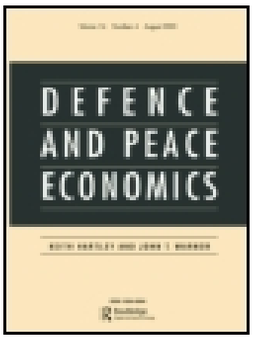

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CONFLICT AND THIRD-PARTY INTERVENTION

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The paper looks at various scenarios of possible concern for intervening third parties when two factions are engaged in a conflict and act strategically against one another. A standard conflict model is used to determine appropriate intervention strategies in order to lower the overall level of conflict. Choosing a suitable strategy in such a setting, the third party must not only take into account the direct impact of its efforts but also the indirect impacts that result from the strategic interaction among the parties involved.

Keywords: Conflict; Third-party Intervention; Strategic Interaction

JEL Code: D74

INTRODUCTION

Since the end of the Cold War, there appears to be an increasing need not only to understand the origin and cause of intrastate conflicts, but also to understand how to manage if not end them (Regan, 1996). Although familiarity with underlying causes may be important in addressing and resolving such conflicts, knowledge of the current dynamics between the fighting factions and the third party is key for evaluating the likelihood of achieving successful outcomes. This would appear to be particularly critical in conflicts where more forcible intervention is required and when there is no negotiated settlement or no "peace to keep".

There are various types and kinds of intervention and peacekeeping missions available, all of which might meet varying degrees of hostility and aggression.[1] However, the focus of the paper is limited to the dynamics of third-party interventions that have the short-run goal of reducing and suppressing the existing level of conflict. Though the approach may seem somewhat limited, it may in fact coincide with the interests and objectives of

[1] In Doyle and Sambanis (2000), the authors divide international peace-building operations into four categories: monitoring and observer missions, traditional peacekeeping, multidimensional peacekeeping, and peace enforcement. The first three tend to be in support of negotiated agreement and includes the consent of the host government, whereas the fourth type, may or may not.

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policymakers of intervening countries. According to Regan (1996), curtailing the fighting in a certain country at least enables policymakers to claim success in addition to providing the space in which dialogue between the competing factions can take place. In especially difficult situations, similar claims and opportunities can be made and can occur when intervening third parties have been successful in lowering the levels of hostilities and violence.

Assuming two competing factions (a government and a rebel or opposition movement) and a single intervening third party for expositional purposes, we can allow various means by which the third party can reduce the level of conflict. Intervention can either be neutral with respect to both factions in an attempt to reduce their efforts, or the intervention can be in the form of choosing sides and supporting one party at the expense of the other. Leaving behind and ignoring such issues as ideology, ethnicity, concerns for justice, and moral considerations, we assume that policymakers, in their attempts to lower fighting efforts, primarily focus on altering the direct costs and benefits faced by the two opposing parties through their use of aid, coercion, and force. Moreover, we take as given what seems to be a necessary condition for successful intervention, the ability of the third party to credibly commit its actions and forces.

To explicitly model the interaction between the vying factions and between the factions and the third party, we utilize the standard conflict and rent-seeking model (see for example Tullock, 1980; Hirshleifer, 1989; Skaperdas, 1996; Neary, 1997). Given previous assumptions, the presence of strategic interaction, and an allowance for differences between the two factions, it is easy to demonstrate that a key to understanding the mechanics of intervention is the knowledge that both direct and indirect effects must be taken into account in the analysis. Nevertheless, even in the best of circumstances, with a simple and limited objective, mission success is by no means assured. Policy can frequently have unintended effects if the third party does not have precise information as to where the fighting factions stand in relation to one another in terms of the conflict. For instance, a seemingly straightforward intervention in favour of the government can lead to an overall increase in the combined efforts of both parties. Such results could at least theoretically explain some of the empirical evidence uncovered by the research of Regan (1996, 2002) and Mason and Fett (1996). In all three studies, the authors find weak or mixed evidence concerning the efficacy of third-party intervention. For example, Mason and Fett find lack of support for intervention favourably affecting the likelihood of a settlement and Regan (2002) shows that unilateral interventions in support of the stronger side, the government, does not necessarily shorten the duration of a conflict.

The paper proceeds as follows. The ensuing section introduces the model, while the following section summarizes the direct impact of the intervention on the two factions and gives the comparative-static results that incorporate the strategic nature of the interactions among the parties involved. The section also looks at some important implications for intervention while the last section offers a brief summary and some suggestions for future research.

