On the Micro-Foundations of Contract versus Conflict with Implications for International Peace-Making

BY

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Abstract

This paper expands the micro-foundations of the traditional greed and grievance non-cooperative model of civil conflict between a government and a rebel group. First, the paper's model allows for greed and grievance to be orthogonal, so that they may affect each other. Second, the model allows for the reaction curves of both parties in non-cooperative games to be substitutes and not inevitably complementary. Third, the paper allows for Diaspora transfers to rebel groups. Fourth, the paper expands external aid in the form of fungible financing of government transfers "buying" peace. These extensions provide a better understanding of conflict persistence, the consequences of competing international aid and why sub-optimal sanctions provision ("cheap talk") by the international community are frequent.

1. Introduction

As with Tolstoy's unhappy families, each conflict is different in its own way: international wars, revolutionary civil wars, secessionist civil wars, colonial independence conflicts, separatist domestic terrorism, international terrorism, narco-guerrillas, state violence, revolutions and genocide may expectedly have specific causes, levels of belligerence, dynamics and persistence. The economics literature, however, has developed a narrower theoretical standard set-up that analyzes civil conflict. For example, a government and rebel group maximize their expected utility from states of war and peace in Grossman (1991). The government party has access to revenues and royalties but is threatened by the excluded rebel group, which may violently overthrow it. As an extension, the government may use the fiscal system to transfer resources to rebels to "buy" peace and an external third party may contribute resources and/or set incentives for the local parties to commit to peace. Recently, Murshed and Tadjoeddin (2008) argue that the dichotomy between greed (appropriation of rents, see Collier and Hoeffler, 1998 and 2004) and grievance (deep-rooted injustices, as expounded by Gurr, 1970, and later by Stewart, 2000) in this standard model to explain the origin of conflict should shift into a balance in which both co-exist. But it has not yet been analytically explored an endogenous relation between greed and grievance. Murshed and Tadjoeddin (2008) argue that either or both greed and grievance may explain the onset of conflict or its duration; neither, however, is sufficient in explaining the ultimate cause of conflict, something which may be attributed to the failure of the mechanisms that peacefully resolve differences (the social contract); see also Addison and Murshed (2001). Another recent development, as in Murshed and Verwimp (2006), is the study of the impacts that external third parties, who may regard peace as a global public good, have in ensuring peace commitments between local factions via financial flows (aid, debt relief) and incentive mechanisms (military deployment, sanctions).

This paper expands the standard model of a civil conflict—defined as a breach of a social contract between local groups—in three directions: (i) greed and grievance are no longer orthogonal but, rather, they may also be endogenous; (ii) the war/peace strategies of each local party are not inevitably complementary (Hirshleifer, 1995) but may also be substitutes, that is, groups may adopt opposing strategies; (iii) the external third party is not exclusively made up of well-intended pro-peace brokers but also by diasporas unwilling to support a peace deal that is not credible. We also examine external mediation to change the incentive structure of the

belligerents so that their interaction becomes more contractual and non-belligerent. By extending the standard model in this way, we add to traditional results on exogenous greed and grievance. International aid in buying peace may not be effective after all, given that diasporas' transfers may reverse the peace incentives created by international aid. Also, rebels may react belligerently to non-credible "peaceful" actions by the government. Well-intended interventions—Nordic conditionality rather than strategic aid as typically provided by the United States, the United Kingdom, or France, for example—may bring about a world-wide public good in the form of peace, but typically at sub-optimal levels if the costs of achieving peace are too high and/or are borne exclusively by donor taxpayers.

The paper is organized as follows. The next section reviews some relevant related literature. Section 3 lays out the theoretical model. Section 4 explores the main findings of the model and its implications for striking a viable peace deal among belligerent factions in the face of external players' own interests. Section 5 concludes.

2. Literature Review

Conflicts have been widely analyzed. Empirical studies have estimated the effects of wars on economic growth and poverty (Alesina et al., 1996; Collier and Hoeffer, 2004; Miguel, Satyantah and Sergenti, 2004; Doppelhofer, Miller and Sala-i-Martin, 2004; Elbadawi and Sambanis, 2002) as well as their impacts on education, health, nutrition, migration or household survival strategies (see Justino, 2006, for a comprehensive literature review). Available evidence is generally inconclusive with respect to a dominant cause of war. Some studies reject the merits of the grievance hypothesis (Collier and Hoeffer, 1998, 2004), others stress it (Stewart, 2000; Deininger, 2003; Østby, 2008); while others argue that grievance may coexist with greed (Murshed and Tadjoeddin, 2008). Murshed and Tadjoeddin (2008) provide a comprehensive review on the supporting evidence for each of these hypotheses. More eclectically, Kaldor (2001) suggests that globalization leads to new internal wars that blend political and criminal motives.

Given both obvious data gaps and restrictions to disentangle causality, recent research has concentrated instead on the microeconomic theoretical underpinnings of conflict origin and resolution. Models develop a "traditional" framework in which greed and grievance are driving forces in fueling conflict among local groups, with a recent incorporation of external players,

commitment mechanisms and imperfect information (Rothchild, 2005; Murshed and Verwimp, 2006; Azam, 2005; Addison and Murshed, 2002; Walter, 2002). Azam and Mesnard (2001) characterize civil war as a situation in which the state breaks its implicit promise to make a fiscal transfer to all of society's members. That creates a grievance in the excluded group, which rebels and fights against the government to redress its grievance. Addison, Le Billon and Murshed (2002) present a model where civil war is motivated by the appropriation of natural resource rents with historical grievances playing a role in explaining how the two opposing groups engage in a conflict. Azam (2001) features inter-ethnic conflict in Africa as the result of the state's failure to make a fair provision of resources among ethnic groups, thus encouraging individuals to rely more on ethnic capital. In this set-up peace will fail to be restored and sustained if grievances about the distribution of rents, resources or public spending (and taxes) are not redressed.

