# Redistribution of Economic Resources due to Conflict: The Maoist Uprising in Nepal

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Abstract

Nepal has seen a significant reduction in poverty over the period 1995–2010 which encompasses the decade-long Maoist-led civil war. 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. These are confirmed by the IV analysis that we perform at the panel level.

*JEL codes:* D72, D78, O20

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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 affected millions of lives, 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 (1996–2006) which eventually culminated in the abolition of monarchy in 2008 and brought the left parties considerable success in the elections that followed. Clearly, this civil war resulted in strengthening multi-party democracy and reducing the erstwhile powerful monarch to a titular head.

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.[3] 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 supports the challenger and how they are 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. The civil conflict in Nepal is a context amenable to studying such issues especially given that the challenger (the Maoist group) achieved a large degree of political power after the hostilities ended. 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

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

[3]See e.g. Mitra (Forthcoming).

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.[4] Specifically, the Maoist group promises (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. 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.

The king has two instruments at his disposal. First, he can provide transfers to the districts which become relevant in case the Maoist rebellion is defeated; this potentially serves to dampen support for the Maoists. Secondly, he can use his finances to buy effort from his army to combat the rebels.[5] Notice, both these instruments have the ability to affect the final outcome of conflict.[6] 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.[7]

We show that poorer districts contribute more effort to support the Maoists.[8] Moreover, they do so even when they are promised *lower* transfers as compared to their rich counterparts. This is without any assumption of ideological affinities between them and the Maoists.[9] Next, we are able to characterize different sets of equilibria: there is one where the king opts for "no expropriation" (zero lump-sum transfers) and another where he sets positive transfers for the districts. We then compare features regarding the intensity of conflict — as a result of the efforts exerted by the two warring groups — across both sets of equilibria. 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.

[4]We discuss an alternative sequence of moves in which $K$ moves after the challenger, $M$, does. See section 2.3.4 for a detailed treatment.

[5]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. The King of Nepal had mobilized about 80,000 Royal Nepalese Army with the aim of ending the Maoist insurgency (see Sharma (2006)).

[6]This role of the incumbent (king) is similar in spirit to that of the political incumbent in **?** where s(he) is allowed to choose the degree of political contestability by deciding how much to spend on vote-buying, bullying, or outright repression.

[7]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).

[8]This is consistent with several empirical studies on Nepal cited above.

[9]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. This possibility is discussed in an extension.

We next examine 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 district's infrastructural and economic development. 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-iterate our main findings.

We also conduct a Two-Stages Least Squares (IV) analysis to check the robustness of our findings. It is argued that one of the important sources of funds for the Maoists came from the control of timber smuggling to India. We exploit this channel in terms of developing an instrument for our conflict measure(s) at the district level. The ecology (specifically, the elevation and vegetation) varies considerably across the different districts of Nepal. However, the type(s) of timber a district can offer is clearly a time-invariant entity. However, the prices of these — in India — *do* vary over time. Thus, a weighted index of these prices at the district-level — where the weights come from the proportion of the district vegetation falling into one of the ecological categories — would be a measure of the funding sources of the Maoists from the district at a point in time. Insofar the price movements in timber in India are independent of the aid disbursements/targetted transfers in Nepal (our outcome variables), such a weighted index would be exogenous and hence allow for improved identification of the effects. The results from our IV analysis re-enforces and in fact strengthens our basic findings.

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.[10] 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

[10]See the survey by **?** for an overview of the literature on civil wars.

model speaks to the conflict and state capacity issue raised by Fearon and Laitin (2003).[11]

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.[12] 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 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. Sharma (2006) states that the failure of development efforts in Nepal contributed to a rise in poverty and rural-urban inequality. This, in turn, fueled frustration among the disadvantaged youth in the rural and remote areas, leading to the eruption of the civil war. 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.

De Juan and Pierskalla (2016) investigate the role of violence in shaping the trust citizens have in their national government. They utilise geo-referenced survey data joined with village level information on civil war casualties to estimate the effects of exposure to violence on political trust in Nepal. They uncover that exposure to violence matters for reducing trust in the national government.

Libois (2016) poses a question which is close to ours in some ways. He looks at the short and

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

[12] 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.

medium term consequences of the Nepalese civil war on rural households livelihoods and on the inter-group distribution of income. He finds that in the short-run all households lose, but high castes by a larger extent. However, high castes diversify their income sources, notably by relying on migration, which allows them to recover. He does not explore the political-economy mechanism which we seek to emphasize: namely, the strategic role of conflict in diverting resources across districts *ex-post*.

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. The political history of Nepal confirms this.[13] 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 $i$. One should think of $y_i$ as being *net* of taxes. The districts are assumed to be identical in all other respects. This abstraction is simply in order to bring certain links — specifically those 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

[13]In 1951, late King Tribhuvan brought democracy to Nepal. Then, two major political parties - Nepali Congress Party and the Communist Party of Nepal - emerged and they forced the King to declare parliamentary elections leading to the establishment of the first democratically elected government in 1959. With the death of King Tribhuvan, his son late King Mahendra overthrew the democratically elected government, curtailed political freedom and outlawed opposition parties by restoring a single party system known as the Panchayat System in December 1960. Under this system, the King kept all executive powers and people around him enjoyed privileges which promoted lack of transparency and favoritism. The late King Birendra, who came to the throne after the death of his father King Mahendra in 1972, continued with the Panchayat System until the political agitation of the late 1980s which forced him to give way to a multi-party democracy in 1990 and became a constitutional monarch. With the re-instatement of multiparty democracy, people's expectations rose and there was widespread perception that they will have a fair go in the democratic process. Unfortunately, due to institutionalization of corruption, nepotism, and favoritism these expectations were not met as power was still concentrated in the hands of the King and his coterie. While the civil conflict was under way, the King sacked the democratically elected government twice in just over two years, and on February 1, 2005 he took over as the head of government (see e.g, Sharma (2006)).

$B$ 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. Where does this $B$ come from? It is partly arising out of the public funds raised by the incumbent government through taxation and part of it may come from foreign investors/donors.

The game proceeds in three stages.[14]

*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 transfer schedule for each district $\mathbf{t} \equiv (t_1, ..., t_N)$, where $t_i \geq 0$[15] for each $i \in \{1, .., N\}$; and (ii) total resources contributed to conflict, denoted by $R_K$ which represents the expenditure on the military and must be non-negative.

*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.[16] 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.

### 2.1.1 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 to bring about a change in the *form* of government; it is not a mere change in the *identity* of the head of the government. 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). The following quote from Sharma (2006) affirms this:

*"The declared aim of the Maoists is to wipe out the bureaucratic-capitalist class and state, uproot semi-feudalism, and drive out imperialism."*

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

[14] We discuss an alternative sequence of moves in section 2.3.4.

[15] We discuss an extension later where $t_i$ is allowed to be negative, i.e., can be a tax rather than a transfer.

[16] This is basically to avoid any free-rider issues. This assumption of a leader or a median voter to circumvent free-riding possibilities is standard in the conflict literature (see e.g., Esteban and Ray (2008)).

the following way. These $x_i$s are implicit campaign promises by $M$ who the district-members believe are going to contest in the elections were $M$ to win the conflict. So these promises by $M$ define a standard which any party must meet in order to defeat $M$ in the elections post-conflict. We assume that these announcements of transfers by $M$ and $K$ — namely, the $x_i$s and the $t_i$s — are credible. This seems reasonable as both players care about their respective reputations: after all, if $M$ emerges victorious and reneges then the chance of their success in the subsequent election(s) is substantially eroded. For $K$, reneging makes the possibility of a new rebellion more potent: the citizens may support $M$ even more strongly in a revolt subsequent to any reneging by $K$.[17]

### 2.1.2 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 the sum of two parts: one is $W > 0$ which can be thought as previously accumulated wealth.[18] The other part comes from a portion of $B$ which $K$ appropriates *systematically* in the face of no potential threats to his authority. Call this $\psi B$ for some $\psi \in (0, 1)$.[19]

It is important to point out that we make a clear distinction between $M$ choosing $NC$ (thereby dropping out of the race altogether) and *pre-emption* of conflict by $K$. In this model, we allow $K$ to choose his instruments ($R_K$ and $\mathbf{t}$) so that all support for $M$ is reduced to nil. This latter possibility will be treated as a conflict ($C$) but one in which the incumbent wins without "firing a shot". Of course, whether or not such a thing occurs in equilibrium is another matter; more on this later.

### 2.1.3 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

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

[17]The idea that reputational concerns drive commitment derives from the (unmodelled) possibility of repeated interaction between the players which is similar to that in probabilistic voting models.

[18]In a truly dynamic setting with multiple periods, this would presumably be dependent on $B$ from the earlier periods.

[19]The exact value of $\psi$ is irrelevant as it plays no role since $NC$ is never chosen in equilibrium by $M$ in our model.

