of income in a peaceful economy. However, conflict proper, understood as fighting, with a well-defined winner and looser, has no reason to occur in this model, as mentioned above, after Skaperdas (1992). Moreover, peace is only allowed to prevail when the two sides are fully armed in this model also.

The present paper analyses also this paradox of power within the framework of a model where fighting or armed peace can actually occur in equilibrium, as in most of this literature. However, this model also allows for unarmed peace, in equilibrium, where the government has the monopoly over holding weapons. This is a more satisfactory definition of the peace, which fits better the experience of countries like Côte d'Ivoire, as mentioned above. In the present model, as in Grossman (1991), the contenders are not in a symmetric position at the beginning of the game. The initial situation is not a state of anarchy, but the roles of government and excluded group are clearly assigned, probably by an implicit historical process, e.g. a war that took place in the past. Fighting here means that the government runs the risk of being toppled, or sharing the product while being armed à la Skaperdas. Peace means that it will stay in power with probability 1, while the excluded group remains unarmed. However, as in Hirshleifer (1991), the probable outcome of the conflict determines the shares of resources appropriated by each side in case of peace, even if fighting proper does not occur. This is done here without accumulating useless weapons in case of peace, at least on the side of the non-ruling group. The model presented below shows that, depending on the parameters values, different types of political regimes may prevail, which are not equally efficient at saving on the accumulation of weapons. Here, the typology of political regimes is based on the mainstay of their peace-keeping strategy, based either on redistribution or on deterrence.

Open conflict and armed peace, as discussed above, imply the wastage of resources, and the two sides have a strong incentive to avoid it, and to share somehow the larger resources left by unarmed peace. Azam (2001) and Azam and Mesnard (2003) have presented models where conflict can actually occur in equilibrium, as well as unarmed peace. In both cases, some resources may be wasted, which could be devoted to production rather than fighting or passive defence. As the wastage of resources is hardly optimal, such an outcome requires a theory of why the two sides cannot agree to an efficient settlement.

The contract-theoretic framework presented below deals with this issue, by dealing explicitly with civil war, as well as unarmed peace. In the latter case, the government keeps the monopoly over the holding of weapons. This model discusses some implementation problems that may result either in a war, or in two different kinds of peace. This is an extension of Azam and Mesnard (2003), aimed at discussing Hirshleifer's "paradox of power" issue. It thus shows first how the relative efficiency at fighting and at producing of the two sides affects the choice between war and peace. Moreover, in case of peace, it also shows that the type of government ruling the country is also a function of these relative efficiencies. This is very much in the same spirit as Hirshleifer's analysis, as it shows how the expected outcome of a fight does affect the sharing of resources in case of peace. It shows additionally that the nature of government is very different in equilibrium if the relatively wealthy or the relatively poor group is in power, for a given fighting efficiency. One finds either a military government, relying on the deterrence of rebellion by defence expenditures for staying in power, or a redistributive state, which combines transfers with defence for avoiding the risk of being overthrown.

This emphasis on redistribution as a means to remain in power was first introduced in the conflict literature by Azam (1995), who shows that the ruling party might not rely exclusively on defence. It can also combine redistribution of the state resources in favour of its opponent with military deterrence, for reducing the incentive to rebel. In Grossman (1991), an equilibrium without insurrection can be achieved by combining a low tax rate with a large level of resources invested in deterrence. This can also be interpreted as involving some redistributive dimension. Also related are the papers by Horowitz (1993) and Grossman (1994) on land reform, where the ruling class chooses to redistribute some land to the poor in order to reduce the threat of appropriation of its property. In Horowitz, however, the probability of power changing hands is exogenous, so that the problem of armed *v.* unarmed peace does not arise. In Grossman (1994), the landlord redistributes land to deter banditry, but the model does not include the possibility for him of investing resource in deterrence. Nevertheless, this model comes close in spirit to the present one, insofar as it produces equilibria without any resources invested by the peasants in banditry, as a

response to some land redistribution, for some parameter values. Similarly, in Bourguignon and Verdier (2000), the ruling elite will redistribute wealth and power, in some cases, through education. The model is driven by a positive externality such that everybody benefits from a higher share of educated people in the population. It does not involve any violent conflict, but allows for a democratic ousting of the initial oligarchy.

This line of analysis is pushed further in Azam (2001) and Azam and Mesnard (2003) who bring out the role of the imperfect credibility of the government's commitment to redistribute in causing war, and give examples taken from sub-Saharan Africa. Commitment problems have also been emphasised independently by Fearon (1998), in the context of secession. In the same vein, Acemoglu and Robinson (2000) argue that the extension of the franchise in the West during the 19th century was a commitment device used by the rulers to prevent a revolution, by making redistribution in favour of the more numerous poor credible. However, this argument cannot be used in many developing countries, and in particular in sub-Saharan Africa, where social classes do not matter much, whereas ethnic rivalry is paramount. There, many examples suggest that majority rule may lead to a dictatorship in favour of one ethnic group, oppressing the others and threatening civil peace. Bratton and van de Walle (1997) show that many attempts at democratisation in Africa failed in the early 1990s because of the ethnic factor. They conclude that democratisation has rather undermined the credibility of the resulting governments. Senegal is one of the few operating democracies in Africa, and has been analysed by Schaffer (1998). The latter shows that the Wolof concept of *demokaraasi* does not translate accurately the western concept of democracy. The emphasis seems to be put on participation and consensus, rather than on competition for office. Azam (2001) discusses various commitment devices used by African governments. Roughly speaking, they mainly rely on the ruler's reputation for keeping its word, while institution building is probably the main challenge for developing a sustainable degree of credibility of the state's commitment. Sometimes, the government can use the pre-colonial social structure for enhancing its credibility. Boone (2003) shows for example how the Senegalese government exposed itself willingly to the influence of the Sufi brotherhoods, in its quest for social control.

