ON THE ECONOMIC MOTIVATION FOR CONFLICT IN AFRICA

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Abstract

Conflict is not a new phenomenon in Africa - the last three decades have seen many civil wars and coups d'etat - but the last ten years or so have seen a disturbing escalation in the violence, which increasingly crosses borders**.** Conflicts are a complex phenomenon, but one feature does stand out: economic factors play a large role in determining the actions of actual and potential belligerents. In particular, contests over natural resource wealth are prevalent. War provides economic and political opportunities that cannot be achieved during peace. Consequently, belligerents may prefer periods of low-intensity conflict to either total war or peace.

1. Introduction[*]

Conflict prevention is one of the most urgent tasks facing the international community, as recent events in Angola, Sierra Leone, and the Democratic Republic of the Congo (DRC) demonstrate. But because conflict is such a complex issue, it is important to identify the core problems that underlie the incentives of actual and potential belligerents. Motives include both greed, when substantial natural resource rents are involved; and grievance, especially when poverty or horizontal inequality across regions and ethnic groups is high (see Collier and Hoeffler, 1999, 2000; de Soysa, 2000). Greed often appears in the guise of grievance, and the two can interact in a vicious cycle. Our purpose in this paper is not to survey conflict in all its complexity, but rather to focus on the important issue of incentives: specifically the pay-offs from peace and war.

2. Economic Motivations for Conflict

2.1 A Model

In our model, there are two parties to the conflict: the government, *G*, and the rebels, *R*. The government's utility is denoted by *U* and the rebel's utility is given by *V*. There are two states of nature: one more peaceful (*P*) and the other associated with greater

[*] We are grateful to Ali A Ali, David Bloom, Ibrahim Elbadawi, participants at the March 2000 World Bank-Princeton University workshop on conflict, as well as participants at a seminar in the Kennedy School of Government (Harvard), for their comments on a longer version of this paper (Addison, Le Billon, and Murshed, 2000).

conflict (*C*), with probabilities π and 1 - π, respectively. Note that in our model, the states of conflict, or peace, are *relative*. Peace, in some circumstances, can be associated with low-intensity warfare or a temporary cease-fire (Angola is an example—see Le Billon, 1999).

The probability of either state is in turn affected by an action (*a*) by the government and effort (*e*) by the rebels. These are also the strategic variables employed by the two sides to the conflict. The probability of the good (peaceful) state π rises with the input of action and effort by the two sides, but at diminishing rates. These actions or efforts are drawn from a continuum of peacefulness (all out war occurs when $\pi = 0$).

In this way, we capture situations in which belligerents may prefer low-intensity conflict to total war. One can imagine a range of activities by one or both sides if they wish to promote peace, including a greater willingness to compromise, devote resources to peaceful economic development, or a greater willingness to respond to calls for peace by third-parties such as the UN or the OAU.

Efforts to seek peace entail costs for each party—monetary expenditures, measures to increase security, or redistributive public finance reform (in the case of the government side)—and these enter as negative values in the respective utility functions. To capture the contest over natural resource wealth, we introduce war booty (*B*) into both sides pay-off or utility from belligerency. The more booty is available, the less likely is the belligerent to seek peace. Booty can take the form of natural resource rents, although in the cold war era it could have included aid to belligerents.

The expected utility of the government side is given by

$$U = \pi(a,e)U^P(T) + (1-\pi)(\cdot)U^C(F + B^G) - C(a) \qquad (1)$$

Where U^P and U^C denote utilities or pay-offs in peace and conflict respectively, weighted by the probabilities of the two states. Payoffs are exogenous whereas the strategic choices are endogenous. T is the revenue obtained by government in peacetime (and could also include foreign aid). F is the pay-off during war, and B^G stands for any booty accruing to the government. C is the cost function of undertaking the action, a, which increases the probability of peace, π. Note that the pure pay-off or utility in a state of war, F is less than in times of peace, T due to the cost of making war.[1]

