



**CENTER ON CONFLICT
AND DEVELOPMENT**
TEXAS A&M UNIVERSITY

The Bush School
OF GOVERNMENT & PUBLIC SERVICE
TEXAS A&M UNIVERSITY 

CEFADES

AN IMPACT EVALUATION OF A VOCATIONAL
REHABILITATION PROGRAM FOR AT-RISK YOUTH IN EASTERN
DEMOCRATIC REPUBLIC OF THE CONGO



CEFADES

AN IMPACT EVALUATION OF A VOCATIONAL REHABILITATION PROGRAM FOR AT-RISK YOUTH IN EASTERN DEMOCRATIC REPUBLIC OF THE CONGO

Principal Investigators

Zike Chen

Gavin Finnegan

David Hobson

Diego Pinzon

Gabriel Vander Hey

DISCLAIMER

The author's views expressed in this publication do not necessarily reflect the views of the Bush School of Government and Public Service at Texas A&M University.

The Center on Conflict and Development at Texas A&M University
600 John Kimbrough Blvd • College Station, TX 77843-2124
condev.org

CEFADES: An Impact Evaluation of a Vocational Rehabilitation Program for At-Risk Youth in Eastern Democratic Republic of the Congo © 2014 by The Center on Conflict and Development at Texas A&M University. All rights reserved. This report or any parts thereof may not be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording or by any information storage and retrieval system, without permission in writing from the publisher.

Cover Photo: Survey Administration at l'Université Catholique du Graben Hospital, April 2014

Chen et al. *CEFADES: An Impact Evaluation of a Vocational and Rehabilitation Program for At-Risk Youth in Eastern Democratic Republic of the Congo* / Chen et al.
1. Youth Employment--Democratic Republic of the Congo. 2. Youth Employment--Central Africa. 3. Youth Employment--North Kivu.

Printed in the United States of America

CONTENTS

| | |
|--|----|
| CHAPTER ONE | |
| Introduction | I |
| CHAPTER TWO | |
| Literature Review | 4 |
| CHAPTER THREE | |
| Research Design | 8 |
| CHAPTER FOUR | |
| Methodology of Analysis | 11 |
| CHAPTER FIVE | |
| Results | 15 |
| CHAPTER SIX | |
| Conclusion | 26 |
| REFERENCES | 28 |
| APPENDIX: PROPENSITY SCORE MATCHING | 31 |

CHAPTER ONE

INTRODUCTION

In the fall of 2013, a group of graduate students at the Bush School of Government and Public Service at Texas A&M University were approached to design and implement a survey to gauge the effectiveness of a youth employment program in the Democratic Republic of the Congo (DRC). At the fundamental level, it was necessary to know if the program was helping the children find employment and if that employment was increasing the incomes earned by participants. Vocational programs, such as the one described in this paper, are not uncommon and have been shown to be quite effective in setting around the world. For the first time though, an analysis of this type of program was implemented in the unique setting of Butembo,

DRC. Butembo, as will be described later, is a unique hub of peace located in an area that has been ravaged by civil conflict in recent decades.

The Texas A&M Evaluation Team suggests narrowing the scope of the SGR policy proposal by eliminating the operational reserve and only creating an emergency reserve.

In this particular context, the conflict affects youth in the area through displacement, loss of education, as well as through recruitment into the conflict or other activities that support rebel groups. The research within this paper uses survey instruments in an effort to determine the level of effectiveness of the vocational program in the region

that focuses on at risk and vulnerable youth. In this paper, our research team will describe the setting of both conflict in DRC and its effects on institutions and programs as well as the setting of this analysis. The team hypothesized that the CEFADES program would both increase rates of employment as well as income earned for participants. In addition, information on the program, CEFADES, will be given along research design and the analysis of our findings.

Butembo

Businessmen, rebel leaders, and nations have waged wars over North Kivu province's mineral wealth for decades. In the wake of fighting, the residents of North Kivu have inherited derelict or non-existent public infrastructure and institutions. In the midst of violent conflict, the city of Butembo in North Kivu province has emerged as a refuge with substantially less conflict than

the region. The provincial capital of North Kivu, Butembo, is the only city in North Kivu whose schools were not looted during war (IRIN 2004).

Butembo is located at a high-altitude in a tropical forest. To the east of the city lies the Albertine Rift Valley and Virunga National Park. To the west of Butembo lies small farming and mining villages. Dirt roads and a small 770-meter runway provide access to Butembo (Hradecky 2012).

Butembo's relative safety is often attributed to multiple reasons including a majority ethnic group composition, Nande, and the city's trade based economy that functions in close proximity from the extraction of tin, gold, coltan, diamonds, and other valuable minerals which are susceptible to exploitation by use of force (Raeymaekers 2007 4).

The general security in the city has contributed to growth from small town of the early twentieth century to the present status as North Kivu's second largest town with an estimated population of at least 600,000. Currently, a small detachment of the 21,189 total uniformed United Nations Organization Stabilization Mission in the Democratic Republic of the Congo (MONUSCO) personnel and a regiment of the Congolese military, Forces Armées de la République Démocratique du Congo (FARDC), based in Butembo provide an additional level of security to the city that is uncommon in a majority of North Kivu (UN 2014).

Security has not translated directly into a prosperous economy. Butembo has decrepit public infrastructure that lacks central power generation, a functioning post office or a single paved road. It has allowed valuable institutions like Université Catholique du Graben, a privately funded university, to provide quality secondary education to 1200 college students and 40 PhD students per year (UCG 2013).

The security the city provides is far from complete. Theft, kidnapping, assault and murder remain a pressing concern that discourages many NGOs from establishing a presence on the ground in the region. Lack of opportunity also remains a major concern and a motivating factor for a large but undocumented number of people that have turned to the streets or rebel groups (Raeymaekers 2010 21-22).

CEFADES

CEFADES stands for *Le Centre d'Animation et de Formation pour un Développement Solidaire* (The Center for the Animation and the Formation of Solitary Development). The CEFADDES program began at the Université Catholique du Graben in Butembo, DR Congo in 1995. The program focuses on what the university calls 'vulnerable' youths in the area. The primary goals of the program are to ensure the rights of vulnerable children and provide the physiological and educational support necessary participants to become productive members of society. Since 2009, five hundred and ninety four children have gone through the program. Although the program does not specifically recruit former child combatants, reports published by the CEFADDES indicate that one hundred and eighty eight participants during the program's history have been former child combatants.

Primary funding for the program comes from a Belgian NGO, Vlaams Internationaal Centrum (VIC, for short). Recruitment is conducted among the local population by staff at the center and by word of mouth in the community. The program, which targets the ‘street children,’ works to ensure that these children will no longer be forced to live on the streets by the end of the program. The program not only focuses on employment but also on the reintegration of these children into their families if and when possible. Oftentimes these children are not at home due to large family size or a lack of resources (e.g. food) for them within the home environment.

According to CEFADES’s resident psychologist Mr. Raymond Kasomia, lack of employment, due to limited access to land and consequent malnutrition, is the leading cause of children leaving their homes to join local Mai Mai rebel groups. Because they are known to eat well, the prospect for working for the Mai Mai is enticing to children who would otherwise go hungry. However, the Mai Mai provide few marketable skills for onward employment. Food is mainly acquired through theft and extortion. The majority of children entering the CEFADES program have psychological damage from combat and or sexual assault experiences.

Many children in the program are referred to in the area as ‘street kids;’ the term captures any youth who may be orphaned, without financial support, formal education, or employment.

In Butembo, a negative stigma is associated with all vulnerable youth, but Mr. Kasomia believes that the psychological and vocational support CEFADES provides eases the transition of vulnerable youth back into society and allows them to become productive members of society.

