The Effect of Civil War Violence on Aid Allocations in Uganda

Stijn van Weezel, University College Dublin

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Stijn van Weezel

School of Economics, University College Dublin

Abstract

In recent years there has been an increase in the number of studies using microlevel data to analyse the aid-conflict nexus at local level, however most of these studies focus on how conflict dynamics are influenced by aid allocations whereas there is relatively little analysis on how conflict affects subnational aid allocations. Estimating the effect of conflict on aid can be difficult given possible reverse causality, therefore this study exploits an exogenous driven shock in conflict intensity in Uganda to estimate the effect of aid allocations at subnational level. Using district level data for Uganda between 2002-2010, and information on both foreign aid commitments and disbursements, the results show that conflict is negatively related to aid allocations: Conflict-struck regions see both lower commitment and disbursement levels in the wake of conflict. Although the sudden outburst of violence in Uganda can help identifying the effect of conflict on aid allocations, one caveat of this approach is that it is hard to know to what extent the results generalise.

The aid-conflict nexus

Annually billions of dollar of aid are transferred to developing countries in order to provide assistance in the wake of humanitarian crises, stimulate development or with the aim to increase stability. However, after decades of development assistance there are some serious doubts about whether foreign aid has any effect. Indeeds, some are concerned that aid might have a negative effect on development by providing rent-seeking opportunities and it has also been linked to violent armed conflict Within the broader aid literature there is a small subset that examines this aid-conflict nexus, analysing how aid allocations influence conflict risk and duration (Arcand and Chauvet, 2001; de Ree and Nillesen, 2009), and also how conflict influences allocations itself (Balla and Reinhardt, 2008; Rodella-Boitreaud and Wagner, 2011).

Most studies within this field rely on the use of national account data aggregated at country-level. Although this approach has provided valuable insights, from a macro perspective, into how policy set in developed countries affects developing countries, one shortcoming is that it ignores within-country variation of both conflict and foreign aid projects. Given that most aid projects are aimed at local development (Findley et al., 2011) and that conflicts tend to be localised (Buhaug and Gleditsch, 2008; Aas Rustad et al., 2011), this means that a lot of information is lost due to the level of aggregation. It has only been very recent that researchers have started to use microlevel data to study the aid-conflict nexus, with the earliest paper dating back to 2011, to the best of my knowledge. This development has been spurred, among others, by better data availability, and as a result there is now a small active literature using subnational data to disentangle local dynamics (Arcand et al.,

2011; Berman et al., 2013; Crost et al., 2014; Strandow et al., 2014; Tahir, 2015). This is of course an important step in improving our understanding of how foreign aid policy potentially influences conflict patterns. However, there still is a paucity of information concerning the possible effect of conflict incidence on aid allocations, specifically at the local level. The contribution of this study is therefore to address this issue by focusing on the effect of violence on aid allocations at district level using data for Uganda between 2002-2010.

Given the complex dynamics between aid and conflict, an important issue to account for in the statistical analysis is possible endogeneity as a result of reverse causality. Although foreign aid could be linked to increase conflict risk or longer durations, as some studies find, conflict itself could be an important determinant of aid allocations to begin with. The incidence of armed conflict likely influences a donor's decision whether or not to commit and/or disburse aid to a particular region, based on a balance of perceived risks and rewards. From this perspective, consider a risk-adverse donor who might decide not to allocate aid to a conflict-struck region as it could reduce the chance of success for a particular aid project. Therefore, the donor might decide to allocate the earmarked money to a different region with better prospects; as such, conflict will divert aid away to other regions. On the other hand, a donor could act principally based on humanitarian considerations, meaning that in the wake of conflict aid will be allocated to a conflict-stuck region with the intend to ameliorate conditions. Under these conditions this means that conflict will actually attract foreign aid, and we would expect to see higher aid levels in conflict-struck regions.