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. We define $R_M$ to be the aggregate contribution, once we sum over all the $N$ districts. To represent this in monetary terms (after all, both $R_M$ and $R_K$ will be denoted in monetary units for the calculation of the relevant payoffs to the players) we let $R_M = \overline{y}.\sum_{i=1}^{N} r_i$ where $\overline{y}$ is the average per-capita income of the whole nation. For ease of exposition, we set $\overline{y} = 1$, so we can write $R_M$ simply as $\sum_{i=1}^{N} r_i$.

Observe, $R_M$ 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.[20] 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).[21]

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 being restricted within a district.

For $M$, the expected payoff involves the expected return from winning the conflict net of any direct costs of conflict which $M$ has to privately pay for. Let $\chi$ represent this cost; this is like an entry fee which signifies $M$'s commitment to overthrowing $K$. So $M'$s payoff is the following:

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

Intuitively, a higher entry cost ($\chi$) serves as a potential deterrent for choosing $C$. If $\chi$ is particularly high, then $M$ might choose $NC$ in the first stage, a situation which we feel is not particularly relevant in light of the empirical evidence. So we assume $\chi << B$ i.e. "small" in relation to $B$ so that conflict is a possibility in equilibrium.

Note, a higher amount of transfers to the districts, as captured by $\mathbf{x}$, may affect the chances

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

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

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 $M$, providing a higher amount of transfers to the districts, as captured by $\mathbf{t}$, (potentially) increases the chances of $K$'s success but reduces $K$'s share of the budgetary funds. Of course, $K$ also can affect $p$ directly by the choice of $R_K$.

## 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.[22] Note, this is given by:

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

where $R_M = r_i + \sum_{j\neq i} r_j$. Observe, if $x_i \leq t_i$ then the optimal choice of $r_i$ is 0. So clearly, the above holds for $x_i > t_i$.[23]

[22] Notice that the CES specification with regard to utility from income *net of conflict contribution* rules out $r_i^* = 1$. We will discuss later why $r_i = 0$ is not possible in equilibrium.

[23] Observation 3 below demonstrates that $x_i > t_i$ for every $i$ in every equilibrium.

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

$$max_{\mathbf{x}\geq\mathbf{0}} \ \ \frac{R_M}{R_M+R_K}.\left(B-\sum_{i=1}^{N} x_i\right)-\chi$$

Given that we are in stage 2, $\chi$ is already paid (like a "sunk cost") and hence $M$'s choice of $\mathbf{x}$ does not depend upon it. 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 mobilising the districts to contribute 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:

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

Hence the (necessary) first order condition w.r.t $R_K$ is the following[24]:

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

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

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

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

[24]Note, $R_M > 0$ in equilibrium implies $R_K > 0$. Since by Observation 3, we have $x_i > t_i$ for every $i$, it follows that $r_i > 0$. Hence we have $R_M > 0$ and so there is no need to consider $R_K = 0$.

In case some districts which are assigned $t \neq 0$, 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 transfer amounts across the districts.

This sets the ground for our main results.

## 2.3 Results

As a starting point, consider the following symmetric benchmark. Suppose $M$ offers the same transfer across all the districts (call it $x$) and $K$ similarly offers the same transfers (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 $i \in \{1, .., N\}$, $x_i = x$ and $t_i = t$ is not possible in equilibrium.*

*Proof.* See Appendix. ■

The intuition behind this result is quite straight-forward. When faced with identical "reward–punishment" schedules ($x$ and $t$), 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 given that the risk-aversion parameter is the same. 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 it possible that the poorer ones are actually offered *lesser* (by $M$) 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, $r_i > r_j$.*

*Proof.* See Appendix. ■

Proposition 1 informs us poorer districts unambiguously supply more effort in $M$'s cause. The reasoning behind the result in Observation 1 can be extended to explain this. Take two districts, $i$ and $j$ with the former poorer than the latter. What is important here is that — starting from the equal transfers scenario — there is a marginal gain from redistributing to $j$ and away from $i$. This redsitribution registers an increase in overall support for $M$. Hence, $M$ must set transfers so that $x_i - t_i < x_j - t_j$. However, this difference in *net* transfers between $i$ and $j$ is not so large so as to reduce $r_i$ to a point below $r_j$. So the more ardent supporter (the poorer district) is paid a bit lower in the net but not so much lower that it's support falls below the less ardent one's (the richer district).

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 $(t_1, .., t_N)$.

### 2.3.1 Equilibrium without transfers by $K$

We next ask if it is possible that in equilibrium $K$ sets $\mathbf{t} = 0$ and seeks to counter the rebellion through the choice of some positive level of $R_K$. Thus, there is no attempt to dissuade the districts by offering them transfers like $M$.[25] We present some properties of such a candidate equilibrium below.

What can we say about the chances of $M'$s victory in such an equilibrium? In fact, as the following result demonstrates, $R_K$ will equal $R_M$ thus make the chances of a Maoist victory rather even.

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

*Proof.* See Appendix. ∎

Recall that $B$ 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 2 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.[26]

The next proposition deals with this issue.

[25] Of course, setting $R_K > 0$ is a factor which discourages support for the Maoists.

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

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.

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 transfers by $K$

$K$ could, in principle, offer positive transfers ($\mathbf{t} > \mathbf{0}$) to the districts in order to discourage their support to $M$. Here we examine equilibria of such kind. A natural question which arises in such a context is: *does $K$ offer as much as $M$ to any district to discourage the rebellion?* The following result provides an answer.

OBSERVATION **3.** *For every district $i \in \{1, .., N\}$, in equilibrium it must be $x_i - t_i > 0$.*

*Proof.* See Appendix. ∎

So by Observation 3, although the king may try to dissuade the districts by offering positive transfers in equilibrium, the amounts offered will *never* be as high as $M$'s. Notice, this result guarantees that $r_i > 0$ (in equilibrium) for every district $i$ thus justifying our focus on

interior solutions in the first place. The intuition behind the result in Observation 3 is quite straightforward. Given that $K$ equals $M'$s offer of transfers, no district would support $M$ and hence there would be an outright victory for the incumbent. Therefore, $M$ can deviate by increasing it's offer to any one of the districts and by cutting down on the others. This would register a positive effort in favour of $M$ from this district with the additional transfer (from $M$) and no reduction of support from the others (who were supplying nil support, to begin with). This possible deviation rules out "pre-emption" by the incumbent as an equilibrium.[27]

The next result deals with the relative sizes of the investments into conflict by the two actors $M$ and $K$.

OBSERVATION **4.** *In equilibrium,* $R_M < R_K$.

*Proof.* See Appendix. ■

In such an equilibrium, the chances of $M'$s victory are lower than that under the "no transfer by $K$" equilibrium (see Observation 2). Here the incumbent is fighting harder — in the sense of exceeding the challenger's conflict investment $R_M$ — and also engaging in active dissuasion by setting $\mathbf{t} > \mathbf{0}$.

In terms of expected payoffs, it is not clear which one is preferred by $K$: the former ("no transfer by $K$" equilibrium) yields a higher prize — all of $B$ rather than $B - \sum_{i=1}^{N} t_i$ — but with lower certainty as compared to the latter. Of course, one needs to compare $R_K$ in both scenarios. The multiplicity of equilibria in the latter case makes a comparison difficult. Specifically, there could be an equilibrium characterised by low $x_i$s and even lower $t_i$s which involve $R_K < B/4$ and this would yield an expected payoff to $K$ which could exceed that under the "no transfers" case. Additionally, there could be an equilibrium with high enough $t_i$s and $R_K$ which would make the "no transfers" scenario more attractive to $K$.

### 2.3.3 Equilibrium selection

To sharpen our focus on equilibria which are meaningful in a practical sense in this context (i.e., $\mathbf{t} > \mathbf{0}$) , we make the following assumption. Suppose there are certain costs (administrative, moral/psychological) for $K$ to providing transfers ($t_i$s) to the districts. Specifically, it is (weakly) cheaper to deliver the same proportion of transfers ($t/y$) the smaller $y$ is. So poorer districts are "easier to transfer to" in this sense.[28] Notice, this does *not* imply $t_j < t_i$.

[27] One might argue that the simultaneity in $M'$s and $K'$s choices of transfers is the reason which precludes such "pre-emptive" situations. We will argue in section 2.3.4 that this result is robust to a sequential moves approach.

[28] One could think that there are costs to finding/conceptualising appropriate developmental projects for every district. So the poorer a district is, more are the dimensions along which it needs projects, and hence these costs are lower for such a district.

It is entirely possible to have $t_j \geq t_i$. Henceforth, we focus on equilibria where $t_i/y_i \geq t_j/y_j$ whenever $y_i < y_j$.

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

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

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 $t_i/y_i \geq t_j/y_j$ 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.[29] Thus, poorer districts may stand to gain even in absolute terms here.

### 2.3.4 Alternative sequence of moves

Consider the following modification to the game. We now 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 and (dissuasive) transfers.[30]

Next we ask — given our modification — what changes obtain in terms of our results. In particular, we examine whether pre-emptive transfers by $K$ resulting in certain victory for the incumbent becomes a possibility in equilibrium.

