Civil conflict and labour market outcomes in Sierra Leone

RESEARCH PROPOSAL REVISED

Presented to

Partnership for Economic Policy (PEP)

By

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Sierra Leone

&

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November 2017
SECTION I – PROJECT OVERVIEW & OBJECTIVES

1.1. Abstract (max 100 to 250 words)

During 1991-2002 Sierra Leone suffered from a violent civil war with asymmetric intensity across regions and effects on birth cohorts. This study exploits this variation, to assess the short and long-term effects of exposure to conflict, during different stages of life, on labour market outcomes (labour market participation and earnings) of civilians in Sierra Leone and investigate some possible causal pathways (education and cognitive skills). For this purpose, this study combines data of the Sierra Leone Integrated Household Surveys (2003/2004 and 2011) with event data on the timing and location of battles, attacks and human rights violations drawn from official crime report (No Peace Without Justice report, 2004) and household of these surveys (household self reported assets lost during conflict). The main expected result is that conflict exposure during different periods of life has heterogeneous effects on labour markets outcome in Sierra Leone. Some of these effects are explained by a loss of human capital accumulation and or lack of cognitive skills development. From this study relevant policies could be drawn to help the government of Sierra Leone and development partners to mitigate the impacts of conflict and other shocks on labour market outcomes and human capital accumulation.

1.2. Historical overview of Sierra Leone civil war

The war in Sierra Leone was ignited in March 1991 when a band of rebels, under the name Revolutionary United Front (RUF), attacked from neighbouring Liberia. Causes of the conflict was partially the result of bad governance (Reno, 1995) and another motivation was the access to Sierra Leone’s diamond wealth (Keen, 2005). The war led to displacement of almost half of country’s population (2.1 millions), the death of around 50,000 people and an important number of human rights violations (rape, kidnapping, abduction of children, etc.). Likewise, the armed conflict has destroyed most of the country’s social, economic and physical structure (UNDP, 2005). However,
as shown in figure 1, there was a considerable variation in conflict intensity across time and space.

According to the No Peace Without justice report (2005), battles, attacks and human rights violation peaked on several years (1991, 1995, 1996 and 1998). In 1991, violence began at the east, the conflict did not spread to the north and south until 1995, and only reach the capital in 1998. In January 2002, the peace agreement was signed and then war was declared over.

Figure 1: Variation of conflict intensity across space and time


Because of their involvement in the conflict, and the impact it had on them, the situation of children in Sierra Leone, especially those who were exposed to conflict during school age, is a major concern for policy maker. As those children are now young active in the labour market, it is imperative to assess how exposure to conflict affects their employment outcomes and determine which development interventions are required. This will also help to consolidate peace.
1.3. **Main research questions and contributions** (max 500 to 700 words)

The main purpose of this study is to provide evidences on the short and long-term impact of exposure to conflict on labour market outcomes of civilians in Sierra Leone. Specifically, the study is focused on the following specifics objectives:

1. Assess the short and long-term impact of exposure to conflict, during different stages of life (in utero, early childhood, preschool age and primary school age), on individuals' (especially young women) labour market participation;
2. Assess the short and long-term impact of exposure to conflict during different stages of life on the earnings of individuals;
3. Establish if education and/or cognitive skills (literacy and mathematics calculations skills) are causal pathways through which exposure to conflict impacts labour market outcomes in Sierra Leone.

The delimitation of different stages of life constraints this study to focus on short and long-term youth labour market outcomes. Moreover, gender differentiation is an important dimension that is considered in achieving the objectives of this study.

Questions deriving from these objectives are interesting particularly for two main reasons.

Firstly, to the best of our knowledge this study is the only attempt that uses very informative, national and representative microdata to examine persistence of labour market consequences of armed conflict in Sierra Leone. Therefore, this study plans to extend the growing microeconomics evidence of long-term impacts of armed conflict and fills the gap about short-term consequences of exposure to war on labour market outcomes of civilians.

Secondly, this study has several policy implications. On one hand, by focusing on labour market consequences of conflict at different stages of life, this study will provide evidences that will help to design well targeted responses to different groups of the population and regions exposed to shocks, with the aim to mitigate

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1 The reference cohort comprises individuals born between 1977 and 1997, they are active labor market youth at the time of the 2011 Sierra Leone Integrated Household Surveys.
2 Women and men.
their potential short and long-term consequences. On the other hand, perceiving the impact of war on labour market participation of vulnerable groups, especially women, is useful to identify effective short and long-term empowerment policies in post-conflict countries. Moreover, the analysis of possible causal pathways connecting exposure to armed conflict at different stages of life and labour supply and productivity is informative to set up effective interventions that will help to minimize welfare losses for individuals and the society as a whole. Finally, policy implications derived from the findings can also be useful for other incidences such as natural disasters\(^3\) that can have potential impacts on labour market outcomes and human capital.