The CEFADES program incorporates both literacy aspects as well as job training for participants. Typically, a cohort of 50-60 children, both boys and girls, receives daily literacy and arithmetic lessons in addition to the children’s chosen areas of vocational training. The students follow a daily schedule with lessons provided throughout the day over a multi-month period. During a typical program period, students can choose to specialize in an area such as carpentry, masonry, culinary skills, hair styling, dressmaking, auto mechanical repairs, and beekeeping.

Another unique aspect of the CEFADES program is the staff’s ability to adapt the vocational training to fill the local demand for particular skills. For example, when a business owner within the community requires a trained worker, he or she can approach CEFADES and offer to train the students and/or offer to provide future students with apprenticeships. Allowing students to work directly with employers often translates into a full time jobs and real world skills; it also avoids flooding the market with any specific type of skilled labor.

CHAPTER TWO

LITERATURE REVIEW

Amnesty International reported that educational and vocational training programs tailored to child soldiers have been slow to materialize. However, some communities have reached a level of progress in this matter (Amnesty International 2008, pp. 14-15). Aside from the lack of vocational training programs, the lack of research also poses a major challenge. Sommers finds that a significant weakness in the literature regarding post-conflict vocational programs is the scarcity of program evaluations as well as the lack of proven techniques that could positively impact youth (Sommers 2006, pp. 24). Comparing current policy in Uganda where funding has been focused on broad-base reintegration programs, Blattman and Annan suggest that more targeted and specialized psychosocial services and educational programming are probably needed for those youth exposed to violence, whether abducted or not (Blattman and Annan 2010, pp. 895). Although some rebel forces claim to educate children that join their ranks, we cannot safely determine the opportunity costs inflicted on children as actors in these groups and what alternative opportunities they may have pursued otherwise (Jo 2013, pp. 114).

Opportunity costs are also inflicted on parents. The cost of primary and secondary education presents a major challenge to families and minimizes opportunities of the poor youth. Although primary education is free and mandatory in DRC, payment of school fees (teachers, buildings, insurance, etc.) heavily relies on parents (Weijjs, Hilhorst and Ferf 2012, pp. 31). In the case of non-payment, students can be denied education.

Today, three out of four students attend primary schools in DRC, while only 32 per cent attend secondary with near parity for boys and girls – though around only half the women aged 15 to 24 are literate.

Some evidence suggests that Butembo youth seek to modernize. When interviewing displaced youth in Butembo, Raeymaekers noted a general trend in African countries emerging from conflict: He observed a steady urbanization and the youth's refusal of "traditional" agricultural lifestyles, along with an embrace of more urban, modern lives

(Raeymaekers 2011, pp. 26). Moreover, Richards and Chauveau suggest that in regions of West Africa ridden by armed groups, cutting off the supply of recruits by offering more suitable employment opportunities attractive to these youth would contribute to peace and stability in the region (Richards and Chauveau 2007, pp. 7). Also, they contest that an important element

to conflict is “hyper-mobility of the impoverished rural youth:” their inability to settle and forge professional and social attachments in rural and urban settings (Richards and Chauveau 2007, pp. 7).

The World Bank also weighs in on the importance of employment and entrepreneurship as a result of education in DRC:

“Post-conflict settings pose specific challenges for the youth (e.g., recently disarmed idle men and displaced young men) as these settings have prominently young populations, many of whom have been deprived of education, have grown up in violent societies, and often have been combatants themselves. Employment and the creation of jobs for young people should therefore form a key component of any peace building processes” (World Bank 2009).

Child recruitment also presents a major problem to communities seeking development through the education of their youth. More than a dozen of modern states have used child soldiers to fill the ranks of government and rebel forces, including the Democratic Republic of the Congo. A closer look at these states shows that among child soldiers, about 70 per cent of child combatants, of whom 40 per cent are girls, are found in the ranks of non-state factions (Gazagne 2009, pp. 239). The Coalition to Stop the Use of Child Soldiers estimates the number of child soldiers in Congo at 7,000 enlisted in government and armed groups including foreign forces operating in eastern Congo. They are used as combatants, porters, guards, and sexual slaves (Coalition to Stop the Use of Child Soldiers 2008, 106-112). Numbers of children recruited into either faction is determined by the intensity of the conflict. Amnesty International reports that at the height of the conflict, around 30,000 children were estimated to be serving in either faction at any level. The majority of these children have been released to UNICEF or local NGOs (Amnesty International 2008, pp 14-15). Additionally, the report mentions that progress in releasing children has been seriously undermined in North Kivu.

Given that many armed factions converge in the Kivus, causing violent clashes that terrorize its local communities, schoolboys have begun to take up their communities’ defense by joining the ranks of local Mai Mai militias (Schulman 2013). Nonetheless, the situation has not improved; many inhabitants complain that it has actually worsened due to recurring clashes between these factions.

Blattman and Annan challenge the dominant view held by some media channels and international leaders that conflict youth are “traumatized, violent, social pariahs” (Blattman and Annan 2010, pp. 882). They conclude that there is no clear evidence suggesting that youth engage in violence after conflict; the evidence points out instead to the negative economic impact inflicted on societies as a result of the time lost in conflict instead of time invested in education and/or training. However, this economic cost is largely a function of the opportunity cost, especially in educational and economic opportunities for women (Annan, et al. 2011, pp. 25-26). This evidence also suggests that women are more resilient than men when dealing with post-conflict trauma. In Uganda, victims of violence show very small systematic difference in social participation and aggressive behavior compared to their peers; however, victims are more likely to vote and take on leadership roles (Blattman 2009, pp. 244).

Despite their resiliency, psychological treatment to children exposed to violence may help them cope with the trauma and ease their return to a normal lifestyle. After interviewing local staff at a vocational training program in Eastern Congo, Johannessen and Holgersen discovered that informants experienced that the former child soldiers required help transforming into normal civilians who participate proactively in their societies (Johannessen and Holgersen 2013, pp. 10). Yet, evidence confirms that although exposure to violence leads to psychosocial problems and emotional distress, a serious expression of these symptoms persists only in a minority (Annan, et al. 2011, pp. 26). Support rather than rejection from families is the most common social norm.

Conflict also leads to a major weakening of state institutions. Milliken and Krause tell us that when the state becomes fragile, the government no longer is capable of providing social services and human suffering becomes widespread (Milliken and Krause 2002, pp. 764). However, particular to conflict zones, a hybrid political order emerge where education is being negotiated by state and non-state actors, namely religious networks and NGOs; ultimately, education's economic survival is supported by parents as the state loses its regulatory power. In this decentralized model of education, DRC communities would benefit more from local-level arrangements between state and non-state actors (De Herdt, Titeca and Wagemakers 2010, pp. 20). The fact that the state has lost part of its regulatory power in education does not mean that the education sector is ungoverned; instead, the state's administrative framework is being redefined as a result of this state and non-state negotiation (Titeca, Kristof and De Herdt 2011). As Hagmann and Peclard noted, the pseudo state that arises from the absence of the central government comes about through "negotiation, contestation, and bricolage" between state and non-state actors involved in service provision (Hagmann and Peclard 2010).

The Catholic Church represents an important educational institution in DRC. Confessional schools represent a majority of almost 70 percent of which the catholic denomination educates approximately 50 percent of students (Weijs, Hilhorst and Ferf 2012, pp. 38).

Armed groups that occupy the region also take part of the institutional framework of Butembo. On one hand, rebels had allied themselves to several commercial ventures to protect their base against other violent contenders (Raeymaekers 2007, pp. 112). On the other hand, rebel leadership had to build relationships with non-militant clandestine networks like Butembo trading network, the member of which some grew to become "village lords" (Raeymaekers 2007). This interconnectedness can be seen beyond the relationship between rebels and economic elites. Border towns, like Butembo, are renowned for the fluidity with which inhabitants shift roles from government worker, to smuggler, to armed rebel (Raeymaekers 2009, pp. 61).