The model presented here belongs to this line of research, and emphasises how the government's ability to commit credibly to its announced redistributive expenditures determines whether war or peace prevails in equilibrium. It is a contract-theoretic model, which brings out that the outbreak of a war may be due to commitment failure. Economic theorists are strongly divided about the validity of assuming commitment. Binmore (1994) argues that the ability of the players to commit credibly to some promised behaviour should not be assumed, but explained instead in a repeated-game framework. By contrast, the whole class of principal-agent models assumes that one of the players, i.e. the principal, will keep its word with probability one (Laffont and Martimort, 2002). Here, a middle way is chosen, assuming random commitment: with a given probability, the government will keep its word, like the principal in contract theory, while it will break it and play the simultaneous-move Nash-equilibrium strategy instead, by not delivering ex post, otherwise. Hence, the analysis is restricted here to the case of imperfect commitment by the government, described by the probability of the latter keeping its word. An attempt at making the credibility of commitment is presented in Addison and Murshed (2002), in a multi-period model based on reputation building. In Azam and Mesnard (2003) an alternative cause of civil war is also analysed, based on asymmetric information.

The model presented below also determines endogenously whether a military regime or a redistributive state will prevail in a peaceful equilibrium, as mentioned above. The new feature introduced here is the relative efficiency at producing of the two sides, which allows to deal explicitly with the "paradox of power" described above. This yields a crucial insight in the relationship between the relative affluence of the group in power and the type of government in place, which is particularly relevant for Africa. Beside its political interest *per se*, the government type matters for social welfare. From a utilitarian point of view, an efficient transfer does not affect social welfare, provided that there is no resource cost involved. By contrast, military deterrence requires the allocation of resources to non productive use. Therefore, the latter is more costly than a strategy based on redistribution. The model thus neglects the fact that in the real world, redistribution can take some inefficient forms, like over manning in public enterprises, or price distortions. However, this

stylisation captures the idea that this type of social costs are of the second order relative to those involved in a civil war. The model presented here shows why the social cost of government is minimised under a redistributive regime, which in turn prevails for intermediate values of the comparative advantage of the two groups. If the ruling group is too rich, or too inefficient at fighting, then civil war may occur, which is a costly outcome. If the opposite situation prevails, with a government run by too poor people, then a military regime prevails, with too little resources devoted to production. This model thus shows how output is related to the regime type, and thus in turn to the relative efficiency of the two sides at producing or fighting. This has interesting implications for aid policy.

Civil wars mainly occur in developing countries, and, since the end of the cold war, mainly affect the African continent. It is also the continent that is the most concerned by foreign aid. Although the latter accounts for a small and declining fraction of the developed countries' GDP, falling well below the UN objective of 0.7 % of GDP, it is still a crucial source of purchasing power for the recipient countries. A theoretical literature on aid policy has recently developed (Adam and O'Connell, 1999, Svensson, 2000, and Azam and Laffont, 2003). Therefore, the present framework also contributes to this line of research, by shedding some light on the way in which political economy considerations should be taken into account for devising aid policy.

3. The Model

There are two groups in the economy under study, indexed by *G* and *E*, for government and excluded, respectively. The model neglects the collective action problems that might prevent the formation of such groups in the real world, or affect their behaviour (see Kuran, 1989 and Noh, 1999, in the specific context of conflict theory, and of course Olson, 1965). In the case of Africa, these collective action problems are generally made irrelevant by the traditional ties that link the elite to their ethnic group of origin. An analysis of this mechanism is presented by Bates (2000). However, this control mechanism does not always function smoothly. Bates (1989) provides an analysis of the *Mau-mau* insurgency in Kenya, which killed many people in the 1950s, suggesting that it was triggered by a breakdown of the relationship between the

Kikuyu elite and its ethnic base. The resulting violence provides an extreme example of the enforcement mechanisms which are liable to maintain the unity of the ethnic groups, in some cases. The model presented here bypasses these issues, and assumes that each group behaves as a unitary agent. The forces that they engage in the conflict are denoted $F_G \geq 0$ and $F_E \geq 0$, respectively. The conflict technology is described by the probability p of the government being overthrown by the rebels, determined as follows:

- $p = 1$, if $\mu F_E \geq F_G$ and $F_G < \omega$, (1)
- $p = \psi$, $0 < \psi < 1$, if $\mu F_E \geq F_G \geq \omega$, (2)
- $p = 0$, if $\mu F_E < F_G$. (3)

The parameter μ represents the fighting efficiency of the rebel troops relative to the governmental ones. This may reflect both the warfare technology, more or less favourable to the government or the guerrilla, and more ideological weapons, like the degree of political mobilisation or the morale of the army or of the rebellion troops. This is assumed given exogenously in the present model, although Herbst (2000) has recently produced an illuminating political analysis of the means used by guerrilla leaders to enhance this efficiency, in Africa. Hence, the rebels are more efficient at fighting than the government army if $\mu > 1$, and less efficient otherwise. The parameter ω captures a scale effect in the defence technology of the government, such that a minimum level of defence expenditures is required, to avoid being ousted by any odd challenge otherwise. This way of modelling the technology of conflict is akin to the S-shaped probability function assumed by Skaperdas (1992). It entails some discontinuity in some behavioural functions, which allow some welcome simplification and a sharp characterisation of the different equilibrium types.

Given this warfare technology, the government can either fight with the excluded group, threaten to fight, or pay the price of peace, i.e. give away to the potential rebels a transfer equivalent to the expected value of their catch in case of war (Azam, 2001). Skaperdas (1992) notes that a transfer could settle the dispute by giving each contender the expected value of his take from the conflict. However, as mentioned in the introduction, what is not explained in most of the conflict literature is how unarmed peace can occur. The

present model shows how this is related to some implementation problems, for building the right institutional framework for an efficient peaceful state to be established, which are the focus of the present paper.

The game takes place in three stages:

(i) The government engages irreversibly F_G and offers to the excluded group the following contract: 'I give you $g \geq 0$ if you choose F_E such that $p = 0$ (i.e. $F_E < \frac{F_G}{\mu}$)'. However, because of the imperfect commitment technology available to the government, it is known that the transfer g will only be effected with probability λ, given exogenously, which measures the credibility of the government.

(ii) The excluded group chooses its forces F_E and the conflict takes place if $F_E \geq \frac{F_G}{\mu}$.

(iii) The transfer g is delivered with probability λ if the conflict was avoided, output comes to fruition, and the players get the payoffs described below.