At the centre of this theoretical approach is the notion of conflict as breach of an agreement between groups, a deviation from a contract that results in some sort of state of anarchy (Hirscshleifer, 1995), following Hobbes' *Leviathan* in 1651, whereby in a non-contractual state of nature men were at perfect liberty to prey upon each other with impunity. Factors such as inequality, poverty, polarization, exclusion, ethnic tensions, natural resource appropriation all contribute to the risk of conflict, yet some societies having such conditions do not descend into conflict. For greed, grievance or both to take the form of large-scale violence there must be some specific weakening of an agreement between parties, what Addison and Murshed (2001) call a breach of the social contract. By social contract we mean a framework of widely-agreed rules, both formal and informal, that govern the allocation of resources, including resource rents, and the peaceful settlement of grievances. If viable, credible and enforceable, the contract can be sufficient to restrain, if not eliminate, opportunistic behavior such as large-scale theft of resource rents and the violent expression of grievance.

Kant's (1795) essay on the "Perpetual Peace" provides us with the fundamental clues as to what constitutes a contract with such desirable properties: first, contracts must be self-enforcing, hence the term perpetual, so that there are no incentives to deviate from it; second, a good government (translated into more modern terminology, good governance) must hold the social contract together; and third, it must emanate from a sovereign and legitimate power. To Kant's list of conditions for a stable social contract we could add an economic dimension of

peaceful exchange. Humphreys (2005) argues that sparse economic interaction makes wars between competing groups more likely as their opportunity cost from a destructive war is smaller. Also, within an economic dimension is the notion of state capacity to collect taxes (fiscal capacity), enforce contracts and promote markets (legal), recently discussed in Besley and Persson (2007). The authors argue that external wars may promote the development of state capacity on behalf of a common interest externally threatened. Instead, prospects of internal conflict may de-incentivize a government from investing in state capacity. In the case of resource-rich societies, in particular, conflict prospects may specifically increase resource extraction, which may be used to either finance the military, increase elite's gains or diversify the economy and deliver public goods to buy peace. The preferred outcome will both depend on what optimizes the survival function of those in power (Caselli and Cunningham, 2007)[1] and on the set of rebels' opportunity and incentives to appropriate such gains. More often than not, this results in strained and feeble social contracts. There are many examples of conflicts emerging out of fiscal disputes. Côte d'Ivoire, for instance, became unstable with the collapse of the social contract engineered by the late President Houphouët-Boigny, in which he allocated public spending across the regions to buy the loyalty of the country's ethnic groups. Disputes over the apportionment of revenues from natural resources are especially common and, as in Indonesia and Nigeria, these take on ethnic and regional dimensions.

Fiscal arrangements need not break down to cause the collapse of a social contract. The redistribution that takes place in existing arrangements may not be perceived as a "fair" manner of sharing gains from economic growth among groups. Conflict theorists (see Bates, 2001; LaFree and Tseloni, 2006)—in contrast to the famous modernization theory of Lipset (1960)—emphasize that the transformation towards capitalist market modern economies has more often than not resulted in increasing inequality, unemployment and poverty. High or higher average incomes may well mask a widening gap among groups, leading to sentiments of greed,

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[1] They also argue that specific conditions will give way to survival strategies that imply increasing repression ("patronage"), increasing productive investments ("visionary" leaders), increasing unproductive investments ("resigned" leaders), or increasing both repression and productive investments ("unconstrained" leaders). Similarly, Dunning (2005) compares Mobutu's Zaire (1965-1997) to Suharto's Indonesia (1965-98), finding that their different developmental performances depend largely on their strongmen's fear of losing power. In one case the dictator (Suharto) chose diversification and growth-enhancing strategies, as well as policies aimed at equalization and poverty reduction to contain political opposition. Development in Indonesia was impressive. In Zaire (now DRC), Mobutu did not, because he felt that diversification and investment in infrastructure would loosen his grip on power and strengthen political opposition to him based on ethnicity. Zaire or the DRC has perhaps the poorest post-1960 growth record on the planet.

selfishness and historical resentment all congruent with increasing violent conflict. In addition, the least-developed nations have histories of weak social contracts or once-strong social contracts that have degenerated. This weakness is in many instances a legacy of colonialism which institutionalized mechanisms favoring settlers over indigenous peoples (Guatemala, Zimbabwe, South Africa); divide and rule favoring one ethnic group over another (Rwanda) market controls to create rents for settlers to the cost of locals (Zimbabwe); and the expropriation of land and resource rents (Angola, the Belgian Congo). Pre-colonial ethnic rivalry over territory and assets, the case in resource-scarce countries such as Afghanistan, Somalia and Sudan, and the failure of long-standing independent states to strengthen mechanisms of political representation, also lie behind weak social contracts.