Interconnectedness is also described in the social networks and informal economies in Nigeria, where Meagher demonstrated how trade, manufacturing, and wars give rise to particular social dynamics embedded in community ethnic, class, or gender relations (Meagher 2010, pp. 16). She explains, "The key issue is not the boundaries between the official and the unofficial spheres, but the distinctive organizational dynamics and power relations that characterize non-formal forms of order." In other words, informality is conceptualized not to be the opposite of formal, but an alternative terrain of regulation operating outside the framework of the State (Kabamba 2012, pp. 672).

Particularly to Butembo, Kabamba concludes that because the town was originally neglected by the colonial state (as well as the post-colonial), The Nande directed proceeds from gold mining toward the town's infrastructural development and elite foundation (Kabamba 2012, pp. 682).

CHAPTER THREE

RESEARCH DESIGN

The research design of this evaluation is meant to determine the impact of the CEFADES training program on the economic livelihood of its participants. A perfect impact evaluation would include randomized assignment into the treatment, a pre-treatment survey of participants and a control group made up of those who qualified for the treatment but were not admitted, and surveys conducted after the treatment of the same individuals over several years. However, there were a number of reasons why such an approach could not be taken here. Most notably, the existing program does not have random treatment selection, and there was only one opportunity to conduct the surveys and they had to be conducted post treatment.

To complete an accurate research evaluation, the research design had to mitigate the potential selection bias the selection process would have on the data. A solid understanding of CEFADES' recruitment methods would be required and additional information about the lives of the participants and non-participants would be needed to compare the two groups. In addition, the limited time frame of a week to conduct as many surveys as possible required good preparation and solid survey design. To ensure success, the evaluation included a team member already in the Democratic Republic of the Congo (DRC). This team member's responsibility included building relationships with local institutions, providing local feedback and perspectives of the project, preparing the locations and training enumerators for our evaluations, and conducting pre-surveys to better inform the phrasing and content of our survey questions. The rest of the team members based in the US were tasked with designing and conducting the surveys during the one-week journey to Butembo and analyzing the results.

The US team's first task was to design the pre-surveys. Common economic indicators were included, such as monthly income or working status, as well as background information of the respondent. This information included where they were born, family information, gender, and other factors that could potentially affect their income, their selection into treatment, or both. Once the pre-surveys were designed, they were sent to the DRC team member to translate and conduct.

Pre-Surveys

Two UCG Students, CEFADES staff, and a Texas A&M team member (ConDev DRC Program Coordinator Gavin Finnegan) administered four rounds of pre-surveys to seven former participants of the CEFADES program. CEFADES staff selected the seven respondents.

In order to provide a representative sample of all former CEFADES participants, the age, sex, and training of the respondents were varied. The two UCG student enumerators were designated as student body representatives who later organized and assisted in training forty-two student enumerators.

Survey Improvement and Training

In order to improve the survey, at the end of each pre-survey the results and the enumerator notes were compiled and sent to the US team so they could revise the survey. For example, during the pre-survey we discovered that respondents and enumerators were having trouble understanding how to respond to a Likert scale due to their unfamiliarity with the format. To address the challenge, the Texas A&M team expanded the questions that used the Likert scale into questions that employed a binary response.

When the survey was finalized all the Congolese enumerators were gathered together for survey administration, ethics and organizational training. This was conducted for a number of reasons, but it is important to note that the training greatly increased the enumerators' efficiency in administering the survey because they were familiar with the content, did not write comments in the margins, and asked for clarification before the actual survey.

In order to obtain a sufficient sample size of former participants, four local stations delivered radio advertisements, fifteen churches made church announcements, and five CEFADES employees spread the word in the local communities. A CEFADES staff member also selected the day the surveys would be administered: Congo's Mother's Day (March 8th). The staff member realized that most people would not be working on Mother's Day and that mothers would encourage their children to take part in our survey.

Final Survey Administration

With the final survey format completed, the US team traveled to Butembo to conduct the final surveys with local CEFADES staff and UCG student enumerators. The treatment surveys were conducted in a building at the CEFADES facility. As CEFADES has limited information concerning the current residences of former participants as well as a lack of time, the participants had to be invited to the CEFADES facility. To ensure that the former participants would be willing to travel to the survey, we reimbursed their travel and offered food as an incentive. This action could, potentially, create a selection bias in our results because those former participants who were the most in need of food or money were the most likely to attend the surveys. However, as this selection bias would underestimate our results (as the participants of the treatment survey would be those treated who were worse off), this was not considered a major issue.

At these surveys, both participants who had not yet completed the training as well as participants who had completed the training were surveyed. Current and former participants were led into the CEFADES building and then directed to a table with an enumerator. Once survey was conducted, the participant was reimbursed for their travel costs and food was provided. Through these surveys, we collected results for 49 current participants in the program and 330 former participants of the program for a total of 379 surveys.

The control surveys were conducted in a very different manner. Enumerators were sent out to different areas of Butembo under instruction to survey random youths they encountered. As the treatment group contains both men and women, the enumerators were instructed to speak to both genders. In addition, as the treatment group's age ranged from 10 to 25, they were also instructed to interview youths that appeared around that age. After three days, the enumerators returned the completed surveys. Respondents themselves did not receive any monetary incentives. Through this method, results from 795 local youths for our control were received.

CHAPTER FOUR

METHODOLOGY OF ANALYSIS

As the surveys are post-treatment surveys with non-randomized selection into treatment, the main focus of the methodology was to minimize the effects of selection bias and to determine the impact of the project on the treated using these control and treatment groups. The first step in the process was to analyze the selection and recruiting methods of the CEFADES program to determine what potential sources of selection bias occur and how they may affect our results.

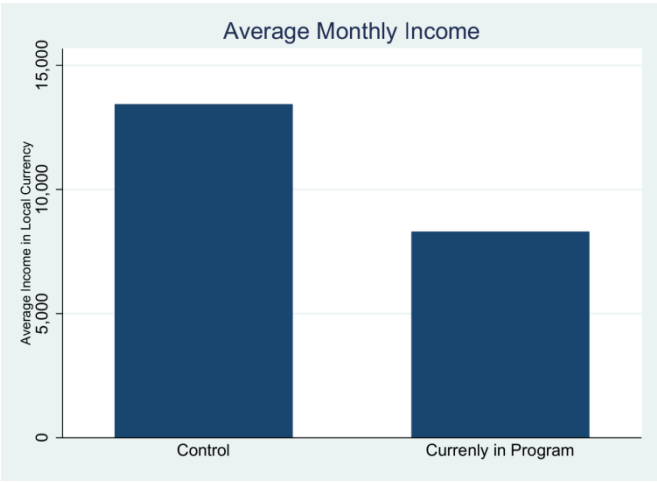
CEFADES recruits participants in three ways: the psychologist on their staff actively looks around Butembo for youths who are worse off than others and offer recruitment into the program; youths are brought to the program by government workers and NGOs who believe the program would benefit the youth; and the project is advertised over the radio and in churches.

Most youths enter the program by being brought by an NGO or government. As these groups would be most likely to send over a youth who they recognize as needing the program, it is likely that the selection bias from these sources is underestimating the impact of the program in the results. The psychologist can also say this of the recruitment of youths, as he is specifically targeting youths in the neighborhoods that are especially poor and vulnerable.

This downward selection bias from these sources is supported by the data. Current participants in the program have been selected into treatment but have yet to feel the impact of the treatment. As such, they provide a sampling of what the treatment group was like upon entering the program and can help us better understand what kind of selection bias CEFADES' selection process provides.

Looking at Figure 1, the control group's income is substantially higher than the group currently in the program, showing that those who are entering the CEFADES program have less income than our control. This selection bias is, therefore, underestimating the impact of the program in the results.

Figure 1: Average Monthly Income of Control and In-Program Respondents



The other selection method used by CEFADES is advertising the program on the radio and through local churches. While it has already been shown that participants entering the CEFADES program have a lower income as a whole, the fact that CEFADES is recruiting from churches has an additional effect on participants' income, which underestimates the impact of the program in the results.