### SECTION II – CAPACITY BUILDING

#### 2.1. Team composition and experience

**Team leader**

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Sex (M, F)</th>
<th>Highest degree/diploma</th>
</tr>
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<tbody>
<tr>
<td>James Fomba Sandy</td>
<td>47</td>
<td>M</td>
<td>PhD in economics</td>
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</tbody>
</table>

**Training and experience**

PhD in economics, African Economic Research Consortium (AERC) CPP fellow. Worked in the Ministry of Finance & Economic Development, Central Bank and research institutions. He has been involved in several policy research studies, specifically undertook a research work on ‘Job Market Feasibility study for Technical and Vocational Training/Job & Business Services (TVET & JBS) in Sierra Leone. Financed by Cotton Tree Foundation & Evangelical Fellowship Sierra Leone (NGO).

**Expected capacity building**

This study will improve his knowledge on labour market and human capital literature. Moreover, this project will strengthen his capacities in terms of the management of individuals and regional data, policy setting and evaluation in post-conflict countries.

**Contribution to project**

In this project, he will be in charge of collection and treatment of all relevant data on conflict and labour market in Sierra Leone (country of study). He will be also responsible of the literature and policy context review.

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\(^3\) The mudslides and flooding that occurred on 14\(^{th}\) August, 2017.
## Team member #2

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<tr>
<th>Name</th>
<th>Age</th>
<th>Sex (M, F)</th>
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<tbody>
<tr>
<td>Mboutchouang Vincent de Paul</td>
<td>33</td>
<td>M</td>
<td>PhD in economics</td>
</tr>
</tbody>
</table>

**Training and experience**
PhD in economics, African Economic Research Consortium (AERC) CPP fellow and researcher at Centre d’Etudes et de Recherche en Economie et Gestion (CEREG) and Recherches en Microéconomie Appliquée (REMA). He has been involved in several research projects on labour market issues, research environment and productivity, informal sector issues with respective funding of International Labour Organization (ILO), International Development Research Centre (IDRC), Global Development Network (GDN) and AERC.

**Expected capacity building**
This study will strengthen his capacities in addressing causal relationship with several econometric issues.

**Contribution to project**
He will be in charge of the econometric strategies and estimation techniques.

## Team member #3

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<th>Name</th>
<th>Age</th>
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<tbody>
<tr>
<td>Isata Mahoi</td>
<td>38</td>
<td>F</td>
<td>PhD in economics</td>
</tr>
</tbody>
</table>

**Training and experience**
PhD in economics, Catholic University of Milan. She is a consultant researcher at Center for Economic Research and Capacity Building. She worked with many International Non-Governmental Organisations and Ministries in Sierra Leone. Her research interests are Economic policy, human resources economics and development studies.

**Expected capacity building**
This project will improve her skills in setting policy advices and research vulgarisation. Also, this project will improve her capacity in management of individuals and regional data.

**Contribution to project**
In this project, she will be working with Mr. James F. Sandy to gather the relevant data and treatment of all relevant data on conflict and labour market in Sierra Leone (country of study). She will be also responsible of policy advices that can be drawn from the results of this research. She will equally serve as a bridge between the research team and relevant stakeholders in the Ministries, Departments and Agencies.

## Team member #4

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<th>Age</th>
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<tbody>
<tr>
<td>Korie Chetachi Vanessa</td>
<td>25</td>
<td>F</td>
<td>Master in economics</td>
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</tbody>
</table>
Training and experience

She is currently a PhD student in economics at University of Yaounde II, her thesis dissertation is focus on personality traits and labour market outcomes. She is a junior researcher at Centre de Recherches en Economie et Gestion (CEREG).

Expected capacity building

This project will improve her skills on microeconometrics methods, proposal writing and presentation as well as research management.

Contribution to project

She will assist in data cleaning, descriptive statistics, results derivation and interpretation.

2.2. List of past, current or pending (non-PEP) projects in related areas involving team members, including resulting publications (If any)

<table>
<thead>
<tr>
<th>Name of funding institutions</th>
<th>Title of projects and related publications (link)</th>
<th>Team member(s) involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Labour Organization</td>
<td>Title: Non standard forms of employment and labour market outcomes in Cameroun, Chad and DRC</td>
<td>Mboutchouang Vincent de Paul</td>
</tr>
<tr>
<td>Global Development Network</td>
<td>Title: Doing Research in Social Science in social science index and knowledge production in Cameroon and Côte d’ivoire</td>
<td>Mboutchouang Vincent de Paul</td>
</tr>
<tr>
<td>International Development Research Centre</td>
<td>Title: Enhance youth active labour market policies in Francophone Sub-saharan Africa</td>
<td>Mboutchouang Vincent de Paul</td>
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<td></td>
<td>Publication (reference): Underreview</td>
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<td>UNDP</td>
<td>Title: The State of Climate Information, Early Warning Systems and Adaptation to Climate Change in Sierra Leone, Financed by United Nations Development Programme (UNDP)-2015/2016</td>
<td>James Fomba Sandy</td>
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<td></td>
<td>Publication (reference): Under review</td>
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<td>Budget Advocacy Network</td>
<td>Title: Ebola Epidemic and Revenue Generating Opportunities for Social Sector Spending in Sierra Leone Budget Advocacy Network (BAN) – Non-Governmental Organisation (NGO) - 2015</td>
<td>James Fomba Sandy</td>
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<td></td>
<td>Publication (reference): IMF/World Bank</td>
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<td>GIZ</td>
<td>Title: Status of Economic Research in ECOWAS member States’ - 2016/2017 GIZ/Abuja, Nigeria and Freetown, Sierra Leone</td>
<td>James Fomba Sandy</td>
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<td></td>
<td>Publication (reference): Under review</td>
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<tr>
<td>International Growth Centre (IGC)</td>
<td>Realities of cross border trade in Mano River Union Countries</td>
<td>James Fomba Sandy and Isata Mahoi</td>
</tr>
<tr>
<td>UNICEF</td>
<td>Research on Situational Analysis on Community Participation in Sierra Leone.</td>
<td>Isata Mahoi</td>
</tr>
</tbody>
</table>
2.3. **List of past or current PEP-supported projects involving team members, including resulting publications**