Both the ruling group and the potential rebels allocate their labour endowments N_G and N_E, respectively, between production and military activity. In order to address the paradox-of-power issue, the productivity of the two groups is allowed to differ. The parameter $\alpha > 0$ is thus defined to measure the efficiency at producing of the excluded group, relative to the ruling one. Then, the output levels are:

$$Y_G = N_G - F_G \text{ and } Y_E = \alpha(N_E - F_E). \qquad (4)$$

Hence, the excluded group is more efficient at producing than the ruling one if $\alpha > 1$, and less efficient otherwise[1]. Moreover, in the real world, α would not depend only on the relative productivity of the two groups, but on relative prices as well. For example, in most coastal countries of West Africa, briefly described in the introduction, an increase in the price

[1] Treating as given the initial endowments assumes implicitly that there are no incentive effects of any taxation that the government could have to impose for funding either military expenditures, or redistributive ones. In turn, this assumes that producers cannot retreat into untaxable activity, including leisure. This is an acceptable approximation, if one considers that "Harberger triangles" are negligible relative to the wastage of resources involved in military expenditures or civil war. However, this aspect of government activity would have to be introduced in the analysis for applying the model to some extreme cases of predatory government.

of cotton relative to coffee or cocoa would increase the production efficiency of the northerners relative to that of the southerners.

The expected utility of the government is :

$$U_G = (1-p)(N_G - F_G) - \lambda g , \qquad (5)$$

Assume that $N_G >> \omega$ in what follows, to ensure that the government can afford the minimum defence level, while keeping some resources available for other uses. The government is facing the following budget constraint:

$$N_G - F_G - g \geq 0 . \qquad (6)$$

Let N_E denote the exogenous endowment of the excluded group. Its expected utility is then:

$$U_E = \alpha(N_E - F_E) + \lambda g + p(N_G - F_G) . \qquad (7)$$

This formulation captures clearly the stakes of the civil war, namely the transfer with probability p of the output produced by the remaining resources of the government to the excluded group. For further reference, it is useful to spell out the following definitions.

Definitions 1 : Denoting F_E^W and F_E^P, as the excluded group's forces in case of war and peace, respectively, and $p^W = 1$ if $F_G < \omega$ and $p^W = \psi$ if $F_G \geq \omega$, define

(i) the *price of peace* as λg, and

(ii) the *expected profit from war* as $p^W(N_G - F_G) - \alpha F_E^W$.

The former is the expected value of the transfer from the government in case of peace, while the latter is the expected value of the take from the government in case of war, net of the labour cost of fighting, evaluated at its opportunity cost. One can now prove the following:

Proposition 1 : (i) the excluded group accepts the social contract, with $F_E^P = 0$, if the following participation constraint holds :

$$\lambda g \geq p^W (N_G - F_G) - \alpha F_E^W , \qquad (8)$$

(ii) it wages the war, with $F_E^W = \frac{F_G}{\mu}$ otherwise.

Proof : In case of peace, the excluded group seeks to

$$\max U_E^P = \alpha (N_E - F_E^P) + \lambda g \; s.t. \; 0 \leq F_E^P < \frac{F_G}{\mu} ,$$

entailing $F_E^P = 0$, and in case of war, it seeks to :

$$\max U_E^W = \alpha (N_E - F_E^W) + p^W (N_G - F_G) \; s.t. \; F_E^W \geq \frac{F_G}{\mu} ,$$

entailing $F_E^W = \frac{F_G}{\mu}$. Then, $U_E^P \geq U_E^W$ implies (8). ***QED***

Condition (8) means that the price of peace must at least compensate the excluded group for the expected profit that it could get by waging the war, and which is foregone if peace is to be chosen by the potential rebels. It also hints at the social gain from peace, namely the resources saved from being engaged in the war by the excluded group, as the expected revenue $p^W (N_G - F_G)$ is essentially an involuntary transfer from the government. Moreover, it shows that the government is facing a trade off between promising more transfer or increasing its defence expenditures as a way to deter rebellion, after substituting the value of the rebels' forces in case of war from (ii) into (8). This assumes that the excluded group has enough manpower to meet the requirement for a meaningful fight, namely $N_E >> F_G / \mu$. This assumption is maintained in the following. The larger the forces engaged by the government, the lower the expected value of the transfer required to fulfil this participation constraint. This comes out clearly from writing the participation constraint as:

$$\lambda g \geq p^W N_G - \left(p^W + \frac{\alpha}{\mu} \right) F_G . \qquad (9)$$

Notice that the price of peace is thus a function of the comparative advantage of the excluded group at producing. For a given level of government forces, the price of peace is lower, the larger is the comparative advantage at producing of the potential rebels. This captures two potential effects. If the two sides are equally efficient at fighting as each other,

then a higher productivity of the excluded group's labour increases the opportunity cost for the potential rebels of devoting more soldiers to the rebellion. Otherwise, if the two sides have the same productivity, the same result may happen if the relative efficiency at fighting of the government's forces is larger, as this forces the potential rebels to engage more forces in the fight, if it wishes it to happen, with a negative impact on the expected profit from war. This similarity of effects explains why it is the comparative advantage of the excluded group that matters, and not the absolute advantage in either of these activities.

In order to proceed further, we need the following lemma:

Lemma 1 : The government chooses $F_G \geq \omega$, and thus $p^W = \psi$, in all cases.

Proof : See appendix.

The intuition for lemma 1 is straightforward: if the government does not engage at least this minimum level of forces, then its expected gain is zero, while if it does, the budget constraint ensures that the remaining resources are non negative. Using lemma 1 allows to write the rebels' participation constraint in the peaceful equilibrium as:

$$\lambda g \geq \psi N_G - \left(\psi + \frac{\alpha}{\mu}\right) F_G . \tag{10}$$

Examination of (10) shows that the threat of civil war vanishes trivially unless:

$$\omega < \frac{\psi N_G}{\psi + \alpha / \mu} . \tag{11}$$

Then we can characterise the possible strategies chosen by the government for maintaining peace as in definitions 2:

Definitions 2 : (i) a *redistributive state* is a government that chooses $F_G = \omega$, thus relying mainly on redistribution, and (ii) a *military regime* is a government relying on a higher level of defence expenditures for deterring rebellion.