Figure 2: Average Monthly Income of Church Goers and Non Church Goers Among Control

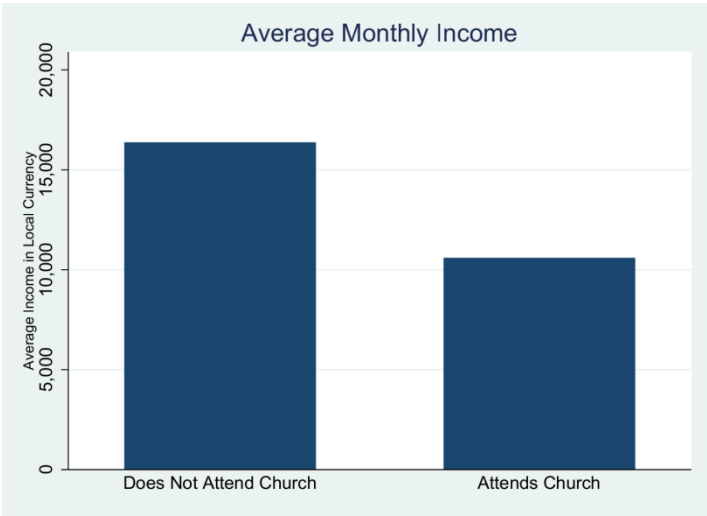
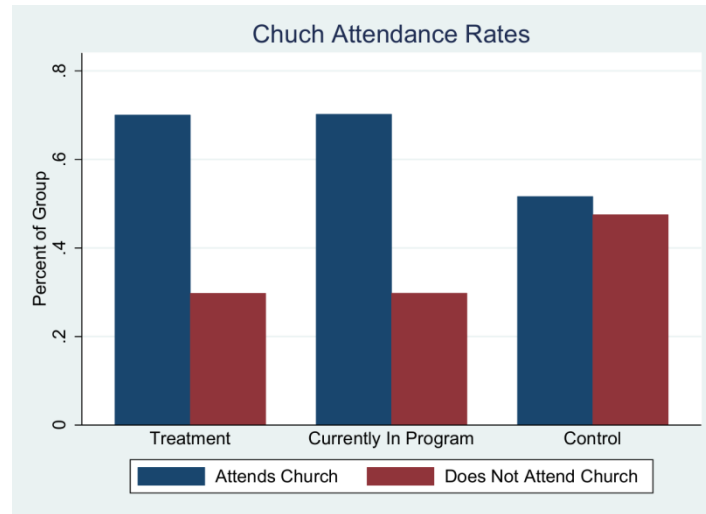


Figure 1 shows that, using data only from our control, the income of respondents who attend church is less than those who do not attend church. Figure 2 demonstrates that the percentage of the treatment group and those currently in the program are higher than the percentage in the control. As such, CEFADES recruits many participants from churches; and people in Butembo who attend church tend to be poorer, which means that CEFADES participants are poorer than the average person in Butembo and, therefore, means the results are underestimating the impact of the program.

Figure 3: Church Attendance Rates Among Treated, Control, and Currently In Program Respondents



Overall, the impact of CEFADES' selection process is causing our results to underestimate the impact of the program. Regarding our research question on the impact of the program of the economic well being of respondents, we propose our first and second hypotheses:

Hypothesis I: Respondents who received trainings in the CEFADES program will have a higher chance to get employed compared to similar groups who did not.

Hypothesis II: Respondents who received trainings in the CEFADES program will earn a higher income compared to similar groups who did not.

To determine the impact of the program on working status, a probit regression was used, with whether or not they are working as the dependent variable. This equation is:

$$Pr(Employed) = \beta_0 + \beta_1 Treatment + \beta_2 x + \mu$$

In order to test our second hypothesis, OLS regressions are used with monthly income as the dependent variable. The equation is shown as below (bold x stands for the vector combining all control variables):

$$\ln(income) = \beta_0 + \beta_1 Treatment + \beta_2 x + \mu$$

As Butembo is in a high-conflict area with a large child soldier population, considerable interest has been shown concerning how this program affects the livelihoods of former child soldiers. As the program targets at-risk youth, and as a large portion of the at-risk youth population in Butembo consists of former child soldiers, this question is particularly relevant in determining the impact of the CEFADES program. As former child soldiers tend to have less formal education as well as less engagement in the local communities to seek employment opportunities, we speculate that the marginal improving effect of the CEFADES program would

be higher for them compared to children who are not former child soldiers. This is reflected in our third hypothesis:

Hypothesis III: The impact of the CEFADES program on the economic well being of respondents varies across child soldier and non-child soldier groups; the improving effects of the program for child soldiers are higher than that for non-child soldiers.

In order to determine this separate impact, child soldier status was also collected as a dummy variable from the respondents in the control and treatment groups. Using this information, a Difference-in-Difference regression using an interaction variable for treatment status and child soldier status was also run to see if the program has any additional impact on the child soldier population in particular. These equations are as follows:

$$Pr(Employed) = \beta_0 + \beta_1 Treatment + \beta_2 chilsoldier + \beta_3 interaction + \beta_4 x + \mu$$

$$\ln(income) = \beta_0 + \beta_1 Treatment + \beta_2 chilsoldier + \beta_3 interaction + \beta_4 x + \mu$$

CHAPTER FIVE

RESULTS

There are two main outcome variables that are being used to determine the impact of the program on the economic well being of the participants. The first is a dummy variable for the current working status of the respondent. The second is that income that respondent has earned in the last 30 days.

Figure 4 shows the percent of the treatment population who are currently working and not working and the percent of the control population who are currently working and not working. The difference in the treatment population between the percent that are working and the percent that are not working is much greater than the same difference in the control population. In other words, there is a greater portion of the treatment group who are working than the control group.

Figure 4: Working Status of Treatment and Control Groups

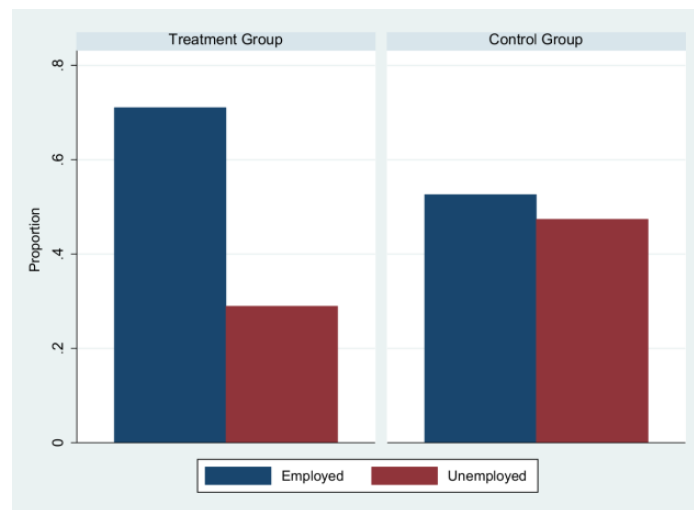
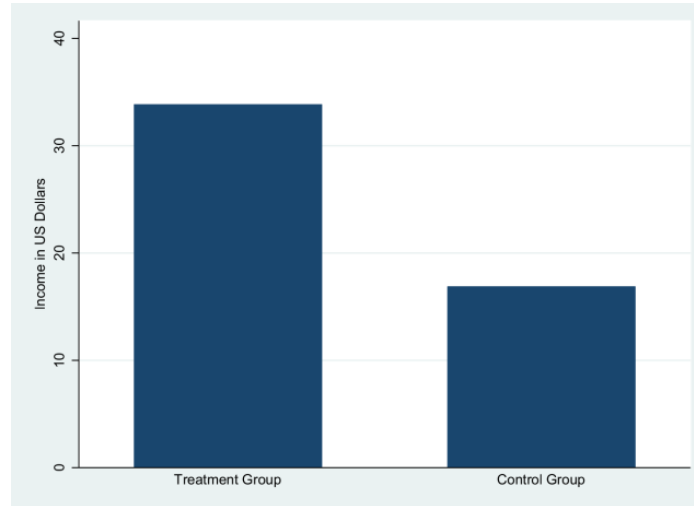


Figure 5 shows the average income in US dollars for the treatment and control groups. The treatment group is earning over \$30 a month (a little more than \$1 a day) while the control group is earning much closer to \$15 a month (or 50 cents a day). This graph not only demonstrates the absolute poverty of the region, but it also shows that the treatment group is earning twice the money of the control group.