THE MODEL AND NASH EQUILIBRIUM

Let player r be the challenging faction or the rebel movement and player g, the established player or the government. Also assume that each of the two factions, respectively, exert effort levels of e_r and e_g in an attempt to gain or maintain control over V, a fixed amount of rent or resources of the state. As is common in the literature, let faction r's probability of winning be given by

$$\pi_r = \frac{e_r}{\phi + e_r + e_g} \tag{1}$$

and faction g's by $\pi_g = (1 - \pi_r)$. Note that ϕ represents the additional barriers faced by the rebel movement given that faction g is already, in a sense, entrenched. Thus even if $e_g = 0$, faction r must exert a positive level of effort in order to have a positive probability of winning V. Given the specific functional form of the contest success function (CSF) and positive levels of effort, the probability of winning is positively related to own effort and decreasing in the effort level exerted by the other faction. In addition, the probability of a faction being successful is strictly concave in own effort. In short, the properties of the CSF can be summarized by the following: $\partial\pi_i/\partial e_i > 0$, $\partial\pi_i/\partial e_j < 0$, and $\partial^2\pi_i/\partial e_i^2 < 0$ for $i = r, g$ ($i \neq j$). However, an increase in a rival faction's level of effort can lead to an increase, no change, or a decrease in the marginal probability of winning depending on whether one's own effort is sufficiently large or small enough:[2]

$$\frac{\partial^2\pi_r}{\partial e_r \partial e_g} \gtreqless 0 \text{ as } e_r \gtreqless \phi + e_g$$

As will be shown later, the above cross-partial term and its counterpart for faction g will turn out to be important for determining the slopes of each faction's reaction curve over various levels of effort.

The factions' cost functions are represented by $C_r(e_r, \alpha_r, \beta)$ and $C_g(e_g, \alpha_g, \beta)$ where each is increasing and strictly convex in terms of their first argument. In addition, it is assumed that $C_i(0, \alpha_i, \beta) = 0$ for $i = r, g$. The other terms, α_r, α_g and β, are shift parameters that enter positively into both cost functions. It is assumed that they are determined by the intervening third party and are treated as exogenous by the two competing factions. The above specification allows the parameters to enter the two cost functions so that the third party has the ability either to target one of the factions with a policy that increases its costs ($\partial C_i/\partial\alpha_i > 0$) or to target both with a "neutral" policy, β, that simultaneously increases the cost functions of both ($\partial C_i/\partial\beta > 0$, for $i = r, g$).[3] An example of the former policy is the withdrawal of aid from a faction or an direct attack on its forces. An example of the latter policy might be economic sanctions imposed on a particular country by a broad coalition of third-party countries. Finally, it is also assumed for $i = r, g$, that $\partial^2 C_i/\partial e_i \partial\alpha_i > 0$ and $\partial^2 C_i/\partial e_i \partial\beta > 0$, that the marginal costs of effort is increasing in α_i and β.

From the above specifications, the objective function for each faction can be written as:

$$U_r = \frac{e_r}{\phi + e_r + e_g} V - C_r(e_r, \alpha_r, \beta) \tag{2a}$$

$$U_g = \frac{\phi + e_g}{\phi + e_r + e_g} V - C_g(e_g, \alpha_g, \beta) \tag{2b}$$

[2] A somewhat similar interpretation also holds for $\partial^2\pi_g/\partial e_g \partial e_r$. Note that $\partial^2\pi_g/\partial e_r \partial e_g = [e_r - (\phi + e_g)]/(\phi + e_r + e_g)^3$ and $\partial^2\pi_r/\partial e_g \partial e_r = -[e_r - (\phi + e_g)]/(\phi + e_r + e_g)^3$

[3] More generally, the specification allows us to investigate interventions of policies that may (according to the literature) initially seem to favour one faction over the other in addition to neutral interventions that may help or hinder efforts of both factions simultaneously.

Implicit in our assumptions is that each faction has solved its free-riding or membership problem with respect to its own group. Also implicit is the assumption that there is no dissent within the group and all members follow a unified command structure or at least act as if they did. Thus, the problem a faction faces is to choose its own level of effort, while taking the other's as given, in order to maximize their expected payoff. Focusing only on interior solutions, the first-order conditions for each faction are given by:

$$\frac{\partial U_r}{\partial e_r} = \frac{\phi + e_g}{(\phi + e_r + e_g)^2} V - \frac{\partial C_r(\cdot)}{\partial e_r} = 0 \tag{3a}$$

$$\frac{\partial U_g}{\partial e_g} = \frac{e_r}{(\phi + e_r + e_g)^2} V - \frac{\partial C_g(\cdot)}{\partial e_g} = 0 \tag{3b}$$