However, the government is not necessarily able, or willing, to maintain peace, as shown in the next section.

4. The Typology of Political Regimes

This section analyses first how the imperfect credibility of the government promise to redistribute part of its resources can lead to a civil war, defined as is standard in the conflict literature by the fact that the two sides are armed, rather than just the government, and that the latter has a positive probability ψ of being overthrown. It then shows how the government's level of credibility interacts with the comparative advantage of the two groups at fighting or producing for determining the type of political regime prevailing in equilibrium.

Definitions 3 : (i) A *feasible* social contract is a pair $\{g, F_G\}$ such that both the participation constraint (10) and the budget constraint (6) hold simultaneously. This requires:

$$\lambda \geq \psi - \frac{\alpha F_G}{\mu(N_G - F_G)}. \tag{12}$$

(ii) A social contract is *desirable* for the government if :

$$(1-\psi)(N_G - F_G) + \frac{\alpha F_G}{\mu} \geq (1-\psi)(N_G - \omega). \tag{13}$$

Notice that (12) is trivially satisfied if $\lambda \geq \psi$. Credibility problems may thus arise only when the probability of toppling the government by a civil war is higher than the probability of the government keeping its promise of a transfer in case of peace. Then, the government must compensate this credibility gap by increasing its defence expenditures, for reducing the expected profit from war for the potential rebels. The left-hand side of (13) is the expected resources left to the government after promising the minimum transfer required to ensure peace, while the right-hand side is the expected resources left in case of war. This condition holds trivially if $\alpha / \mu \geq 1 - \psi$, or if $F_G = \omega$. Otherwise, it requires:

$$F_G \leq \frac{(1-\psi)\,\omega}{1 - \psi - \alpha/\mu}. \tag{14}$$

Condition (14) gives the maximum value that the government is prepared to invest in defence, when μ is relatively large. Beyond that level, it is cheaper to go for a war. Define

F_{GMax} as the right-hand side of condition (14), noticing that it is larger than ω when $\alpha/\mu \leq 1-\psi$. Notice that this ceiling on the government's desired defence expenditures is independent of its initial endowment. This reflects the countervailing impact of the latter on the expected gain of the excluded group in case of war, which determines the price of peace, and the government's expected loss in case of war.

These conditions determine jointly the opportunity set within which the government chooses the social contract offered. It might be empty for some values of the parameters. In this case, civil war is the only option left. Figure 1 depicts a case where, given F_{GMax} and the other parameters, there exists a range of values of $\lambda < \lambda_{Min}$ such that there is no social contract that is both feasible and desirable. The downward sloping curve is the feasibility frontier, i.e. the minimum value of λ such that (12) holds. The vertical line represents the maximum value of F_G such that desirable contracts exist, i.e. such that (14) holds. These curves partition this space in four zones, corresponding to social contracts that are feasible (above the feasibility frontier) or not, or desirable (to the left of F_{GMin}) or not. Their intersection determines λ_{Min}, below which a civil war breaks out, as no feasible social contract is then desirable for the government. This result may be stated formally as in proposition 2.

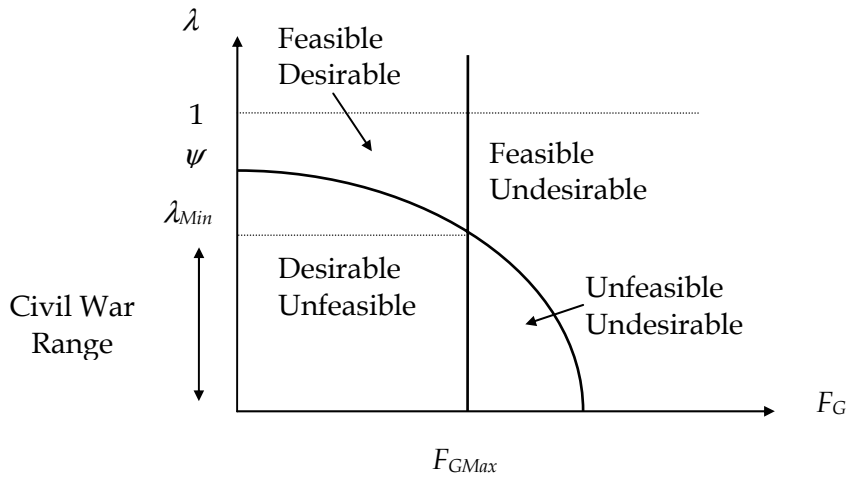

Figure 1: Determination of the Civil War Range

Proposition 2 : If $\alpha/\mu < 1-\psi$, the civil war breaks out if :

$$\lambda < \lambda_{Min} = \psi - \frac{\alpha F_{GMax}}{\mu(N_G - F_{GMax})} \ . \qquad (15)$$

Peace prevails otherwise.

Proof : Conditions (12) and (14) must hold jointly in order for peace to be chosen by the government, while (15) makes this impossible. If $\alpha / \mu \geq 1 - \psi$, the social contract is always desirable to the government. ***QED***

The intuition for this result is that low credibility makes the level of transfer required for peace very costly to the government, inducing the latter to move along the trade off identified at equation (9), and to rely on higher defence expenditures. Beyond a point, the latter become more costly than accepting the risk of a civil war. Otherwise, when the credibility of the government makes the set of feasible and desirable contracts non empty, it will choose either $F_G = \omega$, or the point on the feasibility frontier corresponding to the given value of λ, whichever is the largest. This strategy minimises the cost of maintaining peace.

Now, define λ_ω as the minimum value of λ that satisfies (12) with $F_G = \omega$. It is thus the minimum degree of credibility that the government needs to have for a peaceful outcome based on redistribution to exist. Then, if $\lambda_\omega > \lambda \geq \lambda_{Min}$, the government is constrained to rely on a larger level of military expenditures to ensure peace. In this case, the government is combining defence expenditures above ω with some redistribution. Call this the mixed military regime, by contrast with the pure military (or praetorian) regime, where $g = 0$.

