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The Impact of Conflict and Shocks on Poverty

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ABBREVIATIONS AND ACRONYMS

ACLED	Armed Conflict Location & Event Data
AGI	Adolescent Girls Initiative
CPI	Consumer price index
CRS	Crisis Recovery Survey
CFSAM	Crop and Food Security Assessment Mission
DFID	Department for International Development
DT	Demographic targeting
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FSNMR	Food Security and Nutrition Monitoring Reports
GDP	Gross domestic product
GESS	Girls' Education South Sudan
GT	Geographic targeting
HFS	High Frequency Survey
IASC	Inter-Agency Standing Committee
ICT	Information and communication technologies
IDMC	Internal Displacement Monitoring Center
IDP	Internally displaced person
IGA	Income generating activity
IGAD	Intergovernmental Authority on Development
IMF	International Monetary Fund
IPC	Integrated Phase Classification
LIC	Lower income country
LMIC	Lower middle-income country
MPS	Market Price Survey
NBHS	National Baseline Household Survey

NBS	National Bureau of Statistics
NGO	Nongovernmental organization
PCA	Principal component analysis
PMT	Proxy means testing
POC	Protection of civilians
SNSDP	Safety Net and Skills Development Project
SPLA	Sudan People's Liberation Army
SPLM	Sudan People's Liberation Movement
SPS	Skills Profile Survey
SSA	Sub-Saharan Africa
SSDF	South Sudan Defense Forces
SSN	Social safety net
SSP	South Sudanese pound
UN	United Nations
UNICEF	United Nations Children's Fund
UNDP	United Nations Development Programme
UNHCR	United Nations High Commissioner for Refugees
UNMISS	United Nations Mission in South Sudan
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
UNOPS	United Nations Office for Project Services
USAID	U.S. Agency for International Development
WASH	Water, sanitation and hygiene
WDI	World Development Indicators (World Bank)
WFP	World Food Programme

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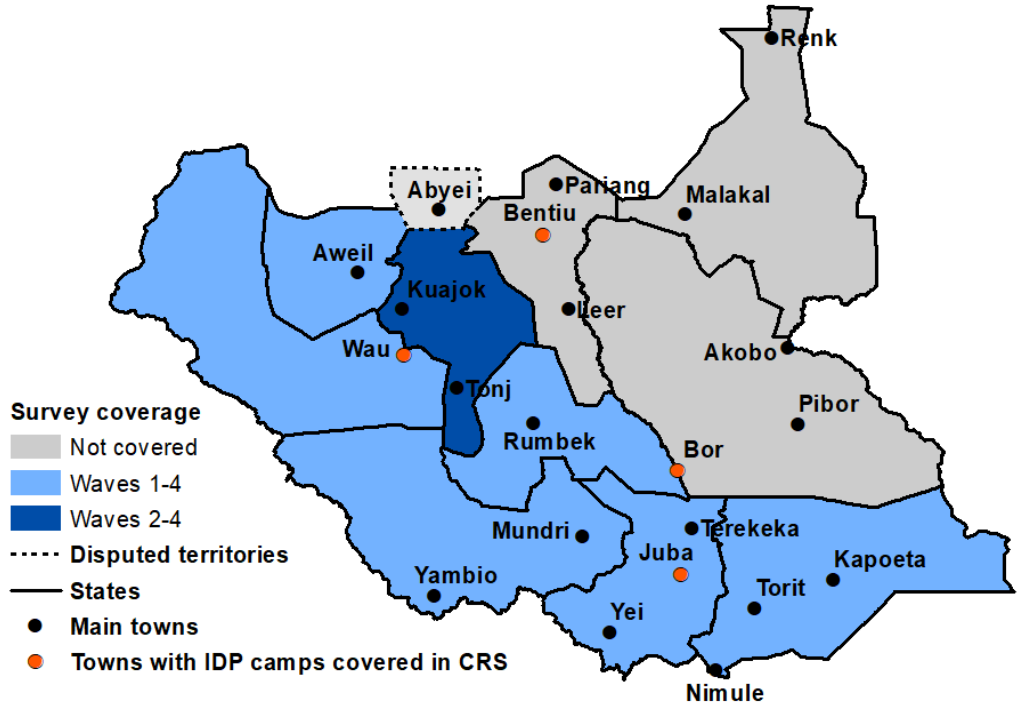
Executive Summary

The most recent nationally representative household survey measuring poverty in South Sudan was conducted in 2009. Thus, little was known about welfare and livelihoods in South Sudan in the early years of its independence since 2011. The High Frequency Survey (HFS) data collected between 2015 and 2017 by the South Sudan National Bureau of Statistics (NBS) in collaboration with the World Bank and funded by the U.K.'s Department for International Development (DFID) provides a long overdue update on poverty numbers in South Sudan. These rich datasets, designed in a consistent manner to facilitate comparisons, present an opportunity for a detailed analysis of welfare and livelihoods over the entire history of the country and across its different regions. However, it is important to keep in mind that the HFS could not cover the Greater Upper Nile region because of insecurity. Thus, the analysis in this report will be limited to the states in Greater Bahr el Ghazal and Greater Equatoria, and only when mentioned explicitly expanded – via satellite imputations – to the whole country. The analysis in this report will also cover displaced populations, given the scale of the problem in South Sudan, where almost a third of the population has been driven from their homes. The data underlying this analysis was collected in the Crisis Recovery Survey (CRS), a nationally representative survey of the largest internally displaced persons (IDPs) camps, which accompanied the fourth and last wave of the HFS, as well as the World Bank's Skills Profile Survey (SPS), which interviewed South Sudanese refugees residing in Ethiopia.

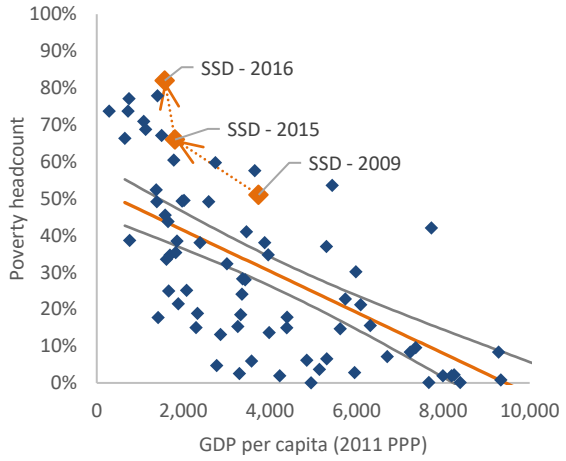
HFS and CRS coverage



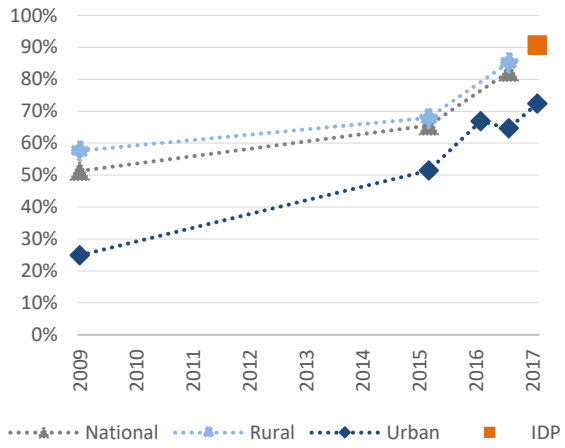
Poverty trends

South Sudan has become one of the poorest countries in the world with more than 4 out of 5 people living under the international poverty line in 2016. The region that became the Republic of South Sudan has a history marred by conflict, with a legacy of violence that has undermined the development of the country's social fabric and left it vulnerable to falling back into the cycle of conflict. Despite a vast oil wealth and a considerable influx of foreign aid after independence, civil war broke out in December 2013 and continues at the time of writing. The protracted impact of this conflict and the recent macroeconomic crisis have driven poverty rates to unprecedented levels. The poverty headcount – measuring the proportion of the population living under the international poverty line of US$1.90 PPP (2011) – was equal to 82 percent in 2016, placing South Sudan among the poorest countries in the world. The country's extremely poor developmental outcomes reflect a history of conflict, characterized by a poorly functioning state and a lack of institutional services provision. Currently, South Sudan ranks 181 out of 188 countries in the Human Development Index with a life expectancy of only 56 years.

Poverty headcount in LICs and LMICs



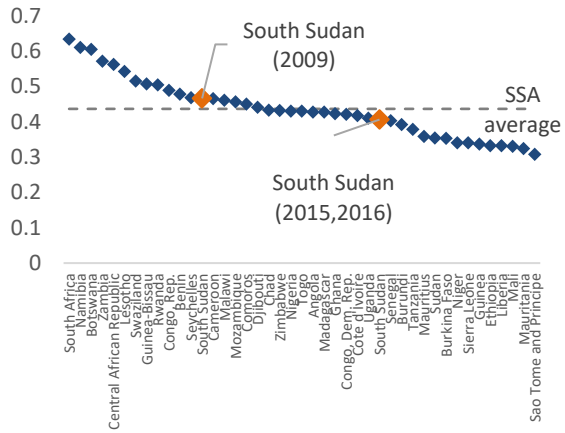
Poverty headcount in South Sudan



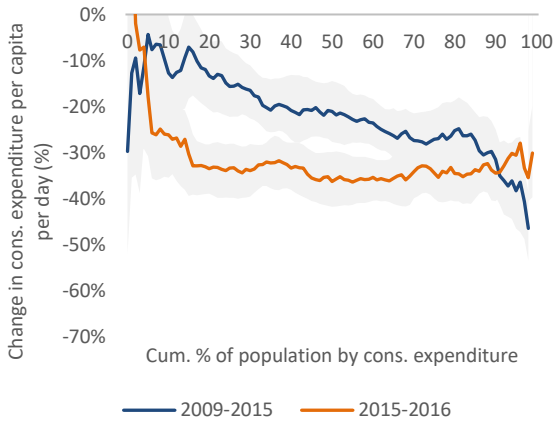
The recent sharp increase in poverty is driven by combined shocks of conflict and macroeconomic crisis. Poverty increased substantially from 51 percent in 2009 to 66 percent in 2015 and further to 82 percent in 2016. The poverty headcount increased by 2.5 percentage points per year, or 15 percentage points overall, between 2009 and 2015, before rising in a single year by an additional 16 percentage points. The sharp increase in poverty is aligned with the escalation and spread of the conflict since 2013, as well as with a macroeconomic crisis driven by the depreciation of the local currency and onset of near hyperinflationary price hikes. The impact of this dual shock was not limited to monetary poverty. Hardly any improvements can be observed between 2009 and 2016 across most dimensions of welfare. Much of the population in 2016, therefore, remained, returned or dropped further into a state of destitution with extremely low rates of access to amenities, infrastructure and services.

Consumption levels declined for households at virtually all levels of consumption, plunging much of the population into abject poverty. The change in consumption between 2009 and 2016 is large and negative across virtually all percentiles of consumption expenditure, implying that households with the same relative levels of expenditure are consuming less in 2016 than they did in 2009. The poverty gap, which measures poor households' average deficit in consumption relative to the poverty line, has increased from 23 percent in 2009 up to 32 percent in 2015 and then further to 47 percent in 2016. The average poor household has therefore gone from consuming about three quarters of the poverty line in 2009 down to only about one half in 2016. The poverty severity index places more weight on people with consumption levels that are further below the poverty line. Thus, changes in the severity index can better capture trends in severe welfare deprivation. In the period between 2009 and 2016, the severity index increased in relative terms even more than the poverty gap and poverty headcount, by 121 percent compared to 104 and 61 percent respectively. The larger relative increase indicates that the growth in the aggregate deficit in consumption is driven by households lying further below the poverty line.

Gini index in SSA LICs and LMICs

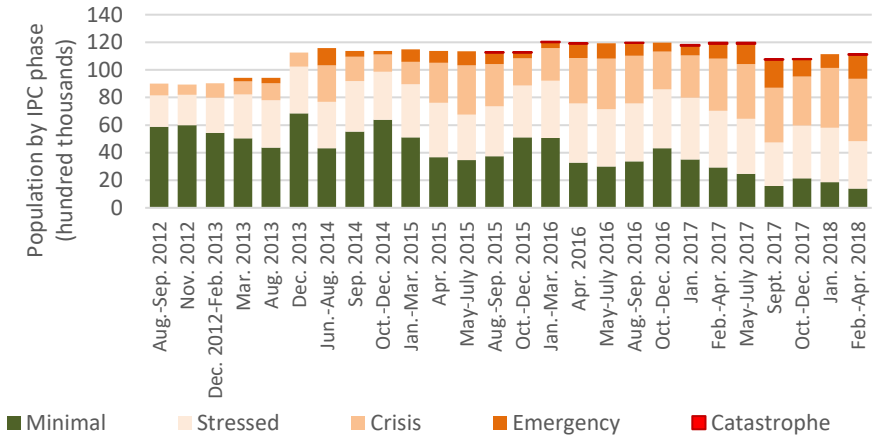


National growth incidence curves



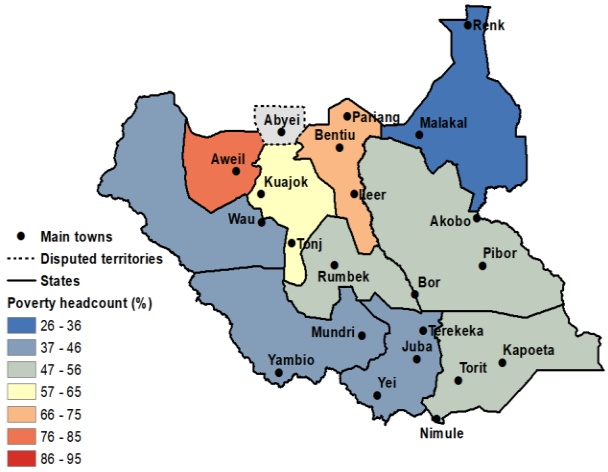
Inequality fell considerably between 2009 and 2016, driven by wealthier households experiencing greater consumption losses and a concentration of livelihoods barely at subsistence levels. Measuring inequality, the Gini index in South Sudan declined from about 0.47 in 2009 to 0.41 in 2016. However, the driver of the reduction in inequality was not pro-poor growth but rather a greater decline in expenditures for wealthier households compared to poorer households – literally a race to the bottom. The larger decrease in inequality occurred between 2009 and 2015. In contrast, consumption losses between 2015 and 2016 are much more uniform across poorer and richer households. The confluence of the escalation of the conflict and onset of near hyperinflation are likely responsible for these patterns, since once combined they are difficult to hedge against, independent of wealth status.

Population by IPC phase

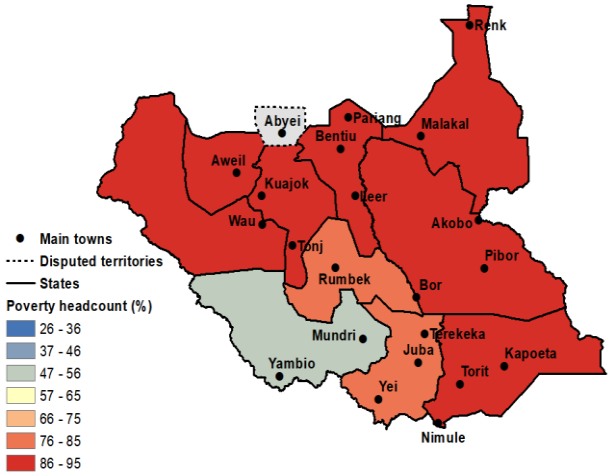


High levels of welfare deprivation as observed in South Sudan translate into widespread hunger and food insecurity, implying potentially large-scale child malnutrition and stunting. Depth of poverty such as that observed in South Sudan is synonymous with a situation of rampant food insecurity. Indeed, food security has continuously deteriorated since late 2012, sometimes reaching famine conditions in certain vulnerable counties. During the harvest season in 2017, a time when food usually abounds, as many as 4.8 million people were severely food insecure. By mid-2018, the number of severely food insecure people is expected to rise to more than 6 million, reaching almost half of the total population. Malnutrition among children is particularly worrisome, with some 1.1 million children under five expected to be acutely malnourished and almost 300,000 severely malnourished.

Poverty headcount in 2009



Poverty headcount in 2016 – incl. satellite imputation



Northern states experienced higher levels of poverty in 2009, but by 2016 the conflict and inflation caused poverty to rise across almost all states covered by the HFS. In 2009, higher levels of poverty were concentrated in the northern former states of Northern Bahr el Ghazal, Unity and Warrap. These states had historically lower levels of development due to their neglect before independence and the impact of the pre-independence civil war. By 2016, the fighting had led to rising poverty rates across the country. One notable exception is the state of Western Equatoria, which maintained high but more stable poverty rates. Western Equatoria was less affected by the fighting relative to other states and has benefitted from high soil fertility and favorable weather conditions. Indeed, Western Equatoria was the only state to record a consistent cereal production surplus in the years from 2014 to 2016. Accordingly, the residents of Western Equatoria were much more likely to be able to sustain their livelihoods through their own production.

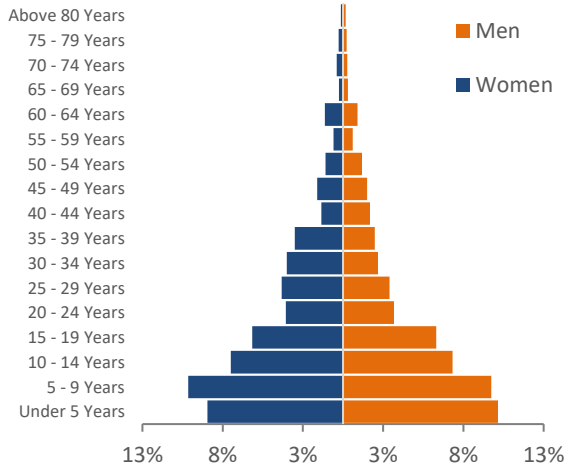
Imputing poverty headcount ratios in the states not covered by the HFS based on satellite and geo-spatial data indicate potentially extremely high levels of poverty in those regions as well. A statistical model leveraging the availability of satellite imagery and geo-spatial data is used to extend the poverty estimation to non-covered states in the Greater Upper Nile region. Poverty as measured in the 2016 wave of the HFS is modeled by a range of geo-spatial characteristics such as distance to urban centers, annual rainfall, urban-rural status, Integrated Phase Classification (IPC) and others, which are available for all areas of South Sudan. Based on this model, poverty is predicted for every square kilometer across South Sudan and weighted by local population counts, to eliminate potential bias caused by vast uninhabited areas. The results indicate high poverty rates in the Greater Upper Nile region, which is expected given the predominantly rural nature of the region and its state of instability. Given the higher incidence of conflict in the states with predicted poverty compared to the states covered by the HFS, it is likely that the poverty prediction underestimates poverty.

Poverty profile

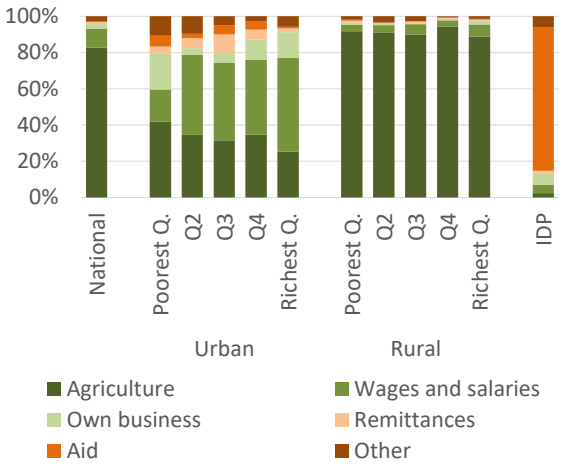
Poverty in South Sudan is a primarily rural, structural type of poverty, characterized by a general lack of access to services, infrastructure and opportunities beyond basic agricultural production. More than 85 percent of the 12 million South Sudanese reside in sparsely populated rural areas spanning an area of 650,000 square kilometers (approximately the size of France) connected by a mere 200 kilometers of paved roadways – about 2 percent of all roads in the country. Rural poverty has therefore always been much higher than urban poverty, with the urban populations always having had better access to amenities and services, generating more opportunities and better livelihoods. A high degree of inequality prevailed between urban and rural areas in 2009. However, the extremely disruptive consumption shocks from the conflict and near hyperinflationary price increases have led to the spread of a much more *situational* type of poverty, especially in urban areas. As a result, disparities across non-monetary indicators of wellbeing and access to services between *urban* and *rural* populations have become much more clearly delineated than disparities between the *poor* and *non-poor* populations.

South Sudan has a young population with few opportunities, exacerbating the risk of further conflict in the future. Life expectancy at birth in 2015 was estimated to be 56 years, which is much lower than the global average of 72 years and places the country among the bottom 10 countries in the world in terms of life expectancy. A majority of South Sudanese are not of working age. In 2016, almost 3 in 5 people were below 18 years of age and 1 in 5 under 5 years of age (57 and 22 percent respectively). A large portion of the population is therefore too young to be productively engaged in the labor market, such that the working age population needs to care for a large number of dependents. In 2016, the average ratio of dependents to workers was about 1.55. The burden of having to provide for a larger household is strongly related with the depth of poverty, and the shocks of the conflict and inflation have increased this burden.

Population distribution in 2016



Primary source of livelihood in 2016

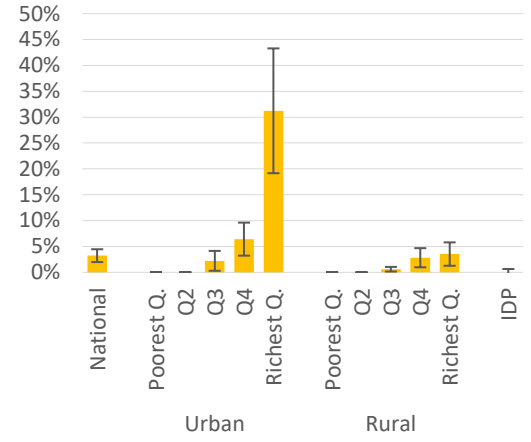


Rural households rely almost exclusively on their own agricultural production to sustain their livelihoods. The South Sudanese economy is overwhelmingly agricultural. Agriculture accounts for two-thirds of employment and more than 8 out of 10 households' primary source of livelihood (83 percent). Little economic activity in South Sudan is conducted outside of the agricultural sector. Employment in manufacturing is particularly low at about 2 percent of total employment. Salaried labor is associated with greater levels of consumption expenditure, especially in urban areas, as is expected in an economy such as South Sudan, where the stability associated with regular wages and salaries can stave off vulnerability to poverty. Women are slightly more likely to be employed in own-account agricultural production while being four times less likely than men to be holding waged employment (73 and 62 percent compared to 20 and 5 percent respectively).

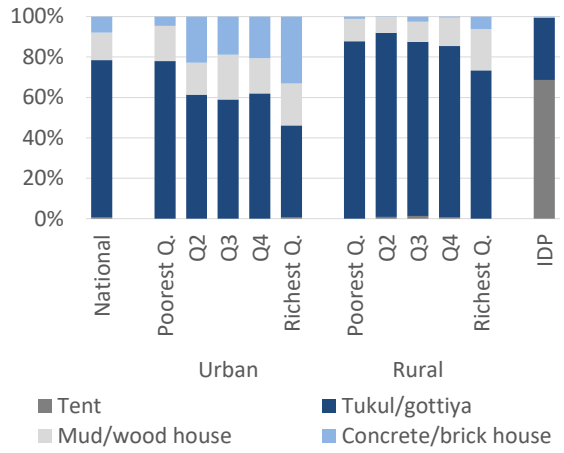
Infrastructure provision is extremely poor and almost exclusive to urban households. About 3 out of 4 people (78 percent) in South Sudan live in *tukuls/gottiyas* (traditional mud huts with grass thatched roofs). Access to modern sources of energy for lighting or cooking is extremely low: only 3 percent of households in 2016 lit their homes with electricity and virtually none used electricity as a source of cooking. Electrical

connections are more common in urban areas and virtually non-existent in rural areas (14 and 1 percent respectively). The poorest 40 percent of households according to a measure of consumption expenditure do not have access to electricity at all. The availability of adequate water and sanitation infrastructure is also extremely poor. The consequences are severe, with South Sudan having just emerged from its longest running cholera outbreak. In 2016, only about 1 in 8 people had access to improved sanitation infrastructure (13 percent). The divide is strongly demarcated along the urban-rural distinction: 2 in 3 urban residents have access compared to 1 in 20 rural residents (62 and 5 percent respectively). In contrast, about 7 in 10 people in 2016 had access to an improved source of drinking water according to water, sanitation and hygiene (WASH) guidelines, with similar rates across urban and rural areas (68 percent). These levels of access rank South Sudan among some of the lowest performing countries in Sub-Saharan Africa (SSA).

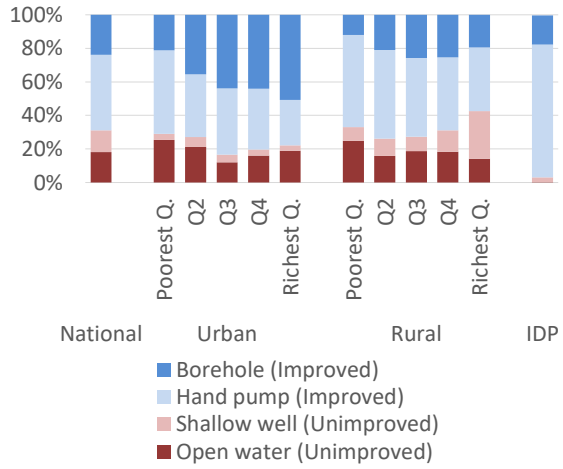
Access to electricity in 2016



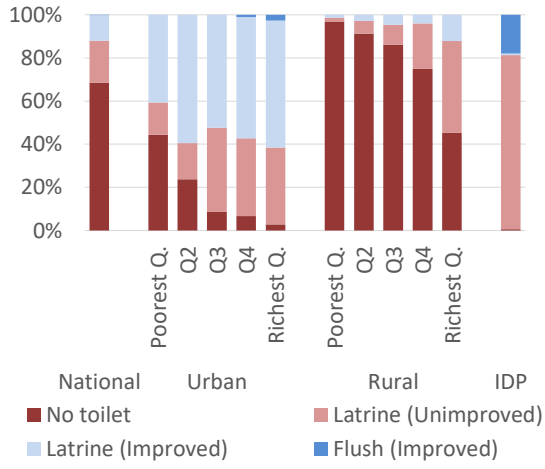
Quality of housing in 2016



Access to water sources in 2016

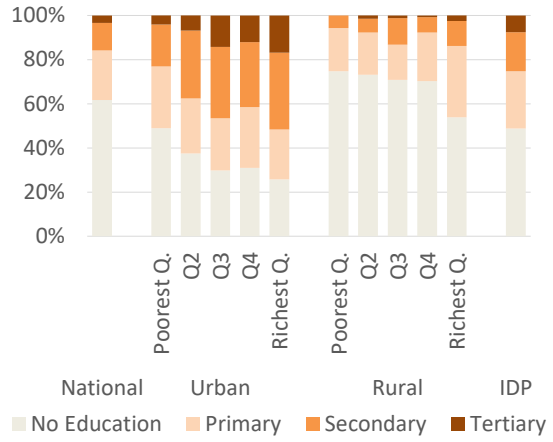


Access to sanitation facilities in 2016

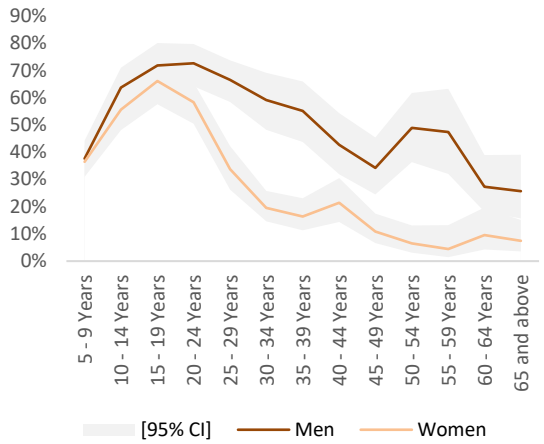


South Sudan has one of the lowest literacy rates in Africa, explained by low availability, access and quality of education. In 2016, only about 4 in 10 people in South Sudan reported being able to read and write. While this constitutes an improvement over the 2009 rate of about 3 in 10 (29 percent), it is still among the lowest in Sub-Saharan Africa. Educational outcomes are strongly positively correlated with consumption expenditure and poverty status, but the urban-rural divide is also here a much stronger determinant of both adults' educational attainment and children's school attendance. Low literacy levels and poor learning outcomes are the result of important deficiencies in the availability, access and quality of education in South Sudan. Severe underfunding has resulted in a gap in schooling infrastructure, inadequate teaching and learning environments, and in significant shortages of qualified teachers.

