# CEFADES

An impact evaluation of a vocational and rehabilitation program for at-risk youth in Eastern DRC

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I. Introduction

In the fall of 2013, a group of 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. 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, DR Congo. Butembo, as will be described later, is a unique hub of peace within an area that has been ravaged by civil conflict in recent decades.

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. In addition, information on the program, CEFADES, will be given along research design and the analysis of our findings.

II. 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 CEFADES program began at the Universite Catholique du Graben in Butembo, DR Congo in 1999. The program focuses on what the university calls 'vulnerable' youths in the area. The primary goal of the program is to ensure the rights of vulnerable children, that these children are respected, and that their lives improve. The secondary goal of the program is to reinsert children directly and indirectly affected by the armed conflict in the area back into their communities. Since the beginning of the program, five hundred and ninety four children have gone through the program. Although the program does not seek out former child combatants, reports from the organization indicate that one hundred and eighty eight participants during the program's history have been former child combatants. A large portion of the children in the program are what they refer to in the area as 'street kids' which captures any youth who may be orphaned, without financial support, without formal education, or without employment.

Primary funding for the program comes from a Belgian NGO, Vlaams Internationaal Centrum or VIC. Recruitment is among the local population by staff at the center and by word of mouth in the community. The program targets the previously mentioned 'street children' and 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 reintegration of these children into their families if and when possible. Oftentimes these children are not at home due to large family sizes or a lack of resources, ie food, for them within the home environment. The CEFADES program incorporates both literacy aspects as well as job training for

participants.  Typically, classes of 50-60 children, both boys and girls, enter and receive daily lessons on reading and writing and simply mathematic skills in addition to their chosen area of vocational training.  The students follow a typical daily schedule with lessons provided throughout the day over a multi-month period. During a typical program, students can choose to specialize in areas such as carpentry, masonry, culinary skills, hair styling, dressmaking, auto mechanical repairs, and beekeeping.

Another unique aspect to the CEFADES program is their ability to change these specialities as needed.  For example, if a specialized laborer within the community has need for trained worker, they can approach CEFADES and offer to train the students for their field of work.  For example: if a specialized mechanic such as foreign cars or motorcycles needs three workers to help his shop grow, he will work with CEFADES to train these students who will then go on to work for him in the future.  This has multiple benefits of allowing students to work directly with their employers in an apprenticeship that will transition into full time work in the future and also by responding to the needs of the local market so as not to flood the market with any one type of skilled labor.  If CEFADES created sixty dressmakers twice a year, the market would inevitably become unbalanced and the demand for labor in that one field would drastically decrease.

III. 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 presenting proven techniques that could positively impact the youth (Sommers 2006, pp. 24).  Juxtaposing 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).  And 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).  These 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 (Weijs, Hilhorst and Ferf 2012, pp. 31).  In the case of non-payment, students can be denied education.  Today, three out of four attend primary school in the 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 (Institut National de la Statistique 2010).

Some evidence suggests that the Butembo youth seek to modernize.  When interviewing displaced youngsters in Butembo, Raeymaekers noted a general trend in African countries emerging from conflict involving a steady urbanization and the youth's refusal of "traditional" agricultural lifestyles and embrace more urban, modern ones (Raeymaekers 2011, pp. 26).  Moreover, Richards and Chauveau suggested 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 contested 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 in the Democratic Republic of the Congo. A closer look at these states show that among child soldiers, about 70 per cent of them are found in the ranks of non-state factions of whom 40 per cent are girls (Gazagne 2009, pp. 239). The Coalition to Stop the Use of Child Soldiers estimated the number of child soldiers in Congo at 7,000 enlisted in government and armed groups including foreign forces operating in eastern Congo. They were 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 reported 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). The report also mentioned that progress in releasing children have been seriously undermined in North Kivu.

Given that many armed factions converge at 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 worsen 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 concluded 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 social lifestyle. After interviewing local staff at a vocational training program in Eastern Congo, Johannessen and Holgersen derived 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 persist only in a minority (Annan, et al. 2011, pp. 26). Support rather than rejection from families is the most common social norm.

Conflict also has led 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 emerged 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 the one hand, rebels had to ally themselves to several commercial ventures to protect its base against other violent contenders (Raeymaekers 2007, pp. 112). On the other hand, rebel leadership had to also 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 its 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 that "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 as well as the post-colonial state, the Nande, in a show of "strong embeddedness," directed proceeds from gold-mining toward the town's infrastructural development and elite foundation (Kabamba 2012, pp. 682).