Turning to the rebel side, we have

$$V = \pi(a,e)V^P(D) + (1-\pi)(\cdot)V^C(S + B^R) - \theta E(e) \qquad (2)$$

V^P and V^C denote the rebel's utilities in peace and conflict respectively, weighted by the probabilities of the two states. D is the income obtained by the rebels in peacetime and S is the pay-off during war which may be supplemented by war booty, B^R, $D > S$. E is the cost of effort, e, which increases the probability of peace, π.[2] A shift

[1] Also, $\pi_a > 0$, but $\pi_{aa} < 0$. Both $C_a > 0$ and $C_{aa} > 0$.
[2] Also, $\pi_e > 0$, but $\pi_{ee} < 0$, $E_e > 0$, and $E_{ee} > 0$.

parameter, θ affects the rebel cost function ($0 < \theta < 1$). A rise in θ could be caused by an increase in poverty or a greater perception of injustice; it serves to increase the cost of peaceful effort and raises the belligerency of rebels. The parameter θ could also reflect the income gap between the government and rebels.[3]

The nature of the non-cooperative or Cournot-Nash game played by the two sides involves a two-stage process. In the first stage the pay-offs or utility levels from the two states of nature to both sides are determined. During the second stage the strategic choices regarding levels of *a* and *e* are made. Both sides move simultaneously. Equations (1) and (2) provide the basis for deriving reaction functions, shown in Figures 1 and 2.

[Insert Figure 1 here]

[Insert Figure 2 here]

The non-cooperative solution to the model generates moral hazard. From the viewpoint of domestic non-combatants and the rest of the world, the actions and efforts by the governments and rebels are not always observable or verifiable. Also, neither side has the incentive to engage in globally optimal levels of action or effort. Since the moral hazard is found in both parties, we have double moral hazard (see Murshed and Sen, 1995). In both Figs. 1 and 2, the non-cooperative solution associated with moral hazard is given by point N. The fully cooperative and Pareto optimal solution is illustrated at point C.

[3] Note we rule out situations where $T + D$ = national income, as the government and rebel sides are not

Also, in Fig. 2, when the strategies are substitutes we have an additional 'equity' problem. In the non-cooperative equilibrium (point N) the government has effectively passed on some of the burden of adjustment to the rebels. In fact the level of effort exercised by the rebels is greater than in the cooperative solution. We could say that the government is free riding on the rebels. The positions could equally be reversed, so it was the rebels who were passing on the burden of action to the government. The elimination of double moral hazard requires the design of a mechanism that induces cooperation and transparency.

What if one side, say the government, acts as a Stackelberg leader, as discussed in Azam (1995)? This means that the leader takes the follower's reaction function into account, and the leader's utility function is made tangent to the follower's reaction function. A variety of multiple equilibria are possible under Stackelberg leader-follower situations. We depict some of the possibilities by the point S in Figs. 1 and 2. These are associated with Pareto improvements on Cournot-Nash behaviour. But this is not necessarily always the case, as a variety of equilibria are possible. In Azam's (1995) model a Pareto improvement does occur, but in a very specific setting. The government is in a position to pay the opposition a bribe, in the form of an unrequited fiscal transfer. This could also be easily construed as a power sharing agreement (the outcome in Sierra Leone in 1999) or the promise of future income through the political power gained by participating in multi-party elections after a formal peace agreement (the incentive implicitly offered to Mozambique's rebels, Renamo, to make peace in 1992). But it could also take the form of privatizing an asset in favour of the

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the sum total of society.

rebels: the aborted proposal for privatizing Angola's state diamond-mining company in favour of UNITA is one example (Addison, 1998).

For the government the alternative to not ruling is simply ceasing to exist. By contrast, the opposition is faced with two outcomes: either acquire power (become the government) by force of arms, or alternatively receive the transfer from the government in a state of rebellion. In this situation, it might pay the government to move first as a Stackelberg leader, precisely because it has this gift in hand, which in turn lowers the probability of its own extinction. This, however, may not always be the case especially because commitments made by the government are not *credible* or time consistent given the government's past reputation. If the government is not in a position to make a credible fiscal transfer to the rebels (or to offer a power sharing agreement), Cournot-Nash behaviour as characterised in our model above is more relevant. It is our contention that it is the role of outside agencies to somehow resolve the credibility problem, and compel the two factions to cooperate so as to improve on the Pareto-inferior Cournot-Nash equilibrium.