Recall, that $K$ matching $M'$s transfer schedule (i.e., setting $\mathbf{t} = \mathbf{x}$) was ruled out as a part of any equilibrium in the original game since a profitable deviation always exists for $M$ (see Observation 3 and the discussion which follows it). Given this altered sequence of moves, $M$ is aware that regardless of what it sets $\mathbf{x}$, the incumbent can follow up with an *identical* transfer schedule. But recall, one possible deviation available to $K$ in the original game is to choose $\mathbf{t} = \mathbf{x}$ and $R_K = 0$. Of course, that would not constitute an equilibrium but it is still a feasible choice for $K$. Hence, all the equilibria in the original game are robust to such a "pre-emptive" deviation by $K$. Therefore, altering the sequence of moves does not generate any novelty in terms of "pre-emptive" equilibria. What is does have implications for is in respect to selection of equilibrium which effectively reduces the set of possible equilibria (as

[29] In the proof of Proposition 1, it is established that $x_i - t_i < x_j - t_j$ whenever $y_i < y_j$. However, $t_i$ may exceed $t_j$ to the extent that $x_i > x_j$.

[30] 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.

compared to those in the original game).[31]

## 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 three 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 $(t_l(i), t_h(i))$ respec-

[31] $M$ has a first-mover advantage here in the sense that it can "select" equilibrium favourable to itself by choosing the appropriate transfer schedules among the possible ones from the equilibria in the original game.

tively. 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. [32]

### 2.4.3 Extortion possibility by $K$

So far we have allowed the incumbent, $K$, to offer non-negative transfers to the various districts which are effectively to be financed out of the budgetary funds $B$. This is akin to the transfers, $\mathbf{x}$, promised by the Maoists. Here we discuss the possibility of allowing the incumbent to actually extort in the sense that some or all of the $t_i$s could be negative. We do not make the same extension to the Maoists, since we believe that democracy imposes certain restraints on the extortionary powers of the ruling head of government.

It turns out that allowing $K$ to impose such "taxes" (negative $t_i$s) does enrich the baseline model.[33] In fact, it introduces a new set of equilibria where $K$ sets $t_i$s to be negative and also fights hard in the sense of high $R_K$ as compared to the case of $\mathbf{t} = \mathbf{0}$. We also consider the alternative sequence of moves — like in Section 2.3.4 — where $K$ can make his announcements *after* observing $M'$s. A detailed treatment is provided in a separate section in the Appendix. What is noteworthy is that our basic findings as regards Propositions 1 and 2 are unaltered by this extension.

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). 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).[34]

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 is not available and we use data on consumption expenditure that is available from the nationally representative Nepal Living

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

[33] Though it clearly increases the asymmetry between the incumbent and the challenger.

[34] Incidentally, our model is agnostic about how the transfers would look like had the Maoists failed. All we can say is that the aggregate level ($\sum_{i=1}^{N} t_i$) would be lower than under $M$ (i.e., $\sum_{i=1}^{N} x_i$) by Observation 3.

Standards Survey (NLSS).[35] 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.

We utilise two different datasets on conflict. The one which we primarily use is the same as that in Do and Iyer (2010). It is based on information provided in the annual Human Rights Yearbooks published by the Informal Sector Service Centre (INSEC), a Nepalese non-governmental organization. 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 this total broken down by 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.[36]

As a robustness check, we also use data from the Global Database of Events, Language and Tone (GDELT) Project. This project monitors the world's broadcast, print, and web news from nearly every corner of every country in over 100 languages and identifies the people, locations, organizations, counts, themes, sources, and events driving our global society every second of every day, creating a free open platform for computing on the entire world. The GDELT 1.0 Event Database contains over a quarter-billion records covering the entire world over 30 years (dating back to 1979) and organized into a set of tab-delimited files by date. It collapses information broadly into date, actors, event and geographical location. We exploit the data from here pertaining to Nepal for the time period relevant to the civil war.

For the data on the Foreign aid funded projects, we use the data available from Nepal's Aid Management Platform. This is a comprehensive source of data on foreign aid maintained at Ministry of Finance, Nepal. There is detailed information on foreign aid-funded projects, their starting date, the funds allocated and the districts they operate in, among other things.[37] 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. 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

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

[36]The population of Nepal in 1991 was around 18.57 million and in 2011 it was around 26.5 million.

[37]The dataset is available for download at AMP (Aid Management Platform) maintained at the website of Ministry of Finance, Nepal. The relevant link is: http://data.opennepal.net/content/amp-aid-data-apr-17-2014.

in a district between 1996 and 2006 and then from 2007 to 2014.[38] We also use the total funds allotted to any district.[39] Along with this we also use data from the 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.[40]

| | 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 | 1.827 | 4.193 | 0.006 | 22.158 |
| Number of Foreign aid projects | 0.503 | 0.205 | 0.100 | 1.100 |
| Per capita DDA | 5.957 | 8.941 | 1.870 | 71.530 |
| Poverty Headcount Rate | 0.683 | 0.201 | 0.164 | 1.000 |
| Poverty Gap | 0.271 | 0.142 | 0.037 | 0.579 |
| Poverty squared gap | 0.135 | 0.095 | 0.012 | 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 | 6,801 | 2,549 | 3,220 | 18,191 |

Table 1: Descriptive Statistics (1996–2006). *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 computed on the basis of the data 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 period 1996–2006. 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 is on average

[38] A project is classified as "active" within a certain duration (say 1996 to 2006) if the "start date" for the project lies within that period.

[39] First, for the calculation of the foreign aid we exclude the projects that were national in nature, since we have no 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.

[40] 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.

less than one project (the exact number being 0.503) active in a given year 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 though both have risen compared to the previous period. Note, the number of projects increased to almost 20 times of their previous value. Here the average number of projects financed by foreign aid in a district per year is above 9.6. 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 | 14.019 | 49.348 | 0.823 | 408.456 |
| Number of Foreign aid projects | 9.676 | 2.993 | 5.000 | 20.571 |
| Per capita DDA | 11.325 | 20.010 | 3.070 | 165.320 |
| Poverty Headcount Rate | 0.352 | 0.175 | 0.046 | 0.824 |
| Poverty Gap | 0.072 | 0.056 | 0.004 | 0.255 |
| Poverty squared gap | 0.025 | 0.025 | 0.001 | 0.131 |
| 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 | 1,193 | 2,312 | 8,218 |

Table 2: Descriptive Statistics (2007–2014). *Notes:* The aid data is from the Government of Nepal's Aid Portal and the inequality and polarization measures are computed on the basis of the data from NLSS Round III conducted during 2010-11. The per capita District Development Fund and per capita allocation of foreign aid are stated in USD.

Also note that there has been a large decline in poverty across these two periods; the poverty headcount shows a drop from about 68% to 35% . 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."

The last line of the quoted text betrays the concern that the foreign donors had been raising: namely, that they could *not* get a clear perspective of how the funds they were sending to Nepal were getting utilised. This strengthens our belief that the Nepalese government had in fact significant say over the allocation and use of these funds.

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 where 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 corresponds to NLSS I (1995-96) 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 district $d$ at period $t$. This variable can be either the number of projects funded by foreign aid in that district (averaged over the years in that period) 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, conflict events based on the GDELT dataset).

$\mathbf{Z}_{dt}$ is a set of time-varying demographic and socio-economic controls and includes the measures of inequality or polarization. $\alpha_d$ represents the district fixed effects while $\gamma_t$ captures the time effect. Here $\epsilon_{dt}$ is the error term which is clustered at the district level.

It is important to bear in mind that all measures of conflict for every district are *zero* in the first period while they vary by district in the second. So measures of aid in period 1 (which goes from 1996 to 2006) are a function of prior conflict (zero by definition since there was no civil conflict before 1996) and the measures of aid in period 2 (which goes from 2007 to 2014) are a function of prior conflict (so the aggregate non-zero conflict numbers from the 1996–2006 period). This lagging is necessary as we are interested in the effect of conflict on subsequent aid distribution.[41]

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 intensities 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 correlated 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 in 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 $\Delta y_d$ 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, $\epsilon_d$ denotes the error term for the cross-sectional specification.

[41] One could raise the concern that perhaps foreign aid during 1996–2006 was dampened particularly in conflict-prone districts and hence it would be appropriate to use foreign aid data from years prior to 1996. However, district-wise data on aid disbursement is not available prior to 1996. However, the aggregate figures for Nepal suggest that the amount of foreign aid during the years before 1996 was not substantial, particularly when compared to the period 2007 onwards. Moreover, we try to address the issue of potential reverse causation by our 2-SLS IV approach.

## 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

| | [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.

conflict which Do and Iyer (2010) emphasized. Notice, this is also in line with the predictions of our theory (see Proposition 1). 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. In other words, the positive correlation which existed between conflict and poverty *measured prior to conflict* disappears when we look at poverty levels in the post-conflict period. So, districts which were poor had experienced more conflict but their subsequent poverty levels seem to bear no relation to the conflict intensity they experienced. This, by itself, is suggestive that conflict may have induced targeting so as to have an impact on poverty levels.