IV. Research Design

The research design of this evaluation is to determine the impact of the CEFADES training program on the economic livlihood of its participants. A perfect impact evaluation would include randomized selection into the treatment, a pre-treatment survey of participants and of 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 program is an already existing program whose selection into treatment is not random, while 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 strong preparation and good 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 perspective of the project, preparing and training the locations and 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, such as where they were born, family information, gender, and other factors that could potentially affect their income, the selection into treatment, or both. Once the pre-surveys were designed, they were sent to the DRC team member to translate and conduct.

**Pre-Survey:**

Once the US team received the information from the pre-survey, the questions and answers were redesigned to help respondents better understand. For example, during the pre-survey we discovered that many respondents were having trouble understanding how to respond to a Likert scale due to unfamiliarity with the format, forcing us to redesign many of our questions to gain the same information.

With the final surveys done, 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 on 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 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.

V. 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.  This can also be said of the recruitment of youths by the psychologist, as he is specifically targeting youths in the neighborhood that are especially poor and vulnerable.

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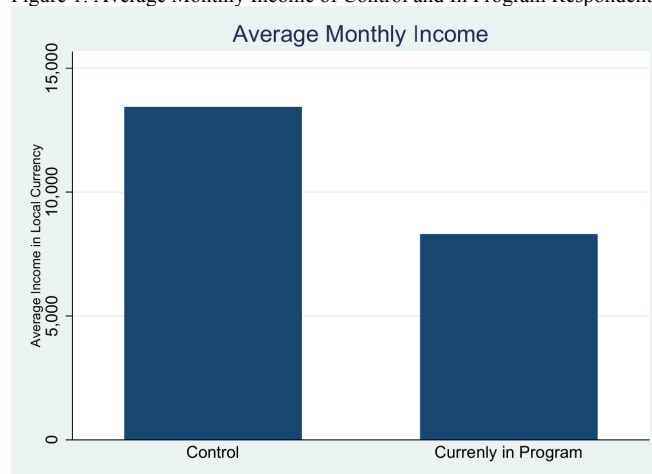


This downward selection bias from these sources is supported by the data.  Current participants in the program have been selected into treatment but have yet to feel the impact of the treatment.  As such, they provide a sampling of what the treatment group was like upon entering the program and can help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

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 underestimating the impact of the program in the results.

Figure 2: Average Monthly Income of Church Goers and Non Church Goers among Control
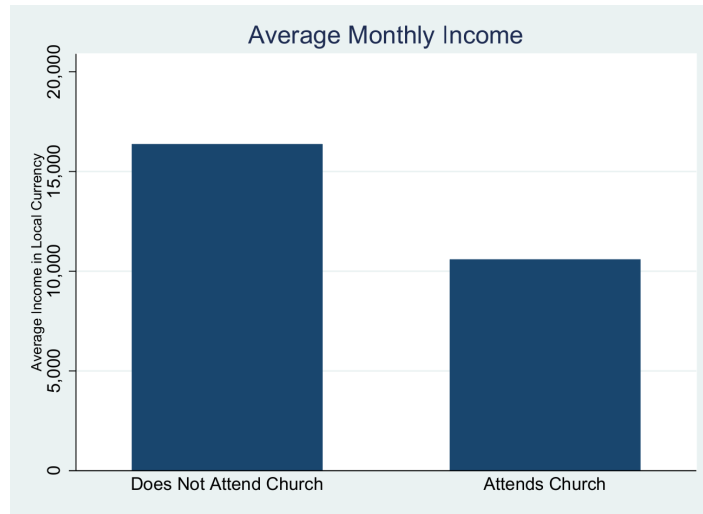
Figure 3: Church Attendance Rates Among Treated, Control, and Currently In Program Respondents
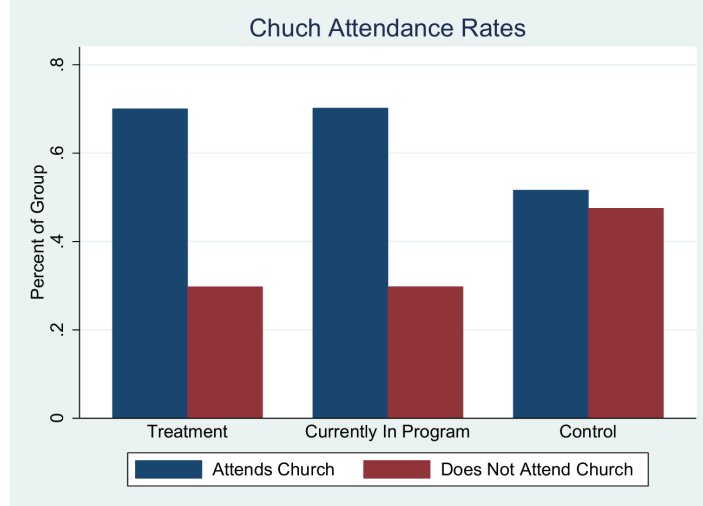


Figure 1 shows that, using data only from our control, that the income of respondents who attends church is less than those who do not attend church. Figure 2 demonstrates that the percentage of the treatment group and those currently in the program are higher than the percentage in the control. As such, 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.