SECTION III – RESEARCH

3.1. **Literature review** (max 1000 to 1500 words)

Since the end of the Second World War, several developing countries have experienced violent conflicts with causes, durations and frequencies that vary considerably from one nation to another. In this context, several studies have been carried out to determine causes of conflicts (Hugon, 2001; Fearon and Laitin, 2003; Collier and Hoeffler, 1998; 2004; Justino, 2011; Dabalen and Paul., 2012). As short-term effects of war are dramatic and well documented (Collier and al., 2003), a growing empirical literature has turned attention to the long-term impacts of conflict on economic performance (Davis and Wesitein, 2002; Brackman and al., 2004), aggregate welfare and development indicators (Cerra and Saxena, 2008; Chen, Loayza and Reynal-Querol, 2008; Miguel and Roland, 2011), human capital accumulation and individuals labour markets outcomes (Islam and al., 2016; Galdo, 2013; Leon, 2012; Chamarbagwala and Moran, 2011, Shemyakina, 2011 a & b; Bundervoet and al., 2009; Annan and al., 2009).

In practice, different factors explain the effects of conflict exposure on labour market outcomes. In a cross-cutting way, if war affects labour market-outcomes, it is through the factors that determine the productivity of workers, especially factors related to human capital (education, health, experience, cognitive skills, ability, among others).

Since the contribution of Becker (1964), it is widely accepted that human capital accumulation determines the level and disparities of wages in the labour market. However, the occurrence of a negative shock is harmful as a conflict negatively affects human capital (education, experience) accumulation in regions where cohorts of individuals are exposed to violence. This situation results in poor labour market outcomes (wages) for cohorts of individuals exposed to conflicts. This
argument is, however, not supported by the analysis developed by Acemoglu, Autor and Lyle (2004). These authors suggest that civil conflicts are followed by a drastic drop in the labour supply in the areas most exposed to violence, therefore after the war the scarcity of labor is compensated by higher wages.

Two arguments also emerge regarding the effects of exposure to conflict on labour market participation. Specifically, when conflict affected areas are significantly damaged by destruction during the war, it results to poor job opportunities and high unemployment rate. In this context, two effects may be observed as far as labour suppliers behavior is concerned (Killingsworth, 1983). The first is the discouraged worker effect that occurs when labour market conditions are not sufficiently incentivized to stimulate job search and therefore, labour market participation. The second alternative is known as the added worker effect. This strategy consists of increasing household members’ labour market participation, or labour supply in order to compensate for the decline in labour market income due to conflict.

The previous arguments take a particular dimension when exposure to violence occurs during the first years of life. There is growing literature on this issue (Godfrey and Barker, 2000; Aizer et al., 2009; Almond and Currie 2011). Studies support that exposure to shocks during the early stages of life negatively affects children’s human capital in the short and long term, especially health and cognitive skills development. Precisely, evidences (Strauss and Thomas, 1998; Alderman and al., 2006; Mancinni and Yang, 2009; Bundervoet and al., 2009) recognized height as one of the most valuable markers through which exposure to shocks affects economics outcomes. On the other hand, Steckel (1995), Case and Paxson (2006) identify height as a source of wage premium. They explain this result by the positive relationship that exists between cognitive skills development and height in childhood.

As far as lasting effect of conflict is concerned, as predicted by the neoclassical growth models, some evidences on cross-country or cross-regional data show a long-term catch-up in most physical capital and investment indicators in post-
conflict countries (Davis and Wesitein, 2002; Brackman and al., 2004). Other aggregate studies (Cerra and Saxena, 2008; Chen, Loayza and Reynal-Querol, 2008; Miguel and Roland, 2011) show a significant recovery in most welfare indicators including labour market income, even if the required time for this process is heterogeneous. Using a panel of developed and developing countries, Cerra and Saxena (2008), show that output losses during war are recovered partially and in a very short time (4 years after the conflict). Chen and al., (2008) find that, as the end of the conflict marks the beginning of a relative peace, there is recovery in terms of basic economic performance, education, health, demographics trend and political development. In the same vein, Miguel and Roland (2011) show that 27 years after U.S. bombing in Vietnam, there is no persistent effects on population density, infrastructure, poverty rate or literacy skills. However, as suggested by Blattman and Miguel (2010 a), there is a need for empirical evidence drawn from micro-level analysis and case studies. This suggestion is motivated by the fact that, impact of conflicts on civilians can be considerable, lasting and asymmetric between individuals and regions. Therefore, microeconomic evidence of the effect of civil war is pertinent to set up efficient and well targeted post-conflict policies.