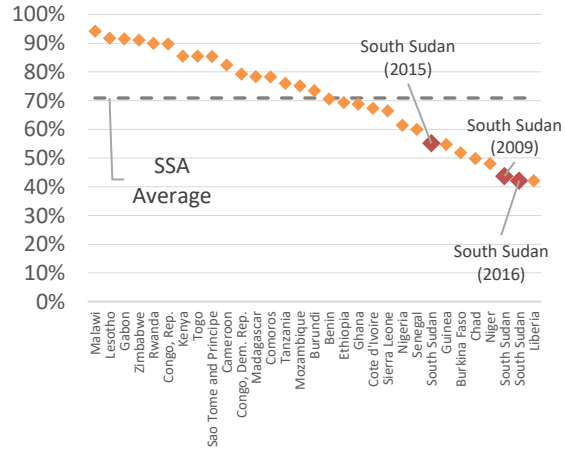
Adult educational attainment in 2016, ages 18+



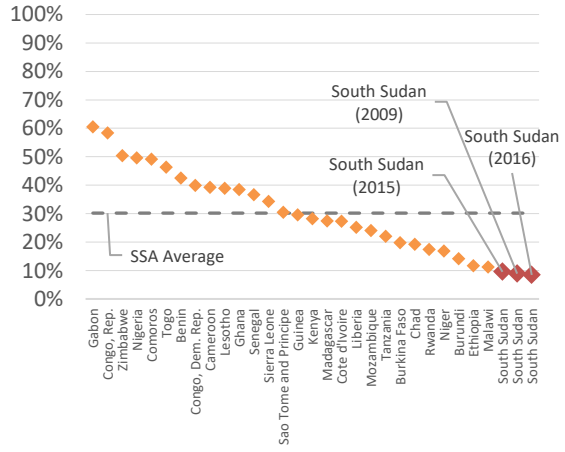
Has attended at least primary school by age group in 2016



Net primary attendance rate in SSA countries, 2009-2016



Net secondary attendance rate in SSA countries, 2009-2016



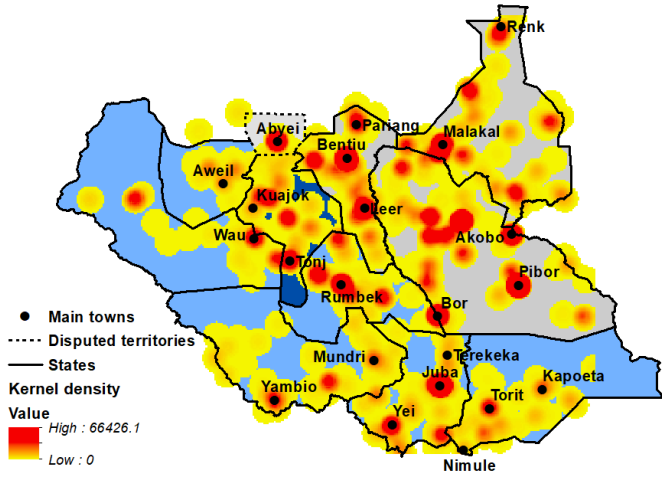
The youth's educational outcomes improved in comparison to previous generations in the states covered by the HFS between 2009 and 2015, with the gender gap continuing to close. Young people in South Sudan are much more likely to be attending or to have attended school than their counterparts in previous generations. Almost 2 in 3 children aged between 10 and 20 years have attended some schooling, compared to about 1 in 3 for older cohorts (64 and 37 percent respectively). Furthermore, the gender gap in educational outcomes is narrowing. Differences in attendance and literacy rates between boys and girls are much smaller for youths under 25 years old than among older adults. Nevertheless, these improvements are modest when put in an international context. Attendance rates of school-aged children in South Sudan remain well below the Sub-Saharan Africa average. Improvements were also limited to primary education; secondary attendance rates remained strikingly low at less than 1 in 10 throughout the entire period.

The escalation of the conflict and the macroeconomic crisis have undone these improvements and by 2016 attendance rates had fallen back to 2009 levels. The conflict has caused extensive damage to many schools, with an estimated 31 percent of schools across the country having suffered from some form of attack since 2013, and many others occupied by IDPs or armed forces. Many schools have therefore been shut down across the country. Out of all the schools that were open at any point since 2013, 1 in 4 were non-functional by the end of 2016. The education sector was also affected by the macroeconomic crisis. In 2016, teacher attendance fell by almost one-third, primarily due to the governments' continuing failure to pay teacher salaries. Furthermore, inflation had reduced households' ability to pay school fees. In 2017, about 4 in 10 children in urban areas who were not going to school were unable to do so because of a lack of financial resources (40 percent).

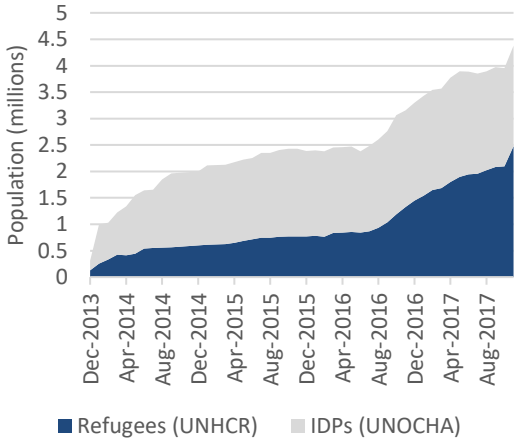
Drivers of poverty

Poverty in South Sudan is driven primarily by the conflict and was exacerbated by the macroeconomic crisis. Falling international oil prices leading to declining government revenues brought to light South Sudan's continued fragility with a relapse into cycles of violence. In December 2013 clashes broke out in Juba between factions of soldiers loyal to President Salva Kiir and former vice-president Riek Machar, triggering the third civil war in the region's post-colonial history. Despite the involvement of United Nations Mission in South Sudan (UNMISS) and Intergovernmental Authority on Development (IGAD) leading to the signing of the Addis Ababa peace agreement in August 2015, a constant state of violence has largely prevailed. In July 2016, the conflict intensified after renewed clashes in Juba, which ultimately resulted in the forced exile of Riek Machar. A Cessation of Hostilities agreement was signed between the two main warring parties in December 2017. However, present signs indicate that violence continues and conflict events, many of which are unrelated to the original central power struggle, continue to be reported across the entire country.

Heatmap of conflict fatalities, 2011-2017



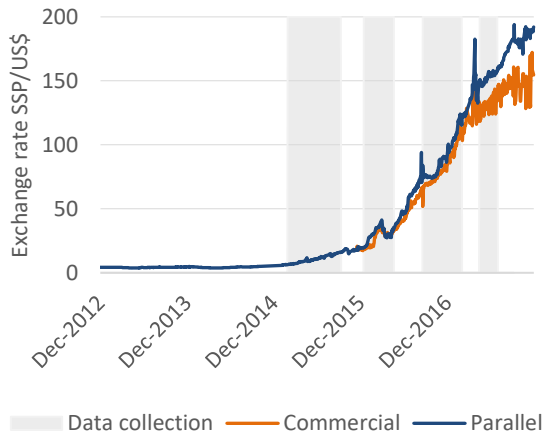
Refugee and IDP populations



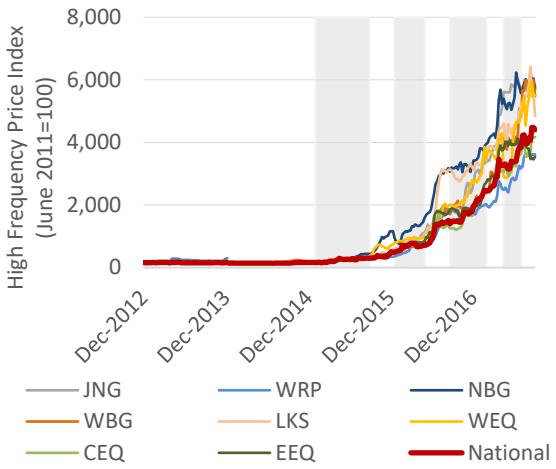
South Sudan is facing an unprecedented humanitarian crisis with more than a third of the population forcibly displaced amid growing concerns over ethnic violence. By the end of 2017, almost 4.5 million people had been forced from their homes – more than a third of the population. Approximately 1.9 million of the displaced have been internally displaced, while about 2.4 million have been forced to flee South Sudan entirely. Clashes among civilians increase in frequency, leaving some international observers fearing potential tribal and ethnic violence. There is growing evidence of hate speech especially on social media, tit-for-tat killings and atrocities, including on a large scale. Although the causes and drivers of the conflict are complex, ethnic elements contribute to the violence, personified by the conflict between President Salva Kiir, a Dinka, and former vice-president and leader of the opposition Riek Machar, a Nuer. A powerful indicator of the potential scale of ethnic clashes is the ethnic and tribal make-up of IDPs who sought refuge in protection of cilivians (POC) camps. In the surveyed camps in government-controlled areas of Bentiu, Bor and Juba, more than 19 in 20 IDPs are Nuer compared to less than one percent of the urban population of these cities.

The South Sudanese economy is experiencing a severe contraction, driven by falling oil revenues and conflict-related disruptions of economic production. The gross domestic product (GDP) of the South Sudanese economy contracted by 11.2 percent in FY2016/17 and was expected to further contract by 6.9 percent in FY2017/18. The decline in GDP was primarily driven by falling oil revenues. Nevertheless, the protracted insecurity and large-scale displacement, among other factors, took a huge toll on livelihoods, with private consumption consistently falling since the end of 2013. Smallholder farming is highly prevalent in South Sudan, where more than 8 out of 10 households rely on own-account agricultural production as a primary source of livelihood (83 percent). Widespread fighting and large-scale displacement over several consecutive planting seasons disrupted many households' normal agricultural activities, resulting in increasingly large production deficits each year. Poor production levels in 2016 translated into a net cereal deficit of almost 500,000 tons in 2017, enough to feed about 4.5 million people for an entire year.

Exchange rate SSP/US$, national average



High frequency price index



Falling global oil prices contributed to the rapid depreciation of the local currency, which triggered an inflationary process given a rise in import prices at a time of domestic shortages. The South Sudanese pound (SSP) underwent a process of rapid depreciation after it was floated in December 2015. The loss in value was driven by pressures from low international demand for local currency and a corresponding low domestic supply of foreign currency. It was exacerbated by concurrent high domestic demand for foreign currency due to the need to supplement domestic production shortages with imported food. Domestic markets could not absorb the increase in the relative prices of imports by increased production. Therefore, a high pass-through rate from the depreciation of the SSP to consumer prices imported inflation. Conflict-related disruptions to trade routes and market closures caused by insecurity aggravated existing market fragmentation and placed further upwards pressure on prices. Overall, in the two-year period between December 2015 and December 2017, the official consumer price index (CPI) rose by more than 1,100 percent, from 357 points up to 4,502 points (June 2011=100).

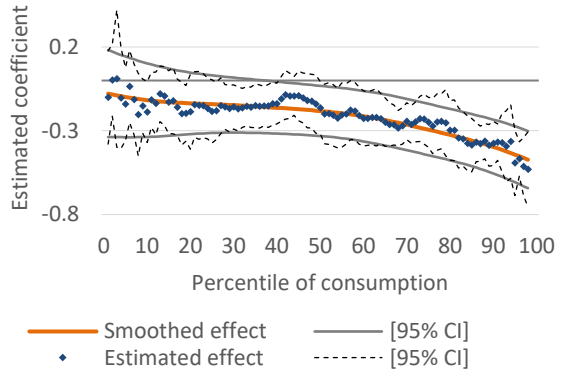
Low international oil prices and large security sector expenditures have strained government resources, leading to deficit financing and monetization, and further fueling inflation. Declining oil production and oil prices created difficulties for the government to meet its payment obligations, given its almost exclusive dependency on oil revenues to fund expenditure. The government resorted to financing its deficit by borrowing from the Central Bank and by printing money, which further contributed to inflation. The main components of expenditure included outsized spending on security and public administration, which accounted for a combined 70 percent of budgeted expenditure (28 and 43 percent respectively in FY2017/18). In contrast, the combined expenditures on health, education and infrastructure were expected to sum up to around only one eighth of total expenditure (4, 6 and 2 percent respectively). Developmental objectives therefore remain largely unmet, and the population's perceptions of government performance are extremely low.

Vulnerability and poverty

The impact of the conflict and inflation in South Sudan had pervasive effects and may further exacerbate poverty and vulnerabilities. By comparing the change in consumption of households more exposed to conflict to the change in consumption of those less exposed to conflict, the impact of conflict on consumption and, thus poverty, can be estimated. The impact is estimated at about 32 percent on average across households residing in conflict-exposed areas. Wealthier households experienced greater proportional losses, reaching approximately 40 percent in the top quintile of consumption compared to 10 percent in the bottom quintile. The impact of high inflation can similarly be estimated by comparing changes in households' outcomes before and after inflation between households more and less exposed to inflation. The estimation reveals that an increase in inflation by 10 percent increases poverty incidence by 3.5 percent. Girls are particularly vulnerable to escalating food prices, with a 10 percent increase in food price inflation reducing girls' primary and secondary school attendance by 1.3 percent. Food inflation also results in workers leaving the labor force and becoming unemployed. Unsurprisingly, high inflation exacerbates food insecurity and hunger, with a 10 percent increase in inflation resulting in 5.1 percent higher incidence of hunger across affected households.

The South Sudanese population is highly vulnerable to welfare deprivation, with a large portion of people living only just above the poverty line and in danger of falling below it in the case of even a small consumption shock. Vulnerability in this context means that an individual or household has a high risk of falling into poverty in the near future. In a country with such a high poverty rate, most non-poor households are themselves vulnerable. In 2016, about 3 percent of the total population lived within 10 percent of the poverty line and slightly over 5 percent within 20 percent. Although these estimates seem small, they represent about one-sixth and one-third of the *non-poor* population (16 and 31 percent respectively). Thus, a 10 percent consumption shock in the states covered by the HFS risks pushing about 160,000 people into poverty, while a 20 percent shock would push more than 300,000 people into poverty. Based on estimates of the impact of the conflict between 2009 and 2016, further escalation of the violence may lead to a poverty headcount reaching upwards of 9 in 10 people. Those already living in poverty or extreme poverty would also suffer, with the national average poverty gap reaching up to 60 percent. An increase in the year-on-year inflation rate by 50 percent would have a similar impact on the poverty headcount and push the poverty gap up to 65 percent.

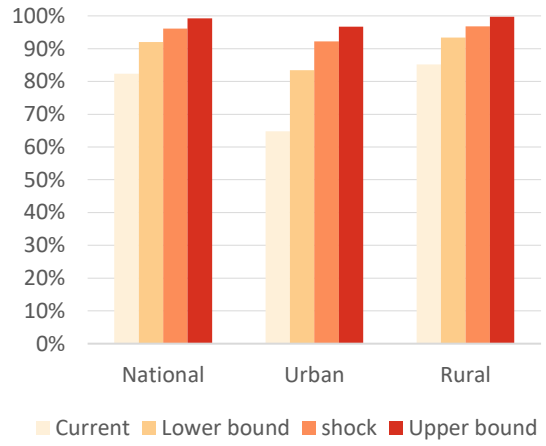
Estimated impact of conflict exposure on consumption, 2009-2016



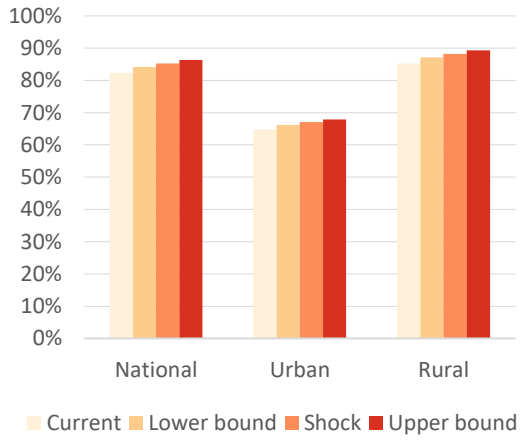
Estimated impact of inflation

Outcomes	Total Inflation	Food Inflation
Poverty		
Poor (below US$1.90 PPP)	0.353**	0.031
Log (real consumption)	-0.833***	-0.173
Education		
Attending school (Girls)	-0.024	-0.134***
Labor		
Active in the labor force	-0.124	-0.208***
Unemployed	0.019	0.086*
Hunger		
Hunger incidence	0.510***	0.327**

Simulated poverty headcount before and after escalation of the conflict



Simulated poverty headcount before and after 10 percent increase in inflation



Conflict and displacement

Exposure to conflict-related violence has had a particular impact on teenage girls, deteriorating their socio-economic and psychosocial wellbeing, even though it led to greater perceived empowerment. In addition to the effect of suffering direct harm from violent encounters, being exposed to violent conflict can have powerful impacts on psychological wellbeing. This is especially true for vulnerable groups such as teenage girls, who are experiencing traumatizing events during a key stage of personal and mental development. In a sample of teenage girls across four large cities in South Sudan, exposure to violent conflict resulted in the deterioration of a host of measures compared to a control group of non-conflict

affected girls. This includes employment opportunities taken up, marriage-related outcomes, personal aspirations, anxiety and physical household conditions. These challenges highlight the need for interventions that focus on the provision of psychosocial and mental health services, as well as wider prevention programming addressing pervasive gender-based violence and challenging harmful social norms. Most of these impacts have been observed in other contexts and are documented in the literature. Somewhat more surprisingly, the conflict seems to have increased girls' empowerment and entrepreneurial potential.

Conflict can force the shut-down of programs, though some positive program impacts can remain. A startup business grant program for youth in South Sudan had to be canceled due to the conflict, after grants were promised but before they were received in most cases. Those who had received a grant showed significant improvements in their savings and investments. However, employment and debt of participants who received training but did not receive grants remained largely unaffected by the program cancellation. This could be interpreted as a positive finding, as the unplanned cancellation did not appear to induce participants to make bad financial decisions. Furthermore, despite the cancellation of the grants, participants benefited from the business and life skills training components of the program, with an improvement in the frequency and number of good business practices. Although the cancellation of the grant disbursement had no negative impact on participants' psychological wellbeing, it did reduce the general trust level of participants.

Conflict leads to a large number of displaced households living in a dire economic situation. About 91 percent of IDPs are poor. South Sudanese refugees in Ethiopia fare slightly better, with a poverty headcount of 71 percent. IDPs and refugees living in camps are deprived of livelihood opportunities, and are forced to rely on aid. Non-displaced urban residents have substantially higher rates of labor force participation compared to South Sudanese refugees (in Ethiopia) and IDPs. In addition, both displaced and non-displaced people experienced a substantial shift from mainly salaried labor before the conflict to more generic and less remunerative help in non-farm business. Indeed, IDPs and refugees have suffered from nearly complete loss of almost all their livelihood means including land, livestock and other types of productive assets since the war broke out. Despite suffering a significantly declined standard of living, depleted assets and a condition of dependence, nearly 60 percent of IDPs and refugees in Ethiopia prefer to stay in their current location. *Personal security*, which was the main driver of displacement, continues to be singled out by IDPs and refugees as the most important factor in their intention to stay in their current place or to move to a different location.

Policy options

Breaking the cycle of conflict, and ending the current political and economic instability, is a prerequisite for meaningful poverty alleviation. In addition to the enormous suffering caused by the conflict and its disruptions, the uncertainty caused by a state of insecurity and by high inflation stifles the kind of long-term planning, both by institutions and individuals, that underlies economic recovery and growth. South Sudan is greatly underdeveloped and there is significant scope for interventions that are likely to generate large marginal benefits. However, as long as the conflict continues to drain government resources and block access to entire areas of the country, the potential benefits from development interventions are muted. Improving the security situation inside and outside displaced persons camps is also a prerequisite for abating the displacement crisis, given that security is the primary concern expressed by the displaced. It is therefore the utmost priority to achieve a peace.

Once even a preliminary peace holds, the government should take active steps towards credibly signaling a commitment to development objectives, in order to restore institutional legitimacy and break the cycle of conflict. The perception of the government's lack of legitimacy and the public's discontent with its effectiveness in meeting policy objectives are likely to be major barriers to breaking the cycle of conflict. Indeed, re-establishing confidence in institutions is a fundamental requirement for generating a lasting peace. The government must therefore credibly signal a commitment to development objectives, which have been largely neglected in the past, as evidenced by expenditure patterns. Implementing the ambitious program of macroeconomic reforms declared in the FY2017/18 budget, aimed at curbing inflation and maintaining price stability, provides such an opportunity. The budget also places an emphasis on controlling public expenditure, including the removal of subsidies to the national oil company, but a substantial reduction of military security expenditures will also be needed. The budget also aims at refraining from borrowing from the Central Bank and takes steps towards increasing non-oil revenues. Further fiscal reforms aimed at increasing transparency and curbing excess expenditures would also alleviate the population's concerns over corruption and mismanagement of public funds.

The urgency of the crisis nevertheless requires continued humanitarian intervention to avoid the potentially long-term consequences of acute malnutrition and stunting. Hunger and welfare deprivation have reached such depths that urgent action is needed to restore food security and avoid the potentially long-lasting development consequences of malnutrition at such a large scale. Child malnutrition and stunting have been consistently linked to lower economic growth and to a wide range of individual economic outcomes, including lower mental development, lower wages and fewer years of education – risking a "lost generation". Interventions addressing the population's immediate nutritional needs as well as interventions providing access to health and education are fundamental to South Sudan's development potential, and future stability.

Interventions supporting agricultural production can help to alleviate food insecurity and improve livelihoods in the longer term. South Sudan has enormous agricultural potential given its favorable soil, water and climatic conditions – yet most of the food sold in markets is imported from neighboring countries. Prior to the December 2013 conflict, 70 percent of the country's land was deemed suitable for crop production, but only 4 percent was being cultivated. More than 3 in 4 working age adults are involved in agricultural production, overwhelmingly as subsistence farmers. Although the South Sudanese economy is largely agricultural, farm productivity is low relative to neighboring countries. Interventions addressing agricultural productivity will be key to enhancing livelihoods. Improved agricultural production would also promote stability across local markets by decoupling the link between exchange rates and food prices. Such interventions could be accompanied by improvement of rural connectivity, such as road maintenance and repair as well as (prospectively) construction, to alleviate prohibitive costs borne by farms, traders and consumers. Of course, supporting connectivity is contingent on ending the conflict and reducing insecurity at least locally. Reducing food insecurity and generating income, improved agricultural production is an important pathway out of poverty.

A lasting peace will require generating opportunities for young people. Idle youth can become a risk factor for relapse into conflict. Although prioritization is challenging in a fiscally constrained space with ongoing insecurity, it is paramount to focus interventions on providing opportunities for at-risk youth. Participation in non-politically motivated mercenary work and crime has been found to respond to monetary incentives in this kind of context. Thus, additional income in the form of grants, workfare program opportunities, and/or training and entrepreneurship programs can lead to higher rates of employment, potentially reducing insecurity. Programs implemented in fragile contexts or targeted at at-risk youth help to reduce crime and mercenary activities, at least modestly. Such programs are also often linked to investment in productive assets, agricultural inputs, and livestock, an intervention in the context of South Sudan that could generate a substantial multiplier effect on local economies. Furthermore, there is evidence that young people in fragile states have a high rate of return to capital.

Economic and business development initiatives should include criteria for incentivizing participation of young women in economic activities. Adolescent girls exposed to conflict reported higher entrepreneurship index scores, indicating willingness to work and start businesses in the future. Such changing gender norms can be a consequence of conflict situations, resulting in part from the prolonged absence of men creating a necessity for women to increase their participation in the labor force. Economic engagement and capacity building interventions for adolescent girls could build on this increased entrepreneurial potential and empowerment. Depending on the types of activities in which girls choose to engage, an integrated approach that enables a school-to-work transition through both livelihoods and skills development, including cognitive and non-cognitive skills training interventions, would prove useful. Creating opportunities for girls has the potential to contribute to economic growth and poverty reduction, as well as address pervasive conditions of income inequality among the poor.

Public works programs can help to support livelihoods and to build up badly needed infrastructure, ideally leveraging the agricultural potential of South Sudan to contribute to food security. Public works programs are particularly suited to the South Sudanese context, partly because they help boost the stock of infrastructure. Improving access to infrastructure and services for neglected communities can also promote the government's legitimacy while providing a safety net for the poor. Furthermore, involving communities in the development of their own space may help to build social cohesion, particularly after a long period of conflict. Supporting the achievement of these objectives through a bottom-up approach, for example with communities selecting projects based on their needs, would enhance the potential impact of development projects on institution building. Successful examples include the World Food Programme (WFP) and DFID's Food Assistance for Assets programs, where food distribution and cash transfers are made conditional on community participation in asset building, where assets include various types of community level public goods, such as irrigation ditches. An added advantage of such a program is that it can help support policies and programs to improve agricultural production.

Political and ethnic tensions imply that universal or demographic targeting for social protection programs might be the most appropriate options. The choice of beneficiaries for a social protection program is an inherently political decision that can have significant implications for social cohesion and community satisfaction with the implementing institution, especially in a volatile and fragile context. In South Sudan perceptions of government performance and corruption are overwhelmingly negative. Thus, social protection programs should be conducted in a careful and transparent manner to avoid potential misperceptions of the programs' intention. *Self-targeting* is an attractive solution in such situations, which is inherent in the case of public works. However, self-targeting might lead to the exclusion of vulnerable groups. Specifically *targeting vulnerable groups*, such as women and children, mitigates some of the risk of elite capture and ethnic sensitivities and provides another potential solution. Targeted transfers can empower women, and transfers given directly to women increase their decision-making power, creating additional positive outcomes for children, like increased school attendance and improved nutrition. There might also be situations in which interventions respond to urgent basic needs, for example when responding to localized crises. In such cases, targeting programs may be burdensome and a *universal targeting approach* might be favored.

A phased approach can be readily implemented, at least in selected peaceful counties, but interventions must clearly pass a "do no harm" test. Breaking the cycle of conflict may be a slow process that takes generations, in which case waiting for a general return to stability may result in significant delays and little progress in development. Instead, a phased approach in which interventions are implemented on a county-by-county basis, for example, and where geographical coverage is gradually expanded, is a preferable course of action. However, careful consideration must be given as to whether the interventions abide by a principle of "do no harm", particularly in marginal communities where stability might be fragile. Indeed, the design of interventions should pay extremely close attention to avoiding inciting potential conflicts. This involves gaining an intimate understanding of localized dynamics of conflict as well as recognizing relevant actors and their respective incentives. Further, it is crucial to understand exactly how an intervention may interact with relevant dynamics and actors and the potential impact this might have on

community relations. Ideally, interventions should be providing opportunities to disengage from the violence and help develop alternative grievance redressing mechanisms.

The risk of relapse to conflict should not be used as a reason not to intervene at all, but interventions should be designed with measures to mitigate potential negative impacts of program cancellation. In highly fragile and insecure contexts, there is always a risk that programs are cancelled before being fully implemented. Yet negative impacts may not be so significant as to warrant not intervening in potentially risky environments. For example, although the startup business grant program was canceled, an evaluation suggests some lasting impacts were achieved for participants who received business training. Thus, interventions should be designed to be conflict-sensitive, including upfront communication of potential program cancellation, to avoid the negative implications of reduced trust in particular among women.

In sum, while the policy focus might need to be centered on re-establishing security and macroeconomic stability, short-term interventions can help the poor to mitigate negative impacts to some extent. Food security is necessary to avoid further suffering and reduce malnutrition with its often-lifelong impacts on health and economic wellbeing. Thus, programs to spur agricultural production, at least at the subsistence level, will be important. The potential loss of a generation due to weak or no schooling should also be avoided by ensuring that schools are rebuilt, opened and staffed with minimum security where necessary. Opportunities for the youth must be created to avoid idle youth and relapses into conflict. Entrepreneurial activities should also be offered, specifically for young women to tap into their improved entrepreneurial potential. Public works programs can be combined with social safety nets to create opportunities and foster resilience against future shocks. Interventions should be implemented even if the possibility of cancellation cannot be excluded, as negative implications from program cancellation are limited.

Introduction

The Republic of South Sudan gained its independence on 9 July, 2011 following a peace agreement with the Republic of Sudan in 2005, which put an end to Africa's longest running civil war. South Sudan is a small country with vast oil wealth. Apart from a few oil enclaves, the productive structure of South Sudan is one of a rural pastoralist society, where more than 4 in 5 people practice subsistence agriculture. More than 85 percent of the 12 million South Sudanese reside in sparsely populated rural areas spanning an area of 650,000 square kilometers (approximately the size of France) connected by a mere 200 kilometers of paved roadways – about 2 percent of all roads in the country. South Sudan's extremely poor developmental outcomes reflect a history of conflict, characterized by a poorly functioning state and a lack of institutional services provision. Consequently, large swathes of the population are living in a state of destitution. Indeed, South Sudan ranks 181 out of 188 countries in the Human Development Index with a life expectancy of only 56 years. With the recent escalation of the conflict, South Sudan has become one of the poorest countries in the world. In 2016, more than 4 out of 5 people were living under the international poverty line of US$1.90 PPP (2011).

Only two years after independence, civil war broke out in South Sudan and an unfavorable external macroeconomic environment triggered an economic crisis. The South Sudanese economy displays many of the characteristics of a war economy, including severe output contraction, rapid currency devaluation and soaring inflation. Oil dependency has tied the fate of the nation to global commodity prices, with their risk of volatility. The South Sudanese economy contracted by more than 11.2 percent in FY2016/17 and is expected to further contract by 6.9 percent in FY2017/18 (Table 1-1).[1] Widespread fighting and large-scale displacement over several consecutive planting seasons have disrupted many households' normal agricultural activities, resulting in increasingly large production deficits each year and widespread food insecurity. Compounding this, falling international oil prices triggered the rapid devaluation of the local currency driven by pressures from a low domestic supply of foreign currency, and exacerbated by concurrent high domestic demand for foreign currency due to the need to supplement domestic production shortages with imported food. Falling oil prices also meant a collapse of government revenues, with the government resorting to financing its deficit by printing money and incurring a growing stock of debt. Combined, these shocks have led to rapidly rising food prices, with the year-on-year consumer price index (CPI) inflation reaching its peak at 549 percent in September 2016.[2]

The most recent nationally representative household survey measuring poverty in South Sudan, the National Baseline Household Survey (NBHS), was conducted in 2009, but newly available data collected by

[1] World Bank, 2017a. Note: The lack of reliable data from the South Sudanese Government means that these numbers should be interpreted with caution.

[2] South Sudan National Bureau of Statistics CPI available at:

http://www.ssnbss.org/home/documents/publications.

the High Frequency Survey (HFS) between 2015 and 2017 provides a long overdue update. Little was known about welfare and livelihoods in South Sudan during the early years of its independence since 2011. The HFS data collected between 2015 and 2017 by the South Sudan National Bureau of Statistics (NBS) in collaboration with the World Bank and funded by the U.K.'s Department for International Development (DFID) provides an update on poverty numbers in South Sudan. These rich datasets, designed in a consistent manner to facilitate comparisons, present an opportunity for a detailed analysis of welfare and livelihoods over the entire history of the country and across its different regions. However, it is important to keep in mind that the HFS could not cover the Greater Upper Nile region, because of insecurity. Thus, the analysis in this report will be limited to the six former states in Greater Bahr el Ghazal and Greater Equatoria, and only when mentioned explicitly expanded – via satellite imputations – to the whole country.