A final factor at play in weakening social contracts is the interaction of these "domestic" factors with external events and actors. In the pre-9/11 world, the Cold War provided finance and ideological succor to ruling elites and rebels. The net result of these processes is the accumulation of grievances within a context of a disintegrating social contract, with a state increasingly perceived to exercise favoritism in public spending and to tax unjustly and increasing greed-based motivations. In such situations, external players may or may not promote durable and stable peace through mechanisms that enhance commitment to peace. Peace talks, aid, debt relief, economic sanctions, military peacekeeping interventions, internationally sponsored courts prosecuting human rights violations, among others, can reduce conflict provided that their enforcement mechanisms are credible. For example, former conflict regions in the Balkans, which have maintained stable peace agreements, received more external assistance per capita than their counterparts in Africa. UN peace-keeping humanitarian interventions may be less credible for local factions than NATO military deployments. In Darfur, Sudan, peace-keeping is carried out by African military forces typically perceived to be too-little-too-late, ill-equipped and subject to the flinching moods of public opinions in the rich Western countries that finance them. Diamond (2004) argues that the Bush administration failed to commit sufficient military forces necessary to ensure order in post-war Iraq, which would have required half a million troops to maintain the same ratio to population as NATO had in Bosnia.

3. A Model of Social Contract and Civil Conflict

As indicated above, civil conflict is defined as a breach of a social contract between local groups within a standard set-up in which government and rebels maximize their expected utility from states of war and peace. The government party has access to revenues and royalties, but is threatened by the excluded rebel group, which may violently overthrow the government. Either strategy (war or peace) has costs for each player, whose strategy is also motivated by greed and grievances. Note that the roles formulated below for the government and the rebels can be reversed. In what follows, we set out the model, starting with the expected utility of the government side (G), which is given by:

The Government Side

$$G = \pi(a,e)G^P + (1-\pi)(\cdot)G^C - C(a) \tag{1}$$

where G^P and G^C denote utilities or pay-offs in peace and conflict respectively, weighted by the probabilities of the two states, peace (π) and war ($1 - \pi$). The pay-offs are endogenous in the sense that the probabilities of the two states depend on a strategic action (a) undertaken by the government, which is defined in a manner such that it increases the chances of peace. The strategic action parameter itself will depend on a number of variables described below.

The net income of the government (Y^G) is defined in (2), and includes *fungible* aid. Note also that the government's income is greater during peacetime. The parameter, a, is the strategic choice variable of the government.

$$
\begin{aligned}
G^P &= Y^G - pF^G - T \\
G^C &= Y^G - cF^G \\
c &> p > 0, c + p = 1.
\end{aligned}
\tag{2}
$$

T is the "transfer" made by the government to the rebels in the state of relative peace and depends on government income. This can take a variety of forms including broad-based social and development expenditure extended to the rebels (El Salvador, Colombia), power sharing (as recently in Kenya), and the inclusion of the otherwise excluded group in government jobs (Rwanda and Burundi) and state contracts. On these points see Azam (2001). F denotes military expenditure; this is clearly greater in wartime than during peace, hence $c > p$. The parameter a is

the strategic choice variable of the government and determines quantities of F and T chosen. This is described below and depends on the grand objective function of the state. Note that even the peaceful outcome is a state of armed peace, as a minimum credible deterrent is required by the state, and up to now choices between fighting or conflict and peace are not all-or-nothing (0, 1) choices.

The probabilities of the two states are not related to a Tullock-type rent-seeking contest (Hirshleifer, 1995, for example).[2] This is because the low-intensity conflict is not a war of attrition. The rebels cannot expect to oust the government solely via a military victory and vice versa, which is characteristic of virtually all civil wars at present. Nor does the government have a Weberian monopoly over violence. We are concerned with a continuum of possible states of peace or war.

In fact, the strategic actions of the two players are a trade-off between peaceful-belligerent behavior. On the government side, its strategic action, (a), depends on which is welfare from peace and a trade-off between T and F^G.

$$a = -bG^C + (1-b)G^P \qquad\qquad (3)$$

Here b refers to the relative welfare from war and 1-b the relative social utility of peace, the minus sign before conflict is to relate it to social welfare in terms of peace. The parameter b is left *exogenous* at this stage. We may simplify the expression above into:

$$a = -bF^G + (1-b)T \qquad\qquad (4)$$

The above expression is justified by the fact that war involves fighting (negative sign before the first term on the right hand side of (4)), and peace implies transfers to the rebels (a positive sign before the second term on the right-hand side of (4)). Totally differentiating the expression in (4) we obtain:

$$da = -bdF^G + (1-b)dT \qquad\qquad (5)$$

A more benevolent and developmental state may prefer making transfers to rebels to fighting them. In that case $b < \frac{1}{2}$; if $b > \frac{1}{2}$ fighting is preferred to transfers; in the limit if $b = 0$

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[2] This is where the chances of winning the prize (winner takes all) is related to the outlays (fighting effort) made by each protagonist relative to the total effort of all contenders.

then there is only peace, and $b = 1$ implies only war, $b = 1/2$ implies indifference. Observe that, when $b \to 0$, we have a social contract from the government's point of view, and when $b \to 1$, we have war; in the intermediate region we have an *imperfect* social contract. Thus, it is possible for the state to be both benevolent or developmental and repressive at the same time, and various degrees of benevolence (repression) are possible as b declines (rises).

The parameter b may also be regarded as a measure of grievance or war-related greed. Grievance can be viewed as historical mistrust, as in the case of Hutus versus Tutsis in Rwanda and Burundi; greed may be construed as the value of staying in power, and not making concessions to disaffected groups (the excluded) after the discovery of oil, as was the case in Chad or Sudan. Note that we have modeled the simultaneous existence of both greed and grievance, based on our earlier argument that at any point in time, once conflict has progressed, greed and grievance can and do function simultaneously. A similar argument may be made about the rebels.