Once microeconomic data of post-conflict countries recently become available, several studies investigate the effect of armed conflict on welfare indicators (poverty, consumption, income), education and health of individuals. On this point, evidences converge on a largely negative and long-lasting significant effects of war on health (Palmer and al., 2016; Bundervoet and al., 2009; Alderman and al., 2004). There is also a growing literature that assess the impact of conflicts on human capital and labour market outcomes. A part of this research is based on former combatants. For instance, Blattman and Annan (2010 b) show that child soldiers engaged in Northern Uganda conflict have a wage penalty explained by a significant loss of human capital accumulation (education, experience)⁴. Humphreys and Weistein

⁴ Annan and al. (2009) in the same country find that young adult recruited as soldier have less schooling and work experience and are less likely to be engaged in skilled work. Moreover, they experienced a wage penalty.
(2007) show that an increase of exposure to violence reduces employability of former combatants in Sierra Leone.

With respect to civilians, Galdo (2013) finds that exposure to conflict during early childhood has a negative effect on wage of individuals in Peru several decades later\(^5\). He suggests that infant health and school deficits are plausible pathways connecting adult earning and early life exposure to violence. In the same vein, Islam and al. (2016) find that the degree of exposure to civil conflict during primary school age has a negative impact on education and thus on long-term earnings in Cambodia. On the contrary, Shemyakina (2011 b) shows that women that were most exposed to violence were more likely to hold a job\(^6\), but she does not find a significant effect of exposure to conflict on wage of male or female in Tajikistan. Unlike Annan and al. (2009) or Justino and al. (2011), Shemyakina (2006) does not find a significant effect of conflict on school attainment of tajik boys and younger children.

As suggested by Blattman and Miguel (2010 a), all these results show that the long-term effects of war remain mixed.

With regard to the effects of the conflict in Sierra Leone, there are two major contributions to our knowledge\(^7\). But they do not, however, address the effect of the conflict on civilians’ labour market outcomes. More specifically, for Bellows and Miguel (2009), the war led households directly exposed to violence to participate more actively in local collective actions. Humphreys and Weistein (2007) find a negative correlation between employment and participation to the war as combatant.

This study intends to expand the existing literature on the effect of conflict on labour market outcomes of civilians on several points. Firstly, this study is the first micro

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\(^5\) See also Ichino and Winter-Ebmer (2004) that also find that armed conflict negatively affects the earnings of individuals in the long-run.

\(^6\) Menon and Rodgers (2015) find the same result in Nepal and conclude that it is an evidence for the “added worker hypothesis”.

\(^7\) Voors and al. (2017) produce an evidence on causes of conflict in Sierra Leone. However, they analyze how natural resources endowments and governance explain the intensity of war during 1991-2002.
evidence that plan to assess the short and long-term effects of exposure to conflict during different stages of life on labour market outcomes in Sierra Leone. Thus, given that existing evidences only provide the long-term impacts, this study focuses both on short and long-term effects\textsuperscript{8}. Therefore, it will be possible to determine whether the effect of exposure to conflict, on the targeted indicators, is strengthened, decreased or stable over time. Secondly, this study uses two datasets (Sierra Leone household integrated survey and the report of No Peace Without Justice conflict mapping project) to obtain various exposure to conflict measures. Moreover, the quality of these data gives the opportunity to tackle potential econometric issues related to the assessment of the relationship of interest. Finally, the study aims to find potential pathways (education and cognitive skills) through which exposure to conflict could affect labour market outcomes. Many studies focus on the impact of war on schooling attainment, but during periods of instability, graduation conditions can be more flexible. Therefore, literacy and mathematics skills can give a better signal of productivity in the labour market.

3.2. **Methodology** (max 1200 to 1600 words)

\textbf{a. Short and long-term effects of conflict exposure on labour market outcomes}

The identification strategy of this study is based on a differences-in-differences approach. Specifically, this study takes advantage of the variation in temporal and geographical incidence of the conflict and also relies on a set of fixed effects. The short and the long-term effects are derived using respectively 2003/2004 and 2011 Sierra Leone Integrated Household Survey (SLIHS).

\textsuperscript{8} Menon and Rodgers (2015) in Nepal study short, medium and long-term effect of war on women labour supply in Nepal, but they do not focus on earnings or assess the impact of conflict exposure during keys stages of early age.
Figure 2: Timing of the SL conflict and structure of the data

Source: Authors using SLL-LED database of De Bruijne (2014).

Note: This figure shows the number of events (battles, attacks, human rights violation, etc.) reported each year during the Sierra Leone conflict and how it overlaps with individual-level data set that will be used for the analysis. For the 2003 SLHIS, people between 14-26 years of age will be considered to assess the short-term impact (few periods after the end of the war) of conflict exposure in early childhood, pre-school age and primary school age. For the 2011 SLHIS, people aged between 14-32 years are considered specifically to assess the long-term impact of conflict exposure in utero and during others stages in life.