Despite the scale of the crisis in South Sudan requiring urgent action, the primary objective of this report is not to provide an up-to-date picture of the rapidly evolving situation in South Sudan but rather to portray a detailed picture of the profile of poverty over the past decade and across the country. While it is clear that the South Sudanese crisis requires urgent and continued humanitarian intervention, the informational needs of many forms of emergency assistance cannot be entirely fulfilled by the analysis contained in this report. Such interventions will require information that is as recent as possible, given the rapidly evolving nature of the situation in South Sudan, which renders the task of the poverty analysis incredibly complex. The HFS already leverages several technological innovations to hasten the task of producing poverty estimates, and has achieved a faster turnaround than is typical. Given the depth and breadth of the analysis, this report should be seen as a companion to other relevant data collection exercises that best serve the needs of emergency assistance. For example, the work undertaken for this report cannot be equated to the Food Security and Nutrition Monitoring Reports (FSNMRs), implemented by the Food Security Cluster – including the World Food Programme (WFP), Food and Agriculture Organization of the United Nations (FAO), UNICEF, South Sudan NBS and other organizations – which collects valuable though slightly less comprehensive data on consumption and related indicators but at more regular intervals.[3] The data collected in the HFS differs in scope and covers a broader range of topics. This report is hence better suited to analyzing long-term trends in poverty and inequality, and allows linking these trends to trends in education, employment, living standards, access to services, and perceptions of public institutions and the future.

As well as offering a background on the conflict and shocks in South Sudan, Part I of this report leverages this newly collected HFS data to analyze trends in poverty and welfare deprivation during this tumultuous initial period of the world's youngest nation. *Chapter 1* describes the conflict and macroeconomic crisis as well as citizen perceptions of public institutions. The chapter identifies important constraints to breaking the cycle of conflict, particularly with respect to past government policy and the state of institutional legitimacy across the country. Next, Part I of the report details the sharp increase in poverty and deterioration of welfare that has occurred in South Sudan after the onset of the conflict in December 2013. *Chapter 2* details trends in consumption-based measures of welfare, including trends in poverty and inequality as well as food insecurity. This chapter details a sharp decline in welfare in recent years and an

[3] For more information on the FSNMR in South Sudan see: http://fscluster.org/south-sudan-rep.

unprecedented depth of welfare deprivation. *Chapter 3* takes a broader look at the dimensions of deprivation and describes the profile of the poor in South Sudan. This includes labor market outcomes and employment; access to amenities, infrastructure and assets; education and subjective wellbeing. Finally, *Chapter 4* explores the impact of the crisis on vulnerability and presents results from estimations of the effect of conflict exposure and high inflation. These results are considered with respect to policy recommendations for creating and sustaining resilience. The chapter also explores some of the issues surrounding the design of interventions in the context of South Sudan as well as the impact of different targeting mechanisms.

Part II of this report explores several specific facets of the impact of conflict with relevant policy implications for restoring stability and improving wellbeing. *Chapter 5* explores the impact of conflict exposure on young women and its implications for program design. This section uses data collected before and after the 2013 conflict, intended for the impact evaluation of NGO BRAC's Adolescent Girls Initiative (AGI), to examine the effect of conflict exposure on a host of socio-economic and psychological characteristics. The results suggest the need for interventions to tackle trauma and psychological wellbeing, and also indicate the potential benefits of interventions promoting entrepreneurship while leveraging newfound empowerment. *Chapter 6* explores potential implications of canceling programs in an insecure environment. In highly fragile contexts such as South Sudan there is the risk that programs are cancelled before being fully implemented. However, the impact of this on intended beneficiaries is not fully understood and cannot be made the explicit focus of research for obvious ethical reasons. This report uses a natural experiment based on a planned impact evaluation of a partially implemented business training program that had to be terminated due to the conflict. The results suggest that the impact of cancellation was negligible relative to the benefits accrued even from partial implementation. Nevertheless, an approach that carefully considers the principle of "do no harm" remains imperative. Finally, the issue of displacement is explored in *Chapter 7*, given that almost a third of the population has been displaced by conflict or food insecurity. The data underlying this analysis was collected in the Crisis Recovery Survey (CRS), a nationally representative survey of the largest internally displaced persons (IDPs) camps, which accompanied the fourth and last wave of the HFS, as well as in the World Bank's Skills Profile Survey (SPS), which interviewed South Sudanese refugees residing in Ethiopia.

The first priority for poverty alleviation and promoting development is an end to the conflict and re-establishment of macroeconomic stability, but additional interventions ranging from agricultural livelihood programs to increased opportunities for the youth to social protection programs are essential to safeguard developmental potential and avoid a lost generation. The primary obstacle to poverty alleviation in South Sudan is the conflict and macroeconomic instability, which will require complex political solutions as well as monetary and fiscal reforms. Nevertheless, while the policy focus may be centered on security and macroeconomic stability, specific interventions can help the poor to mitigate negative impacts to some extent. Food security is necessary to avoid further deaths and reduce malnutrition with its often-lifelong impacts on children. Thus, programs to spur agricultural production, at least at the subsistence level, will be important. The potential loss of a generation due to weak or no schooling should also be avoided by ensuring that schools are rebuilt, opened and staffed with minimum security where necessary. Opportunities for the youth must be created to avoid idle youth and relapses into conflict. Public works programs can be combined with social safety nets to create opportunities and foster resilience against

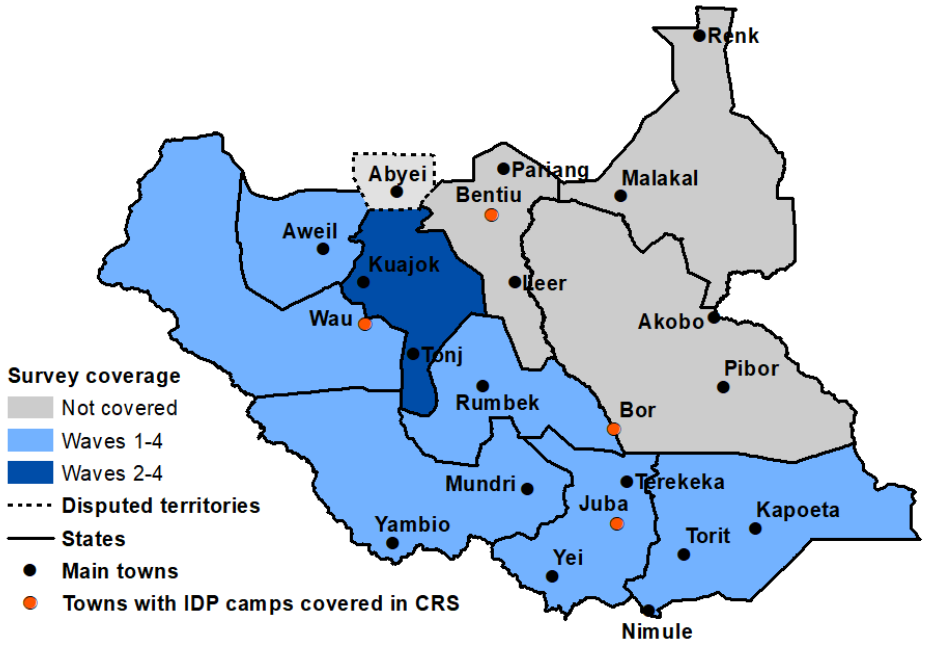
future shocks. These kinds of programs and interventions should be implemented even if the possibility of cancellation cannot be excluded, as negative implications from program cancellation are limited. Entrepreneurial activities should also be offered, specifically for young women to tap into their entrepreneurial potential. Finally, displacement should be ended implementing durable solutions, with a focus on guaranteeing the security of the displaced population.

Box 0-1: The High Frequency Survey (HFS) collects key data in South Sudan

The HFS conducted four waves of almost nationally representative surveys across South Sudan between 2015 and 2017. The HFS was based on a pilot that collected six waves of panel data across four of the largest urban centers between 2012 and 2014. The pilot was then scaled up in 2015 to a representative wave covering six of the 10 former states of South Sudan. Between 2015 and 2017, the HFS was expanded to a seventh state and conducted three more waves. Waves 2 and 4 were limited to urban areas but included a panel component. The HFS was accompanied by market price surveys, which collected weekly price data and daily exchange rate data in 17 locations across the country (Figure 1-1).

The fourth wave of the HFS was accompanied by the Crisis Recovery Survey (CRS), a representative survey of four of the largest IDP camps in South Sudan. The CRS was conducted simultaneously to Wave 4 of the HFS in mid-2017. It covered the largest protection of civilians (POC) camps with well-defined boundaries accessible to enumerators. The camps include Bentiu POC, Bor POC, Juba POC1 and 3, and Wau POC. Although the CRS covers POCs, where only 12 percent of South Sudan's IDPs are located, the detailed microdata fills important information and knowledge gaps for IDP-focused programming.

Figure 1-1: High Frequency Survey coverage, 2015-2017



Source: HFS 2015-2017 and CRS 2017.

The HFS and CRS questionnaires cover a large range of topics and draw a comprehensive picture of socio-economic livelihoods of people in South Sudan. The HFS questionnaire covers topics including demographics, employment, education and consumption, as well as perceptions of wellbeing and of the effectiveness of public institutions. Consumption is measured using the newly developed rapid consumption methodology.[4] The CRS and wave 4 HFS questionnaires, designed to be exactly comparable, also collected details on displacement-specific outcomes guided by the IASC Framework on Durable Solutions for Internally Displaced Persons.[5] These were developed to understand the motivations for displacement, return intentions, sense of security, relations with the surrounding community, social capital, and pre-displacement outcomes in the standard of living, education and labor.

The data from the HFS and CRS is complemented by video testimonials providing a glimpse into the lives of the people of South Sudan. The testimonials capture the situation on the ground and provide a much richer qualitative element that accompanies and complements the quantitative data. While the data may help the government fine-tune its policies, the videos may reach a broader audience and depict the sense of powerlessness, the pain of hunger, the stress of hopelessness and the feelings of disappointment that characterize people's experiences. Overall, this helps to create a more rounded perception of the situation on the ground in South Sudan.[6]

[4] More details on the application of the rapid consumption methodology in Appendix A. This methodology was developed in Pape and Mistiaen, 2015.

Background

KEY MESSAGES

The impact of the protracted conflict has been to destroy the primarily agricultural livelihoods of the South Sudanese, leaving many exposed to heightened food insecurity. The South Sudanese economy contracted by more than 11.6 percent in FY2016/17 and was expected to contract further by 6.6 percent in FY2017/18.[7] Though this contraction is primarily driven by declining oil revenues, insecurity and large-scale displacement as a result of the conflict have led to a large decline in agricultural production, the primary source of livelihood for much of the population. Household consumption has declined continuously since the outbreak of the conflict in 2013, and many households have fallen into poverty.

Falling international oil prices triggered the rapid devaluation of the local currency driven by pressures from a low domestic supply of foreign currency, exacerbated by concurrent high domestic demand for foreign currency due to the need to supplement domestic production shortages with imported food. In light of these domestic production shortages, the devaluation of the currency passed through to consumer prices and resulted in a process of imported inflation. An increase in the share of food consumption produced at home can be observed across the population; however, this was not enough to prevent growing poverty and food insecurity.

[5] The Inter-Agency Standing Committee (IASC) Framework on Durable Solutions for Internally Displaced Persons aims to provide guidance for achieving durable solutions following internal displacement in the context of armed conflict, situations of generalized violence, violations of human rights and/or natural or human-made disasters. The framework primarily aims to help international and non-governmental actors to better assist governments dealing with humanitarian and development challenges resulting from internal displacement. The framework is also designed to assist those in the field in determining whether a durable solution to internal displacement has been found, depending on the context of the local environment. The framework builds on a pilot version released in 2007, which was revised and finalized in 2009. The revision process was led by the Representative of the Secretary-General on human rights of internally displaced persons, working in close cooperation with the Cluster Working Group on Early Recovery and the Protection Cluster Working Group, in particular the United Nations High Commissioner for Refugees, the United Nations Development Programme, the Office for the Coordination of Humanitarian Affairs, the International Organization for Migration, the United Nations Children's Fund (UNICEF), the United Nations Environment Programme and the Internal Displacement Monitoring Centre. Support was also provided by the Brookings-Bern Project on Internal Displacement.

[6] The translated testimonials are available at: http://www.thepulseofsouthsudan.com.

[7] World Bank, 2017a.

Low international oil prices as well as large security sector expenditures have strained government resources, leading to deficit financing and printing money, further fueling inflation. The FY2017/2018 budget seemed to indicate a significant commitment from the government to reducing the deficit and stabilizing inflation; however it remains to be seen whether this will be implemented. Based on the trends of past few years, it is likely that government expenditures will remain skewed towards defense and security at the expense of development objectives. Therefore, much of the assistance available to citizens may continue to be primarily donor funded in the form of short-term humanitarian aid. **The surveys reveal across-the-board citizen dissatisfaction with the governments' perform*ance in improving livelihoods and considers international development institutions more effective. Without a comprehensive set of reforms, it is unlikely that meaningful poverty alleviation can be achieved, and public perceptions about the legitimacy and effectiveness of South Sudan's public institutions may continue to suffer.***

1. Conflict and Shocks in South Sudan

The fragile institutional structure in South Sudan eventually succumbed to internal and external pressures: in 2013 civil war broke out anew and South Sudan relapsed into cycles of violence. Internally, the elite pact underlying peace broke down, due in part to perceptions of the consolidation of power by South Sudan's president, who had drastically reorganized the country's leadership and dismissed a large number of high-ranking political and military appointees. Externally, falling oil prices placed pressure on government revenues and triggered an economic decline. In December 2013, clashes broke out in Juba between factions of soldiers loyal to President Salva Kiir and factions loyal to former vice-president Riek Machar, triggering the third civil war in the region's post-colonial history.[8] Although the involvement of the United Nations Mission in South Sudan (UNMISS) and Intergovernmental Authority on Development (IGAD) led to the signing of the Addis Ababa peace agreement in August 2015, a constant state of violence has largely prevailed (Figure 1-1).[9,10] In July 2016, the conflict intensified after renewed clashes in Juba, which ultimately resulted in the forced exile of Riek Machar.[11] Since then, violence has continued to spread ever further throughout the country (FIgure 1-2).[12] Recently, a Cessation of Hostilities agreement was signed between the two main warring parties in December 2017. However, present signs indicate that violence

[8] The first being the north-south Sudan war, 1955–1972; the second, 1983–2005; the third, the civil conflict in South Sudan, 2013 to date.

[9] United Nations OHCHR, 2018.

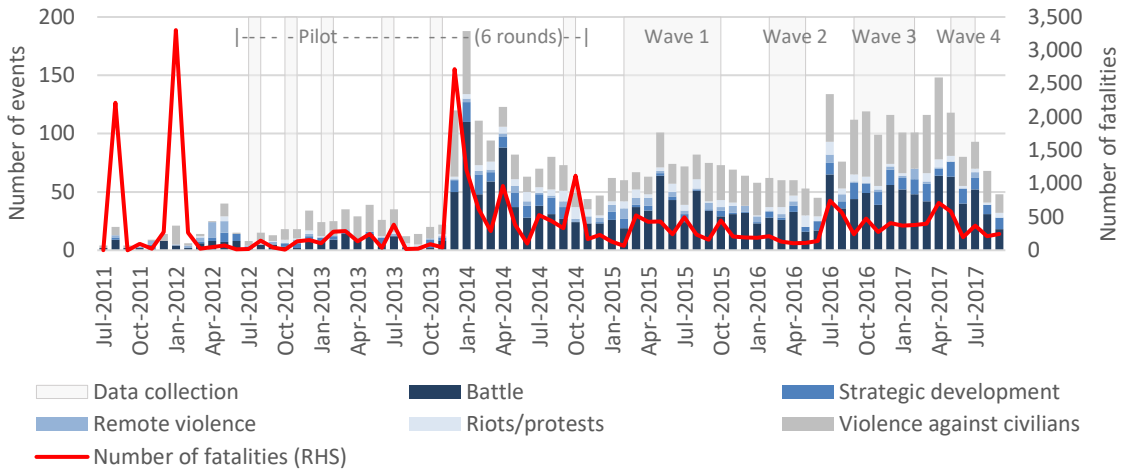
[10] IGAD is the regional block for the Horn of Africa under the African Union. Its member countries are: Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, the Sudan and Uganda.

[11] United Nations OHCHR, 2018.

[12] United Nations Report of the Secretary-General on South Sudan, *S/2017/1011*, 1st December 2017.

continues and conflict events, many of which are unrelated to the central power struggle, continue to be reported across all 10 states.[13]

Figure 1-1: Conflict events by type per month since independence and HFS data collection



Source: Authors' calculations based on Armed Conflict Location & Event Data (ACLED) project data (accessed on Sept 30, 2017).

[13] United Nations Report of the Secretary-General on South Sudan, *S/2017/784*, 15 September 2017.

Box 1-1: Understanding the conflict in South Sudan

The independence of The Republic of South Sudan on 9 July, 2011 marked the end of one of Africa's longest running civil wars, but the legacy of violence hindered the development of adequate democratic institutions. The region that became South Sudan has a history marred by conflict. South Sudan is a highly diverse region comprising more than 63 distinct ethnic and language groups, and the perpetual state of violence and insecurity has harmed the development of its social fabric. During the wars prior to independence, even though the primary conflict was with northern Sudan, much of the fighting took place between southerners.[14] After the Juba declaration of 2006 and a brief period of stability, the movement for independence quickly gained momentum and served to unite various southern factions. However, deep and unresolved political grievances meant that this process was not conducive to building solid democratic foundations.[15] Ultimately, the result was a system with few checks and balances in place and weak institutional mechanisms to hold governing bodies accountable.[16]

Windfalls from massive oil revenues in South Sudan's early years incited the growth of a large patronage network underpinning the peace process. South Sudan emerged from independence as a dynamic country benefitting from a massive humanitarian aid influx and an extraordinary windfall from oil revenues.[17] Government revenues grew rapidly, from about US$100,000 in 2005 to US$3.4 billion in 2011/2012. This revenue was used by the government to effectively buy peace, with the absorption of various factions and insurgent militias into the governing party's payroll – the Sudan's People Liberation Army (SPLA), renamed the South Sudan Defense Forces (SSDF).[18,19] Just before the 2005 (Nairobi) agreement the SPLA numbered around 40,000. By 2011, the SPLA payroll had grown to include 240,000 members, with an additional 90,000 'organized forces' including police and wildlife services, and 745 generals.[20] In these early years the defense and security sector accounted for about 60 percent of the government's budget. The weakness of institutions and lack of accountability allowed the growth of widespread corruption, even publicly recognized by the government.[21] An audit of the government accounts of 2006 indicated that approximately US$1 billion had 'disappeared'. At one point the president admitted that some US$4 billion had been stolen by Cabinet ministers.[22]

Falling international oil prices and the consequent decline in government revenues further undermined this system, ultimately contributing to the breakdown of those fragile political alliances. With very little other economic activity and a minimal tax base, oil revenues have always accounted for a large portion of government revenues. In the 2016 budget, oil revenues were expected to account for 80 percent of government expenditure.[23] Persistently low oil prices have led to sustained difficulties in maintaining the government's payment obligations, including the extensive patronage networks sustaining peace. The situation was exacerbated by the revenue sharing agreement with Sudan, whereby South Sudan paid a flat fee to export its oil using pipelines running through Sudanese territory. The disagreement ultimately resulted in a production shutdown in 2012 as oil prices fell below levels at which extraction remained profitable. Although production resumed in 2013, it never fully recovered to pre-war levels.[24]

South Sudan is facing an unprecedented humanitarian crisis with more than a third of the population being forcibly displaced. By the end of 2017, almost 4.5 million people, or a third of the population, had been forced from their homes.[25,26] Approximately 1.9 million of the displaced have been internally displaced, while about 2.4 million have been forced to flee South Sudan entirely (Figure 1-3). The most common destination for refugees is Uganda, which neighbors the more populous southern states, and where more than one million people had sought refuge by the end of 2017. Other principal destinations include Sudan and Ethiopia, which host about 780,000 and 420,000 South Sudanese refugees, respectively. Many of the remaining displaced people have fled to neighboring Kenya and the Democratic Republic of the Congo (approximately 100,000), with a small minority in the Central African Republic (approximately 2,000).[27]

[14] Johnson, 2011.

[15] Pinaud, 2014.

[16] De Vries and Schomerus, 2017.

[17] Osborne, 2014.

[18] De Waal, 2014.

[19] *Sudan Tribune*. "South Sudan president says changed SPLA name to represent will of people." Juba. August 4, 2017.

[20] International Peace Institute, 2015.

[21] See, for example: "War Crimes Shouldn't Pay", *The Sentry Report*, September 2016.

[22] Pinaud, 2014.

[23] IMF Article 4 consultation, 2016.

[24] IMF Article 4 consultation, 2016.

[25] UNOCHA: https://www.unocha.org/south-sudan & UNHCR: http://data.unhcr.org/SouthSudan/regional.php.

[26] World Development Indicators, The World Bank.

[27] UNHCR South Sudan Regional Refugee Response Plan 2018: https://data2.unhcr.org/en/documents/details/61894.

FIgure 1-2: Heatmap of conflict fatalities, 2011-2017

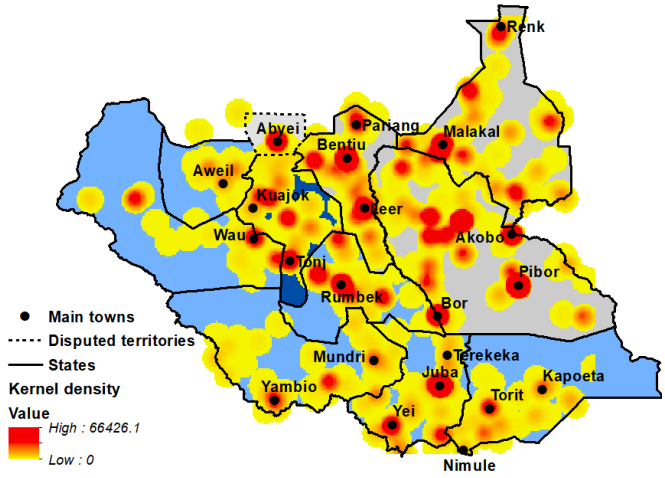
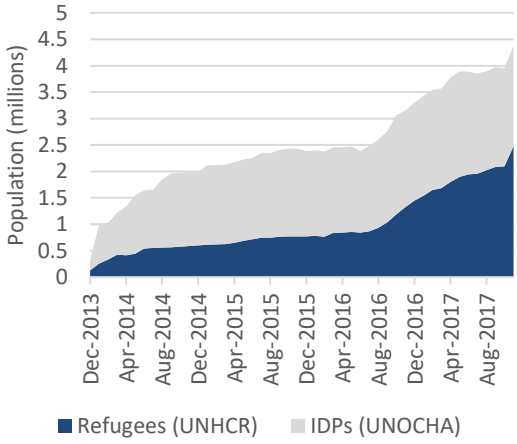


Figure 1-3: Refugee and IDP populations



Source: Authors' calculations based on ACLED, UNHCR and United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) data.

The prevalence of violent crime and other conflict-related afflictions is extremely high. A large share of the population knows someone who has been affected by violent crime, and often this is related to the conflict. Acts of violence against civilians committed by armed forces remain common and have increased in frequency (Figure 1-1). Approximately 1 in 10 people personally know someone who was assaulted in the past 12 months, and even more know someone who was killed by a gunshot or by explosives. A noteworthy 3 percent of respondents know someone who has been kidnapped. In the recent conflict, an estimated 16,000 children have been recruited into various armed groups and forces participating in the conflict.[28] As a result of this permanent state of insecurity, many people do not feel safe even within the confines of their homes. More than 1 in 6 people feel unsafe when they are alone at home, 1 in 8 feels unsafe when walking around during the day, and almost half feel unsafe when walking around at night (16, 12, and 49 percent, respectively).

Clashes among civilians, such as tribal and ethnic violence, are increasing in frequency, leaving some international observers fearful of the potential for ethnic violence.[29] Many international organizations and external observers have issued warning over the risks of genocide and mass atrocities. There is growing evidence of hate speech especially on social media, tit-for-tat killings, and atrocities including on a large scale.[30] The ethnic make-up of the POCs interviewed in the CRS exemplify these growing tensions. Although

[28] Human Rights Watch, 2015.

[29] South Sudan Law Society and United Nations Development Programme (UNDP), 2015.

[30] See for example: African Union. 2015. Final Report of the African Union Commission of Inquiry on South Sudan and the UN Panel of Experts Report to the UN Security Council, S/2016/70, January 2016; UN Secretary General (UNSG) Report (November

only about 1 percent of the urban population is from the Nuer tribe (the tribe of the leader of the opposition, Riek Machar) almost 4 in 5 IDPs in camps are Nuer. These estimates reach upwards of 19 in 20 in the camps in Juba, Bor and Bentiu, which are located in government-controlled areas (see Chapter 7 in Section II for more details). Furthermore, reports of incidents of cattle raiding, which often take place along ethnic lines in South Sudan, have been increasing.[31] Among the households who raised cattle interviewed in the HFS in 2016 about 8 percent had been the victim of theft in the past 12 months and an additional 4 percent specifically mentioned cattle raiding.[32]

1.1. Lasting conflict

The South Sudanese economy has experienced a severe output contraction since the conflict started in December 2013. The South Sudanese economy contracted by more than 11.2 percent in FY2016/17 and was expected to further contract by 6.9 percent in FY2017/18 (Table 1-1). The protracted insecurity and large-scale displacement, among other factors, took a huge toll on livelihoods, with private consumption falling consistently since the end of 2013, and expected to decline by an additional 15 percent in FY2017/18. External markets have been disrupted, with exports and imports collapsing since 2015. This is reflected by falling manufacturing and services GDP, both of which have experienced significant declines since 2015. The economy is frozen by this instability and capital investment was estimated to be insignificant between 2015 and 2016. In contrast, government consumption has consistently increased given the prioritization of defense spending. Continued government spending in times of economic hardship and low revenues therefore led to a worsening fiscal balance between 2013 and 2016.

Table 1-1: South Sudan macroeconomic outlook

	2012	2013	2014	2015e	2016e	2017f	2018f	2019f
GDP at constant market prices (% change)	-46.1	13.1	3.4	-10.8	-11.2	-6.9	-3.5	1.8
Private Consumption	4.5	4.2	-6.5	-26	-16	-15	-7.5	0.7
Government Consumption	-6.8	10.9	13	1.4	3	3	4	4
Gross Fixed Capital Investment	-53.2	17.6	-2.5	2	0	3	4	5
Change in Inventories, percent contribution	0.1	0	0	0	0	0	0	0
Exports, Goods and Services	-91.9	99.5	52.8	-40	-44	-20	-10	0
Imports, Goods and Services	-35.3	10.7	5.1	-41	-17	-10	3.2	5.1
GDP at constant factor prices (% change)	-46.1	13.1	3.4	-10.8	-11.2	-6.9	-3.5	1.8

2016); statements of the UNSG Representative for the Prevention of Genocide (November 2016); the UN Human Rights Council (December 2014).

[31] Wild et al., 2018.

[32] Livestock herding is a common employment activity in South Sudan; one fifth of all households interviewed raised cattle and about one half raised livestock of some kind (20 and 47 percent, respectively).

Agriculture	8.4	15.5	5	2.5	-15	-10	-5	0
Manufacturing	-81.2	45.7	26.9	-23.3	-20.5	-7	-1.5	1.8
Services	4.8	18.2	-6.2	-6.1	-6.1	-6.1	0	2
Inflation (Consumer Price Index)	45.1	0	1.7	153	410	125	n.a	n.a
Current account balance, percent of GDP	-20.6	8.7	-4.8	-4.8	-3.8	-6.1	-5.2	-3.7
Fiscal balance, percent of GDP	-16.3	-3.3	-12	-20.8	-8.5	-4.6	-4.4	-3.6
Poverty rate+	50.1	..	55.1e	65.6*	82.3*			

Notes: e = estimate, f = forecast. * These estimates exclude the states of Warrap, Upper Nile, Unity and Jonglei (more information on consumption and poverty measurement in Appendix A). + More details on the poverty lines in Box 2-1.

Source: National Bureau of Statistics (2012-2014), World Bank projections (2015-2018), Poverty: World Bank projections.

Fighting and widespread displacement over several consecutive planting seasons have led to large agricultural production shortages. Smallholder farming is highly prevalent in South Sudan, where more than 8 out of 10 households rely on own-account agricultural production as a primary source of livelihood (83 percent, Figure 1-7). Widespread fighting and large-scale displacement over several consecutive planting seasons have disrupted many households' normal agricultural activities, resulting in increasingly large production deficits each year (Figure 1-4).[33] Net smallholder cereal production in 2016 was equal to about 826,000 tons, the lowest net level of production in the years since the start of the conflict, lower than in 2014 and 2015 by 10 and 18 percent respectively.[34] In 2017, these poor production levels were expected to translate into a net cereal deficit of almost 500,000 tons, an amount required to feed about 4.5 million people for a year.[35] The size of the cereal deficit has been growing each year, increasing by more than 30 percent since 2016 (248,000 tons), and more than doubling since in 2015 (381,000 tons).[36]

The impact of production shortages on households' ability to procure food has been exacerbated by market closures and disruptions to the normal functioning of trade routes. South Sudan has historically poor market linkages and a high degree of market fragmentation primarily due to very low levels of infrastructure.[37] South Sudan has the lowest road density in Sub-Saharan Africa (SSA), where only about 2 percent of roads are paved (less than 200 kilometers).[38] Furthermore, heavy seasonal flooding completely

[33] International Rescue Committee, Famine in South Sudan, March 2017.

[34] Net cereal production excludes post-harvest losses and seeds used for sowing.

