Redistribution of Economic Resources due to Conflict: The Maoist Uprising in Nepal[1]

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Abstract

Nepal has seen a large reduction in poverty over the period 1995-2010. This period roughly coincides with the Maoist uprising which resulted in the abolition of the monarchy in 2008. So was the post-conflict provision of economic resources to districts related to their involvement in promoting the Maoist cause? We tackle this question combining theory and empirics. Our model predicts that poorer districts are more likely to support the Maoists and in return they get promised economic gains conditional on the Maoists prevailing post-conflict. Combining data on conflict with consumption expenditure data from the Nepal Living Standards Survey and data on foreign aid, we test these predictions. Our panel data estimates and our cross-sectional analysis consistently find strong support for our hypotheses.

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1 Introduction

Civil wars have been studied by academics from various disciplines and from many different angles. Given that civil wars have persisted over centuries in this world and have claimed millions of lives (if not more), this attention is quite justified. According to Miguel, Satyanath, and Sergenti (2004), the toll civil wars have taken dwarf the casualties exacted by inter-state wars since World War II. Even though sub-Saharan Africa has borne the brunt of civil wars for decades now, this phenomenon is by no means restricted to that area. In recent years, several countries in Asia too have witnessed civil conflict. We study the decade-long Maoist uprising in Nepal (1995-2005) which eventually resulted in the abolition of monarchy in 2008 and brought multi-party democracy to the country.

We are particularly interested in the following questions: (i) From which quarters did the Maoist get the maximum support? Was it poorer areas or richer ones? Theoretically it is far from clear. On one hand, the poor may sympathize more with the Maoist cause on ideological grounds. On the other hand, a non-democratic setup where markets are regulated by a government which does not enjoy popular support may not sit well with the rich.[2] (ii) Do the Maoists actually end up "rewarding" those who put their weight behind the Maoist movement? Was there an implicit *quid pro quo*? (iii) Nepal witnessed a large reduction in poverty levels over the period 1995-2010. However, the reduction was far from uniform across the districts (see Mitra (Forthcoming)). Given that this period roughly coincides with the duration of the civil war and the subsequent joining of the Maoist parties in the government, can one link this differential poverty reduction to the putative "rewards" story raised in (ii)?

Our interest in analysing the situation in Nepal extends beyond understanding a particular country's experience. Our basic goal is to understand the mechanics of civil wars in general: who supported the challenger and how were they rewarded (if at all). In particular, our interest is in the fortunes of different groups *subsequent to the cessation of the civil war*; thereby our focus on the economic consequences of conflict. Clearly, any reasonable approach to understanding the questions outlined above must account for the political economy of the country under consideration.

We proceed by combining theory with empirical analysis. In our model, there are three key sets of actors: the Maoist group, the king and the districts constituting the nation. By construction, we have kept the districts identical in all respects but one: they have different income distributions. In this way we are able to isolate the interplay between district-level income and conflict. The game proceeds as follows: first the Maoists decide whether or not they want to challenge the regime. If they do challenge, then both the Maoist group and the king simultaneously decide on how hard to fight.[3] Specifically, the Maoist group promises

[2] Empirical studies suggest that the poorer districts witnessed greater conflict. See Do and Iyer (2010) among others.

[3] We discuss an alternative sequence of moves in Section 2.3.2

(non-negative) transfers to the various districts which are to be delivered to them only if the Maoist group prevails in the conflict. Thus, these transfers are the "rewards" conditional on a Maoist victory. Also, these transfers are to be financed out of a budget whose control lies with the head of the government. The idea is that once the Maoists win the power of the king will be heavily curtailed and the country will move to democracy; more details are in Section 2.

The king has two instruments at his disposal. First, he can exact lump-sum taxes from the district in case the Maoist rebellion is defeated. Secondly, he can use his finances to buy effort from his army to combat the rebels.[4] Notice, both these instruments have the ability to affect the final outcome of conflict.[5] The first one actually works in favor of the Maoist group as higher taxes under the king's rule impel districts to side with the Maoists; however, higher taxes also mean that the king has more to enjoy in case of his victory. The impact of the second instrument (army effort) on the conflict outcome is more straight-forward.

Faced with these choices, the districts then decide individually and simultaneously on their supply of effort for the Maoist group. Of course, choosing to supply zero effort is possible and is interpreted as not supporting the Maoist group. There is no ideology in our model. Assuming that poorer districts sympathize more with the Maoist cause may be plausible but it would add no significant insights within our framework. Even in this rather frugal setup, we are able to ask and answer a rich set of questions.

We show that poorer districts contribute more effort to support the Maoists; this is true even when they are promised lower transfers (in absolute terms) as compared to their rich counterparts. Next, we are able to characterize different sets of equilibria: there is one where the king opts for "no expropriation" (zero lump-sum taxes) and another where he sets a positive level of taxes and also puts more conflict effort than in the "no expropriation" one. We then discuss some implications of exogenous changes in the size of the budget. Finally, we show that although poorer districts may receive lower transfers in an absolute sense they are gainers in a relative sense. This in turn suggests that districts with poverty figures above the national average tend to converge towards the national average; this is indicative of a non-uniform pattern of poverty reduction.

We next examined these predictions with data from Nepal. Using data on conflict, data on consumption expenditure from the Nepal Living Standards Survey (NLSS) and foreign aid data, we created a district-level panel. We have data on consumption expenditure for the pre-conflict period from the NLSS-I (conducted during 1995-96) and for the post-conflict period we use the third wave of NLSS that was conducted in 2010-11. We combine these with data on projects financed through foreign aid. These projects are mainly for the purpose of a

[4]Think of this army as a private one who must be maintained at some expense to the king. Of course, the upkeep of such an army may be financed by taxes on the districts; but then again this is money which the king could potentially "consume" himself but chooses not to and implicitly uses it to "pay" his army.

[5]We assume (as is standard) that the outcome follows from a contest success function whose inputs are the aggregate conflict contributions from each side (the king and the Maoist group).

district's infrastructural and economic development (details on this can be found in Section 3). This is what we primarily use as our measure for transfers ("rewards") to districts.

Using these data and performing both panel level and cross-sectional analysis, we consistently find that districts which experienced higher levels of conflict during the decade-long Maoist war were more likely to have a greater number of foreign aided projects in years after the war even when controlling for the district-level poverty rate. Our results survive a series of robustness checks: alternative measures of conflict, of poverty, of inequality. We split the projects into seven broad categories and separately examined the results for each category. By and large (with just a single exception), these sectoral regressions re-iterated our main findings. Our results are robust to the use of non-linear estimators (Poisson) as well. All in all, our empirical results strongly corroborate with our theoretical predictions.

Our work relates in different ways to several strands of the relatively recent but growing literature on conflict.[6] It adds to the literature on the relationship between economic conditions and warfare (see e.g., Acemoglu and Robinson (2001), Bates, Greif, and Singh (2002), Chassang and Padro-i Miquel (2009), Esteban and Ray (1999), Esteban and Ray (2008), Gawande, Kapur, and Satyanath (2012), Grossman (1991), Grossman and Kim (1995), Hirshleifer (1991), Skaperdas (1992)). In terms of linking the budget size to conflict intensity our model speaks to the conflict and state capacity issue raised by Fearon and Laitin (2003).[7] Our model shares some similarities with Besley and Persson (2010) who study why weak states are often plagued by civil disorder which reinforce low investments in legal and fiscal capacity.[8] In focussing on foreign aid and conflict, our paper relates to Dube and Naidu (2015) who find that US military assistance leads to differential increases in attacks by paramilitaries in Colombia.

Our result concerning poorer districts supplying more effort for the Maoists resonate with Collier and Hoeffler (1998, 2001, 2002) who argue that civil wars are essentially driven by poor economic opportunities. Like Dube and Vargas (2013) and Mitra and Ray (2014), we touch upon the "opportunity cost effect" and "rapacity effect" albeit from a slightly different standpoint. Lind, Moene, and Willumsen (2014) examine the effect of conflict on illegal activities like opium production in the context of Afghanistan. They argue that conflict affects general lawlessness in states where instituions are weak and this induces farmers to switch from foodgrain cultivation to crops (like opium) which may be illegal but provide ready money. Like in our paper, they too focus on how conflict affects incentives.

Our paper shares certain similarities with papers which focus on Nepal, particularly, Do

[6]See the survey by Blattman and Miguel (2010) for an overview of the literature on civil wars.

[7]They argue that the main routes that link poverty and civil war are low repressive capabilities resulting from weak armies and bad road connectivity.

[8]In a related paper, Besley and Persson (2011) study which political and economic factors drive one-sided or two-sided violence (repression as opposed to civil war). Powell (2004) approaches the issue of how power is used inefficiently (e.g., by means of open conflict as opposed to peaceful bargaining) when information is complete. Our setup also involves complete information though bargaining is not an option for the players.

and Iyer (2010) , Acharya (2009), Gates and Murshed (2005) , Bohara, Mitchell, and Nepal (2006) and Bohara, Gawande, and Nepal (2011). Acharya (2009) finds geography and the history of political activism to be relevant for violence. Gates and Murshed (2005) find a strong association between the Gini and conflict. Bohara, Gawande, and Nepal (2011) find strong evidence that greater inequality escalates deadly violence. However, it matters how one measures inequality: polarization turns out to be the more persistent type of inequality causing conflict. In sum, these studies provide evidence on variables associated with the origin and escalation of Maoist violence in Nepal; this feature distinguishes them from our work which tries to identify the effects of conflict on resource allocation.

The remainder of the paper is organized as follows. Section 2 presents a simple model designed to address our main questions. Section 3 describes the data, the empirical strategy and findings and Section 4 concludes. All proofs are contained in the appendix.

2 Theory

2.1 Basic Setup

Prior to the Maoist conflict, the *de facto* head of the government was the monarchy. We denote the incumbent head of government by K (for 'King'). The potential challenger is the Maoist group, denoted by M. Let the entire country be partitioned into (administrative) districts and let the total number of districts be $N \geq 2$. The income distribution is allowed to vary across districts; in particular, let y_i denote the average per-capita income in district i. The districts are assumed to be identical in all other respects. This abstraction is simply in order to bring the links between the economic prosperity of a district, it's participation in the Maoist conflict, and the subsequent allocation of funds for reconstruction post-conflict into sharper focus.

Why do either K or M want to stay at the helm of the government? We take the position that there are "rents" from holding office. These rents may take the shape of economic gains made possible from holding the reins of power. Specifically, there is an amount of money B which can be thought of as funds which can be allotted to the various districts for their economic development. However, it is also possible to appropriate a part or the whole of B by the incumbent ruler. However, there is an asymmetry with regard to the appropriation possibilities by K and M. We shall return to this issue later.

The game proceeds in three stages.

Stage 1: M decides whether or not to initiate a nationwide uprising/conflict against K. Formally, M chooses an action a where $a \in \{C, NC\}$; here C denotes 'conflict' and NC denotes 'no conflict'. If $a = NC$ then the game ends and everbody gets their default or peace payoffs (stated below). Otherwise, we move to the next stage.

Stage 2: Here both M and K move simultaneously. Here, M promises an allocation $\mathbf{x} \equiv (x_1, ..., x_N)$ to each of the N districts from the funds B were K to be deposed and replaced by M at the end of the conflict. Note, $x_i \geq 0$ for each $i \in \{1, .., N\}$. Here K makes two choices: (i) a tax schedule for each district $\mathbf{t} \equiv (t_1, ..., t_N)$, where $t_i \geq 0$ for each $i \in \{1, .., N\}$; and (ii) total resources contributed to conflict, denoted by R_K which must be non-negative. Note, $t_i \leq y_i$ for each $i \in \{1, .., N\}$.