The objective of the study is to assess the effects of the exposure to the 1991-2002 Sierra Leonean conflict one year before birth (-1 year) up to school age (13 years maximum). As shown in figure 2, the study will focus on individuals that were pre-birth, early childhood or at school age during the conflict and active in the labour market in 2003 and 2011 (at least 14 years old), respectively. As a result, to what is presented in figure 2, the group of interest will be restricted to a subset of individuals born between 1977 and 1997\(^9\) and who lived in the regions with high incidence of the

\(^9\) In order to do analysis on the population that can be considered as active (at least 14 years old), the birth cohort 1977-1997 is considered for the long-term (2011 SLIHS, individuals between 14 and 34 years)
conflict. However, the comparison group is a subset of individuals that would not have been significantly affected by the war during the keys periods (in utero, early childhood, preschool age and primary school age) considered in this study. Specifically, this counterfactual group contains individuals born during the same year in less affected regions as well as individuals of different birth cohorts within the same region.

In order to assess the effect of exposure to conflict at different stages of life on labour market outcomes of civilians in Sierra Leone, this study relies on the following specification, derived from the work of Bundervoet and al. (2009), Leon (2012) and Galdo (2013):

\[
LMO_{ijt} = \delta + \sum_{k=1}^{4} \beta_k \text{household\_asset\_lost}_{jk} + \sum_{k=1}^{4} \lambda_k \text{NPWJ\_violence\_report}_{jk} + \alpha X_i + \mu_d(t) + v_j + \tau_t + \epsilon_{ijt} \tag{1}
\]

In this equation, the various variables and parameters of interest are defined as follows:

- \(LMO_{ijt}\): This is the labour market outcome (participation or earnings) of the individual \(i\), born in chiefdom \(j\) and in year \(t\). Chiefdoms represent administrative units that many households use to specify their residence. The average size of a chiefdom is 20,000 inhabitants and there are 152.

- \(k\): It specifies the different stages of life (birth cohorts) for individuals exposed during their early age or school age. More specifically, this study distinguishes four groups. In utero (a year before birth, \(k = 1\)), exposure during early childhood (between 0 and 3 years, \(k = 2\)), during preschool age (between 4 and 6 years, \(k = 3\)) during school age (between 7 and 13 years, \(k = 4\)). As a result, the reference cohort is expected to be between 1 and 26 years old in 2003 (born between 1977 and 2002) and between 9 and 34 years in 2011. However, in order to reduce the analysis to the active cohort in the labour analysis. For the short-term analysis, the birth cohort 1977-1989 will be considered in order to meet the 14 years old constraints, therefore the pre-birth (in utero) group is not qualified. However, the 2003 SLIHS offers the flexibility to have labor market characteristics of individuals that have 7 years of age and more.
market and in the spirit of Leon (2012) on Perú, the reference cohort will be restricted to individuals between 14 and 26 years old (born between 1977 and 1989) in 2003\(^\text{10}\) and therefore between 20 and 34 years old in 2011 (born between 1977 and 1991).

- Household\(_{\text{asset\_lost}}\) and NPWJ\(_{\text{violence\_report}}\): This study relies on two measures of exposure to conflict. The variable household\(_{\text{asset\_lost}}\) specifies in regression (1) measures the number of assets lost by households of chiefdom \(j\) during a given period \(k\). This last measure is a household reports of victimization which indicates deprivation of assets during the war. Household reports of victimization does not, however, cover other crimes associated to war, like killing, rape, attacks against civilians or battle between belligerents. Therefore, in order to assess the potential effect of that dimension of the conflict violence, this study intends to use an official crime reports during the period. The second variable, NPWJ\(_{\text{violence\_report}}\), measures the number of attacks and battles in each chiefdom during a given period.

The choice to use these two measures is drawn from the literature\(^\text{11}\) (Shemyakina, 2011 a & b; Bellows and Miguel, 2009; Leon, 2012; Galdo, 2013) and motivated by the context. During the Sierra Leone conflict, rebels occupied specific areas for long period (Keen, 2005). Therefore, the regions where the rebels, specifically, the Revolutionary United Front (RUF), did not establish permanent bases where more exposed to sporadic raids that led to looting of properties and destruction of houses of mainly defenseless civilians. On the contrary, battles and attacks were the main forms of exposure to conflict for the chiefdoms, especially endowed with diamond,

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\(^{10}\) The first part of the 2003/2004 SLIHS that contained household members’ characteristics was conducted in 2003. This restriction constraints the short-term analysis to individuals exposed to conflict during early childhood (between 2 and 3 years rather than 0 to 3 years), during preschool age, during preschool age and during school age. The long-term analysis can be restricted as well in other to appreciate the evolution of the effects of exposure to conflict.

where rebels were established. For these reasons, it is practically useful to assess the impact of each of these two forms of exposure to conflict.