[35] Based on population projections of about 12 million, consuming on average 110 kilograms per person per year (FAO and WFP Crop and Food Security Assessment, May 2017).

[36] FAO and WFP, Crop and Food Security Assessment, May 2017.

[37] Pape at al., 2017.

[38] http://www.worldbank.org/en/news/feature/2016/02/09/a-triumph-over-long-odds-building-rural-roads-in- south-sudan

isolates certain areas across the country for extended periods of time.[39] The conflict also exacerbated market fragmentation by blocking most major trade routes and leading to the closing of most major markets (Figure 1-5). The high degree of market fragmentation implies that local markets respond strongly to shocks, leaving nearby households with few alternatives other than to produce their own food.[40]

Figure 1-4: Estimated cereal deficit/surplus

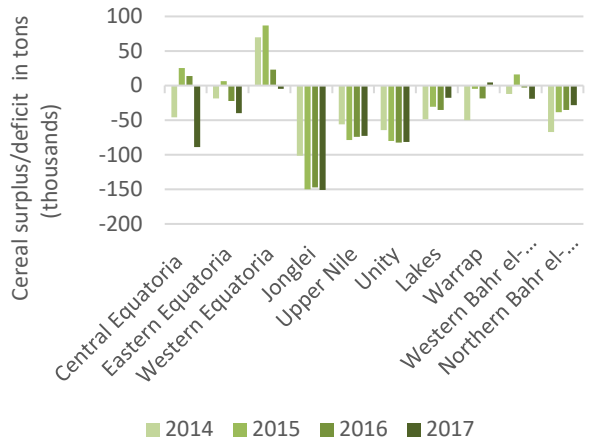
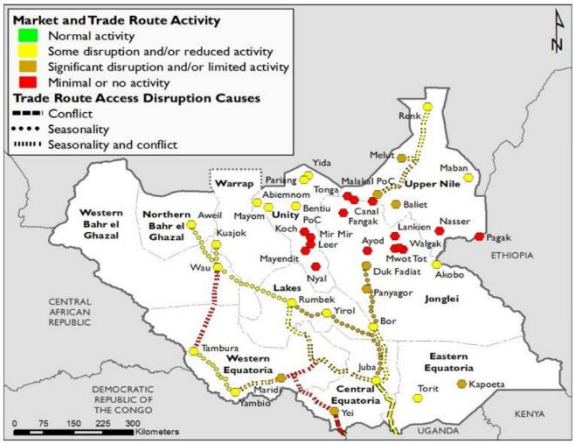


Figure 1-5: Market and trade routes functioning, Oct 2017



Source: Authors' calculations based on National Baseline Household Survey (NBHS) 2009, HFS 2015-2017, and FAO and WFP Crop and Food Security Assessment Mission (CSFAM) (2017).

The share of households relying on own production for at least one third of consumption increased across all states between 2015 and 2016 as price hikes accelerated. Only about 1 in 5 households in 2015 produced more than a third of their consumption; by 2016 the share had increased to 1 in 2 (Figure 1-6). The average share of own produced food also increased, from about one-fifth to two-fifths (18 and 42 percent respectively, $p<0.001$). Generally, rural households are more resilient to the impact of high inflation than urban households, because they can more easily turn to their own production or rely on food stocks in the face of rising prices. Indeed, poverty increased drastically across all states except for Western Equatoria, where incidentally the share of households relying on own production is almost 9 in 10 (88 percent, Figure 1-6). However, conflict-related disruptions rendered most households in other states unable to produce food for their own consumption and the share of own production remains low, implying that own production generally was not enough to make up for the consumption deficit.

[39] Pape at al., 2017.

[40] Pape at al., 2017.

Figure 1-6: Share of households relying on own production for food consumption per state

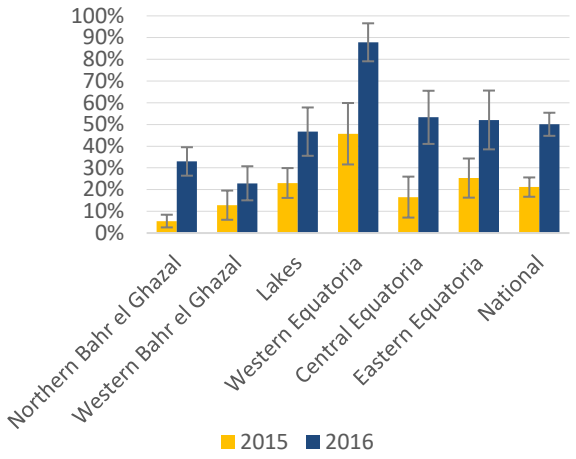
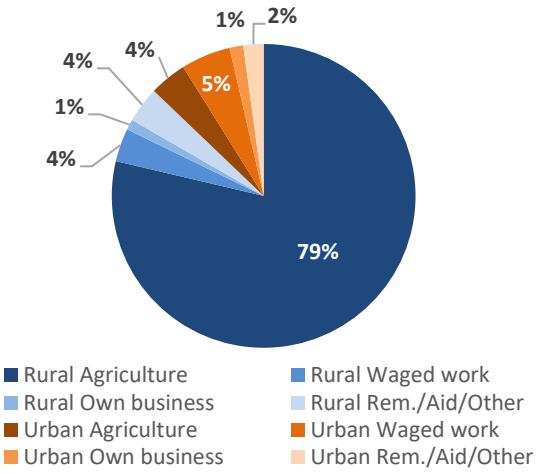


Figure 1-7: Households' primary source of livelihood by urban-rural (percent of total), 2016



Source: Authors' calculations based on HFS 2015-2017.

1.2. Falling oil prices and imported inflation

Simultaneously, falling global oil prices caused the rapid devaluation of the South Sudanese pound (SSP). Between 2015 and 2017 the value of the SSP on international foreign exchange markets declined due to conflict-related disruptions to trade and foreign direct investment. This devaluation was accelerated by internal markets for foreign currency, driven on the one hand by persistently low oil prices and declining oil revenues reducing the dwindling domestic supply of foreign exchange in South Sudan. On the other hand, domestic demand for foreign currencies was growing due to the need to supplement low levels of domestically produced food with imports. Thus, the pressure from (i) low international demand for local currency and a corresponding low domestic supply of foreign currency and (ii) high domestic demand for foreign currency, pushed the value of foreign exchange upwards relative to the SSP while the SSP began a long and consistent period of accelerating devaluation (Figure 1-8).

The value of the SSP against the US dollar (US$) collapsed between 2015 and 2017. Following a growing mismatch between the commercial and parallel exchange rates the SSP was floated in December 2015, from where it previously stood at the official commercial rate of 2.95 SSP to the dollar. By December 2017 the commercial exchange rate had risen to approximately 150 SSP per US$. The parallel market exchange rate rose even higher to about 190 SSP per US$. The difference between the commercial and parallel rates – the black market premium – highlights the persistent mismatch between the supply and demand for foreign exchange with the demand for foreign exchange outstripping the limited supply. The growing

magnitude of the difference reflects the persistency of these imbalances, due to unresolved fiscal and monetary imbalances and remaining challenges in the interbank market for foreign exchange (Figure 1-8).[41]

Figure 1-8: Exchange rate SSP/US$ (national average)

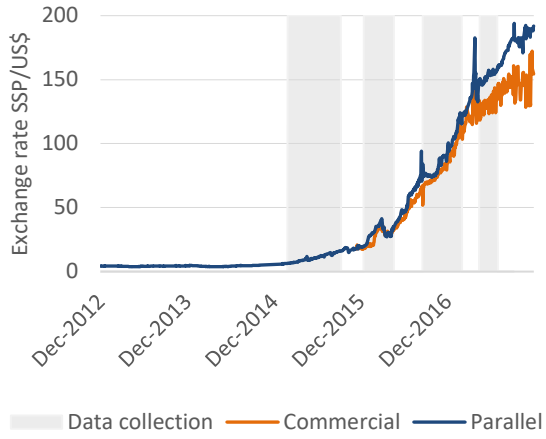
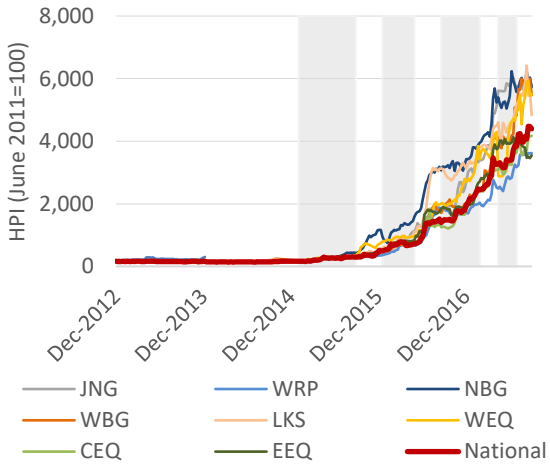


Figure 1-9: High Frequency Price Index



Source: Authors' calculations based on HFS Market Price Surveys (MPSs).

The devaluation of the SSP triggered an inflationary process causing a rise in import prices at a time of domestic production shortages. The South Sudanese consumption basket had traditionally included a large portion of imports due to low levels of domestic production and poor market linkages.[42] The devaluation of the SSP, therefore, had a large pass-through rate to consumer prices, in a process of *imported inflation*. This was exacerbated by the inelastic domestic supply with domestic production not being able to absorb the increase in the relative prices of imports. Conflict-related disruptions exacerbating market fragmentation contributed to placing further upwards pressure on prices (Figure 1-5). The combination of these factors triggered near hyperinflationary increases in prices, with year-on-year CPI inflation peaking at 549 percent in September 2016. In the two-year period between December 2015 and December 2017, the official CPI rose by more than 1,100 percent, from 357 up to 4,502 points (June 2011=100).[43] The price increases can largely be attributed to rising prices of food and non-alcoholic beverages, which account for about 70 percent of the CPI food basket.[44]

[41] World Bank, 2017c.

[42] In the MPSs conducted in the HFS a large portion of the products for which prices were collected since 2012 were imported (60 percent overall). More evidence in Pape et al., 2017.

[43] South Sudan National Bureau of Statistics, available at http://www.ssnbss.org/; or on the pulse of South Sudan website at: http://www.thepulseofsouthsudan.com/

[44] South Sudan National Bureau of Statistics: http://www.ssnbss.org/home/documents/publications.

Rising market prices forced many households to rely on their own food production to supplement food consumption, although this remains insufficient to prevent growing food insecurity. The share of households relying on own production for at least one third of their food consumption increased from 21 percent in 2015 up to 50 percent in 2016 ($p<0.001$). The share and the value of own produced food relative to total food consumption also more than doubled, increasing by 147 and 127 percent respectively ($p<0.001$ for both). It would be expected that households who could substitute away from food purchased in markets towards food produced at home would be less affected by price increases. However, the conflict, and other afflictions to crop farming and livestock earnings (e.g. fall armyworm) impeded this process, leaving many households without a stable source of income or food.[45]

1.3. Government finances and deficit monetization

Low international oil prices and large security sector expenditures have strained the government's resources, leading to deficit financing and printing money, further fueling inflation. Since independence the Government of South Sudan has remained dependent on oil resources; in 2016, 80 percent of the revenue was accounted for by oil revenues.[46] Oil production since independence has steadily fallen due to the impact of disagreements with the Republic of Sudan in 2012 and falling global oil prices since around 2014. In 2017, South Sudan was producing approximately 127,000 barrels per day, less than half of pre-independence levels when production stood closer to 350,00 barrels per day.[47] The government is therefore facing difficulties meeting its payment obligations. The main sources of expenditure include outsized spending on security and fuel subsidies, the former of which accounts for about one third of expenditure (33 and 28 percent in FY2016/17 and 2017/18 respectively, Figure 1-10).[48] The government has therefore resorted to financing its deficit by borrowing from the Central Bank, monetizing the deficit and therefore further contributing to price increases.[49]

The FY2017/2018 budget seemed to indicate a significant commitment from the government to reducing the deficit and stabilizing inflation. Overall, the FY2017/18 budget foresees an ambitious two-fifths cut in expenditure compared with the FY2016/17 budget and aims at refraining from borrowing from the Central Bank. The FY2017/18 budget places an emphasis on increasing non-oil revenues, encouraging investment and economic diversification, and controlling public expenditure in part through the removal of subsidies to the national oil company, Nile Petroleum Corporation or Nilepet. The budget makes increasing non-oil revenues a priority for FY2017/18, and takes significant steps towards this goal by implementing measures

[45] Republic of South Sudan, "National Multi-Hazard Early Warning", August 2017.

[46] IMF Article IV consultation, 2016.

[47] World Bank, 2017c.

[48] Despite fiscal constraints the government continues to procure weapons and war vehicles: UN Panel Report, S/2017/326, April 2017.

[49] World Bank, 2017c.

set out in the 2016 Taxation Amendment Act, which was subsequently revised and restated in the FY2017/18 Financial Bill. This would see the establishment of a National Revenue Authority, which would improve tax administration by bringing customs and taxation operations into a single unified structure.[50] Finding new sources of revenues is crucial for South Sudan for short-term stability and because in the longer term the potential oil revenues are predicted to dissipate, given the maturity of the country's oil reserves (Figure 1-11).[51]

Figure 1-10: Budget allocation by sector (percent of total)[52]

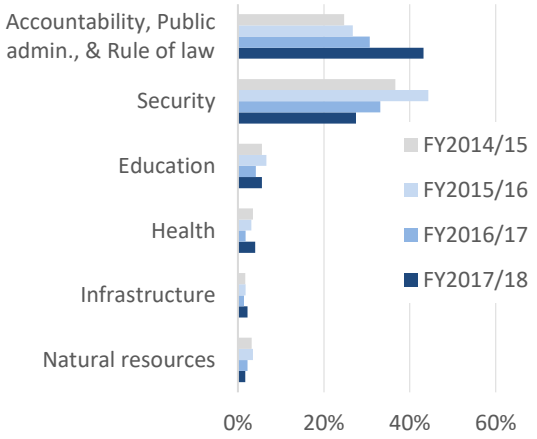
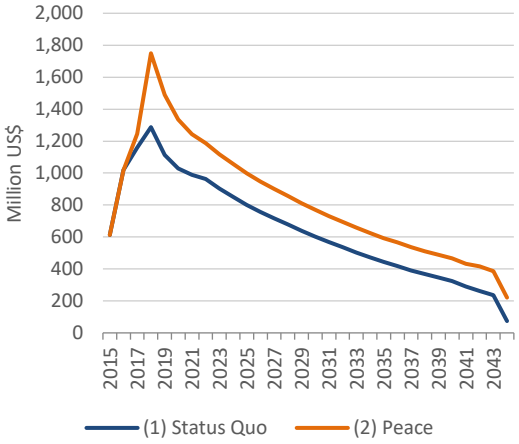


Figure 1-11: Projected oil revenues



Source: South Sudan Ministry of Finance and Economic Planning, World Bank Republic of South Sudan Inclusive Growth Country Economic Memorandum (2017).

Despite the government's stated objectives of addressing the crisis it remains to be seen whether the appropriate changes can and will be implemented. There has already been strong resistance to the removal of the Nilepet subsidy. In July 2017, the Ministry of Finance asked for the parliament's approval to lift fuel subsidies and meet other fiscal obligations, but the measure was rejected by the National Legislative Assembly in September 2017.[53] The scarcity of hard currency makes it difficult to keep the subsidy scheme in place. Without freeing up expenditure items, it is unlikely that there will be enough cash available to

[50] New increases for FY2017/18 include the airport departure tax (increasing from US$20 to US$30), and an increase in sole proprietor personal income tax rates from 10 to 15 percent.

[51] IMF Article 4 consultation, 2016.

[52] Accessible at: http://grss-mof.org/.

[53] According to the National Assembly Speaker, the measure was rejected so that "it does not bring additional burden to the people". However, despite parliament's rejection, the Ministry of Finance is considering the removal of the subsidy nonetheless. According to government officials, Nilepet, the sole fuel importer in the country, was failing to procure more fuel for subsidized sale, generating severe fuel shortages and leading the majority of consumers to turn to the parallel market, where one liter was priced at 300 SSP. Consequently, little fuel at subsidized prices was available in the local market.

execute all the budgeted items. The government's First Quarter Macro-Fiscal Report for FY2017/18 revealed persistent funding gaps and a first quarter deficit of 2,682 million SSP. After detracting ongoing payments to Sudan and the fuel subsidies to Nilepet, there remains only about 20 percent of net oil revenues available to fund government spending. This is unlikely to be sufficient, especially given the need to also repay significant advances obtained by borrowing from the private sector.[54]

Based on the past few years, it is likely that the government's expenditures will remain skewed towards defense and security at the expense of development objectives and poverty reduction. The combined expenditure on health and education is expected to make up around only one tenth of total expenditure (4 and 6 percent respectively). Similarly, spending on infrastructure or the development of natural resources combined is equal to less than one twentieth of total expenditure (2 percent for both). These levels are in line with the trend of the past three years, where spending on public administration and defense/security far outweighed other categories (Figure 1-10). As a result, few institutional social programs are in place that can alleviate the impact of the crisis, and much of the assistance available to the people has been donor funded, largely in the form of short-term humanitarian aid.[55] Thus, there is an urgent need to reprioritize the allocation of public expenditure away from defense, with increased focus on capital expenditure and poverty-targeted expenditure, such as education, health, agriculture and essential infrastructure.

1.4. Perceptions of public institutions

The South Sudanese overwhelmingly believe that their government has not been effective in meeting policy objectives and providing basic public goods. The population is dissatisfied with the government's performance in terms of most basic policy objectives and services provision. More than 9 in 10 people believe that the government has performed badly in terms of creating jobs, keeping prices down, improving the living standards of the poor, and ensuring everyone has enough to eat (Figure 1-12). The same is true for providing and maintaining infrastructure, such as reliable electricity, roads and bridges, and providing adequate water and sanitation. Perceptions of government performance are slightly more positive with respect to the provision of basic health and educational services, albeit that more than two-thirds of respondents view the government's performance negatively.

Accordingly, peoples' perceptions of the effectiveness of the government and other domestic public institutions at improving the livelihoods of the South Sudanese are much lower than that of international institutions. In general, households in South Sudan do not feel that domestic public institutions are very effective in improving living conditions. The Central Government of South Sudan and other domestic political actors are consistently viewed as some of the least effective of all the formal institutions acting in South Sudan (Figure 1-13). In contrast, people tend to perceive international institutions as more effective than formal local authorities. In all likelihood, this is due to the heavy dependence on aid and donor-funded

[54] The government must repay the oil advances estimated at 11,100 million SSP which were taken from Trafigura, a multinational commodity trading company (World Bank, 2017a).

[55] World Bank South Sudan Country Engagement Note for the FY 2018.

safety nets, which have largely filled the void left by the government. Nevertheless, religious institutions are considered the most effective at improving people's living conditions; only about 1 in 8 people hold a negative view of religious institutions in this aspect (15 percent, Figure 1-13).

Figure 1-12: Perceptions of government performance in meeting policy objectives, 2016

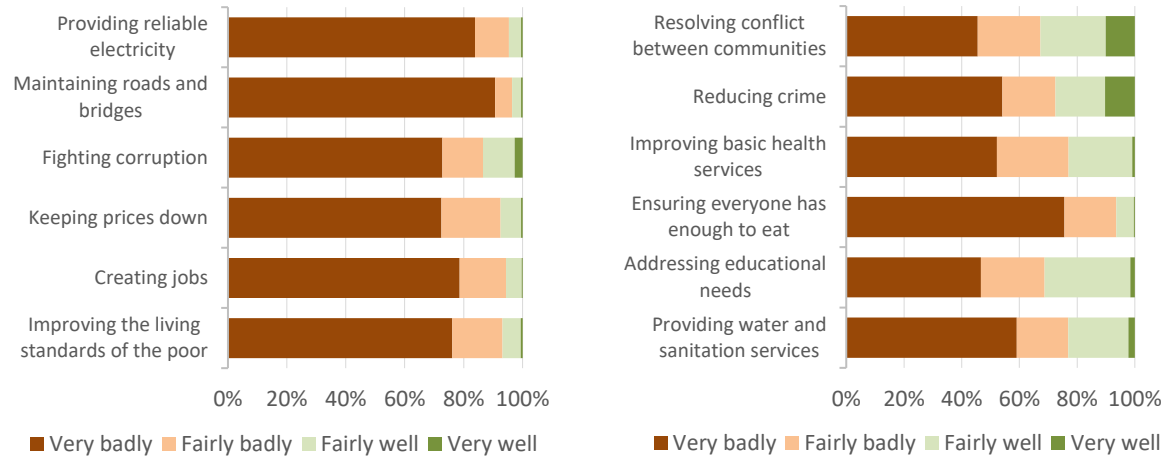
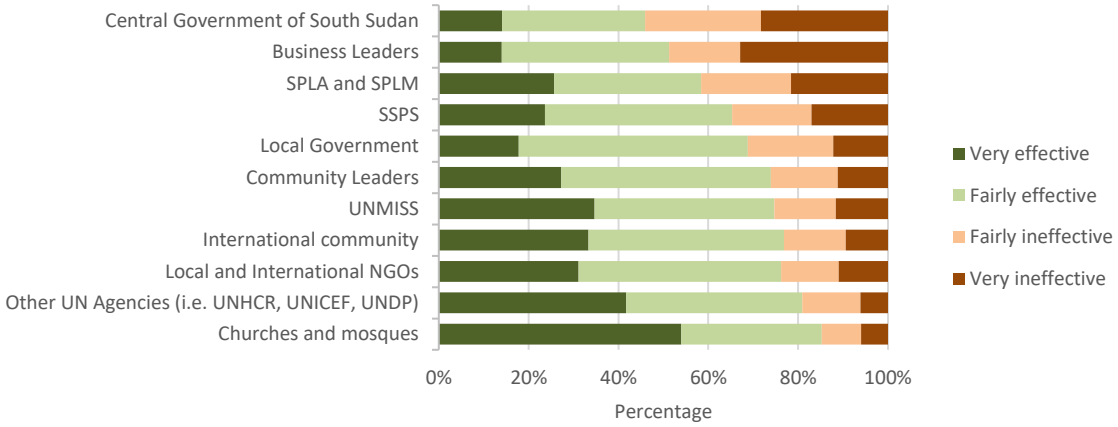


Figure 1-13: Perceptions of performance of public institutions, 2015



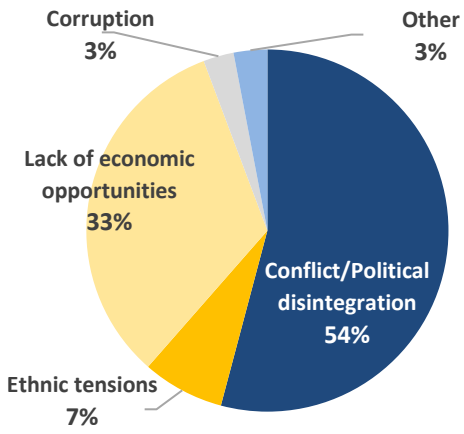
Source: Authors' calculations based on HFS 2015-2017 data.

The South Sudanese are dissatisfied with the government's management of security and they fear further political disintegration. The South Sudanese generally have a negative view of the government's effectiveness at resolving conflict between communities and reducing crime. Over two-thirds believe that the government has performed very badly or fairly badly in achieving these policy objectives (Figure 1-12). When prompted regarding their single greatest fear for the future of the country, the most common response is civil war, insecurity and further political disintegration, provided by slightly over half of respondents (54 percent, Figure 1-14). Poor economic conditions and the lack of economic opportunities is another important concern for the South Sudanese, mentioned by about one third of respondents (33

percent). Ethnic tensions are also commonly mentioned, by slightly under 1 in 10 households (7 percent). IDP households, who are much more likely to have suffered directly from the violence, are much more likely to mention ethnic tensions or conflict and political disintegration as their greatest fear (54 and 75 percent respectively, p<0.001, more details in Chapter 7). IDPs are also almost twice as likely to mention ethnic tensions as non-IDP respondents (12 and 7 percent respectively, p<0.001).

Figure 1-14: Greatest fear for the future of South Sudan

National, 2016



IDP, 2017

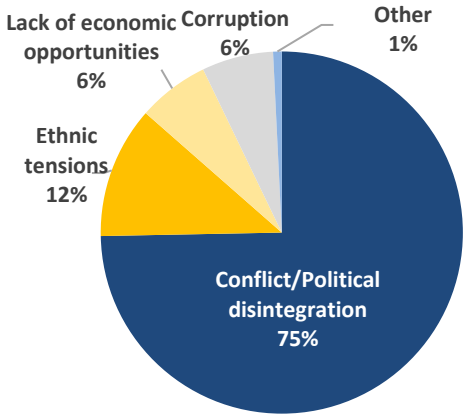


Figure 1-15: Who do you seek to resolve a conflict?

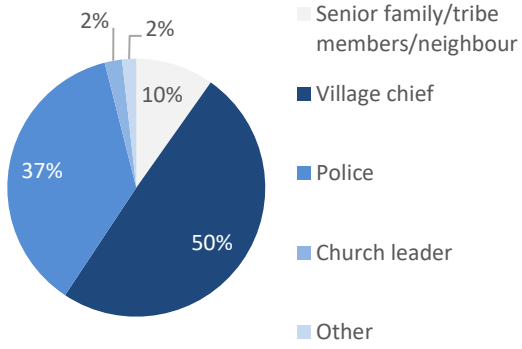
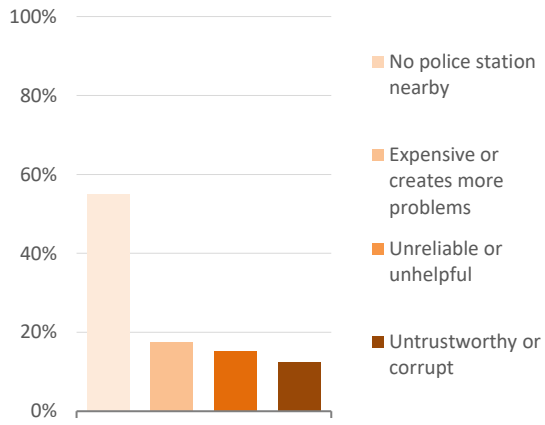


Figure 1-16: Why not turn to the police?



Source: Authors' calculations based on HFS 2015-2017 data.

Formal authorities are seldom sought when people are forced to deal with problems arising within the community, although in large part this simply stems from the lack of authorities' presence. Only slightly more than one third of respondents would turn to the police or official authorities to resolve a dispute or when something is stolen (37 percent, Figure 1-15). Many prefer instead to rely on traditional authorities

such as village chiefs or senior family and tribe members (50 and 10 percent respectively). In part, this is driven by a lack of trust of the police and formal institutions. Respondents provide reasons including that turning to the police is expensive and often creates more problems, or that police are unreliable and unhelpful, or untrustworthy and corrupt (17, 15 and 12 percent respectively, Figure 1-16). However, a slight majority of respondents claim that they do not turn to the police because there are no police stations nearby (55 percent, Figure 1-16) – this is especially true for rural households compared to urban households (56 percent in rural areas and 25 percent in urban areas, $p<0.001$). This absence of even basic forms of authority is likely to contribute to poor perceptions of the government's effectiveness, compounded by the fact that the people are also deprived of services and infrastructure.

1.5. Conclusions

Breaking the cycle of conflict will require restoring stability and ending the stresses that the political and macroeconomic crises are placing on the population. Ending the current political and economic instability is a prerequisite for meaningful poverty alleviation. In addition to the enormous suffering caused by the conflict and its disruptions, the uncertainty caused by a state of insecurity and by high inflation stifles the sort of long-term planning, both by institutions and individuals, that underlies economic recovery and growth. South Sudan is greatly underdeveloped and there is significant scope for interventions that are likely to generate large marginal benefits. However, as long as the conflict continues to drain government resources and block access to entire areas of the country, the potential benefits from development interventions are reduced. It is therefore the utmost priority to achieve peace. Concurrently, implementing the ambitious program of macroeconomic reforms declared in the FY2017/18 budget, aimed at curbing inflation and maintaining price stability, provides the opportunity to lay the foundation for a sustainable development process.

A lasting peace will also require establishing and maintaining institutional legitimacy. Perceptions around the government's lack of legitimacy and the public's discontent with government effectiveness in meeting policy objectives are likely to be major barriers to breaking the cycle of conflict. A credible commitment to development objectives could help to change these perceptions; indeed, it is paramount for the government to take active steps towards ending the conflict and credibly signaling a commitment to development objectives, including macroeconomic reforms aimed at curbing inflation. Given recent patterns of expenditure there is significant scope for reallocation of budget priorities towards achieving development objectives that benefit the population at large. Fiscal reforms aimed at increasing transparency and curbing excess expenditures, specifically on defense and security, would also improve perceptions of the government's legitimacy and alleviate citizen concerns over corruption and mismanagement of public funds. Re-establishing confidence in institutions and promoting their legitimacy in the eyes of the population is a fundamental requirement for generating a virtuous cycle resulting in the establishment of a lasting peace.

Part I: Poverty and Vulnerability

2. Poverty and Inequality

KEY MESSAGES

In 2016, more than 4 in 5 people residing in the six former states covered by the HFS lived under the international poverty line of US$1.90 PPP (2011) per capita per day. In 2016, the poverty headcount ratio, which measures the proportion of the population living under the international poverty line, was equal to 82 percent, placing South Sudan among the poorest countries in the world. Poverty increased substantially from 51 percent in 2009 to 66 percent in 2015 and further to the most recent rate of 82 percent. Most of the observed increase in poverty occurred between 2015 and 2016 given the simultaneous onset of near hyperinflation and intensification of the conflict. Depth of poverty such as that observed in South Sudan is synonymous with a situation of rampant food insecurity. The number of severely food insecure people was expected to rise to 6 million by mid-2018, reaching almost half of the total population.