Equations (3a) and (3b) also define each faction's best-response function for given levels of the other's effort: $e_i^* = BR_i(e_j; \phi, V, \alpha_i, \beta)$, $i = r, g$ $(i \neq j)$. Depending on the relative values of effort, the slope of the response function can be positive, zero or negative. This can be seen by implicitly solving each first-order condition for e_i^* and then differentiating each with respect to e_j, in order to obtain the following:

$$\frac{\partial BR_r}{\partial e_g} = \frac{[e_r - (\phi + e_g)]V}{[\phi + e_r + e_g]^3 D_r} \gtreqless 0 \text{ as } e_r \gtreqless (\phi + e_g) \tag{4a}$$

$$\frac{\partial BR_g}{\partial e_r} = -\frac{[e_r - (\phi + e_g)]V}{[\phi + e_r + e_g]^3 D_g} \gtreqless 0 \text{ as } e_r \lesseqgtr (\phi + e_g) \tag{4b}$$

where D_r and D_g are identically equal to the absolute value of each faction's second-order conditions and are strictly positive.[4] As should be readily apparent, the signs of the slopes of the best-response functions are inversely related to one another. This has implications for the characteristics of the Nash equilibrium, which is determined by the simultaneous solution of equations (3a) and (3b) and is denoted by the following: $e_i^*(\phi, V, \alpha_i, \alpha_j, \beta)$, $i = r, g$ $(i \neq j)$.

To differentiate graphically among the possible Nash equilibrium, we let ρ represent the line $e_r = \phi + e_g$. With e_g on the vertical axis and e_r on the horizontal axis, it can be easily shown that a Nash equilibrium will be above ρ whenever $e_r^* < \phi + e_g^*$, and below ρ whenever $e_r^* > \phi + e_g^*$.[5] Two such representative outcomes are depicted in Figures 1 and 2. Also note that where the response curves intersect ρ, their respective slopes must be equal to zero.[6]

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[4] More specifically, $D_r \equiv \frac{2(\phi + e_g)V}{[\phi + e_r + e_g]^3} + \frac{\partial^2 C_r}{\partial e_r^2}$ and $D_g \approx \frac{2e_r V}{[\phi + e_r + e_g]^3} + \frac{\partial^2 C_g}{\partial e_g^2}$.
Also note that with a negative sign out in front of these expressions, each faction's second-order condition is satisfied.

[5] Baik (1994) has a similar result, expressed as Lemma 2. As in Lemma 2, the current statement characterizing the Nash equilibrium is in terms of the parameters of the problem. For another paper with asymmetric players (but in terms of valuations), see Nti (1999).

[6] Graphically speaking with respect to the e_g axis, where the two curves intersect ρ, the slopes of BR_g must be zero and the slope of BR_r must be infinite. With respect the expressions of (4a) and (4b), both will be zero given that $e_r - (\phi + e_g) = 0$.

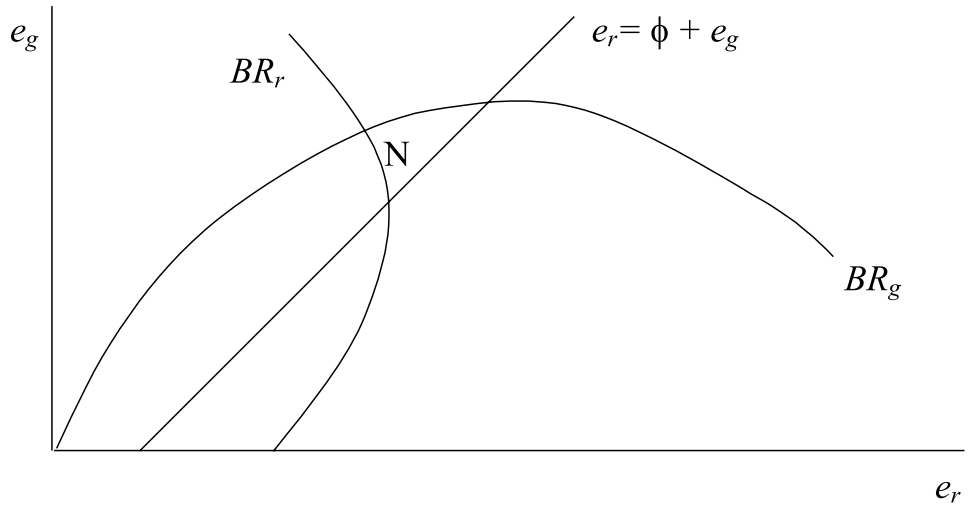

FIGURE 1 Nash equilibrium when $e_r^* < \phi + e_g^*$.

One of the more significant aspects in the position of the equilibrium is the relationship between it and the probability of winning of both parties. If equilibrium is as depicted by *N* in Figure 1, then it can be easily shown that $\pi_r < \pi_g$. In other words, any equilibrium that lies above and to the right of ρ implies that faction *g* will have a greater probability of capturing *V* than does faction *r*. For any equilibrium such as the one depicted by *N′* in Figure 2, the opposite holds true and $\pi_r > \pi_g$. In the latter case however, in order for faction *r* to have a greater probability of success than faction *g*, it must necessarily exert greater effort than *g* and ϕ. If the equilibrium is on ρ, then $\pi_r = \pi_g = \frac{1}{2}$.