The theory therefore illuminates a recurring problem—that of credibility—which is frequently encountered in processes to end civil wars. In a detailed empirical study, Walter (1999) finds that negotiations to end civil wars break down more frequently than negotiations to end wars between states.[4] This she attributes to the greater difficulties encountered by each side in making credible commitments. Guinea-

[4] In Walter's (1999) sample of 29 cases of full-scale civil war between 1940 and 1992, peace lasted more than five years in only eight out of 17 cases in which the belligerents had embarked on serious negotiations to end hostilities.

Bissau's conflict provides one African example of this problem; the peace agreement negotiated under ECOWAS auspices broke down soon after it was signed (see Kovsted and Tarp, 1999). The Angola conflict is also a tragic example of the credibility problem; the credibility of UNITA in any future peace-agreement is now very low—at least under its present leadership (Le Billon, 1999).

2.2 An Increase in the Cost of Peaceful Effort to the Rebels

Recall that θ is a shift parameter ($0 < \theta < 1$) such that a rise in θ increases the costs to the rebels of engaging in peaceful activity. Such a rise may be induced by several factors. Some studies suggest that high and rising inequality or poverty is a determinant of conflict's occurrence in low-income countries (Nafziger and Auvinen, 1997). In Africa, but also elsewhere, regional and inter-ethnic inequality (horizontal inequality) is a strong motivation for rebellion when a region is a source of natural resource wealth (oil for example) but receives little of the bounty and suffers from the environmental impact of extraction. The conflict in the Delta region of Nigeria and the creation of the rebel movement in Equatorial Guinea are just two examples. Whatever the reason, the participation constraint for rebels is relaxed. In both Figs. 1 and 2 a downward movement in the rebel's reaction functions represents this increase in θ, and the new intersection points are denoted by θ.

2.3 A Rise in Booty

This raises relative utility in the state of conflict. During the cold war period, booty could take the form of strategically motivated assistance to parties in a conflict that

had an ideological element. At present, however, a rise in booty is more likely to reflect an increase in the endowment of natural resources or an increase in its value.

In Figs. 3 and 4 we consider the rise in available war loot, bearing in mind that this increase could be relevant to either or both sides. Fig. 3 represents the case where the two strategies are complements. An increase in available booty to the government (B^G) shifts its reaction function leftwards, indicating a lower optimal choice of a for any level of e. For the rebels a greater availability of lootable resources (B^R) has the effect of a downward shift in its reaction function pointing to reduced e for every level of a. When both sides have equal access to booty the shift is to point B with an obvious decline in activities to promote peace. When it is exclusive to the government point G becomes applicable, when it is only the rebels, point R is the new equilibrium. The side receiving the booty lower its action or effort accompanied by a corresponding, but less than proportionate, decline in its opponent strategic variable.

[Insert Figure 3 here]

[Insert Figure 4 here]

A qualitatively different picture emerges in Fig. 4 where the strategies are substitutes. Greater loot shifts reaction functions in a downward direction. Here the greater endowment of booty by one side exclusively not only reduces its incentive to undertake its own relevant strategic action or effort, but also causes it to shift part of the burden of peaceful behaviour to its opponent.

In general, the greater availability of booty or lootable resources to both sides (as opposed to one side only) reduces the equilibrium levels of peaceful behaviour as illustrated by point B in Fig. 3 and 4.