These different types of equilibria can be organised in a typology, showing how they result from the same model, for different combinations of parameter values. The latter determine the type of government which is ruling in peaceful equilibria, or the occurrence of the civil war. This typology thus spells out what the "paradox of power" looks like in this model. In particular, it aims at identifying the different types of political regimes that are entailed by different values of the comparative advantage of the two groups at producing or fighting, as well as by the government's level of credibility.

We can now characterise further the set of social contracts prevailing in peaceful equilibria as follows:

Proposition 3 : (i) A redistributive state is in operation if $\lambda > \lambda_\omega$ and $\alpha/\mu < 1-\psi$;

(ii) a military regime prevails if either :

(a) $\lambda_\omega > \lambda \geq \lambda_{Min}$ and $\alpha/\mu < 1-\psi$,

then $F_G = \dfrac{(\psi-\lambda)N_G}{\psi-\lambda+\alpha/\mu}$ and $g = \dfrac{(\alpha/\mu)N_G}{\psi-\lambda+\alpha/\mu}$, or

(b) $\alpha/\mu > 1-\psi$, in which case $F_G = \dfrac{\psi N_G}{\psi+\alpha/\mu}$ and $g = 0$, or

(c) $\alpha/\mu = 1-\psi$, in which case $F_G \in \left[\omega, \dfrac{\psi N_G}{\psi+\alpha/\mu}\right]$.

Proof : In case of peace, if $\lambda > \lambda_{Min}$ the government solves :

$$\min_{g,F_G} \lambda g + F_G \text{ s.t. } \lambda g \geq \psi(N_G - F_G) - \frac{\alpha F_G}{\mu} .$$

Then (i) and (ii.b) and (ii.c) follow immediately, knowing proposition 2. Case (ii.a) follows from the discussion above, taking condition (12) into account, with $\omega \leq F_G \leq F_{GMax}$. ***QED***

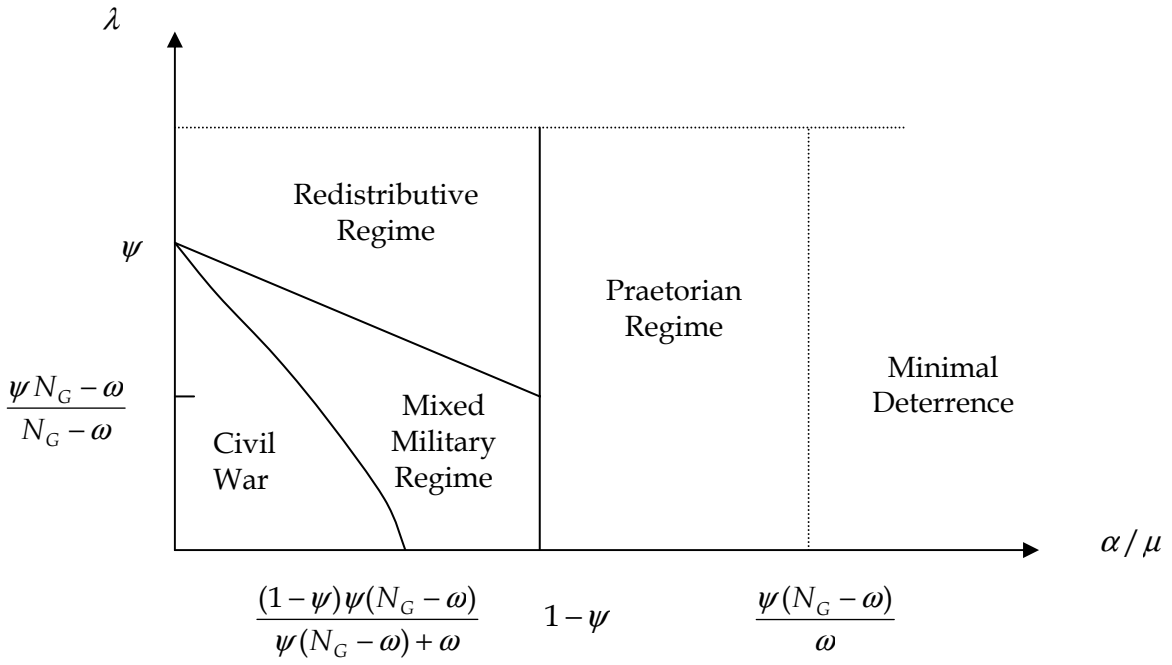

Figure 2: Typology of Equilibria

Figure 2 summarises proposition 3, by partitioning the (λ, α/μ) space. The two downward sloping curves represent respectively the λ_ω and the λ_{Min} frontiers, the former

lying entirely above the latter. Between these two curves we have a military regime corresponding to case (ii.a), where the government is constrained by the feasibility constraint, and combines redistribution with military deterrence. This is called the mixed military regime. The upper borderline is linear in α/μ. Above it, the government has enough credibility to maintain peace by offering the social contract described above. Notice that no redistributive regime is possible if credibility is too low, as (11) entails that $\psi N_G > \omega$ when $\alpha/\mu = 1-\psi$. Hence, the borderline between the redistributive regime and the mixed military regime cuts the vertical line at 1-ψ strictly above the horizontal axis. Below the λ_{Min} frontier, the government cannot afford peace, and the civil war breaks out. Civil war is thus predicted to erupt when two conditions are fulfilled: (i) the government lacks credibility in its promise to pursue a public expenditure policy with a strong redistributive content, and (ii) the group in power has a comparative advantage in production, while the excluded group has a comparative advantage in fighting. Hence the ruling group has the resources for transferring resources to the excluded group, and is quite willing to do it. But it is prevented from doing so by its lack of credibility. In all the other regimes of this model, the excluded group is unarmed. This is at variance with most of the models in the conflict literature.

The vertical line on the left represents the borderline between the set of $\{\lambda,\ \alpha/\mu\}$ pairs for which a pure military (or praetorian) regime prevails and the redistributive state zone, corresponding to case (ii.c). This vertical line captures the fact that the praetorian government does not need any credibility at all, as it does not rely on any type of redistributive policy. To its right-hand side, we have a military regime proper, corresponding to case (ii.b), without any redistribution at all (g = 0). This is the pure military regime, i.e. the praetorian one. It can be subdivided in two sub-regimes, as $F_G = \omega$ when $\alpha/\mu \geq \psi(N_G - \omega)/\omega$. Hence, beyond this point, the government spends the minimum on defence, and nothing on redistribution. It can afford this expenditure policy because in this case the opportunity cost of labour is too high for the excluded group to attempt any insurgency, while the government's army is too strong (or the opposition too weak) to make deterrence expensive. This minimal deterrence regime thus describes a case where specialists in violence are ruling over a country of harmless producers. In the two other cases of

peaceful equilibria, on the left of $\alpha/\mu = 1-\psi$, some redistribution occurs, in order to fulfil the excluded group's participation constraint.