Within the empirical literature different econometric strategies have been used to deal with this type of endogeneity, such as first-differences and propensity score matching, and to account to some extent for the donor's decision making process. These approaches help with trying to identify the effect of foreign aid on conflict risk, but due to the focus of the existing research we have made little progress in better understanding the way in which conflict influences aid allocations, specifically at subnational level. The few existing studies on this particular subject have found slightly diverging results. Some have found that donors indeed tend to be risk adverse and reduce aid to countries either with or nearby a conflict (Balla and Reinhardt, 2008), whereas others found little to no effect of conflict on aid allocations (Rodella-Boitreaud and Wagner, 2011). To the best of my knowledge the only study so far using micro-level data has found that conflict-struck areas receive more aid commitments but fewer commitments are made to areas that experienced very severe levels of violence (Bezerra and Braithwaite, 2016).

Trying to estimate the effect of conflict on aid allocations entails that the results are once more prone to reverse causality. In order to deal with this problem, this study exploits an exogenously driven shock in conflict intensity in Uganda between 2002-2005. Although Uganda has been harried by low-intensity insurgencies for decades, due to geopolitical developments there was a sudden outburst of violence in the Northern part of the country as a result of a military operation. In the context of Operation Enduring Freedom, the global war against terror by the U.S, the Lord's Resistance

Army (LRA), which operates mainly in Northern Uganda, was declared a terrorist organisation by the 2001 U.S. Patriot Act. Due to this development, Sudan ceased its tacit support of the LRA and allowed Ugandan military forces to operate within certain areas of its territory. Therefore, in March 2002 the Ugandan defense forces launched Operation Iron Fist which had the strategic objective to root out the LRA. Fighting between the Ugandan military and the LRA in Northern Uganda, as well as violent LRA reprisals against the local population, lasted until 2005, and hostilities were officially ended by a cease-fire agreement in 2006. This sudden surge in violence is used to estimate the effect of conflict on aid allocations, looking at both commitment and disbursement levels. The fact that this study is able to estimate the effect on both commitments and disbursements is a departure from the existing literature which typically relies on commitment data.

The upper panel in Figure 1 illustrates the large outbreak of violence between 2002-2005 which was preceded by a relatively calm period and afterwards followed by a large reduction in conflict intensity from 2006 onwards. The lower panel shows aid commitments and disbursements illustrating that commitments largely exceeds disbursements. Comparing the upper and lower panel there does not seem to be a strong correlation between conflict intensity and aid allocations at the aggregated level. Although a sharp drop in aid commitments is noticeable from 2002 to 2004. To exploit the shock in violence the regression analysis is based on a Differences-in-Differences approach, where the country is divided across time and space in a violent and non-violent periods, and in districts affected by the violence and districts unaffected (at least directly). The regression results show that although aid

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allocations have increased between 2002-2005 and 2006-2010, conflict seems to have had a negative effect on aid commitments and disbursements in conflict-struck districts. This seems to suggest that in terms of setting foreign aid policy donors are somewhat risk adverse and maybe opt to allocate aid to regions with lower risks.
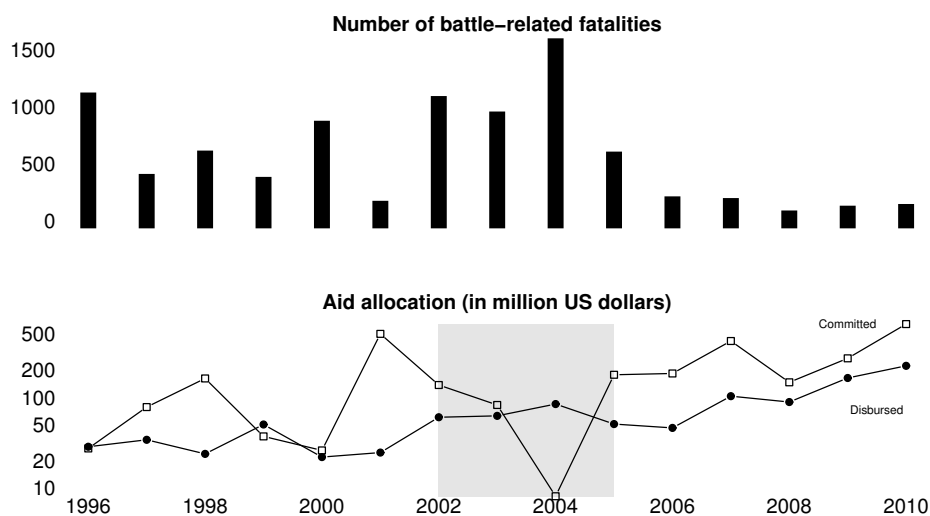