In equation (1), C is the cost function of undertaking the action, a, which increases the probability of peace, π, $\pi_a > 0$, but $\pi_{aa} < 0$, implying diminishing returns to this type of action in terms of its input into the probability of peace, as shown, for example, in the Israeli-Palestinian confrontation. This is costly because of direct political costs of accommodating enemies to some hawkish supporters of the government. Both $C_a > 0$ and $C_{aa} > 0$. This cost function may also incorporate psychological costs of making peace to historical foes.

The Rebel Side

Turning to the rebel or excluded group, its expected utility (R) is given by:

$$R = \pi(a,e)R^P + (1-\pi)(\cdot)R^C - E(e) \tag{6}$$

where

$$R^P = Y^R - pF^R + (1-\delta)T$$
$$R^C = Y^R + B - cF^R + \delta S \tag{7}$$

The pay-offs are endogenous in the sense that the probabilities of the two states depend on a strategic action (e) undertaken by the rebels, which as with the government raises the probability of peace. The strategic action parameter itself will depend on a number of variables

described below. The income of the rebel group in the state of war is supplemented by contributions from sympathetic citizens' abroad (S), as in Armenia, Sri Lanka or Eritrea; as well as exports (B) of narcotics (Colombia) and/or natural resources such as alluvial or blood diamonds (Angola, Liberia, Sierra Leone). This is admittedly a simplified characterization of diasporas but it is still a useful addition to challenge the plain assumption of international donors transferring resources to "buy" peace exclusively. Analogously, diasporas may transfer resources to "buy" war, through money, arm trafficking or lobbying for international support. Interestingly, they also bear historical grievances as do the rebels, but they do not benefit from government transfers aimed at making peace. We capture the role of diasporas through the parameter, δ, which is a measure of the credibility of the government transfer vis-à-vis the transfer from diasporas abroad who are sympathetic to their compatriots but really want the rebels to fight the government. If $\delta = 1$, then the state's transfers are not credible to expatriate rebels, but the rebels have diasporas finance S to use either in a relatively more conflictive state. So, the inverse of δ measures state credibility and legitimacy to its supporters outside the country. Put differently, δ relates the valuation that rebels grant to transfers received, both from the government and diasporas. For the sake of analytical simplicity, we have made transfers (T) from the government occur only in peacetime, and diasporas finance (S), or the export of narcotics and lootable resources (B) happen only in the state of belligerence. Furthermore, we have made both T and S vary inversely, so the greater the credibility of transfers from the state the lesser are contributions from sympathetic kinsmen abroad, and made this depend on δ. This reflects the fact that during peace the contributions of sympathetic diasporas are considerably diminished, as is rebel control over the sources of lootable revenues. Note, δ is at this stage exogenous; in a sense it captures state credibility (including legitimacy, the strength of the social contract etc.), and its inverse captures the legitimacy of diasporas.[3] In principle, with more state legitimacy, the rebels' utility function should increase with peace and decline with conflict, other things being equal.

E is the cost of effort, e, which increases the probability of peace, π. Also, $\pi_e > 0$, but $\pi_{ee} < 0$, $E_e > 0$, and $E_{ee} > 0$. Turning to its determination, adopting a method similar to the government side:

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[3] More precisely, δ is exogenous to *current* decisions of both factions and captures in a sense the strength of historical grievance that depends little on what currently the opposing side is doing (either increasing T or F^G, for instance). It is a parameter invariant to increasing well-intended international aid or the establishment of healing truth commissions, or the signing of weak peace agreements.

$$e = -k(F^R + B) + (1-k)T - k\delta S \qquad (8)$$

where k is the relative weight given to war. The term $(1-k)$ is the relative benefit of peace. Note that in war time, there the rebels have access to some wartime booty. Totally differentiating the above:

$$de = -kdF^R - kdB + (1-k)dT - \delta k dS \qquad (9)$$

if $\delta = 0$ the state is perfectly credible to diasporas, and totally incredible when $\delta = 1$. In practice, it is a measure of diasporas' grievance that affects the valuation of transfers to rebels: the higher that grievance, the higher should be expected the valuation by rebels of transfers accruing from diasporas vis-à-vis government transfers. Note there are intermediate possibilities. If $k = 1/2$, the rebels are indifferent to war or peace; preferring peace when $k < \frac{1}{2}$, war if $k > \frac{1}{2}$; only war if $k = 1$, and only peace when $k = 0$. So k is a measure of grievance of the *domestic* rebels or war-time greed. [4] Note that the peaceful effort of the rebels depends both on the subjective preferences of domestic rebels, as well as the attitudes of sympathetic diasporas. Observe that the closer δ and k are to zero, the more proximate the social contract outcome from the excluded group's (potential rebels) point of view.

4. Solving the Model

Non-Cooperative Behavior

Conflict (non-cooperation) occurs because neither side can cooperate or enter into a social contract due to the presence of historical grievances, low levels of transfers to the rebel group, imperfectly credible transfers to the rebel group or because the returns to peace relative to war are insufficient. In the model, the strategies adopted by the two sides (a and e) in a Cournot-Nash non-cooperative one-shot game are endogenous. This in turn depends on disposable income, transfers and fighting intensities hinging on the nature of the government as well as pure grievances on the rebel side.