As a casual test of the relevance of this framework, one may look at some episodes of the recent African history. For example, the civil war erupted in Chad in the mid-1970s, when the drought had decimated the herds of the northern herdsmen. At the same time, the 1974 oil shock triggered a wave of prospecting for new reserves by the major oil companies. They found some quite large reserves in southern Chad, south of the Shari river. The civilian government led by Tombalbaye was eventually overthrown by the insurgent northerners, after a massive bloodshed. This may be viewed in the terms of figure 2 as the result of a fall in the relative efficiency at producing of the excluded group, moving α/μ far enough to the left so as to lead the economy into the civil war zone. Another example is provided by the case of Côte d'Ivoire in the late 1980s. When the prices of coffee and cocoa collapsed at the end of 1987, reaching a prolonged trough, the civilian regime led by Houphouët-Boigny stepped up massively its military expenditures, increasing in particular the number of soldiers, which he had traditionally kept below 5000. His well-known catch phrase used to be before this change: "no soldiers, no coup". This move would be interpreted in the present framework as the result of a rightward shift in figure 2, turning a redistributive regime into a praetorian one. Within the present framework, this would not reveal any change in political ideology, but simply a fall in the ruling group's relative efficiency at producing.

The typology emerging from figure 2 rests on the means used for maintaining peace, or the failure to do so. It defines the political regime by a kind of political tree rooted in conflict, with a war/peace node leading to a redistribution/deterrence one if the latter prevails. Other typologies are used in the literature, especially in political science. For example, Bratton and van de Walle (1997) provide a typology of African regimes before the wave of democratisation of the 1990s using two criteria: participation and competition. Their emphasis is thus put on how far is each government from a full democratic regime, which would both ensure competitive elections and political participation of a large part of the people. Here, we are looking for deeper parameters, as we regard the type of policies pursued as a function of the comparative advantage of the groups at fighting and at

producing. However, it is clear that the praetorian or mixed military regimes are not likely to be democratic at the same time. One could nevertheless observe such a regime where democracy prevails within the ruling group, while deterrence is used to keep the excluded one at bay. In the days of apartheid, South Africa was close to such a system. The present typology does not necessarily assume that a redistributive regime is democratic. What Bratton and van de Walle (1997) call "inclusionary authoritarianism" could as well fit in this category. Moreover, the present typology does not clarify how the group in power got to that position. One obvious way is through a war that took place in the past. However, the model does not explain how governments are changed within the peaceful regimes. One can assume that coups are the privileged method of taking over in the praetorian or mixed military regimes, with young military officers overthrowing older ones, within the same ruling group.

To each of these political regimes is associated a different level of social welfare. In order to show this, one can look at the social loss entailed by military expenditures. It is natural to define it as follows, weighting the forces from either side by their respective productivity:

$$L = F_G + \alpha F_E . \qquad (16)$$

This way of estimating the social cost of warfare probably underestimates the real cost of war. It neglects one of the dominant costs of real-world wars, namely violence against civilians. The latter has been analysed by Azam (2002), who focuses on looting and warlord competition, and Azam and Hoeffler (2002), who model the military objectives of terrorising civilians, and the ensuing flow of refugees.

Nevertheless, this conservative welfare measure allows to establish easily the following proposition.

Proposition 4: The social cost of government is minimal in the redistributive regime;

Table 1: The Forces Engaged in Each Regime

	F_G	F_E
Praetorian Regime $\alpha/\mu > 1-\psi$	$\frac{\psi N_G}{\psi+\alpha/\mu} > \omega$	0
Redistributive Regime $\alpha/\mu < 1-\psi$	ω	0
Mixed Military Regime	$\frac{(\psi-\lambda)N_G}{\psi-\lambda+\alpha/\mu} > \omega$	0
Civil War	ω	ω/μ

Proof: Proposition 4 is easily proved by comparing the social cost of government in the different regimes. Table 1 represents the level of military expenditures by the two groups in the different regimes. Almost by definition, it is only in the civil war regime that the excluded group engages a strictly positive level of forces. Otherwise, the social cost of government is entirely driven by the level of forces engaged by the government only. It is immediately apparent that the redistributive regime is the one that entails the lowest social loss, as the excluded group remains unarmed, while the government spends just the minimum requirement to remain in power with some non zero probability. All the other regimes entail a higher social cost of government, except for the limit case of minimal deterrence. In the case of the civil war, the additional cost is that of the forces engaged by the rebels. In the two peaceful military regimes, the additional cost is due to the substitution of higher military spending to the transfer of resources in favour of the excluded group. While the former entails a resource cost, as labour is diverted away from production, the latter only entails a socially costless transfer. Hence, a switch from the redistributive state to the military government entails necessarily an additional social cost. Alternatively, this result may be interpreted as pin pointing the social value of redistribution in favour of the excluded group. ***QED***

The type of effects captured by table 1 is not rejected by the econometric results presented by Azam *et al.* (1996). They find that redistributive expenditures like health and education have a negative impact on political risk, and a positive one on growth, while military expenditures have a negative one on the latter. Table 1 presents similar effects, albeit in a discontinuous framework. In the real world, redistribution may at times take a more wasteful form than the simple transfers taken here into account. Over manning in parastatals, price distortion, rent-seeking, etc. involve a higher social cost than a pure transfer. However, these costs are plausibly benign relative to the social cost of military spending or civil war.

Proposition 4, as well as figure 2, has interesting implications for aid policy.

5. Implications for Aid Policy

As mentioned in the introductory section, civil wars occur mainly in developing countries, while the latter are, almost by definition, the main recipients of foreign aid. It is therefore interesting to derive from the present model its implications for aid policy. In this theoretical framework, aid can take several forms.