- $\mu_d(t)$ is a district-specific trend. It allows to control for differences in economic performance between the different districts of Sierra Leone over time. Moreover, it allows to account variations in individuals’ labour market outcomes that diverge from long-term trend of individuals in their birth district.

- $\nu_j$ is a fixed effect that permits to control for heterogeneity between individuals born in the same chiefdom.

- $\tau_t$ is included in all regressions to control for specific cohorts effect.

- $\epsilon$ is an error term with the properties required for this form of specification.

The estimation of the coefficients of interest of this specification is subject to several biases that result from the violation of model identification assumptions. In this context, three biases are highlighted.

Firstly, the victimization bias. In practice, the exogeneity of exposure to conflict variables is assumed. However, this assumption is violated when households or chiefdoms affected by the war are those with poor increases in labour market outcomes. In this context, different techniques have been used to validate the credibility of the exogenous hypothesis (Galdo, 2013, Leon 2012, Islam and al., 2016) or to correct this bias (Bellows and Miguel, 2009, Shemykina, 2011). In this study, we will follow the approach of Bellows and Miguel (2009) by adopting a control function approach. It allows to support the selection bias using several variables that remain constant despite the conflict, this include the number of diamond mines, pre-conflict population density, and the distance between the chiefdom and the capital.

Secondly, measurement errors in violence data is another source of bias. On this point, Galdo (2013) suggests a strategy to get rid of this attenuation bias. However, with regard to the discussion that exists on instrumental variables properties, several other studies assume and interpret their results as a lower bound impact of the conflict.
Thirdly, the migration bias. Since the measure of exposure to conflict considers the place of birth, there is a possibility of household displacement that can affect labour market outcomes. On this point, the household survey conducted in Sierra Leone in 2011 accounts for household displacement during the conflict. Therefore, it is possible to control for migration bias in the long-term regression. However, for the short-term effect, obtained using SLIHS 2003/2004, regressions will be made on sub-samples of migrants and non-migrants to assess the relevance of this bias in Sierra Leone.

Moreover, for robustness check of the long-term labour market impact of conflict, analysis will be restricted to individuals that were between 18-32 years, since conflicting results can be obtained when focus is on individuals between 14-17 years of age, given that they may have a lower labour market attachment compared to other groups of ages.

b. Causal pathways

There are several channels through which exposure to conflict during different stages of life can have an incidence on labour market outcomes. As suggested by the human capital theories, health and education are arguably the initial causal pathways by which exposure to conflict during early stages of life affects labour market outcomes. This study shall test two causal channels:

- Firstly, educational attainment is analyzed, according to its well-established effect on labour market outcomes.
- Secondly, the cognitive skills channel will be tested, based on the strong relationship between height (health indicator) and cognitive skills development during early life (Aizer et al., 2009; Case and Paxson, 2006). This choice is made because the SLHIS (2003 and 2011) doesn’t record information...

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12 In this survey, for respondents who left their residences during the conflict, the following information is collected (Section 10, Part C) : Q.3 When did the household leave home for the first time (Month, year)? Q.4 Have you returned to your place of origin since the war got over? Q.5 What year did you return (Month, year)? Q.6 Where did your household stay most after leaving home?

13 In the same vein, we can also control the migration variable in the outcome equation and assess its relevance.
on height\textsuperscript{14} of household members. However, in the SLIHS (2003 and 2011) there are 3 questions\textsuperscript{15} that can help to assess two cognitive skills (literacy and mathematics).

As far as the empirical strategy is concerned, this study will rely on the same framework as the one use by Islam and al. (2016) in the case of Cambodia. In their study, after estimating a reduced form as specified in equation [1], they assume that education is the main channel through which conflict affects labour market outcomes. Therefore, they run an estimation of a wage equation with endogenous education and use exposure to conflict as an instrument.

This study is in line with this logic and plans to estimate the following model:

\[
\begin{align*}
\bar{H}C &= \alpha + \sum_{k=1}^{k=4} \beta_k \text{household}_\text{asset}_\text{lost}_{ijk} + \sum_{k=1}^{k=4} \lambda_k \text{NPW}_\text{violent}_\text{report}_{ijk} + \gamma Z_i + \omega X_i + m_j + f_t + v_{ijt} \quad [2] \\
\text{LMO}_{ijt} &= \beta + r\bar{H}C_{ij} + \alpha X_i + \mu_d(t) + v_j + \tau_t + u_{ijt} \quad [3]
\end{align*}
\]

Equation [2] represents the first stage equation and has as dependent variable (HC) the number of years of education or measure cognitive skills. Equation [3] is the second-stage equation (the dependent variables for labour market outcomes, will be wage and the number of working hours instead of an indicator variable for labour market participation as in equation\textsuperscript{16} [1]).

In addition to measures of exposure to conflict, the level of education of the father and mother (Z) are also used as instruments. The success of this identification strategy is based on a double condition. Firstly, the instruments must be highly correlated with the number of years of education. Secondly, the only channel through which the exposure to war can affect labour market outcomes is through education. This condition is generally difficult to verify since conflict can affect labour market

\textsuperscript{14}SLIHS has information on health status (subjective measure) but that measure is poor to reveal information about the health during a long period, as height or weight can do.