Each side will maximize its own utility function with respect to its own choice variable. For the government it implies maximizing utility in (1), with respect to a (holding the arguments in the a function as given and constant):

$$\frac{\partial G}{\partial a} = \pi_a \left[G^P(\cdot) - G^C(\cdot) \right] - C_a = 0 \qquad (10)$$

Rebels maximize (4) with respect to e (again holding the arguments in the e function constant):

$$\frac{\partial R}{\partial e} = \pi_e \left[R^P(\cdot) - R^C(\cdot) \right] - E_e = 0 \qquad (11)$$

Equations (10) and (11) form the basis of the reaction functions for both sides, obtained by totally differentiating them with respect to a and e. Thus:

$$\frac{de}{da/R^G} = \frac{C_{aa} + \pi_{aa} \left[G^C(\cdot) - G^P(\cdot) \right]}{\pi_{ae} \left[G^P(\cdot) - G^C(\cdot) \right]} \overset{\geq}{\underset{\leq}{}} 0 \; if \; \pi_{ae} \overset{\geq}{\underset{\leq}{}} 0 \qquad (12)$$

and

$$\frac{de}{da/R^R} = \frac{\pi_{ae} \left[R^P(\cdot) - R^C(\cdot) \right]}{E_{ee} + \pi_{ee} \left[R^C(\cdot) - R^P(\cdot) \right]} \overset{\geq}{\underset{\leq}{}} 0 \; if \; \pi_{ae} \overset{\geq}{\underset{\leq}{}} 0 \qquad (13)$$

Note that $\pi_{ae} = \pi_{ea}$ by symmetry.

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[4] As in the case of δ, which measures the historical grievance of diasporas, k may be deemed the historical grievance and/or greediness of the rebels.

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Figure 1. Strategic Complements
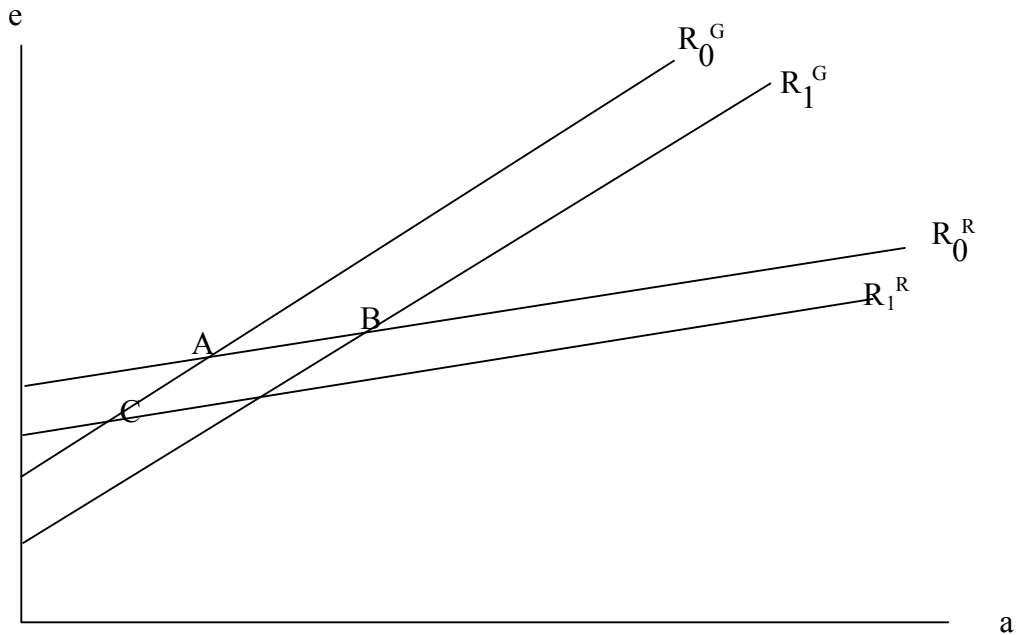
The reaction functions are positively sloped if $\pi_{ae} > 0$, implying that the two strategies are complements (Figure 1). This is the standard assumption in the literature on conflict; see, for example, Hirshleifer (1995). It means that increases in fighting or peaceful efforts by one side are matched in the same direction by the other side. In our model, however, we allow for the possibility that $\pi_{ae} < 0$, the choice variables are strategic substitutes, and the reaction functions could slope downwards (Figure 2). In fact, this is also the result of δ being exogenous to current efforts (being instead entrenched in historical events).

This can only occur because the strategy space is defined in terms of peace. Thus if one side behaves more peacefully it increases the utility of both parties, and the other side may free ride on this action by actually reducing their own action. Note that the free riding does not necessarily lead to a rise in the equilibrium level of conflict, as the side raising its efforts may compensate more than proportionately for the group lowering their action. Recall that we are concerned with relative states of war and peace. Thus the two strategies can become substitutes the closer society is to complete peace, or the lower is the state of belligerency. The higher is the intensity of war or deeper the grievances, the greater the likelihood of the two strategies being complements (Figure 1), as is conventional in the literature.