Figure 1: Upper panel: Number of battle-related fatalities. **Lower panel:** Foreign aid disbursements and commitments over time (in million U.S. dollars). *Data:* UCDP-GED, AidData.

Background on conflict in Uganda

Uganda has a history of political instability and civil unrest, ever since it gained independence from the United Kingdom in 1962. Under the presidency of the current leader, Museveni, who took power in 1986, the country has been confronted with a number of insurgencies. The most protracted of these insurgencies has been in the Northern part of the country, predominantly in the ethnic homeland of the Acholi people. In 1986 a popular revolt started against the Museveni government, the result of fears over political marginali-

sation. This rebellion was followed, around 1988, by the insurgency of Kony's Lord's Resistance Army (LRA), operating mainly in the Northern part of the country, terrorising the local population and abducting children to serve in the LRA (Project, 2004). The main aim of the LRA, according to its leader Kony, is to impose the biblical ten commandments on the country. The LRA followed initially on the earlier rebellions, based on Acholi grievances, but the atrocities of the group have long overshadowed the original causes of conflict. Besides the actions of the LRA in the Northern regions, the Western part of Uganda has been harried by the Alliance of Democratic Forces (ADF), which is an Islamic group who want to establish Sharia law throughout Uganda. Both groups have been using guerrilla tactics in their campaign against the government, combined with violence against the local population.

A difficulty in combating these groups has been the fact that they use bases in neighbouring countries to launch their attacks; Sudan in the case of the LRA and the Democratic Republic of the Congo (DRC) in the case of the ADF. Also, both groups were likely sponsored by the Sudanese government which was involved in a proxy war against Uganda. There are two factors that changed conflict dynamics. First, during the chaos of the Second Congo War, the Ugandan military made use of the opportunity to operate, uninvited, in the DRC which led to the military defeat of the ADF, seizing their actions in Uganda. Following the end of the Second Congo War this meant that military resources were freed up; now available for the continued war against the LRA. Second, following the 9-11 terrorist attacks in the US, the LRA, along with the ADF, was designated as a terrorist organisation by the US government in the context of their global war on terror. In addition, the

US put pressure on states supporting terrorist groups, such as Sudan, which led to an improvement in bilateral relation between Uganda and Sudan. Practically, this meant the Ugandan forces were allowed entry into Sudan in pursuit of LRA elements. Due these developments, the Uganda military launched Operation Iron Fist (OIF) in March 2002 in an attempt to root out the LRA. In response, the LRA took revenge on the local population throughout Northern Uganda, also striking targets outside of its usual zone of operation. As a result of the violence, fatalities reached levels not witnessed since the mid-1990s (Dunn, 2004; van Acker, 2004). OIF, which was from a tactical point of view a failure, lasted from 2002 till 2003, after which the conflict continued at lower intensity levels up until 2005. In 2006 a cease-fire agreement was signed between the LRA and Ugandan government which put an end to hostilities, at least temporarily.

Estimation framework

To estimate the impact of violence on aid allocations a Differences-in-Differences (DiD) approach is used (Angrist and Pischke, 2008). In its simplest form the DiD model divides the country along two separate dimensions, space and time, creating four different groupings: a violent and post-violence period crossed with a violent and non-violent zone. The aim is to test whether districts in the violent zone are associated with relatively higher levels of aid allocation. Equation 1 formalises this idea where d indexes the districts, t gives the time period, and v defines zone, either violent or non-violent. The equation includes three dummy variables, $D_t, D_v, D_v t$, which are set equal to 1, respectively, for districts during the post violent period, in a violent zone, and in the violent zone during the post-violent period.