The first type of aid which has been traditionally discussed in the literature is unconditional aid, i.e. a transfer to the government without any conditions being attached to its use. Many types of paradoxes have been brought out about this in the literature, and proposition 5 below is probably just adding one to this long series. It is straightforward to derive the impact of a transfer from abroad by treating it as an exogenous increase in the government's initial endowment. One then proves easily the following proposition.

Proposition 5: An unconditional increase in N_G

(i) increases the set of values of α/μ for which the civil war occurs,

(ii) increases proportionately the level of defence expenditures in the two types of military regimes,

(iii) increases the price of peace in the redistributive regime or the mixed military regime.

Proof: From proposition 3, we know that F_G is proportional to N_G in the two types of military regimes, from which (ii) follows immediately. The same proposition also states that g is proportional to N_G in the mixed military regime. From (10) and 2 (ii), we also know that g is increasing in N_G in the redistributive regime, which completes the proof of (iii). Differentiating the definition of λ_{Min} from (15), after substituting from (14) for F_{GMax}, proves (i) by showing that the former shifts upwards, i.e. rotates counter-clockwise about the point $\{0, \psi\}$. ***QED***

While points (ii) and (iii) of proposition 5 are intuitively obvious, point (i) needs a comment. It is useful to refer to figure 1 for building an intuitive interpretation. When the government's endowment increases, the feasibility constraint (12) shifts out, or more precisely rotates counter-clockwise. This reflects the increased value of the expected catch that the excluded group may hope to get from a war, and thus its more demanding participation constraint. However, we have noticed above that the maximum level of defence expenditures that the government is willing to engage is independent of its endowment, because the latter affects the price of peace and the expected loss from war in a countervailing way. Hence, the vertical line in figure 1 does not shift. This is why point (i) can be established unambiguously, despite the relaxation of the government's budget constraint entailed by the unconditional aid flow.

Notice that this result rests on the implicit assumption that the aid flow would not be interrupted in case of war, if the excluded group was taking over. It could thus be mitigated if a credible condition could be attached to it, promising to cut the aid flow in case of war. However, this is hardly convincing from the point of view of realism. During cold war, aid was coming by one side or the other, especially in case of war. In the today's real world, post-conflict situations are certainly one of the cases where the delivery of aid is the most certain to come. In fact, it was in such a case that modern aid policy was invented, when the Marshall Plan was implemented for helping Western Europe to reconstruct in the wake of World War 2. Ethiopia and Mozambique, in modern days Africa, provide more recent examples of the aid wave that follows generally the end of a civil war.

This result suggests that some form of conditionality should be attached to aid, as in Azam and Laffont (2003). However, as shown by Svensson (2000), this type of contracts between the donor and the local government raises as well some serious credibility problem. A simple way out in the present framework is to return to the old-fashioned type of project-aid, whereby the donor is funding a particular project. Here, the project would have to be targeted at enhancing the initial endowment of the excluded group N_E, without affecting the government's endowment N_G. In Africa, this type of targeting is very simple to implement, as the different groups have a strong geographical definition. For example, in Zimbabwe, the money should be spent in Matabeleland, and in Chad it should target the Sara country, south of the Shari river. In Côte d'Ivoire, it should be targeted at the north of the country, mainly in the Mande area. As a corollary to this result, proposition 5 implies that the aid flow should be mainly targeted at the defeated side, in a post-conflict situation. However, there is a participation constraint to be taken into account, as a sovereign state can reject the offer of foreign aid (see Azam and Laffont, 2003). Hence, a small transfer would probably be needed to induce the government to accept the aid flow.

However, such a conditional aid transfer certainly falls short of the kind of impact that can be aimed at by contracting for aid. The main point for it is that it does not increase the risk of war, or the level of military expenditures in case of peace. A more ambitious policy could be devised for making aid more powerful. Among the traditional tools used by former colonial powers, we find many examples of countries which signed a treaty of military assistance. This was especially common during the cold war, as foreign powers were supporting aligned governments militarily, while turning a blind eye on their behaviour. In the present theoretical framework, this can be interpreted as an action that reduces the value of ψ and μ. A glance at figure 2 shows that this can reduce the risk of war, in the relevant part of the parameter space. In other words, there exists a non-empty set of parameter values for which external military support enhances the chances of a redistributive state to prevail. We know from proposition 4 that this is a way of maximising social welfare, by minimising the cost of government to the country. This might explain why the end of the cold war was greeted by the eruption of several civil wars in various republics of the former Soviet Union,

as well as in several parts of Africa, as the military support of the foreign power lost credibility. For example, General Gueï correctly anticipated that the French troops present in the country would not intervene when he launched his successful coup against the civilian president Konan-Bédié of Côte d'Ivoire in 1999. Similarly, in the same country in 2002, the mutineers from the north correctly foresaw that the French would not move beyond defending the French residents and other expatriates from developed countries, with some help from the US army. However, the reduction in μ might also turn the regime into a praetorian one, if it goes too far, which is not a desirable outcome from a welfare point of view. Hence, regarded as a policy towards economic development, military assistance should be handled with care, and requires some fine tuning depending on initial conditions. Moreover, there might exist some asymmetric information problems, as discussed by Murshed and Sen (1995), in the context of a model where aid is used as an incentive for demilitarisation.

A more sophisticated type of conditional aid can be devised in the present theoretical framework, aiming at changing the comparative advantage of the ruling group at producing and fighting, i.e. at changing α/μ, or at changing the government's credibility λ. These parameters would admittedly change quite slowly in the real world, while the aid relationship can also be predicted to last for several decades to come. Figure 2 helps to understand how the conditionality should be targeted depending on the initial political regime. Faced with a praetorian regime, for example, the donor community should aim at increasing the comparative advantage at producing of the ruling group (i.e. reducing α/μ), if the government's credibility λ is high enough. This could be achieved either by education and training aimed at improving their productivity, or by reducing their comparative advantage at fighting. If credibility is too low, the donor community could enhance it by pledging to deliver the price of peace g with a high probability, conditional upon war not breaking out. The donor could use tied aid as a method for making the latter condition credible, for overcoming the problem discussed by Svensson (2000). Other actions could be taken for strengthening the government's credibility through institutional development, by helping to develop checks and balances. Notice that these actions should be undertaken

without increasing too much the initial endowment of the government, for the reasons discussed above. Therefore, measures aimed at increasing the capacity of the excluded group to mobilise, by strengthening civil society and empowering minorities, should be favoured, insofar as they increase μ. Due attention should be paid in this case to the government's participation constraint.

