Cost-Effectiveness of Development Aid in Local Conflict Prevention Efforts

Prepared as part of the Milt Lauenstein Research Initiative on cost-effectiveness and peacebuilding

Researched and Written by
Iris Malone, Ph.D. Candidate
Political Science Department,
Stanford University

Contact Information
E: irismalone@stanford.edu
M: (530) 559-7645
W: web.stanford.edu/~imalone

Cost-Effectiveness of Development Aid in Local Conflict Prevention Efforts

Key Highlights

- Development aid is most cost-effective in preventing ethno-nationalist conflicts
- Development aid is not cost-effective – and sometimes even counterproductive – in preventing leftist and religious conflict
- In general, development aid is more cost-effective in ethno-nationalist conflict prevention in urban, rich environments rather than in rural, poor environments
- Two key factors that substantively moderate the cost-effectiveness of aid on local conflict prevention are (1) the number of armed groups and (2) whether a country has historically experienced conflict

1 Introduction

This report assesses under what conditions development aid is most cost-effective in peacebuilding efforts, defined here as conflict prevention.[1] Despite over $140 billion spent in Official Development Assistance in 2016, policy-makers have had little systematic evidence to rely on when deciding where development assistance or any other activities to promote peace will do the most good.[2] This report offers one of the first in-depth studies about the cost-effectiveness of one such instrument development aid on preventing intrastate conflict. The results reveal that development aid has different effects on conflict prevention depending on when and where it is used.

2 Debate over Aid and Conflict

Understanding where development aid stands to do the most good is important to both public and private actors working on this issue. Public officials at non-governmental organizations like the World Bank or government agencies like the United States Agency for International Development must make important strategic decisions about where to allocate their limited resources based on their beliefs about where these funds will be most effective. Similarly, private philanthropists, like the Bill and Melinda Gates Foundation, want to use their endowments in a

[1] Development aid in this context is defined as financial assistance administered by outside states and/or multilateral institutions aimed at improving the economic welfare of individuals within developing countries. For more information, see "Official development assistance – definition and coverage." OECD. 2017. < http://www.oecd.org/dac/stats/officialdevelopmentassistancedefinitionandcoverage.htm>

[2] Development assistance is foreign aid administered by outside states and/or multilateral institutions aimed at improving the economic welfare and development of individuals within developing countries.

sound and responsible manner, but this intrinsically requires an understanding of where development aid will have the greatest effect.

Despite the importance of this question, scholars and think tanks have long debated whether development assistance is effective in preventing conflict and, if so, under what conditions. Some analyses find that increasing development assistance helps prevent conflict by providing economic opportunities to locals and reducing the need to fight.[3,4] Other analyses find the opposite: increasing development assistance is correlated with an increased likelihood of conflict because it provides armed actors the resources to keep fighting.[5,6]

There are three limitations to current research on development aid and conflict. First, while this literature can inform policy debates about the *effectiveness* of development aid, it says little about the *cost-effectiveness* of development aid. Funneling more money into development project may eventually yield returns, but at what cost? Public and private officials often treat development assistance as an investment so that an area will grow and prosper.
As such, these actors have incentives to make sure they see a return on their investment or – in other words - get the most "bang for their buck."[7]

However, once an assistance project starts, it can be hard to change direction. Actors in this field may have a vested interest in maintaining assistance flows for a particular region or project in order to preserve their own jobs. As such, improving policy understanding about where to *initially* target these efforts can pre-empt some of these long-term problems.[8]

Second, this research draws its conclusions based on country-level aid flows. This masks subnational variation across regions, obscuring under what environmental conditions aid flows are more cost-effective than others. Drawing inferences about development assistance in local areas based on national trends risks under- or over-estimating its cost-effectiveness if the two environments do not look the same. This can then guide inappropriate policy recommendations such as dedicating development assistance to conflict prevention and instead exacerbating the dilemma.