$$y_{dt} = \gamma D_t + \lambda D_v + \beta D_{vt} \tag{1}$$

The estimated parameters will be positive if there is a general tendency for districts in the violent zone to receive higher levels of aid allocations during the post-violence period compared to the violent period. Specifically, γ will be positive if district receive more aid during the post-violence period, while λ will be positive if districts in the violent zone receive larger aid allocations. The main coefficient in the DiD model is β which represents the average difference in aid allocations, for the post-violence period minus the violent period, between districts in the violent zone and those in the non-violent zone. This means that the coefficient estimates the effect on aid allocations subject from being a district in the violent zone after the violence controlling for the effect of being in the violent zone and being in the post-violence period.

In this particular case the sign of the estimated coefficient will depend on donors' characteristics. If they are risk adverse than the outbreak of violence in Northern Uganda will lead to a decrease in aid allocations to the districts that were subject to attacks, resulting in a negative sign. Uncertainty on the side of a risk-adverse donor whether after 2005 the violence will flare up again or not will likely lead to a reduction in commitment and postponement of disbursement, again corresponding to a negative sign. We will expect to see a positive estimate when the donors humanitarian motives prevail in an aim to help out the victimised population in the conflict-affected districts, leading to an increase in likely both commitments and disbursements.

One remaining question is how to define whether a district belong to the violent or non-violent zone? In the standard DiD framework the binary indicator is somewhat arbitrary and restrictive. For this particular case, given that the violence was highly localised across Northern Uganda but without any spillovers to other parts of the country, a binary indicator would not be as arbitrary as in other situations. Nonetheless, in order to exploit the information available on fatality numbers, and estimate the effect at the intensive margin, a more generalised form of model 1 will be used; one that allows for differences in violence levels. Therefore, the empirical framework has the following functional form:

$$y_{dt} = \alpha + \gamma p_t + \lambda Violence_d + \beta(p_t \cdot Violence_{dt}) + \delta X' \qquad (2)$$

The outcome variable captures the level of aid commitment or disbursement in district d during period t. Coefficients γ and λ represent the estimated effect of the period, which is a dummy indicator, and the violence levels on aid while β is the DiD estimator. In this case the data is split into two periods: the years 2002-2005 which saw a large outburst of violence, and the 2006-2010 period during which violence levels dropped considerably following the cease-fire agreement.

The model includes a number of other explanatory variables, in vector X', to account for other factors associated with aid allocations. Since aid allocations could be persistent over time, a variable is included measuring aid commitments to a district before 2002. Additionally, population size is included as aid projects might be allocated on the basis of trying to serve as

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many people as possible. Given the existing animosity between the central government and particularly the Acholi people in the North, as well as the possibility of regional favouritism, the distance to the capital is included in the model.

Given the sample size ($N = 224$), Bayesian estimations is used as it doesn't suffer from small-sample bias and also has the advantage of providing coefficients with a probabilistic interpretation. The parameters in the model, such as β, are modeled using vague or non-informative priors with distribution $N(0, 10)$ (Gelman et al., 1995). This means the obtained estimates will be similar to those of comparable maximum likelihood methods.

Data & measurement

Data on foreign aid projects is taken from the Uganda Aid Management Platform Geocoded Dataset which contains information provided by the Ugandan Ministry of Finance and is geocoded by AidData. This dataset covers the period 1996-2013 and includes information on aid commitments and disbursements for 569 projects from 38 donors at 2,458 locations worth about 9 billion U.S. dollars (measured in 2010 constant U.S. dollars). Although it is a comprehensive overview of the amount of aid allocated to various regions in the countries, it likely provides a lower bound given that the dataset does not include projects run by non-governmental organisations. One major advantage of the dataset is that it include information on the year in which aid money was committed and the years in which the money was actually disbursed. This means that in the analysis we can examine whether the levels of commitment and disbursement are different for districts that have been subject to the surge in violence.

The original dataset contains a wealth of information, but we do need to keep in mind that geocoding the projects is associated with some uncertainty concerning the actual locations. The data is therefore cleaned to include only those projects that can be accurately located at the district level. This entails a reduction in the number of aid projects to 295, which still totals about 3 billion U.S. Dollars. One final issue concerning data preparation is that some of the projects cover multiple districts. There is no exact information on the share of the aid allocation going to each individual district. Therefore, following Dionne and Kramon (2013), the allocated amount is divided on the basis of the population size of each district. Meaning that the total amount of allocated aid money, committed or disbursed, is multiplied by the population share of the district relative to the aggregate population of all the districts part of the particular aid project.

For conflict data this study uses the Georeferenced Event Dataset (GED) provided by the Uppsala Conflict Data Programme (Sundberg, 2013). This dataset contains detailed information on the time, location, and number of battle-related deaths associated with a conflict event. The GED is preferred over other geocoded conflict datasets as it is more accurate according to various studies (Eck, 2012; Weidmann, 2013, 2015). An additional advantage is that the procedure used to check the accuracy of the geocoding is the same as the aid data which makes cleaning the data and matching it at district level relatively straightforward. To differentiate between non-violent and violent districts this study used conflict intensity which is measured by the number of battle-related fatalities for a district, in each period. In this

case a continuous measure is used counting the number of battle-related deaths. One possible concern, given the origin of the conflict data, is potential measurement error given that the information on conflict events is mainly drawn from media reports. As such, this means that some events could be omitted from the records, particularly smaller events, if they are deemed not news-worthy enough. Additionally, given the the conflict data set only includes battle-related fatalities this means that the fatality number will be an underestimate of the true number of fatalities. Given this measurement error on the right hand side of the equation this means that the estimates will be unbiased but the standard deviation of the posterior distribution will probably be larger.

The empirical framework includes a number of other variables to account for factors possibly influencing aid allocations such as distance to the capital and population size. In this case distance to the capital is measured by the Euclidean distance between Kampala and the district centroid. For population data this study uses the 2000 estimate of Gridded Population of the World.

Figure 2 provides an overview of the data and illustrates that while the violence was highly localised in Northern Uganda, after it had ended in 2006 the aid levels in that particular pert of the country are comparable to the other districts located in regions not directly affected by the violence.
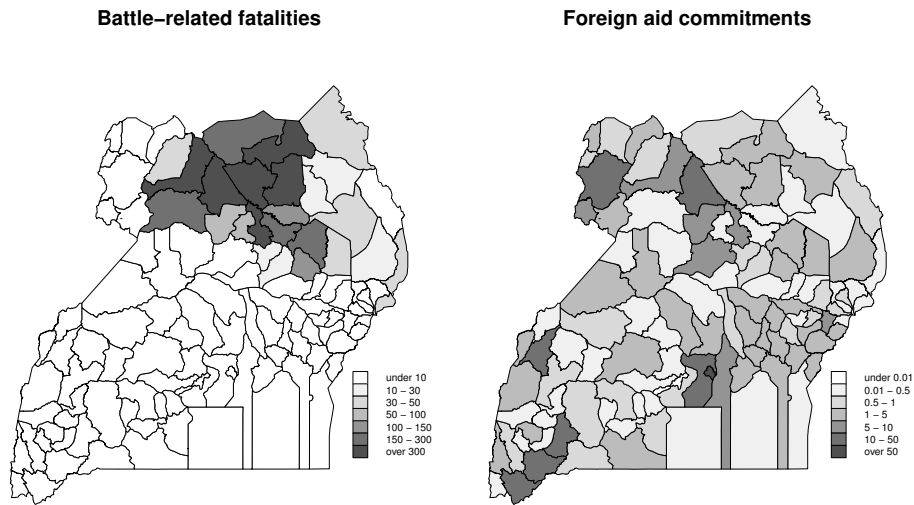
Battle–related fatalities

Foreign aid commitments

Figure 2: Number of battle-related fatalities between 2002-2005 (left) and aid commitments (in million U.S. dollars) between 2006-2010 (right) per district. *Data:* UCDP-GED, AidData.

Regression results

Table 1 presents estimation results, reporting the point estimate along with the 50% interval (between parentheses), for both aid disbursements (panel a) and commitments (panel b). I start the analysis with a relatively simple model based on the gravity model for trade (col. 1), which in this link aid allocations to the the distance from Kampala, population size, and a period indicator. Regional favouritism could influence aid allocations (Hodler and Raschky, 2014), meaning that districts further away from Kampala could receive less aid as a result. The estimated point estimate is negative for disbursements, but this result is not robust to different model specifications, moreover the estimated magnitude is small. In contrast, population size is positively associated with foreign aid flows, a results that is robust to using either disbursements and commitments as well as different model specification including additional variables. The estimated effect shows that a two

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Table 1: Predicting level of foreign aid allocations (*log*) in district *d*

Specification	(1)	(2)	(3)	(4)
Panel A: Foreign aid disbursements				
Distance to Kampala	-0.03 (-0.06; 0.01)		0.01 (-0.02; 0.03)	0.02 (-0.01; 0.04)
Population	0.31 (0.27;0.35)		0.16 (0.13; 0.19)	0.16 (0.13; 0.18)
p	0.52 (0.48; 0.55)	0.55 (0.52; 0.59)	0.62 (0.60; 0.65)	0.62 (0.59; 0.64)
Violence		-0.03 (-0.08;0.01)	-0.01 (-0.04; 0.02)	-0.01 (-0.04; 0.02)
$p*$Violence		0.1 (0; 0.2)	-0.21 (-0.27; -0.15)	-0.17 (-0.24; -0.10)
Commitments$_{t-1}$			0.60 (0.57; 0.63)	0.61 (0.58; 0.64)
$p*$violence W				-0.08 (-0.14; -0.02)
α	-0.26 (-0.28;-0.23)	-0.27 (-0.30;-0.25)	-0.32 (-0.34; -0.30)	-0.32 (-0.34; -0.30)
	(1)	(2)	(3)	(4)
Panel B: Foreign aid commitments				
Distance to Kampala	0.01 (-0.03; 0.04)		0 (-0.03; 0.03)	0 (-0.03; 0.03)
Population	0.12 (0.09; 0.16)		0.07 (0.04; 0.10)	0.07 (0.04; 0.10)
p	0.72 (0.69; 0.75)	0.75 (0.72; 0.78)	0.78 (0.75; 0.81)	0.78 (0.75; 0.81)
Violence		0.15 (0.11; 0.18)	0.16 (0.13; 0.19)	0.16 (0.13; 0.19)
$p*$Violence		-0.1 (-0.17; 0)	-0.24 (-0.31; -0.17)	-0.23 (-0.31; -0.16)
Commitments$_{t-1}$			0.28 (0.25; 0.31)	0.28 (0.25; 0.32)
$p*$Violence W				-0.02 (-0.08; 0.05)
α	-0.36 (-0.38; -0.34)	-0.38 (-0.40; -0.36)	-0.40 (-0.42; -0.38)	-0.40 (-0.42; -0.38)

Notes. Table presents point estimates with 50% interval between parentheses. Estimates are taken as the mean from 3 parallel chains with 10,000 iterations each where the first 2,500 are discarded as burn-in, thinning rate was set to 2. Priors are $N(0, 10)$. All input variables are placed on a common scale by subtracting the mean and dividing by twice the standard deviation. Commitments$_{t-1}$ covers 1996-2001 for period 2002-2005. p indicates period which is 0 for 2002-2005 and 1 for 2006-2010.

standard deviation increase in population is associated with a 36% increase in aid disbursements, but only 12% for commitments (col. 1). The data also exhibits a strong period effect, indicating that there are higher commitment and disbursement rates in 2006-2010 compared to 2002-2005. This increase could be the result of the violence, drawing more aid money to the country for humanitarian needs and reconstruction. However, it could also be that the aid data suffers from non-random measurement error where the reporting of aid improved over time. If this is the case, this would entail that the estimate suffers from an upward bias.