In 2009, northern states experienced higher levels of poverty, concentrated specifically in the former states of Northern Bahr el Ghazal, Unity and Warrap. These states had historically lower levels of development due to their neglect before independence and the impact of the pre-independence civil war. However, by 2016 the southward spread of the conflict and inflation caused poverty to rise across almost all states covered by the HFS. By 2016 the continuation of the fighting in the northern states and its spread to the south raised poverty across the country. One exception is the state of Western Equatoria, which was less affected by the fighting and has benefitted from high soil fertility and favorable weather conditions. As a result, its residents were much more able to rely on own production to supplement consumption in the face of rapidly increasing market prices.

Inequality fell considerably between 2009 and 2016, but driven by wealthier households experiencing greater consumption losses. The Gini index in South Sudan declined from 2009 to 2016, from about 0.47 to 0.41. The driver of the reduction in inequality was not pro-poor growth but rather a greater decline in expenditure for wealthier households compared to poorer households. These trends are likely to be conflict related as conflict events have tended to happen in wealthier and more urbanized regions during this period. The larger decrease in inequality occurred between 2009 and 2015. In contrast, consumption losses between 2015 and 2016 are much more uniform across poorer and richer households. The confluence of the escalation of the conflict and onset of near hyperinflation in 2016 are likely responsible for these patterns, since once combined they are difficult to hedge against,

independent of wealth status. Despite these changes in inequality, decomposing the change in the poverty headcount ratio between 2009 and 2016 suggests that the reduction in economic output explains most of the observed increase in poverty.

2.1. Poverty indices

In 2016, more than 4 in 5 South Sudanese lived under the international poverty line of US$1.90 PPP (2011) per capita per day. The poverty headcount ratio measures the proportion of the population living under the international poverty line (Box 2-1 and Box 2-2), and was equal to 82 percent in 2016, with a 95 percent confidence interval from 79 to 86 percent. Poverty increased substantially from 51 percent in 2009 to 66 percent in 2015 and further to the most recent rate of 82 percent ($p<0.001$ for both, Figure 2-2). IDPs residing in camps fared worse than the general population, with more than 9 in 10 living under the international poverty line (91 percent). Most of the increase in poverty occurred between 2015 and 2016, given the simultaneous onset of near hyperinflation and intensification of the conflict. Between 2009 and 2015, the annualized average growth rate of the poverty headcount was equal to approximately 2.5 percentage points per year or 15 percentage points over the entire period. In contrast, between 2015 and 2016 the poverty headcount increased by 16 percentage points in a single year (Figure 2-2). The deterioration of economic conditions has driven many poor households further towards hardship conditions. These levels of poverty place South Sudan among the poorest countries in the world. Indeed, South Sudan's poverty headcount ratio is much higher than the average estimates of other countries at similar levels of development (Figure 2-1).

Figure 2-1: Poverty headcount in LICs and LMICs[56]

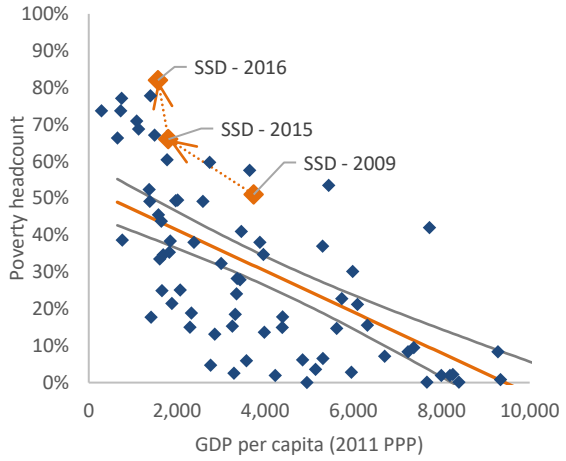
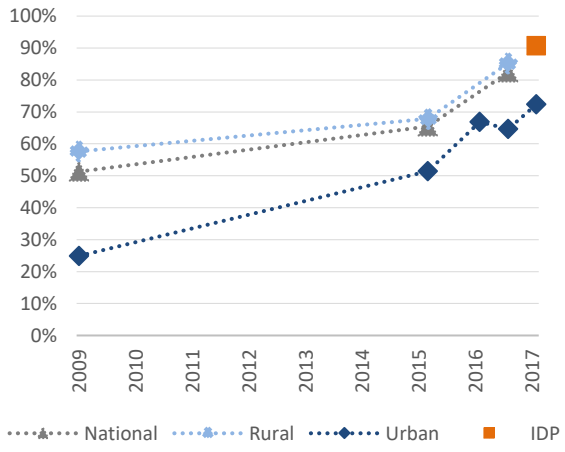


Figure 2-2: Poverty headcount



Note: Figure 2-1 includes low income countries (LICs) and lower middle-income countries (LMICs) with poverty data post-2008. (SSD: South Sudan)

[56] Data for real GDP per capita in 2011 PPP for South Sudan was obtained from the IMF World Development Outlook Database.

Source: Authors' calculations based on NBHS 2009, HFS 2015-2017, World Bank World Development Indicators (WDI), and IMF World Economic Outlook.

Between 2009 and 2016 households at all levels of consumption expenditure experienced a decline in consumption, implying that the average poor person fell even further below the poverty line. The growth incidence curves illustrate the average change in consumption for each percentile of consumption between 2009 and 2016. The change in consumption between 2009 and 2016 is large and negative at virtually all percentiles of consumption expenditure, implying that households at the same relative levels of expenditure were consuming less in 2016 than they did in 2009 (Figure 2-11). The poverty gap, which measures poor households' average deficit in consumption relative to the poverty line (Box 2-2), increased from 23 percent in 2009 to 47 percent in 2016 ($p<0.001$). The average poor household therefore went from consuming about three-quarters of the poverty line in 2009 down to only about one half in 2016 (US$1.46 to US$1 2011 PPP). The consumption deficit is even greater for poor IDP households, equal to 56 percent in 2017 (US$0.84 PPP 2011, Figure 2-3).

Figure 2-3: Poverty gap

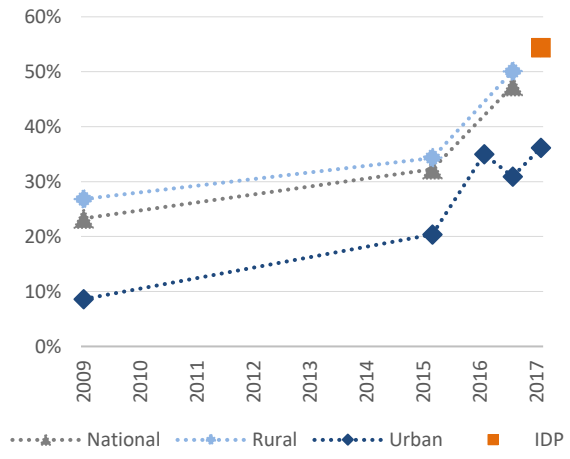
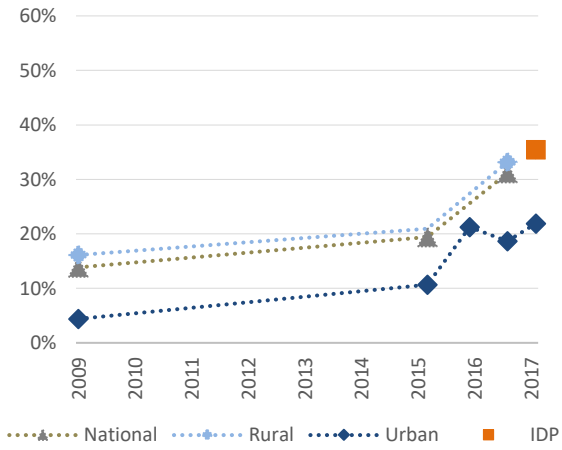


Figure 2-4: Poverty severity



Source: Authors' calculations based on NBHS 2009 and HFS 2015-2017 data.

The poverty severity index increased by more than the poverty gap between 2009 and 2016, pointing to an increase in inequality among the poor due to an especially marked increase in people living far below the international poverty line. The poverty severity index, which is square of the poverty gap (Box 2-2), more than doubled between 2009 and 2016 from about 0.14 to 0.31 ($p<0.001$, Figure 2-4). The poverty severity index places more weight on people with consumption levels that are further below the poverty line. Thus, changes in the severity index can better capture trends in severe welfare deprivation. In the period between 2009 and 2016, the severity index increased by relatively more than the poverty gap, 121 percent compared to 104 percent. The larger relative increase indicates that the growth in the aggregate deficit in consumption is driven by households lying further below the poverty line ($p<0.001$, Figure 2-3 and Figure 2-4). The increase in severe deprivation was particularly marked between the years 2015-2016 relative to the 2009-2015 period: the increase in the poverty severity index between 2015 and 2016 was 63 percent higher than the increase observed during the period 2009 to 2015. Similarly, the increase in the poverty gap between 2015-2016 was 47 percent higher than between 2009-2015.

Box 2-1: Poverty lines in National Baseline Household Survey (NBHS) 2009 and HFS 2015-2017

NBHS 2009

The NBHS was conducted in 2009, prior to South Sudan's independence, and is representative of the area that would become South Sudan in 2011.

The poverty line was derived based on a *cost of basic needs* approach and is equal to 112 SSP (July 2017). The poverty line is equivalent to the monetary value required to obtain a consumption basket that covers basic consumption needs. An individual is considered poor if they consume a bundle of food and non-food items with a real value lower than the poverty line. An individual's poverty status therefore does not depend on the actual composition of the basket of goods consumed, but rather on whether they have the means to purchase this basket. An individual is determined to be living in poverty if their household's consumption per adult equivalent is lower than the sum of the food and non-food poverty lines.

The food poverty line was determined by the nutritional requirement for achieving an adequate standard of living, set to 2,400 calories per person per day. Determining the average monetary value of obtaining these calories requires a reference consumption bundle, so that the price of consuming 2,400 calories can be calculated based on a set of predetermined preferences. The chosen bundle was that realized by the bottom 60 percent of the population in terms of real per capita consumption, implying that the poverty line will more closely capture the preferences of the poor. The average calorific intake of the bundle was estimated based on item-specific nutritional values, and assigned a monetary value based on each item's median market price in Sudanese pounds. The value of this food consumption basket could then be scaled proportionately to obtain the average price of consuming 2,400 calories.

The non-food poverty line was based on the consumption bundle of households living close to the food poverty line. The guiding assumption is that if an individual is spending on food what has been determined as the minimum necessary to be healthy and to maintain certain activity levels, then this person is also likely to have acquired the minimum non-food goods and services to support this lifestyle. The procedure to obtain the value of such a consumption basket consists of obtaining the average food consumption of the population living within plus and minus 1 percent of the food poverty line, then 2 percent, and so on, until reaching plus or minus 10 percent. Finally, these means are averaged to obtain one value for the non-food poverty line.

HFS 2015-2017

The poverty line used in the HFS is based on the international poverty line, first introduced in the 1990 World Development Report with the intent of measuring poverty across countries in a consistent manner. This international poverty line used data on 33 national poverty lines for the 1970s and 1980s and represented the predicted poverty line for the poorest country in the sample, equal to about US$0.76 PPP (1985). The international poverty line was subsequently adjusted for inflation as new sets of PPP were made available through the International Comparison Program. The computation of the current international poverty line of US$1.90 PPP per day was obtained as the unweighted average of the poverty line for the 15 poorest countries, as such: i) by adjusting the national poverty lines of the 15 poorest countries for inflation up to 2011; ii) then converting the national poverty lines to real US$ using the 2011 PPPs; and iii) then computing the simple average of the 15 national poverty lines. The resulting average poverty line is equal

to US$1.88 PPP (2011) per person per day, which was rounded up to US$1.90 PPP (2011). The international poverty line and the 2009 South Sudan poverty line are highly comparable, since the international poverty line consists of the predicted poverty line for countries similar to South Sudan, based on poverty lines that are often calculated in a similar manner.

To calculate poverty in the HFS, the US$1.90 PPP (2011) poverty line was converted into SSP and adjusted for inflation, resulting in a value of 122 SSP (July 2017). The process consisted of the following: i) the poverty line of US$1.90 was first adjusted to reflect PPP in South Sudan, using the South Sudan PPP conversion factor for 2011; ii) it was then converted into current SSP; iii) it was then adjusted for inflation up to July 2017 using the national CPI calculated by the NBS. The consumption aggregates in the HFS were treated as such: i) consumption was deflated within-wave across strata and months of data collection using food and non-food urban-rural month-specific Laspeyres deflators; and ii) the deflated values were adjusted for inflation up to SSP (July 2017) using the national CPI from the NBS. Individuals are determined to be poor if they reside in a household where consumption per capita of food, non-food, and a durables consumption flow was lower than the international poverty line.

Sources: South Sudan National Bureau of Statistics, 2010. "Measuring Poverty in Southern Sudan, Estimates from the NBHS 2009". The World Bank, 2016a. "South Sudan Poverty Profile 2015: Findings from the 2015 wave of the High Frequency South Sudan Survey."

Box 2-2: Foster-Greer-Thorbecke class of poverty measures

Poverty analysis in this report is based on the first three poverty measures of the Foster-Greer-Thorbecke (FGT, 1984) class of poverty indicators. FGT measures consist essentially of variations of the following specification, where the parameter α takes the value of 0 for the poverty headcount, 1 for the poverty gap, and 2 for poverty severity:

$$FGT(\alpha) = \frac{1}{n}\sum_{i=1}^{p}\left[\frac{z - y_i}{z}\right]^{\alpha}$$

The poverty headcount captures the share of a population living under the poverty line. The poor population includes the sum of individuals, p, of a population, n, living in a household where consumption per capita per day falls under a pre-specified poverty line, z.

$$FGT(0) = \frac{p}{n}$$

The poverty gap captures the average consumption deficit of the poor relative to the poverty line. Non-poor households are assigned a value of 0. The sum of the poverty gap across all individuals is a measure of the consumption deficit of the entire population relative to the poverty line. This value is effectively equal to the total consumption value which would be needed to lift every individual out of poverty, through a perfectly targeted cash transfer.

$$FGT(1) = \frac{1}{n}\sum_{i=1}^{p}\left[\frac{z - y_i}{z}\right]$$

where y_i denotes the consumption y of individual i, and n, p and z denote the total population, the poor population and the poverty line, respectively.

Poverty severity captures the severity of poverty. Conceptually, it consists of the poverty gap squared and hence places more emphasis on households lying further away from the poverty line. In a sense the poverty severity index captures inequality among the poor.

$$FGT(2) = \frac{1}{n}\sum_{i=1}^{p}\left[\frac{z - y_i}{z}\right]^{2}$$

Sources: Foster, James, Joel Greer, and Erik Thorbecke. "A class of decomposable poverty measures." *Econometrica: Journal of the Econometric Society* (1984): 761-766.

Foster, James, Joel Greer, and Erik Thorbecke. "The Foster–Greer–Thorbecke (FGT) poverty measures: 25 years later." *The Journal of Economic Inequality* 8.4 (2010): 491-524.

2.2. Food insecurity

High levels of welfare deprivation as observed in South Sudan translate into widespread hunger and food insecurity. Depth of poverty such as that observed in South Sudan is synonymous with a situation of rampant food insecurity. Disruptions to agricultural production and the near hyperinflationary increases in prices of most staple foodstuffs have left most households struggling to find enough food to sustain themselves.[57] Food security has continuously deteriorated since late 2012, sometimes reaching famine conditions in certain vulnerable counties. Despite slight improvements during the harvest seasons in the second half of the year, a clear downward trend in the share of households that are not facing food insecurity can be observed. Furthermore, each successive harvest season seems to be providing less and less relief; i.e. the difference in food security between the harvest season and the lean season has become minimal (Figure 2-5). During the most recent harvest season in 2017, as many as 4.8 million people were severely food insecure.[58]

Figure 2-5: Population by IPC classification, 2012-2017

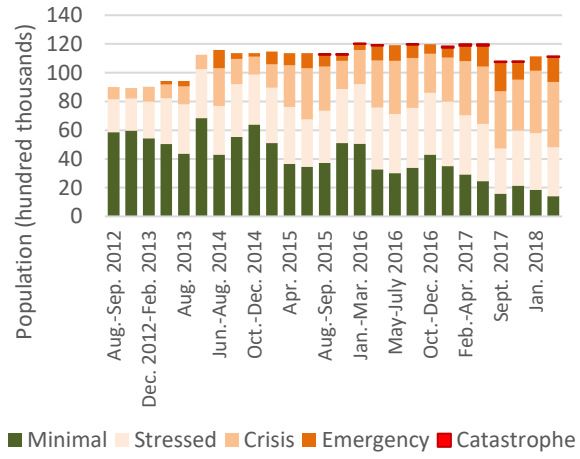
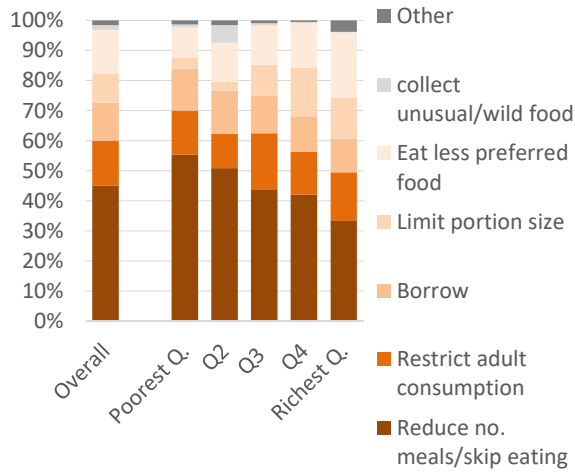


Figure 2-6: Main coping strategy to deal with a lack of food in the household, 2016



Source: Authors' calculations based on HFS 2015-2017 data and FAO (2017).

By mid-2018, the number of severely food insecure people is expected to rise to 6.2 million, reaching more than half of the total population.[59] Based on the food production shortages noted in Chapter 1, a recent Integrated Phase Classification (IPC) estimates that only about 61 percent of the cereal needs of 2018 will

[57] IDMC, Priority Needs and Vulnerabilities, 2017.

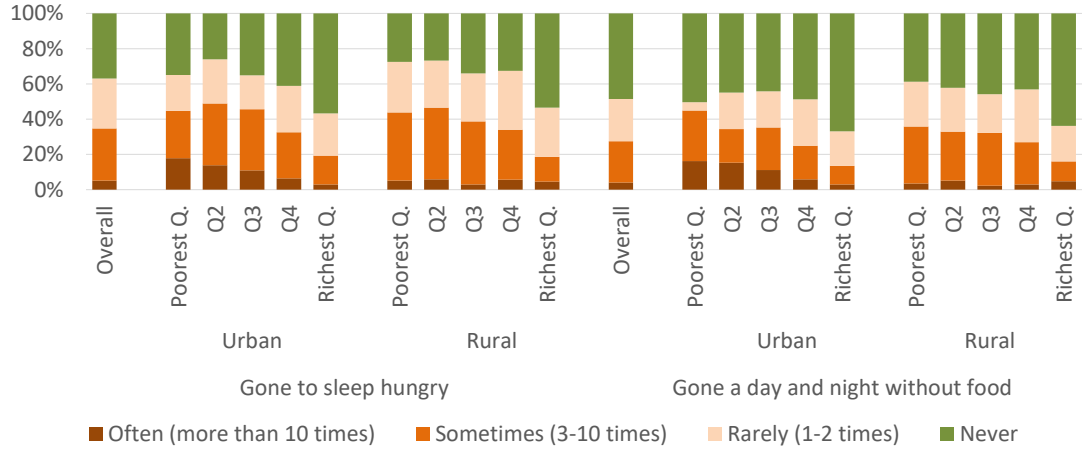
[58] FAO South Sudan Situation Report, 4 December 2017.

[59] FEWSNET Food Security Outlook, February to September 2018.

be met by recent harvests. The number of severely food insecure households will therefore continue rising in 2018, up to 6.2 million.[60] Furthermore, an expected 50, 000 people are expected to experience in famine conditions. Malnutrition among children is particularly worrisome, with some 1.1 million children under five expected to be acutely malnourished, and almost 300,000 severely malnourished.[61] Given the severity of the crisis, households are left with few recourses for dealing with food insecurity. The most common manner in which households deal with a lack of food in the house is to reduce the number of meals or skip eating for an entire day (45 percent, Figure 2-6). The likelihood of skipping meals is highly correlated with consumption levels, more than one half of the poorest households mention it as their primary coping strategy compared to about one third of the richest households (55 and 33 percent respectively, p<0.001, Figure 2-6).

A majority of households in 2016 have experienced hunger or a lack of food in the past 30 days, with the poorest urban households most vulnerable to food insecurity. Almost 2 in 3 households have had a member going to sleep hungry in the past 30 days and 1 in 2 have had a household member going without food for an entire day and night (65 and 52 percent respectively, Figure 2-7). Urban areas are worse off than rural areas in terms of food security. The likelihood of having a member having gone to sleep hungry or having gone a full day and night without food is higher in urban areas, and the share of households experiencing this is often greater in urban areas (Figure 2-7). More specifically, the severity of poverty is more strongly correlated with food insecurity in urban areas than in rural areas, possibly due to greater reliance on purchasing from markets. Non-poor households also often experience situations of food insecurity. About one third of non-poor households have had a household member go one day and night without food and slightly under one half have had a member go to bed hungry in the past four weeks (35 and 45 percent respectively, Figure 2-7).

Figure 2-7: "In the past 30 days at least one household (HH) member has:", 2016



Source: Authors' calculations based on HFS 2015-2017 data.

[60] IPC Info, Key findings for January-July 2018.

[61] FAO South Sudan Situation Report, 4 December 2017.

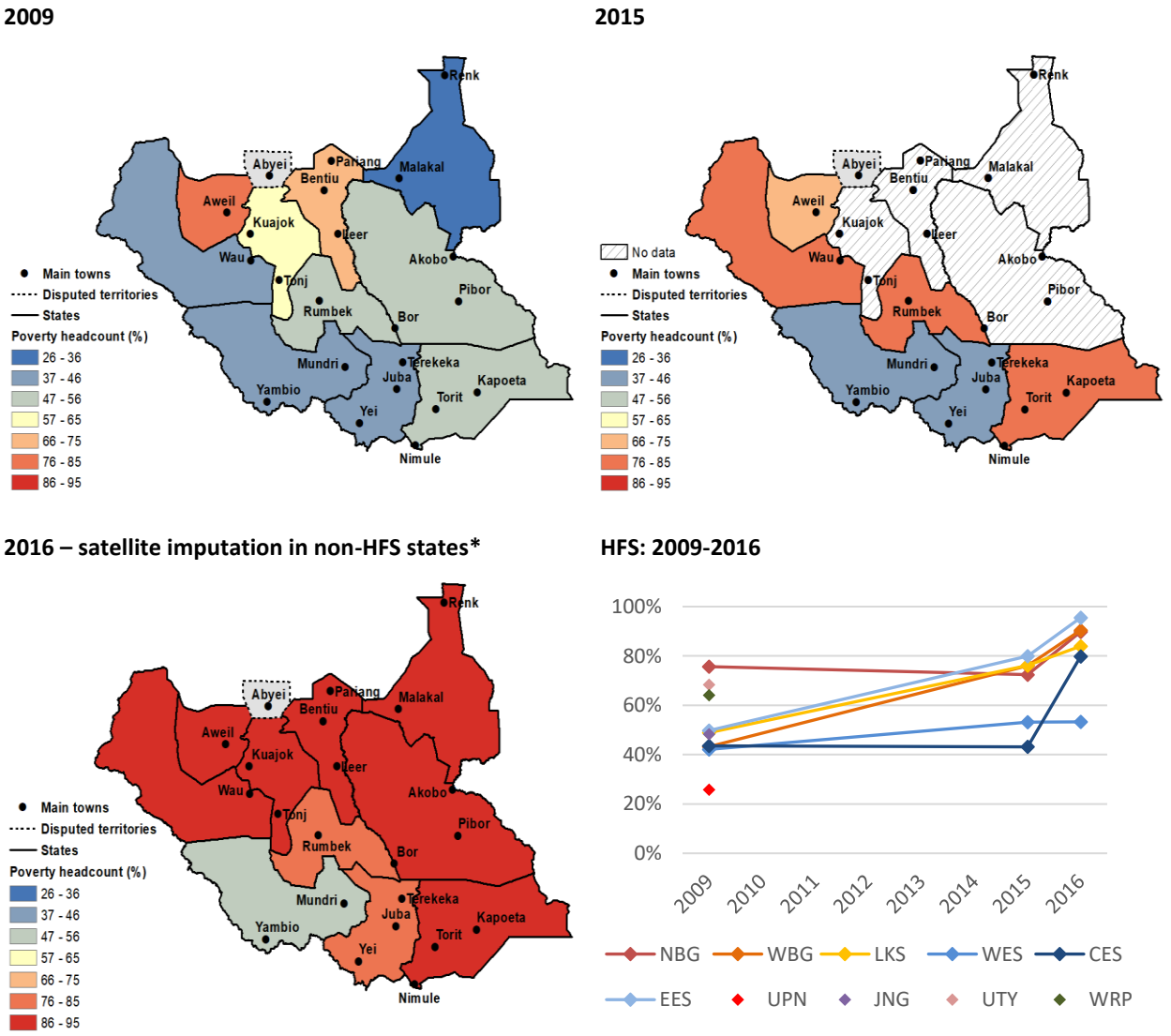
2.3. Spatial trends

The incidence of poverty is much more widespread in rural areas than in urban areas, but the gap has been closing. There has always been a large disparity between urban and rural poverty in South Sudan. In 2009, 3 in 5 rural residents lived under the poverty line compared to 1 in 4 urban residents (25 and 58 percent respectively, p<0.001, Figure 2-2). By 2016 rural poverty climbed to almost 9 in 10 and urban poverty to 2 in 3 (85 and 65 percent respectively, p<0.001). Despite the persistent and large differences, the disparity between urban and rural poverty has become smaller (Figure 2-2). Overall, the decline in average consumption between 2009 and 2016 was higher in urban areas than in rural areas (57 vs. 48 percent respectively, p<0.001). This shrinking gap is due in part to the conflict particularly affecting urban areas, with many of the more severe conflict events concentrated in more populous urbanized regions (FIgure 1-2, and Appendix B). This effect was exacerbated by urban households' heightened sensitivity to market disruptions and rapid changes in prices, given that they have less recourse to substituting food purchased from markets with their own production.

Nevertheless, rural poverty remains deeper than urban poverty. Although there has been significant growth in urban poverty, the rural poor continue to experience a deeper poverty than urban residents, with a higher poverty gap and poverty severity (Figure 2-3 and Figure 2-4). Again, however, the disparity between the two strata has been shrinking. In 2009,10 the average urban poverty gap was equal to one-third of the average rural poverty gap (9 and 27 percent respectively, p<0.001). By 2016 the urban poverty gap had tripled and the rural poverty gap doubled, with former at almost two-thirds of the latter (31 and 50 percent respectively, p<0.001). A similar pattern can be observed for poverty severity, where the urban severity index was equal to one-quarter of the rural index and then grew to account for three-fifths of the rural index (4 and 16 percent in 2009, and 19 and 33 percent in 2016, respectively, Figure 2-3). Nevertheless, both the gap and the severity indices remain much higher in rural areas than they are in urban areas. Chapter 3, which describes the profiles of the poor, will document the many other dimensions of deprivation that rural households experience compared to urban households.

Poverty in 2009 was concentrated in the northern states, most likely due to the historical conflict with the Republic of Sudan. In 2009, higher levels of poverty were concentrated in the more northern former states of Northern Bahr el Ghazal, Unity and Warrap (76, 68 and 64 percent respectively, Figure 2-8). These states had historically lower levels of development due to their neglect before independence and the impact of the pre-independence civil war. The remaining states experienced a more uniform level of poverty in 2009, though still high at around 50 percent. In the regions covered by the HFS where the fighting was more prevalent, namely Eastern Equatoria, Western Bahr el Ghazal and Lakes, large increases in poverty could be observed. In contrast, poverty in the less conflict-affected states covered by the HFS, Central Equatoria and Western Equatoria, remained relatively stable between 2009 and 2015, though sudden changes in welfare are not unlikely given the episodic bouts of fighting especially in Central Equatoria. Poverty rates in Northern Bahr el Ghazal in 2015 also remained stable relative to 2009 levels.

Figure 2-8: Poverty headcount per former state



**Poverty in 2016 in non-HFS covered states is imputed based on satellite imagery; a description on the estimation and data can be found in Box 2-3 and Appendix B.*

Note: Northern Bahr el Ghazal (NBG), Western Bahr el Ghazal (WG), Lakes (LKS), Western Equatoria (WES), Central Equatoria (CES), Eastern Equatoria (EES), Upper Nile (UPN), Jonglei (JNG), Unity (UTY), Warrap (WRP).

Source: Authors' calculations based on NBHS 2009 and HFS 2015-2017 data.

By 2016 the southward spread of the conflict and inflation caused poverty to rise across almost all states covered by the HFS. By 2016 the incidence of poverty reached unprecedented levels in the states of Eastern Equatoria, Northern Bahr el Ghazal and Western Bahr el Ghazal, where about 9 in 10 people live under the international poverty line (95, 90 and 90 percent respectively, Figure 2-8). In the states of Lakes and Central Equatoria, the poverty headcount is slightly lower at about 8 in 10 people (84 and 80 percent respectively),

though still extremely high by international standards. The continuation of the fighting in the northern states and its spread to the south are evident from the observed trends in the latter's poverty headcounts. This is exemplified by the extremely large increase in the poverty headcount in Central Equatoria, where severe fighting took place in 2016. One notable exception is the state of Western Equatoria, as it was less affected by the conflict and has benefitted from high soil fertility and favorable weather conditions. Indeed, Western Equatoria was the only state to record a consistent cereal production surplus in the years from 2014 to 2016 (Figure 1-4). Accordingly, the residents of Western Equatoria are much more likely to be able to sustain their livelihoods through own production (Figure 1-6).