Figure 5: Average Income of the Treatment and Control Groups



There are several other variables that can affect the working status and income of an individual. Several regressions were run to account for these other factors. Probit regressions were run with a dummy variable for working status was used as the dependent variable and treatment was used as the main independent variable. Control variables were added for the respondents' age, gender, and years of education as research has shown that these play a direct role in income and working status. Additional control variables were added for whether or not the respondent was a former child soldier, has any children, or was an orphan in an attempt to account for the family support structure of the child soldier. As it was demonstrated that attending church both impacts the selection into treatment as well as the respondent's income, it too was included as a control variable.

Table I: Probit Regressions Demonstrating Treatment's Impact on Working Status
Dependent Variable: Working Status

| | I | II | III |
|--------------------|---------------------|---------------------|---------------------|
| Treated | 0.477*** (0.093) | 0.389*** (0.103) | 0.417*** (0.106) |
| Age | | 0.050*** (0.019) | 0.050*** (0.019) |
| Male | | 0.297*** (0.094) | 0.274*** (0.096) |
| Child Soldier | | -0.087 (0.143) | -0.089 (0.143) |
| Orphan | | 0.065 (0.098) | 0.074 (0.099) |
| Years of Education | | -0.001 (0.014) | 0.001 (0.014) |
| Have Children | | 0.400*** (0.135) | 0.387*** (0.136) |
| Attend Church | | | -0.116 (0.092) |

| | | | |
|-----------------------|------------------|----------------------|----------------------|
| Constant | 0.083 (0.050) | -1.079*** (0.322) | -1.022*** (0.326) |
| N | 913 | 871 | 860 |
| Pseudo R ² | 0.0219 | 0.0513 | 0.0527 |

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

**Table 2: OLS Regressions Demonstrating
Treatment's Impact on Income**
Dependent Variable: Log of Monthly Income

| | I | II | III | IV |
|--------------------|---------------------|---------------------|----------------------|----------------------|
| Treated | 1.164*** (0.298) | 0.897*** (0.327) | 1.109*** (0.339) | 0.360 (0.333) |
| Age | | 0.248*** (0.054) | 0.247*** (0.055) | 0.218*** (0.055) |
| Male | | 1.118*** (0.314) | 0.919*** (0.317) | 0.717** (0.306) |
| Child Soldier | | -0.160 (0.451) | -0.132 (0.448) | -0.030 (0.416) |
| Orphan | | -0.081 (0.306) | -0.045 (0.308) | -0.119 (0.289) |
| Years of Education | | 0.025 (0.045) | 0.031 (0.046) | 0.032 (0.044) |
| Have Children | | 0.818* (0.421) | 0.770* (0.426) | 0.304 (0.392) |
| Attend Church | | | -0.865*** (0.295) | -0.853*** (0.275) |
| Cooking | | | | -2.444*** (0.371) |
| Hairdressing | | | | 1.474*** (0.403) |
| Construction | | | | -0.078 (0.537) |
| Sewing | | | | 1.162 (1.046) |
| Mechanic | | | | 1.419*** (0.460) |
| Carpentry | | | | 0.900 (2.163) |
| Farmer | | | | 0.904 (0.575) |
| Constant | 6.090*** (0.174) | 0.716 (0.944) | 1.247 (0.948) | 3.105*** (0.981) |
| N | 922 | 878 | 866 | 866 |
| R-squared | 0.016 | 0.070 | 0.078 | 0.200 |

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The results of the probit regressions are shown on Table 1. Here the treatment is shown to have both a positive and statistically significant impact on the working status of the individual. The coefficient of this regression suggests that the treatment increases the likelihood of working by roughly 40 percent. Our first hypothesis is confirmed here.

To determine how the treatment affects income, OLS regressions were ran where the natural log of monthly income was used as the dependent variable to ease interpretation of the results. The main independent variable was again treatment, and the same controls were used.

In regression IV of Table 2, controls were added for the careers of the respondents, with a miscellaneous category of other careers left out to avoid multicollinearity. When controls are added for different careers, the treatment coefficient loses its statistical significance. This implies that the impact that the project has on individuals' incomes is related more to their careers and less on the treatment itself.

Looking at Table 6 (below), interaction terms between the treatment and careers were added to determine what impact the program has on an individual career. With the exception of the cooking interaction variable, neither the interaction variables nor the treatment variable have statistically significant coefficients. This means that a hairdresser who entered the program has the same income as a hairdresser who did not enter the program. The higher average income of the treated group is likely the result of their higher rate of work. In other words, the impact of the program lies in its ability to provide the participants the skills needed to find a job.

To determine the project's impact on child soldiers, another probit regression was run with working status as the dependent variable and another OLS regression with the log of monthly income as the dependent variable. An interaction term was added between treatment and child soldier to represent any additional impact the treatment has on child soldiers.

Table 3 shows the probit regressions demonstrating the treatment's impact on child soldiers working status. The interaction term is statistically significant when we include all the controls except attending church, and even then, the coefficient for our interaction term changes by only a small amount. Overall, the regressions suggest that the program does have an impact on child soldiers' working status in addition to the impact it has on the treatment group in general. The interaction term is negative, however, and is nearly equal to the impact of being in treatment. This implies that the treatment has no overall impact on child soldiers. The child soldier coefficient, however, has a positive coefficient. Implying that child soldiers start off working at a higher rate than non-child soldiers. This contradicts much of the literature, which implies that child soldiers have a more difficult time reintegrating into society.

Table 3: OLS Regressions Demonstrating Treatment's Impact on Working Status with Child Soldier Interaction Term

Dependent Variable: Working Status

| | I | II | III |
|-----------------------|---------------------|----------------------|----------------------|
| Treated | 0.541*** (0.102) | 0.466*** (0.114) | 0.488*** (0.116) |
| Child Soldier | 0.349** (0.174) | 0.125 (0.182) | 0.114 (0.182) |
| Interaction | -0.545** (0.261) | -0.469* (0.278) | -0.446 (0.278) |
| Age | | 0.051*** (0.019) | 0.051*** (0.019) |
| Male | | 0.284*** (0.095) | 0.264*** (0.097) |
| Orphan | | 0.064 (0.098) | 0.071 (0.099) |
| Years of Education | | 0.002 (0.014) | 0.003 (0.014) |
| Have Children | | 0.388*** (0.135) | 0.377*** (0.136) |
| Attend Church | | | -0.103 (0.092) |
| Constant | 0.052 (0.053) | -1.117*** (0.321) | -1.062*** (0.326) |
| N | 910 | 871 | 860 |
| Pseudo R ² | 0.0253 | 0.0538 | 0.0550 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4: OLS Regressions Demonstrating Treatment's Impact on Income with Child Soldier Interaction Term
Dependent Variable: Log of Monthly Income

| | I | II | III |
|--------------------|---------------------|---------------------|----------------------|
| Treated | 1.025*** (0.327) | 0.756** (0.356) | 0.919** (0.366) |
| Child Soldier | 0.281 (0.658) | -0.560 (0.653) | -0.689 (0.649) |
| Interaction | 0.631 (0.875) | 0.870 (0.874) | 1.217 (0.867) |
| Age | | 0.248*** (0.055) | 0.246*** (0.055) |
| Male | | 1.146*** (0.314) | 0.949*** (0.316) |
| Orphan | | -0.078 (0.306) | -0.037 (0.308) |
| Years of Education | | 0.020 (0.046) | 0.024 (0.046) |
| Have Children | | 0.835** (0.422) | 0.792* (0.426) |
| Attend Church | | | -0.899*** (0.294) |
| Constant | 6.082*** (0.180) | 0.780 (0.947) | 1.354 (0.950) |
| N | 918 | 878 | 866 |
| R-squared | 0.019 | 0.071 | 0.080 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5: Quartile Regressions Demonstrating the Impact of the Treatment on Child Soldiers' Income by Quartile
Dependent Variable: Log of Monthly Income