Figure 2. Strategic Substitutes
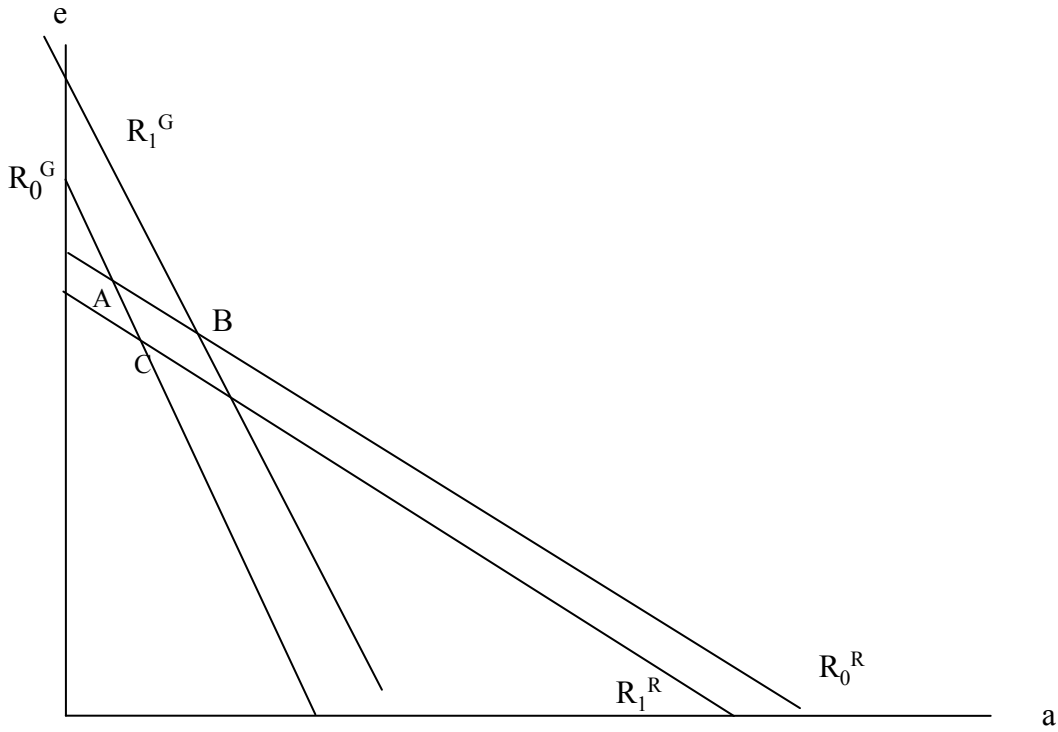
[Insert figure 2]

International Aid, Diaspora Finance, Greed and Grievance

Since most bilateral and multilateral aid donors are limited to giving assistance to the state or government, we will confine our attention to aid to the government for the moment (although it is often the case that donors can reach out to rebel groups via intermediaries such as NGOs or their own secret services). Aid to the government augments its income (Y^G). First, in terms of our model, if donors can engineer a situation that makes foreign aid conditional on peace or transfers to the rebel group, the R^G curve rightwards in Figure 1 along the rebel reaction function when the government receives aid in a state of peace only, and there is a rise in T to the rebels; we move from point A to B in Figure 1 with increased peaceful activity by both sides. In terms of (5) this means that donors are dealing with a state that derives greater welfare from transfers to the rebels when its income in (1) rises, rather than trying to emasculate them through military force ($b \rightarrow 0$).

In Figure 2 a similar gift causes the government's reaction function to move upwards, along the rebel reaction function, and we move from A to B. The government raises peaceful action, *a*, but the rebels have lowered *e*, as the strategies are substitutes in this case. They will free-ride on the government, and we cannot be sure that the overall equilibrium levels of peace have risen or fallen. This is a peculiar result that can take place in some specific contexts: a former authoritarian regime accustomed to the use of force then turning into an electoral or pseudo-democracy, with an opposition that deems democratization efforts a sign of weakness and react to these efforts by resorting to force and violence. This may be the case in Kenya's increased violence following recent elections, or violent strife in Haiti around election time. We can also find this substitutability of efforts in terrorist ceasefires. Peace talks resulted in splintered IRA groups that increased the belligerence of the conflict in Northern Ireland. In Spain, truces or "peace talks" are believed to be periods used by ETA terrorists to regroup.

Thus, when aid or international support is given in this situation (with strategic substitutes) policies have to be adopted to influence rebel behavior as well. Overall, such aid conditionality, which is often desired by Nordic donors, is notoriously difficult to achieve. The recipient may accept aid and then renege on its commitment to work towards peace. As aid is fungible (unconditional), the recipient may transfer all or part of these resources to its military effort. If we examine equation (5) above, taking a derivative with respect to Y^G, we will notice that transfers to the rebels could rise with an increase in government income for values of b < ½. Additionally, unconditional aid to the government may result in an increase in both transfers to the rebels, as well as military efforts to suppress them, if b = ½ in (5). If the donor, as in the case of the United States' aid to Colombia (or arguably in Iraq, Afghanistan or in the past to South Vietnam), gives mainly military assistance (F^G), then the government may only increase fighting intensity, particularly if b→1, in which case both the state and its external supporter prefer military solutions. In terms of Figures 1 and 2 the movements are from point B to A. The upshot of the analysis above is that we can have two types of aid donors, with one category more committed to peaceful solutions to other nation's civil wars relative to others and the latter more interested in seeing its ideological foes defeated. Even the former type of donor is more likely to be constrained in its intervention.

In the case of the rebel's receiving increased diasporas finance, S (or ideologically motivated assistance from a superpower during the cold war)[5], reduced credibility of the state's transfers (increases in δ or k, heightened grievances), increases in greed (due to illicit substance or gemstone rents, rise in B) causes its reaction functions to move down along the government's reaction function (see equations (7) and (9)), and we move from point A to C in both Figures 1 and 2 with more conflict in the case of figure 1 (less a and e). But in the case of figure 2, when the strategies are substitutes the government side's peaceful actions will increase, but the overall effect on war and peace will still be ambiguous.

Mechanism Design

So far we have only considered the weak manipulation of the belligerents' pay-offs by external powers who may be interested in either ending or perpetuating the conflict, or the struggle by one side or another. To go one step further, we may consider mechanism design or the introduction of innovations to the game, and how the exogenous strategic behavior of belligerents can be endogenized or changed by interested parties outside of the conflict. Neighboring countries, aid donors and the great powers often interfere in a conflict or sometimes even mediate between warring factions. We will confine our attention to the more altruistic (or Nordic type) donor who wants to establish peace. We will try to demonstrate why, despite the best of intentions well-meaning donors cannot commit enough resources to establish peace in distant lands, which if very costly cannot be justified to their domestic taxpayers.