3. Policy Conclusions

Our model attempts to capture the profitability of war in Africa, the cost of peaceful behaviour, and the continuum from total war *to* complete peace that this gives rise to (rather than the mutually exclusive states of total war *or* complete peace that are used in other models). It is not natural resource revenues per se but the *type* of natural resource that matters. In Africa, countries with point resources such as oil and diamonds have a high propensity for conflict: this ranges from the high levels of political violence evident in Equatorial Guinea to the outright conflicts of Angola, Congo-Brazzaville, DRC and Sierra Leone. Point resources often result in poor economic growth and patrimonial regimes sustained by the control and redistribution of rents (Auty, 1998). They also expose governments to a drastic loss of power when armed groups working in association with unregulated international trading networks succeed in capturing such key resources, giving rise to merchant-capital wars. Some countries with diffuse resources such as fertile soils, grazing land, and fisheries have also experienced intense conflict (for example, Somalia), but overall it seems that conflict is less likely in this group. Moreover, there appear to be better chances of ending wars in countries with diffuse resources than those with point resources. Since total booty is lower in the former; aid, and thus third-party intervention exerts greater leverage on belligerents. Mozambique's success in achieving peace and multi-party democracy, and Angola's failure in both, supports this conclusion.

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Figure 1: Strategic Complements