Overall, the impact of CEFADES' selection process is causing our results to underestimate the impact of the program. In order to account for other factors that can affect

income, OLS regressions are used with monthly income as the dependent variable. To determine the impact of the program on working status, a probit regression was also used with whether or not they are working as the dependent variable.

As Butembo is in a high conflict area with a large child soldier population, much interest has been shown about how this program affects the livelihoods of former child soldiers in particular. As the program targets at-risk youths, and much of the at-risk youth population in Butembo are former child soldiers, this question is particularly relevant in determining the impact of the CEFADES program. In order to determine this separate impact, child soldier status was also collected 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.

VII. 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: Working Status of Treatment and Control Groups
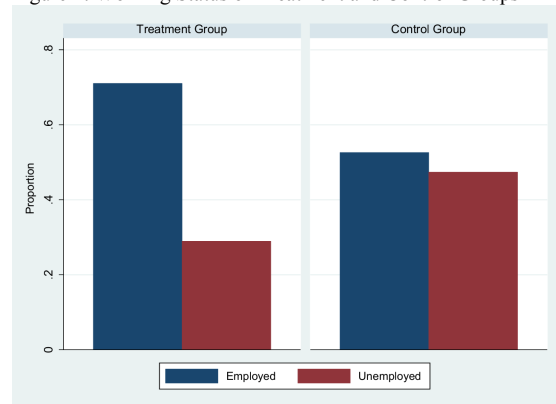


Figure 5: Average Income of the Treatment and Control Groups
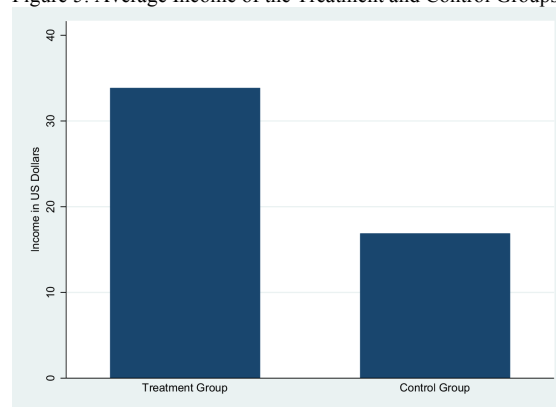


Figure 4 shows the percent of the treatment population who are currently working and not working and the percent of the control population who are currently working and not working. The difference in the treatment population between the percent who are working and the percent who are not working is much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

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.

Table 1: Probit Regressions Demonstrating Treatment's Impact on Working Status

## Dependent Variable: Working Status

| | I | II | III |
|---|---|---|---|
| Treated | 0.477*** | 0.389*** | 0.417*** |
| | (0.093) | (0.103) | (0.106) |
| Age | | 0.050*** | 0.050*** |
| | | (0.019) | (0.019) |
| Male | | 0.297*** | 0.274*** |
| | | (0.094) | (0.096) |
| Child Soldier | | -0.087 | -0.089 |
| | | (0.143) | (0.143) |
| Orphan | | 0.065 | 0.074 |
| | | (0.098) | (0.099) |
| Years of Education | | -0.001 | 0.001 |
| | | (0.014) | (0.014) |
| Have Children | | 0.400*** | 0.387*** |
| | | (0.135) | (0.136) |
| Attend Church | | | -0.116 |
| | | | (0.092) |
| Constant | 0.083 | -1.079*** | -1.022*** |
| | (0.050) | (0.322) | (0.326) |
| | | | |
| N | 913 | 871 | 860 |
| Pseudo R² | 0.0219 | 0.0513 | 0.0527 |