Stage 3: In this stage, each district i decides on how much support, if any, to provide to the Maoist side in the conflict. We assume that within each district there is a "leader" who decides on the allocation of resources for the conflict.[9] Call this allocation r_i which again must be non-negative. It is the sum of these individual district contributions that make up the total resources in favor of M. Call it R_M. The outcome of the conflict is realized based on R_M and R_K and everybody gets the "conflict payoffs" which are described below.

Interpretation of conflict. Before proceeding further it is important to state as what we mean by the term"conflict" in our setup. Conflict should be viewed as a channel which may bring about a change in the *form* of government; it is not a mere change in the *idenitity* of the head of the government. So if the Maoists are able to win the conflict, then monarchy would be abolished (thereby curtailing K's influence on governance to a significant degree) and the country would transition into multi-party democracy.

Notice, there is *no* guarantee that the Maoists will actually win the elections after emerging victorious in the conflict. So their promises of transfers x_i to district i can be interpreted in (at least) two different ways. First, these x_is could be campaign promises by M who the district-members believe are going to prevail in the elections with certainty were M to win the conflict. The second interpretation is that these x_is directly promised by M implicitly define a standard which any party must meet in order to defeat M in the elections post-conflict.

2.1.1 Peace payoffs.

In case there is no conflict, i.e., M chooses NC in stage 1, then all players get their default payoffs. M gets a payoff of 0. All the districts enjoy their respective per-capita incomes; so district i enjoys y_i for each $i \in \{1, .., N\}$. For K, the default payoff is $W > 0$ which can be thought as previously accumulated wealth presumably dependent on B.

As mentioned briefly earlier, there is an asymmetry with regard to the appropriation possibilities by K and M. Notice that when M comes to power after winning the conflict, then the transfers that M can implement, namely $\mathbf{x}$ must necessarily be non-negative. So M can appropriate at most B. However, K can appropriate *more*; specifically K can implement (positive amount of) taxes $\mathbf{t}$ on the district which would be financed by their respective incomes, y_i for district i. The reason why we build this asymmetry into the model is to emphasize that M's victory ushers in democracy and hence this imposes an upper bound

[9] This is basically to avoid any free-rider issues.

on the degree of expropriation by the ruling party/parties. Under monarchy, the ruler has greater leeway in extorting the citizens. Another justification of this asymmetry is that even if K were to promise $\mathbf{t} < \mathbf{0}$ (i.e. positive transfers to the districts rather than taxes) this would not be credible given the history of appropriation.

2.1.2 Conflict payoffs.

The outcome of the conflict, provided M chooses C in stage 1, is determined by a standard contest function. Specifically, the probability that M wins is denoted by p which is given by

$$p = \frac{R_M}{R_M + R_K}$$

where $R_M = \sum_{i=1}^{N} r_i$ for $R_M + R_K > 0$. In case $R_M + R_K = 0$ the outcome follows from a lottery whose odds are public information.

So, the expected payoff to a district i in a conflict is given by:

$$\frac{[y_i(1-r_i)]^{(1-\sigma)}}{1-\sigma} + px_i + (1-p)(-t_i)$$

where $\sigma \in (0,1)$. Note, by construction r_i lies in the unit interval. The idea is that each district has one unit of time endowment which can be used for income-generating activities or for conflict. Hence, r_i is the fraction of time devoted to the Maoist cause. Moreover, $R_M = \sum_{i=1}^{N} r_i$ and this determines the chances of M's victory. This implies that the amount of time spent in the Maoist cause is important for determining M's success; it does not matter if that time input came from a rich district or a poor district. In the conflict literature, it is argued that conflict requires both "money and bodies". While this is no doubt true, we emphasize the "bodies" aspect here and hence the logic for R_M being the measure of time devoted to M's cause rather than financial resources.[10] This is reasonable in developing countries where conflict — and therefore it's impact — involves a large degree of human participation and often with little resort to physical capital (in the sense of sophisticated expensive armaments).[11]

Notice that both x_i and t_i are the same for every individual in district i; hence, these are to be viewed as public goods albeit local in the sense of restricted within a district.

For M, the expected payoff is:

$$p(B - \sum_{i=1}^{N} x_i).$$

Note, a higher amount of transfers to the districts, as captured by $\mathbf{x}$, (potentially) affects

[10]The total financial resources devoted to M's cause is $\sum_{i=1}^{N} r_i y_i$ which is typically different from R_M.

[11]See Grossman (1991) and Mitra and Ray (2014) among others.

the chances of M's success but leaves less for M's own "consumption". For K, the expected payoff is:

$$W - R_K + (1-p)(B + \sum_{i=1}^{N} t_i).$$

Like for M, a higher amount of taxes on the districts, as captured by $\mathbf{t}$, (potentially) affects the chances of K's success adversely but yield more for K's own "consumption". Of course, K also can affect p directly by the choice of R_K.

Another asymmetry between M and K is that M bears no direct cost of conflict; M's support is generated via the promises conditional on victory. K however has to bear the cost of R_K regardless of the outcome of the conflict.

2.2 Equilibrium

We use the standard notion of subgame perfection as the equilibrium concept for this game. To be specific, an equilibrium (SPNE) of this game is given by M's strategy $a \in \{C, NC\}$, a collection of districtwise allocations by M and K, K's conflict resource allocation and the individual district conflict contributions, $\{x_i, t_i, r_i; R_K, a\}_{i=1}^{N}$, all of which together satisfy the following:

(i) Each district's contribution to conflict — r_i for district i — is a best-response to $\{x_i, t_i; R_K, a\}$ and $\{r_j\}_{j\neq i}$.

(ii) M's choice of $\{a, \mathbf{x}\}$ is a best-response to $\{R_K, \mathbf{t}, \{r_i\}_{i=1}^{N}\}$.

(iii) K's choice of $\{R_K, \mathbf{t}\}$ is a best-response to $\{x_i, r_i; a\}_{i=1}^{N}$.

Given the equilibrium notion adopted, we start by solving backwards.

Consider the problem faced by a typical district i in the last stage. This district takes $\{x_i, t_i; R_K, a\}$ and $\{r_j\}_{j\neq i}$ as given. Hence, the problem is the following:

$$max_{r_i \in [0,1]} \frac{[y_i(1-r_i)]^{(1-\sigma)}}{1-\sigma} + \frac{r_i + \sum_{j\neq i} r_j}{r_i + \sum_{j\neq i} r_j + R_K} x_i + \frac{R_K}{r_i + \sum_{j\neq i} r_j + R_K}(-t_i)$$

Observe that the objective function is concave in r_i and hence the first order condition w.r.t r_i for an interior solution is both necessary and sufficient.[12] Note, this is given by:

$$(t_i + x_i)\frac{R_K}{(R_K + R_M)^2} = \frac{y_i^{(1-\sigma)}}{(1-r_i)^{\sigma}} \tag{1}$$

[12]Our main focus is on interior solutions. We later specify conditions under which such solutions are guaranteed. But notice that the CES specification with regard to utility from income *net of conflict contribution* rules out $r_i^* = 1$.

where $R_M = r_i + \sum_{j \neq i} r_j$.

Now, we step back to stage 2. Let us begin with M. Note, M's problem takes the following form:

$$max_{\mathbf{x} \geq \mathbf{0}} \quad \tfrac{R_M}{R_M + R_K} \cdot \left(B - \textstyle\sum_{i=1}^{N} x_i \right)$$

Notice, $\mathbf{x}$ affects M's payoff through two channels: (i) as a "payment" made out of funds B, hence decreasing M's consumption and (ii) by (potentially) affecting the districtwise contribution to conflict, i.e., via the effect on r_i for $i \in \{1, .., N\}$; this in turn affects the chances of M's success in conflict.

Hence the first order condition w.r.t x_i in M's problem for an interior solution is the following:

$$\frac{\partial r_i}{\partial x_i} \left(B - \sum_{i=1}^{N} x_i \right) = \frac{(R_K + R_M)}{R_K} R_M \tag{2}$$

In equilibrium – from M's perspective – the marginal return from any additional transfer to district i must be equalized across all districts which receive a positive transfer. Otherwise M could redistribute resources across the districts and gain. So it must be that $\frac{\partial r}{\partial x}$ must be equalized across all districts who are promised $x > 0$. This is reflected in Equation (2).

Now we turn to K. Recall, K has two actions available to affect his payoff, namely, R_K and $\mathbf{t}$. Formally, K's problem can be depicted by:

$$max_{\mathbf{t} \geq \mathbf{0}, R_K \geq 0} \quad W - R_K + \left(\tfrac{R_K}{R_M + R_K} \right) \left(B + \textstyle\sum_{i=1}^{N} t_i \right).$$

Hence the (necessary) first order condition w.r.t R_K is the following[13]:

$$B + \sum_{i=1}^{N} t_i = \frac{(R_K + R_M)^2}{R_M} \tag{3}$$

The (necessary) first order conditions w.r.t t_i for each $i \in \{1, .., N\}$ are the following:

$$(R_K + R_M) - \frac{\partial r_i}{\partial t_i} \left(B + \sum_{i=1}^{N} t_i \right) \leq 0 \tag{4}$$

$$t_i \left[(R_K + R_M) - \frac{\partial r_i}{\partial t_i} \left(B + \sum_{i=1}^{N} t_i \right) \right] = 0 \tag{5}$$

[13]Note, $R_M > 0$ in equilibrium implies $R_K > 0$. Since we focus attention on $R_M > 0$, there is no need to consider $R_K = 0$.

In case some districts which are assigned $t > 0$, equations (4) and (5) tell us that for such districts the term $\frac{\partial r}{\partial t}$ is the same and it is equal to $\frac{R_K+R_M}{(B+\sum_{i=1}^{N} t_i)}$. This is interpreted as the optimality condition that K sets $\mathbf{t}$ in such a way so that there is no gain from redistributing the tax load across the taxpaying districts.

Now the ground is set for our main results.

2.3 Results

As a starting point, consider the following symmetric benchmark. Suppose M offers the same (positive) transfer across all the districts (call it x) and K similarly offers the same (non-negative) taxes (call it t) across all of the districts. Can this be part of any equilibrium of this game?

The following observation provides the answer.

OBSERVATION **1.** *For every $i \in \{1, .., N\}$, $x_i = x > 0$ and $t_i = t \geq 0$ is not possible in equilibrium.*

Proof. See Appendix. ■

The intuition behind this result is quite straight-forward. When faced with identical "reward" and "punishment" schedules (x and t, respectively), the incentives of districts to supply effort for conflict (in M's cause) differ by the level of per-capita incomes. When faced with the same lottery, a poor district is willing to supply more effort than a rich one. After all, the stakes are relatively higher for poorer districts. However, what M cares about in equilibrium is to equalize the marginal returns (in terms of conflict contribution) to transfers (x) across all the districts; otherwise M could gain by shifting transfers to the district which offers a higher marginal return. And even though poorer districts would willingly contribute more in this case, the marginal return to M from their contribution would be lower than that from richer districts *for the same x and t*. This is basically what prevents such symmetric schedules from being part of any equilibrium.

This leads us to the question as to which districts actually supply more conflict effort in equilibrium: is it the rich ones or poor ones? The discussion above suggests that poorer districts are willing to contribute more to conflict when offered the same returns as the rich ones. But given the argument about equalization of $\frac{\partial r_i}{\partial x_i}$ across districts it seems that it may be possible that the poorer ones are actually offered *lesser* than their rich counterparts. If that is indeed so, then it is not clear whether they will end up offering higher levels of support for M. The following proposition sheds some light on this matter.