We begin by looking at a hypothetical situation where a mythical global agency is able to conjure the joint maximization of both the government's and rebel's welfare. Let us call this social welfare function, *SW*, which is the sum of (1) and (6), the expected utilities of the government and the rebels. Maximization with respect to a and e, respectively, would lead to:

$$\pi_a \left[G^P(\cdot) - G^C(\cdot) + R^P(\cdot) - R^C(\cdot) \right] = C_a \qquad (14)$$

and

$$\pi_e \left[G^P(\cdot) - G^C(\cdot) + R^P(\cdot) - R^C(\cdot) \right] = E_e \qquad (15)$$

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[5] Such as the Western-backed assistance to rebels in the Angolan and Mozambique civil wars who were initially aided via South Africa.

In this type of cooperative behavior the total social marginal benefits have been equated to social marginal costs, leading to greater (cooperative) levels of peaceful behavior (a and e), when compared to the levels in the non-cooperative equilibrium in (10) and (11). This can be argued to be nearer the peaceful social contract associated with some form of power-sharing or legitimate election of the governing party. But how can this hypothetical case outlined above be achieved in practice? Consider the following policy innovation or mechanism design in (4) and (8) involving an intervention M, which affects behavioral parameters:

$$a = -b(M)F^G + (1 - b(M))T \qquad (16)$$

and

$$e = -k(M)(F^R + B) + (1 - k(M))T - \delta k(M)S \qquad (17)$$

where M is a carrot-cum-stick package to the government, domestic rebels and diasporas to affect the behavioral parameters in their welfare functions. One can think of M as a combination of aid and military sanctions that keep the peace and induce cooperation and power-sharing among erstwhile belligerents, as was successfully done in Kosovo and Bosnia. We can also think of M as a combination of international isolation or limited recognition with a simultaneous provision of technical cooperation and specific aid relief, as in North Korea or Palestine, or military support as in Taiwan.

Totally differentiating the above two equations with respect to M:

$$\frac{da}{dM} = -b_1 dF^G - b_1 dT > 0 \qquad (18)$$
$$b_1 < 0 \text{ if } M(t+1) > 0;\ b_1 > 0 \text{ if } M(t+1) < 0$$

$$\frac{de}{dM} = -k_1(dF^R + dB + dT + \delta dS) - \delta_1 k dS \qquad (19)$$
$$k_1, \delta_1 < 0 \text{ if } M(t+1) > 0;\ k_1, \delta_1 > 0 \text{ if } M(t+1) < 0$$

In other words, the aid-cum-sanctions package (M) will have the desired effect on the behavioral parameters of the belligerents (b, k and δ), and increase equilibrium levels of peaceful effort (a and e) towards a social contract, if M is large enough (a necessary condition which we assume fulfilled), and expected to last into the future at time ($t + 1$). This latter feature captures the

credibility of the commitment by the donor to building peace and the social contract. Otherwise, it will be perceived as "cheap talk," and the signs of the partial derivatives in (18) and (19) acquire opposite signs and belligerents (or spoiler groups) go back to war; see Murshed and Verwimp (2006).

Typically the policies considered above, *M*, will involve costs to outside powers and agencies, as it is they who initiate them. We now consider the benefits of sanctions to outside sponsors. It also describes situations where the finance and production of the sanction, *M,* is not carried out by the same party. The separation of finance and enforcement of peace deals is not uncommon. Often the financiers of peace treaties, especially the aid component, are donors such as Norway and Finland without a direct security interest in the conflict zone. An organization like the African Union, through the armed forces of its member states, may actually enforce a peace deal, whereas the funding and logistical support for the operation may be provided by Western donors like the European Union, as is practiced in Darfur at the time of writing of this paper. Even UN peacekeeping mandates are carried out by the military forces of member states, who are paid for their efforts in this regard. The idea here is that the sponsor or financier of peacekeeping derives some utility from peace in other parts of the world due to security considerations (terrorism, refugee influxes), humanitarian considerations or because promoting peace enhances the sponsor's international prestige. But how much is the external sponsor of the peace willing to pay, and how far is it willing to go in this respect?

In many ways, the sponsor or financier of the sanction can be regarded as the principal, and the implementer of the sanction the agent (either the government or rebels or some UN agency or African Union), in a principal-agent framework of the type considered by Laffont (2005). Let the utility function (*V*) of the external sponsor (principal) be:

$$V = D(M) - MQ(M) - (1+\lambda)u \ldots M' > 0, M'' < 0, \lambda < 1 \qquad (20)$$

Here *D* represents the benefits from the sanction in deterring the onset of war to the external sponsor; *Q(M)* is the inverse demand function for sanctions given its price or cost which is paid to the agent, *Q*; *u* represents the transfer made to the agent to carry out the task; λ captures the cost of distortionary taxation needed to finance the transfer. There are diminishing returns to the benefits of the sanction, which means as expenditure is increased the utility for each additional amount starts to decline.