Finally, this research does not differentiate between different types of conflict. Each conflict originates in a set of different grievances, environments, and political circumstances. If ethno-

---

[3] Nielsen, Richard A., Michael G. Findley, Zachary S. Davis, Tara Candland, and Daniel L. Nielson. "Foreign aid shocks as a cause of violent armed conflict." *American Journal of Political Science* 55, no. 2 (2011): 219-232.

[4] Savun, Burcu, and Daniel C. Tirone. "Foreign aid, democratization, and civil conflict: how does democracy aid affect civil conflict?." *American Journal of Political Science* 55, no. 2 (2011): 233-246..

[5] Crost, Benjamin, Joseph Felter, and Patrick Johnston. "Aid under fire: Development projects and civil conflict." *American Economic Review* 104, no. 6 (2014): 1833-56.

[6] Narang, Neil. "Assisting uncertainty: how humanitarian aid can inadvertently prolong civil war." *International Studies Quarterly* 59, no. 1 (2015): 184-195.

[7] Sheamer, Steve, Alexa Courtney, and Noah Sheinbaum. "Cost-Effectiveness for Peacebuilding: Exploring the Possibilities." Frontier Design Group. 2017.

[8] This cannot address the separate problem of diminishing returns on a project.

nationalist conflicts emerge and evolve under different conditions than – for example – religious conflicts, then assistance might have countervailing effects in different circumstances.

This has immense policy implications for several current conflicts around the world. For example, peacebuilding efforts in Nigeria may need to take on wildly different forms depending on when and where the conflict lies. For the last ten years, Nigeria has faced two different conflicts in two different regions.[9] The ethno-nationalist separatist conflict in the richer, Niger Delta region protested the state's economic predation and exploitation of its oil wealth. The second religious, transnational conflict in the poorer, rural, north spearheaded first by a murky organization known as the Nigerian Taliban and later Boko Haram aimed to establish Shariah law and an Islamic state. These differences highlight the importance of studying different kinds of violent conflict, studying the cost-effectiveness of various types of preventive action, and beginning to draw some conclusions about what types of help are most likely to do some good in those types of situations. Development aid may be useful in addressing one type of conflict, but not the other.

This report addresses three questions related to the cost-effectiveness of development aid and conflict prevention:
    (1) What is the cost-effectiveness of aid in preventing conflict?
    (2) Does the cost-effectiveness of aid vary across different types of conflict prevention?
    (3) What factors increase the cost-effectiveness of aid?

Through this line of questioning, it addresses the limitations raised above. It accomplishes this by (1) asking research questions, which measure the cost-effectiveness of assistance, (2) employing more refined data about district-level aid flows instead of conventional country-level measurement, and (3) comparing results across different types of conflict.
The report answers these questions by examining the historical cost-effectiveness of development aid programs on preventing conflict recurrence in five countries: Colombia, Bangladesh, Nigeria, Philippines, and Iraq. The report focuses on these five countries because they each exhibit a large number of local militant organizations and large variation across districts in conflict dynamics.

3 Procedure and Methods

The report evaluates the cost-effectiveness of World Bank-administered aid based on whether – and at what cost – it helps prevent future conflict occurrence. It accomplishes this by integrating existing geocoded aid data (the *cost* of a program) with new geocoded data on armed conflict incidents (the *effectiveness* of a program in preventing conflict). In other words, the cost is measured by how much aid the World Bank invests in a particular district and effectiveness is measured by the likelihood of a district experiencing future conflict given this aid.[10] The World Bank recently released geocoded aid data from 1995 to 2014, which is hosted by the Aid Data

---

[9] "Fighting on All Fronts: Insecurity in Nigeria." The Economist. 2016.
<https://www.economist.com/middle-east-and-africa/2016/04/02/fighting-on-all-fronts>
[10] Future work could also try to incorporate information from the Costs of War project at the Brown University Watson Institute for International and Public Affaris to measure effectiveness as the cost of future conflict as well.

Project at William and Mary.[11] The Armed Group Dataset at Stanford University records information about the characteristics and duration of nearly 1,000 different armed conflicts around the world to provide insight into subnational variation.[12]

The unit of analysis is the administrative district-year in 5-year increments (2000, 2005, 2010). The district-level records the boundaries at the administrative or province level.[13] I choose to look at how aid over the previous five years affect the likelihood of future conflict in the following year because aid packages are dispersed over multiple years.[14] In order to partially address the resulting concern of whether conflicts attract more aid or whether aid attracts more conflict, I employ a method called "lagging" which compares aid flows in one year to conflict patterns in a separate year. It is very hard to disentangle the individual effects of any aid package on the likelihood of conflict. Since aid flows are not normally distributed, I log the variable in order to make sure I derive accurate estimates.[15]

The analysis uses a series of statistical models to estimate the cost-effectiveness of development aid on conflict. The key metric – cost-effectiveness of aid - is measured by the slope, m, of a regression line between development aid on the x-axis and conflict incidence on the y-axis.[16] The simplest interpretation is how much a 1% increase in development aid leads to a $m\%$ probabilistic change in conflict. Negative probabilistic changes indicate aid is effective in reducing the probability of conflicts; positive probabilistic changes indicate aid is effect in increasing the probability of conflict. Larger coefficient sizes indicate that a fixed amount of aid is increasingly cost-effective.

There are three notes of caution in interpreting the results of the following analysis. First, aid is not distributed at-random, which prevents causal analysis in this setting. The results here characterize general relationship between aid and conflict, but policy-makers cannot infer they are directly causal. Second, it only focuses on five countries, which limits the generalizability of the findings. However, I control for country-specific factors that could also affect the likelihood of conflict as well as whether the district also experienced conflict in a previous year. Third, the time scale is limited. Some argue that the character of conflicts since 2011 have changed dramatically due to a proliferation of armed groups, which might undermine the policy

---

[11] Goodman, S., BenYishay, A., Runfola, D., 2016. Overview of the geo Framework. AidData. <geo.aiddata.org>

[12] Malone, Iris. "Armed Group Dataset, 1970-2012." Working Dataset. Stanford University. <https://web.stanford.edu/~imalone/data.html >

[13] To better understand what a district-level focus means, consider, for example, if the report hypothetically looked at aid flows inside the United States. Conventional reports would look at the grand sum of aid flows to the United States instead of differentiating between aid flows at the district (state) level of California versus Nevada. By looking at the district-level, the accuracy of the findings increases; there is a smaller risk of making the wrong inferences by drawing on national trends.

[14] Data download limitations from the Geocoded Aid Data prevent more fine-grained analysis.

[15] If the aid flows were uniformly distributed, then I would be able to estimate the effect of, say, a $1 increase in aid flows. However, a 1% change in aid flows in the lowest quantile is different than a 1% change in aid flows in the next quantile. For usability, I later draw some inferences about the effects based on what a typical (median) district looks like.

[16] This is the same as the structural equation $y=mx + b$ where m is the slope, b is the y-intercept, and x is the main parameter of interest like aid.

implications of these results.[17] However, I also control for time-varying shocks and look at how the number of groups moderates the cost-effectiveness of development aid.

4 Results

4.1 Initial Findings

The first set of results looks at whether development assistance prevents *any conflict* and at *how much* development assistance prevents conflict.[18]

I first examine whether development assistance prevents *conflict incidents*. I disaggregate between four different outcome variables:
- Baseline: Any conflict
- Religiously-motivated conflict
- Ethno-nationalist conflict
- Leftist conflict

For each outcome variable, I measure the number of future militant incidents associated with this I choose these three ideological measures because they collectively describe most types of conflict. For example, we tend to think about conflicts in the world as (1) religious conflicts in the Middle East and North Africa perpetrated by groups like ISIS or Al Qaeda, (2) ethno-nationalist conflict in Sub-Saharan Africa and Asia like the Rohingya in Burma or Tuareg in Mali, and (3) leftist revolutionary conflicts in Latin America and Asia like the FARC in Colombia or Communist Party of India-Maoist in India. These categories are not mutually exclusive.

To illustrate the trend in the data, I plot the number of different conflict incidents by the amount of aid given to a district in **Figure 1**. I then add a best-fit line in each graph to capture the relationship between the two variables. The slope of each line in **Figure 1** captures the cost-effectiveness of aid flows on a particular type of conflict prevention in each country.

---

[17] "There's Been a Global Increase in Armed Groups. Can They Be Restrained?" New York Times. June 18, 2018. <https://www.nytimes.com/2018/06/18/magazine/armed-groups-increase-sudan-icrc.html>

[18] In both set-ups, I use a Poisson model to estimate the number of conflict incidents since the outcome is a count variable. I cluster my standard errors by the district to correct for differences between districts that affect the likelihood of conflict as is standard in the literature.

Figure 1. Incident-Aid Trends by Country and Ideology.
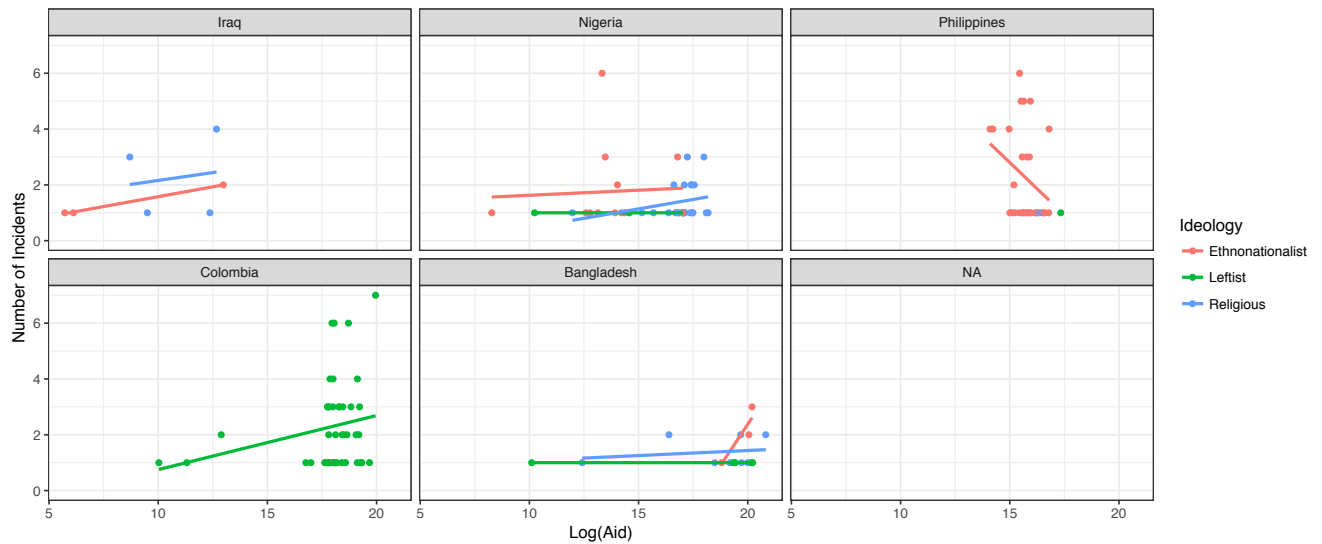
The results in **Figure 1** highlight a large amount of variation in conflicts and aid flows across countries. Notably, increasing aid in Colombia seems correlated with increasing numbers of leftist conflict.[19] In contrast, increasing aid flows in the Philippines seem correlated with decreasing numbers of future ethno-nationalist conflict. In other countries like Bangladesh, the slope – or cost-effectiveness – of increasing aid flows on conflict is relatively flat. This informally suggests that there are diminishing returns to aid against certain types of conflict.

Since the trends presented above could be driven by country-specific factors or previous conflict histories, I estimate these relationships using a more robust set of statistical procedures. The results are summarized in **Table 1**.

---

[19] This finding is puzzling and may partially be an outlier due to the start of Plan Colombia in 2000. When the U.S. launched Plan Colombia in 2000, its original aim was to provide economic assistance in order to undermine the drug trade within Colombia. At the time, left-wing militant organizations in Colombia heavily relied on drug trafficking revenues to support their fight. Future research should expand the sample to examine other countries in Latin America or other countries at-risk for leftist conflict to identify whether this is a systematic trend. That said, the policy implications are minimal given that most conflicts in 2018 are ethno-nationalist or religious in ideological nature.

Table 1. Effect of Development Aid on Local Conflict Prevention Outcomes

Conflict Prevention Outcome	Description	Cost-Effectiveness Return[20]
Any Conflict	A 1% percent increase in aid is significantly correlated with a **18% increase** in the number of incidents.	+18%
Religious Conflict	A 1% percent increase in aid is **not correlated** with an increase in the number of incidents.	~0%
Leftist Conflict	A 1% percent increase in aid is correlated with a **22% increase** in the number of incidents.	+22%
Ethno-Nationalist Conflict	A 1% percent increase in aid is correlated with a **10% decrease** in the number of incidents.	-10%

The results are striking. The results suggest that the cost-effectiveness of aid varies across different types of conflict prevention. If we do not differentiate between different types of conflict, then development assistance looks counter-productive. If we differentiate between types of conflict, we find major differences in the cost-effectiveness of aid on conflict depending on the type of conflict. Aggregating different types of conflict can lead to misleading conclusion about the cost-effectiveness of development assistance on conflict.

In addition, the results suggest that small changes in development aid is cost-effective, but under vastly different conditions. Development assistance is cost-effective at *increasing* the likelihood of leftist conflict. Development assistance is not cost-effective at preventing religious conflict. Development assistance is cost-effective at *decreasing* the likelihood of ethno-nationalist conflict. The baseline expected number of ethno-nationalist incidents in any given district-year is about 0.35. A 1% increase in aid at the median quantile corresponds to an increase of about $260,000 and a 0.1 decrease in the number of ethno-nationalist conflict incidents. Thus, for a median district, an increase of approximately $2,500,000 in aid is associated with a reduction in at least one ethno-nationalist incident breaking out. In contrast, an increase of approximately $2,500,000 in aid is associated with an *increase* in the likelihood of 2 leftist incidents.

It suggests that mixed findings over the relationship between aid and conflict stem from the pooling of different conflicts into previous analyses. In this analysis, development aid only reduces the probability of ethno-nationalist conflict. When applied to religious conflicts, it risks making conflict more likely. Why?

One reason may be due to the different conditions under which each type of conflict emerges. Ethno-nationalist conflicts often start because local communities protest the poor economic conditions in their areas. Development aid will improve the welfare of local citizens by providing services, jobs, and basic infrastructure for communities. This will reduce their motivation to fight making conflict less likely. In contrast, religious conflicts are rooted in different belief systems than ethno-nationalist conflicts. Development aid does not address the

---

[20] This metric records the probabilistic change in conflict per 1% increase in development aid.

underlying grievances driving religious conflict and does not reduce a community's motivation to fight. Further, religious armed groups might receive support from transnational, religious actors like Al Qaeda. This external support could reduce their dependence on local communities and make local development programs less effective at the margins.

4.2 Conditional Findings

U*nder what* conditions is development assistance most cost-effective? While the results in the previous section suggest aid is *most* cost-effective at peacebuilding in ethno-nationalist conflicts, it is possible aid may be even *more* cost-effective under certain environmental conditions.

What follows are five possible moderating variables that could shift the cost-effectiveness of aid on ethno-nationalist conflict prevention.

- **GDP and State Capacity:** Scholars typically believe that increasing state capacity increases the likelihood of peace.[21] However, some policy-makers believe that state capacity fuels conflict and the breakdown of peace by making it easier for state officials to use force against discriminated populations.[22] It is thus possible that increasing GDP might moderate -- or affect -- the cost-effectiveness of aid on preventing ethno-nationalist conflict.
- **Urbanization (Population Density):** Over the last two decades, conflicts and peacebuilding efforts have shifted from traditional, rural environments to cities.[23] Scholars note that increasing urbanization likely leads to more collateral damage.[24] As more development aid is allocated towards reconstruction efforts in urban settings, it can be increasingly cost-effective by being able to service more people in one setting.
- **Border Distance:** Armed conflicts closer to the border – and typically further from the capital – are harder to triage because there are increased logistical burdens to providing services and peacebuilding programs. Newer work finds that state capacity in these peripheral regions is also much weaker.[25] The delivery of development aid to more peripheral areas may be more cost-effective than the delivery of development aid because it is less frequent and so posed to have a larger-than-normal impact.
- **Conflict Legacy:** I define conflict legacy as a country with a history of intra-state violence. Countries that experience conflict tend to be at-risk for conflict recurrence.[26] Development aid may decrease the cost-effectiveness by enticing armed groups to keep

---

[21] Fearon, James D., and David D. Laitin. 2003. "Ethnicity, insurgency, and civil war." *American Political Science Review*. 97(1): 75-90.

[22] Interview with Senior Government Official. September 2017. Washington, D.C.

[23] See, for example, urban fighting in the Syrian Civil War (2011-present) and the Iraqi Insurgency (2003-2011).

[24] Kilcullen, David. 2015. *Out of the mountains: The coming age of the urban guerrilla*. Oxford University Press.

[25] Lee, Melissa, and Nan Zhang. 2017. "Legibility and the informational foundations of state capacity." *The Journal of Politics* 79(1): 118-132.

[26] Walter, Barbara F. 2004. "Does conflict beget conflict? Explaining recurring civil war." *Journal of Peace Research* 41(3): 371-388.

fighting or it may increase the cost-effectiveness by being used for more tailored
programs based on prior conflict knowledge.

- **Conflict Fragmentation (Number of Armed Groups):** I define conflict fragmentation
  by the number of multiple armed groups fighting in an area. As the number of armed
  groups grow, the conflict becomes more fragmented and vice versa. In areas with a larger
  number of armed groups, there is a lot of competition between groups for resources like
  fighters.[27] As the number of armed groups grow, it becomes harder for any one group to
  provide enough resources, wages, or support to keep one fighter employed. This can
  make it easier for development aid programs to compete militant organizations and make
  development aid more cost-effective in peacebuilding.

For each type of conflict, I estimate the *marginal effect* of these factors on the cost-effectiveness
of aid, holding the moderator variable at its median value. The key parameter of interest is the
marginal effect of aid flows on conflict prevention as the moderating variable increases. When
the marginal effect is positive, it indicates the moderator reduces the cost-effectiveness of aid on
conflict. When the marginal effect is negative, it indicates the moderator variable increases the
cost-effectiveness of aid on conflict.

Table 2. Moderating Variables and Cost-Effectiveness

Conflict Prevention Outcome	Moderator	Description	Marginal Effect at Median
Ethno-Nationalist Conflict	GDP	The marginal effect of increasing GDP on the cost-effectiveness of aid is **negative.**	-11%
	Urbanization	The marginal effect of increasing urbanization on the cost-effectiveness of aid is **negative.**	-8%
	Border Distance	The marginal effect of increasing border distance on the cost-effectiveness of aid is **negative.**	-11%
	History of Conflict	The marginal effect of a conflict legacy on the cost-effectiveness of aid is **negative.**	-39%
	Fragmentation	The marginal effect of increasing armed groups on the cost-effectiveness of aid is **negative**.	-23%

The results from the moderating analysis reveal that 2 factors – **conflict legacy and
fragmentation – substantively shape the cost-effectiveness of aid**. Further, these effects are

---

[27] Cunningham, Kathleen Gallagher, Kristin M. Bakke, and Lee JM Seymour. "Shirts today, skins
tomorrow: Dual contests and the effects of fragmentation in self-determination disputes." *Journal of
Conflict Resolution* 56, no. 1 (2012): 67-93.

highly conditional on the type of conflict policy-makers are trying to prevent. These can be summarized by the following:

- The marginal effect of moderating variables on ethno-nationalist conflict prevention efforts is negative. In other words, **development aid in more urban, rich, or areas close to the border are more cost-effective than development aid in more rural or poor areas.**
- A larger number of armed groups **decreases** the cost-effectiveness of development aid against **ethno-nationalist conflict prevention**.
- A historical legacy of ethno-national conflict **decreases** the cost-effectiveness of development aid against **ethno-nationalist conflict prevention**.

To illustrate the marginal effect of fragmentation, I plot the interaction between fragmentation and development aid in **Figure 2**. The coefficient is the estimated cost-effectiveness of aid on conflict prevention as the number of armed groups within a country increases. The result illustrates that while the marginal effect is negative the error bars – or uncertainty - around this estimate is also increasing. While development aid may become more cost-effective as the number of armed groups increases, the variance or noise surrounding this estimate also increases.

Figure 2. Marginal Effect of Fragmentation on Development Aid for Ethno-Nationalist Conflict
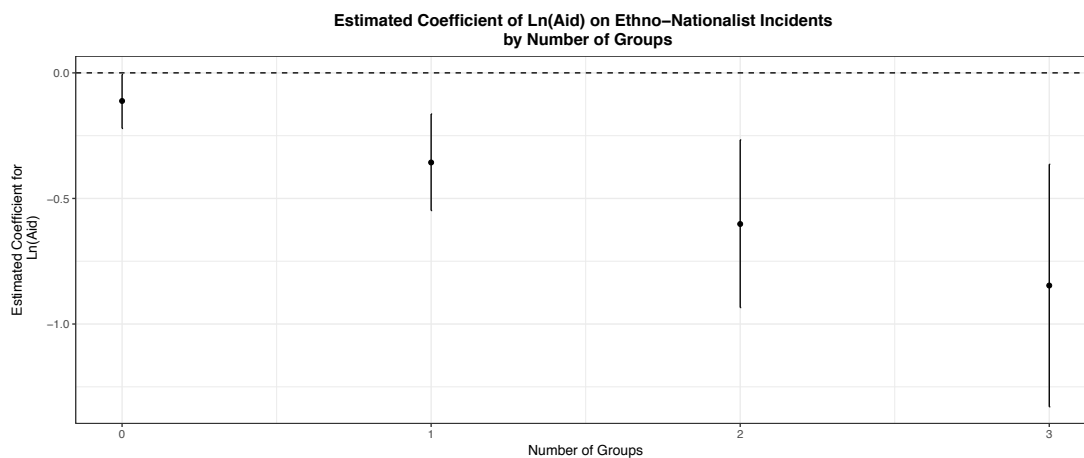
5 Conclusions

Development assistance is one of the most prevalent tools in peacebuilding today, but difficult to study. Despite the seemingly important benefit of understanding the cost-effectiveness of aid of conflict, policy-makers have lacked the conflict data to study this question before now. New data on different types of conflict sheds new, important insight into the conditions under which development aid is most cost-effective.

This report identifies when and where development assistance has the largest preventative effect on conflict. Using new conflict data and district-level aid data reveals:

- increases in development aid are *most* cost-effective in reducing future ethno-nationalist conflict such that a 1% increase in development aid can reduce the probability of future ethno-nationalist conflict by up to 10%;
- increases in development aid are not cost-effective in reducing the probability of future religious conflict;
- increases in development aid are *least* cost-effective in reducing future leftist conflict; and,
- development assistance is more cost-effective when applied to situations with historical legacies of conflict and larger numbers of armed groups.

For policy-makers, this has two policy implications:
- First, peacebuilding strategies should depend, in part, on the character of the conflict they are designed to address. What works in one situation may not work in another.
- Second, policy-makers should reassess peacebuilding strategies to combat transnational terrorist threats like Al Qaeda, given assistance to prevent religious conflict is not cost-effective.

Moving forward, research should strive to understand why development assistance has such multi-faceted effects. Ethnographic and fieldwork can bolster our understanding about whether the logic proposed here is true and if so guide future development programs. Similarly, research could look beyond pure financial assistance and more at targeted programs, which provide citizens education or access to civil services.

Development assistance can be a powerful, cost-effective tool in peacebuilding if policy-makers know where to use it. This report previews just some of important, practical policy implications from studying cost-effectiveness and lays the foundation for future research on the topic.