Imputing poverty headcount ratios in the states not covered by the HFS based on satellite and geo-spatial data indicate potentially extremely high levels of poverty in those regions as well. A statistical model leveraging the growing availability of satellite imagery and geo-spatial data is used to extend the poverty estimation to non-covered states in the Greater Upper Nile region. Poverty as measured in the 2016 wave of the HFS is regressed on a range of geo-spatial characteristics such as distance to urban centers, distance to the electricity grid, annual rainfall, annual temperatures, urban-rural status, IPC phase, and others. The resulting model is used to calculate the expected poverty rate of regions where household data is not available. Poverty is predicted for every square kilometer across South Sudan and weighted by local population counts, to eliminate potential bias caused by vast uninhabited areas. The results indicate high poverty rates in the Greater Upper Nile region, which is expected given the predominantly rural nature of the region and its state of instability (Table 2-1). Given the higher incidence of conflict in the states with predicted poverty compared to the states covered by the HFS, it is likely that the poverty prediction underestimates poverty.

Table 2-1: State-level predictions of poverty headcount (percent)

	Poverty (survey)	Poverty (predicted)	Poverty Rural (survey)	Poverty Rural (predicted)	Poverty Urban (survey)	Poverty Urban (predicted)
Central Equatoria	80	76	84	84	17	63
Eastern Equatoria	95	91	97	94	28	42
Jonglei		92		95		17
Lakes	84	86	86	89	29	47
Northern Bahr el Ghazal	90	90	91	93	12	68
Unity		92		95		17
Upper Nile		92		95		36
Warrap	86	89	90	92	43	65
Western Bahr el Ghazal	90	88	95	92	38	70
Western Equatoria	53	68	61	74	39	31
Total	**83**	**92**	**86**	**92**	**66**	**77**

Box 2-3: Imputing poverty through satellite imagery

Recent advances in the processing and availability of satellite imagery and geo-spatial data have led to a growing field of research on predicting a range of outcomes based on diverse such data sources. This technology was leveraged for this report in order to fill the gap left by the HFS in the non-covered states. A statistical model was estimated for the households in the covered states that related their poverty status to various geo-spatial variables. The model could then be used to predict outcomes in the states not covered in the HFS using the same set of geo-spatial correlates that would be available across the entire country. After testing a large range of variables, the final correlates employed in the model included: the distance to urban centers, the IPC phase, average temperatures and precipitation, distance to the electricity grid, an urban-rural-unsettled dummy, as well as a Juba and Western Equatorial dummy.

The econometric model estimates were used to predict poverty at the 100m x 100m level, before the estimates were weighted using data on settlements to the improve accuracy of predictions. The econometric model allows predicting poverty at a high level of disaggregation. However, it does not make much sense to estimate poverty for the vast uninhabited rural expanses. Furthermore, because rural areas are more likely to be poor this would drive average predicted poverty levels to unrealistically high levels. Therefore, the estimates are limited to settled areas.

2.4. Inequality and redistribution

Inequality dropped considerably between 2009 and 2016, driven by wealthier households experiencing greater consumption losses. Measuring inequality, the Gini index in South Sudan declined from 2009 to 2016, from about 0.47 in 2009 to 0.41 in 2016 (Figure 2-9).[62] This is slightly lower than the average Gini index for countries in Sub-Saharan Africa, which is approximately 0.44. However, South Sudan's inequality is higher compared to the global average Gini index of 0.38. Comparing the consumption of households between 2009 and 2016 by decile explains the reduction in inequality. While all households suffered consumption losses, the losses for richer households are larger than for poorer households (Figure 2-11). Thus, the driver of the reduction in inequality was not pro-poor growth but rather a greater decline in expenditures for wealthier than for poorer households. This is also captured in the measure of shared prosperity at 0.9, indicating that the bottom 40 percent lost 90 percent of the average consumption loss (Figure 2-11). Indeed, although inequality might be lower in South Sudan than in many other countries, the breadth and depth of the poverty observed is far worse.

[62] The Gini index is calculated from the area under the Lorenz curve, which plots the cumulative percentage of consumption expenditure against the cumulative percentage of the population, with perfect equality lying along the 45-degree line.

Figure 2-9: Gini index, SSA LICs and LMICs

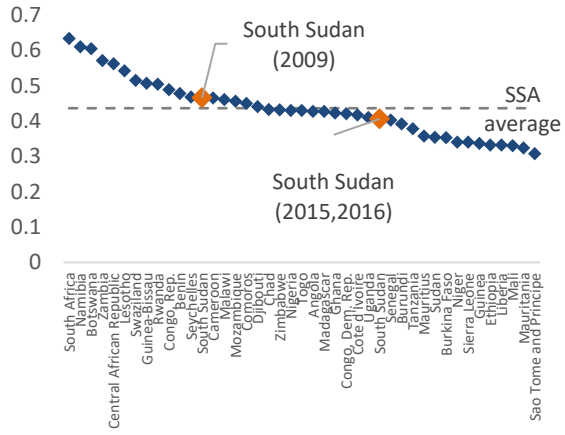
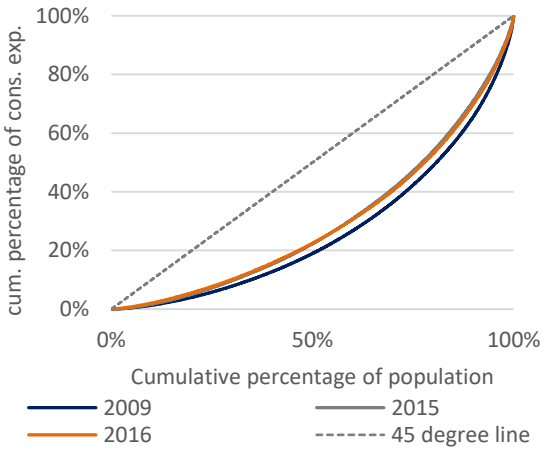


Figure 2-10: Lorenz curve, 2009-2016



Source: Authors' calculations based on NBHS 2009 and HFS 2015-2017 data.

The bulk of the decline in inequality happened between 2009 and 2015, with inequality remaining stable between 2015 and 2016. The larger decrease in inequality occurred between 2009 and 2015, when wealthier households experienced greater relative losses than poorer households (Figure 2-12). A greater decline in consumption for wealthier households can be observed across both rural and urban areas (Figure 2-13 and Figure 2-14). Furthermore, the average welfare decline was much greater in urban areas than in rural areas. Since the urban-rural disparity was particularly pronounced in 2009, this would have contributed to the large reduction in inequality. These trends are likely to be conflict related, as conflict events have tended to happen in the more urbanized regions. Indeed, more intense conflict events with higher numbers of casualties are often located closer to larger and wealthier urban centers (FIgure 1-2), displacing many urban households (Chapter 7). Among rural populations the likelihood of conflict exposure is also related to consumption expenditure levels (see Appendix B). In contrast, consumption losses between 2015 and 2016 are much more uniform across poorer and richer households alike (Figure 2-12). Thus, the Gini index remained constant at 0.41 between 2015 and 2016 (Figure 2-9). Accordingly, the shift in the Lorenz curve is marginal from 2015 to 2016 (Figure 2-10). The confluence of the escalation of the conflict and onset of near hyperinflation, forces which once combined are difficult to hedge against, are responsible for this welfare decline observed across the whole population.

Changes in poverty can generally be attributed to a combination of economic decline and indirect redistribution; in South Sudan the impact of indirect redistribution was small relative to that of the overall economic decline. Decomposing the change in the poverty headcount ratio between 2009 and 2016 suggests that the reduction in economic output explains the majority of the observed increase in poverty (Figure 2-15). Indirect redistribution reduced poverty slightly between 2009 and 2015. Trends differ across urban and rural areas in terms of the direction of poverty headcount was consistently negative and slightly more pronounced. The impact of indirect redistribution is more prominent when interpreting its contribution to changes in the poverty gap, which can better account for households far below the poverty line. Indirect redistribution did seem to actually increase the poverty gap between 2015 and 2016, possibly

due to the greater losses observed for poorer urban households in this period (Figure 2-13). In rural areas, indirect redistribution is associated with a very small increase in the poverty headcount. This result should be interpreted with caution, especially given its very small magnitude. Indeed, the more salient insight is that in absolute terms the contribution of indirect redistribution is minimal relative to that of the overall economic decline (Figure 2-15).

Figure 2-11: Growth incidence curve, national 2009-2016

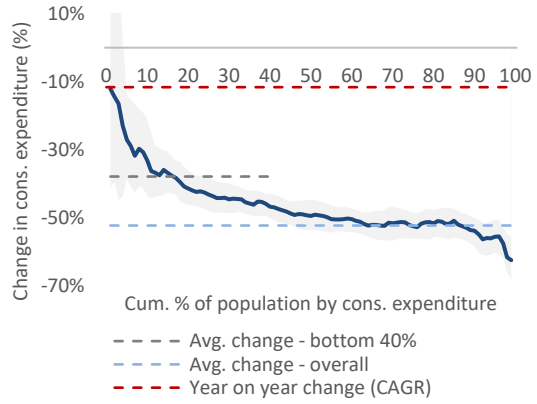


Figure 2-12: Growth incidence curves, 2009-2015 and 2015-2016

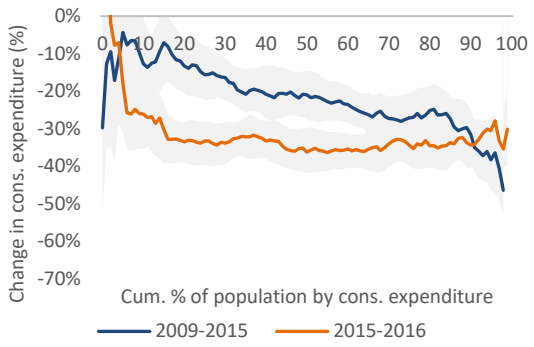


Figure 2-13: Urban growth incidence curves, 2009-2015 and 2015-2016

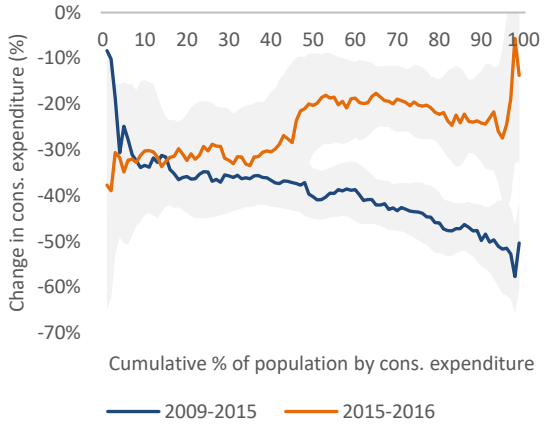
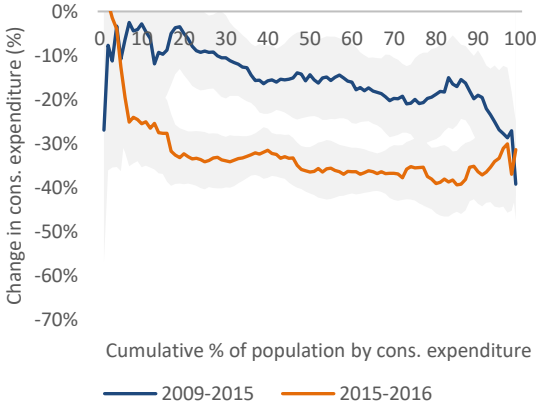


Figure 2-14: Rural growth incidence curves, 2009-2015 and 2015-2016



Source: Authors' calculations based on NBHS 2009 and HFS 2015-2017 data.

Figure 2-15: Growth-redistribution decomposition poverty headcount (FGT0), 2009-2016

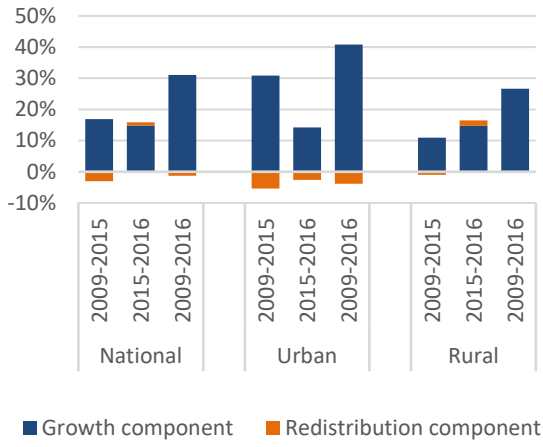
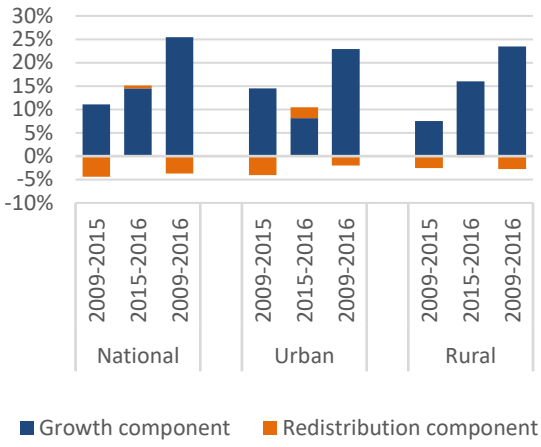


Figure 2-16: Growth-redistribution decomposition poverty headcount (FGT1), 2009-2016



Source: Authors' calculations based on NBHS 2009 and HFS 2015-2017 data.

2.5. Conclusions

The sheer breadth of poverty and depth of welfare deprivation in South Sudan are linked to the scale of the political and macroeconomic crises, which has deteriorated outcomes across almost the entire population. Although South Sudan has historically experienced high levels of poverty as well as a lower level of development relative to similar countries, the recently observed levels of poverty are clearly related to the shocks from the crises. Few have been able to weather the impact of the conflict and the macroeconomic collapse. Average consumption levels have declined across the entire country, reflecting the pervasive impact of the conflict and its consequent severe food production shortfalls. Consumption levels have fallen across all wealth levels, reflecting the severity of the impact of the combined shocks on both poor and non-poor. The decline in inequality echoes this, and does not indicate pro-poor growth but rather a greater decline in expenditures for wealthier households compared to poorer households – literally a race to the bottom.

Poverty and hunger have reached such depths that urgent action is needed to restore food security and avoid the potentially long-lasting developmental consequences of malnutrition and stunting at such a large scale. Poverty alleviation in South Sudan is a daunting task, with an aggregate poverty gap across the six HFS covered states in 2016 equal to about 120 billion SSP (July 2017) or US$900 million.[63] However, given the severity of poverty and breadth of food insecurity, one of the more urgent tasks at hand will be to alleviate some of the deepest suffering and prevent further instances of hunger and even starvation.

[63] At the July 2017 commercial exchange rate of 134 SSP/US$.

Significant sections of the population are at risk of malnutrition; many are children who are currently highly likely to experience stunted growth. Child malnutrition and stunting has been consistently linked to lower economic growth and to a wide range of individual economic outcomes – including lower mental development, lower wages and fewer years of education.[64] The impact of such widespread stunting and other associated health effects of malnutrition is significant, and may result in a lost generation, prolonging the poor state of development of the country. Compensating these nutritional needs and ensuring access to nutritious food will be extremely important in the short run to avoid a catastrophe.

[64] McGovern et al, 2017; Heltberg, 2009; Grantham-McGregor, 1995.

3. Profiles of the Poor

KEY MESSAGES

South Sudan is one of the most underdeveloped countries in the world, with structural poverty especially in rural areas. According to the 2008 Population and Housing Census, more than 17 in 20 of the South Sudanese population in the HFS-covered states reside in rural areas. The rural population is often isolated across large swathes of land where infrastructure provision is extremely poor. Rural poverty in South Sudan is a structural type of poverty characterized by a general lack of access to services, infrastructure, and opportunities beyond basic agricultural production.

Employment primarily consists of own-account agricultural production, which is being strained by demographic pressures and conflict-related disruptions. People living in rural areas and the urban poor rely heavily on agricultural production for their livelihoods. In urban areas, better off households are more likely to rely on wages and salaries, though women are largely excluded from salaried labor. Labor force participation and unemployment rates are low; the latter can largely be explained by little churn in labor markets given the informal nature of employment.

Access to amenities and infrastructure is extremely low and almost exclusive to urban households; indeed, access is much less strongly related to poverty status than it is to rural or urban location. The South Sudanese own very few valuable assets and ownership is almost exclusive to the wealthiest urban households. Housing is generally of poor quality, with household members often living in crowded conditions. Access to modern and improved sources of energy is limited and largely delineated along the urban-rural divide. Nevertheless, even among the wealthiest urban households, only a minority have access to electricity. The availability of adequate water, sanitation and hygiene (WASH) infrastructure remains a significant challenge, and is again largely determined by urban-rural status.

Poor households have lower levels of education than wealthier households, given urban-rural disparities in provision of education. South Sudan has very low rates of adult educational attainment, and one of the lowest adult literacy rates in Africa. This is largely explained by low availability, access to and quality of education. However, youth educational outcomes show an improvement over those of previous generations, with the gender gap continuing to close. Despite these improvements, net attendance rates remain lower than in most other countries in Sub-Saharan Africa. Furthermore, the conflict continues to jeopardize the progress in education achieved between 2009 and 2015, with

school attendance rates falling to 2009 levels since the intensification of the conflict and onset of inflation in 2016.

3.1. Structural poverty

South Sudan is one of the most underdeveloped countries in the world, with structural poverty especially in rural areas. According to the 2008 Population and Housing Census, more than 17 out of 20 South Sudanese people reside in rural areas.[65] The rural population is often isolated across large swathes of land where infrastructure provision is extremely poor. South Sudan has the lowest road density in Sub-Saharan Africa with only about 200 kilometers of paved roads in rural areas, accounting for an estimated 2 percent of all roads.[66] Seasonal weather and floods often leave much of the country totally inaccessible for months at a time.[67] In this context, rural poverty in South Sudan is a structural type of poverty that is characterized by a general lack of access to services, infrastructure, and opportunities beyond basic agricultural production. Rural poverty is thus more widespread and much deeper than urban poverty (Figure 2-2 and Figure 2-3).

The lack of services provision and the impact this has had on livelihoods is exemplified by South Sudan's extremely poor performance even in the most basic health indicators. South Sudan is not only one of the poorest countries in terms of monetary poverty, but also consistently ranks among the poorest countries in the world in terms of multidimensional indicators of welfare deprivation.[68] According to most recent estimates, South Sudan ranks 181 out of 188 countries in the Human Development Index.[69] Basic health indicators in South Sudan are extremely poor, highlighting the state of destitution in which much of the population lives. Life expectancy at birth in 2015 was estimated to be 56 years, which is much lower than the global average of 72 years and places the country among the bottom 10 countries with lowest life expectancies.[70] The under-5 mortality rate is 106 per 1,000 births and maternal mortality rate sits at about 2,504 deaths per 100,000 live births. Chronic malnutrition is prevalent. In 2010, it was estimated that approximately 28 percent of children under 5 years of age were underweight and 31 percent of children were stunted.[71] These figures primarily pertain to the period prior to 2016 and are likely to have risen given recent developments in the crisis.

The political and macroeconomic crisis have resulted in a much less clearly delineated situational poverty, especially in urban areas. With a high poverty rate driven by extremely disruptive shocks such as the conflict and near hyperinflationary price increases, the profile of the poor has become much less clearly

[65] South Sudan National Bureau of Statistics, 2008 Sampling and Census Exercise Results. The urban population is likely to have risen since, given displacement trends, but up-to-date population data is not available.

[66] World Development Indicators (WDI).

http://www.worldbank.org/en/news/feature/2016/02/09/a-triumph-over-long-odds-building-rural-roads-in-south-sudan

[67] Pape et al., 2017.

[68] http://hdr.undp.org/en/composite/MPI

[69] http://hdr.undp.org/en/composite/HDI

[70] World Development Indicators.

[71] South Sudan Health Survey, 2016. World Development Indicators.

delineated. Instead, for most indicators of wellbeing the disparities between the urban and rural populations become much more marked than differences between poor and non-poor populations. Except perhaps among the poorest of them, urban residents at all levels of consumption expenditure tend to have better access to many amenities than the rural population, even those in the top quintile of consumption. Therefore, the profiles of the poor described in this section will not be structured relative to the dichotomous distinction poor and non-poor but rather in terms of the five consumption quintiles and the rural and urban distinction. In this manner, given a national poverty rate of about 4 in 5, the top quintile will correspond to the non-poor population.

Table 3-1: Characteristics of the poor, 2009-2016

	2009				2016			
	Poor	Non-Poor	Diff.	Logit Reg.	Poor	Non-Poor	Diff.	Logit Reg.
Urban/Rural	0.094	0.299	-0.205***	-0.207***	0.11	0.299	-0.190***	-0.011
	[0.008]	[0.013]		-0.04	[0.009]	[0.026]		-0.025
Household size	7.92	7.305	0.615***	0.021***	7.581	6.24	1.341***	0.023***
	[0.133]	[0.132]		-0.004	[0.150]	[0.192]		-0.004
Working age to dependents ratio	1.125	1.164	-0.04	0.005	1.039	1.415	-0.376***	-0.008*
	[0.038]	[0.035]		-0.009	[0.047]	[0.116]		-0.004
HH head is a woman	0.349	0.262	0.087**	0.058**	0.414	0.291	0.123	0.027
	[0.016]	[0.013]		-0.026	[0.019]	[0.028]		-0.022
HH head has no education	0.783	0.595	0.188***	0.070***	0.676	0.437	0.240***	0.003
	[0.015]	[0.015]		-0.025	[0.018]	[0.033]		-0.024
One child is not attending school	0.677	0.42	0.257***	0.132***	0.644	0.27	0.374***	0.081***
	[0.015]	[0.015]		-0.026	[0.018]	[0.031]		-0.021
Livelihood: Agriculture	0.821	0.694	0.127***	-0.140***	0.853	0.703	0.150***	-0.048
	[0.013]	[0.013]		-0.047	[0.011]	[0.027]		-0.036
Livelihood: Wages/Own business	0.088	0.234	-0.146***	-0.214***	0.103	0.256	-0.152***	-0.097***
	[0.009]	[0.012]		-0.043	[0.010]	[0.025]		-0.033
Livelihood: Remittances/Aid/Other	0.091	0.072	0.019*	-	0.044	0.042	0.002	-
	[0.010]	[0.007]			[0.006]	[0.009]		
HH lives in improved housing	0.055	0.091	-0.036***	0.039	0.041	0.165	-0.124***	-0.078***
	[0.007]	[0.008]		-0.045	[0.006]	[0.022]		-0.022
HH has access to electricity	0.012	0.073	-0.061***	-0.292***	0.015	0.12	-0.105***	-0.046
	[0.003]	[0.007]		-0.076	[0.005]	[0.020]		-0.029
HH lives in overcrowded dwelling	0.305	0.208	0.097***	0.088***	0.302	0.078	0.224***	0.063**
	[0.016]	[0.013]		-0.025	[0.018]	[0.019]		-0.03
HH has access to improved sanitation	0.176	0.373	-0.198***	-0.082**	0.105	0.278	-0.173***	-0.059**
	[0.013]	[0.015]		-0.035	[0.011]	[0.027]		-0.024
HH has access to improved water source	0.554	0.614	-0.060***	-0.041	0.696	0.593	0.102	0.016
	[0.017]	[0.015]		-0.028	[0.017]	[0.032]		-0.021

The values displayed for t-tests are the differences in the means across the groups. The values displayed in the Logit regression columns indicate the marginal effects at the mean. Fixed effects using variable state are included in all estimation regressions. ***, ** and * indicate significance at the 1, 5 and 10 percent critical level respectively. Working age household members are aged 15-64 years; improved housing is defined as cement or wooden houses with roofs of higher quality than grass; overcrowding is defined as 4+ household members per room.

3.2. Demographics and labor markets

South Sudan has a young population, which is straining labor markets; dependency ratios are hence strongly correlated with poverty. A majority of the South Sudanese population is not of working age. In 2016, almost 3 in 5 people were below 18 years of age and 1 in 5 were under 5 years of age (57 and 22 percent respectively, Figure 3-1). This implies that a large portion of the population is too young to be productively engaged in the labor market, such that the working age population needs to care for a large number of dependents. In 2016, the average ratio of dependents to workers was about 1.55. More dependents need to be supported in rural areas than in urban areas (1.63 and 1.08 respectively, $p<0.001$). Having to provide for a larger household is strongly related with the depth of poverty (Figure 3-2). The shocks of the conflict and inflation have increased this burden. By 2016, the difference in average household size and in the working age to dependents ratio had grown between the poor and non-poor, with non-poor households having smaller households and fewer dependents (Table 3-1).

Figure 3-1: Population distribution, 2016

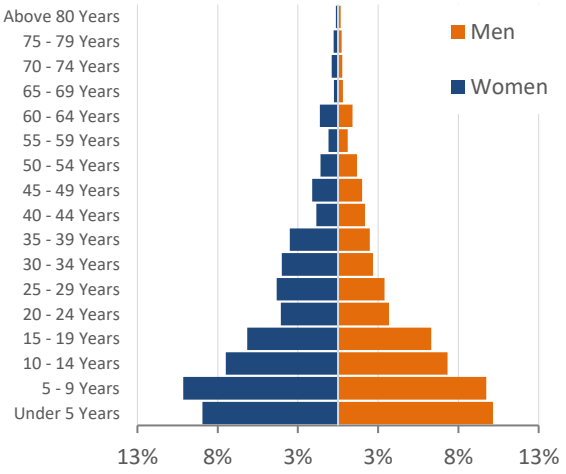
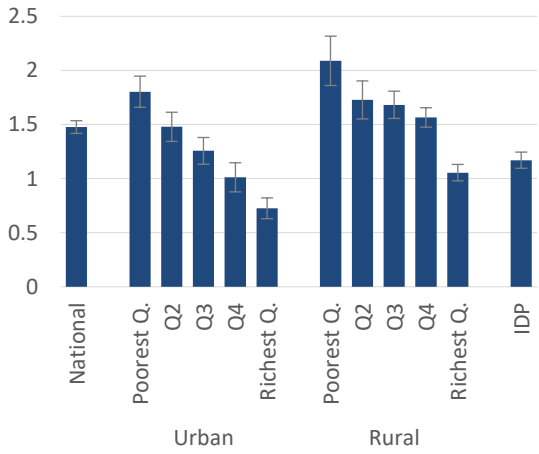


Figure 3-2: Dependents to working age ratio, 2016



Source: Authors' calculations based on HFS 2015-2017 data.

People living in rural areas and the urban poor rely more heavily on agricultural production for their livelihoods. The South Sudanese economy is overwhelmingly agricultural. Agriculture accounts for two-thirds of employment and more than 8 out of 10 households' primary source of livelihood is own-account agricultural production (Figure 3-3 and Figure 3-4). Little economic activity in South Sudan is conducted outside of the agricultural sector. Employment in manufacturing is especially low, at about 2 percent of total employment. In rural areas, livelihoods are almost exclusively sustained by own-account agricultural production at all levels of consumption expenditure (Figure 3-4). Even in urban areas agriculture plays an important role, attracting almost one third of employment relative to about three quarters in rural areas (29 and 74 percent respectively, $p<0.001$). Employment in agriculture in rural areas is common across all consumption expenditure quintiles. In contrast, wealthier households in urban areas are much more likely to be employed in services than poorer households, with this relationship increasing with consumption levels (Figure 3-3).

Figure 3-3: Employment by sector per urban-rural consumption quintiles, 2016

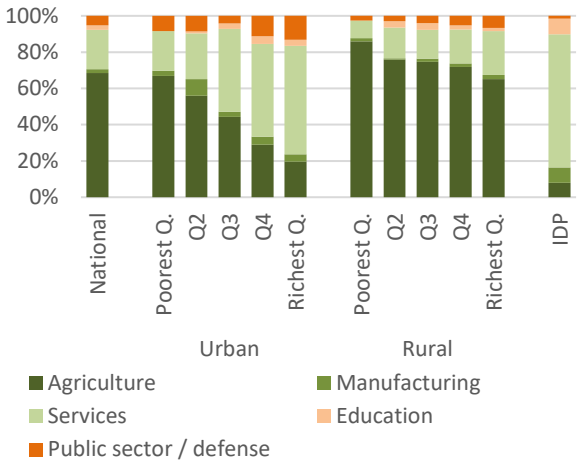


Figure 3-4: Primary source of livelihood per urban-rural consumption quintiles, 2016/17

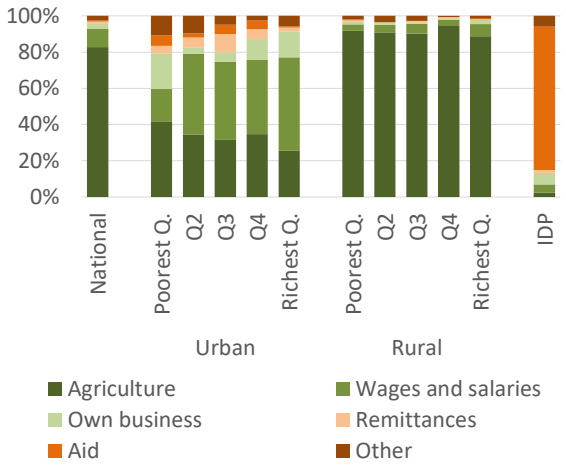


Figure 3-5: Employment by type of activity per urban-rural consumption quintiles, 2016/17

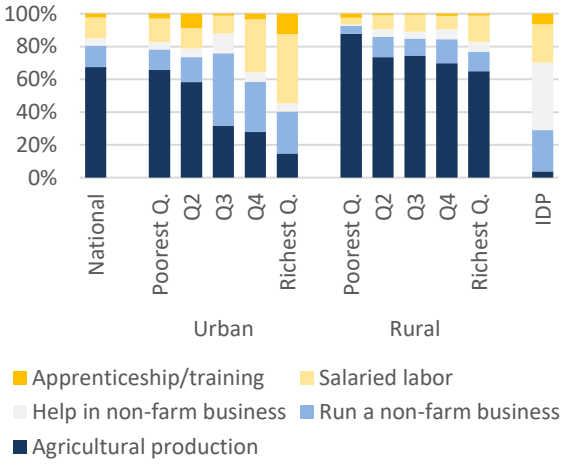
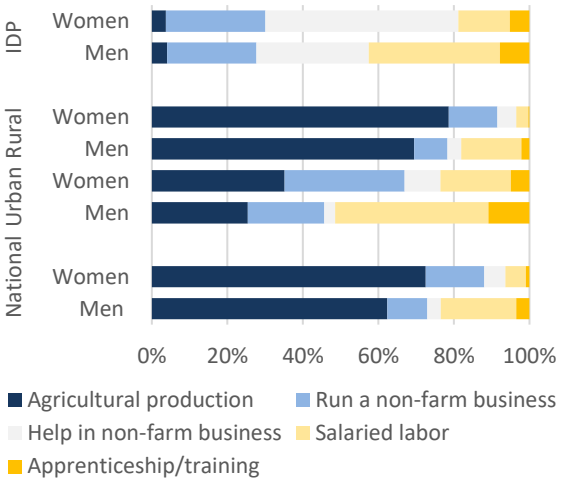


Figure 3-6: Employment by type of activity per urban-rural and gender, 2016



Source: Authors' calculations based on HFS 2015-2017 data.

In urban areas better off households are more likely to rely on wages and salaries, though women tend to be excluded from salaried labor. Urban households are much more likely to rely on wages and salaries for their livelihoods, except for the poorest residents who rely on a broader range of activities (Figure 3-4). Salaried labor is associated with greater levels of consumption expenditure. This is expected in an economy such as South Sudan's, where the stability associated with regular wages and salaries can stave off vulnerability to poverty. The wealthiest urban residents are hence more likely to be employed in salaried labor (Figure 3-3). Furthermore, there is a clear relationship between employment in the services sector in urban areas and consumption expenditure (Figure 3-3). However, men are much more likely than women to be holding waged employment (Figure 3-6).

Labor force participation rates are low, possibly due to conflict and economic disruptions. In 2016, only about 3 in 5 of the working age population was engaged in the labor market (59 percent, 7 days reference period). Labor force participation is higher in rural areas than in urban areas, due in large part to a lower availability of safety nets and subsistence agricultural production (62 vs. 46 percent, p<0.001). Indeed, one would expect much higher rates of labor force participation in a country with a virtually non-existent system of social safety nets. Low levels of labor force participation are most likely due to the conflict disrupting economic activity as well as the seasonal nature of agricultural employment. In the preceding 12 months, 87 percent of the working age population was active in the labor market (Figure 3-7).

Figure 3-7: Labor force participation per urban-rural quintiles, 2016

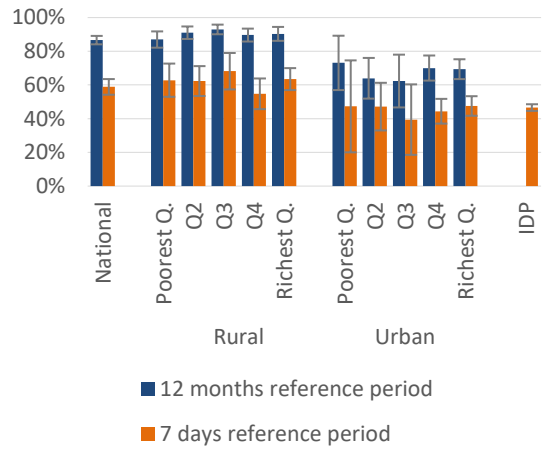
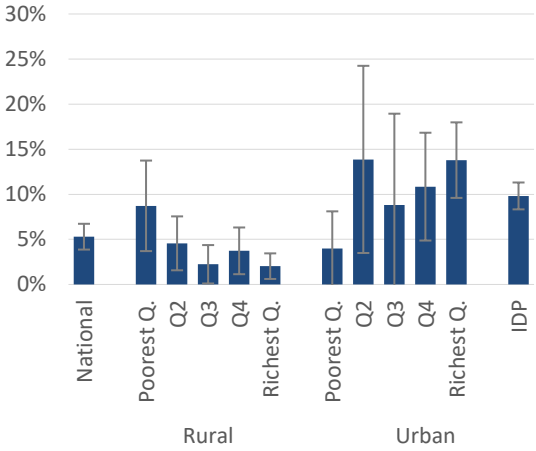


Figure 3-8: Unemployment rate per urban-rural quintiles, 2016



Source: Authors' calculations based on HFS 2015-2017 data.

Low unemployment can be explained by little churn in labor markets given the informal nature of employment. In 2016, the unemployment rate in South Sudan was at around 5 percent nationally (Figure 3-8). This low rate is not unexpected in a context where employment is often informal and agricultural and where others might have given up looking for work. Furthermore, prolonged spells of unemployment are hard for people to sustain because of the lack of social safety nets. Particularly in rural areas, better off people are less likely to be unemployed (Figure 3-8).

3.3. Amenities and durable goods

Ownership rates of durable goods are strongly correlated with food and non-food consumption levels. Households in the top quintile of food and non-food consumption own more assets and durable goods than households in the bottom four quintiles. Ownership rates are much more similar among the bottom four quintiles. Some of the more valuable assets though are owned almost exclusively by the wealthiest households, for example cars and trucks, computers and laptops, motorcycles, and refrigerators. Less valuable and more common types of assets instead vary much more strongly with consumption levels, especially mattresses and beds, mosquito nets, mobile phones, radio transistors and bicycles. Generally,

households in the poorest quintiles own very few durable goods, though a majority still own tools for agricultural production; i.e. a hoe, spade or axe, as well as mosquito nets to sleep under (Figure 3-9).

Figure 3-9: Ownership of selected assets by food and non-food consumption quintile, 2016

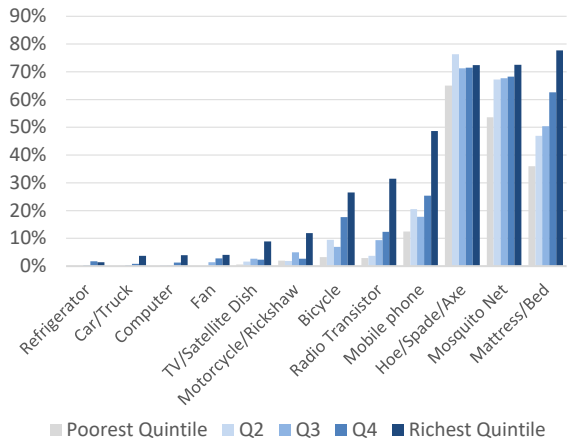
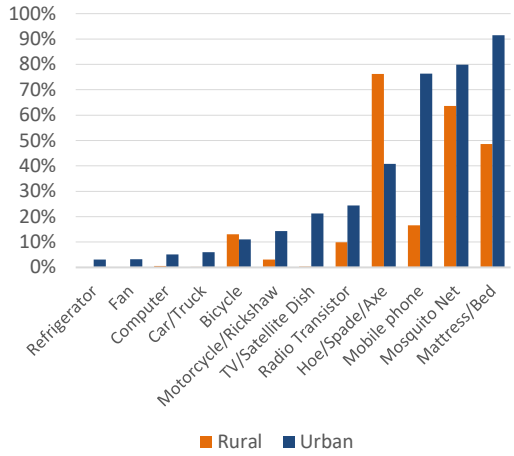


Figure 3-10: Ownership of selected assets by urban-rural, 2016



Source: Authors' calculations based on NBHS 2009 and HFS 2015-2017 data.

The urban-rural divide in terms of asset ownership is particularly strong, with urban households much more likely to own most types of assets and durable goods. Only for tools used in agricultural production are rural ownership rates (considerably) higher than urban (76 and 41 percent, p<0.001, Figure 3-10). Ownership of more valuable assets is concentrated among urban households and very few rural households own a car, truck, motorcycle, refrigerator, TV or computer. Rural ownership of mobiles phones is very low compared to that of urban households: at less than 1 in 5, compared to 3 in 4 for urban households (17 and 76 percent, p<0.001). The very low estimated ownership rates of radios, televisions, computers and mobile phones, imply that a majority of the South Sudanese population is deprived of means to access information, especially in rural areas. This highlights the disconnect of South Sudan's development with the rest of the world, where ownership of mobile phones and mobile subscription rates have risen sharply. In 2009, there were approximately 14 mobile subscriptions per 100 people in South Sudan compared to an average of 38 per 100 in all of Sub-Saharan Africa. By 2016, these estimates had risen to 21 in South Sudan compared to 74 in Sub-Saharan Africa. The corresponding estimates for the entire world are 68 (2009) and 102 (2016).[72] This contrast between local and Sub-Saharan African and indeed global estimates for transportation assets, such as cars, trucks and motorcycles, also holds true for transportation assets such as cars and trucks, and motorcycles, reinforcing the sense that rural households are truly isolated from the rest of the world.

Housing is generally of poor quality, with household members often living in crowded conditions. Three out of 4 people in South Sudan (78 percent) live in *tukuls/gottiyas*, traditional mud huts with grass thatched roofs. More people in urban areas live in better quality housing (concrete houses) than in rural areas, about

[72] International Telecommunication Union, World Telecommunication/ICT Development Report and database.

1 in 4 compared to fewer than 1 in 20 (27 percent and 3 percent respectively; p<0.001). Within urban areas, people in all consumption quintiles have relatively similar levels of quality of housing; only the poorest urban residents have similar housing as the rural population. Households in South Sudan tend to be large, with an average household size of about 6 household members including 3.6 children under the age of 18. The combination of poor-quality housing and large households means that overcrowding is common. More than 1 in 3 people live in a household with more than 4 members per room (Figure 3-12). In 2016, 3.75 household members on average were sharing a bedroom. Interestingly, over-crowding is particularly an urban problem due to a larger average household size in urban than in rural areas (6 and 6.6 members respectively, p<0.001). Over-crowding is also strongly related to consumption levels, especially in urban areas, and almost 3 in 4 of the poorest urban in the bottom consumption quintile live in overcrowded conditions (73 percent, Figure 3-12).

Figure 3-11: Quality of housing by urban-rural consumption quintiles, 2016

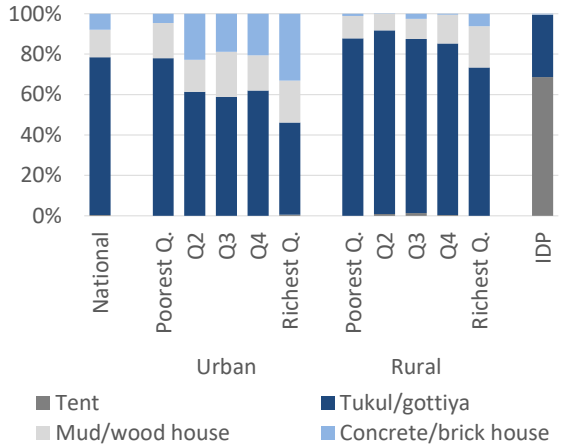
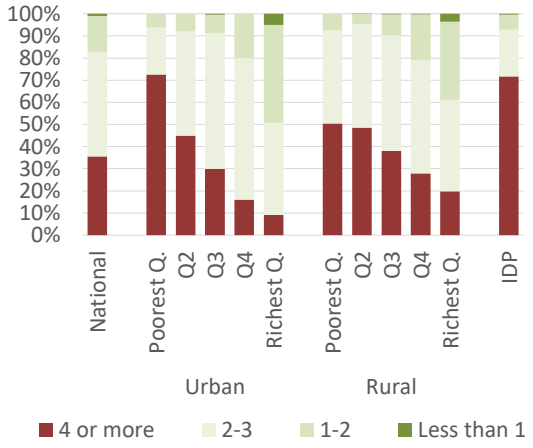


Figure 3-12: HH members per room by urban-rural consumption quintiles, 2016



Source: Authors' calculations based on HFS 2015-2017 data.

Access to modern and improved sources of energy is limited, with even the non-poor rarely having access to electricity. Access to modern energy sources for lighting or cooking is very low in South Sudan. Only 3 percent of households in 2016 could light their homes with electricity and virtually none could use electricity as a source of cooking (Figure 3-13 and Figure 3-14). Access to electricity is slightly more common in urban areas and virtually non-existent in rural areas (14 and 1 percent respectively, p<0.001, Figure 3-13). It is only for households in the third consumption quintile and above that access to electricity is observed. However, even for the wealthiest urban households only about 1 in 3 has access to electricity (31 percent, Figure 3-13). Rural households cook almost exclusively with collected firewood or grass, while urban households are more likely to cook with charcoal (3 and 65 percent respectively, p<0.001). The less poor a household is, the more often it cooks with charcoal. Access to modern fuels is clearly determined much more by households' residence in rural or urban areas than by their level of expenditure.

Figure 3-13: Access to electricity by urban-rural consumption quintiles, 2016

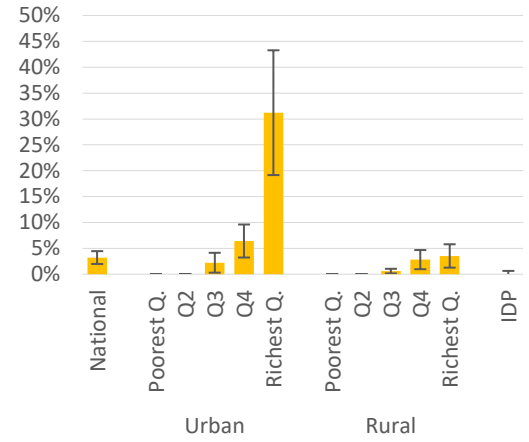


Figure 3-14: Cooking fuel by urban-rural consumption quintiles, 2016

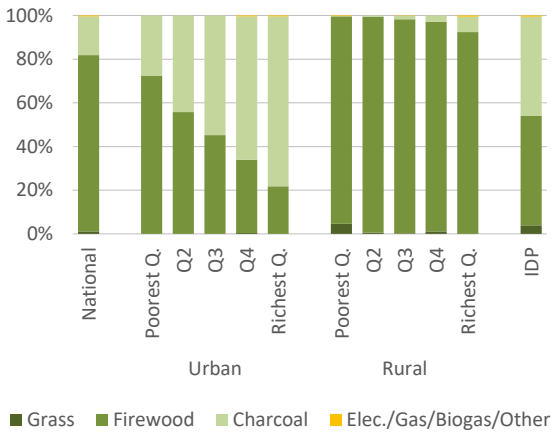


Figure 3-15: Access to water sources by urban-rural consumption quintiles, 2016

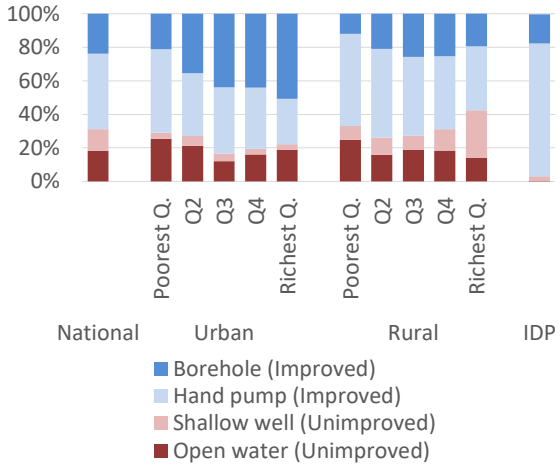
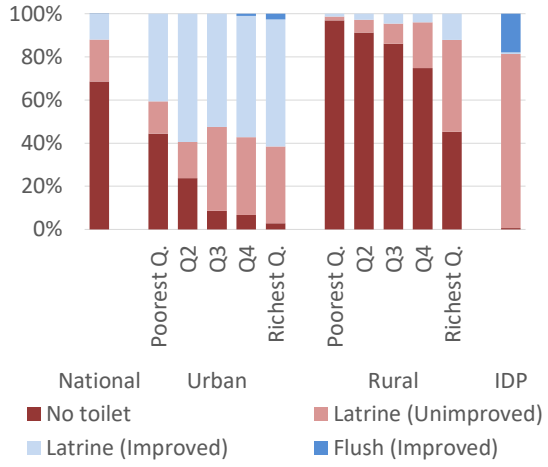


Figure 3-16: Access to sanitation facilities by urban-rural consumption quintiles, 2016



Source: Authors' calculations based on HFS 2015-2017 data.

Access to adequate WASH infrastructure is lacking and largely delineated along urban and rural lines. Poor access to sanitation and hygiene is a large problem in South Sudan. The consequences are severe; for instance, South Sudan has only just emerged from its longest running cholera outbreak.[73] In 2016, only about 1 in 8 people had access to improved sanitation infrastructure (13 percent). Better off households are more likely to have access to improved sanitation, but the level is still low. Approximately 1 in 4 non-poor households have access to improved sanitation compared to 1 in 12 for the bottom four quintiles (24 vs. 8 percent, respectively, $p<0.001$). Again, the difference between poor and non-poor is much smaller than the difference between rural and urban areas. Urban households are about eleven times more likely

[73] UNOCHA Humanitarian Needs Overview, 2018.

to have access to improved sanitation than rural households (57 vs. 5 percent respectively, p<0.001). The improved facilities are overwhelmingly latrines, while less than 1 percent of the population has access to a flush toilet (Figure 3-16). A majority of households in South Sudan are able to access safe and clean drinking water; about 7 in 10 people in 2016 had access to an improved source of drinking water according to WASH guidelines (68 percent). However, this level of access still ranks South Sudan among the lowest performing countries in Sub-Saharan Africa.

3.4. Education

Poor households have lower levels of education than wealthier households, linked to urban-rural disparities in provision of education. Educational outcomes are strongly positively correlated with consumption expenditure and poverty status. However, as in the case of amenities and living standards, the urban-rural divide is a much stronger determinant of both adult's educational attainment and children's school attendance than is consumption expenditure and poverty status. Adults in the poorest households in urban areas are about as likely as the richest rural adults to have never received any education (44 and 54 percent respectively). In addition, they are more than twice as likely to have attended secondary school (12 and 24 percent respectively, p<0.1, Figure 3-17). Attendance rates of school-aged children are also related to expenditure levels and urban-rural status. There are much stronger disparities across wealth within the rural population, with non-poor rural households clearly demarcated from the bottom four quintiles (40 and 59 percent respectively, p<0.001). In contrast, in urban areas attendance rates depend much less on the depth of poverty.

South Sudan has one of the lowest literacy rates in Africa, explained by low availability, access to, and quality of education. In 2016, only about 4 in 10 people in South Sudan reported being able to read and write (41 percent). While this constitutes an improvement over the 2009 rate of about 3 in 10 (29 percent, p<0.001), it still performs among the lowest in Sub-Saharan Africa.[74] Low literacy levels and poor learning outcomes are the result of fundamental deficiencies in the quality of education in South Sudan. Resource constraints limit materials per student. On average, three pupils need to share one textbook, with this ratio reaching up to more than 7 in the counties most exposed to insecurity.[75] Education is not implemented as a priority in South Sudan, and is allocated a very low share of the budget (Figure 1-10). The severe underfunding has resulted in a large gap in schooling infrastructure, generally inadequate teaching and learning environments, and large shortages of qualified teachers.[76] This has had an impact on teacher quality with only 41 percent of the teaching force in 2015 considered qualified, and primary education teachers even

[74] This literacy rate is self-reported and may overstate the ability of respondents to read and write.

[75] Global Partnership for Education, 2016.

[76] UNESCO, IIEP and South Sudan Ministry of General Education and Instruction, 2017.

less qualified than secondary education teachers. Given low transition rates from primary to secondary education, few pupils ever obtain adequate education.[77]

Figure 3-17: Adult educational attainment by urban-rural consumption quintiles, ages 18+, 2016

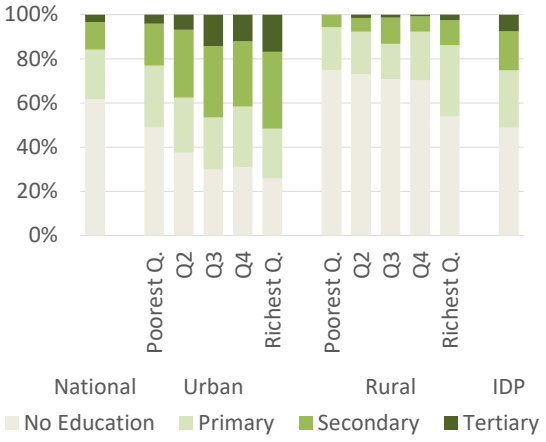
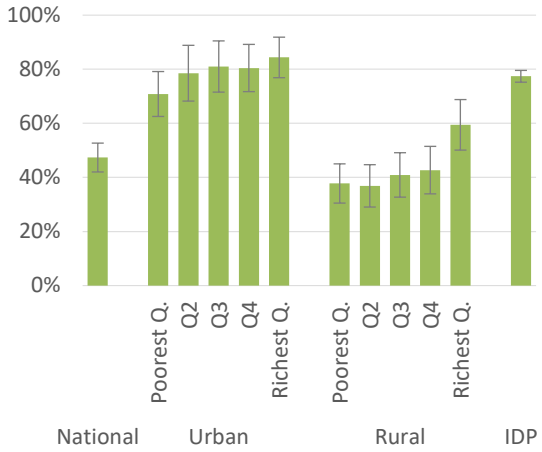


Figure 3-18: School attendance by urban-rural consumption quintiles, all levels, ages 6-18, 2016



The educational outcomes for youth show an improvement over those of previous generations, with the gender gap continuing to close. Children's school attendance is low, and less than half of children aged 6 to 18 were going to school at any level in 2016 (47 percent, Figure 3-20). Nevertheless, young people in South Sudan are much more likely to be attending or to have attended school than previous generations. Among the South Sudanese aged 10 to 20 years old, 2 in 3 have attended some schooling compared to slightly more than 1 in 3 for older cohorts (64 and 37 percent respectively, $p<0.001$). The gender gap in educational outcomes of the youth is much narrower than that of older generations. The difference between men and women in each 5-year age group having attended at least primary school is only statistically significant for adults aged 25 and above. Nevertheless, a gender gap still exists even among younger children, and girls between 6 and 18 years old were less likely to be attending school in 2016 than boys (49 and 56 percent respectively, $p<0.001$).

Despite these improvements, net attendance rates remain lower than in most other countries in Sub-Saharan Africa and have returned to 2009-levels since the intensification of the conflict in 2016. The improvements in educational outcomes between 2009 and 2015 were modest. The attendance rates of school-aged South Sudanese children remained well below the average of Sub-Saharan Africa countries (Figure 3-21 and Figure 3-22). The improvements were also limited to primary levels of education, and secondary attendance rates remained the same throughout the entire period at around 1 in 10. Furthermore, these improvements were short-lived and attendance rates fell back to 2009 levels in a single year between 2015 and 2016. The underdeveloped education sector in South Sudan has suffered from the

[77] UNESCO, IIEP and South Sudan Ministry of General Education and Instruction, 2017.

impact of the conflict. Out of all the schools that were open at some point since 2013, 1 in 4 became non-functional at the end of 2016.[78]

Figure 3-19: Literacy rate in SSA countries, ages 15+

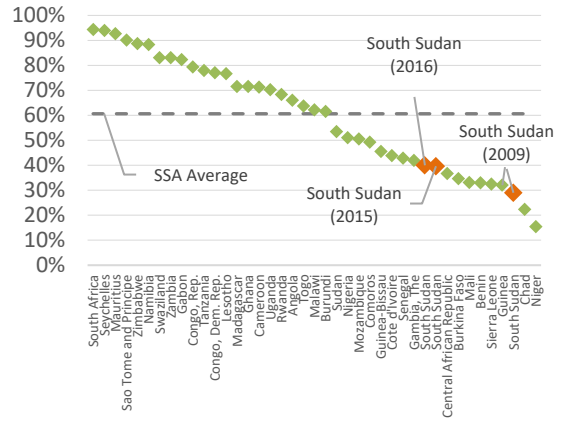


Figure 3-20: Has attended at least primary school by age group, 2016

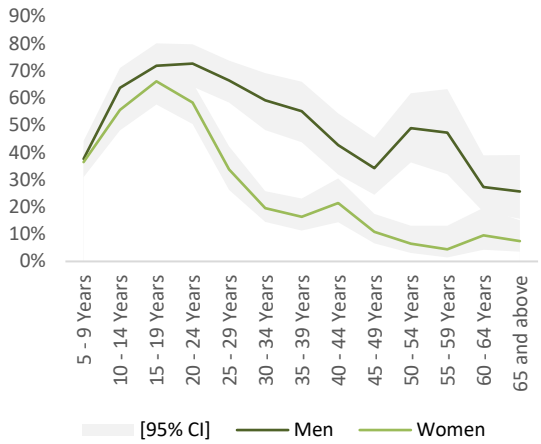


Figure 3-21: Net primary attendance rate in SSA countries, 2009-2016

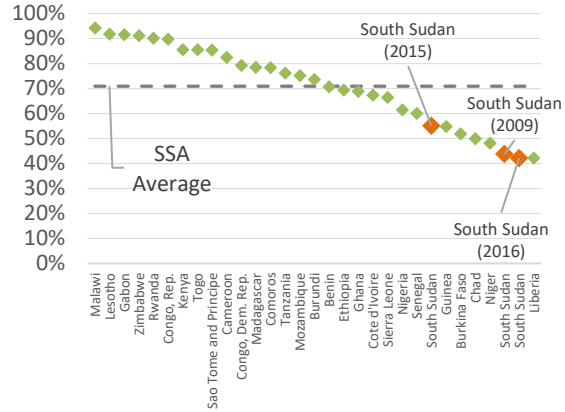
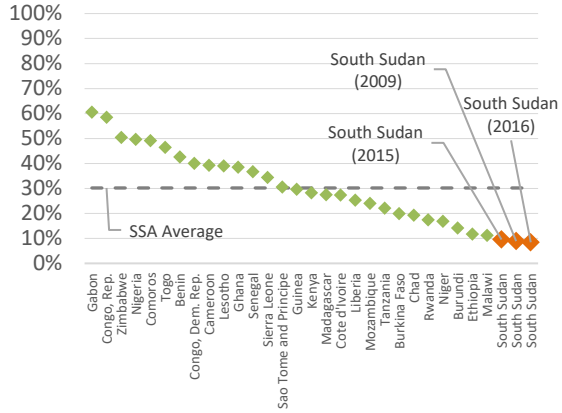


Figure 3-22: Net secondary attendance rate in SSA countries, 2009-2016



Source: Authors' calculations based on NBHS 2009, HFS 2015-2017 and WDI data.

Conflict affects school attendance by insecurity in the short-term and lower school availability in the longer-term. The conflict has caused extensive damage to many schools, with an estimated 31 percent of schools across the country having suffered from some form of attack since 2013. Many others have been

[78] Global Partnership for Education, 2016.

occupied by IDPs or by armed forces.[79] The safety of children at school is an issue; one-quarter of girls reported that they do not feel safe on the school playground (25 percent). In addition, one fifth of all students report not feeling safe on their way to school and more than one half do not feel safe using school toilets (20 and 54 percent respectively).[80] The lack of government funding has also caused teachers' salaries to often go unpaid for extended periods of time. As a consequence, in 2016 teachers' attendance fell by almost one third (31 percent).[81] Inflation has reduced households' ability to pay fees, with about one-fifth of children not attending school being due to their inability to pay fees and purchase school supplies.[82] In 2017, in urban areas about 4 in 10 children who were not going to school were unable to do so because of a lack of financial resources (40 percent).

The international community has stepped in to fill the gaps in the provision of education, but with large gaps remaining. NGOs and, primarily, UNHCR and UNICEF are attempting to fill gaps in educational outcomes, particularly for displaced people. The impact can be observed through the considerably higher attendance rates observed for children residing in IDP camps (77 and 37 percent respectively, $p<0.001$).[83] A major donor program, the Girls Education South Sudan (GESS) program, funded by DFID, has provided cash transfers to more than 200,000 school-aged girls, helping them to stay in school. The program is accompanied by capitation grants to more than 2,000 not-for-profit schools that can help pay for teachers' salaries and improve learning environments, and training programs for teachers and school administrators, as well as a radio program promoting attitudes and behaviors beneficial to girls' education.[84] As long as insecurity prevails with the government paying little attention to the education sector, donor-funded programs such as these will continue to contribute to improved educational outcomes, important to avoid a lost generation and additional risks of instability from idle youth in the future. Once the government is able to focus on providing social services again, these programs should be gradually transitioned to be funded and implemented by the government. This would allow the programs to reach a greater scale, would generate greater accountability, and would serve to improve the government's legitimacy.

3.5. Subjective wellbeing

South Sudan ranks among the lowest countries in the world in terms of comparable metrics of life satisfaction. Mental wellbeing is an important aspect often overlooked in poverty analyses, particularly due to the difficulty of measuring such subjective concepts. Nevertheless, one commonly used measure of

[79] UNESCO, IIEP and South Sudan Ministry of General Education and Instruction, 2017.

[80] Girls' Education South Sudan School Baseline Survey Final Draft Report, 2014.

[81] Global Partnership for Education, 2016.

[82] UNESCO, IIEP and South Sudan Ministry of General Education and Instruction, 2017.

[83] 99 percent of IDPs interviewed in the CRS claim to have received education from NGOs.

[84] Girls' Education South Sudan website: http://girlseducationsouthsudan.org/; and GESS quarterly progress report for Q1 in 2018, available at: http://girlseducationsouthsudan.org/wp-content/uploads/2018/05/GESS-QPR-18-Q1-2018.pdf.