\textsuperscript{16}We can still go for a control function approach with an indicator variable for labour market participation.
outcomes through other pathways. Therefore, this study will also test the relevance of other channels, especially cognitive skills (literacy and basic computation). This channel can be relevant as a proxy of height and can be more reliable than education, since graduation system could be more flexible during war. As a consequence, cognitive skills can represent a better signal in the labour market.

3.3. Data requirements and sources (max 400 to 700 words)

This study relies on a set of data to assess the consequences of exposure to conflict on labour market outcomes. These are the 2003/2004 and 2011 Sierra Leone Integrated Household Surveys (SLIHS), data from the 2004 No Peace Without Justice report and administrative data on demography and endowments of diamond for each chiefdom.

The SLIHS of 2003/2004 and 2011 are national, representative and original data collected by Statistics Sierra Leone. These surveys are organized in two main parts. The first part (A) records information on the socio-demographic characteristics of the household and its members and the second part (B) is devoted to household income and expenditure.

Part A, on which this study is focused, is composed of several sections, common to the two surveys; for instance: the geographic and demographic information of the household (gender, age, ethnicity, place of residence, location, etc.), education, health, employment, migration and housing. The 2011 survey has a special section dedicated to the effects of the conflict, while the 2003/2004 survey has just few questions.

Section 4 of these two surveys is focused on labour market issues (labour market participation, working conditions, job characteristics, etc.) and time use. As a result, it allows to derive appropriate measures of labour market outcomes targeted in this study. This section focuses on all members of the household having at least 7 years of age for the 2003/2004 survey and on individuals with at least 5 years of age for
the 2011 survey. This delimitation makes it possible to have in each database the labour market information for the target cohort.

With respect to the construction of the victimization measure of households in a chiefdom, this study is based on several sections of the SLIHS. Sections 0 and 5 of these two surveys record information on current and birth location. Section 10 of the 2011 survey is exclusively devoted to the effects of the conflict. Specifically, this section includes questions, with temporal references, on the effects of conflict on household income (part A), household assets (part B) and household displacement (part C). The connection of all this information will help to produce the household victimization measure used in this study.

The 2003/2004 and 2011 surveys collected information on 3174 households (12682 individuals in the labour market section) and 6727 households (21817 individuals in the labour market section), respectively.

The NPWJ report is based on fieldwork in Sierra Leone right after the conflict. It chronologically traces all attacks and battles in each Sierra Leone chiefdom during the conflict. It mainly contains confidential information as well as crosscheck information from media and NGO reports during the conflict. The report registered approximately 8,800 independent incidents in violation of human rights (NPWJ report, 2004). De Bruijne (2014) introduces the Sierra Leone Local-Location Event Dataset (SLL-LED) that is a comprehensive, disaggregated and geo-coded dataset of the Sierra Leonan conflict. This dataset is based on the NPWJ report and has multiple advantages than the one constructed by Bellows and Miguel (2009) (De Bruijne, 2014). Therefore, this study will use that dataset.

For data on diamond endowments before the war we will use information from Peace Research Institute Oslo (PRIO). Demographic data will be acquired from the government agencies mentioned by Bellows and Miguel (2009) or directly from these researchers. Geospatial data are provided by Sierra Leone national mining agency (gims.nma.gov.sl).

**SECTION IV – POLICY ENGAGEMENT**
4.1. Policy relevance

4.1.1. Describe policy context and needs

Sierra Leone’s development plans and strategic documents consider that solving labour market issues is a key to achieve inclusive growth, poverty reduction and social stability (Sierra Leone, 2005, Sierra Leone, 2013, World Bank, 2013, Braima and al., 2015). In other words, improving labour market outcomes is a key instrument for the inclusion of vulnerable groups (youth, women), to reduce poverty and to maintain a peaceful society. Since the consequences of the 1991-2002 Sierra Leonan conflict on human development did not evaporate with the end of battles or the signing of a peace settlement agreement, post-conflict analyses are important to mitigate the impacts. Specifically, identifying heterogeneous effects conflict can, result in in the long-term, to well targeted and efficient policies. By examining the effects of exposure to war on labour market outcomes at different stages of life in Sierra Leone, the results of this study will be useful for several reasons to current policies. 

Poverty reduction and the inclusion of vulnerable groups

In Sierra Leone, poverty affects 50% of the population and has a greater impact on vulnerable groups (Sierra Leone Statistics, 2014). In this context, better labour market outcomes are useful. On this point, the analysis, of the effects of exposure to conflict, at different stages of life, on labour market outcomes, permits to target vulnerable group (women and young active cohorts) after the war as well as possible pathways. As a result, it will be possible to set efficient and well targeted policies to tackle poverty and enhance women empowerment.
Peace preservation

Unemployment is recognized as one of the causes of conflict participation or resurgence (World Bank, 2011). Therefore, identifying and analyzing the heterogeneous effects of conflict on the labour market outcomes is important to set policies that help to ensure social stability.