From the standpoint of the agent (who could directly be the government or some foreign agency such as the African Union), let us postulate a utility function, H:

$$H = u + MQ(M) - (h-x)M - F - f(x)\ldots f' > 0, f'' > 0 \qquad (21)$$

On the right-hand side of (21) we have the transfer to the agent from the principal, u, the revenue from the sanction, $MQ(M)$, F represents a fixed cost of sanctions production, the production of the sanction (M) depends on the qualitative type of the agent, h and the effort exercised by him (x) and $f(x)$ represents the cost or disutility of effort to the agent.[6] Note that a higher value of h implies a more productive agent,[7] and his cost of producing sanctions is correspondingly lower. Greater effort, which is costly to the agent, also elicits more output. Since the principal takes into account the agent's objectives, we need to solve for u in (21) and substitute it into (20), obtaining:

$$V = D(M) + \lambda MQ(M) - (1+\lambda)[(h-x)M + F + f(x)] - (1+\lambda)H \qquad (22)$$

We add the utility of the agent, H, to the above function to obtain the grand utilitarian welfare function, $W = V + H$:

$$W = V + H = D(M) + \lambda MQ(M) - (1+\lambda)[(h-x)M + F + f(a)] - \lambda H \qquad (23)$$

Maximizing the above with respect to M:

$$D'(M^*) + \lambda[Q'(M^*)Q^* + Q(M^*)] = (1+\lambda)(h-x^*) \qquad (24)$$

In the above, asterisks (*) indicate optimal values. Equation (24) implies that the world marginal utility of sanctions production is equated to its world marginal cost. From (24), the lower the marginal utility of sanctions to the sponsor $D'(M)$, the more expensive the aid cum military sanctions package is in terms of "price," $Q'(M)$, the greater the shadow cost of the distortionary tax, λ, that has to be levied to finance it and the greater the effort levels (x) needed to produce a unit of sanction, the lower is the optimal level of sanction chosen. This relates to the "cheap talk" result above, from equations (18) and (19). If the optimal level of sanctions and aid produced are low in (24) then the peacekeeping force's sanction is cheap talk or ineffective, as

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[6] This effort (x) is different from a and e, when the agent is acting as a sub-contractor to the donor.
[7] If it is the domestic government, a low b type; if it is the rebels, a low k type; and if it is the diasporas, a low δ type.

M(*t*+1) < 0 in the future; the sanction and aid will wither away in the future, and this is also expected to happen by the various belligerents to the conflict. This is likely to happen if the conflict is in a distant land, which lowers both the marginal utility of the sanctions-aid package and raises the cost of doing so because of the endemic poverty in the country in question, as well as logistical difficulties. In a sense, this is a reflection of a public good with externalities not captured by donors: the benefits of peace, political stability and the absence of terrorism go to geographical regions or the entire world while the costs are borne by far-away tax payers. The result is a sub-optimal level of sanctions production. One may argue that there is just not enough will in the West to finance security in far away war torn places, in contrast to problems at their back door, say in the former Yugoslavia, which are considerably more menacing. There, benefits from peace-making were more directly 'consumed' by Western taxpayers.

5. Conclusions

This paper expands the micro-foundations of conflict generation and persistence within the traditional set-up of greed and grievances governing government and rebel relations. First, we allow for substitutive (in addition to complementary) reactions by each party in a non-cooperative Cournot-Nash game. As a result, rebels may respond to pro-peace moves by a government by increasing belligerence. This may explain protracted conflicts even when peacemaking is attempted periodically. Second, we also allow for diasporas' transfers to rebel groups. Diasporas are subject to similar historical grievances as domestic rebel groups but they do not benefit from government peace transfers. Interestingly, those transfers now introduce a trade-off in the gains associated with peace and war faced by rebels. This may also explain why conflicts may persist over time even when resources are mobilized to compensate for domestic rebels' grievances. Third, we further characterize international interventions into two types: direct (and often fungible) resources to governments to buy peace in the form of money, development assistance, power sharing or inclusion measures; as well as mechanisms that induce behavioral change towards peace, such as conditional aid, sanctions, military peace-keeping. These mechanisms may be altruistic, like those from Nordic states, or more strategic, like support from the United States, for instance. Within a principal-agent set up we explore several reasons why such mechanisms may be ineffective in practice and how sanctions, military

deployment, political or technical cooperation act as public goods with externalities in the form of worldwide benefits with costs borne specifically by Western taxpayers.

These extensions have two important implications for conflict resolution. First and foremost, although transfers from governments to rebels may resolve or mitigate the issue of greed, grievance may still persist if efforts to increase viability, credibility, and enforceability are not in place. The lesson for the international community is that pouring out resources, aid or debt relief and ensuring their distribution to rebels may not work on its own in altering strategic behaviour. Other things must occur for civil conflicts to cease. Governments may also opt out from traditionally repressive policies and adopt a more developmental approach. Rebels—and diasporas—need to make concessions. Second, conflict resolution must be aligned with the donor's interests; otherwise, external aid will not be sufficient or effective. The donor's interest also explains the form of aid selected to assist other countries immersed in conflict. Pakistan's military governments have been aided by the United States in the 1950s (Cold War anti-Soviet military pacts), the 1980s (Afghanistan) and now (post 9-11) in spite of mainly choosing repression against its population instead of development, sowing the seeds of future conflict. In contrast, ex-conflict zones in the Balkans, aid per capita is very high and those regions are policed by high quality, well-motivated and adequately mandated Western and NATO forces. At the same time, lip service is paid to the need to end civil wars in Africa, and weak and ineffectual forces are dispatched there from inside and outside the continent, usually under the aegis of virtually impotent Security Council-sanctioned UN mandates. Underlying the lack of a willingness to pay by international donors is the fact that peace, stability and progress are global public goods whose costs are borne only by donors' taxpayers. The externalities of the global peace public good result in a sub-optimal provision of peace-making efforts by the international community, with provision concentrated where global benefits are perceived to accrue more readily to Western taxpayers.

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