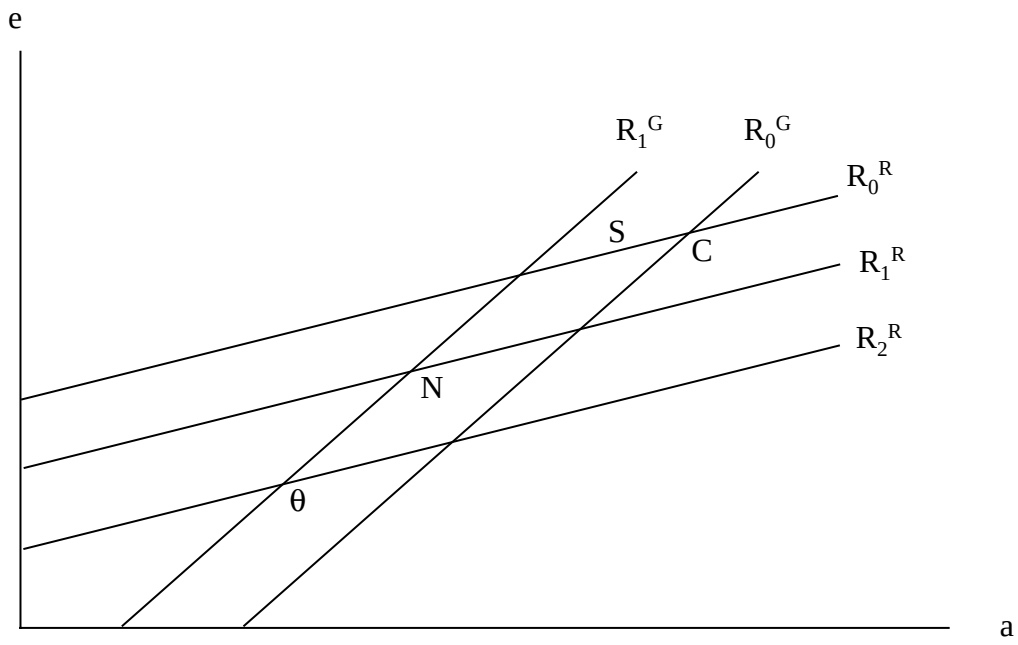

Figure 2: Strategic Substitutes

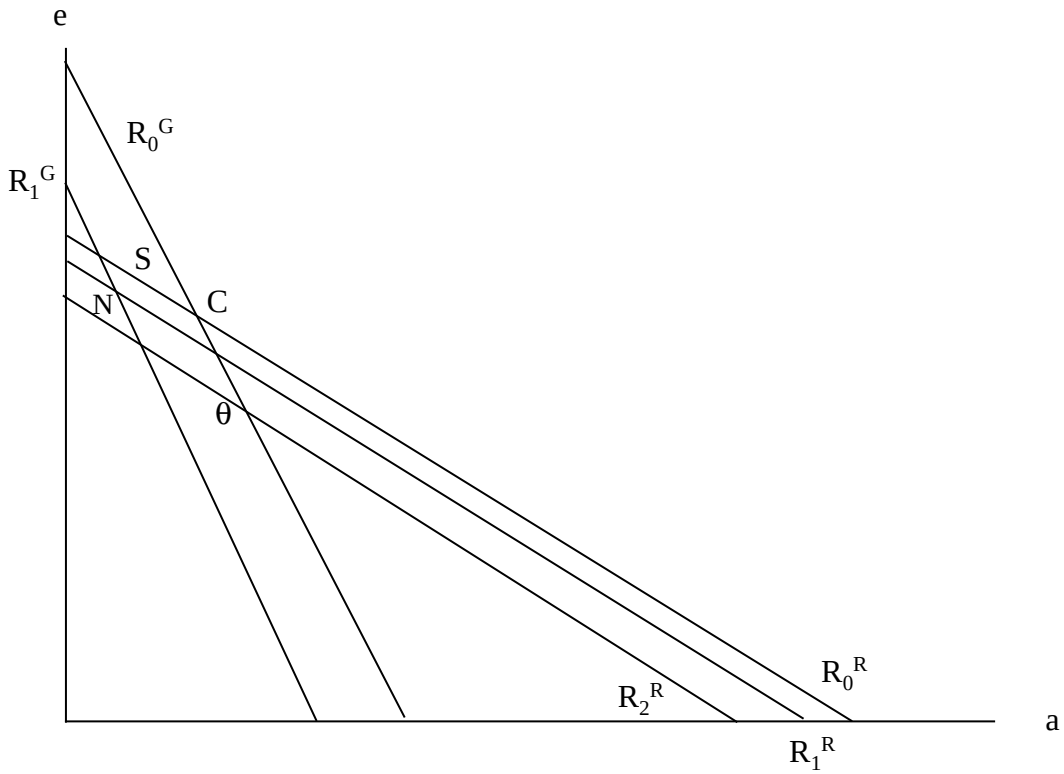

Figure 3: Booty (Complements)

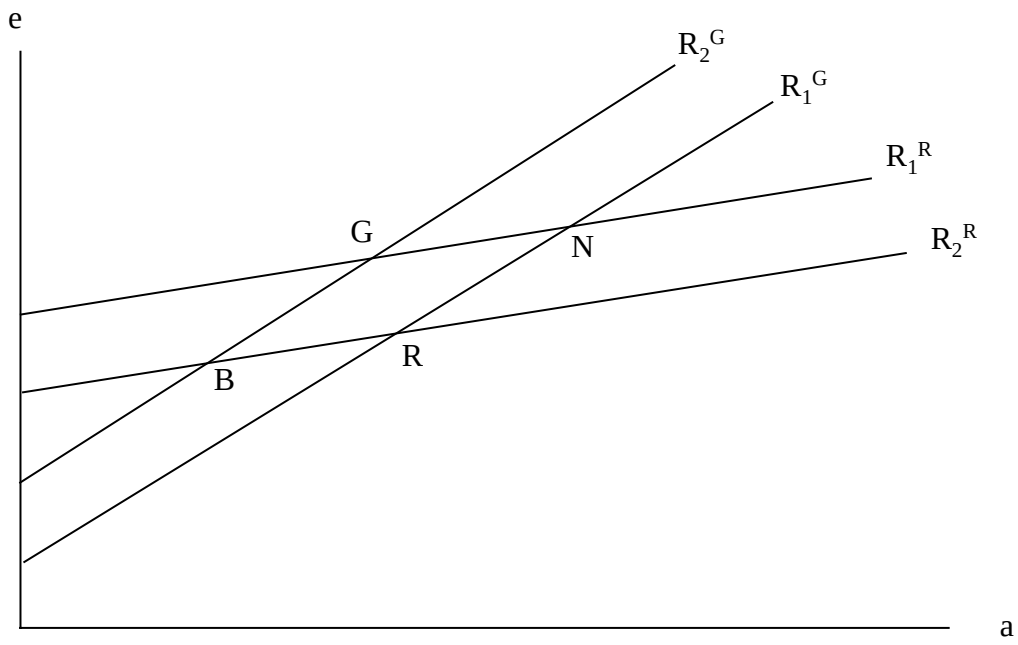

Figure 4: Booty (Substitutes)