| | (25%) I | (50%) II | (75%) III | (25%) IV | (50%) V | (75%) VI |
|-----------------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|
| Treated | 4.615*** (0.348) | 1.120*** (0.332) | 0.357*** (0.127) | 1.677*** (0.570) | 0.663*** (0.210) | 0.460*** (0.156) |
| Child Soldier | 0.000 (0.322) | 1.204** (0.569) | 1.050*** (0.225) | -1.759** (0.864) | 0.441 (0.347) | 0.292 (0.263) |
| Interaction | 2.986*** (0.780) | -1.182 (0.857) | -0.490 (0.330) | 4.224*** (1.298) | -0.658 (0.506) | -0.113 (0.383) |
| Age | | | | 0.485*** (0.082) | 0.162*** (0.034) | 0.065** (0.027) |
| Male | | | | 1.113** (0.487) | 0.851*** (0.185) | 0.449*** (0.142) |
| Orphan | | | | -0.215 (0.474) | 0.015 (0.184) | 0.104 (0.139) |
| Years of Education | | | | -0.054 (0.073) | 0.049* (0.026) | 0.036* (0.019) |
| Have Children | | | | 0.215 (0.640) | 1.088*** (0.239) | 0.774*** (0.190) |
| Attend Church | | | | -1.167** (0.454) | -0.553*** (0.174) | -0.421*** (0.132) |
| Constant | -0.000 (0.105) | 8.007*** (0.182) | 9.547*** (0.071) | -6.571*** (1.403) | 4.381*** (0.598) | 7.949*** (0.464) |
| N | 918 | 918 | 918 | 866 | 866 | 866 |
| Pseudo R ² | 0.029 | 0.008 | 0.009 | 0.056 | 0.052 | 0.041 |

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4 shows the OLS regressions demonstrating the treatment's impact on child soldiers' income. In all three regressions, the coefficient estimates for the interaction term are statistically insignificant. Table 7 looks at only the treatment group and consists of OLS regressions where main independent variable is the treated groups child soldier status. There as well, the impact of the treatment on child soldier's income is statistically insignificant. In other words, we cannot say that the program has any additional benefit to child soldiers' income beyond that received by the treatment group in general. It seems that, by now, our third hypothesis is rejected.

However, when a quartile regression is run with the same variables, as in Table 5, we do get a statistically significant result. This statistically significant result occurs in the lowest 25% quartile, is very statistically significant, and suggests that child soldiers' income in this lower quartile increases by over 400%. A possible explanation to the fact that our third hypothesis is being rejected could be that child soldiers who are in the bottom 25% quartile likely represent those child soldiers who have had the greatest difficulty readjusting to society and have missed more years of schooling.

**Table 6: OLS Regressions Demonstrating Treatment's Impact on Income
with Career Interaction Terms**

Dependent Variable: Log of Monthly Income

| | I | II | III |
|-------------------|----------------------|----------------------|----------------------|
| Treated | -0.884 (0.630) | -0.617 (0.620) | -0.462 (0.628) |
| Age | | 0.218*** (0.0536) | 0.221*** (0.0540) |
| Male | | 0.856*** (0.297) | 0.687** (0.303) |
| Child Soldier | | -0.114 (0.408) | -0.104 (0.410) |
| Orphan | | -0.231 (0.285) | -0.248 (0.288) |
| Have Children | | 0.288 (0.384) | 0.245 (0.387) |
| Attend Church | | | -0.785*** (0.275) |
| Cooking | -3.227*** (0.411) | -2.919*** (0.409) | -2.899*** (0.411) |
| Cooking Int. | 2.365*** (0.803) | 1.766** (0.795) | 1.810** (0.801) |
| Hairdressing | 1.276** (0.619) | 1.337** (0.607) | 1.218** (0.613) |
| Hairdressing Int. | 1.085 (1.308) | 0.782 (1.312) | 0.974 (1.315) |
| Construction | 0.652 (0.818) | 0.216 (0.807) | 0.149 (0.846) |
| Construction Int. | 0.533 (1.075) | 0.115 (1.058) | 0.191 (1.091) |
| Sewing | 2.233 (2.020) | 2.401 (1.977) | 2.012 (1.981) |
| Sewing Int. | -1.561 (2.741) | -1.422 (2.685) | -1.203 (2.684) |
| Mechanic | 1.075 (0.714) | 1.396* (0.721) | 1.407* (0.722) |
| Mechanic Int. | 0.732 (1.144) | -0.00276 (1.128) | 0.0450 (1.130) |
| Carpentry | 2.246 (2.834) | 2.463 (2.782) | 2.934 (2.782) |
| Carpentry Int. | -2.557 (3.251) | -2.517 (3.243) | -3.082 (3.247) |
| Farmer | -0.542 (1.372) | 0.388 (1.418) | 0.601 (1.418) |
| Farmer Int. | 1.554 (1.627) | 1.055 (1.663) | 0.902 (1.663) |
| Constant | 7.658*** (0.352) | 3.115*** (1.029) | 3.553*** (1.039) |
| N | 922 | 911 | 898 |
| R-squared | 0.167 | 0.201 | 0.205 |

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

As such, the increased likelihood of finding a job benefits the child soldiers in the bottom quartile more. Having started off at a lower point, they have a bigger boost in human capital. This explains our results from Table 3, where we saw that overall, child soldiers were receiving no benefit from the program, while starting off more likely to be working. The implication is that different subsets of the child soldier treatment population might be affected by the treatment in different ways and would be a possible area of future research.

Table 7: OLS Regressions Demonstrating Treatment's Impact on Income for Only Child Soldiers in Treatment
Dependent Variable: Log of Monthly Income

| | I | II | III |
|--------------------|---------------------|---------------------|---------------------|
| Child Soldier | 0.913 (0.577) | 0.362 (0.594) | 0.490 (0.589) |
| Age | | 0.287*** (0.079) | 0.275*** (0.080) |
| Male | | 1.339** (0.587) | 1.267** (0.600) |
| Orphan | | 0.216 (0.493) | 0.274 (0.496) |
| Years of Education | | 0.022 (0.086) | 0.017 (0.087) |
| Have Children | | -0.265 (0.742) | -0.072 (0.745) |
| Attend Church | | | 0.090 (0.545) |
| Constant | 7.107*** (0.274) | 0.696 (1.460) | 0.868 (1.485) |
| N | 297 | 271 | 269 |
| R-squared | 0.007 | 0.077 | 0.076 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

In general, these results demonstrate that the CEFADES program has a significant and strong impact on the economic lives of its participants. Respondents who completed CEFADES had a greater likelihood of working and a greatly improved income. Child soldiers, a subset of the CEFADES program of great interest to many researches, receive additional benefit from this program, especially those who are the worst off, through increased likelihood of finding employment.

In terms of labor market performance, Blattman and Annan (2010) discovered that both abducted and non-abducted Ugandan youth displayed little difference in having any work, yet among those who do work; abductees are 43 percent less likely to be involved in skilled intensive jobs than non-abductees.

Although our evaluation looked at child soldiers vs. non-child soldiers instead – which includes both abducted and non-abducted recruitment – we find that CEFADES has no overall impact on child soldiers and instead child soldiers start off at higher rates of employment than non-child

soldiers. However, our results do not specify, per se, the skill level of the jobs child soldiers had participated or currently participate in. Instead, these results simply highlight whether they were or were not employed after the program regardless of the job's skill level.

Extrapolating from Blattman, if abductees are less likely to be involved in skilled intensive jobs post conflict, then we could conclude that at least a segment of child soldiers were indeed employed but in low skilled jobs compared to non-child soldiers. Our results do complement Blattman and Annan in that by adding the quartile component to our methodology when analyzing program impact on child soldiers those at the very bottom quartile benefited the most from rehabilitation and reintegration programs like CEFADES. Thus looking at abductees in terms of quartiles based on level of education, literacy, employment status, skill vs. labor-intensive job category, and wage level could potentially isolate children with the most to gain from these programs, which could ultimately improve program impact.

In the context of Butembo, these positive results yielded by CEFADES corroborate what Blattman and Annan suggested regarding educational programs in regions susceptible to conflict. Because the opportunity cost of participating in conflict reduces human capital development of children due to the time spent outside of school, programs like CEFADES may serve as catalyzer, preparing children on their return to their post-conflict lives. In essence, these programs may close the educational gap that ultimately harms the local economy – as demonstrated by the low wages and the unemployed status of non-participants relative to participants.

As far as conflict youth wrongly seen by their communities as “traumatized, violent, social pariahs,” as Blattman and Annan pointed out, both our data and personal experience also corroborates that this is not necessarily the case in the context of Butembo. Through interviews with CEFADES staff, we determined that the community at large has internalized the status of being a child soldier. That is, there is greater acceptance of this social status than our team generally expected.

Our results show that child soldiers do not necessarily struggle to enter the labor market and thus are more likely to be assimilated within the Butembo society. Children seemed compliant at answering inquiries related to this matter and to describe experiences known personally or as common knowledge. Our lesser expectations in regards to answers and the precaution for IRB regulation minimized our depth in this subject; thus, future research should inquire deeper in regards to child soldiering in Butembo.

Following Johannessen and Holgersen (2013), we too conducted interviews with staff working at CEFADES and equally agreed that former child soldiers require help to be transformed into civilians – as informed by Mr. Kasomia. However, taking our results into account we find that there are wide differences in the way former child soldiers and non-child soldiers react to the program given that most of the former child soldiers in our sample did not show major improvements after treatment.

Although these rehabilitation staffs agree that at-risk youth require professional help to transform into active, social participants, there is still a lingering question of the stoic resiliency and adaptability that most former child soldiers seem to have and the degree of professional

care each child need. Further studies should look side-by-side at staff and former child soldier experiences before and after joining a warring faction to assess a better understanding of the effect of vocational programs and plan for their improvement according to each need.

For instance, programs should look at gender-based reactions to conflict and try to compensate for these differences – as evidenced by Annan (2011) who noted the superior resiliency of exposed women to post-conflict effects in comparison to men. Although conducting studies via interviewing staff will paint a picture of how these programs function and the criteria that accompanies recruitment, children still remain the most important source of evidence and should be specially targeted in future studies.

CHAPTER SIX

CONCLUSION

Overall, the impact of CEFADES' selection process is causing our results to underestimate the impact of the program.

The results of this study have demonstrated that the CEFADES program is increasing the employment and the income of its participants through the collection of surveys and the use of regression analysis. There are a great many implications of this project on current literature and for the participating partners.

Literature on the effects of educational attainment in conflict zones is at most lacking. As Blattman and others have suggested, more data is required to understand the relationship between education and conflict. Our study has added further to the academic consensus that educational attainment and vocational training may offer better alternatives to families living in conflict zones as well as improve the economic standing of these communities. As evidenced by some of the literature, some of the Butembo youth join the ranks of the Mai Mai rebels because they perceive them as a better economic alternative to what is offered elsewhere, or because simply there were not any other options available. Programs like CEFADES might offer an alternative to this choice making, particularly among the poor and disenfranchised children. Further study is needed to sum to this upcoming body of evidence.

Evaluations of programs such as the CEFADES are an effective way to ensure that the programs are reaching their intended goal. This analysis shows that the program is in fact working. The implications from these findings are diverse for the several stakeholders involved. The literature on the effects of educational attainment in conflict zones is at most lacking. As Blattman and others have suggested, more data is required to understand the relationship between education and conflict.

The Universite Catholique du Graben can and should use this evaluation to ensure the continuation of the program in the future. In addition to this, the Center on Conflict and Development, along with partners such as USAID, can utilize this information to create similar programs. In order to maximize success in other countries, this evaluation should be applied to countries with similar context to Butembo. As other regional communities and NGOs operating in conflict-exposed areas perceive the success and the international attention achieved from similar youth-oriented programs, they may adopt the CEFADES model.

As with any project in a fragile context, the implementation of CEFADES in another country, region, or community will not be an automatic success. The established peace within the area, the strength of the local institutions, as well as the positive reception by the community have all be contributing factors to the success of CEFADES within the Butembo context.

Ultimately, in fragile and conflict-affected countries, unemployed youth must be addressed in order to help create security in both the social and the economic realms. The involvement of all parties – including warring factions – in the educational progress of Butembo may be key to the consistency and future sustainability of CEFADES. Programs such as CEFADES can be used to help in the creation and the maintenance of this security by giving youth the skills necessary to find employment as well as allow them to earn incomes at greater levels than those without training.

REFERENCES

- Amnesty International (2008). *No End to War on Women and Children. North Kivu, Democratic Republic of Congo*. Regional Report AFR 62/005/2008.
- Annan, J., Blattman, C., Mazurana, D., & Carlson, K. (2011). Civil War, Reintegration, and Gender in Northern Uganda. *Journal of Conflict Resolution*, 1–32.
- Blattman, C. (2009). From Violence to Voting: War and Political Participation in Uganda. *The American Political Science Review*, 231–247.
- Blattman, C., & Annan, J. (2010). The Consequences of Child Soldiering. *Review of Economics and Statistics*, 882–898.
- Coalition to Stop the Use of Child Soldiers (2008). *Child Soldiers Global Report 2008*. Global Report.
- De Herdt, T., Titeca, K., & Wagemakers, I. (2010). Making Investment in Education Part of the Peace Dividend in the DRC. Chronic Poverty Research Centre Conference, Ten Years of War Against Poverty. Manchester, 8–10.
- Gazagne, P. (2009). Engaging Armed Non-State Actors on the Issue of Child Recruitment and Use in *Seen, but Not Heard: Placing Children and Youth on the Security Governance Agenda*, ed. David Nosworthy. Geneva: Transaction Publishers, 239-258.
- Hagmann, T., & Péclard, D., Eds. (2011). *Negotiating Statehood: Dynamics of Power and Domination in Africa*. Oxford und Malden, MA: Wiley-Blackwell, 539-562.
- Hradecky, S. (2012, October 31). Accident: Cetraca L410 at Butembo on Oct 30th 2012, Runway Excursion. *The Aviation Herald*. Retrieved April 2, 2014, from <http://avherald.com/h?article=4584d9e4>
- Institut National de la Statistique (2010). *Democratic Republic of the Congo Multiple Indicator Cluster Survey MICS - 2010 Preliminary Findings*, Ministere du Plan with collaboration of United Nations Children Fund (UNICEF). Report. UNICEF.

- Integrated Regional Information Networks (2004). DRC: Special Report on War and Peace in the Kivus. Retrieved April 2, 2014, from <http://www.irinnews.org/report/50941/drc-special-report-on-war-and-peace-in-the-kivus>
- Jo, H. (2013). Compliant Rebels. Rebel Groups and International Law in World Politics. White Paper. Austin: Texas A&M University.
- Johannessen, S., & Holgersen, H. (2013). Former Child Soldiers' Problems and Needs: Congolese Experiences. *Qualitative Health Research*, 1-12.
- Kabamba, P. (2012). A Tale of Two Cities: Urban Transformation in Gold-Centered Butembo and Diamond-Rich Mbuji-Mayi, Democratic Republic of the Congo. *Journal of Contemporary African Studies*, 669-685.
- Meagher, K. (2010). *Identity Economics: Social Networks and the Informal Economy in Nigeria*. Ibadan: Heinemann Educational Books.
- Milliken, J., & Krause, K. (2002). State Failure, State Collapse, and State Reconstruction: Concepts, Lessons, and Strategies. *Development and Change*, 2325-2368.
- Raeymaekers, T. (2011). Forced Displacement and Youth Employment in the Aftermath of the Congo War: From Making a Living to Making a Life. Working Paper 38, Brighton: MICROCON Research.
- Raeymaekers, T. 2007. The Power of Protection. Governance and Transborder Trade on the Congo-Ugandan Frontier. Dissertation, Ghent: Ghent University.
- Raeymaekers, T. (2009). The Silent Encroachment of the Frontier: A Politics of Transborder Trade in the Semliki Valley (Congo-Uganda). *Political Geography*, 55-65.
- Raeymaekers, T. (2010). Not Going Home: Displaced Youth After War. *Forced Migration Review* 36, 21-22.
- Richards, P., & Chauveau, J. (2007, February). *Land, Agricultural Change and Conflict in West Africa: Regional Issues from Sierra Leone, Liberia, and Cote d'Ivoire*. Historical Overview, Issy-Les-Moilleux: CSAO/SWAC. Retrieved April 2, 2014, from <http://www.oecd.org/countries/sierraleone/39495967.pdf>
- Schulman, S. (2013, April 30). In Congo, a Force of Child-Soldiers Rises Up to Fight Rebels. *The Atlantic*. Retrieved April 2, 2014, from <http://www.theatlantic.com/international/archive/2013/04/in-congo-a-force-of-child-soldiers-rises-up-to-fight-rebels/275425/>
- Sommers, M. (2006, May). Youth and Conflict: A Brief Review of Available Literature [Review]. USAID. Retrieved April 2, 2014, from http://pdf.usaid.gov/pdf_docs/Pnadt380.pdf

- Titeca, K., & De Herdt, T. (2011). Real Governance Beyond the 'Failed State': Negotiating Education in the Democratic Republic of the Congo. *African Affairs*, 213-231.
- Université Catholique du Graben (2013). Facts and Figures. Retrieved April 2, 2014, from <http://www.ucgraben.org/>
- United Nations (2014). MONUSCO Facts and Figures. United Nations Peacekeeping. Retrieved April 2, 2014, from <http://www.un.org/en/peacekeeping/missions/monusco/facts.shtml>
- Weijjs, B., Hilhorst, D., & Ferf, A. (2012). Livelihoods, Basic Services, and Social Protection in Democratic Republic of the Congo. Working Paper, Wageningen: Wageningen University.
- World Bank (2009). DDR in the Democratic Republic of the Congo. Program Update, World Bank.

APPENDIX: PROPENSITY SCORE MATCHING

In addition to the main regressions results section of the paper, additional regressions were run using Propensity Score Matching (PSM). PSM was done by running a probit regression with treatment as the dependent variable and numerous control variables to determine which had an impact on selection. From this, age, whether or not the participant was an orphan, whether or not they had children, whether or not they were a child soldier, years of education, and whether or not they attended church all had an impact on their selection. The OLS regressions were rerun weighted by the propensity score determined in Stata. As the results of our PSM regressions did not substantially differ from our main regressions, they were not included in our main results. However they are added here for additional robustness.

Table A1: OLS Regressions Demonstrating Treatment's Impact on Income with PSM

Dependent Variable: Log of Monthly Income

| | I | II | III |
|--------------------|---------------------|---------------------|----------------------|
| Treated | 1.545*** (0.334) | 1.291*** (0.353) | 1.483*** (0.361) |
| Age | | 0.267*** (0.061) | 0.272*** (0.061) |
| Male | | 1.054*** (0.353) | 0.930*** (0.353) |
| Child Soldier | | -0.122 (0.466) | -0.225 (0.462) |
| Orphan | | 0.057 (0.324) | 0.033 (0.323) |
| Years of Education | | 0.082 (0.051) | 0.100* (0.051) |
| Have Children | | 0.664 (0.485) | 0.586 (0.485) |
| Attend Church | | | -0.925*** (0.323) |
| Constant | 6.002*** (0.206) | -0.191 (1.025) | 0.321 (1.032) |
| N | 866 | 866 | 866 |
| R-squared | 0.031 | 0.100 | 0.109 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A2: OLS Regressions Demonstrating Treatment's Impact on Income with Child Soldier Interaction Term and PSM

Dependent Variable: Log of Monthly Income

| | I | II | III |
|--------------------|---------------------|---------------------|----------------------|
| Treated | 1.423*** (0.361) | 1.240*** (0.383) | 1.387*** (0.388) |
| Child Soldier | 0.335 (0.696) | -0.248 (0.674) | -0.478 (0.671) |
| Interaction | 0.354 (0.955) | 0.243 (0.919) | 0.482 (0.918) |
| Age | | 0.267*** (0.061) | 0.271*** (0.061) |
| Male | | 1.064*** (0.355) | 0.946*** (0.354) |
| Orphan | | 0.060 (0.324) | 0.039 (0.323) |
| Years of Education | | 0.080 (0.052) | 0.097* (0.052) |
| Have children | | 0.667 (0.485) | 0.591 (0.485) |
| Attend Church | | | -0.948*** (0.321) |
| Constant | 5.951*** (0.212) | -0.161 (1.018) | 0.394 (1.025) |
| Observations | 866 | 866 | 866 |
| R-squared | 0.034 | 0.101 | 0.110 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A3: Quartile Regressions Demonstrating the Impact of the Treatment on Child Soldiers' Income by Quartile with PSM

Dependent Variable: Log of Monthly Income

| | (25%) I | (50%) II | (75%) III | (25%) IV | (50%) V | (75%) VI |
|-----------------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|
| Treated | 6.909*** (0.000) | 1.184*** (0.270) | 0.511*** (0.185) | 3.554*** (0.667) | 0.802*** (0.281) | 0.666*** (0.160) |
| Child Soldier | 0.000 (0.000) | 1.204*** (0.422) | 1.099*** (0.292) | -1.449 (1.012) | 0.568 (0.452) | 0.399 (0.252) |
| Interaction | 0.693*** (0.000) | -1.184* (0.644) | -0.511 (0.451) | 2.631* (1.476) | -0.812 (0.654) | -0.539 (0.363) |
| Age | | | | 0.408*** (0.111) | 0.161*** (0.048) | 0.074*** (0.026) |
| Male | | | | 1.433*** (0.592) | 0.932*** (0.258) | 0.398*** (0.152) |
| Orphan | | | | 0.097 (0.545) | 0.098 (0.242) | 0.162 (0.141) |
| Years of Education | | | | 0.113 (0.090) | 0.072* (0.037) | 0.054*** (0.020) |
| Have Children | | | | 0.004 (0.806) | 1.012*** (0.343) | 0.711*** (0.199) |
| Attend Church | | | | -1.277** (0.544) | -0.692*** (0.242) | -0.462*** (0.138) |
| Constant | -0.000 (0.000) | 8.007*** (0.149) | 9.393*** (0.101) | -6.316*** (1.824) | 4.281*** (0.842) | 7.658*** (0.480) |
| N | 866 | 866 | 866 | 866 | 866 | 866 |
| Pseudo R ² | 0.077 | 0.012 | 0.004 | 0.104 | 0.059 | 0.044 |

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The Center on Conflict and Development at Texas A&M University seeks to improve the effectiveness of development programs and policies for conflict-affected and fragile countries through multidisciplinary research, education and development extension.

The Center uses science and technology to reduce armed conflict, sustain families and communities during conflict, and assist states to rapidly recover from conflict.

For more information, please visit:

condev.org

The Center on Conflict and Development
at Texas A&M University
600 John Kimbrough Blvd.
College Station, TX 77843-2124
Tel: (979) 458-9399
condev.org