We first provide a visual representation of our baseline specification. Figure 1 contains a two–way scatterplot with a fitted line where the number of Foreign Aid-funded Projects is plotted against the total incidences of conflict in the district; this is done after removing district–, time– and population effects. The basic pattern indicates a positive relationship. And this is what we test repeatedly in various specifications in the analysis that follows.[42]

[42]The Appendix contains similar figures for two other measures of conflict: *casualties by the State* and *casualties by the Maoists*.

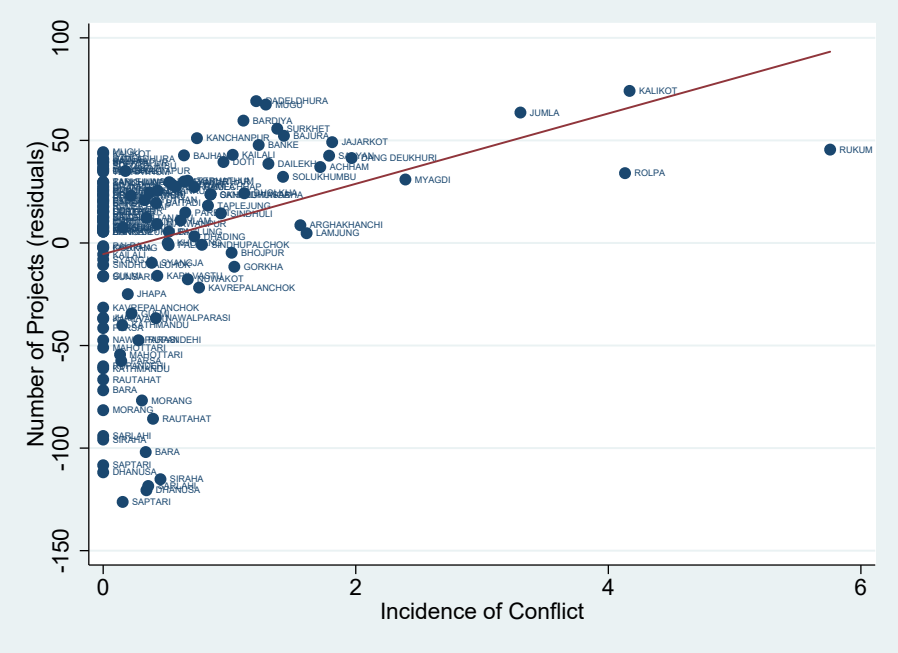


Figure 1: Number of Foreign Aid-funded Projects and Total Conflict. The vertical axis plots the residual of number of Foreign Aid-funded Projects in the period following conflict after district–, time– and population effects have been removed. The horizontal axis plots the total incidences of conflict in the district. So each district appears twice in the figure (once for every period).

| | **DDA** | | **Aid Allocation** | | **Aid: No. of Projects** | |
|---|---|---|---|---|---|---|
| | **[1]** | **[2]** | **[3]** | **[4]** | **[5]** | **[6]** |
| Conflict deaths per 1000 population | 0.287 | 1.343 | 19.974 | 19.841 | 0.836*** | 0.856*** |
| | (1.116) | (1.450) | (17.712) | (15.815) | (0.232) | (0.199) |
| Av. Per-capita expenditure | | -0.002** | | 0.002 | | -0.000 |
| | | (0.001) | | (0.001) | | (0.000) |
| Headcount of poverty | | -13.316* | | 50.408* | | -1.281 |
| | | (7.553) | | (30.001) | | (1.503) |
| Ethnic group sizes | N | Y | N | Y | N | Y |
| Population | Y | Y | Y | Y | Y | Y |
| Time dummy | Y | Y | Y | Y | Y | Y |
| Number of observations | 140 | 140 | 140 | 140 | 140 | 140 |
| Adjusted $R^2$ | 0.305 | 0.479 | 0.224 | 0.344 | 0.941 | 0.952 |

Table 4: OLS 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] and [6] have the number of projects as the dependent variable. Robust standard errors clustered by district are given in parentheses.

Our baseline results for the panel specification are collected in Table 4. The dependent variable in the first two 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) and (6) it is the average number of foreign-aid funded projects per year in the district. 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) and (6)). The positive and significant coefficients indicate that as conflict increases within a district there is an increase in foreign-aid funded 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.

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 endogeneity 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 because 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.

One could ask how conflict support for Maoists in the theory maps to casualties from conflict in the data. In particular, one could argue that casualties suffered by the Maoists at the hands of the State is a better proxy. Alternatively, one could argue that casualties inflicted by the Maoists actually constitute a better measure. We are agnostic about this and hence report results for all the three different measures: total, killed by State and killed by Maoists.

Table 5 presents some such 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.

Recognizing that inequality or polarization within a district may affect both the intensity

| | DDA | | Aid Allocation | | Aid: No. of Projects | |
|---|---|---|---|---|---|---|
| | [1] | [2] | [3] | [4] | [5] | [6] |
| Killed by state per 1000 population | 1.632 | | 23.481 | | 1.074*** | |
| | (1.935) | | (19.990) | | (0.280) | |
| Killed by Maoists per 1000 population | | 5.065 | | 79.222 | | 2.989*** |
| | | (4.680) | | (56.708) | | (0.784) |
| 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) |
| Headcount of poverty | -13.330* | -12.993* | 50.539 | 54.739* | -1.308 | -1.050 |
| | (7.567) | (7.495) | (31.630) | (30.506) | (1.534) | (1.445) |
| Ethnic group sizes | Y | Y | Y | Y | Y | Y |
| Population | Y | Y | Y | Y | Y | Y |
| Time dummy | Y | Y | Y | Y | Y | Y |
| Number of observations | 140 | 140 | 140 | 140 | 140 | 140 |
| Adjusted $R^2$ | 0.478 | 0.481 | 0.316 | 0.389 | 0.951 | 0.952 |

Table 5: OLS Fixed effects Regressions: Alternative definitions of conflict. 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] and [6] have the number of projects as the dependent variable. Robust standard errors clustered by district are given in parentheses.

of conflict and the number of foreign-aided projects, we include different measures of such in our regressions. Table 11 (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. So, one need not have the implicit *quid pro quo* theory that we propose. 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.

We try 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 11 (in the appendix), however the coefficient on poverty is not significant across various specifications in stark contrast to the positive and significant coefficients on the conflict variable. These results suggest that it is not poverty *via the channel of conflict* which explains the pattern of aid-funded project growth but conflict intensity in and of itself.

| | **Agriculture** | **Communication** | **Development** | **Education** | **Health** | **Infrastructure** | **Institution** |
|---|---|---|---|---|---|---|---|
| Conflict deaths per 1000 population | 0.286*** | -0.013*** | 0.254*** | 0.150*** | 0.143** | 0.033 | 0.003 |
| | (0.047) | (0.004) | (0.070) | (0.052) | (0.071) | (0.037) | (0.022) |
| 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) |
| Headcount of poverty | 0.332 | -0.050 | -0.569 | -0.024 | -0.654 | 0.008 | -0.324* |
| | (0.450) | (0.051) | (0.578) | (0.274) | (0.514) | (0.280) | (0.187) |
| Ethnic group sizes | Y | Y | Y | Y | Y | Y | Y |
| Population | Y | Y | Y | Y | Y | Y | Y |
| Time dummy | Y | Y | Y | Y | Y | Y | Y |
| Number of observations | 140 | 140 | 140 | 140 | 140 | 140 | 140 |
| Adjusted $R^2$ | 0.893 | 0.404 | 0.907 | 0.888 | 0.919 | 0.894 | 0.950 |

Table 6: SECTOR SPECIFIC AID ALLOCATION. Sources and Notes: We have divided the total number of projects into seven broad categories: agriculture, communication, infrastructure, education, health, institutional and general development. Each column has the dependent variables as the specific sectoral project numbers. Robust standard errors clustered by district are given in parentheses.

Rather than looking at all the projects collectively, one could divide them according to the sector (defined broadly) towards which the funds are targeted. So we have divided the total funds into seven (disjoint) categories: (i) agriculture, (ii) communication, (iii) infrastructure, (iv) education, (v) health, (vi) institutional and (vii) general development. Such an exercise serves two purposes. First, we can examine category by category how strong and large the effects are and in particular examine the sector-wise heterogeneity if any. Next, we are interested to see whether the effects are largely driven by reconstruction efforts. Once could argue that conflict-prone areas suffered heavy damages to infrastructure and institutional buildings (government offices, police stations) and hence it could be rebuilding of these which is driving our results and not the *quid pro quo* — story which we posit.

The detailed results for all seven sectors are collected in Table 6. We see that the results for the number of projects (Tables 4, 5 and 11) are replicated for most sectors except for three sectors: 'infrastructure', 'institution' and the 'communications' sectors. In the 'infrastructure' and 'institution' categories we see no statistical significance at the 10% level. This serves to allay our concern that conflict-damaged reconstruction projects are driving our results. For the 'communications' sector we see a significant effect but with the opposite sign. 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)).

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 1996–2006. We see that districts with higher intensity of conflict had more foreign aid projects allotted to them. This is true for all the three different measures of conflict intensity based on casualties (*total*, *killed by the State* and *killed by the Maoists*).