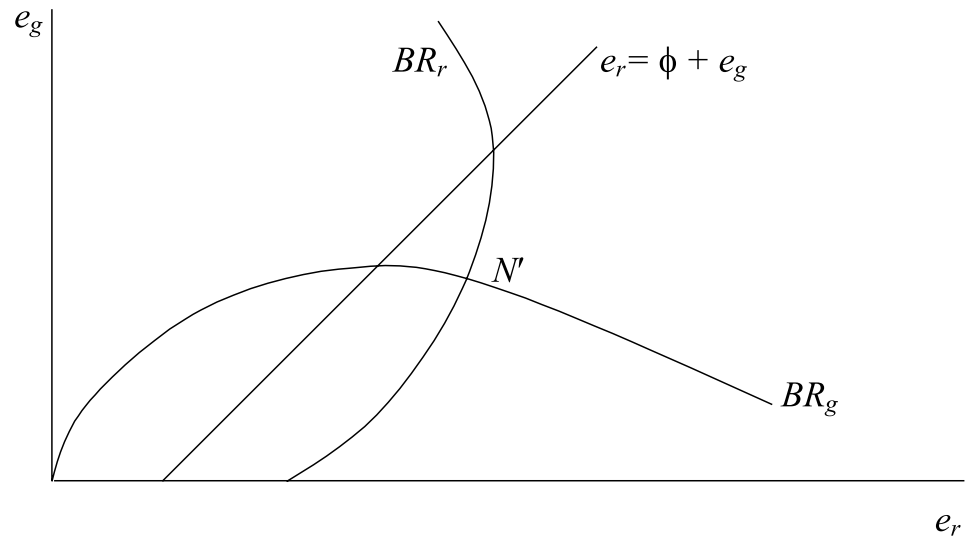

FIGURE 2 Nash equilibrium when $e_r^* > \phi + e_g^*$.

COMPARATIVE STATICS WITH ASYMMETRIC PLAYERS AND STRATEGIC INTERACTION

Using equations (3a) and (3b), and the relevant implied best-response functions of the two factions, we can depict how each faction's effort level directly responds to various changes in parameters when the other faction's effort remains constant. These results are summarized below for changes in ϕ, V, α_r, α_g and β.

Result 1

Summary of the impacts on the best-response function of faction r:

$$\frac{\partial BR_r}{\partial \alpha_r} < 0,\ \frac{\partial BR_r}{\partial \alpha_g} = 0,\ \frac{\partial BR_r}{\partial \beta} < 0,\ \frac{\partial BR_r}{\partial V} > 0, \text{ and}$$

$$\frac{\partial BR_r}{\partial \phi} \gtreqless 0 \text{ as } e_r \gtreqless (\phi + e_g).$$

Summary of the impacts on the best-response function of faction g:

$$\frac{\partial BR_g}{\partial \alpha_r} = 0,\ \frac{\partial BR_g}{\partial \alpha_g} < 0,\ \frac{\partial BR_g}{\partial \beta} < 0,\ \frac{\partial BR_g}{\partial V} > 0, \text{ and}$$

$$\frac{\partial BR_g}{\partial \phi} < 0.$$

As given by the sign of $\partial BR_r/\partial \alpha_r$ ($\partial BR_g/\partial \alpha_g$), a policy that raises the cost of faction r (g) results in a downward (leftward) shift in the best-response curve for rebels (the government). Clearly the result $\partial BR_r/\partial \alpha_g = 0$ ($\partial BR_g/\partial \alpha_r = 0$), means that there is no shift to the best-response curve for rebels (the government) when policies are government- (rebel-) specific. The rest of the above impacts are also relatively straightforward (see below for discussion of the impacts of β and V) except possibly for changes in ϕ, which not only affects both response functions, but also alters the intercept of ρ as well. As depicted in Figure 3, an increase in ϕ causes ρ to shift to the right and BR_r to twist such that below ρ', BR_r lies to the right of BR_r and above ρ, BR_r' lies to the left.[7] On the other hand, an increase in ϕ results in a downward shift in BR_g.

In order to gauge the available shifts possible as a result of intervention, each of the parameters ϕ, V, α_r, α_g and β, should be viewed as possibly being influenced in some way by the actions of the third party. For example, if the third party decided to engage in neutral economic aid that aims at bolstering the overall resources of the country such that V increases, both factions would have incentives to increase their levels of effort in contesting it. On the other hand, destroying part of faction r's forces using an aerial bombing campaign leads to a leftward shift in BR_r and no impact on the position of BR_g. An increase in β, say by damaging the infrastructure of the country used by both parties, simultaneously results in a leftward and a downward shift in BR_r and BR_g respectively. Although the impacts on the two response curves are generally clear-cut, the story is incomplete since we are only investigating the direct impacts on effort, holding the other faction's level of effort constant.

[7] Baik (1994) also has a similar result, but with similar shifts in both players' response functions.