The other cases can be treated along similar lines, using figure 2 for identifying the direction in which the $\{\lambda, \alpha/\mu\}$ pair should be changed, as a function of the government's type. Moreover, it is straightforward to extend the analysis of aid policy by assuming that the donor is not only interested in delivering aid for optimising output, by minimising the social cost of government as assumed above, but also has preferences over the political regime. Let's hope that it prefers the redistributive regime to the military ones, or to civil war.

6. Conclusion

Therefore, the foregoing analysis leads us to qualify the "paradox of power", described in the introduction. Although the present model gives to the comparative advantage of the two sides in production or fighting a central role, as in Hirshleifer's seminal analysis, its effects are more complex in the present model. First of all, the latter shows that the type of equilibrium analysed in the conflict literature, where the two sides own a stock of weapons, results from a specific implementation problem. It only prevails if the government lacks the credibility to offer a social contract that gives the excluded group as much as what it could hope to get by fighting, or cannot accumulate enough weapons to make the challenge worthless.

In case of peace, defined by the fact that the government has the monopoly over the control of weapons, the present model predicts that the political regime in place depends on the comparative advantage of the two sides at fighting or producing. When the excluded group has a comparative advantage in production, resulting either from a high efficiency at producing or a low one at fighting, then the praetorian regime prevails. The government thus relies on military deterrence when the poor are in power, and the rich are maintained at bay in this fashion. This fits quite well with the experience of West Africa mentioned in the

introduction. When the rich are in power, defined as those with a comparative advantage in production, for a given fighting efficiency, the outcome is more uncertain. If the government has a credible commitment technology, then it relies on redistribution for staying in power. It pays the price of peace, by giving to the potential rebels the equivalent of the expected value of what they would be able to grab by launching an insurgency against the government. This fits quite well with the experience of civilian governments in many developing countries, where patronage and corruption are widespread, as well in some cases as broad-based public expenditures for growth and poverty alleviation. This is interpreted within the present framework as a method for paying the price of peace. However, if the government's credibility falls low enough, then it is forced to blend its redistributive policy with more and more military deterrence, as its credibility falls. Beyond a point, peace-keeping becomes too expensive, and the civil war is the preferred outcome. Then, the two sides get simultaneously armed, entailing a waste of resources. In this model thus, the decision to go for a war is always made by the government. It is maximising its own payoff, given the credibility constraint.

Moreover, the welfare analysis of these different equilibria brings out that the redistributive regime is socially less costly than the other ones, be they peaceful under a military regime, or at war. The main advantage of a redistributive regime over a military one comes from the fact that a transfer does not reduce output, while military expenditures involve the diversion of productive labour. However, the government is not necessarily in a position to choose such a political regime. This requires that a credible commitment technology is available to the government, and that the comparative advantage of the excluded group be neither too high nor too low in either direction. Only a highly credible government can maintain peace when the excluded group has a strong comparative disadvantage at producing output.

This analysis allows discussing aid policy, adding a political economy dimension to the current literature. It shows as usual that unconditional transfer is not an advisable policy. The most striking effect of such a policy in the present framework is to increase the risk of war, by expanding the set of parameter values for which civil war occurs. It also shows that

unconditional aid would tend to increase military expenditures in some cases. Some rehabilitation of the old-fashioned concepts of project aid and military assistance is also coming out of this theoretical framework. At a more sophisticated level, this model shows that aid policy should be tailored according to the political-economic characteristics of the countries, and that the ruling group and the excluded group should not necessarily be treated equally. As much as possible, aid policy should aim at combining a policy for enhancing the credibility of the government, and at affecting the comparative advantage of the two groups. In all cases, increasing the endowment of the ruling group should be restricted to the minimum required for satisfying its participation constraint, as any sovereign government is in a position to reject aid.

This result shows the way for further research, which should aim at explaining what type of commitment devices are available to the governments of the different types of countries of the world. While the Acemoglu-Robinson (2000) analysis has brought out the role of the universal franchise for countries divided along class lines rather than by ethnic groups, more analysis is required for the others. Azam (2001) discusses verbally this issue, with several examples, but a lot of analytical work, as well as of case studies, is certainly required if we want to understand how the shadow of ethnic war is to be dispelled, for clearing the path to growth and development in these countries. Political scientists have already analysed how governance is about conflict management in many countries (e.g. Zartman *et al.*, 1997), and have documented how power-sharing and patronage are prominent features of many political regimes. However, economists still have to spell out in more analytical terms what makes a redistributive policy credible in different types of countries.

Appendix

Proof of lemma 1.

(i) In case of war, the government seeks to :

$$\max_{F_G} U_G^W = (1 - p^W)(N_G - F_G)$$

$$\text{s.t.} \qquad p^W = 1 \text{ if } F_G < \omega \text{ and } p^W = \psi \text{ if } F_G \geq \omega \ ;$$

then it chooses $F_G \geq \omega$ and $p^W = \psi$ as $N_G > \omega$.

(ii) In case of peace, neglect first the budget constraint. Then, the government seeks to :

$$\max_{F_G} U_G^P = N_G - F_G - \lambda g$$

$$\text{s.t.} \quad \lambda g \geq \psi(N_G - F_G) - \frac{F_G}{\mu} \text{ if } F_G \geq \omega \text{ and } \lambda g \geq N_G - F_G - \frac{F_G}{\mu} \text{ if } F_G < \omega .$$

Then, $U_G^P = (1-\psi)(N_G - F_G) + \frac{F_G}{\mu}$ if $F_G \geq \omega$ and $U_G^P = \frac{F_G}{\mu}$ if $F_G < \omega$. So, it will choose $F_G \geq \omega$ as $N_G - F_G \geq g \geq 0$, by the government's budget constraint. ***QED***

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