The results are also robust to alternative measures of poverty and inequality (see Table 12 in the appendix).

## 3.4 Additional robustness checks

### 3.4.1 The role of elections

It may be argued that the distribution of resources may be basically dependent upon how successful the left parties were in the elections post–conflict. In particular, in places the left were electorally successful *in relation to their pre-conflict position* there would be higher channeling of funds and projects. If the success of such parties were indeed higher in dis-

| | [1] | [2] | [3] | [4] |
|---|---|---|---|---|
| Conflict deaths per 1000 population | 0.692*** | 0.544** | | |
| | (0.245) | (0.238) | | |
| Deaths caused by state per 1000 population | | | 0.577* | |
| | | | (0.294) | |
| Deaths caused by Maoists per 1000 population | | | | 2.462** |
| | | | | (0.933) |
| Headcount of poverty in 1995-96 | -1.272 | -2.235 | -2.221 | -2.413 |
| | (2.071) | (2.421) | (2.441) | (2.369) |
| Linguistic polarization 1995-96 | | 0.754 | 0.770 | 0.600 |
| | | (1.569) | (1.582) | (1.547) |
| Caste Polarization 1995-96 | | 0.106 | 0.269 | 0.205 |
| | | (4.256) | (4.315) | (4.105) |
| Infant mortality 1995-96 | | 0.028** | 0.029** | 0.026* |
| | | (0.014) | (0.013) | (0.014) |
| Elevation max | | -0.544*** | -0.541*** | -0.549*** |
| | | (0.132) | (0.132) | (0.130) |
| No. of Project 1996-2006 | 0.256 | 0.311* | 0.303* | 0.318* |
| | (0.192) | (0.169) | (0.170) | (0.166) |
| Population | Y | Y | Y | Y |
| Number of observations | 70 | 70 | 70 | 70 |
| Adjusted $R^2$ | 0.122 | 0.287 | 0.278 | 0.308 |

Table 7: CROSS-SECTIONAL OLS REGRESSIONS.The change in foreign aid (number of projects) over the two periods (2007–2014 and 1996–2006) is the dependent variable in all columns. Robust standard errors are given in parentheses.

| | [1] | [2] | [3] | [4] |
|---|---|---|---|---|
| Conflict deaths per 1000 population | 0.894*** | 0.915*** | 0.801*** | 0.848*** |
| | (0.192) | (0.205) | (0.217) | (0.231) |
| Left seatshare | -0.026 | | | |
| | (0.033) | | | |
| Ultra-Left seatshare | | -0.049 | | |
| | | (0.070) | | |
| Left voteshare | | | 0.010 | |
| | | | (0.025) | |
| Ultra-Left voteshare | | | | 0.001 |
| | | | | (0.025) |
| Av. Per-capita expenditure | -0.000 | -0.000 | -0.000 | -0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| Headcount of poverty | -1.099 | -1.036 | -1.180 | -1.158 |
| | (1.717) | (1.758) | (1.721) | (1.759) |
| Ethnic group sizes | Y | Y | Y | Y |
| Population | Y | Y | Y | Y |
| Time dummy | Y | Y | Y | Y |
| Number of observations | 138 | 138 | 138 | 138 |
| Adjusted $R^2$ | 0.951 | 0.951 | 0.951 | 0.951 |

Table 8: OLS Fixed Effects regressions: Left electoral presence. Sources and Notes: All columns have the number of projects as the dependent variable. The left parties performance is measured in four different ways; first, we categorise the left parties into two groups on the basis of their stated ideologies — *Left* and *Ultra-left*. Next, we look at their share of votes in the district and also the number of seats they won in a district. We utilise the 1994 and the 2008 elections for these measures. Robust standard errors clustered by district are given in parentheses.

tricts which witnessed more conflict, then our results could simply be a reflection of greater targeting by the left rather than any (implicit) compensation for conflict–support. We use data from two elections: one in 1994 which is prior to the start of conflict and the other in 2008 which is after the conflict had ended.

We account for this by creating different measures of left electoral presence. In particular, we employ two definitions of "leftist" parties: one is a rather stringent one while the other is more lenient. We call a party "Ultra-Left" if it stood for militant leftist ideology and in fact were active in the Maoist war. A party is coded as "Left" if it simply promoted a leftist ideology without necessarily being directly involved with the Maoist war. Note, only a breakaway faction of the Communist Party of Nepal (led by Prachanda–Bhattarai) actually took up armed struggle; so such a faction would be both *Ultra-left* and *Left* while a "moderate" party like Communist Party of Nepal (UML) is coded as *Left* but not *Ultra-left*.

Apart from CPN (Maoist), we included the following parties under *Ultra Left* because they were legal fronts for more extremist leftist ideology: *Janamorcha* and *Rastriya Janamorcha* (for the 2008 elections) and *Samyukta Janamorcha Nepal* and *Nepal Janavadi Morcha* (for the 1994 elections).

For each of these *Left/Ultra-left* parties in each election (1994 and 2008), we created two different variables at the district level: one is the share of seats won by these parties and the other is the total share of votes won by these parties. These two measures are indicators of the electoral presence of the *Left/Ultra-left* parties in each election period.

Table 8 contains some regressions where these different measures of *Left/Ultra-left* electoral presence is included as an additional control. Columns (1) and (2) have the shares of the seats won by the *Left* group and the *Ultra-left* group respectively as the political control variables. Columns (3) and (4) use the shares of votes of these parties. Interestingly, the coefficients on these variables are not statistically significant at the 10% level in these specifications.[43] Notice, inclusion of such variables does not alter our main findings in any way: the coefficient on the conflict variable remains positive and significant throughout.

### 3.4.2 Alternative measures of conflict

As mentioned earlier, we also use a second source of data on conflict to validate our results. This is from the Global Database of Events, Language and Tone (GDELT) Project. For our purposes, we created (a subset of) the GDELT database of events pertinent to internal conflict in Nepal from 1995–2011. The database consists of 37,689 observations[44]. We use the following GDELT event codes: 07 ("Provide Aid"), 14 ("Protest"), 15 ("Exhibit Force Posture"), 18 ("Assault"), 19 ("Fight") and 20 ("Use Unconventional Mass Violence").[45]

Table 9 is the exact counterpart of the table containing the baseline results (Table 4); so there is a column-by-column correspondence.

From Table 9, we can see that the basic pattern that has been documented so far continues to hold up when using this new measure of conflict intensity. Moreover, the coefficients on the conflict variable are positive and significant for not just the number of foreign aid-funded projects; in fact, it is so for the Nepal government's development funds (DDA) and the foreign aid allocations variables as well (see columns (1)—(6)). Overall, this serves to allay our concerns as to whether the relation between conflict (which we measure by casualties in the INSEC dataset) and aid was owing to some specific features of the INSEC dataset.

[43]This of course does not establish that political considerations did not have a role. We plan to take up this matter seriously in a related paper.

[44]While the original database consisted of 42,221 observations pertaining to the above-mentioned event codes in Nepal, only those geo-coded according to the geographical co-ordinate system within the Nepalese territory have been selected for analysis.

[45]See the GDELT codebook here: http://gdeltproject.org/data/lookups/CAMEO.eventcodes.txt

| | DDA | | Aid Allocation | | Aid: No. of Projects | |
|---|---|---|---|---|---|---|
| | [1] | [2] | [3] | [4] | [5] | [6] |
| Conflict (GDELT) | 0.010*** | 0.010*** | 0.005* | 0.012* | 0.001*** | 0.001*** |
| | (0.001) | (0.001) | (0.002) | (0.007) | (0.000) | (0.000) |
| Av. Per-capita expenditure | | -0.000 | | 0.006* | | 0.000* |
| | | (0.000) | | (0.004) | | (0.000) |
| Headcount of poverty | | -8.241 | | 65.228 | | -0.498 |
| | | (6.472) | | (43.355) | | (1.496) |
| Ethnic group sizes | N | Y | N | Y | N | Y |
| Population | Y | Y | Y | Y | Y | Y |
| Time dummy | Y | Y | Y | Y | Y | Y |
| Number of observations | 136 | 136 | 136 | 136 | 136 | 136 |
| Adjusted $R^2$ | 0.808 | 0.817 | 0.086 | 0.242 | 0.939 | 0.954 |

Table 9: OLS Fixed Effects regressions: Alternative Measure of Conflict. Sources and Notes: Conflict is measured using data from GDELT. 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] and [6] have the number of projects as the dependent variable. Robust standard errors clustered by district are given in parentheses.

We also replicate the results for the sectoral divisions (*a la* Table 6) to check whether a similar pattern holds. It turns out that even when using the GDELT data, the effects are quite similar. The table is provided in the Appendix (see Table 13). Next, we check whether the electoral performance of the Left parties have any influence on the coefficients on the GDELT–based conflict variables. We present regressions which are in the spirit of Table 8. Table 14 in the appendix contains some of these results. The coefficient on the conflict variable using the GDELT data continue to be positive and significant as in the baseline case (Table 8); moreover, it is true also for the Nepal government's development funds (DDA) and the foreign aid allocations variables.

