Group Sanctions and Intergroup Conflict

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Abstract

We present a theoretical model of intergroup conflict in which sanctions imposed by groups on their respective members are instrumental for augmenting group effort levels in intergroup conflict. The key finding of this paper is that even when productivity of group members in out-group secular activities is high, group elites do not tend to opt for lower level of sanctions out rightly and they do so only when the productivity is above a certain threshold. In all other cases they tend to choose highest level of prohibitions for the group members in order to win the intergroup conflict. We also present few examples from India where group authorities keep the general population deprived from income generating economic activities.

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1   Introduction

We often witness social groups that are at loggerheads with state or some other social group over some issue, having an irrational approach towards economic development and modernization. They often resist the economic, pro development activities. For example, in naxal affected areas in India, we often encounter news about burning the schools, looting of mid day meal grains, halting road construction projects, opposing industrial projects etc. This kind of approach is counter intuitive and does not sync with the premise of naxal and tribal movements that is supposedly about fighting for the poor. In their fight for poor they end up opposing the economic activities or government run development projects that are going to benefit poor the most. In ethnic religious groups also, we can find similar behaviour pattern in terms of polarized approach towards education, vaccination, dress code and eating habits etc. This chapter analyses this very behaviour of groups involved in conflict. We consider such behaviour as a repercussion of a mechanism that group elites adopt to intact the group and augment the group efforts in conflict. In our chapter, we name this mechanism as sanctions imposed by group elites on members of the group. We model intergroup conflict and study effects of sanctions and other related implications.

Group elites use the mechanism of sanctions to mend the productivity of the members of their respective group in out-group secular income generating activities and hence redirect their efforts towards group cause to augment net level of effort of the respective group in conflict. Sanctions also help group elites to mitigate the problem of free riding that remains one of the main obstacles in any form of collective action. In intergroup conflict also, free riding lowers the net effort of the group and consequently, it decreases respective odds in intergroup conflict. To counter the problem of free riding, elites use the mechanism of sanctions. In this process, groups tend to acquire a peculiar and sometimes polarized approach towards economic development and modernization. Few groups welcome the economic development and cultural integration while others resist them. We show that group sanctions happens to be one of the reasons behind this approach of the group towards development and modernization. Our model builds upon Carvalho and Koyama (2016) where in a similar model, sanctions give rise to emergence of more rigid and conservative form of religious denominations. We apply their model to the conflict setting and study the effect of sanctions on conflict.

In our model, an agent divides his efforts between group cause that is, in-

tergroup conflict and secular production that generates personal income. The key assumption in our model is that the group authority imposes sanctions on group members and these sanctions reduce their return from out-group secular activities. While doing so, they face a trade off between targeting relatively prosperous members of the group that expend little effort but can make huge monetary contribution in conflict and relatively poorer members that devotes a large amount of time and effort but less of money to group conflict efforts. In this process, elites also take care of the level of attachment of group members. Our model focuses on how economic development shapes this trade off. In this way, our model investigates the fact that why some groups have more stringent restrictions on its members while others relax such prohibitions.

Sanction, in our model, is any restriction imposed on group members that deprives them of out-group contact or opportunities. A group, by imposing restrictions, makes group members deprived of economic and social opportunities and thus establishes its monopoly among its members. Our model does not only caters the civil groups like naxals in India but also other social groups based on religion, ethnicity etc. For example, such group in religious domain can be perceived as one that accepts none but one interpretation, governed by single authority whereas a liberal group is the one that does not subscribe to any single authority, and is open to multiple interpretations. In that sense, a liberal group provides differentiated products to different consumers, thereby keeping competition alive. Besides this, high level of compulsory education in group specific institutions, dress code, eating habits, compulsory sacrifices and abstinence etc. also come in the ambit of such sanctions. In pure economics domain, opposing development work such as burning schools, halting road construction, opposing employment generating industrialization are also part of what we call sanctions in this chapter for all such activities deprive the members out-group income generating activities.

In our model, group sanctions are not responsible for emergence of intergroup conflict per se. They act merely as a tool in the hands of group elites to increase cohesion among group members and thereby to keep group intact and mitigate the problem of free riding among group members. To do so, group sanctions enter the picture through an economic route and lower the productivity of group members in secular world thereby increasing their chances to devote more effort in intergroup conflict. In this way, it establishes a link between group behaviour and economic well-being of group members and further relates them with their efforts in intergroup conflict.

Our model also distinguishes between two types of contribution towards conflict efforts of the group viz. monetary contribution (that can buy arms) and labour contribution as economically better off members of the group will be at more ease to contribute financially as opposed to labour contributions. In other words, the members that are more productive in secular world will more likely prefer to contribute financially and those that are not so productive in secular world will more likely contribute in form of labour in intergroup conflict. Esteban and Ray (2011) and Joan Esteban (2008)) also assume that in case of ethnic conflicts rich elites finance the conflict and the poor contribute as labour. The group sanctions conceptualized in our model go even further and provides the elites a tool to mend productivity of group members in secular world and hence the mode of contribution as per the requirement to win intergroup conflict. Our model predicts that when the economic and social opportunities for group members are limited, group elites tend to impose harsh sanctions to augment group efforts in intergroup conflict and when the economic opportunities for members are plenty group elites tend to relax prohibitions and that let members earn more in secular world and contribute more in monetary terms to the group efforts in conflict. It further explores the possibility of exit from the group in case of very high productivity of members in out-group secular activities. Hence, elites to keep the group intact have to relax sanctions but that results into poor authority of elites and probably lower net efforts. Hence, they impose sanction on group members to keep masses away from such productive activities so that they can never exit the group.

This chapter contributes to the vast literature related to distributional civil conflict[1]. The question why a rational agent chooses to get into conflict at the first place has been of paramount interest for social scientists. In this regard it is also imperative to investigate the difference between groups in their approach towards conflict. At one end, there are communities that live in harmony despite of heterogeneity but on the other end we see widespread conflicts occurring in certain communities for long. This chapter sheds some light on this difference in behaviour of different groups towards conflict. The key finding of our chapter is that the restrictions imposed on group members by group authorities play a major role in this disparity among groups.

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[1]Read Garfinkel and Skaperdas (2007) for detailed summary of theoretical models in two party conflict and Blattman and Miguel (2010) for a detailed analysis and survey of civil war related literature

However, this is not the first attempt to address this problem, ubiquitous in modern world. Previously also, many social scientists have addressed the same question. To start with, much celebrated Varshney (2002) finds civic engagement between groups to be important determinant of civil conflict. In connection to Hindu Muslim riots in India, it finds that the cities where both communities have more civic engagement with each other are less prone to such riots. The group sanctions described in our model act as a mechanism to segregate the members of both groups by limiting out group opportunities and contact and hence inter-community engagement.

The economics of conflict does share the notion of self interested behaviour of economic agent but it departs considerably from conventional economics when it comes to property rights and enforceability of contracts between parties. Contrary to traditional economics, the conflict research assumes an environment where property rights are neither well defined nor their protection is costless or automatic. additionally, in this environment, there is no authority that enforces contract between two parties. Hence, in such an environment of lawlessness, appropriation or insurrection becomes a feasible alternative to production and exchange. One more difference that conflict has with traditional economic production is as follows. In latter the factors of production act in synergistic manner whereas in conflict the resources act in adversarial manner. So, In this changed setting, trade off between appropriation and production becomes central to economics of conflict. In this regard, Haavelmo (1954) marks the development of first model of this trade off and this idea is further developed in Hirshleifer (1988), Hirshleifer (1989), Grossman (1991), Garfinkel (1990), Skaperdas (1992) and Esteban and Ray (2011). In most of these models, conflict has been modelled as a contest game[2] in which adversarial parties expend their resources to increase their respective probability of wining in case of an overt conflict. In case of a covert conflict, these resources act as bargaining tool or deterrent. Central to all contest games is the Contest Success Function (CSF).[3] [4] Just like other contests, Contest Success Function (CSF) is the workhorse of conflict also.

In our model too intergroup conflict is modelled as contest where group prohibitions help enthuse cohesion among group members and that then fur-

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[2]See Corchón (2007) for a recent survey

[3]Technology of conflict is another name given to Contest Success Function (CSF) by Jack Hirshleifer(Hirshleifer (1989)).

[4]Read Skaperdas (1996) for axiomatization of Contest Success Function (CSF) and Jia et al. (2013) for issues related to their empirical estimation.

ther translates into more committed efforts in intergroup conflict thereby increasing the winning odds. The central assumption of our model is that the intra-group restrictions diminish the productivity of group members in out-group secular activities. Our model falls in the tradition of instrumentalist approach to conflict. As per this approach, conflict is an activity by rational agents to acquire the control of material resources or political power. The works like Bates (1974), Bates (1983) and greed and grievance theory proposed in Collier and Hoeffler (2004) are examples that also fall in this tradition. Among the other theoretical models, Esteban and Ray (2011) and Joan Esteban (2008) postulate the role of within group heterogeneity in ethnic-religious conflict. There, the intra-group heterogeneity, provides the useful framework that maintains the demand and supply of the activists. In a theoretical model of ethnic conflict, presented in Esteban and Ray (2011), discriminatory government policies or social intolerance is responsive to ethnic activism and hence ethnic conflict. As per these chapters, the poor of a group provide the labour force in a conflict and rich finance this labour force. The notion of group sanctions developed in our chapter constitutes a mechanism to create or maintain the intra-group heterogeneity in a group at one hand and facilitates the intergroup animosity by discouraging intergroup interaction through workplace or cultural integration. The group sanctions also contribute to emergence of some salient markers in long run. These silent markers are of immense importance in ethnic conflict according to Caselli and Coleman (2013) which describes porosity of group boundaries as important determinant of ethnic conflict and ethnic markers act as a device to check the porosity of group boundaries and hence to stop the leakage of group resources. Most of the theoretical models of conflict usually have passive roles of agents that is limited to contributing towards conflict. Our model, on the other hand, is inspired from industrial organization and takes up more detailed investigation. It shows that how group members choose between private consumption and group specific contributions and how group elites affect their decisions and take leverage by imposing sanctions.

The idea of group restrictions adopted in our model has its root in Iannaccone (1992). In this seminal work on economics of religion, religion is modelled as a club good and group elites impose prohibitions on group members to increase group efforts for group cause. The mechanism to increase group efforts probably lies in the fact that prohibitions and incentives act as a barrier to free riding (Olson (1965)) in a group. Based on this are the works like Berman (2000) and Carvalho and Koyama (2016) that inquire

the role of prohibitions in emergence and persistence of conservatism in religious denominations. Berman (2000) explain emergence and persistence of ultra-orthodox Judaism. In his model, extraordinarily high levels of religious education and other behavioural restrictions characterize the orthodox Judaism. Similarly, Carvalho and Koyama (2016) explain polarization in Judaism i.e. emergence of both liberal and conservative variants of Judaism in nineteenth century Europe. This chapter takes up a similar approach and analyses the group behaviour in the backdrop of the intergroup conflict. In our chapter, a group decides about the level of group sanctions, while taking the choice of other group and productivity levels of opponent vis-a-vis self productivity in out group secular activities in consideration.

The remainder of the chapter is organised as follows. The next section describes the model of intergroup conflict and then the section 3 describes the equilibrium and implications of the model. Section 4 concludes the chapter with certain limitations of the work and some future directions.

2 Model of Intergroup Conflict

2.1 Model Preliminaries

We consider two groups 1 and 2 that are at conflictual terms due to some historical reason. The population share of group 1 is n_1 and that of the group 2 is n_2 with $n_1 + n_2 = 1$. Each group is characterized by group specific sanctions (τ_i) imposed by group elites on respective group members and productivity (η_i) of its members in secular world ($i = 1, 2$). Agents choose to devote effort $l_i \in [0, 1]$ to appropriative activities and $1 - l_i$ to income generating secular activities. The restriction (τ), imposed by group reduces the productivity of its members in secular income generating activities. So, the net secular produce of an individual in group i is

$$I = (1 - \tau_i)\eta_i(1 - l_i), \tag{1}$$

Apart from labour effort l_i, group members also contribute money contributions (g_i) to the intergroup conflict. This money can be used to buy arms.

We model this scenario as a contest game comprising following stages:

1. Group elites decides the level of sanctions ($\tau_i \in [0, 1]$) for their respective groups.

2. Given the sanctions announced at stage 1, group members decide how much time to allocate to conflictual activities and to income generating secular activities. They also decide their monetary contribution for the conflict from the income generated in secular world.

3. The total contribution (sum of effort and money contributions) of group members decides the fate of groups in conflict and the winner enjoys control over the disputed public good.

Success of a group in this contest in third stage of game depends on the total contributions ($R_i = a_i \sum l_i + b_i \sum g_i$) of the group members with a_i and b_i are parameters that represent effectiveness of a factor in conflict as our model distinguishes between two factors viz. labour and money. Probability of success for group i in this contest game is governed by following contest success function (CSF)

$$p_i(R_1, R_2) = \frac{f(R_i)}{f(R_1) + f(R_2)}, \tag{2}$$

and that for the other group is $1 - p$.

with $f(.)$ a strictly increasing in its argument and $f(0) = 0$. The same additive form of CSF has been employed in number of fields, including rent-seeking (Tullock (1980), Nitzan (1994)), Sports Economics (Szymanski (2003)), Conflict (Hirshleifer (1995), Skaperdas (1992)) and Political Campaigns (Dixit (1987), Skaperdas and Grofman (1995)).

2.2 Payoffs

A typical group member maximises following CES function ($\sigma < 1$) while choosing optimal level of contribution

$$[((1 - \tau_i)\eta_i(1 - l_i) - g_i)^\sigma + \beta(l_i + g_i)^\sigma]^{\frac{1}{\sigma}}. \tag{3}$$

and group elites maximise the probability of success in conflict given in equation (2).

The parameter β, in equation (3), represents how much a group member values contributing to the group cause relative to secular income generating activities. In this way β represents the level of attachment of members to the group philosophy. A high value of β represents high level of attachment to core values of the group and vice versa.

Table 1: Optimum Labour and Money contribution by an agent

Case	l^*	g^*
$(1-\tau)\eta < 1$	$\frac{\beta^{1/1-\sigma}}{\beta^{1/1-\sigma}+((1-\tau)\eta)^{\sigma/1-\sigma}}$	0
$(1-\tau)\eta > 1$	0	$\frac{\beta^{1/1-\sigma}}{1+\beta^{1/1-\sigma}}(1-\tau)\eta$
$(1-\tau)\eta = 1$	$l^* + g^* = \frac{\beta^{1/1-\sigma}}{1+\beta^{1/1-\sigma}}$	

3 Equilibrium

We obtain the equilibrium of this game by the technique of backward induction. First, we will see how a typical member optimally allocates labour between appropriative and productive activities, and his optimal monetary contribution to the group cause in conflict. Given the optimal labour and money contribution so obtained, we will optimize the choice of level of sanction that the respective group authorities/elites impose on group members. To keep things simpler, we will assume equal population of groups $(n_1 = n_2)$ and that the both inputs in conflict are equally effective $(a_i = b_i = 1)$. A typical member of a group optimizes following problem that is very much similar to the one in Carvalho and Koyama (2016)

$$\max_{(l_i,g_i)} \quad [((1-\tau_i)\eta_i(1-l_i) - g_i)^{\sigma} + \beta(l_i + g_i)^{\sigma}]^{\frac{1}{\sigma}}$$

$$\text{subject to} \quad 0 \leq l_i \leq 1$$
$$0 \leq g_i \leq (1-\tau_i)\eta_i(1-l_i)$$

(4)

The benefit that a typical group member realizes when his group wins the conflict is captured by his level of attachment β. A member with high attachment values the victory in conflict more than what a member of low attachment values. To solve the optimization problem we partition the parameter space through following three cases:

Case a: $(1-\tau_i)\eta_i > 1$
Case b: $(1-\tau_i)\eta_i = 1$
Case c: $(1-\tau_i)\eta_i < 1$

Table (1) summarizes the optimal choice of a representative member of a

group for l^* and g^* for these three cases[5]. The following observation summarizes the optimal choice of a group member regarding labour and monetary contributions. Please refer to appendix for detailed solution.

Observation 3.1. *Optimal labour and money contribution made by a typical group member depends on his productivity in secular world.*

1. *A group member with net productivity lesser than unity $((1-\tau)\eta < 1)$ contributes only labour whereas one with net secular productivity more than unity $((1-\tau)\eta > 1)$ contributes only money.*

2. *A group member with unit net productivity $((1-\tau)\eta = 1)$ is indifferent between contributing labour or money as long as both factors are equally effective in conflict.*

Optimization Problem of a Group Elites

Group elites want to maximize the probability of their group wining the conflict so set the level of strictness for group members accordingly. To do so they maximize following problem

$$
\begin{aligned}
\max_{(\tau_i)} \quad & \frac{R_i(\tau_i; \eta_i)}{R_i(\tau_i; \eta_i) + R_j(\tau_j; \eta_j)} \\
\text{subject to} \quad & 0 \le \tau_i, \tau_j \le 1 \\
& \eta_i, \eta_j > 0
\end{aligned}
\tag{5}
$$

We will solve this maximization problem with the perspective of player 1. So, player 1 maximises his pay off facing player 2 as opponent. We solve group elites problem through following cases:

case I: $(1 - \tau_2)\eta_2 = 1$ *(Player 1 faces an opponent (player 2) with net productivity as unity)*

Sub-cases are:

1. $\eta_1 < 1$ so $(1 - \tau_1)\eta_1 < 1$
   This case implies that player one with productivity (η_1) lesser than unity will always have net productivity lesser than unity $((1 - \tau_1)\eta_1 < 1)$ whatever value he chooses for τ_1.

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[5]For a detailed solution of the maximization problem of a typical group member see proof of proposition 1 in web appendix A in Carvalho and Koyama (2016).

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So, this gives

$$p = \frac{\frac{\beta^{1/1-\sigma}}{\beta^{1/1-\sigma}+((1-\tau_1)\eta_1)^{\sigma/1-\sigma}}}{\frac{\beta^{1/1-\sigma}}{\beta^{1/1-\sigma}+((1-\tau_1)\eta_1)^{\sigma/1-\sigma}} + \frac{\beta^{1/1-\sigma}}{1+\beta^{1/1-\sigma}}} \qquad (6)$$

To maximize p, player 1 sets $\tau_1 = 1$ and p becomes

$$p = \frac{1+\beta^{1/1-\sigma}}{1+2\beta^{1/1-\sigma}} > \frac{1}{2}. \qquad (7)$$

2. $\eta_1 \geq 1$ and player 1 chooses τ_1 such that the net productivity of the player 1 remains less than unity $((1-\tau_1)\eta_1 < 1)$
   This case will be same as the previous case.

3. $\eta_1 \geq 1$ and player 1 chooses τ_1 such that the net productivity of player 1 becomes unity $((1-\tau_1)\eta_1 = 1)$
   In this case, both parties will expend same effect and the probability of win for both parties will be equal and half. So, this choice of τ_1 will always be dominated by previous case as p was greater than half in previous case.

4. $\eta_1 \geq 1$ and player 1 chooses τ_1 such that the net productivity is more than unity $((1-\tau_1)\eta_1 > 1)$
   It gives

$$p = \frac{(1-\tau_1)\eta_1}{1+(1-\tau_1)\eta_1} \qquad (8)$$

So, to maximize p, elites of group 1 choose $\tau_1^* = 0$ giving rise to following value of p

$$p = \frac{\eta_1}{1+\eta_1} \qquad (9)$$

But this is a best response only when

$$\frac{\eta_1}{1+\eta_1} > \frac{1+\beta^{1/1-\sigma}}{1+2\beta^{1/1-\sigma}} \qquad (10)$$

This is true only when $\eta_1 > \tilde{\eta}$ where $\tilde{\eta} = 1 + 1/\beta^{1/1-\sigma}$.
So, player 1 chooses $\tau_1 = 0$ only when $\eta_1 > \tilde{\eta}$ otherwise he sets the $\tau_1 = 1$ to keep net productivity less than unity $((1-\tau_1)\eta_1 < 1)$.

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case II: $(1 - \tau_2)\eta_2 < 1$

This case corresponds to the situation when the opponent of player 1 i.e. player 2 has net productivity less than unity.

Sub-cases are:

1. $\eta_1 < 1$ so $(1 - \tau_1)\eta_1 < 1$

   This encompasses the possibilities when player 1 has net productivity lower than unity by the virtue of productivity being lower than unity ($\eta_1 < 1$) irrespective of the choice of τ_1. This case gives rise to following p

   $$p = \frac{\beta^{1/1-\sigma} + ((1 - \tau_2)\eta_2)^{\sigma/1-\sigma}}{2\beta^{1/1-\sigma} + ((1 - \tau_2)\eta_2)^{\sigma/1-\sigma} + ((1 - \tau_1)\eta_1)^{\sigma/1-\sigma}} \tag{11}$$

   So, player 1 sets $\tau_1 = 1$ to maximize this probability and as a best response to this, player 2 sets $\tau_2 = 1$ and probability of win for both players becomes equal and half.

2. $\eta_1 \geq 1$ and player 1 chooses τ_1 such that the net productivity becomes lower than unity $(1 - \tau_1)\eta_1 < 1$

   This case will be same as that of the previous case.

3. $\eta_1 \geq 1$ and player 1 chooses τ_1 such that the net productivity is unity $(1 - \tau_1)\eta_1 = 1$

   In this case, $p = \frac{\beta^{1/1-\sigma}}{1+2\beta^{1/1-\sigma}}$ which is lesser than half so this is never an optimal choice for player 1 to choose such τ_1 that makes net productivity unity in spite of η_1 being more than unity.

4. $\eta_1 \geq 1$ and player 1 chooses the level of sanctions (τ_1) such that the net productivity becomes more than unity $((1 - \tau_1)\eta_1 > 1)$ and p becomes

   $$p = \frac{((1 - \tau_1)\eta_1)(\beta^{1/1-\sigma} + ((1 - \tau_2)\eta_2)^{\sigma/1-\sigma})}{1 + \beta^{1/1-\sigma} + (((1 - \tau_2)\eta_2)^{\sigma/1-\sigma} + \beta^{1/1-\sigma})(1 - \tau_1\eta_1)} \tag{12}$$

   In this case elites of group 1 choose $\tau_1^* = 0$ and as a best response to it the other player sets $\tau_2 = 1$ and p becomes

   $$p = \frac{\eta_1 \beta^{1/1-\sigma}}{1 + \beta^{1/1-\sigma} + \eta_1 \beta^{1/1-\sigma}} \tag{13}$$

   But this a best response only when

   $$\frac{\eta_1 \beta^{1/1-\sigma}}{1 + \beta^{1/1-\sigma} + \eta_1 \beta^{1/1-\sigma}} > \frac{1}{2} \tag{14}$$

which gives the following condition

$$\eta_1 > \tilde{\eta} = 1 + 1/\beta^{1/1-\sigma} \tag{15}$$

So, the player 1 sets $\tau_1^* = 0$ only when $\eta_1 > \tilde{\eta}$ where $\tilde{\eta} = 1 + 1/\beta^{1/1-\sigma}$ and otherwise they choose $\tau_1^* = 1$.

case III: $(1 - \tau_2)\eta_2 > 1$
This is the scenario when the opponent is of high productivity.
Sub-cases are:

1. $\eta_1 < 1$ so $(1 - \tau_1)\eta_1 < 1$
   It covers the cases when the player has his productivity lower than unity so it does not matter what τ_1 he chooses, his net productivity remains lower than unity too. So, p becomes

   $$p = \frac{1 + \beta^{1/1-\sigma}}{1 + 2\beta^{1/1-\sigma} + (1 - \tau_2)\eta_2 \left[\beta^{1/1-\sigma} + ((1 - \tau_1)\eta_1)^{\sigma/1-\sigma}\right]} \tag{16}$$

   In this case, player 1 chooses $\tau^* = 1$ and player 2 chooses $\tau_2 = 0$ as best response to choice of player 1. p becomes

   $$p = \frac{1 + \beta^{1/1-\sigma}}{1 + \beta^{1/1-\sigma} + \eta_2\beta^{1/1-\sigma}}. \tag{17}$$

   Clearly, the probability of player 1 p is greater than half only when $\eta_2 < \tilde{\eta} = 1 + 1/\beta^{1/1-\sigma}$.

2. $\eta_1 \geq 1$ and player 1 chooses τ_1 such that the net productivity remains lesser than unity $((1 - \tau_1)\eta_1 < 1)$ giving rise to the case same as that of the previous case.

3. $\eta_1 \geq 1$ and player 1 chooses τ_1 such that net productivity becomes unity $((1 - \tau_1)\eta_1 = 1)$ and p becomes

   $$p = \frac{1}{1 + (1 - \tau_2)\eta_2} \tag{18}$$

   Player 2 chooses $\tau_2 = 0$, win probability of group 1 is then $p = 1/1 + \eta_2$ which is always lesser than half because $\eta_2 \geq 1$. So, this is never a best response.

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4. $\eta_1 \geq 1$ and player 1 chooses level of restrictions (τ_1) such that the net productivity remains more than unity ($(1 - \tau_1)\eta_1 > 1$). p becomes

$$p = \frac{(1 - \tau_1)\eta_1}{(1 - \tau_1)\eta_1 + (1 - \tau_2)\eta_2} \tag{19}$$

In this case, both groups choose $\tau^* = 0$ and it gives $p = \eta_1 / \eta_1 + \eta_2$. But its an optimal choice for player 1 only when

$$\frac{\eta_1}{\eta_1 + \eta_2} > \frac{1 + \beta^{1/1-\sigma}}{1 + \beta^{1/1-\sigma} + \eta_2 \beta^{1/1-\sigma}} \tag{20}$$

i.e.

$$\eta_1 > \tilde{\eta} = 1 + 1/\beta^{1/1-\sigma} \tag{21}$$

and off course, $\eta_1 > \eta_2$.

The findings of this section are summarized in following propositions

Proposition 3.2. *In a **Symmetric intergroup conflict** (i.e. productivity of adversaries are equal),*
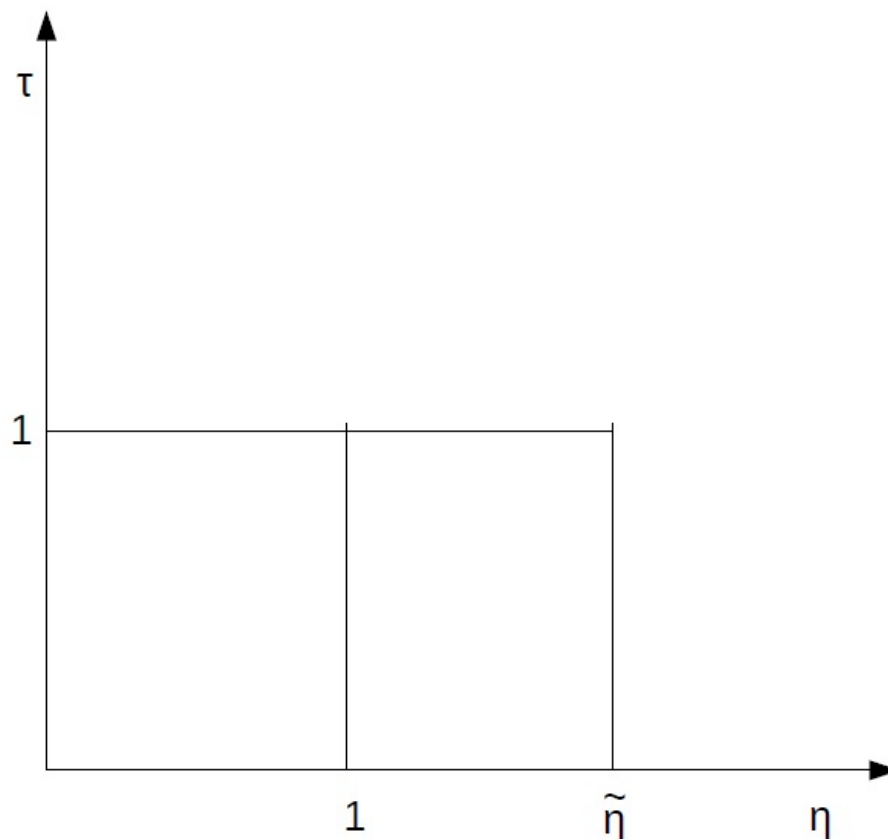
1. *when adversaries are less productive in secular world ($\eta \leq 1$), then both groups end up choosing highest level of sanctions ($\tau = 1$) on respective group members leading to win probabilities equal and half.*

2. *When both parties are highly productive in secular world ($\eta > 1$), both of them choose lowest level of sanctions only when their productivities are higher than respective threshold ($\tilde{\eta}_i$) and the player with higher productivity wins the contest.*

The proposition (3.2) is about symmetric intergroup contest. Similarly, the following proposition deciphers the choice of sanctions chosen by groups and subsequent outcome in an asymmetric contest between two groups.

Proposition 3.3. *In an asymmetric conflict (i.e. adversaries are of different net productivities in secular world) between two groups,*

1. *when a group is of low productivity (i.e. the net productivity in secular world can't reach one whatever sanction level a group chooses ($(1 - \tau)\eta < 1$)), it ends up choosing highest level of sanctions ($\tau = 1$) irrespective of the productivity of it's opponent.*

Figure 1: τ as a function of η

2. *A group even with higher productivity in secular world ($\eta \geq 1$ giving rise to $(1-\tau)\eta \geq 1$) can't out rightly choose low sanctions ($\tau = 0$). It does so only when its productivity $\eta > \tilde{\eta} = 1 + \frac{1}{\beta^{1/1-\sigma}}$ otherwise it ends up choosing high sanctions ($\tau = 1$).*

   In our model the productivity parameter (η) is an indicator of economic development of a community. So, n the light of these propositions it is clear that the choice of sanction level by group elites and subsequent decision of group members for contributing toward group cause in intergroup conflict is dependent on the level of economic development (η). For the lower values of η (below than a threshold $\tilde{\eta}$), group chooses higher levels of group sanctions and for higher values of η, group elites choose lower level of sanctions. This

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phenomenon is depicted in figure (1).

4   Different βs?

Now we consider that the members of the group are not equally attached to the group philosophy. We assume that few members of the group have strong attachment while few are not so-strongly attached to the group philosophy. This gives rise to β_θ with $\theta = \{L, H\}$ instead of β. The type θ_L represents the members with low attachment while θ_H corresponds to high attachment members of the group. If we replace β with β_θ, findings of previous section do not change qualitatively. Now, they will also depend on relative population of high attachment types in groups. Keeping other things fixed, the probability of wining the conflict will depend on proportion of members with high attachment in the group. In the changed scenario, the threshold level of productivity $\tilde{\eta}$ takes another value $\bar{\eta}$ which will be also a function of proportion of high attachment members in the group. The new value of the threshold value of productivity of group members in secular world is as follows

$$\bar{\eta} = \frac{1}{\alpha_i \frac{\beta_H^{\frac{1}{1-\sigma}}}{1+\beta_H^{\frac{1}{1-\sigma}}} + (1 - \alpha_i)\frac{\beta_L^{\frac{1}{1-\sigma}}}{1+\beta_L^{\frac{1}{1-\sigma}}}} \tag{22}$$

Clearly, this threshold value is decreasing in α_i as $\beta_H > \beta_L$.

5   Few Examples from India

The Economic Times, on June, 6, 2014 writes[6] "...Between 2001 and April 2014, Left-wing extremists unleashed numerous attacks on government buildings and infrastructure......destroying 113 schools, 75 panchayat and cultural buildings, four hospitals and 119 road and culverts...."
This is one of the many such news articles that describes how naxalites halt development projects and keep larger population away from basic needs which in turn reduces the productivity of this population group. The naxalite movement was started from the village named Naxalbari in West Bengal

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[6]http://economictimes.indiatimes.com/news/politics-and-nation/
chhattisgarh-decline-in-naxal-attacks-on-key-infrastructure-and-buildings-since-2011-observed/
articleshow/36139052.cms

province in India. It was started against the atrocities of landlords and later it took the form of a conflict against states. It is clear from the cited news article that how the naxal authorities halt development activities of state in these area so that the population remains poor and becomes a puppet in their hands. They burn schools[7], destroy road projects, loot the grains of mid day meal scheme, a central government initiative directed to child nutrition and burn hospitals.

Figure 2: Condition of road to Dhinkiya in Odisha

Just like in Naxalite movement, we can observe similar behaviour in another same kind of movement, the anti POSCO movement. POSCO is a South Korean conglomerate that signed an MoU with Indian state of Odisha in 2005 to set up an Steel plant in Odisha. However, due to opposition from anti POSCO movement, the MoU could not be renewed in 2011 and there is not even a distant hope of the completion of the project. In the anti POSCO

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[7]http://www.ndtv.com/india-news/bihar-naxals-blow-up-school-in-aurangabad-415078

movement also, local populace is subjected to the sanctions or restrictions that deprive it from basic facilities and rights that in turn keeps them poor and decrease their productivity in outer world. Movement authorities use children, women and old people as human shield (figure 5)[8] and arm them. In this way children are kept deprived from education. Additionally they also keep the schools closed. They don't let the government make the roads by inciting local population. Figure (5) shows state of roads in the locality where this movement operates. The movement authorities also restrict the general public to interact with outer world. An outside person can only talk to leaders. In this way they keep the general population aloof from outer world so that they know the reality as they want them to know. Authorities have also kept a provision of compulsory attendance of meetings called by them. If someone fails to attend, he is penalized by social boycott, life threat etc.[9].

In yet another conflict zone Kashmir, we can see similar trends. Kashmir has been ailing due to separatist movement for decades. In India, we regularly come across incidents of stone pelting on security personnels by Kashmiri youths who are allegedly compensated by separatist leaders. In retaliation from security forces, many youths sustain serious injuries and many even die. It is common in Kashmir that separatists call for bandhs in the valley. They ask students to boycott the schools and hence in valley schools remain closed most of the time in the year[10]. In this way, the separatist leaders are leading the valley youths astray and keeping them away from normal income generating activities or the activities that increases their chances in income generating activities so that they keep on getting the fighters for their movement[11].

6 Conclusion

This chapter shows how group authorities can effectively mitigate the problem of free riding by choosing an higher level of sanctions over group members

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[8]Image Source: `http://www.countercurrents.org/paikray071215.htm`

[9]Thanks to Mr. Manoranjan Das, a fellow PhD student in Sociology, for sharing the information about anti POSCO movement from the primary survey he conducted for his PhD thesis.

[10]`http://www.livemint.com/Politics/abNJkeBt6gKEEzn6EBLh8K/Schools-in-Kashmir-Valley-reopen-after-eight-months.html`

[11]`http://www.tribuneindia.com/2010/20100919/main2.htm`

Figure 3: Using school going children and women in anti POSCO movement

and thus by augmenting group efforts they can increase the odds in their favour. Such sanctions deprive the group members of out-group contacts and opportunities hence, automatically, their group specific contribution increases. One other important feature of our model is to distinguish between labour and monetary contribution in a contest. Implications of our model are also valid for other sorts of contests as lobbying, electoral competitions etc.

We also show some instances from India that showcase such kind of behaviour on the part of protest organisers how they keep general population intact with them by depriving them from economic outer world contacts and opportunities. Difficulty in empirical testing of the findings of the model, partly due to paucity of relevant data, remains a drawback of this kind of theoretical models. This is true for the present model also but substantiation of the findings of the model on the basis of some detailed case studies

of different conflicts in society is obviously a pending work. Last but not the least, analysis of the model in the scenario when each group is composed of members with different attachment to the group ideals and the two factros viz. monetary contribution and labour contribute differently remains an interesting direction to extend this model.

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