PROPOSITION **1.** *Suppose $y_i < y_j$ for $i, j \in \{1, .., N\}$. Then in equilibrium, $r_i > r_j$ whenever $x_i, x_j > 0$.*

Proof. See Appendix. ■

Proposition 1 informs us poorer districts unambiguously supply more effort in M's cause. Moreover, what must transpire is that the *sum* of x and t must be lower for poorer districts as compared to one which is richer. Observe that it is both x and t which incentivize districts to support M. In fact, higher values for each of these variables lead to a higher level of conflict effort. Given that it is $x + t$ which affects the effort level, in two identical districts (say, i and j with $y_i = y_j$), M would offer $x_i < x_j$ whenever K sets $t_i > t_j$. Therefore, there is no guarantee that two identical districts will get the same "reward" and "punishment" offers in equilibrium. More on this later.

The next issue that we deal with concerns the cumulative efforts/contributions made in support of either side: K or M. Of course, K directly chooses R_K while R_M is not directly chosen by M. M can only influence the choice of $(r_1, .., r_N)$ via $(x_1, .., x_N)$. Also recall that K can similarly influence $(r_1, .., r_N)$ through the choice of $(t_1, .., t_N)$. The next result, stated in Observation 2, deals with equilibria where K sets $\mathbf{t} > \mathbf{0}$.[14]

Observation **2.** *In any equilibrium with* $\mathbf{t} > \mathbf{0}$*,* R_K *always exceeds* R_M*.*

Proof. See Appendix. ■

By Observation 2, we know that in any equilibrium where K sets $\mathbf{t} > \mathbf{0}$ K also "fights" harder than M. Therefore, the chances of K's victory are higher ($p < 1/2$). Why is that the case? The basic reason is the following. In such cases, K stands to gain more in case of victory $(B + \sum_{i=1}^{N} t_i)$ as opposed to just B. But this comes at a price: a higher t_i *ceteris paribus* tends to raise r_i and thereby R_M. To counterbalance this effect, R_K has to be raised. The opposite logic plays out in M's case here. Since $\mathbf{t} > \mathbf{0}$ rather than $\mathbf{t} = \mathbf{0}$, this tends to push p upwards given $\mathbf{x}$ and so M may "cut back" on $\mathbf{x}$ owing to this. This cutting back on the x_is coupled with K's concomitant increase in R_K tilts the balance in K's favor. Clearly, this is a higher stakes contest for K as opposed to one in which K sets $\mathbf{t} = \mathbf{0}$. We will return to such matters in section 2.3.2.

2.3.1 Equilibrium without expropriation ($\mathbf{t} = \mathbf{0}$)

We next ask if it is possible that in equilibrium K sets $\mathbf{t} = 0$. We first present some properties of such a candidate equilibrium and then outline conditions for its existence.

Recall, K has two instruments at his disposal by means of which he can affect his payoff, namely, R_K and $\mathbf{t}$. Choosing to not "use" $\mathbf{t}$ implies that the marginal gain from setting a positive t_i for any i is non-positive. Hence, the conditions in equation (4) apply. Therefore,

[14] The issue of whether there exists an equilibrium where K sets $\mathbf{t} > \mathbf{0}$ is discussed later (see Section 2.3.2).

we can no longer claim

$$\frac{\partial r_i}{\partial t_i}\left(B+\sum_{i=1}^{N} t_i\right) = (R_K + R_M)$$

for any i. Note however, $\frac{\partial r_i}{\partial t_i} = \frac{\partial r_i}{\partial x_i}$ still applies since that follows from the FOC w.r.t. r_i (see equation (1)).

Using the same steps as in the proof of Observation 2 we get that

$$\frac{(B - \sum_{i=1}^{N} x_i)}{B} \leq \frac{R_M}{R_K}.$$

So with $\mathbf{t} = \mathbf{0}$ in equilibrium, it is no longer *necessarily* the case that $R_K > R_M$. In fact, as the following result demonstrates, R_K will equal R_M thus making the chances of a Maoist victory higher than in any $\mathbf{t} > \mathbf{0}$ equilibrium (compare with Observation 2).

Observation **3.** *In any equilibrium with* $\mathbf{t} = \mathbf{0}$*,* p *always equals* $1/2$*. Moreover,* $R_M = R_K = B/4$*.*

Proof. See Appendix. ■

The result that p is higher here than in any $\mathbf{t} > \mathbf{0}$ equilibrium is perhaps intuitive. The fact that K chooses $\mathbf{t} = \mathbf{0}$ in equilibrium implies that $\frac{\partial r_i}{\partial t_i}$ is high enough to discourage setting $t_i > 0$ for any i. In words, this means that the marginal impact on conflict contribution (against K) by the district on imposition of a positive tax ($t_i > 0$) is sufficiently high to overcome the potential gains from the enjoyment of the tax *were* K *to prevail in the conflict*. Hence, K chooses to affect the conflict outcome via R_K while "soft-pedalling" on the imposition of taxes. Observe, $\mathbf{t} > \mathbf{0}$ rather than $\mathbf{t} = \mathbf{0}$ implies a higher p (M's chances of victory) for a given level of R_K.[15] So setting $\mathbf{t} = \mathbf{0}$ enables K to reduce R_K without adversely affecting p. Such a strategy may be optimal when K perceives that M's chances of victory are sufficiently high and hence wants to cut back on his cost of conflict (captured by R_K).

Next we turn to the conditions for the existence of such an equilibrium.

Existence. The following relation is crucial for the existence of such equilibria. The details of the derivation of this relation are in the appendix.

$$1 - \sum_{i=1}^{N} \frac{y_i^{(1-\sigma)}}{(1-r_i)^{\sigma}} = 2\frac{y_i^{(1-\sigma)}}{(1-r_i)^{\sigma}}\left[1 + \frac{\sigma}{1-r_i}\sum_{i=1}^{N} r_i\right] \tag{6}$$

for $i = 1, .., N$.

[15] Since a higher $\mathbf{t}$ tends to raise R_M.

Notice, the relations depicted in (6) taken together constitute a system of N simultaneous equations in N variables, i.e., $r_1, .., r_N$. Moreover, the system of equations is not linear. A vector $(r_1, .., r_N) > \mathbf{0}$ which solves the above is necessary and sufficient for the existence of such $\mathbf{t} = 0$ equilibria. Observe that for any specific i, given $\{r_j\}_{j \neq i}$ the LHS of equation (6) is decreasing in r_i while the RHS is increasing in the same.

In general, for arbitrary values of the parameters $(\sigma, y_1, ..., y_N)$ there is no way to guarantee that a solution to the above system exists. However, for a certain subset of the entire possible parameter space, it is possible to guarantee that there exists $(r_1, .., r_N) > \mathbf{0}$.[16] We will henceforth assume that we are operating within this restricted parameter space.

Also, note that guaranteeing $(r_1, .., r_N) > \mathbf{0}$ immediately establishes $(x_1, .., x_N) > \mathbf{0}$ given that $\mathbf{t} = \mathbf{0}$.

B defines the budget the control over which precipitates the conflict. Hence, it is interesting to ask as to how the two warring groups — K and M — react to a change in the size of B. Observation 3 above provides us with an answer in the case where $\mathbf{t} = \mathbf{0}$ in equilibrium. Both parties invest more into conflict as the "prize" increases.

We now turn to the assessment of gains from the Maoist conflict. We are particularly interested in identifying which districts gain more than others following the success of M in the conflict.[17]

The next proposition deals with this issue.

PROPOSITION **2.** *In the case that M wins the conflict, poorer districts gain lesser in absolute terms but more in relative terms.*

In other words, (i) $x_i < x_j$ and (ii) $\frac{x_i}{y_i} > \frac{x_j}{y_j}$ whenever $y_i < y_j$.

Proof. See Appendix. ∎

Proposition 2 makes it clear that although poorer districts get lesser transfers in the absolute sense, they are better off than richer districts in a relative sense. In particular, the transfer received as a fraction of the initial per-capita income is *decreasing* in terms of (initial) per-capita incomes. In this sense, one could call the poorer districts the relative gainers post-conflict conditional on M winning. This is particularly salient when one thinks of a national level poverty line and considers how individual districts fare in comparison to each other based on this line. Set aside what happens to districts with poverty levels below the national average and focus on the remaining districts. Proposition 2 suggests that these districts come closer to the national average now; in other words, poverty levels in these impoverished districts fall bringing them closer to the national average.

[16] We need the absolute value of the y_is to be bounded above and also σ to be close to 0 but positive.

[17] Restricting district heterogeneity to income differences makes the comparison sharper though perhaps not without loss of generality.

The careful reader may point out that it is not $\frac{x_i}{y_i}$ which matters but one should consider how x_i fares in relation to the per-capita net of conflict contributions, since that contribution is made upfront and irrespective of who wins or loses. In other words, the comparison should be based on $y_i(1-r_i)$ as opposed to y_i. But it is easy enough to address this. Take districts i and j with $y_i < y_j$. By Proposition 1, we have $r_i > r_j$. Hence this implies $y_i(1-r_i) < y_j(1-r_j)$. Therefore,

$$\frac{x_i}{y_i} > \frac{x_j}{y_j} \Rightarrow \frac{x_i}{y_i(1-r_i)} > \frac{x_j}{y_j(1-r_j)}$$

and the conclusions of Proposition 2 still apply. In fact, we are in an even stronger position to suggest that poverty levels in poorer districts decline post-conflict.

2.3.2 Equilibrium with expropriation ($\mathbf{t} > \mathbf{0}$)

Observation 2, which informs us that $p < 1/2$ in any $\mathbf{t} > \mathbf{0}$ equilibrium, serves as an appropriate starting point for a discussion of such equilibrium. So clearly, the Maoists are less likely to win the conflict in this situation. We next examine how overall conflict, namely $R_K + R_M$, in such equilibrium compare with that in a $\mathbf{t} = \mathbf{0}$ equilibrium. Recall, by Observation 3 we have that $R_K + R_M = B/2$ in the latter equilibrium.

OBSERVATION **4.** *$R_K + R_M > B/2$ with $R_K > B/4$ in any equilibrium with $\mathbf{t} > \mathbf{0}$.*

Proof. See Appendix. ■

By the result above, in any equilibrium where $\mathbf{t} > \mathbf{0}$, the overall level of conflict is higher than in the one(s) discussed previously in section 2.3.1. This is definitely being driven by K's choice of conflict input as is reflected in $R_K > B/4$. In fact, it may be possible that R_M falls below $B/4$ (which was the optimal value in the $\mathbf{t} = \mathbf{0}$ equilibrium).

K's best response to M's choice of $\mathbf{x}$ necessarily involves a complementarity between the two actions K has at his disposal. To see that clearly, fix M's choice of $(x_1, .., x_N)$. Recall, K's conflict payoff is given by

$$W - R_K + \frac{R_K}{R_K + R_M} . \left(B + \sum_{i=1}^{N} t_i \right).$$

Now observe that a higher $\mathbf{t}$ must induce a higher R_K to keep K's payoff at the original level.[18] The fact that K invests more heavily into conflict in this scenario is clearly tied up with the fact that there is more to gain — via expropriation ($\mathbf{t} > \mathbf{0}$) — in case of victory. But that does not necessarily imply that the expected payoff to K would be higher in such an equilibrium. Interestingly, it turns out that such *is* indeed the case.

[18]Recall that a higher $\mathbf{t}$ given M's choice of $(x_1, .., x_N)$ will raise R_M and thus adversely affect K's chances of victory.