## 3.5 2-SLS IV analysis

We have so far interpreted our OLS fixed effects regression results as a difference-in-differences analysis in the spirit that conflict-related deaths is like a "treatment". To account for the fact that this "treatment" is not randomly assigned across districts, we tried to control for various factors which are systematically different in these two sets of districts: namely, the *treated* and the *control*.[46] To further move in the direction of a causal interpretation of

[46]We controlled for various correlates of conflict as identified in the literature. There is no possibility of checking for a "parallel trends" assumption due to the lack of disaggregated data on foreign aid prior to

conflict on resource–redistribution, we employ a *two-stage least squares IV analysis*.

One of the important sources of funds for the Maoists came from the control of timber smuggling to India (see ICG (2005)). This idea is echoed in the following excerpt:

*"The Nepal army and the Maoists needed forest products to maintain their presence in rural areas. They needed fuel-wood and grazing for animals and timber for construction, whilst the Maoists needed timber to sell as a source of revenue"* (LFP (2010)).

This is *precisely* the channel we seek to exploit in terms of developing an instrument for our conflict measure(s) at the district level. The returns from smuggling timber to India would naturally depend on the prices for the various types of timber in India. Moreover, the ecology (specifically, the elevation and vegetation) varies considerably across the different districts of Nepal. However, the type(s) of timber a district can offer is clearly a time-invariant entity. However, the prices of these — in India — *do* vary over time. Thus, a weighted index of these prices at the district-level — where the weights come from the proportion of the district vegetation falling into one of the ecological categories (more on this below) — would be a measure of the funding sources of the Maoists from the district at a point in time. Insofar the price movements in timber in India are independent of the aid disbursements/targetted transfers in Nepal (our outcome variables), such a weighted index would be exogenous and hence allow for improved identification of the effects.

The International Centre for Integrated Mountain Development (ICIMOD) has established a Regional Database System (RDS) that acts as a central data repository for different thematic areas in the Hindu Kush Himalayan (HKH) region and provides access to these data through the RDS portal. The map of the ecology of Nepal prepared by ICIMOD provides the digital polygon data of ecology (elevation and vegetation zones) for the country in 2003.[47] This dataset has been used to assess district-wise spread of timber resources in Nepal. To that end, the vegetation types in the ICIMOD dataset were broadly classified further into coniferous, non-coniferous and non-coniferous tropical forests.[48] The International Tropical Timber Organization (ITTO) divides the price of timber into these very same categories (coniferous trees, non-coniferous trees and non-coniferous tropical trees).[49] We use these price data along with the above-mentioned ecology data to construct our proposed instrument for district-level conflict.

This brings us to the question as to the partial correlation between our proposed instrument and the measures of conflict. Say, a rise in the price of the relevant timber types imply greater resources for the Maoists. But what is the resultant effect on conflict? Does it increase or decrease? In principle, the effect could go either way. It would depend upon the

1996.

[47]This is based on the Dobremez Maps series published in France from 1970 to 1985. (Website publication date of the map: 2014-11-04T15:00:24, Standard Name: ISO 19115:2003/19139)

[48]The classification has been performed using the ecological tables provided here: http://lib.icimod.org/record/22584/files/c_attachment_178_3632.pdf.

[49]We are grateful to Francois Libois for sharing the data on the timber prices.

military strategies of the warring groups. Thus, we treat it as an empirical question which would resolve itself in the first-stage regressions.

The idea behind our instrument is similar in spirit to the strategy employed in Libois (2016) but there are some clear distinctions. Libois (2016) constructs a similar variable at the Village Development Committee (VDC) level and interacts this variable with the inverse of the distance of the VDC to India. The instrument in his case is this *interaction term* and not simply the weighted index which we use.

Now we turn to our results from this 2SLS-IV analysis. Table 10 contains some of the results. Column 1 reports the first-stage regression where conflict intensity is regressed on our weighted index ((log) Value of Wood) and the other controls. The coefficient on the instrument is negative and significant with an $F-$ statistic above the conventional threshold of 10. This indicates that our instrument is *not* weak. The negative partial correlation seems to suggest that areas where the Maoists got access to higher funds/ "deeper pockets" (through an increase in the timber prices in India) saw a reduction in violence. This is akin to a "deterrent" effect possibly because the government forces thought best against taking the battle to the (financial) strongholds of the insurgents.

The second-stage results are reported, in turn, for all three outcome variables: the Nepal government's budgetary development allocation (DDA), the foreign aid allocation and the average number of foreign aid-funded projects. Columns 2 – 4 report the results. In all of them, the effect of conflict on aid howsoever measured, is positive and significant. Moreover, it is so for the Nepal government's budgetary development allocation (DDA) and the foreign aid allocation variables which is contrast with the previous OLS fixed effects results. Columns 5 and 6 report the results for conflict deaths by the State and by the Maoists, respectively, for the average number of foreign aid-funded projects as the outcome variable. We note that basic results are the same. Observe that the $F-$ statistics from their first-stage regressions are again in excess of 10.

Table 15 in the appendix contains regressions pertaining to conflict deaths by the State and by the Maoists, respectively, for the other two outcome variables: the Nepal government's budgetary development allocation (DDA) and the foreign aid allocation. The results are in line with the ones discussed above.

# 4 Conclusion

In this paper, we examine the role conflict plays in determining the distribution of economic resources after conflict has ended. Most studies on conflict have highlighted factors which precipitate conflict but the literature on the economic consequences of conflict is relatively sparse. Our study of the Maoist uprising and its aftermath in Nepal aims to close this gap.

| | **Overall** *1st stage* [1] | **Overall** *DDA* [2] | **Overall** *Aid Alloc.* [3] | **Overall** *Projects* [4] | **State** *Projects* [5] | **Maoists** *Projects* [6] |
|---|---|---|---|---|---|---|
| Conflict deaths per 1000 population | | 11.479** | 27.831* | 1.733*** | | |
| | | (5.292) | (14.692) | (0.594) | | |
| Deaths caused by state per 1000 population | | | | | 2.362*** | |
| | | | | | (0.832) | |
| Deaths caused by Maoists per 1000 population | | | | | | 6.508*** |
| | | | | | | (2.300) |
| (log) Value of wood | -1.946*** | | | | | |
| | (0.546) | | | | | |
| Av. Per-capita expenditure | 0.000* | -0.003*** | 0.001 | -0.000 | -0.000 | -0.000 |
| | (0.000) | (0.001) | (0.001) | (0.000) | (0.000) | (0.000) |
| Poverty (Headcount) | 0.593 | -21.663** | 47.207 | -1.872 | -2.022 | -1.457 |
| | (0.519) | (10.744) | (29.272) | (1.562) | (1.635) | (1.561) |
| Ethnic group sizes | Y | Y | Y | Y | Y | Y |
| Time dummy | Y | Y | Y | Y | Y | Y |
| Population | Y | Y | Y | Y | Y | Y |
| Number of observations | 136 | 136 | 136 | 136 | 136 | 136 |
| F-statistic (Kleibergen-Paap rk Wald) | 12.691 | | | | 11.289 | 12.542 |

Table 10: 2 SLS-IV LINEAR REGRESSIONS. Sources and Notes: The variable *(log) Value of wood* is constructed as a weighted timber price index at the district level (see main text for detailed description) and is used an instrument for conflict. Column 1 reports the first-stage regression results. Columns 2–4 report the second-stage results for the three different outcome : the Nepal government's budgetary development allocation (DDA), the foreign aid allocation and the average number of foreign aid-funded projects. Columns 5 and 6 report the results for conflict deaths by the State and by the Maoists, respectively, for the average number of foreign aid-funded projects as the outcome variable. Robust standard errors clustered by district are given in parentheses.

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-ridden districts and the Maoist group. 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 may 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 Living Standards 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? While our work does not directly deal with welfare analysis, 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* social welfare whatever may be the means to secure this. But that said, whether such redistribution is happening at the expense of overall growth or not is an open question. 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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# 5 Appendix

*Proof of Observation 1:* First, we show that $x_i - t_i = 0$ for every $i \in \{1, .., N\}$ is not possible in equilibrium.

Suppose it is true. Then $r_i = 0$ for every $i$. Hence, $p = 0$. But then $M$ can gain by the following deviation: pick any $i$ such that $x_i > 0$. Clealry, there must be at least one such $i$ otherwise $M$ can gain by setting some $x_i > 0$. W.l.o.g. suppose $i = 1$. Now set $x_1 = 0$ and increase the transfer of district 2 by the amount $x_1$. This will make $r_2 > 0$ while leaving all other $r_i$s unaffected and hence result in $p > 0$. This contradiction establishes that $x_i - t_i = 0$ for every $i \in \{1, .., N\}$ is not possible in equilibrium.

Also note that $x_i - t_i < 0$ for any district $i$ cannot be part of any equilibrium since $K$ can deviate to $x_i - t_i = 0$ and gain.

So we can restrict attention to $x_i = x$ and $t_i = t$ such that $x - t > 0$. Now suppose there exist such $x$ and $t$ such that this is part of an equilibrium. This implies that the FOC w.r.t $r_i$ for every $i$ becomes (see equation (1)):

$$(x - t)\frac{R_K}{(R_K + R_M)^2} = \frac{y_i^{(1-\sigma)}}{(1 - r_i)^\sigma} \tag{6}$$

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 (6) 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 (6), $r_i \neq r_j$. 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:

$$\frac{\partial r_i}{\partial x_i}\left[\frac{2}{R_K + R_M} + \frac{\sigma}{1 - r_i}\right] = \frac{1}{x_i - t_i} \tag{7}$$

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 (7) for $i$ and $j$ respectively and invoking $\frac{\partial r_i}{\partial x_i} = \frac{\partial r_j}{\partial x_j}$ yields $r_i > r_j$ thus completing the proof. ■

*Proof of Observation 2:* Start with the FOC w.r.t $r_i$ which in this case takes the following form:

$$\frac{(1 - r_i)^\sigma}{r_i + \sum_{j \neq i} r_j} = \frac{B}{x_i} . \frac{y_i^{(1-\sigma)}}{R_K} \tag{8}$$

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 (8). 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 (7) 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,

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

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 3:* In the proof of Observation 1 we have established that in equilibrium the following will not be observed: (i) $x_i - t_i = 0$ for every district $i$ and (ii) $x_i - t_i < 0$ for any district $i$. Hence, for any district $i$ in equilibrium it must be $x_i - t_i \geq 0$. Next we show that the inequality must be strict for every $i$.

Suppose not. Let there be district $j$ such that $x_j - t_j = 0$ in equilibrium. Clearly, $r_j$ must be 0, since there is no gain in transfer to district $j$ from supporting $M$. Suppose $x_j > 0$. Then $M$ can gain by setting $x_j = 0$; so $x_j$ (and hence $t_j$) must be 0. Now consider the following deviation by $M$. Suppose $M$ sets $x_j = \epsilon$ where $\epsilon$ is infinitesimally small but positive.

By equation (1), we have $r_i$ increasing in $x_i - t_i$ whenever $x_i - t_i > 0$. Hence, for $x_j - t_j = \epsilon \to 0$, $r_j \to 0$. Using this in equation (7) (in Proposition 1's proof) we have $\frac{\partial r_j}{\partial x_j} \to \infty$. Therefore, $M$ can gain by increasing $x_j$ since $\frac{\partial r}{\partial x}$ must be finite and equal across all districts. This establishes $x_j = 0$ cannot be part of an equilibrium and hence completes the proof.

■

*Proof of Observation 4:* 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:

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

Moreover, by Observation 3, $\sum x_i - \sum t_i > 0$. Combining these yield $R_M < R_K$. ■

## 5.1 Taxes rather than transfers by $K$

The next result, stated in Observation 5, deals with equilibria where $K$ sets $\mathbf{t} < \mathbf{0}$.

OBSERVATION **5.** *In any equilibrium with* $\mathbf{t} < \mathbf{0}$*,* $R_K$ *always exceeds* $R_M$*.*

*Proof.* Using arguments analogous to that in the proof of Observation 4, we have

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

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

By Observation 5, 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 ($B - \sum_{i=1}^{N} t_i > B$) as opposed to just $B$. But this comes at a price: a lower $t_i$ *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 $x_i$s 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 $\mathbf{t} = \mathbf{0}$.

Observation 5, 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.

The result that $p$ is lower 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 $R_K$.[50] 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 $R_K$).

[50] Since a lower $\mathbf{t}$ tends to raise $R_M$.

### 5.1.1 Alternative sequence of moves with $K$ choosing taxes

In line with the discussion in Section 2.3.4, we allow $M$ to announce its transfer schedule first and then let $K$ follow up with his announcement of $\mathbf{t}$ and $R_K$. Now we ask — given this modification — whether any of the main insights change as compared to the baseline model. Pre-emptive behaviour by $K$ is ruled out on the same grounds as before. Again, any salient difference would be in terms of the selection of equilibrium driven by $M'$s first-mover advantage. A categorisation in this regard is made difficult by the fact that $K$ and $M$ are not engaged in a zero-sum game.

We utilise the same equilibrium selection criteria as in Section 2.3.3. So we have that:

$-t_i/y_i \leq -t_j/y_j$ whenever $y_i < y_j$.

Here of course, the interpretation changes. This is now consistent with the idea that poorer districts are harder to tax (rather than "easier to transfer to" in the baseline model).

Once this is in place, we are able to invoke Proposition 2 as in the baseline model.

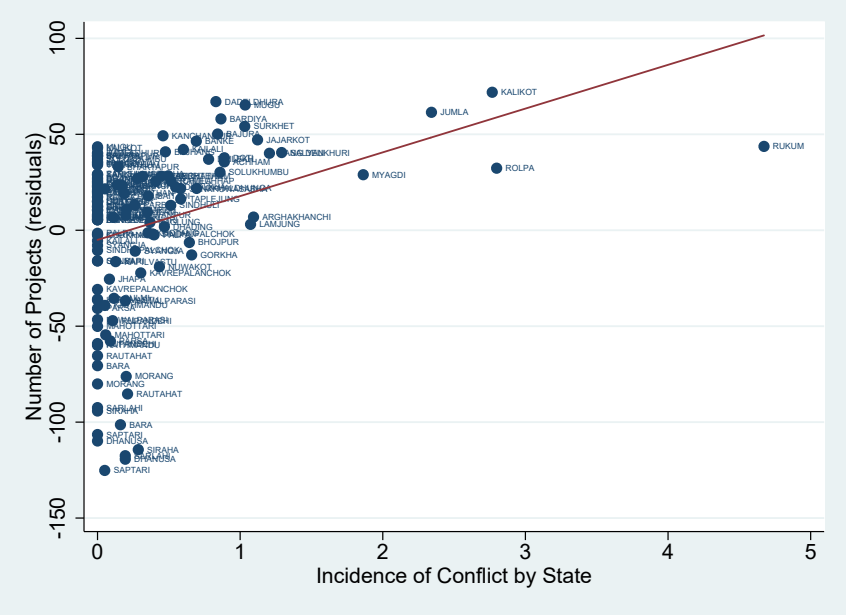


Figure 2: Number of Foreign Aid-funded Projects and Conflict (deaths by State). The vertical axis plots the residual of number of Foreign Aid-funded Projects in the period following conflict after district–, time– and population effects have been removed. The horizontal axis plots the total casualties caused by the State in the district. So each district appears twice in the figure (once for every period).

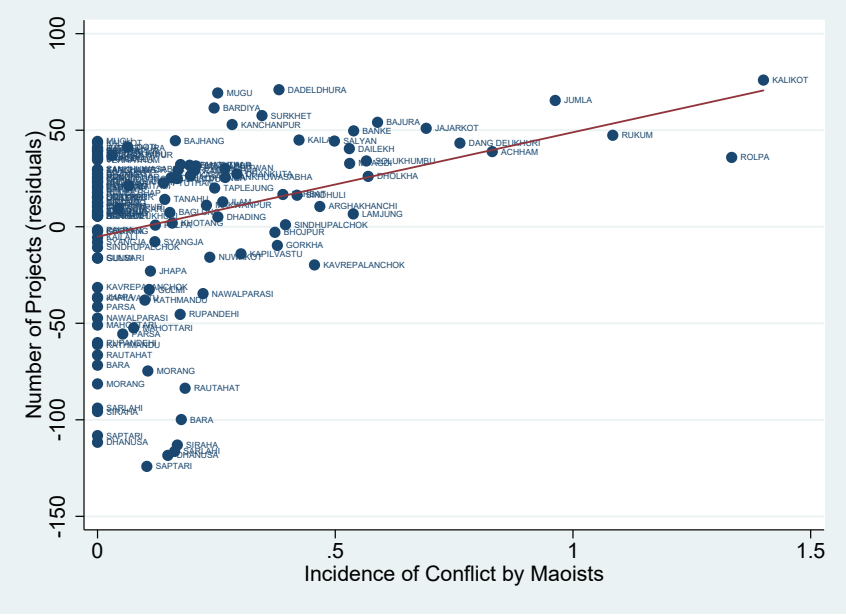


Figure 3: Number of Foreign Aid-funded Projects and Conflict (deaths by Maoists). The vertical axis plots the residual of number of Foreign Aid-funded Projects in the period following conflict after district–, time– and population effects have been removed. The horizontal axis plots the total casualties caused by the Maoists in the district. So each district appears twice in the figure (once for every period).

| | Pov. Gap | Pov. 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 | 0.854*** | 0.832*** | 0.845*** | 0.843*** | 0.854*** | 0.839*** | 0.832*** | 0.819*** | 0.817*** | 0.818*** | 0.820*** | 0.931*** |
| | (0.184) | (0.177) | (0.179) | (0.187) | (0.188) | (0.188) | (0.184) | (0.182) | (0.196) | (0.195) | (0.194) | (0.170) |
| Measure of Dispersion | -4.639 | -6.499 | 3.590 | 2.752 | 1.946 | 1.684 | 2.312 | 1.551 | -9.769 | -18.807 | -33.618 | 7.486*** |
| | (2.824) | (4.066) | (3.801) | (4.724) | (2.892) | (3.944) | (3.706) | (1.986) | (12.598) | (19.449) | (28.950) | (2.379) |
| 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) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Ethnic group sizes | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Time dummy | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Population | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Number of observations | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 |
| Adjusted $R^2$ | 0.953 | 0.953 | 0.952 | 0.952 | 0.952 | 0.952 | 0.952 | 0.952 | 0.952 | 0.952 | 0.952 | 0.957 |