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

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

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

|  | I | II | III |
|---|---|---|---|
| Treated | 1.164*** | 0.897*** | 1.109*** |
|  | (0.298) | (0.327) | (0.339) |
| Age |  | 0.248*** | 0.247*** |
|  |  | (0.054) | (0.055) |
| Male |  | 1.118*** | 0.919*** |
|  |  | (0.314) | (0.317) |
| Child Soldier |  | -0.160 | -0.132 |
|  |  | (0.451) | (0.448) |
| Orphan |  | -0.081 | -0.045 |
|  |  | (0.306) | (0.308) |
| Years of Education |  | 0.025 | 0.031 |
|  |  | (0.045) | (0.046) |
| Have Children |  | 0.818* | 0.770* |
|  |  | (0.421) | (0.426) |
| Attend Church |  |  | -0.865*** |
|  |  |  | (0.295) |
| Constant | 6.090*** | 0.716 | 1.247 |
|  | (0.174) | (0.944) | (0.948) |
|  |  |  |  |
| N | 922 | 878 | 866 |
| R-squared | 0.016 | 0.070 | 0.078 |

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

attending church both impacts the selection into treatment as well as the respondent's income, it too was included as a control variable.

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%.

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

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*** | 0.466*** | 0.488*** |
|  | (0.102) | (0.114) | (0.116) |
| Child Soldier | 0.349** | 0.125 | 0.114 |
|  | (0.174) | (0.182) | (0.182) |
| Interaction | -0.545** | -0.469* | -0.446 |
|  | (0.261) | (0.278) | (0.278) |
| Age |  | 0.051*** | 0.051*** |
|  |  | (0.019) | (0.019) |
| Male |  | 0.284*** | 0.264*** |
|  |  | (0.095) | (0.097) |
| Orphan |  | 0.064 | 0.071 |
|  |  | (0.098) | (0.099) |
| Years of Education |  | 0.002 | 0.003 |
|  |  | (0.014) | (0.014) |
| Have Children |  | 0.388*** | 0.377*** |
|  |  | (0.135) | (0.136) |
| Attend Church |  |  | -0.103 |
|  |  |  | (0.092) |
| Constant | 0.052 | -1.117*** | -1.062*** |
|  | (0.053) | (0.321) | (0.326) |
| N | 910 | 871 | 860 |
| Pseudo R² | 0.0253 | 0.0538 | 0.0550 |

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

results. The main independent variable was again treatment, and the same controls were used.

Looking at Table 2, once again we can see that the coefficient for treatment is both positive and statistically significant. As the dependent variable was the log of monthly income, we can interpret the coefficient for the treatment variable as a percent change in income. Attending the program, therefore, increases the income of the participant by 90-100%.

To determine the project's impact on child soldiers, another probit regression was run where working status is the dependent variable and another OLS regression where the log of

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

monthly income is 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

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*** | 1.120*** | 0.357*** | 1.677*** | 0.663*** | 0.460*** |
| | (0.348) | (0.332) | (0.127) | (0.570) | (0.210) | (0.156) |
| Child Soldier | 0.000 | 1.204** | 1.050*** | -1.759** | 0.441 | 0.292 |
| | (0.322) | (0.569) | (0.225) | (0.864) | (0.347) | (0.263) |
| Interaction | 2.986*** | -1.182 | -0.490 | 4.224*** | -0.658 | -0.113 |
| | (0.780) | (0.857) | (0.330) | (1.298) | (0.506) | (0.383) |
| Age | | | | 0.485*** | 0.162*** | 0.065** |
| | | | | (0.082) | (0.034) | (0.027) |
| Male | | | | 1.113** | 0.851*** | 0.449*** |
| | | | | (0.487) | (0.185) | (0.142) |
| Orphan | | | | -0.215 | 0.015 | 0.104 |
| | | | | (0.474) | (0.184) | (0.139) |
| Years of Education | | | | -0.054 | 0.049* | 0.036* |
| | | | | (0.073) | (0.026) | (0.019) |
| Have Children | | | | 0.215 | 1.088*** | 0.774*** |
| | | | | (0.640) | (0.239) | (0.190) |
| Attend Church | | | | -1.167** | -0.553*** | -0.421*** |
| | | | | (0.454) | (0.174) | (0.132) |
| Constant | -0.000 | 8.007*** | 9.547*** | -6.571*** | 4.381*** | 7.949*** |
| | (0.105) | (0.182) | (0.071) | (1.403) | (0.598) | (0.464) |
| N | 918 | 918 | 918 | 866 | 866 | 866 |
| Pseudo R² | 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

general.

Table 4 shows the OLS regressions demonstrating the treatment's impact on child soldiers' income. In all three regressions, the coefficient for the interaction term 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. 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%. As we know from the regressions in Table 3 that the treatment is increasing the likelihood of child soldiers to be working, then the quartile regression result should be easier to interpret. 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. As such, the increased likelihood of finding a job benefits the child soldiers in the bottom quartile more as they have a bigger boost in human capital having started off at a lower point.

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.

VII. Conclusion

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. What programs like CEFADES might offer is 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. This 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 joined 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. What programs like CEFADES might offer is 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.

This evaluation can and should be used by the Universite Catholique du Graben to ensure the continuation of the program in the future. In addition to this, the Conflict and Development Lab at Texas A&M along with partners such as USAID can utilize this information to create

similar programs in contexts close to Butembo that will maximize success in other countries. Other communities in the region and NGOs operating in areas exposed to conflict may adopt the CEFADES model as they perceive its success and the international attention brought on to these kind of programs. 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.

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*** | 1.291*** | 1.483*** |
|  | (0.334) | (0.353) | (0.361) |
| Age |  | 0.267*** | 0.272*** |
|  |  | (0.061) | (0.061) |
| Male |  | 1.054*** | 0.930*** |
|  |  | (0.353) | (0.353) |
| Child Soldier |  | -0.122 | -0.225 |
|  |  | (0.466) | (0.462) |
| Orphan |  | 0.057 | 0.033 |
|  |  | (0.324) | (0.323) |
| Years of Education |  | 0.082 | 0.100* |
|  |  | (0.051) | (0.051) |
| Have Children |  | 0.664 | 0.586 |
|  |  | (0.485) | (0.485) |
| Attend Church |  |  | -0.925*** |
|  |  |  | (0.323) |
| Constant | 6.002*** | -0.191 | 0.321 |
|  | (0.206) | (1.025) | (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*** | 1.240*** | 1.387*** |
|  | (0.361) | (0.383) | (0.388) |
| Child Soldier | 0.335 | -0.248 | -0.478 |
|  | (0.696) | (0.674) | (0.671) |
| Interaction | 0.354 | 0.243 | 0.482 |
|  | (0.955) | (0.919) | (0.918) |
| Age |  | 0.267*** | 0.271*** |
|  |  | (0.061) | (0.061) |
| Male |  | 1.064*** | 0.946*** |
|  |  | (0.355) | (0.354) |
| Orphan |  | 0.060 | 0.039 |
|  |  | (0.324) | (0.323) |
| Years of Education |  | 0.080 | 0.097* |
|  |  | (0.052) | (0.052) |
| Have children |  | 0.667 | 0.591 |
|  |  | (0.485) | (0.485) |
| Attend Church |  |  | -0.948*** |
|  |  |  | (0.321) |
| Constant | 5.951*** | -0.161 | 0.394 |
|  | (0.212) | (1.018) | (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*** | 1.184*** | 0.511*** | 3.554*** | 0.802*** | 0.666*** |
| | (0.000) | (0.270) | (0.185) | (0.667) | (0.281) | (0.160) |
| Child Soldier | 0.000 | 1.204*** | 1.099*** | -1.449 | 0.568 | 0.399 |
| | (0.000) | (0.422) | (0.292) | (1.012) | (0.452) | (0.252) |
| Interaction | 0.693*** | -1.184* | -0.511 | 2.631* | -0.812 | -0.539 |
| | (0.000) | (0.644) | (0.451) | (1.476) | (0.654) | (0.363) |
| Age | | | | 0.408*** | 0.161*** | 0.074*** |
| | | | | (0.111) | (0.048) | (0.026) |
| Male | | | | 1.433** | 0.932*** | 0.398*** |
| | | | | (0.592) | (0.258) | (0.152) |
| Orphan | | | | 0.097 | 0.098 | 0.162 |
| | | | | (0.545) | (0.242) | (0.141) |
| Years of Education | | | | 0.113 | 0.072* | 0.054*** |
| | | | | (0.090) | (0.037) | (0.020) |
| Have Children | | | | 0.004 | 1.012*** | 0.711*** |
| | | | | (0.806) | (0.343) | (0.199) |
| Attend Church | | | | -1.277** | -0.692*** | -0.462*** |
| | | | | (0.544) | (0.242) | (0.138) |
| Constant | -0.000 | 8.007*** | 9.393*** | -6.316*** | 4.281*** | 7.658*** |
| | (0.000) | (0.149) | (0.101) | (1.824) | (0.842) | (0.480) |
| | | | | | | |
| N | 866 | 866 | 866 | 866 | 866 | 866 |
| Pseudo R² | 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

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