Concerning the effect of violence, column two reports the results of the DiD

model; the estimates indicate that while violence is negatively associated with aid disbursements it correlates positively with aid commitments. So although more aid is allocated to districts with reported fatalities, the level of disbursements is actually lower compared to other districts. The estimated effect for the model with disbursements as outcome variable is relatively small. One possible explanation, besides the fact that there maybe is little to no effect, is that the estimate suffers from attenuation bias if the disbursement levels are not accurately reported by the Ugandan Ministry of Finance. The estimated coefficient for commitments is considerably larger in magnitude, even greater than the associated effect of population size. Focusing on the DiD estimator, which interacts the period indicator with violence levels, shows that districts with higher violence levels are associated with lower commitment but higher disbursement levels. The latter estimated effect is not robust to including additional variables, such as the inclusion of past aid commitments (col.4) to account for persistence in donor behaviour. Indeed, in a more fully specified model the results show a negative correlation between violence and both aid disbursements and commitments. Here, a two standard deviation increase, or about a 170 extra fatalities, is associated with a 19% reduction in disbursements and 21% in commitments. The estimated effects are negative with a probability of 0.99.

The results hint at a possible negative link between districts that experienced violence during Operation Iron Fist, and its aftermath, and aid allocations. To test whether violence possibly has some negative spillover effect, the period indicator is interacted with the spatial lag of violence. This spatial lag is calculated tallying the total number of fatalities in all directly neighbouring

districts for any given district. As such, it accounts for conflict intensity in a district's neighbourhood. The results show (col.4) that there is indeed some negative spillover, although the magnitude of the effect is fairly small at around 2 to 8%. The uncertainty associated with the direction of effect is large for commitments, which is negative with a probability of just 0.57. For the disbursements it is more likely to have a negative effect given the probability of 0.84 according to the posterior distribution.

The analysis presented in this study try to examine how conflict intensity has influenced donor's decision making in allocating aid across districts in Uganda. One important issue that hasn't been discussed yet is the role of the Ugandan government. It is often unclear to what extend the recipient country influences donor's decisions on aid allocations. Indeed, it could be the case that the government has the final say concerning which district the money is going to. To account for these factors the model includes a variable measuring the distance to the capital. This variable serves as a crude proxy for favouritism and is included based on the assumption that districts further away from Kampala, specifically those in Acholiland, are less likely to receive aid. However, as the results show the estimated effect is close to zero in this case.

Conclusions

There is a well-established literature examining the effects of foreign aid policy on development outcomes in low-income countries. A small subset of this literature is devoted to studying the link between aid and conflict, particularly focusing on how aid influences conflict risk. In recent years

there has been an increase in the number of studies using microlevel data to disentangle local dynamics, however there have been relatively few studies that examine how conflict influences aid allocations at subnational level. One concern trying to estimate this effect is the possibility of reverse causality; to overcome this, this study exploited an exogenous shock in violence to estimate the effect on aid commitments and disbursements at local level. Using data at district level for Uganda between 2002-2010, the results show that conflict is negatively related to aid allocations, where conflict-struck regions see both lower commitment and disbursement levels. This result could signal that donors are risk adverse, preferring to allocate aid to areas that are perceived to be less risky.

Given that this study draws on a dataset including mainly development aid aimed at long-term development goals, it would make sense from a policy perspective to postpone with disbursements to conflict affected areas. However, surprisingly these areas also experience a reduction in aid commitments, aid needed for assistance in reconstruction and helping to ameliorate circumstances.

One advantage of analysing the situation in Uganda is that this sudden outburst of violence can help us identify the effect of conflict on aid allocations, but a caveat is of course that it is hard to know to what extent these results generalise to other countries. Indeed, existing work on this topic has shown that in general higher conflict levels, up to a certain point, are associated with increases in aid commitments. It could be the case that Uganda is a

special case, whose effect is potentially averaged out. One advantage that this study provides is that it provides us with an insight into how conflict affects commitments versus disbursements, and the results show that there isn't much difference in the estimated effect.

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