OBSERVATION **5.** *The expected payoff to K in any equilibrium with $\mathbf{t} > \mathbf{0}$ strictly exceeds that from any equilibrium with $\mathbf{t} = \mathbf{0}$.*

Proof. See Appendix. ■

It is important to note that we cannot really make an analogous statement about M's payoff since M and K are not playing a constant-sum game. In particular, a $\mathbf{t} > \mathbf{0}$ equilibrium where M chooses $(x_1, .., x_N)$ positive but infinitesimally small may be possible; and M's expected payoff here may exceed $\frac{1}{2}(B - \sum_{i=1}^{N} x_i^0)$. This feature partly derives from the fact that M faces no private cost of organizing the conflict unlike K who has to pay for R_K upfront; thus not having to bear any costs in case of defeat makes such infinitesimally small $(x_1, .., x_N)$ a possibility in equilibrium.[19]

Hence, allowing the challenger (M in this case) to move first (rather than simultaneously with K in stage 2) in the spirit of Besley and Persson (2010) will not rule out all such equilibria.[20] Notice that for any district i it is the *sum* of x_i and t_i which matter in i's choice of conflict contribution r_i; it is this substitutability between x_i and t_i which generate the multiplicity in this set of equilibria.

To sharpen our focus on equilibria which are meaningful in a practical sense in this context, we make the following assumption. Suppose there are certain costs (administrative, moral/pyschological) to exacting these taxes (t_is) from the districts. Specifically, it is costlier to exact the same proportion of taxes (t/y) the smaller y is.[21] So poorer districts are "harder" to tax in this sense. So we focus on equilibria where $t_i/y_i \leq t_j/y_j$ whenever $y_i < y_j$.

Recall the FOC w.r.t. r_i as given in equation (1):

$$(t_i + x_i)\frac{R_K}{(R_K + R_M)^2} = \frac{y_i^{(1-\sigma)}}{(1 - r_i)^\sigma}$$

By going through the same steps as in Proposition 2, we have for $y_i < y_j$:

$$\frac{x_i + t_i}{y_i} > \frac{x_j + t_j}{y_j}.$$

Applying $t_i/y_i \leq t_j/y_j$ in the above relation yields $\frac{x_i}{y_i} > \frac{x_j}{y_j}$. Therefore, even in a $\mathbf{t} > \mathbf{0}$ equilibrium, we can turn to part (ii) from Proposition 2 just like in the $\mathbf{t} = \mathbf{0}$ equilibrium. Moreover, the possibility that $x_i > x_j$ exists in this set of equilibria. Thus, poorer districts may stand to gain even in absolute terms here.

[19] One may argue that such kind of equilibria make little practical sense given that M chooses to initiate conflict in the first place; but such equilibria are valid from a theoretical standpoint.

[20] The Appendix has a result which contrasts $\mathbf{t} > \mathbf{0}$ – equilibria with $\mathbf{t} = \mathbf{0}$– equilibria under this alternative sequence of moves.

[21] Poorer individuals in most developing countries are often employed in the 'informal' sector. Hence, it is difficult to estimate their actual incomes and tax them.

2.4 Extensions

Our model is rather stylized in some respects. However it is possible to accommodate several changes to this framework without any qualitative changes to our main findings. We discuss two such possible extensions.

2.4.1 Ideology

In trying to keep the setting as parsimonious as possible, we have not accounted for ideology in our model. In particular, it may be natural to assume that district-level per-capita income may be negatively correlated with sympathies for the Maoist cause. Also, M may have a bias towards rewarding poorer districts to a larger extent.

One way to incorporate this would be to assume that there are two shocks: (i) one is in favour of M which is drawn by every district from some known distribution and these distributions could be ranked according to some first-order stochastic dominance criterion and (ii) a similar distribution for M where poorer districts are favored *ceteris paribus*. Note that (i) and (ii) effectively work in opposite directions. The former makes it easier for M to reward the poorer districts lesser while the latter induces M to reward them more. However to justify such shocks in equilibrium, the net result must be that poorer districts are treated better — at least in a relative sense — just as in our baseline model.

2.4.2 Within-district income heterogeneity

So far we had ignored any within-district heterogeneity in incomes by letting the district's conflict contribution depend only upon the average per-capita income within the district. However it is possible to let incomes vary by groups within a district and also allow these groups to make independent choices of conflict contribution; this would not affect the main results in any significant way. Specifically, let us assume that there is a distribution of incomes within each district which is allowed to vary by district.

Let $y_m(i)$ denote the median income, $y_l(i)$ and $y_h(i)$ respectively denote the average of the bottom half incomes and the top half incomes in district i. Therefore, $y_l(i) \leq y_m(i) \leq y_h(i)$ and the sizes of these two sub-groups are equal by construction. Let these two sub-groups choose their respective conflict contributions: $r_l(i)$ and $r_h(i)$. Also, let x_i and t_i potentially vary between these two groups ($l(i)$ and $h(i)$); call them $(x_l(i), x_h(i))$ and $(t_l(i), t_h(i))$ repectively. In this setup we will call district i *poorer* than district j if and only if $y_l(i) < y_l(j)$ and $y_h(i) \leq y_h(j)$. In this modified environment, all of our previous results hold true. [22]

In sum, our model provides us with a set of empirically testable predictions. First, greater support for the Maoists is expected to come from poorer districts (from Proposition 1).

[22] Essentially the problem is the same except that now instead of N there are now effectively $2N$ "districts".

This implies that violence will be greater in such districts. This is in fact borne out by existing empirical studies (see e.g., Do and Iyer (2010)). Secondly, it is precisely these poorer districts who stand to gain the most relative to their original state (in terms of transfers/implementation of development projects or poverty levels) after the end of conflict when Maoists assume power (see Proposition 2).

Next, we take these predictions to the data from Nepal.

3 Empirical Analysis

3.1 Data

For this analysis we need to combine data on incomes with the data on conflict and data on aid allocation to Nepal. For Nepal, data on incomes in not available and we use data on consumption expenditure that is available from the nationally representative Nepal Living Standards Survey (NLSS).[23] Three rounds have been conducted for this survey, the first was in 1995-96 and subsequents ones were in 2003-04 and 2010-11. So we have data consumption expenditure from the pre-conflict period using the NLSS-I and for the post conflict we use the third wave that was conducted in 2010-11. The NLSS is conducted by the Central Bureau of Statistics, Nepal. The sample size was 3388 households in Round I and increased to 5988 in Round III. The sample is divided into four strata based on geographic regions of the country: mountains, urban hills, rural hills and Terai (or lowlands). Using these data we estimate poverty and inequality numbers for each of the 75 districts in Nepal for the different rounds.

The conflict data used in this paper is the same as that used in Do and Iyer (2010). We have from this dataset the total number of causalities for the entire conflict period for each district in Nepal. We have the total number of people killed per 1000 for each district. We also have the number of people killed by the state and by the Maoists separately. The toll exacted by this conflict in terms of human lives exceeds 13,000.

For the data on the Foreign aid funded projects, we use the data available from Nepal's Aid Management Platform. However there is some missing information in some of the entries. For some projects listed in this database either the start date was missing or the amount allocated was missing. To the data available from this source, we added the beginning date for some projects that were missing. From the specific project documents for such projects, we have filled in these missing values into the database. From this source we use the total number of projects active in a district between 1995 and 2005 and then post–2005. We also use the total funds allotted to any district.[24] Along with this we also use data from the

[23] This is hardly a serious handicap given that the survey is nationally representative. For several devleoping countries (e.g., India) such consumption expenditure surveys are used to estimate poverty levels. This practice is widely accepted.

[24] First, for the calculation of the foreign aid we exclude the projects that were national, since we have no

Government of Nepal on the District Development Allocation for the years 1995 and 2003. These figures provide us with an idea of the Government's development allocation to the district.[25]

	Mean	Std. Dev.	Min	Max
Total Killed per 1000 persons	0.951	0.991	0.000	5.756
Total Killed by State per 1000 persons	0.624	0.744	0.000	4.673
Total Killed by Maoists per 1000 persons	0.327	0.281	0.000	1.401
Per capita allocation of Foreign aid	2.861	6.892	0.006	46.808
Number of Foreign aid projects	4.933	2.029	1.000	11.000
Per capita DDA	6.790	9.581	1.870	71.530
Poverty Headcount Rate	0.681	0.208	0.164	1.000
Poverty Gap	0.271	0.146	0.029	0.579
Poverty squared gap	0.136	0.098	0.004	0.373
Polarization (Esteban-Ray measure, Alpha=1)	0.027	0.017	0.007	0.108
Polarization (Esteban-Ray measure, Alpha=2)	0.013	0.011	0.002	0.064
Polarization (Esteban-Ray measure, Alpha=3)	0.007	0.007	0.001	0.039
Gini Index	0.271	0.074	0.089	0.474
Atkinson 1	0.122	0.063	0.014	0.345
Atkinson 2	0.210	0.093	0.027	0.516
Generalized entropy 0	0.133	0.075	0.014	0.423
Generalized entropy 1	0.145	0.088	0.014	0.410
Generalized entropy 2	0.194	0.158	0.015	0.761
Polarization (Foster-Wolfson measure)	0.175	0.073	0.043	0.431
Average per capita expenditure	6,848	2,661	3,220	18,191

Table 1: Descriptive Statistics (1995-2004). *Notes:* The information on conflict is from Do and Iyer (2010). The aid data is from the Government of Nepal's Aid Portal. and the inequality and polarization measures are from NLSS Round I conducted during 1995-96. The per capita District Development Fund and per capita allocation of foreign aid are stated in USD.

Table 1 gives the description of the main variables for the pre-conflict period. From this table it is evident that per capita District Development Allocation (DDA) is larger, on average, than the per capita foreign aid allocation during this period. Further, there are on average less than 5 projects active in any particular district.

In contrast, Table 2 shows that in the post-conflict period per capita DDA is smaller than per capita foreign aid allocation and the number of projects increased more than 10 fold.

way of knowing if they targeted any specific districts. Secondly, among the projects that were not national but covered more than one district, since we do not know the per district allocation, we use the average amount per district by dividing the total allocation by the number of districts targeted.

[25]Ideally, we would have like to have annual budgetary allocations by the Government, however these documents are not all digitized, so not easily available for all years.

Note that the average number of projects financed by foreign aid is above 66. These averages are indicative of the fact that in the post-conflict period foreign aid has been a significant factor in the development in this region.

	Mean	Std. Dev.	Min	Max
Total Killed per 1000 persons	0	0	0	0
Total Killed by State per 1000 persons	0	0	0	0
Total Killed by Maoists per 1000 persons	0	0	0	0
Per capita allocation of Foreign aid	21.383	58.687	0.823	408.456
Number of Foreign aid projects	66.027	21.755	23.000	144.000
Per capita DDA	12.719	20.322	3.070	165.320
Poverty Headcount Rate	0.322	0.176	0.046	0.824
Poverty Gap	7.146	5.600	0.283	25.454
Poverty squared gap	2.457	2.521	0.008	13.132
Polarization (Esteban-Ray measure, Alpha=1)	0.016	0.010	0.002	0.066
Polarization (Esteban-Ray measure, Alpha=2)	0.007	0.006	0.001	0.037
Polarization (Esteban-Ray measure, Alpha=3)	0.003	0.003	0.000	0.021
Gini Index	0.265	0.054	0.161	0.429
Atkinson 1	0.113	0.044	0.045	0.268
Atkinson 2	0.202	0.071	0.081	0.434
Generalized entropy 0	0.121	0.051	0.046	0.313
Generalized entropy 1	0.129	0.060	0.045	0.334
Generalized entropy 2	0.165	0.111	0.045	0.740
Polarization (Foster-Wolfson measure)	0.124	0.069	-0.000	0.420
Average per capita expenditure	5,235	1,185	2,312	8,218

Table 2: Descriptive Statistics (2005-2011). *Notes:* The aid data is from the Government of Nepal's Aid Portal. and the inequality and the inequality and polarization measures are from NLSS Round III conducted during 2010-11.

Also note that there has been a large decline in poverty across these two periods. In contrast, the inequality and the polarization numbers show lesser change. Note, since Table 2 pertains to the post-conflict period all (district-level) measures of conflict in this period are zero.

We treat foreign aid funded projects at par with DDA funds which are directly allotted by the Government of Nepal. That is to say, in our subsequent empirical analysis, we assume that the implementation of foreign aid funded projects are, to a large extent, in the hands of the Nepal government. The following lines from an official report from the Ministry of Finance (Government of Nepal) in 2014 bear testimony to this (italics inserted by us):

"International development assistance continues to play a significant role in supporting socio-economic development of Nepal. Lately, the development cooperation contributes about 20 percent in the annual budget and it is the major financing source for development projects *implemented through the Government of Nepal*. In this respect, development partners' information is equally important for planning, coordinating and effective utilization of the development assistances ... The Ministry of Finance is putting its best efforts to enhance aid effectiveness through greater transparency and efficient utilization of development assistances."

We now move on to the details of our empirical strategy for the identification of the relevant parameters.

3.2 Empirical Specification

Given the data at our disposal, we utilize both cross-sectional and panel data models.

We have a two period panel comprising of the conflict period (1995 - 2005) and the peace period (2005 - 2012). We use data from the NLSS I (1995 - 96) and NLSS III (2010 - 11) to get the pre- and post-conflict levels of poverty and inequality. With these we combine the foreign aid allocation 1995 - 2005 (for the first period of the panel) and the post-conflict that is the period 2005 onwards (for the second period of the panel). Since we are interested in the effect of conflict on various outcomes, a certain amount of lagging is necessary. Hence for the first period, that is the pre-conflict (peace) period we have zero conflict in all districts. For the second period, we use the conflict numbers per district as described above in Table 1; so these vary across districts and are from 1995 - 2005.

Using these our main specification is the standard OLS with fixed effects which can be stated as the following:

$$y_{dt} = \alpha_d + \gamma_t + \beta \mathbf{X}_{dt} + \rho \mathbf{Z}_{dt} + \epsilon_{dt}$$

where y_{dt} is some measure of aid that is made available to the district. This variable can be either the number of projects funded by foreign aid in that district or it may be per-capita allocation of foreign aid to the district or the per-capita allocation of government aid (DDA) to the district. $\mathbf{X}_{dt}$ is a vector of variables that describe the conflict in the district (numbers killed per 1000 in total, by the state, by the Maoists, or a dummy variable indicating more than 150 deaths in the district). $\mathbf{Z}_{dt}$ is a set of demographic and socio-economic controls and includes the measures of inequality or polarization. α_d represents the district fixed effects while γ_t captures the time effect. Here ϵ_{dt} is the error term.

It is important to bear in mind that all measures of district-level conflict are *zero* in the first period while they vary by district in the second. One may view this panel specification as a sort of *difference-in-differences* model where the treatment is conflict (in particular, the different intensities of conflict). The districts with zero/low intenstities of conflict can be thought of as the "control" group while those with moderate/high levels of conflict are the "treated" group. Of course, this "treatment" is not randomly assigned; hence, it is important to control for any pre-treatment differences between these groups. Earlier studies have identified poverty, inequality, polarization and geography as being corrleated with conflict. So we account for these factors in our regressions to control for pre-treatment differences.

An alternative specification we use is the cross-sectional OLS model in which we examine how the change in development aid provided to the district is affected by the intensity of conflict that the district previously witnessed. Here we control for the initial poverty or inequality of the district. The advantage of this specification is that we can directly see how differences conflict levels across the districts is related to directing more resources towards it. Our main specification here is:

$$\Delta y_d = \beta C_d + \gamma P_d + \rho \mathbf{Z}_d + \epsilon_d$$

where Δy_d is the change in allocation of aid to district d, C_d is the measure of conflict intensity for district d, P_d is the poverty or inequality in 1995 and $\mathbf{Z}_d$ is a set of demographic and geographic controls. Note, ϵ_d denotes the error term for the cross-sectional specification.

3.3 Results

In Table 3 column 1, we first present a result from Do and Iyer (2010) for ease of reference. Here, we see the positive correlation between initial poverty and the subsequent intensity of conflict which Do and Iyer (2010) emphasized.

	[1]	[2]	[3]
	Replication	**2011 data**	**2011 data**
Conflict deaths per 1000 population		0.042	0.024
		(0.030)	(0.032)
Poverty rate 1995-96	1.106***		
	(0.354)		
Maximum elevation ('000 meters)	0.067***	0.013*	0.029***
	(0.020)	(0.007)	(0.010)
Proportion of forested area	1.591***	0.129	0.231**
	(0.502)	(0.098)	(0.096)
Access to motorable road			-0.026
			(0.100)
Ethnicity dummies	No	No	Yes
Number of observations	71	70	70
Adjusted R^2	0.342	0.142	0.235

Table 3: OLS cross-section: Correlations between conflict and poverty. Column 1 uses Do and Iyer (2010) data and replicates their result with conflict as the main dependent variable. Column 2 and 3 have poverty in 2010-11 as the dependent variable. All regressions have the robust standard errors in parentheses.

Notice, this is also in line with the predictions of our theory. Columns (2) and (3) in Table 3 have post-conflict poverty (measured in 2010-11) as the dependent variable. These regressions suggest that there is *no* correlation between the intensity of conflict and *subsequent* district-level poverty.

Our baseline results for the panel specification are collected in Table 4. The dependent variable in the first three columns is the per-capita District Development Allocation (DDA). In the remaining columns it is based on the foreign aid allocations; specifically, in columns (3) and (4) it is the per-capita allocation of foreign aid and in columns (5) – (7) it is the number of foreign-aided projects in the district. The first six columns utilize the OLS fixed effects model while the last columns (column (7)) presents a Poisson regression with fixed effects; this is to mainly account for the fact that the dependent variable in columns (5) – (7) is a count. It is important to bear in mind that the conflict measure is the same (equals 0) across the districts in the first period and varies across the districts in the second period. Hence, the coefficient on the conflict variable has to be interpreted accordingly.

The results, by and large, show a positive association between intensity of conflict and the aid allocation. This is particularly valid for the regressions with *the number of foreign-aided projects* as the dependent variable (columns (5) – (7)). The positive coefficient indicates that as conflict increases within a district there is an increase in foreign-aided projects allotted to that district. This is tantamount to saying that those districts which experienced *greater* levels of conflict had more foreign-aid funded projects allotted to them afterwards. The coefficient is significant for both the linear and the count specifications.

One needs to weigh the different outcome variables in terms of their ability to capture what we intend to measure. Both DDA and the foreign aid allocations are *allocations* and not actual expenditure undertaken whereas the number of foreign-aid funded projects refer to projects which are *active* in the districts. In this sense, the latter is a more accurate measure of transfers made to the districts. In our view, the concerns of endogeniety are substantially lower in the regressions with foreign aid variables as compared to DDA funds. Notice, we lag the conflict measures so as to mitigate concerns of reverse causation in any case. But one may argue that conflict took place — in part — to capture these funds as warring groups need financial resources during conflict. In this respect, using the foreign aid data (rather than DDA) is desirable beacuse of two reasons: (i) There was very little foreign aid in the period before/during conflict while the aid increased substantially after the end of conflict and (ii) the extent of appropriation by the contesting groups must be lower for foreign aid as compared to DDA as there is some amount of accountability to the foreign donors.

Table 5 presents the same regressions estimated with conflict variables that measure number of people killed by state and Maoists separately. These regressions show that our basic relation between conflict intensity and aid-related variables are unchanged: larger the rise in conflict (howsoever measured) over the two periods, the greater is the increase in foreign-aid funded projects allotted to that district.

	DDA		**Aid Allocation**		**Aid: No. of Projects**		
	[1]	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
Conflict deaths per 1000 population	0.287	1.343	19.974	19.841	5.858***	5.996***	0.084**
	(1.116)	(1.448)	(17.702)	(15.798)	(1.606)	(1.351)	(0.035)
Av. Per-capita expenditure		-0.002**		0.002		-0.000	0.000
		(0.001)		(0.001)		(0.001)	(0.000)
Ethnic group 1 (population per cent)		-11.503		41.336		49.436**	0.931**
		(13.175)		(48.400)		(23.829)	(0.417)
Ethnic group 2 (population per cent)		-8.339		-63.763		33.616	0.464
		(13.593)		(39.964)		(23.012)	(0.419)
Ethnic group 3 (population per cent)		-35.228		-1.456		55.596*	-0.279
		(25.057)		(47.475)		(28.961)	(0.868)
Ethnic group 4 (population per cent)		-9.281		0.153		50.028*	0.789
		(13.604)		(33.193)		(25.111)	(0.508)
Ethnic group 5 (population per cent)		-14.969		35.893		-23.472	-0.110
		(13.903)		(47.773)		(35.273)	(0.470)
Headcount of poverty		-13.316*		50.408*		-8.806	-0.031
		(7.545)		(29.968)		(10.414)	(0.346)
Number of observations	143	143	143	143	143	143	140
Adjusted R^2	0.305	0.480	0.224	0.345	0.938	0.950	

Table 4: OLS and Poisson Fixed Effects regressions. Sources and Notes: Columns [1] and [2] have DDA per capita as the dependent variable. Columns [3] and [4] have per capita foreign aid allocation and columns [5], [6] and [7] have the number of projects as the dependent variable. Columns [1][6] have the linear model and column [7] has the poisson fixed effects specification. Robust standard errors clustered by district are given in parentheses and all regressions have time dummies and population proportion added as controls.

	DDA		**Aid Allocation**		**Aid: No. of Projects**	
	[1]	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**
Deaths caused by state per 1000 population	1.632		23.481		7.522***	
	(1.933)		(19.878)		(1.911)	
Deaths caused by Maoists per 1000 population		5.065		79.222		20.986***
		(4.675)		(56.645)		(5.368)
Av. Per-capita expenditure	-0.002**	-0.002**	0.002	0.002*	-0.000	-0.000
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Ethnic group 1 (population per cent)	-11.344	-12.752	42.731	23.772	50.496**	43.525**
	(13.338)	(13.039)	(50.126)	(37.046)	(24.945)	(21.136)
Ethnic group 2 (population per cent)	-8.219	-9.494	-62.964	-79.784*	34.506	28.068
	(13.743)	(13.435)	(41.309)	(44.314)	(23.993)	(20.718)
Ethnic group 3 (population per cent)	-34.805	-37.348	3.694	-32.516	57.898*	46.029*
	(24.954)	(26.022)	(50.582)	(39.443)	(29.992)	(27.206)
Ethnic group 4 (population per cent)	-8.983	-10.869	3.679	-22.956	51.692*	42.809*
	(13.750)	(13.583)	(34.672)	(30.457)	(26.154)	(22.677)
Ethnic group 5 (population per cent)	-15.122	-15.512	32.517	30.055	-23.733	-26.704
	(14.097)	(13.800)	(45.339)	(48.292)	(36.544)	(32.914)
Headcount of poverty	-13.330*	-12.993*	50.539	54.739*	-8.992	-7.192
	(7.567)	(7.495)	(31.630)	(30.506)	(10.634)	(10.032)
Number of observations	143	143	143	143	143	143
Adjusted R^2	0.478	0.481	0.316	0.389	0.949	0.950

Table 5: OLS Fixed effects Regressions: Alternative definitions of conflict. Sources and Notes: Robust standard errors clustered by district are given in parentheses and all regressions have time dummies and population proportion added as controls.

	Agriculture	**Communication**	**Development**	**Education**	**Health**	**Infrastucture**	**Institution**
Conflict deaths per 1000 population	2.018***	-0.093***	1.724***	1.048***	1.015**	0.262	0.022
	(0.334)	(0.030)	(0.482)	(0.369)	(0.492)	(0.262)	(0.151)
Av. Per-capita expenditure	0.000	-0.000	-0.000	-0.000	-0.000	0.000	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ethnic group 1 (population per cent)	16.265***	-0.519	18.760**	5.126	14.108	-4.691	0.388
	(4.414)	(0.675)	(8.450)	(4.260)	(10.970)	(3.086)	(2.266)
Ethnic group 2 (population per cent)	11.870**	-0.943	13.920*	6.712	7.191	-5.334*	0.199
	(4.674)	(0.742)	(8.099)	(4.641)	(10.549)	(3.095)	(2.225)
Ethnic group 3 (population per cent)	8.547	-1.518*	21.591**	3.969	27.893**	-6.885*	1.999
	(7.169)	(0.794)	(10.422)	(5.729)	(12.064)	(4.000)	(2.702)
Ethnic group 4 (population per cent)	11.727**	-0.339	21.918**	3.245	14.408	-2.490	1.560
	(4.939)	(0.722)	(8.935)	(4.379)	(11.251)	(3.362)	(2.351)
Ethnic group 5 (population per cent)	1.836	-0.071	-7.816	5.501	-15.004	-6.153*	-1.765
	(8.796)	(0.640)	(14.014)	(4.567)	(13.586)	(3.650)	(2.290)
Headcount of poverty	2.285	-0.350	-3.951	-0.330	-4.329	0.138	-2.269*
	(3.114)	(0.356)	(4.041)	(1.931)	(3.557)	(1.987)	(1.311)
Number of observations	143	143	143	143	143	143	143
Adjusted R^2	0.887	0.405	0.905	0.883	0.920	0.867	0.950

Table 6: SECTOR SPECIFIC AID ALLOCATION. Sources and Notes: We have divided the total number of projects into seven broad categories. Each column has the dependent variables as the specific sectoral project numbers. Robust standard errors clustered by district are given in parentheses and all regressions have time dummies and population proportion added as controls.

	[1]	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**
Conflict deaths per 1000 population	5.232***	4.424**	0.072***			
	(1.753)	(1.683)	(0.026)			
Deaths caused by state per 1000 population				4.825**		0.080**
				(2.118)		(0.032)
Deaths caused by Maoists per 1000 population					19.414***	
					(6.501)	
Headcount of poverty in 1995-96	-3.581	-7.577	-0.118	-7.024	-9.629	-0.111
	(13.998)	(15.974)	(0.247)	(16.168)	(15.663)	(0.250)
Linguistic polarization 1995-96		5.519	0.076	5.678	4.280	0.079
		(11.106)	(0.163)	(11.198)	(10.972)	(0.164)
Caste Polarization 1995-96		1.880	0.024	3.032	2.789	0.046
		(30.030)	(0.424)	(30.479)	(28.948)	(0.431)
Infant mortality 1995-96		0.148	0.003*	0.157	0.138	0.003*
		(0.100)	(0.002)	(0.099)	(0.101)	(0.001)
Elevation max		-3.882***	-0.070***	-3.872***	-3.905***	-0.070***
		(0.914)	(0.015)	(0.919)	(0.899)	(0.015)
Population proportion 1995-96	0.151***	0.065	0.001	0.065	0.066	0.001
	(0.040)	(0.067)	(0.001)	(0.067)	(0.066)	(0.001)
No. of Project 1995-96	1.714	2.115*	0.038**	2.074*	2.141*	0.037**
	(1.381)	(1.214)	(0.018)	(1.226)	(1.188)	(0.018)
Number of observations	72	72	72	72	72	72
Adjusted R^2	0.138	0.288	0.209	0.277	0.312	0.204

Table 7: CROSS-SECTIONAL REGRESSIONS: OLS AND POISSON. The change in foreign aid (number of projects) is the dependent variable in all columns. Columns [3] and [6] are from poisson regressions; all others are from OLS regressions. Robust standard errors are given in parentheses.

Recognizing that inequality or polarization within a district may affect both the intensity of conflict and the number of foreign-aided projects, we include different measures of such in our regressions. Table 8 (in the appendix) shows that our results are robust to using several other measures of poverty, inequality and polarization.

One concern may be that the link between conflict intensity and aid-induced projects that we document may be explained by a story linking poverty and aid allocation. Specifically, one may argue that once Maoists joined the government they influenced aid allocation in a manner so as to benefit poorer districts: simply directing aid to those who perhaps need it the most. Given the positive correlation between conflict intensity and pre-conflict poverty, this explanation would be entirely consistent with our reported findings so far. Notice moreover, such an argument runs against the implicit *quid pro quo* aspect of the theory we propose.

We do attempt to check whether it is conflict intensity *per se* which affects aid-induced projects or whether conflict is simply proxying for poverty. In our regressions (see e.g., Tables 4 and 5) we explicitly control for some measure of poverty alongside our measures of conflict. It turns out that the coefficient on the poverty variable is not stable whereas the sign and significance of the coefficient on the conflict variables is stable across the different specifications.

In Table 8 (in the appendix), however the coefficient on poverty is negative and significant across various specifications in stark contrast to the positive and significant coefficients on the conflict variable. These results taken together suggest that it is not poverty through the channel of conflict which explains the pattern of aid-funded project growth but conflict intensity in and of itself. This serves to validate both our theory and empirical results.

Rather than looking at all the projects collectively, one could divide them according to the sector (defined broadly) towards which the funds are targeted. We do so and here is how. We have divided the total funds into seven categories: (i) agriculture, (ii) communication, (iii) infrastructure, (iv) education, (v) health, (vi) institutional and (vii) general development.

We see that the results for the total number of projects (Tables 4, 5 and 8) are replicated for all sectors except for the 'communications' sector where we see an opposite effect. Specifically, higher conflict resulted in lesser projects pertaining to communication. One explanation for this could be that the Maoist parties felt that they needed to broadcast their ideology and agenda to places which they had lesser access to earlier (and hence these places were involved in the conflict to a lesser extent). Some evidence points towards such a policy (see Miklian (2009)). The detailed results for all seven sectors are collected in Table 6.

We now turn to the estimates from our cross-sectional regressions. Table 7 contains some of the main results. In all of the reported regressions in this table, the dependent variable is the change in the number of foreign aid–funded projects. The main explanatory variable of interest is *Conflict deaths per 1000 population* and this is from the period 1995 – 2005. We employ both OLS and Poisson specifications here. We see that districts with greater intensity of conflict had more foreign aid projects allotted to them. The results are robust to alternative measures of conflict and also to different measures of poverty and inequality (see Table 9 in the appendix).

4 Conclusion

In this paper, we examine the role conflict plays in determining the distribution of economic resources after conflict has ended. Typically studies on conflict have focussed on factors which precipitate conflict but the literature on the economic consequences of conflict have received lesser attention. In particular, we allude to the paucity of studies on the economic reconstruction and re-building of the affected areas. Our study of the Maoist uprising and its aftermath in Nepal aims to close this gap.

Our theory combines political factors with economic ones to capture some salient aspects of the Maoist uprising. In particular, we derive that it is poorer districts who are the bigger contributors to the Maoist cause; this is true even absent of any ideological ties between poverty and the Maoist agenda. And more importantly, our model also delivers that it is these poor "rebellious" districts who stand to gain more — perhaps not in an absolute — but in a relative sense, in the event of a successful Maoist revolution. So conflict will not bring about an entire "reversal of fortunes" but will serve to help the poorer districts in terms of converging towards the national poverty level.

We also examine these predictions empirically. First, we replicate the findings from Do and Iyer (2010) who have documented that poorer districts experienced higher levels of conflict. Next, we use data on consumption expenditure that is available from the nationally representative Nepal Longitudinal Sample Survey (NLSS) over several years: particularly, from years before and after the decade long Maoist war. This is combined with various data on different kind of district level allocations (for public infrastructure development and the like). Specifically, we exploit the data on the Foreign aided projects which is available from Nepal's Aid Management Platform. Using these data and performing both panel level and cross-sectional analysis, we consistently find that districts which experienced higher levels of conflict (during the decade–long Maoist war) were more likely to have a greater number of foreign aided projects in years after the war even when controlling for the poverty rate at the district level.

So is this really a "reward" for supporting the eventual victors? Or perhaps the victors would have targeted the poorer districts in any case, in the spirit of the benevolent social planner? Our empirical results suggest that the "reward" mechanism seems more plausible than the "benevolent social planner" story: conflict intensity has an independent effect on the number of foreign aid funded projects even aside from the effect poverty has.

From a normative point of view, should one despair? We believe that the answer is in the negative. First, it is hard to argue that greater reductions in poverty for the poorer parts of the country is *reducing* national welfare whatever may be the means to secure this. Secondly, to the extent that the ushering in of multi-party democracy is beneficial for the expression of certain political, social and economic freedoms, such “conflict” may not be outright detrimental. Hence, compensation for the conflict–contributors may well be justified. Of course, the question as to whether clientelistic relations will develop between elements of the Maoist groups and their supporters from these “core” districts remains unanswered. These questions, among others, remain open to further probing.

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Appendix

Existence. Note, that the FOC w.r.t. R_K now becomes $B = \frac{(R_K+R_M)^2}{R_M}$. So $R_K = (BR_M)^{1/2} - R_M$. Now the FOC w.r.t. x_i can be written as

$$\frac{\partial r_i}{\partial x_i}\left(B - \sum_{i=1}^{N} x_i\right) = \frac{R_M.B^{1/2}}{B^{1/2} - R_M^{1/2}} \tag{7}$$

From equation (10), we get:

$$\frac{\partial r_i}{\partial x_i} = \frac{1}{x_i}.\left[\frac{2}{BR_M)^{1/2}} + \frac{\sigma}{1-r_i}\right]^{-1}$$

Note, the FOC w.r.t. r_i gives for every i :

$$x_i = B.\frac{R_M}{(BR_M)^{1/2} - R_M}.\frac{y_i^{(1-\sigma)}}{(1-r_i)^{\sigma}}.$$

Hence, substituting for x_i and $\frac{\partial r_i}{\partial x_i}$ in equation (7) yields gives for every $i \in \{1, .., N\}$:

$$\frac{1 - \left(\frac{R_M}{(BR_M)^{1/2}-R_M}\right).\sum_{i=1}^{N}\frac{y_i^{(1-\sigma)}}{(1-r_i)^{\sigma}}}{\left(\frac{R_M}{(BR_M)^{1/2}-R_M}\right).\frac{y_i^{(1-\sigma)}}{(1-r_i)^{\sigma}}.\left[\frac{2}{BR_M)^{1/2}} + \frac{\sigma}{1-r_i}\right]} = \frac{R_M.B^{1/2}}{B^{1/2} - R_M^{1/2}} \tag{8}$$

where $R_M = \sum_{i=1}^{N} r_i$.

To this we add $R_M = B/4$ from Observation 3. This further simplies the relations outlined above to yield the following:

$$1 - \sum_{i=1}^{N}\frac{y_i^{(1-\sigma)}}{(1-r_i)^{\sigma}} = 2\frac{y_i^{(1-\sigma)}}{(1-r_i)^{\sigma}}\left[1 + \frac{\sigma}{1-r_i}\sum_{i=1}^{N} r_i\right]$$

for $i = 1, .., N$.

Proof of Observation 1: Suppose for every $i \in \{1, .., N\}$, $x_i = x > 0$ and $t_i = t \geq 0$ is part of an equilibrium. This implies that the FOC w.r.t r_i for every i becomes (see equation (1)):

$$(t + x)\frac{R_K}{(R_K + R_M)^2} = \frac{y_i^{(1-\sigma)}}{(1-r_i)^{\sigma}} \tag{9}$$

Differentiating both sides of the above equation w.r.t. x yields:

$$\frac{R_K}{(R_K+R_M)^2} - 2(x+t)\frac{\partial r_i}{\partial x}\frac{R_K}{(R_K+R_M)^3} = \sigma\frac{\partial r_i}{\partial x}\frac{y_i^{(1-\sigma)}}{(1-r_i)^{\sigma+1}}$$

Using the relation in equation (9) and re-arranging terms, we get:

$$\frac{\partial r_i}{\partial x}\left[\frac{2}{R_K+R_M} + \frac{\sigma}{1-r_i}\right] = \frac{1}{x+t}$$

This implies if $r_i > r_j$ then it must be that $\frac{\partial r_i}{\partial x} < \frac{\partial r_j}{\partial x}$.

But this violates the equilibrium condition (consult equation (2)) that $\frac{\partial r_i}{\partial x}$ must be equalized across all i since $x_i = x > 0$. Therefore, it must be that r_i is also equalized across all i.

However, take any y_i, y_j such that $y_i \neq y_j$. Then by equation (9), $r_i \neq r_j$. This leads to a contradiction and hence establishes the observation. ■

Proof of Proposition 1: Start with the FOC w.r.t r_i which is given by equation (1). Differentiating both sides of the above equation w.r.t. x_i and re-arranging terms yields:

$$\frac{\partial r_i}{\partial x_i}\left[\frac{2}{R_K+R_M} + \frac{\sigma}{1-r_i}\right] = \frac{1}{x_i+t_i} \tag{10}$$

Next, we claim that $y_i < y_j$ implies $x_i + t_i < x_j + t_j$ in equilibrium.

Suppose not; i.e., $x_i + t_i \geq x_j + t_j$. In equilibrium, $\frac{\partial r_i}{\partial x_i} = \frac{\partial r_j}{\partial x_j}$ since $x_i, x_j > 0$. This implies

$$\frac{2}{R_K+R_M} + \frac{\sigma}{1-r_i} \leq \frac{2}{R_K+R_M} + \frac{\sigma}{1-r_j}$$

which leads to $r_i \leq r_j$. Recall, the FOC w.r.t r_n for $n = i, j$ (see equation (1)). These jointly imply

$$\frac{y_i^{(1-\sigma)}}{(1-r_i)^\sigma} \geq \frac{y_j^{(1-\sigma)}}{(1-r_j)^\sigma}$$

by $x_i + t_i \geq x_j + t_j$. Since $y_i < y_j$, it must be that $r_i > r_j$ for the above relation to hold. But this leads to a contradiction.

Therefore, it must be that $x_i + t_i < x_j + t_j$ in equilibrium. Using this relation in equation (1) for i and j respectively and invoking $y_i < y_j$ yields $r_i > r_j$ thus completing the proof. ■

Proof of Observation 2: For any district i, it must be that $\frac{\partial r_i}{\partial x_i} = \frac{\partial r_i}{\partial t_i} > 0$ in equilibrium. This is clear from inspecting the FOC w.r.t. r_i (see equation (1)).

Using this relation in the FOC w.r.t. t_i (see equations (4) and (5)) yield:

$$\frac{\partial r_i}{\partial x_i}\left(B+\sum_{i=1}^{N} t_i\right) - (R_K + R_M) = 0$$

Combining the above with the FOC w.r.t. x_i (see equation (2)) gives:

$$\frac{(B-\sum_{i=1}^{N} x_i)}{(B+\sum_{i=1}^{N} t_i)} = \frac{R_M}{R_K}.$$

Since $\sum_{i=1}^{N} x_i$, $\sum_{i=1}^{N} t_i > 0$, the above implies $R_K > R_M$. ■

Proof of Observation 3: Start with the FOC w.r.t r_i which in this case takes the following form:

$$\frac{(1-r_i)^\sigma}{r_i + \sum_{j\neq i} r_j} = \frac{B}{x_i}.\frac{y_i^{(1-\sigma)}}{R_K} \tag{11}$$

Differentiating both sides of the above equation w.r.t. x_i and re-arranging terms yields:

$$\frac{\partial r_i}{\partial x_i}\left[\frac{(1-r_i)^\sigma}{R_M} + \frac{\sigma(1-r_i)^\sigma}{1-r_i}\right] = \frac{B.R_M}{x_i^2}.\frac{y_i^{(1-\sigma)}}{R_K} = \frac{(1-r_i)^\sigma}{x_i}$$

where the last equality follows from equation (11). Hence,

$$\frac{\partial r_i}{\partial x_i}\left[\frac{1}{R_M} + \frac{\sigma}{1-r_i}\right] = \frac{1}{x_i}.$$

Compare this with equation (10) while setting $t_i = 0$. Since they must both hold, it must be that $\frac{2}{R_K+R_M} = \frac{1}{R_M}$. This yields $R_K = R_M$ and hence $p = \frac{1}{2}$.

Since $B = \frac{(R_K+R_M)^2}{R_M}$ and $R_K = R_M$, we get $R_K = R_M = B/4$. ■

Proof of Proposition 2: Part (i) is immediate from the arguments already made in the proof of Proposition 1.

For part (ii), note that x_i is pinned down by the FOC w.r.t. r_i and hence

$$x_i = \frac{R_K + R_M}{1-p}.\frac{y_i^{(1-\sigma)}}{(1-r_i)^\sigma}.$$

Therefore,

$$\frac{x_i}{x_j} = \left(\frac{y_i}{y_j}\right)^{1-\sigma}.\left(\frac{1-r_j}{1-r_i}\right)^\sigma > \left(\frac{y_i}{y_j}\right)^{1-\sigma}$$

since we have $r_j < r_i$ from Proposition 1. Hence,

$$\frac{x_i}{x_j} > \left(\frac{y_i}{y_j}\right)^{1-\sigma} > \frac{y_i}{y_j}$$

where the last inequality follows from $y_i < y_j$ and $\sigma \in (0,1)$.

Re-arranging terms yield $\frac{x_i}{y_i} > \frac{x_j}{y_j}$ thus establishing part (ii) of the proposition. ■

Proof of Observation 4: From the FOCs w.r.t. t_i (see equations (4) and (5)) we have

$$\frac{\partial r_i}{\partial t_i}.B \geq R_K + R_M \qquad \text{for every } i \text{ in any equilibrium with } \mathbf{t} = \mathbf{0}$$
$$\frac{\partial r_i}{\partial t_i}.(B + \textstyle\sum_{i=1}^{N} t_i) = R_K + R_M \qquad \text{for every } i \text{ in any equilibrium with } \mathbf{t} > \mathbf{0}.$$

Now among the equilibria with $\mathbf{t} > \mathbf{0}$ pick the one with the *lowest* value of $R_K + R_M$. Suppose that $R_K + R_M$ for this particular equilibrium is no higher than $B/2$ (which is the value of $R_K + R_M$ for every equilibrium with $\mathbf{t} = \mathbf{0}$ by Observation 3). This implies

$$\left.\frac{\partial r_i}{\partial t_i}\right|_{\mathbf{t}=\mathbf{0}} > \left.\frac{\partial r_i}{\partial t_i}\right|_{\mathbf{t}>\mathbf{0}}$$

for every i by the equations above since $\sum_{i=1}^{N} t_i > 0$ in any equilibrium with $\mathbf{t} > \mathbf{0}$.

By the FOC w.r.t. r_i, we have $(t_i + x_i)\frac{R_K}{(R_K+R_M)^2} = \frac{y_i^{(1-\sigma)}}{(1-r_i)^{\sigma}}$. This holds for both the $\mathbf{t} > \mathbf{0}$ equilibrium under consideration and all $\mathbf{t} = \mathbf{0}$ equilibria.

Note, the term $\frac{R_K}{(R_K+R_M)}$ which is $(1-p)$ is larger in our $\mathbf{t} > \mathbf{0}$ equilibrium as compared to any $\mathbf{t} = \mathbf{0}$ equilibrium (by Observation 2). Therefore, for r_i to remain no higher than under any $\mathbf{t} = \mathbf{0}$ equilibrium, it must be that $\frac{(t_i+x_i)}{R_K+R_M}$ is smaller our $\mathbf{t} > \mathbf{0}$ equilibrium as compared to any $\mathbf{t} = \mathbf{0}$ equilibrium.

Now turn to equation (10). This can be written as

$$\frac{\partial r_i}{\partial t_i}\left[\frac{2(x_i+t_i)}{R_K+R_M} + \frac{\sigma(x_i+t_i)}{1-r_i}\right] = 1$$

since $\frac{\partial r_i}{\partial x_i} = \frac{\partial r_i}{\partial t_i}$ in any equilibrium. Compare terms of the above equation *across* our $\mathbf{t} > \mathbf{0}$ equilibrium and any $\mathbf{t} = \mathbf{0}$ equilibrium.

For the equation to be satisfied in both our $\mathbf{t} > \mathbf{0}$ equilibrium and any $\mathbf{t} = \mathbf{0}$ equilibrium, it must be that r_i is higher in our $\mathbf{t} > \mathbf{0}$ equilibrium as compared to any $\mathbf{t} = \mathbf{0}$ equilibrium. This implies that R_M must also be higher leading to R_K being higher (since $R_K > R_M$ by Observation 2); therefore, $R_K + R_M$ must be higher in our $\mathbf{t} > \mathbf{0}$ equilibrium as compared to any $\mathbf{t} = \mathbf{0}$ equilibrium. This contradicts our initial supposition.

Recalling our choice of the particular $\mathbf{t} > \mathbf{0}$ equilibrium, we can therefore claim that $R_K +$

$R_M > B/2$ in *every* $\mathbf{t} > \mathbf{0}$ equilibrium. Combining this with $R_K > R_M$ (from Observation 2), yields $R_K > B/4$ in every $\mathbf{t} > \mathbf{0}$ equilibrium. ∎

Proof of Observation 5: First consider any equilibrium with $\mathbf{t} = \mathbf{0}$. From Observation 3, we know that $p = 1/2$ and $R_K = R_M = B/4$. Hence, the expected payoff to K is given by

$$W - R_K + (1-p)B = W + B/4.$$

Now turn to any equilibrium with $\mathbf{t} > \mathbf{0}$. We know from the FOC w.r.t. R_K that

$$B + \sum_{i=1}^{N} t_i = \frac{(R_K + R_M)^2}{R_M}.$$

Hence, the expected payoff to K for $\mathbf{t} > \mathbf{0}$ is

$$W - R_K + \tfrac{R_K}{R_K+R_M}(B + \textstyle\sum_{i=1}^{N} t_i) = W - R_K + \tfrac{R_K}{R_K+R_M}.\tfrac{(R_K+R_M)^2}{R_M} = W + R_K.\tfrac{R_K}{R_M}.$$

By Observations 2 and 4, we have $R_K > R_M$ and $R_K > B/4$.

Hence, $W + R_K.\frac{R_K}{R_M} > W + B/4$ which establishes the observation. ∎

Suppose we modify the game slightly. Suppose we introduce another stage: allow M to move first rather than M and K moving simultaneously after stage 1. So M is allowed to choose $(x_1, .., x_N)$ *before* K can choose R_K and $(t_1, .., t_N)$. This seems reasonable given the general context of civil wars. After all, the rebel group may first announce their plans of redistribution before the incumbent can commit to a level of antagonism.[26]

Next we ask — given our modification — whether certain elements of any $\mathbf{t} > \mathbf{0}$ equilibrium may be common with a $\mathbf{t} = \mathbf{0}$ equilibrium. This is dealt with in the following proposition.

Proposition **3.** *Take any $(x_1, .., x_N)$ and $(r_1, .., r_N)$ which are part of an equilibrium with $\mathbf{t} = \mathbf{0}$. Neither of them can be sustained in any equilibrium with $\mathbf{t} > \mathbf{0}$.*

Proof. Consider $(x_1^0, .., x_N^0)$ which is part of any $\mathbf{t} = \mathbf{0}$ equilibrium. Note, the expected payoff to K in such an equilibrium is $W + B/4$. So any feasible strategy by K involving $\mathbf{t} > \mathbf{0}$ must yield $W + B/4$ or lesser when faced with $(x_1^0, .., x_N^0)$ by M. Therefore, if $(x_1^0, .., x_N^0)$ is part of a $\mathbf{t} > \mathbf{0}$ equilibrium, K must get $W + B/4$ or lesser in that equilibrium. This contradicts Observation 5 and thereby establishes the first part of our claim.

For the second part of the claim, consider any $(r_1^0, .., r_N^0)$ which is part of any $\mathbf{t} = \mathbf{0}$ equilibrium. We denote all elements of that equilibrium with 0 superscripts. Suppose this $(r_1^0, .., r_N^0)$ is also part of *some* $\mathbf{t} > \mathbf{0}$ equilibrium.

[26]Allowing the challenger to move first is in the spirit of Besley and Persson (2010). The opposite, namely letting K choose R_K and $(t_1, .., t_N)$ before M chooses $(x_1, .., x_N)$, seems less plausible given the context.

By the FOCs w.r.t R_K and r_i (see equations (1) and (3)) in this $\mathbf{t} > \mathbf{0}$ equilibrium, we have

$$\frac{y_i^{1-\sigma}}{(1-r_i^0)^\sigma} = \frac{x_i + t_i}{B - \sum_{i=1}^N x_i}$$

for every district i. From the FOCs of the $\mathbf{t} = \mathbf{0}$ equilibrium and using $p = 1/2$ therein, we have

$$\frac{y_i^{1-\sigma}}{(1-r_i^0)^\sigma} = \frac{x_i^0}{B}.$$

Hence, $\frac{x_i+t_i}{B-\sum_{i=1}^N x_i} = \frac{x_i^0}{B}$ which implies $x_i + t_i < x_i^0$ for every i.

Note that the term $\frac{R_K}{(R_K+R_M)^2}$ is falling in R_K given R_M as long as $R_K > R_M$.

Hence, $\frac{R_K}{(R_K+R_M^0)^2} < \frac{R_K^0}{(R_K^0+R_M^0)^2}$ since $R_K > R_M^0 = R_K^0$ where the first inequality follows from Observation 2 and the equality follows from Observation 3. Therefore,

$$(x_i + t_i)\frac{R_K}{(R_K + R_M^0)^2} < x_i^0 \frac{R_K^0}{(R_K^0 + R_M^0)^2}. \tag{12}$$

Now revisit the FOC w.r.t. r_i.

In the case of our $\mathbf{t} > \mathbf{0}$ equilibrium, we have $\frac{y_i^{1-\sigma}}{(1-r_i^0)^\sigma} = (x_i + t_i)\frac{R_K}{(R_K+R_M^0)^2}$.

In the case of our $\mathbf{t} = \mathbf{0}$ equilibrium, we have $\frac{y_i^{1-\sigma}}{(1-r_i^0)^\sigma} = x_i^0 \frac{R_K^0}{(R_K^0+R_M^0)^2}$. Therefore,

$$(x_i + t_i)\frac{R_K}{(R_K + R_M^0)^2} = x_i^0 \frac{R_K^0}{(R_K^0 + R_M^0)^2}.$$

This contradicts the relation in (12) above and thus completes the proof. ■

	Poverty Gap	Poverty Sq. gap	Gini	Atkinson(1)	Atkinson(2)	GE_0	GE_1	GE_2	ER_1	ER_2	ER_3	FW
Conflict deaths per 1000 population	5.450***	5.480***	5.925***	5.909***	5.982***	5.881***	5.834***	5.747***	5.729***	5.736***	5.752***	6.523***
	(1.199)	(1.185)	(1.220)	(1.272)	(1.281)	(1.281)	(1.254)	(1.244)	(1.334)	(1.329)	(1.322)	(1.164)
Measure of Dispersion	0.483	1.167	24.750	18.744	13.236	11.378	15.707	10.582	-66.806	-128.584	-230.148	52.317***
	(0.346)	(0.761)	(26.825)	(33.382)	(20.418)	(27.845)	(26.306)	(14.150)	(88.514)	(137.099)	(204.619)	(16.563)
Av. Percapita expenditure	-0.001	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Ethnic group 1 (population per cent)	53.973***	53.826**	46.549**	46.932**	47.494**	47.344**	45.579**	43.241*	46.491**	46.278*	46.244*	71.003***
	(20.007)	(20.526)	(20.333)	(21.321)	(21.046)	(21.737)	(21.415)	(21.822)	(23.093)	(23.228)	(23.357)	(18.999)
Ethnic group 2 (population per cent)	31.116	30.436	26.290	27.486	28.309	28.072	25.832	23.429	26.976	26.520	26.287	47.692**
	(18.765)	(19.009)	(19.405)	(20.057)	(19.723)	(20.309)	(20.467)	(21.284)	(21.305)	(21.364)	(21.425)	(18.215)
Ethnic group 3 (population per cent)	55.768**	53.493*	52.810*	52.802*	53.737*	53.124*	50.997*	48.217*	52.384*	52.385*	52.479*	86.458***
	(26.727)	(27.070)	(27.193)	(27.790)	(27.448)	(28.021)	(28.206)	(28.779)	(28.594)	(28.726)	(28.843)	(27.561)
Ethnic group 4 (population per cent)	51.539**	51.386**	45.901**	46.221**	47.468**	46.465**	44.276*	41.363*	44.243*	44.039*	44.065*	74.069***
	(20.917)	(21.343)	(21.275)	(22.106)	(21.799)	(22.486)	(22.473)	(23.210)	(23.456)	(23.539)	(23.660)	(20.688)
Ethnic group 5 (population per cent)	-19.292	-19.115	-24.394	-24.238	-23.270	-24.066	-25.806	-28.307	-24.477	-24.435	-24.286	4.450
	(31.512)	(31.808)	(32.735)	(33.167)	(33.143)	(33.378)	(32.906)	(32.668)	(33.994)	(33.980)	(33.960)	(31.661)
Headcount of poverty	-37.922***	-38.864***	-42.290***	-42.871***	-42.851***	-43.102***	-42.643***	-42.230***	-43.043***	-42.833***	-42.687***	-43.997***
	(7.893)	(7.278)	(6.630)	(6.587)	(6.562)	(6.578)	(6.643)	(6.693)	(6.770)	(6.812)	(6.822)	(6.187)
Number of observations	143	143	140	140	140	140	140	140	140	140	140	140
Adjusted R^2	0.951	0.951	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.955

Table 8: ALTERNATIVE DEFINITIONS OF DISPERSION (PANEL REGRESSIONS): Sources and Notes: Each column here has a different measure of dispersion as a control variable as indicated by the column heading. In all regressions the dependent variable is the same: the total number of foreign aided projects. Robust standard errors clustered by district are given in parentheses and all regressions have time dummies and population proportion added as controls.

	Poverty Gap	Poverty Sq. gap	Gini	Atkinson(1)	Atkinson(2)	GE_0	GE_1	GE_2	ER_1	ER_2	ER_3	FW
Conflict deaths per 1000 population	4.411***	4.400***	4.407**	4.401***	4.236**	4.433***	4.576***	4.646***	4.012**	3.996**	4.027**	3.975**
	(1.582)	(1.568)	(1.669)	(1.645)	(1.675)	(1.645)	(1.603)	(1.583)	(1.538)	(1.556)	(1.579)	(1.520)
Measure of Dispersion 1995-96	-1.970	1.826	34.636	40.030	24.983	34.552	29.179	16.191	-14.842	35.883	137.336	-7.341
	(19.603)	(26.975)	(27.203)	(31.310)	(19.173)	(26.104)	(25.480)	(16.641)	(92.974)	(139.067)	(205.255)	(19.265)
Linguistic polarization 1995-96	7.170	7.832	8.211	8.587	8.887	8.670	8.164	7.807	8.947	9.012	8.989	9.209
	(10.863)	(10.636)	(9.910)	(9.884)	(9.881)	(9.875)	(9.924)	(10.037)	(9.931)	(9.884)	(9.847)	(10.079)
Caste polarization 1995-96	2.374	2.279	-4.092	-4.432	-2.786	-4.592	-6.303	-7.377	1.528	1.695	1.846	0.985
	(31.456)	(31.737)	(31.280)	(31.452)	(31.163)	(31.517)	(32.092)	(33.114)	(31.816)	(31.771)	(31.675)	(31.881)
Infant mortality 1995-96	0.140	0.139	0.191*	0.188	0.190	0.187	0.185	0.182	0.166	0.163	0.157	0.168
	(0.105)	(0.107)	(0.114)	(0.114)	(0.114)	(0.114)	(0.115)	(0.115)	(0.110)	(0.110)	(0.111)	(0.113)
Elevation maximum	-3.849***	-3.852***	-3.905***	-3.913***	-3.893***	-3.925***	-3.903***	-3.873***	-3.786***	-3.815***	-3.839***	-3.742***
	(0.930)	(0.932)	(0.890)	(0.887)	(0.895)	(0.884)	(0.878)	(0.870)	(0.950)	(0.950)	(0.948)	(0.931)
Population Proportion 1995-96	0.069	0.071	0.067	0.067	0.071	0.066	0.062	0.058	0.073	0.076	0.076	0.073
	(0.069)	(0.070)	(0.074)	(0.074)	(0.074)	(0.074)	(0.075)	(0.076)	(0.074)	(0.074)	(0.074)	(0.074)
No. of aid projects 1995-96	2.067	2.042	1.783	1.791	1.765	1.789	1.856	1.923	1.846	1.846	1.847	1.868
	(1.240)	(1.247)	(1.254)	(1.254)	(1.247)	(1.254)	(1.255)	(1.252)	(1.245)	(1.240)	(1.233)	(1.253)
Number of observations	72	72	70	70	70	70	70	70	70	70	70	70
Adjusted R^2	0.284	0.284	0.277	0.276	0.275	0.277	0.276	0.276	0.262	0.262	0.264	0.263

Table 9: ALTERNATIVE DEFINITIONS OF DISPERSION (CROSS-SECTIONAL REGRESSIONS): Sources and Notes: Each column here has a different measure of dispersion as a control variable as indicated by the column heading. In all regressions the dependent variable is the same: the change in number of foreign aided projects. Robust standard errors are given in parentheses.