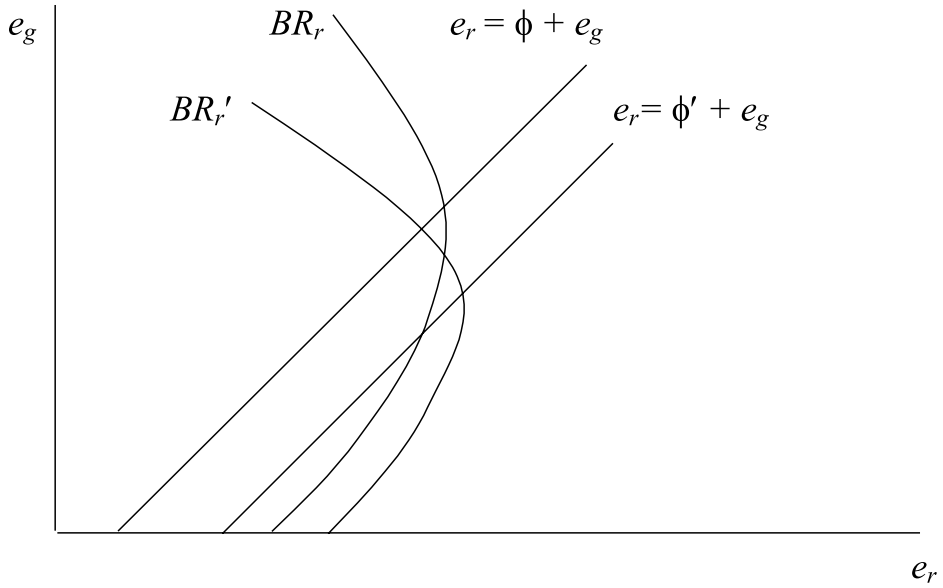

FIGURE 3 Change in ϕ and the impact on BR_r.

To see how the other faction might respond to such changes, we also have to incorporate the indirect impacts of changes in the parameters of interest. Rather than observe what happens to effort levels when a response function travels along another's path, we first use comparative-statics in order to determine how the Nash equilibrium responds to the changes in various parameters of the problem. The results are summarized below.[8]

Result 2

For Faction r:

$$\frac{de_r^*}{d\alpha_r} < 0, \quad \frac{de_r^*}{d\alpha_g} \gtreqless 0 \text{ as } e_r \lesseqgtr (\phi + e_g), \quad \frac{de_r^*}{d\beta} \begin{cases} < 0 \text{ if } e_r \geq (\phi + e_g) \\ ? \; 0 \text{ if } e_r < (\phi + e_g) \end{cases}$$

$$\frac{de_r^*}{dV} > 0, \quad \frac{de_r^*}{d\phi} \gtreqless 0 \text{ as } e_r \gtreqless (\phi + e_g)$$

For Faction g:

$$\frac{de_g^*}{d\alpha_r} \gtreqless 0 \text{ as } e_r \gtreqless (\phi + e_g), \quad \frac{de_g^*}{d\alpha_g} < 0, \quad \frac{de_g}{d\beta} \begin{cases} > 0 \text{ if } e_r > (\phi + e_g) \\ < 0 \text{ if } e_r \leq (\phi + e_g) \end{cases}$$

$$\frac{de_g^*}{dV} > 0, \quad \frac{de_g^*}{d\phi} < 0$$

[8] Explicit derivations of the results are available from the author upon request.

These comparative-statics should be of practical interest, primarily when developing an appropriate strategy for intervening. As argued earlier, the assumed primary objective is to try and reduce the overall effort level of conflict if possible. The question then presumably turns on what would be the best method to accomplish this. One option is to try and achieve a balance of power by assisting the weaker faction while the alternative is to support the government in power or the faction that already maintains an existing advantage in the dispute. The other option is to try and implement a policy that targets both factions simultaneously. These options can be tested using the literature and the results above as clues. For example, Regan (1996) hypothesizes that support for the government should lead to more successful outcomes. As Regan mentions in his paper, support for the government could appear either in the form of positive incentives or rewards for the government or in the form of negative incentives or punishment meted out to the opposing faction. With respect to the options available to the third party in the present model, seemingly comparable policies can be put into place so as to either reduce faction *g*'s costs (via a reduction in α_g) or alternatively to increase faction *r*'s costs (via an increase in α_r).[9] However, even in the best of circumstances, straightforward manipulation of the policy tools does not necessarily lead to the hypothesized outcome. The difficulty can be traced to two sources. First is the fact that there will be differing impacts depending on which side of ρ the equilibrium is on, and second, it will also depend on the nature of strategic interaction among the parties involved around that point.

If equilibrium lies above ρ, support for the government leading to a reduction in α_g, will lead to an upward shift in BR_g and a decrease in e_r* and in increase in e_g*. However, a possibility exists that the overall level of effort might increase if e_r* does not fall enough to offset the increase in e_g*. This is likely, the more steeply sloped is BR_r. This is illustrated in Figure 4, with the aid of a 45° line. Note that, at the new equilibrium, the 45° line is higher than the original.[10,11] Although an increase in α_g does not have direct impact on faction *r*, it does alter its behaviour as a result of how it responds to changes in the behaviour of the government. The optimal response of the rebel movement to increased levels of e_g is to reduce effort whenever the equilibrium is above ρ. On the other hand, if equilibrium lies below ρ, a reduction in α_g results in faction *r* responding with more effort. This leads to increased levels of both e_r* and e_g*, an outcome that is probably contrary to the intent of any potential peacemaker. The result should at least demonstrate the need to have more precise information before any intervention takes place, since a seemingly straightforward policy may end up provoking responses exactly opposite of those intended.

If equilibrium lies above ρ, an increase in α_r shifts BR_r to the left and leads to an unequivocal lowering of overall effort since it lowers the efforts of both factions given that the initial equilibrium lies on the positively-sloped portion of the government's best-response curve. However if equilibrium lies below ρ, an increase in α_r reduces e_r* and increases e_g*. Nonetheless, it remains possible that intervention might result in an overall increase in effort if e_r* does not fall enough relative to the increase in faction *g*'s efforts. This latter case is illustrated in Figure 5, again with the aid of a 45° line.

[9] Whether these conduits for policy are perfect substitutes is another matter. As we will shortly see within the context of the current model, they are not.

[10] The total amount of effort exerted at equilibrium can be measured by the distance from the origin and the point of intersection of the 45° line with either axis (not shown in Figure 4). For an example of how the technique can be employed in a of variety settings with respect to the voluntary provision of public goods, see Cornes and Sandler (1985). The author would like to thank Todd Sandler for suggesting this demonstration.

[11] This result can occur even if the equilibrium is stable, i.e. when the absolute value of the slope of the response function for faction *r* (graphically speaking) is greater than the absolute value of slope of factions *g*'s. See, for example, Moulin (1986). Note that all equilibria depicted in the paper are stable.

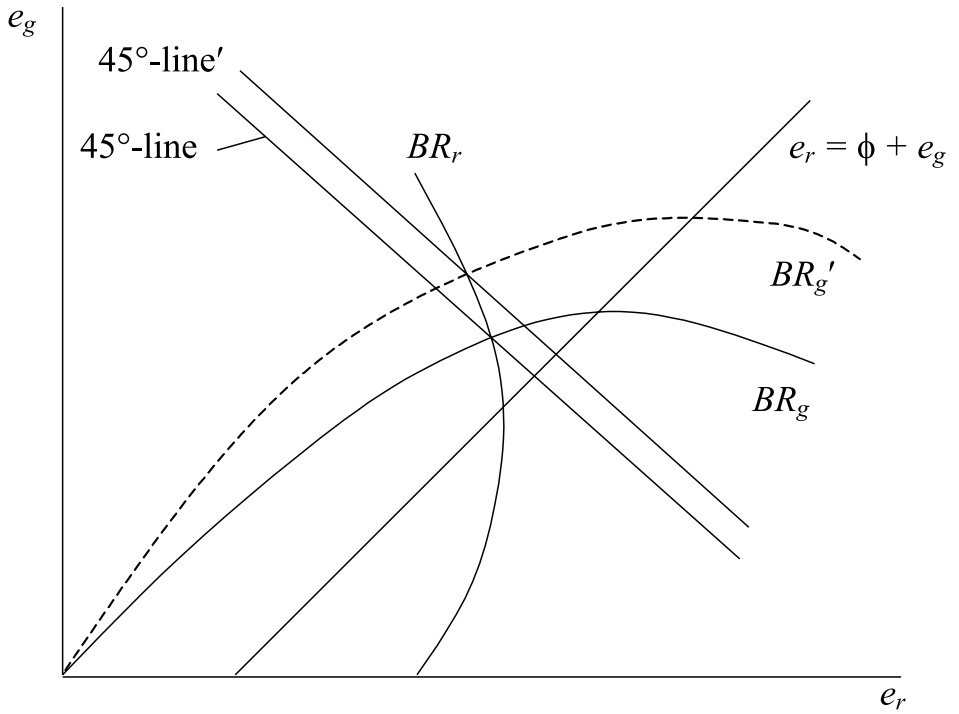

FIGURE 4 A decrease in α_g leads to an overall increase in effort.