Better address the impact of other shocks

Since the end of the war in 2002, Sierra Leone has been subject to other shocks, especially the Ebola epidemic and recently a natural disaster (heavy rains and flooding). As suggested by Islam and al. (2016) understanding the effects of exposure to violence on labour market outcomes also helps to anticipate and respond properly to the consequences of other shocks.

4.1.2. Consultations to date

<table>
<thead>
<tr>
<th>Name of institution/organization #1</th>
<th>Ministry of Finance and Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>List the key representative involved in consultations (names and titles/positions)</td>
<td>Mr. Alimamy Bangura/Director of Economic Policy Research Unit (EPRU)</td>
</tr>
<tr>
<td>Describe main outcomes of consultation – feedback or inputs received</td>
<td>This resource person suggested that we question the effect of conflict on cognitive skills, as policies could be rapidly strengthened in this area.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name of institution/organization #2</th>
<th>Ministry of Education, Science and Technology/Ministry of Labour and social security</th>
</tr>
</thead>
</table>
| List the key representative involved in consultations (names and titles/positions) | Mr. John Ansumana/ Director of the Planning Division  
  - Mr. Mustapha Javomso / Labour officer |
| Describe main outcomes of consultation – feedback or inputs received | These public authorities appreciate the effort of this proposal to carry out specific result and policy action for different regions and class of age. They suggest to find how |
can the results of the study serve as an assessment of post-conflict education and labour market policies launch by the government and development partners.

4.2. Engagement strategy

4.2.1. Identify target audiences

<table>
<thead>
<tr>
<th>Name of institution/organization #1</th>
<th>Ministry of Labour and social security</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explain relevance of this user to inform key decisions</td>
<td>This ministry is in charge of the development and implementation of Sierra Leone’s employment policy. From this perspective, the identification of factors that influence labour market performance is critical for the success of their programs. Therefore, this study is crucial because it will provide the first empirical evidence on the short and long-run effects of the conflict on labour market outcomes and human capital of civilians. As a result, recommendations drawn from this study will strengthen post-shock labour market policies in Sierra Leone.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name of institution/organization #2</th>
<th>Ministry of Youth Affairs and Ministry of Education, Science and Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explain relevance of this user to inform key decisions</td>
<td>This study is of interest to these ministries for at least two reasons. Firstly, it is concentrated on the young labour force that has been exposed to the conflict. Secondly, it appreciates the impact of conflicts on education and cognitive skills. For these reasons, the results of this study will strengthen and extend these ministries’ programs devoted to young civilians. It will help them especially to identify priority areas and group of individuals that need capacity-building interventions.</td>
</tr>
<tr>
<td>Name of institution/organization #3</td>
<td>Ministry of Finance and Development</td>
</tr>
<tr>
<td>-----------------------------------</td>
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</tr>
<tr>
<td>Explain relevance of this user to inform key decisions</td>
<td></td>
</tr>
<tr>
<td>Mobilization, optimal allocation of resources and prioritization of development objectives are the missions of this ministry. By identifying the heterogeneous effects of conflict on labour market outcomes and human capital, this research will result in well-targeted and efficient policy advices, in line with the objectives of this ministry.</td>
<td></td>
</tr>
</tbody>
</table>

### 4.2.2. Define outreach and engagement strategy

At the national level, during this study, economic policy authorities will be consulted to:

1. Further link issues to current government concerns;
2. Give more rationality and operational contents to the economic policy advices that will emerge from the results of the study.

In this concern, we will establish contacts with key decision-makers in the relevant ministries at the beginning of the study and we will ensure a wider communication through a short concept note (it will present the research motivations and objectives and will give the authors contacts to receive all inputs possible), policy briefs and a national dissemination workshop.

At the international level, dissemination will be ensured by the mentioned communication instruments and through participation in international conferences (ILO, World Bank, IZA, CSAE, etc.).

### 4.2.3. Outline your preliminary dissemination strategy

The dissemination strategy of this study relies on several actions.

- The results of this study will be presented and discussed in seminars of the department of economics in two main tertiary institutions in the country (Njala University and Fourah Bay College).
- As soon as the project is launched, we will share of a short concept note to inform stakeholders about the research;
- Organization of a national seminar for the dissemination of results to the economic policy authorities (Ministries of Finance and Economic Development, Labour and Education, Science and Technology) and to academics;
- Policy briefs will be widely distributed (newspaper, blog, ministries, NGO, international organization, etc.);
- A twitter account will also be launched at the beginning of the project in order to inform a wide public about our findings;
- The results of the final report of this study will be used to derived IZA discussion papers and CSAE working paper before being submitted to academic journals for publication.

SECTION V – OTHER CONSIDERATIONS

5.1. Describe any ethical, social, gender or environmental issues or risks that should be noted in relation to your proposed research project.

There is no major risk in this study. Nevertheless, throughout this project, the integrity and security of researchers and authorities associated will be ensured through responsible and transparent communication. Also, the use of Household Integrated Survey data requires the submission of a request to Sierra Leone Statistics. On this point, there is no particular concern. Finally, as regards the production of research outcomes, the background of the researchers involved in this project is a first guarantee of the success of this research.

5.2. References:


