

**Cost-Effectiveness of Demobilization and Reintegration Programs:
Evidence from Sub-Saharan Africa**

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

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Key Highlights

- The Central African Republic (CAR) had the most cost-effective demobilization and reintegration program in the seven Sub-Saharan African countries participating in the Multi-Country Demobilization and Reintegration Program between 2005-2008
- Key factors that contribute to explaining the cost-effectiveness of demobilization programs are (1) ethnic diversity and (2) the number of active armed groups
- Key factors that contribute to explaining the cost-effectiveness of reintegration programs are (1) state capacity, (2) ethnic diversity, and (3) the number of active armed groups
- Older and larger armed groups demobilized in greater numbers than younger and smaller armed groups between 2005-2006 in Uganda

1 Introduction

This report examines the cost-effectiveness of one type of Disarmament, Demobilization, and Reintegration (DDR) program. DDR programs represent one of the most popular peacebuilding strategies in post-conflict settings. Non-governmental organizations (NGOs), aid agencies, and state governments use these programs to stabilize conflict environments and prevent civil war recurrence.¹

This report specifically examines the cost-effectiveness of demobilization and reintegration (DR) efforts due to a lack of data on disarmament efforts.² DR programs help build peace by incentivizing ex-combatants to disarm and reintegrate into civilian life. They provide cash for arms and provide other forms of financial assistance to help house, train, and provide for the welfare of ex-combatants.³ This report offers the first in-depth study about the cost-effectiveness of one program, the World Bank's Multi-Country Demobilization and Reintegration Program (MDRP) in Sub-Saharan Africa. From 2005 to 2008, the \$500 million program saw 279,263 ex-

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¹ "How to stop countries sliding back into civil war." The Economist. 2018. <<https://www.economist.com/international/2018/01/18/how-to-stop-countries-sliding-back-into-civil-war>>

² State governments administer disarmament programs, but typically do not publish the results of their efforts. NGOs administer both demobilization and reintegration programs and do publish the results of their efforts. This creates a rich source of data on demobilization and reintegration efforts available to analyze here.

³ "What is DDR?" UN Disarmament, Demobilization, and Reintegration. 2005. <http://unddr.org/what-is-ddr/introduction_1.aspx>

combatants demobilize and 232,107 of these ex-combatants reintegrate.⁴ Across the six participating countries in the MDRP, results varied substantially due to differences in state capacity, ethnic diversity, and number of active armed groups.

2 Debate over DR Effectiveness

Understanding where DR programs stand to do the most good is important for NGOs, private donors, and national governments working on peacebuilding in post-conflict settings. Despite millions spent on peacebuilding efforts, policy-makers lack strong priors about what an effective and positive contribution to peacebuilding actually entails.

To date, scholars and think tanks have found little support that DR programs are effective in building peace. These analyses have looked at the effectiveness of these programs in Sierra Leone and Liberia and looked at what characteristics drive ex-combatants to demobilize and reintegrate.^{5, 6} Other analyses have compared what regional characteristics drive certain areas to demobilize and reintegrate in larger numbers.⁷ In these cases, scholars have concluded DR programs are ineffective because these programs do not attract large numbers of participants, fall short of their targeted goals, and do not increase the likelihood of long-term peace. These results provide insight into DR programs in West Africa. However, two gaps remain.

First, while this literature suggests that DR programs often fail to meet their stated goals, it is unclear whether this failure stems from a lack of demand for the program or a lack of resources to meet this demand. In 2006, the DR program in Rwanda noted a major hurdle to implementation was the “slow repatriation of armed groups” and lack of demand for the program, while the DR program in the Democratic Republic of Congo (DRC) noted it had a large number of fighters interested in demobilization, but not enough funds to process.⁸ While demand seemed low in Rwanda, demand seemed high in the DRC.

If there is low demand for a DR program, then it would not be cost-effective to implement. We would expect countries with low demand to have high cost-to-combatant ratios. If there is high demand for a DR program, then it would be cost-effective to implement. We would expect countries with high demand to have low cost-to-demobilization or low cost-to-reintegration ratios. In order to assess why demand varied across these countries, it is thus necessary to assess

⁴ “The Multi-Country Demobilization and Reintegration Program: Final Report.” International Bank for Reconstruction and Development. World Bank. 2010.

<http://tdrp.net/mdrp/PDFs/MDRP_Final_Report.pdf>

⁵ Humphreys, Macartan, and Jeremy M. Weinstein. “Demobilization and reintegration.” *Journal of conflict resolution* 51, no. 4 (2007): 531-567.

⁶ Peloquin, Simone. “How effective is disarmament, demobilization and rehabilitation? Research on the cases of Burundi and Sierra Leone.” *Journal of Political Inquiry*, Vol. 4. 2011.

⁷ Solomon, Christiana, and Jeremy Ginifer. “Disarmament, demobilisation and reintegration in Sierra Leone.” *Centre for International Cooperation and Security* (2008): 1-52.

⁸ “Multi-Country Demobilization and Reintegration Program Monthly Statistical Progress Report.” MDRP Program. 2006. P. 28. <http://tdrp.net/mdrp/PDFs/MSR_02_06.pdf>

the cost-effectiveness of these DR programs.⁹ The results will help donors identify whether a particular country is likely to benefit from a DR program or not.

Second, while existing research has done an excellent job examining programs in Sierra Leone and Liberia, scholars and policy-makers risk drawing too many conclusions based on a small sample. If these West African cases are not representative of the environments in which other DR programs are implemented, then policy-makers risk drawing incorrect conclusion about DR programs. It is thus necessary to compare multiple DR programs across countries. Knowing why some countries respond more favorably to demobilization and reintegration programs over others is important in anticipating whether a program implemented in a particular area will have the intended effect.

This report addresses three questions related to the cost-effectiveness of demobilization and reintegration programs:

- (1) Which countries had the most cost-effective demobilization and reintegration programs during the MDRP program?
- (2) What characteristics explain variation in the cost-effectiveness of demobilization and reintegration programs?
- (3) What was the cost-effectiveness of demobilization programs for different types of armed groups within Uganda's MDRP program?

Through this line of questioning, this report addresses the limitations raised above. It accomplishes this by (1) asking research questions, which measure the cost-effectiveness of demobilization and reintegration programs and (2) comparing results across different countries. The report answers these questions by examining the historical cost-effectiveness of DR programs in six countries: Angola, Burundi, Central African Republic, Democratic Republic of Congo, Rwanda, and Uganda. The report focuses on these six countries because they all participated in the Multi-Country Demobilization and Reintegration Program and the World Bank data about their program's results.

3 Procedure and Methods

The report creates a new cost-effectiveness metric to compare programs across countries. The metric records the comparative cost of rehabilitating one ex-combatant through a demobilization or reintegration program. It accomplishes this by coding new data on the cost of the MDRP program with new data on the number of ex-combatants who successfully finished these programs. I also use new cross-national data on the number of armed groups within these countries and socio-economic indicators to examine under what conditions these programs are more cost-effective over others.

Data on DR programs come from the World Bank's MDRP report catalog. The MDRP produced quarterly reports on the cost and number of combatants processed in each of the six countries

⁹ Sheamer, Steve, Alexa Courtney, and Noah Sheinbaum. "Cost-Effectiveness for Peacebuilding: Exploring the Possibilities." Frontier Design Group. 2017.

from 2005 to 2008.¹⁰ Socio-economic indicators come from the World Bank Data Catalog.¹¹ Conflict indicators come from the Armed Group Dataset at Stanford University, which records information about the characteristics and duration of nearly 1,000 different armed conflicts around the world from 1970 to 2012.¹²

The unit of analysis is the country-quarter year. The MDRP released 13 quarterly reports from late 2005 through the end of 2008. Two countries – the Central African Republic and Uganda – ended their DR programs in 2007. Thus, the only programs directly comparable are in 2005 and 2006, leading to 34 observations. The small number of observations makes more sophisticated statistical techniques like linear regression unpractical. Instead, I analyze the data by compiling basic summary statistics and correlations.

The key metric – cost-effectiveness of each program - is measured by the cost of getting one ex-combatant through a program in a given country. Smaller cost-to-combatant ratios indicate greater cost-effectiveness and vice versa.

There are two limitations in interpreting the following results. First, disbursement funds from the World Bank were not distributed at-random, which prevents causal analysis in this setting. For example, the amount of financial assistance provided in a similar reinsertion program administered by the MDRP explicitly varied depending on the country's average national income in order to be competitive with national wages. In Burundi, ex-combatants in the reinsertion program received \$600 while in Uganda, ex-combatants only received \$140.¹³ It is also hard to parse out exactly how funds are distributed to each program so I average across. The results here thus characterize general relationship about the cost-effectiveness of DR programs and nothing causal. Second, the results here only focus on six countries, which limits the generalizability of the findings. However, the income, type of armed groups, and other characteristics of these countries are representative of other countries generally targeted for DR programs.

4 Results

4.1 Cost-Effectiveness of DR Programs by Country

Which countries processed the most ex-combatants during the MDRP program? **Figure 1** plots the cumulative number of ex-combatants that go through different programs. Demobilization programs involve registration and transportation home and reintegration programs provide vocational training, educational opportunities, and housing to ex-combatants to help them

¹⁰ “Documents and Reports.” Multi-Country Demobilization and Reintegration Program. World Bank. 2008. <http://tdrp.net/mdrp/doc_rep.htm>

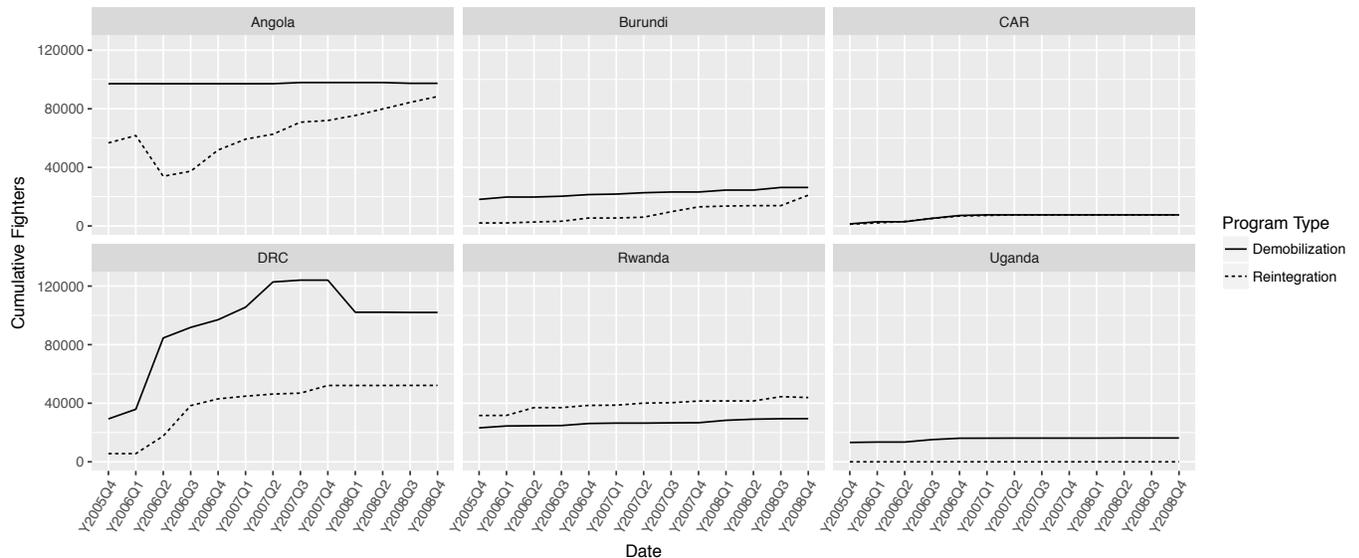
¹¹ “GDP per capita (current US\$).” World Bank Data Catalog. Last updated 2018. <<https://data.worldbank.org/indicator/NY.GDP.PCAP.CD>>

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

¹³ “Reinsertion: bridging the gap between demobilization and reintegration.” In Focus No. 3. MDRP Program. N.d. <http://tdrp.net/mdrp/PDFs/In_Focus_3.pdf>

transition to civilian life.¹⁴ The results show that the number of ex-combatants who went through each program varied substantially across states.

Figure 1. Cumulative Number of Participants by Program and Country, 2005-2008



Overall, the DRC saw the most ex-combatants go through each of its demobilization and reintegration programs. This is unsurprising given that the DRC was the most populous country participating in the program. The programs in Uganda and the Central African Republic ended in 2007 so the number of participants stopped growing after the program ended. In the DRC, the rate of participants going through the program declined after the first few quarters due to a computational error.

At a glance, **Figure 1** suggests a large number of ex-combatants successfully completed both the demobilization and reintegration programs. However, because this figure only shows the raw number of participants, it cannot inform policy-makers about demand for a particular program.

In order to disaggregate demand for each program, it is necessary to look at how cost-effective it was to process one ex-combatant. **Table 1** summarizes the cost-effectiveness of DR programs by country based on available data in 2005-2006.

Table 1. Cost-Effectiveness of DR Programs by Country, 2005-2006

Country	Cost-Effectiveness of Demobilization (\$/Ex-Combatant) ¹⁵	Cost-Effectiveness of Reintegration (\$/Ex-Combatant) ¹⁶
Angola	NA	471
Burundi	7014	6502

¹⁴ “Multi-country Demobilization and Reintegration Program: End of Program Evaluation.” Scanteam Analysts and Advisers. 2010. p. 13. <http://tdrp.net/mdrp/PDFs/MDRP_ReportFinalScanteam.pdf>

¹⁵ This correlation figure is for Burundi, CAR, DRC, Rwanda, and Uganda only. Angola did not report any demobilization figures during this period.

¹⁶ This correlation figure is for Angola, Burundi, CAR, DRC, and Rwanda only. Uganda did not report any demobilization figures during this period.

Central African Republic (CAR)	382	445
Democratic Republic of Congo (DRC)	2389	3501
Rwanda	3329	1952
Uganda	3450	NA

Figure 2 illustrates this further. It plots the cost-effectiveness of a demobilization program by country. The figure is a boxplot, where the box captures the distribution of ex-combatants going through the country's program by quarter. The bottom line represents the 25th quartile, the dark line in the middle captures the 50th quartile, and the upper line represents the 75th percentile. The dot plots the mean, or average, number of ex-combatants per quarter.

The results show that even though the DRC had the largest number of participants, CAR had the most cost-effective program, spending \$382 for every ex-combatant that demobilized. Burundi had the least cost-effective program, averaging \$7014 per ex-combatant. Burundi's numbers are much higher because it had several quarters of low ex-combatant numbers completing the program despite the continual disbursement of more funds.

In other words, the results here suggest that Burundi's program was less cost-effective because of a lack of demand. In contrast, the results suggest that CAR was more cost-effective because of lots of demand for the program.

Figure 2. Cost-Effectiveness of Demobilization Program by Country, 2005-2006

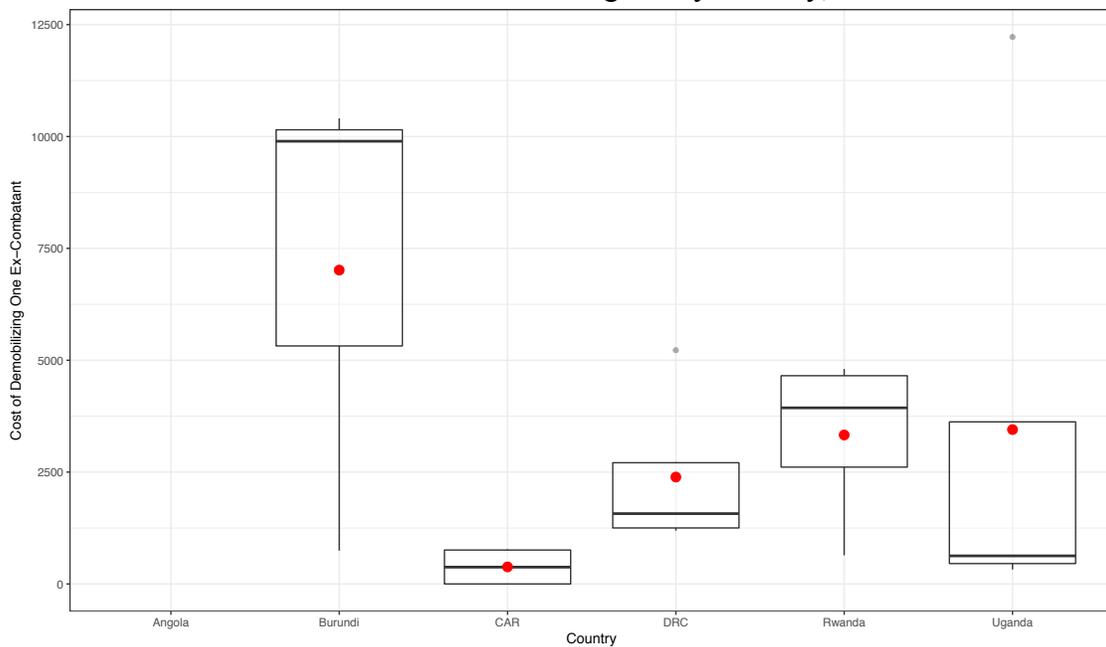
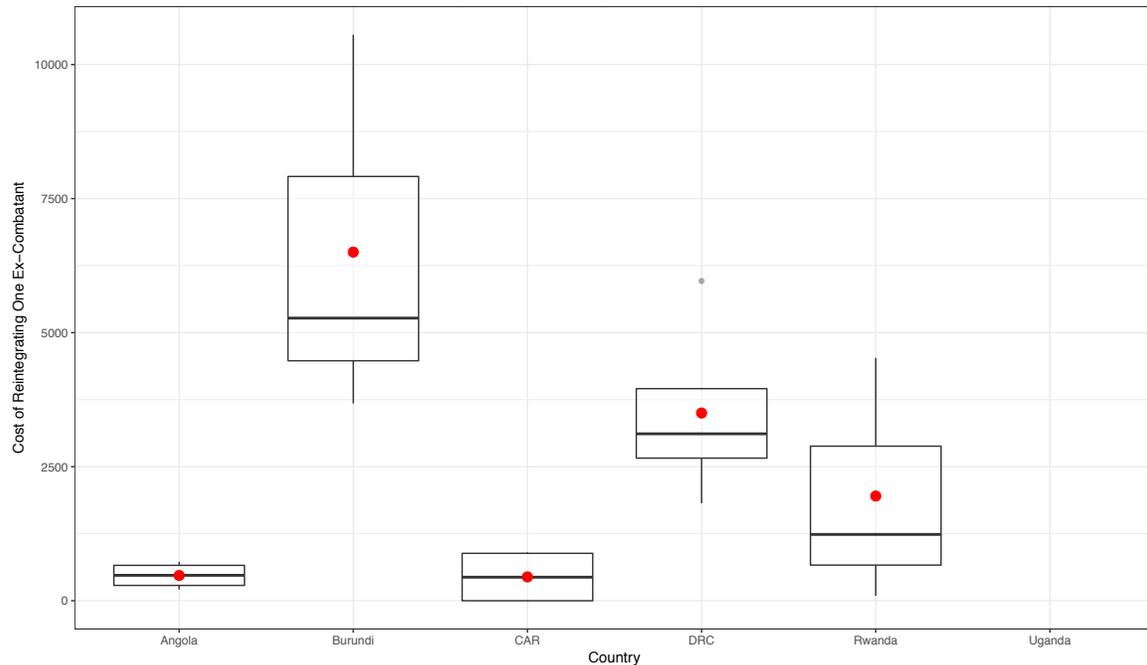


Figure 3 plots the cost-effectiveness of reintegration programs by country. The Central African Republic again reported the most cost-effective program; it cost an average of \$445 per ex-combatant to reintegrate. Angola was similarly close, averaging \$471 per ex-combatant. Again,

these results suggest that demand for reintegration was much higher in the Central African Republic and Angola. Burundi had less demand resulting in a higher cost-to-reintegration ratio.

Figure 3. Cost-Effectiveness of Reintegration Program by Country, 2005-2006



4.2 Explanations for Cost-Effectiveness

Why are DR programs more cost-effective in some countries over others? While the results in the previous section suggest DR programs were most cost-effective in the Central African Republic during the MDRP, it is necessary to examine *why* this country may be particularly adept at conducting demobilization or reintegration programs.

What follows are three possible explanatory variables that could contribute to explaining variation in the cost-effectiveness of DR programs:

- **GDP/Capita:** Scholars typically believe that increasing state capacity increases the likelihood of peace.¹⁷ 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.¹⁸ It is thus possible that increasing GDP might make DR programs less efficient – because there is less demand to join them – or make DR programs more efficient – because there are more financial resources to facilitate the process.
- **Ethnic Diversity:** Ethnic diversity – more commonly known as ethnic fractionalization – measures how many distinct ethnic groups operate in the particular area; larger numbers

¹⁷ Fearon, James D., and David D. Laitin. 2003. “Ethnicity, insurgency, and civil war.” *American Political Science Review*. 97(1): 75-90.

¹⁸ Interview with Senior Government Official. September 2017. Washington, D.C.

indicate more ethnically diverse countries and vice versa.¹⁹ Ethnic diversity is often thought to make peacebuilding harder because there are more divergent interests across communities, which are harder to accommodate and increase the risk of conflict.²⁰ This would predict that increasing ethnic diversity would reduce the cost-effectiveness of DR programs by making ex-combatants less willing to disarm.

- **Number of Armed Groups:** The number of armed groups – defined as active militant organizations employing political violence against the state – can also affect the cost-effectiveness of programs. On the one hand, these conflicts generally involve larger armed groups, creating more potential ex-combatants to go through the program. On the other hand, these conflicts can also reduce the willingness of these ex-combatants to disarm if combatants believe they can earn more from fighting than from disarming.

Table 2 reports the correlations for the cost-effectiveness of these different programs across these potential explanatory variables.²¹ A positive correlation indicates that increasing the value of the explanatory variable makes a program less cost-effective because it requires more money to process one fighter. A negative correlation indicates that increasing the value of the explanatory variable makes a DR program more cost-effective.

Table 2. Correlations for Cost-Effectiveness of DR Programs

Explanatory Variable	Demobilization²²	Reintegration²³
GDP/Capita	-0.13	-0.59
Ethnic Fractionalization	-0.72	-0.55
Number Armed Groups	0.63	0.76

First, while increasing the GDP/capita of a country increases the cost-effectiveness of both DR programs, the size of the correlation is only significant for reintegration programs. Why? Richer countries may have to commit more money to demobilization programs because they have to offer ex-combatants more money in order to entice them to disarm. This drives down the perceived cost-effectiveness of demobilization programs. In richer areas, reintegration programs already have a population of ex-combatants interested in transitioning to civilian life so they do not need to deal with the same supply and demand problems. Richer countries have the existing infrastructure to provide vocational training, educational opportunities, or other programs to ex-combatants. Reintegration programs do not have to compete against the possible wages armed groups can provide.

¹⁹ Fearon, James D., and David D. Laitin. 2003. "Ethnicity, insurgency, and civil war." *American Political Science Review*. 97(1): 75-90.

²⁰ Cederman, Lars-Erik, Andreas Wimmer, and Brian Min. "Why do ethnic groups rebel? New data and analysis." *World Politics* 62, no. 1 (2010): 87-119.

²¹ For reference, the correlation between two variables is constrained between -1 and 1. In absolute terms, a strong correlation estimate ranges between 0.5 – 1, a moderate correlation estimate ranges between 0.3-0.5, and a weak correlation estimate ranges between 0-0.3.

²² This correlation figure is for Burundi, CAR, DRC, Rwanda, and Uganda only. Angola did not report any demobilization figures during this period.

²³ This correlation figure is for Angola, Burundi, CAR, DRC, and Rwanda only. Uganda did not report any demobilization figures during this period.

Second, increasing ethnic fractionalization increases the cost-effectiveness of demobilization and reintegration. In other words, more ethnically diverse countries are more likely to have cost-effective programs. Ethnic fractionalization could increase the cost-effectiveness of demobilization because it leads to a larger number of potential conflicts in countries like the Democratic Republic of Congo, Burundi, or Rwanda. This produces a larger number of potential ex-combatants, who are willing to disarm, driving up supply.

In contrast, increasing the number of active armed groups within a country decreases the cost-effectiveness of DR programs. When there are more armed groups, each armed group may compete and try to outbid each other by offering to pay fighters more.²⁴ When there are more armed groups, it is costlier to disarm one fighter because they must pay more to compete against what armed groups offer than if there were fewer armed groups. This reduces the cost-effectiveness of a program. Notably, the correlation between the number of armed groups and the cost-effectiveness metric is very strong.

Overall, these results can partially help explain the CAR's success in demobilization and reintegration. In contrast to everyone other country in the MDRP, the CAR had no active armed groups in 2006 because the government had signed a peace agreement with the largest coalition of armed groups known as the Union of Democratic Forces for Unity. This removed competition from the program and helped the DR program attract a large number of ex-combatants. Similarly, the CAR's ethnic diversity is smaller than other countries like the DRC or Uganda, which could further reduce the number of potential armed conflicts within the CAR relative to these other countries.

4.3 Cost-Effectiveness of DR Programs by Armed Group

If the number of armed groups are important, then scholars and policy-makers may be interested in better exploring these actors and their roles in DR programs. Uganda's MDRP program records are unique in that they systematically record which armed group each ex-combatant came from. Examining which armed groups responded more favorably to demobilization efforts can provide additional insight into the conditions under which demobilization and reintegration programs are more cost-effective.

In Uganda, there have generally been three distinct conflicts centered around different geographic regions:

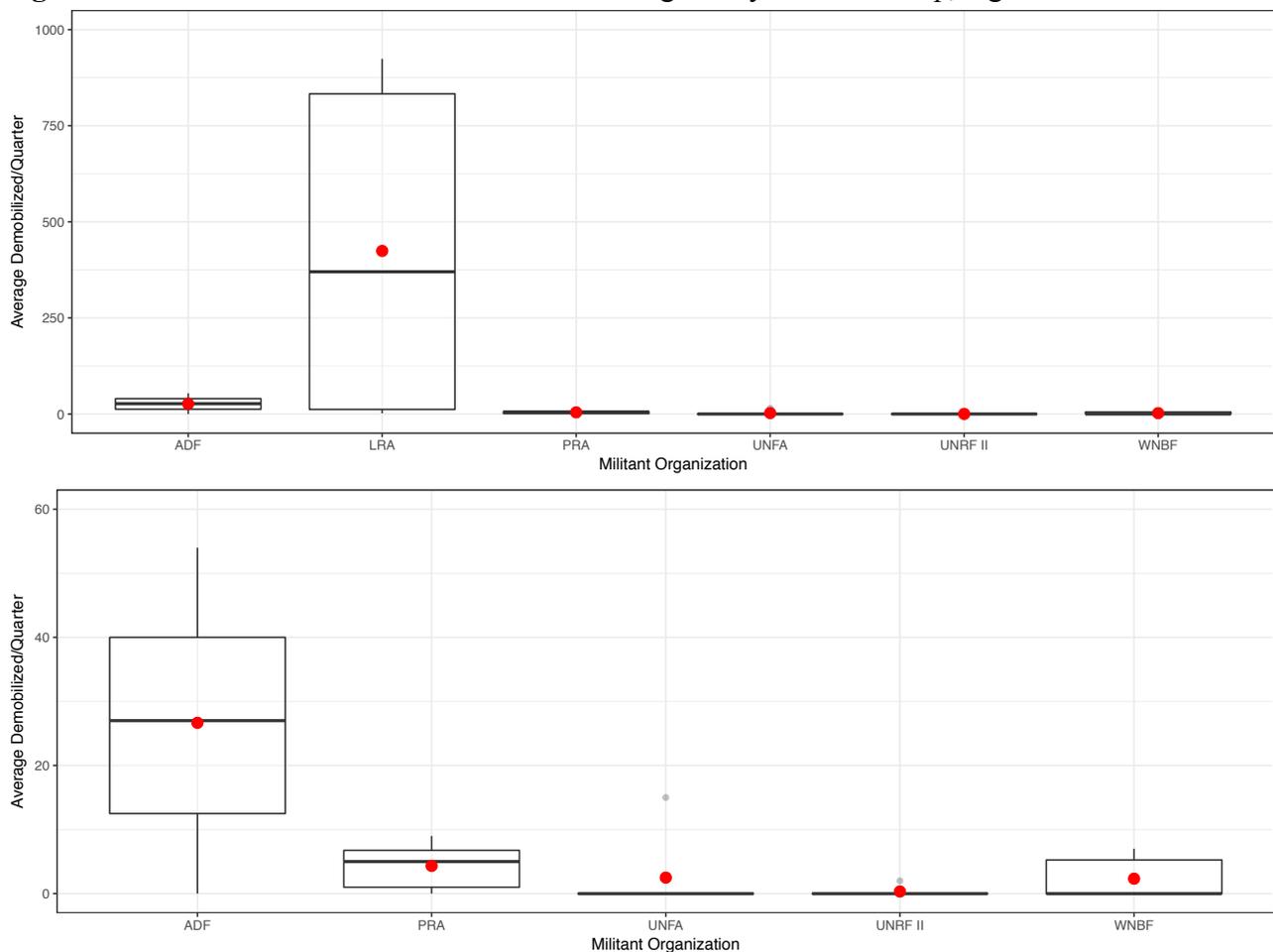
- **Northern Region:** The primary armed group in this region, the Lord's Resistance Army (LRA) was – and remains as of 2018 - a quasi-Christian organization led by Joseph Kony with the aim to overthrow the Ugandan government. It has been fighting since 1987 and agreed to partially disarm in 2006 following Operation Iron Fist and peace talks in Juba.
- **Western Uganda:** Several armed groups operated in this region. The Allied Democratic Forces (ADF) and People's Redemption Army (PRA), and Uganda National Freedom Army (UNFA) are part of a larger insurgency in Western Uganda, fighting to overthrow the government since 1996. These groups often use the DRC for an external base and were less violent than the LRA.

²⁴ Krause, Peter. *Rebel power: why national movements compete, fight, and win*. Cornell University Press, 2017.

- West Nile Region:** A smaller conflict erupted in northwest Uganda in the mid-1990s. The two primary actors – the West Nile Bank Front (WNBF) and Uganda National Resistance Front (UNRF II) - formed to fight against the Ugandan government due to political differences. These groups were relatively small than the LRA, ADF, PRA, and UNFA. They also suffered several military defeats in the late 1990s, essentially mitigating their threat.

Figure 4 plots the average number of ex-combatants that demobilized from each of these groups. The Lord’s Resistance Army saw the largest average number of combatants demobilize in 2005-2006. The second plot zooms in on the remaining smaller groups to look at their distribution of demobilization. Outside the northern region, the ADF and PRA in Western Uganda also demobilized in larger numbers. Demobilization numbers were weakest in the West Nile Region.

Figure 4. Cost-Effectiveness of Demobilization Program by Armed Group, Uganda



Why did the LRA respond more favorably to demobilization efforts? First, the LRA represented one of the largest insurgencies in the region. In 1997, the group had at least 5,000 fighters.²⁵ In

²⁵ Malone, Iris. “Uganda Armed Group Case Narratives.” Armed Group Dataset. Stanford University.

contrast, the UNFA had 1,500 members, the UNRF II had 1,000 fighters, and the ADF had 800-1400 fighters.²⁶ Thus, the LRA simply had more fighters available to disarm.

Second, the LRA's campaign was one of the longest conflicts in Uganda. Combatants who fight in long conflicts often experience battle fatigue and have less resolve to keep fighting. When DR programs are implemented in areas where a conflict has been going on longer, fighters in those areas are likely to be more responsive to demobilization efforts because they no longer have the will to fight.

5 Conclusions

DR programs are a popular tool for peacebuilding in conflict settings. Despite the seemingly important benefit of understanding when and whether they are cost-effective peacebuilding initiatives, policy-makers have lacked the data to study this question before now. New data on the cost and number of participants in these programs sheds important insight into the conditions under which demobilization and reintegration programs are most likely to be cost-effective.

Using new coded DR data, this report reveals:

- Central African Republic had the most cost-effective demobilization program in the MDRP at an average demobilization cost of \$362/ex-combatant and an average reintegration cost of \$445/ex-combatant;
- increases in ethnic fractionalization correspond to increases in the cost-effectiveness of both demobilization and reintegration programs;
- increases in the number of active armed groups decrease the cost-effectiveness of demobilization and reintegration; and,
- within Uganda, larger and older armed groups demobilized in larger numbers than smaller and younger armed groups.

For policy-makers, this has three policy implications:

- First, peacebuilding strategies should address how to reduce the number of active armed groups within a country *before* adopting peacebuilding tools like DR.
- Second, learning more about the history of an armed group and where it operates should shape expectations about whether a DR program in that region will work.
- Finally, learning more about the country's ethnic diversity and history can guide predictions about whether there will be demand for DR and the potential for future conflict

Moving forward, research should strive to understand how the country-level factors driving differences in DR programs interact with existing research on differences in individual participation rates. Ethnographic and fieldwork interviews with ex-rebels from the LRA, for example, can bolster our understanding about whether the logic proposed in this report is true and if so guide where states choose to set-up DR programs in the future. Similarly, future research could expand on these findings and assess whether these efforts reduce the likelihood of civil war recurrence in the long-run.

²⁶ No size estimates on PRA or WNBK were found.

Demobilization and reintegration programs can be costly, so understanding which conflict environments are most likely to have demand for these programs is important. If states better understood under what conditions demobilization and reintegration programs are likely to work, then they could more effectively strategize against conflict recurrence. As the UN, World Bank, and other organizations weigh their options for rebuilding Syria and other conflict zones around the world, they must consider whether the situation warrants DR, the most popular peacebuilding option.

This report previews just some of important, practical policy implications from studying cost-effectiveness and lays the foundation for future research on the topic.