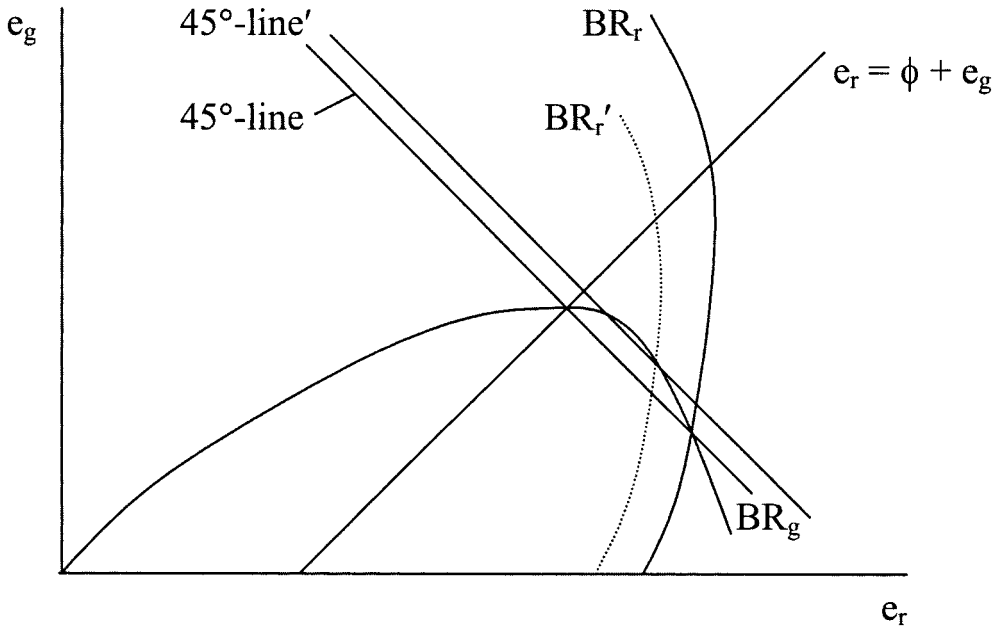

FIGURE 5 An increase in α_r leads to an overall increase in effort.

Given the above mix of results, a somewhat more sophisticated plan of action is required. Such a plan might proceed as follows: whenever the government faction enjoys a favourable advantage in terms of a higher probability of success ($\pi_g > \pi_r$), the third party should target the weaker faction, raising its costs by increasing α_r. Alternatively, if the rebelling faction has gained the upper hand and enjoys a higher probability of success, then the intervening party should pull the plug on government, raising its costs by increasing α_g. In short, whenever a particular faction has an advantage in terms of having a greater probability of success, the third party should tailor its policy to attack the weaker faction. Such a policy shifts the weakest faction's best-response curve in the direction that leads to reductions of effort by both factions.

Such a plan appears to run counter to the hypothesis and a result that Regan uncovers in his 1996 paper: that intervening on behalf of government, rather than the opposition, tends to lead to more successful outcomes. However, this would be the case if the occurrence of $\pi_g > \pi_r$ tends be more frequent than the possibility of the rebel movement enjoying a higher probability of success. If so, plans that tend to favour governments over opposition forces ought to be more successful.[12] Result 2 also shows that giving support to the government is not always a perfect substitute to punishing faction *r* if the goal is to reduce the overall level of fighting. If the latter is the goal, it is perhaps better to go after the weaker faction as defined in the preceding paragraph. Otherwise aid to a party that enjoys a higher probability of success can lead to an increase in the overall intensity of fighting. Nonetheless options in support of government can sometimes have the desired effect if the policy bolsters the government's advantage in terms of its probability of success. By increasing ϕ, the efforts of both parties will decrease if an initial equilibrium lies above ρ. If below, effort by faction *r* will likely increase even as effort of faction *g* decreases.

With respect to possible neutral policies, the most direct and clear are obviously polices with regard to altering *V*. Policies that seek to alter faction costs through changes in β are a little more complicated and deserve a little further explanation. For points above ρ, an increase in β will lead to a decrease in faction *g*'s efforts but without any further a priori restrictions, it remains unclear how faction *r* will respond. The direct impact on faction *r* from an increase in its costs is to reduce effort in response to an increase in β. However, an indirect effect tends to move faction *r*'s effort in the other direction as a result of an increase in faction *g*'s costs and the consequent reduction in government effort. Depending on the relative magnitudes of the direct and indirect effects, faction *r* will tend to decrease (increase) effort if the former effect dominates (is dominated by) the latter effect. For points below ρ, the analysis is similar but with the role of the factions reversed.

Another way of summarizing the result concerning changes in β is that the sign of the comparative static is ambiguous for the weaker faction (in terms of having the lower probability of success) for a given region of the graph as partitioned by ρ. However, irrespective of the region, if the direct effect dominates, an increase in β results in a decrease of effort levels by both factions. But if the indirect effect dominates instead, then the effort level of the weaker faction will increase as β increases even though the effort level of the other faction decreases. This latter case is illustrated in Figure 6. When the initial equilibrium is above ρ for example, an increase in β can lead to an increase in rebel effort.

[12] Regan (2002) finds no support for the hypothesis that a unilateral intervention in favour of the government at an early stage tends to shorten a conflict.