Table 11: 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.

| | Pov. Gap | Pov. 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 | 0.563** | 0.567** | 0.630** | 0.629*** | 0.605** | 0.633*** | 0.654*** | 0.664*** | 0.573** | 0.571** | 0.575** | 0.568** |
| | (0.226) | (0.222) | (0.238) | (0.235) | (0.239) | (0.235) | (0.229) | (0.226) | (0.220) | (0.222) | (0.226) | (0.217) |
| Measure of Dispersion 1995-96 | -1.770 | -1.853 | 4.948 | 5.719 | 3.569 | 4.936 | 4.168 | 2.313 | -2.120 | 5.126 | 19.619 | -1.049 |
| | (2.878) | (3.841) | (3.886) | (4.473) | (2.739) | (3.729) | (3.640) | (2.377) | (13.282) | (19.867) | (29.322) | (2.752) |
| Linguistic polarization 1995-96 | 0.956 | 1.048 | 1.173 | 1.227 | 1.270 | 1.239 | 1.166 | 1.115 | 1.278 | 1.287 | 1.284 | 1.316 |
| | (1.532) | (1.493) | (1.416) | (1.412) | (1.412) | (1.411) | (1.418) | (1.434) | (1.419) | (1.412) | (1.407) | (1.440) |
| Caste polarization 1995-96 | 0.263 | 0.270 | -0.585 | -0.633 | -0.398 | -0.656 | -0.900 | -1.054 | 0.218 | 0.242 | 0.264 | 0.141 |
| | (4.496) | (4.540) | (4.469) | (4.493) | (4.452) | (4.502) | (4.585) | (4.731) | (4.545) | (4.539) | (4.525) | (4.554) |
| Infant mortality 1995-96 | 0.025* | 0.024 | 0.027* | 0.027 | 0.027 | 0.027 | 0.026 | 0.026 | 0.024 | 0.023 | 0.022 | 0.024 |
| | (0.015) | (0.015) | (0.016) | (0.016) | (0.016) | (0.016) | (0.016) | (0.016) | (0.016) | (0.016) | (0.016) | (0.016) |
| Elevation (maximum) | -0.538*** | -0.540*** | -0.558*** | -0.559*** | -0.556*** | -0.561*** | -0.558*** | -0.553*** | -0.541*** | -0.545*** | -0.548*** | -0.535*** |
| | (0.134) | (0.133) | (0.127) | (0.127) | (0.128) | (0.126) | (0.125) | (0.124) | (0.136) | (0.136) | (0.135) | (0.133) |
| Aid projects 1995-96 | 0.313* | 0.314* | 0.298 | 0.299 | 0.295 | 0.298 | 0.308* | 0.318* | 0.307* | 0.307* | 0.307* | 0.310* |
| | (0.177) | (0.180) | (0.179) | (0.179) | (0.178) | (0.179) | (0.179) | (0.179) | (0.178) | (0.177) | (0.176) | (0.179) |
| Population | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Number of observations | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| Adjusted $R^2$ | 0.275 | 0.272 | 0.285 | 0.284 | 0.283 | 0.285 | 0.284 | 0.284 | 0.270 | 0.270 | 0.272 | 0.271 |

Table 12: 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.

| | **Agriculture** | **Communication** | **Development** | **Education** | **Health** | **Infrastructure** | **Institution** |
|---|---|---|---|---|---|---|---|
| Conflict (GDELT) | 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) |
| 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) |
| Headcount of poverty | 0.624 | -0.066 | -0.338 | 0.111 | -0.567 | 0.048 | -0.311 |
| | (0.491) | (0.052) | (0.548) | (0.309) | (0.481) | (0.292) | (0.191) |
| Ethnic group sizes | Y | Y | Y | Y | Y | Y | Y |
| Population | Y | Y | Y | Y | Y | Y | Y |
| Time dummy | Y | Y | Y | Y | Y | Y | Y |
| Number of observations | 136 | 136 | 136 | 136 | 136 | 136 | 136 |
| Adjusted $R^2$ | 0.884 | 0.374 | 0.915 | 0.874 | 0.930 | 0.895 | 0.949 |

Table 13: Sector Specific aid allocation. Sources and Notes: The conflict measure is computed using the GDELT dataset. We have divided the total number of projects into seven broad categories: agriculture, communication, infrastructure, education, health, institutional and general development. Each column has the dependent variables as the specific sectoral project numbers. Robust standard errors clustered by district are given in parentheses.

| | DDA | | Aid Allocation | | Aid: No. of Projects | |
|---|---|---|---|---|---|---|
| | [1] | [2] | [3] | [4] | [5] | [6] |
| Conflict (GDELT) | 0.010*** | 0.011*** | 0.012* | 0.012* | 0.001*** | 0.001*** |
| | (0.001) | (0.001) | (0.007) | (0.007) | (0.000) | (0.000) |
| Left seatshare | -0.219** | | -1.583 | | -0.019 | |
| | (0.109) | | (1.165) | | (0.032) | |
| Ultra-Left seatshare | | -0.160 | | 0.363 | | -0.021 |
| | | (0.228) | | (0.799) | | (0.075) |
| Av. per-capita expenditure | -0.000 | -0.000 | 0.008* | 0.006* | 0.000* | 0.000* |
| | (0.000) | (0.000) | (0.005) | (0.004) | (0.000) | (0.000) |
| Headcount of poverty | -8.645 | -8.725 | 77.352 | 71.453 | -0.171 | -0.153 |
| | (6.721) | (6.763) | (49.548) | (47.646) | (1.689) | (1.720) |
| Ethnic group sizes | Y | Y | Y | Y | Y | Y |
| Population | Y | Y | Y | Y | Y | Y |
| Time dummy | Y | Y | Y | Y | Y | Y |
| Number of observations | 134 | 134 | 134 | 134 | 134 | 134 |
| Adjusted $R^2$ | 0.832 | 0.818 | 0.300 | 0.240 | 0.953 | 0.953 |

Table 14: OLS Fixed Effects regressions: Left electoral presence. Sources and Notes: Conflict is measured using the GDELT dataset. 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] and [6] have the number of projects as the dependent variable. We categorise the left parties into two groups on the basis of their stated ideologies — *Left* and *Ultra-left*. Next, we look at their share of seats they won in a district. We utilise the 1994 and the 2008 elections for these measures. Robust standard errors clustered by district are given in parentheses.

| | **State** *1st stage* [1] | **State** *DDA* [2] | **State** *Aid Alloc.* [3] | **Maoists** *1st stage* [4] | **Maoists** *DDA* [5] | **Maoists** *Aid Alloc.* [6] |
|---|---|---|---|---|---|---|
| Deaths caused by state per 1000 population | | 15.645** | 37.932* | | | |
| | | (7.421) | (21.066) | | | |
| Deaths caused by Maoists per 1000 population | | | | | 43.105** | 104.508** |
| | | | | | (19.465) | (49.278) |
| (log) Value of wood | -1.428*** | | | -0.518*** | | |
| | (0.425) | | | (0.146) | | |
| Av. Per-capita expenditure | 0.000* | -0.003*** | 0.001 | 0.000* | -0.004*** | 0.001 |
| | (0.000) | (0.001) | (0.002) | (0.000) | (0.001) | (0.001) |
| Poverty (Headcount) | 0.498 | -22.659** | 44.793 | 0.094 | -18.919 | 53.859* |
| | (0.356) | (10.708) | (29.756) | (0.196) | (12.038) | (30.184) |
| Ethnic group sizes | Y | Y | Y | Y | Y | Y |
| Time dummy | Y | Y | Y | Y | Y | Y |
| Population | Y | Y | Y | Y | Y | Y |
| Number of observations | 136 | 136 | 136 | 136 | 136 | 136 |
| $F-$statistic (Kleibergen-Paap $rk$ Wald) | 11.289 | | | 12.542 | | |

Table 15: 2 SLS-IV LINEAR REGRESSIONS. Sources and Notes: The variable *(log) Value of wood* is constructed as a weighted timber price index at the district level (see main text for detailed description) and is used an instrument for conflict. Column 1 reports the first-stage regression result for conflict deaths by the State. Columns 2 and 3 report the second-stage results for different outcomes: the Nepal government's budgetary development allocation (DDA) and the foreign aid allocation. Column 4 reports the first-stage regression result for conflict deaths by the Maoists. Columns 5 and 6 report the corresponding second-stage results for different outcomes: the Nepal government's budgetary development allocation (DDA) and the foreign aid allocation. Robust standard errors clustered by district are given in parentheses.