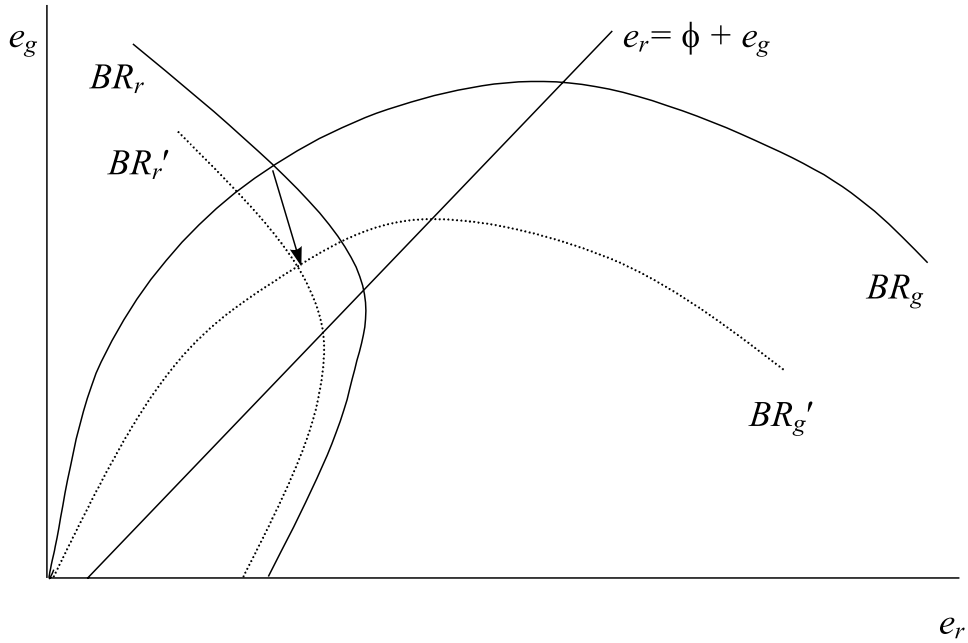

FIGURE 6 An increase in β leads to an increase in rebel effort when the indirect effect outweighs the direct effect.

CONCLUSIONS

Although it is doubtful whether there will ever be an intervention strategy that works best in all kinds of situations, a lot of work remains to be done before the intricacies of intervention are revealed and understood.[13] Recent empirical studies with respect to interventions in civil wars and intrastate conflicts have provided some answers as well as raised new questions. If anything is apparent at this juncture, it is the fact that simple rules of intervention are inadequate to the task. The main goal and contribution of the paper is to begin to undertake and explain why military and economic intervention might not be up to accomplishing the goals set by policymakers. Admittedly this is demonstrated using the approach "that just about anything can happen", but the lesson is instructive and more can be taken from this method than perhaps some others.

For one, the relationship between the fighting factions needs to be clearly understood. When a great deal is at stake and when factions are large and few, it is not unreasonable to expect that they will act strategically vis-à-vis one another. In such an environment, a policy that weakens one party may only embolden the other to increase their own intensity of fighting. Disturbingly, this can occur even when the balance of forces is stable and when there is no lack of commitment on the part of the third party.

Of possible further interest, however, is to determine how some of the analysis might change if allowance is made for corner solutions. Assuming the presence of fixed costs and using more specific functional forms for the cost function, for example, it would be possible to gauge under what conditions it would take to drive one of the factions into choosing a zero

[13] Collier and Sambanis (2002) make comparable observations with respect to understanding civil wars. In as much as they seem to be interrelated, progress requires advances in both understanding civil wars and the role of intervention.

level of effort. Nonetheless, one of the drawbacks of using the specific contest success function utilized here is that zero effort on part of faction *r* would imply all the rent going to faction *g*, even if it too exerted no effort in contesting *V* (a point similar to one made by Hirshleifer (1989) for this particular family of CSFs). Although in some circumstances this might be a plausible outcome, it is not hard to foresee that the present model would have to undergo some additional modification if the issue is to be addressed. Another worthwhile alteration might be to also change the partial equilibrium nature of the model towards a more general one that allows for consumption, production, and appropriation activities.[14]

Finally, although we did not explicitly model a policymaker's optimization problem, we did demonstrate the possibility that an optimum might be difficult to obtain. As a case in point, if the cost of third-party intervention increases in own effort levels in addition to faction effort levels, then a failure to reduce overall faction activity can also fail to satisfy another possible objective for the peacemaker, to minimize the overall costs of intervention. Furthermore, whether the objective is to minimize costs and monetary damages or to maximize welfare, if the third party's objective function contains elements of the best-response functions of the various factions, it may not have the appropriate properties to ensure a minimum or a maximum. In other words, the curvature of the objective function will also depend on third derivatives of functions that constitute elements of the factions' own optimization problems. This makes signing terms, even with specific functional forms, difficult at best. However, this suggests that a better approach to tackling the problem of intervention might be in specifying and concentrating on satisfying more limited goals set for (and by) peacekeepers.

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[14] For general equilibrium conflict models, see Hirshleifer (1989) and Neary (1997).