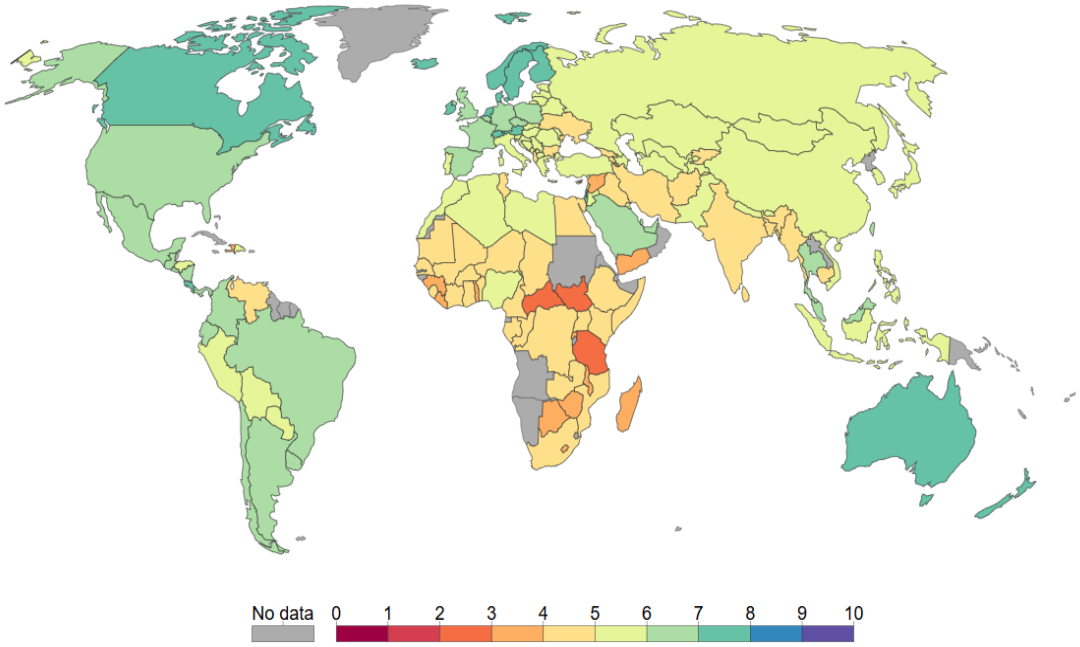
life satisfaction is the Cantril ladder, which asks respondents the following question: "*Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?*" On this scale, South Sudan ranks among the countries with the lowest scores in the world, including other war-torn countries such as the Central African Republic, Syria and Liberia. In 2016, the average score for the South Sudanese population was approximately 2.8, lower than the Sub-Saharan African average of approximately 4.4, and much lower than the global average of 5.3.[85]

In the context of the conflict and macroeconomic crisis, almost the entire South Sudanese population is dissatisfied with their lives; the intensity of dissatisfaction is correlated with monetary deprivation. The conflict has taken a significant toll on the psychological wellbeing of the South Sudanese population. Much of the population is wholly dissatisfied with their lives. Overall, almost 9 in 10 respondents disagree to some degree with the statement *"I am satisfied with my life"*, and almost 4 in 10 express strongly disagree with the statement (88 and 37 percent, respectively). Dissatisfaction is present at all levels of consumption expenditure and there is very little difference across quintiles in the share of people who express at least some dissatisfaction with their lives. More intense feelings of dissatisfaction are much more strongly correlated with high levels of deprivation and poverty (Figure 3-24). Respondents in the bottom quintile of consumption expenditure are more than twice as likely to be intensely dissatisfied with their lives as those in the top quintile (55 and 22 percent, respectively, $p<0.001$). While association between wealth and happiness or mental wellbeing is not unambiguous, it is likely non-linear.

The rapid political and economic disintegration that occurred between 2015 and 2016 is reflected in a deterioration of respondents' optimism regarding future personal and economic conditions. There was a large decline in respondents' perceptions of their living conditions between 2015 and 2016. In 2015, about 3 in 5 people felt that their personal living conditions were bad; this increased to almost 3 in 4 in 2016 (60 and 74 percent respectively, $p<0.001$, Figure 3-25). An even greater increase was observed in perceptions of economic conditions, from about 4 in 10 up to more than 3 in 4 (43 and 77 percent respectively, $p<0.001$). People also become more pessimistic about the near future: in 2015, only about one-third of people believed that their living conditions would deteriorate further; by 2016 this estimate doubled to almost two-thirds (35 and 64 percent, $p<0.001$). Pessimism with respect to economic conditions is particularly bad: in 2016 almost 19 in 20 people expected further deterioration, up from 7 in 10 in 2015 (94 and 71 percent respectively, $p<0.001$).

[85] World Happiness Report, 2018: http://worldhappiness.report/ed/2018/.

Figure 3-23: Life satisfaction worldwide – Cantril ladder, 2016[86]



Source: HFS 2015-2017 data, World Happiness Report and Gallup World Poll.

Figure 3-24: Agree with statement: "I am satisfied with my life" by consumption quintile, 2016

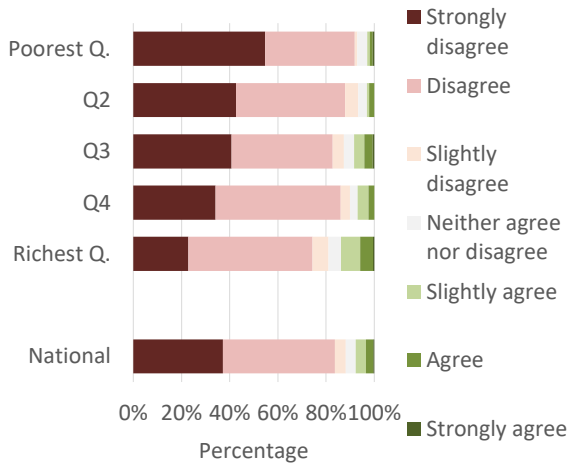
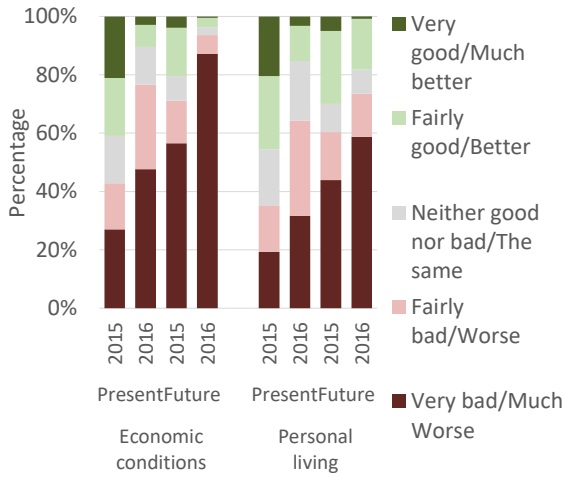


Figure 3-25: Satisfaction with present and future conditions, 2016



Authors' calculations based on HFS 2015-2017 data.

[86] Data obtained from the World Happiness Report, available at: http://worldhappiness.report/. Visualization accessed from *"Our World in Data"*, available at: https://ourworldindata.org/happiness-and-life-satisfaction.

3.6. Conclusions

South Sudan seriously lacks the infrastructure and amenities required to ensure a decent standard of living and provide livelihood opportunities beyond subsistence agriculture. Poverty in South Sudan is multidimensional in nature, with the majority of the population deprived along multiple dimensions of welfare which interact and may result in real poverty traps. Only a small minority has access to basic amenities and infrastructure including adequate roads, modern sources of energy and decent housing. The South Sudanese are also deprived in terms of durable goods including many productive assets, as well as assets used for transportation or for communication. These deprivations limit the scope of livelihood opportunities, resulting in most working age adults being forced to participate in basic agricultural production. Furthermore, gender norms surrounding participation in the labor force and especially the type of activities that can be undertaken by women are further stifling economic activity. The stark urban-rural divide in consumption levels and poverty as well as in the access to virtually all types of infrastructure and amenities highlights the sheer isolation much of the population is experiencing. Indeed, poor infrastructure are some of the primary bottlenecks undermining development efforts in South Sudan.

Improving access to infrastructure and services for neglected communities – implemented as public works programs – can be crucial to promoting the government's legitimacy while providing a safety net for the poor. Involving rural and neglected communities in the development process and improving service provision are integral to nation building, particularly after a long period of conflict. Given the poor state of infrastructure in South Sudan, there are likely large marginal gains to be reaped from initial investments with ample scope to establish a more significant institutional presence across isolated communities. Provision of services and infrastructure is likely to contribute to improving the public's perception of the government's effectiveness and improve its legitimacy. Public works programs could be leveraged to build up much needed infrastructure, while providing a safety net for those in need of assistance. In addition, supporting the achievement of these objectives through a bottom-up approach, for example with communities selecting projects based on their needs, would enhance the potential impact of development projects on institution building and would generate stronger links between the government and local communities. While some level of security is required for such programs, a phased county-by-county approach can be readily implemented at least in selected peaceful counties.

4. Resilience and Vulnerability

KEY MESSAGES

The South Sudanese population is vulnerable to further deprivation, meaning that they face a high risk of falling into poverty in the near future, even if they are not poor now. The conflict has had a profound impact on the livelihoods of the South Sudanese, and many are living just above the poverty line. Based on estimates of the effect of conflict exposure on consumption, further escalation of the conflict across the states covered in the HFS would push estimated poverty rates upwards of 9 in 10, and would have an even more pronounced impact on measures that account for the depth of poverty, as most of the affected households are already living under the international poverty line.

High inflation contributes to increased poverty, lowers school attendance of girls especially, and creates higher unemployment and more hunger. The impact of high inflation can be estimated by comparing changes in households' outcomes before and after inflation between households more and less exposed to inflation. The estimation reveals that an increase in inflation by 10 percent increases poverty incidence by 3.5 percent. Girls' education outcomes are particularly vulnerable to escalating food prices, with a 10 percent increase in food price inflation reducing girls' primary and secondary school attendance by 1.3 percent. High inflation also exacerbates food insecurity and hunger, with a 10 percent increase in inflation resulting in 5.1 percent higher incidence of hunger across affected households.

In this context of widespread poverty and vulnerability, interventions should bridge the gap between short-term humanitarian assistance and long-term development objectives. While South Sudan remains within the cycle of conflicts, supporting the delivery of emergency basic services for vulnerable populations while promoting the building of basic livelihoods, ensuring future food security and stimulating basic economic recovery can help to prevent further escalation of the crisis. Continued humanitarian intervention can help to avoid the potentially long-term consequences of acute malnutrition and stunting. Meanwhile, interventions intended to create sustainable livelihoods by providing social safety nets, supporting agricultural production, or even promoting entrepreneurship and private sector development, can help to involve idle youth in the development process.

4.1. Impact of shocks

Most of the population of South Sudan can be described as vulnerable, given the existing depth and breadth of poverty in the country and the sheer scale of the shocks driving the rising poverty rates. Vulnerability in this context means that an individual or household has a high risk of falling into poverty in the near future. When the main drivers of poverty include powerful forces such as a civil war and near hyperinflationary price increases, it becomes difficult to distinguish which segments of the population may be especially vulnerable to falling into poverty. Indeed, given the high poverty rate in the country, even most non-poor households are themselves vulnerable. There are few things that a household can do to hedge against such shocks, aside from leaving the country or seeking protection in IDP camps – which, as documented in Chapter 7, is likely to result in a significant decline in living standards. Most of the population would likely be driven into poverty or into a state of extreme deprivation with a further escalation of these shocks. Indeed, in 2016 the regions with the lowest poverty rates primarily included areas that were less hard-hit by the conflict – notably Western Equatoria, where agricultural output remained more stable, and helped households maintain their consumption levels against the impact of inflation (Chapter 2, Figure 2-8), though the relative fertility of the region is also likely to have played a role. Unfortunately, the conflict has since intensified in Western Equatoria and more recent food security projections indicate a rapid decline.[87]

An intensification of the conflict and inflation would drive many non-poor into poverty as well as push the poor to further destitution. A large portion of the non-poor live just above the poverty line and are therefore highly vulnerable to falling into poverty. A poverty rate of 82 percent means that less than 1 in 4 of the South Sudanese are living above the poverty line (18 percent). In 2016, about 3 percent of the total population lived within 10 percent of the poverty line and slightly over 5 percent within 20 percent. These estimates may seem small; however, because there are so few non-poor households, they represent about one-fifth and one-third of the non-poor population (16 and 31 percent respectively). IDP households are especially vulnerable to falling into poverty, given that 9 in 10 already live under the poverty line. Almost 2 percent of IDPs live above 10 percent of the poverty line and 3 percent within 20 percent. Again, this translates into almost 1 in 4 and 4 in 10 of the population of non-poor IDPs (23 and 40 percent, respectively). The impact of intensification of the conflict and/or inflation would likely be even greater at lower levels of consumption due to the larger share of the population living far below the poverty line. A 10 percent uniform consumption shock would drive the share of the population living under US$1.00 PPP (2011) in 2016 from 57 percent up to 63 percent; a 20 percent consumption shock would bring this estimate up to 67 percent.

[87] Based on more recent ACLED data and food security projections from IPC Info, for example see *IPC Info: Key IPC Findings, September: 2017-March 2018* at:

http://www.ipcinfo.org/fileadmin/user_upload/ipcinfo/docs/South_Sudan_KeyMessages_Sept2017.pdf.

Impact of conflict

The fighting has caused substantial consumption losses across exposed households, and a continuation in the fighting is likely to have a significant impact. Wave 3 of the HFS was conducted shortly after the escalation of the conflict in 2016, and thus provides a wealth of data with which the impact of direct conflict exposure can be estimated. The impact of the conflict in South Sudan has resulted in large losses in terms of consumption levels, estimated at around 32 percent on average across the households residing in conflict-exposed areas (Box 4-1). Wealthier households have experienced greater proportional losses, experiencing a reduction in welfare of approximately 40 percent compared to about 10 percent for the poorest households. These estimates allow simulating the percentile-specific impact of a hypothetical consumption shock, which might be caused by a continuation or escalation of the conflict.

Based on estimates of the impact of the conflict between 2009 and 2016, further escalation of violence is likely to leave 9 in 10 people in poverty. A country-wide escalation of the conflict would push estimated poverty rates upwards to near universal levels (Figure 4-1, Box 4-1). Both urban and rural poverty would increase to levels higher than 9 in 10 people; the rural and urban poverty headcounts would reach 97 and 93 percent respectively. The response of the urban poverty headcount would be greater than that of the rural headcount because a larger proportion of the urban population lives just above the international poverty line.[88] Even the lower bound estimates are high: even the most conservative estimation of the impact of a countrywide escalation of the violence would bring the poverty headcount up to more than 9 in 10 and the extreme poverty headcount up to almost 8 in 10 (92 and 77 percent respectively, Figure 4-1). Those already living in poverty or extreme poverty would also suffer from the escalation of the fighting. The poverty gap would reach up to 60 percent nationally; 47 percent in urban areas and 62 percent in rural areas (Figure 4-2).

[88] This is due to the cumulative urban consumption distribution being steeper at this level.

Figure 4-1: Poverty headcount before and after shock, 2016

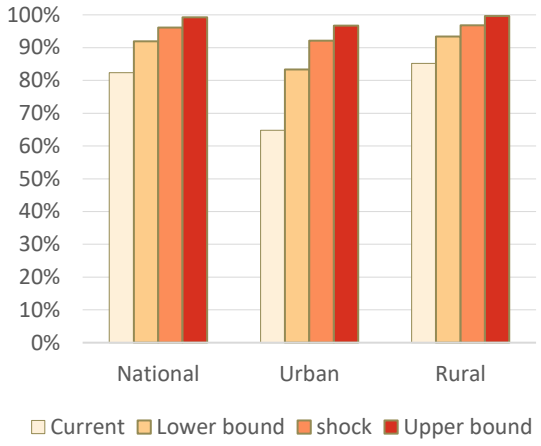
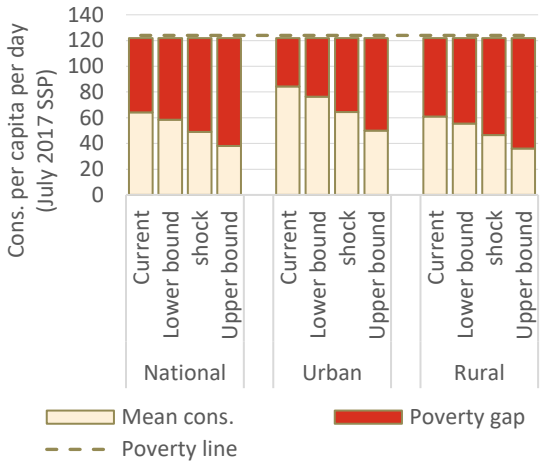


Figure 4-2: Poverty gap before and after shock, 2016



Source: Authors' calculations based on NBHS 2009, HFS 2015-2017 and ACLED data.

While the predictions are restricted to consumption levels and poverty rates, the overall impact of prolonged conflict will clearly be larger. First, the estimation does not consider losses in livelihoods to the forcibly displaced population who left the country. Those losses are likely to be large given that IDPs and refugees experience poorer outcomes across most dimensions of welfare (Chapter 7). Second, further violence would lead to a deterioration of a much broader range of socio-economic indicators, such as educational outcomes, living standards and access to amenities, as well as the impact of shock and deprivation on mental wellbeing. Indeed, the effect of further conflict would not only be marked on near-term consumption levels, but would also have long-lasting consequences for the country, with the risk of creating another lost generation. Only an end to the hostilities and spending redirected towards development objectives can mitigate the already grave impacts and avoid a further deterioration.

Box 4-1: Modelling the impact of the conflict

The impact of conflict and insecurity is estimated using pre-conflict data from 2009 and post-conflict data from 2016. Using data from before and after conflict events allows estimating the effect of exposure to conflict-related violence on consumption levels and poverty. The estimated effect summarizes the differential experience from households residing in areas exposed to conflict with households residing in areas that did not experience conflict events. It therefore encompasses several direct and indirect mechanisms, including the direct harm from violence as well as indirect harm caused by higher food prices and shortages due to market closures and production disruptions.[89]

[89] More details on the estimation and data in Appendix C.

The impact of conflict exposure is estimated using a quantile difference-in-differences specification, which suggests that conflict-exposed households experienced an additional consumption loss of about one-third. A difference-in-differences specification allows controlling for group-specific effects as well as overall time trends. These potentially confounding factors are important in the context of South Sudan because conflict-exposed regions tend to be better off, and the country as a whole experienced negative economic growth due to external shocks caused by volatility in oil prices (see Chapter 1). The estimation results suggest that wealthiest households experienced greater relative losses than poorer households. On average, conflict-exposed households experienced a 32 percent additional decline in consumption relative to non-exposed households. Households in the top quintile experienced consumption losses reaching about 39 percent, while households in the bottom quintile experienced losses closer to 11 percent (Figure 4-3).

The estimation results are used to build a consumption percentile-specific shock, assuming an escalation of the conflict across the entirety of the six covered states. To best take into account the heterogenous impact of conflict exposure, an econometric model is estimated for every percentile of consumption expenditure. The margin of error of the estimated effect of exposure, given by the 95 percent confidence interval, is used to define an upper and lower bound to the hypothetical effect of further conflict exposure. The results from the shock presented in Figure 4-1 and Figure 4-2 abstracts from making predictions on the most likely geographic location of further fighting and assumes violence spreading equally throughout the six covered states. Although it is difficult to predict the evolution of highly complex and interconnected social and political crises, a country-wide escalation is not entirely unrealistic. This reflects at least in part the reality of the conflict in South Sudan, where a clear escalation in the previously less-affected southern regions can be noted, occurring simultaneously to the continuation of the fighting in the northern regions (Figure 4-3).

Figure 4-3: Estimated coefficients for the impact of conflict exposure on consumption, 2009-2016

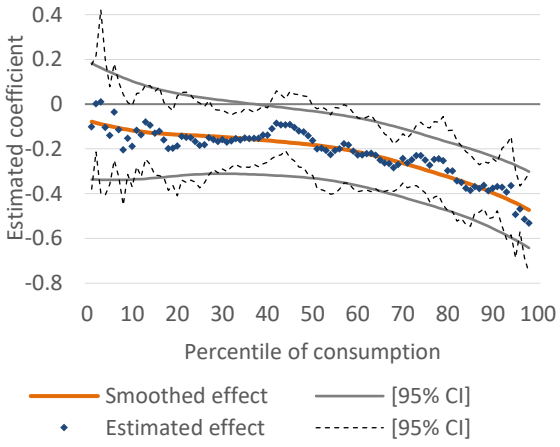
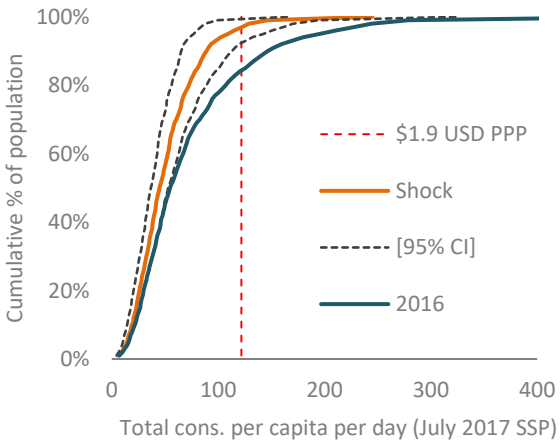


Figure 4-4: Cumulative consumption distribution after country-wide conflict escalation, 2016



Note: Estimated coefficients for each percentile are smoothed using locally weighted regressions (LOWESS).

Source: Authors' calculations based on NBHS 2009, HFS 2015-2017 and ACLED data.

Impact of high inflation

The South Sudanese urban population is vulnerable to the burgeoning inflation, which had a largely detrimental impact on livelihoods and education. In 2016, urban poverty deteriorated to 70 percent from 49 percent in 2015. Poverty is likely to have increased further due to continued high inflation without compensatory income increases. This is particularly so for the wage-dependent urban population, who lost real purchasing power, putting them under extreme financial stress. Panel data from the HFS allows analyzing the impact of high inflation on household livelihoods in urban South Sudan between 2015 and 2017. The results from the estimation (Table 4.1) show that high inflation has had negative impacts on urban households' livelihoods and education and must therefore be addressed effectively.

The loss of purchasing power of wages and salaries, resulting from high inflation, has driven many urban South Sudanese into poverty. High inflation caused the urban population to lose real purchasing power, as reflected by the considerable decrease in real consumption between 2015 and 2017. Consequently, poverty increased with the severity of household exposure to inflation. If inflation increases by 1 percent, the share of poor urban population (living below US$1.90 per day PPP) increases by 0.353 percent. Further increase in inflation will likely worsen the already high poverty situation. Households whose heads are employed in the services sector are less likely to be poor compared to those in the agriculture sector. This probably reflects higher wages for those in the services sector. An important finding to emphasize is the important role of education on household consumption. The impact of inflation on real consumption is significantly less for households whose heads have university education than for those who do not (the coefficient on the interaction term is 0.985, $p<0.01$).

Girls are especially vulnerable to escalating prices, with high inflation having negative impact on their primary and secondary school attendance, particularly for those living far away from schools. The probability of a girl attending school diminishes as food prices increase. While the cost of schooling is a major constraint for school attendance of both boys and girls, it disproportionately affects girls. The extent of inflation impact among girls depends on how close they live to the nearest schools. The impact of food price inflation on school attendance is greater for girls who take more than 5 hours to walk to the nearest school from their homes compared to girls who take less than 30 minutes to do so. When faced with an economic shock such as inflation, households become poorer, and tend to sacrifice the education of their female children whose schools are far away from their homes, due to the costs related to living far away from school. Thus, bringing schools closer to households will help to mitigate the adverse impact of inflation on girls' school attendance. This, coupled with the finding that school attendance of both girls and boys increases if the household head is a woman and has at least secondary education, suggests that designing programs to promote female education will help to improve overall education outcomes, particularly for girls. Without boosting education levels, it will be difficult to reduce poverty and improve the welfare of the South Sudanese people in the long run.

Table 4.1: Summary of regression results for each outcome indicator and inflation variable

	Total inflation	Food price inflation	Non-food price inflation
Poverty			
Poor (below US$1.90 PPP)	0.353**	0.031	0.322***
Log(real consumption)	-0.833***	-0.173	-0.684***
Education			
Currently attending school (girls)	-0.024	-0.134***	0.017
Labor			
Labor force participation: active	-0.124	-0.208***	-0.025
Unemployed	0.019	0.086*	0.011
Hunger			
Hunger incidence	0.510***	0.327**	0.241**
Perceptions of welfare			
Life satisfaction	-1.206*	-0.178	-0.807*
Present living conditions	0.480**	0.220	0.220
Future living conditions	1.789*	-0.039	1.343**
Control over own life	-0.611**	-0.055	-0.514**
Present economic conditions	0.264	0.394**	0.053
Future economic conditions	1.369	-0.588	1.22*

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

Source: Authors' calculations based on HFS 2015-2017 data.

High inflation is associated with significant unemployment across exposed households, leading to a shift in employment type. The probability of being in the labor force decreases with higher exposure to inflation and increased food prices. In 2017, farming, hunting or fishing at own account became the most common type of employment, followed by running a non-farm business. The share of those in farming, hunting or fishing at own account increased by 13 percentage points from about 30 percent in 2016 (which was itself an 8 percentage-points increase from 2015) to 43 percent in 2017. The main reason behind this shift in employment type is that more men, especially in poor households, became engaged in farming hunting or fishing at own account. This shift in employment type is consistent with business income or wages and salaries becoming less reliable sources of income, forcing people to embark on activities that might allow them to better support livelihoods of their households. Perhaps employment programs with a focus on poverty reduction need to consider ways to mitigate the impact of rising food prices. For example, providing on-site meals for employees and take-home rations (targeted food transfer) may push people to re-join the labor market through helping to reduce hunger.

High inflation is exacerbating food insecurity and hunger, particularly for the poorest households, who are more vulnerable to hunger. While the pinch of inflation was felt by every household, the poorest were the worst affected by food insecurity and hunger. For these households, the likelihood of experiencing hunger 'sometimes' (3-10 times per month) increased from 29 percent in 2015 to 40 percent in 2016 and 43 percent in 2017, confirming that poorest households are more vulnerable to hunger than richer households in the face of rising food prices. This may pose serious health issues, and affect children education

outcomes, with both short-term and long-term adverse effects on poverty. Food insecurity will most likely stretch the government's finances, as well as pose challenges to humanitarian relief given the predicted worsening food-security situation of the most vulnerable groups. The finding that rapidly rising food prices is a causal source of hunger and food insecurity is consistent with findings from other poor countries, including a recent study on Malawi.[90] The poorest households are the most vulnerable because their coping strategies (e.g. selling productive assets such as livestock) typically put them at an even greater disadvantage in the future. They may also become even poorer due to consequences of hunger (including poor health, child malnutrition and education outcomes).

The deterioration of economic conditions in South Sudan is echoed by households' perceptions, which have been significantly adversely affected by high inflation. Urban residents who are exposed to inflation strongly feel that they are powerless and have no control over their lives. This has led to less satisfaction with life. South Sudanese in urban areas are increasingly worried about the future of their country, citing civil war, ethnic violence, insecurity, poverty and lack of jobs and opportunities for youth, as well as an overall bad economy as their greatest fears for the future of South Sudan. Further increase in prices will likely result in people being even less satisfied with their lives as they lose more control due to weakened purchasing power.

All of the above emphasizes the need for the government to implement urgent macroeconomic measures to reduce high inflation and curb its adverse impacts on vulnerable populations. Addressing the problem of high inflation will help to curb poverty, and is crucial for progress towards achieving the first Sustainable Development Goal (SDG 1) to end poverty by 2030. In addition, for South Sudan to achieve SDG 2 (to end hunger and ensure access to food for all people, including the poor by 2030), the rising inflation will need to be quickly contained.

4.2. Creating resilience

Breaking the cycle of conflict and alleviating poverty will require restoring stability and ending the stresses that the political and macroeconomic crises are placing on the population. Ending the current political and economic instability is a prerequisite for meaningful poverty alleviation. In addition to the enormous suffering caused by the conflict and its disruptions, the uncertainty caused by a state of insecurity and high inflation stifles long-term planning, both by institutions and individuals, that underlies economic recovery and growth. South Sudan is greatly underdeveloped relative to many otherwise similar countries and there is significant scope for interventions that are likely to generate large marginal benefits. However, as long as the conflict continues to drain government resources and block access to entire regions of the country, the potential benefits from development interventions are reduced. Improving the security is also a prerequisite for abating the displacement crisis, given that security is the primary concern expressed by the displaced. It is therefore the utmost priority to achieve a peace.

[90] Jolliffe et al., 2016.

The urgency of the current crisis requires continued humanitarian intervention to avoid the potentially long-term consequences of acute malnutrition and stunting. Hunger and deprivation have reached such depth that urgent action is needed to restore food security and avoid the potentially long-lasting developmental consequences of malnutrition at such a large scale. At this current point in time it is likely that this action should be spearheaded by the international community. Significant sections of the population are at the risk of malnutrition; many are children who are currently highly likely to grow up stunted. The impact of such widespread stunting and other associated health effects of malnutrition is potentially enormously important and may result in a lost generation, prolonging the poor developmental state of the country. Indeed, child malnutrition and stunting has been consistently linked to lower economic growth and to a wide range of individual economic outcomes, including lower mental development, lower future wages and fewer years of education.[91] Immediately compensating these nutritional needs and ensuring access to nutritious food will be extremely important in the short-run to avoid a catastrophe.

Even though South Sudan is likely to remain within the cycle of conflicts in the near-future, delivery of emergency basic services for vulnerable populations should be supported by developmental interventions. Although addressing the basic consumption needs of the population remains a priority, interventions with a longer-term impact should not be discounted. Such interventions would work better to promote the building of basic livelihoods, ensuring future food security and stimulating basic economic recovery, which would in turn help prevent further escalation of the crisis.[92] Such interventions can be implemented through a variety of different modalities, including but not limited to: cash transfers (conditional or unconditional), food or in-kind transfers, school feeding programs, public works, and different types of subsidies and allowances (including housing allowances, fee waivers for education- or health-related expenditures, pensions, etc.). Entrepreneurship and private sector development programs can also have positive impacts, although their effectiveness might be limited to urban areas and they would be much more heavily dependent on a stable macroeconomic environment. Nevertheless, Chapter 6 reports the positive impact of a short week-long business training on the number and frequency of good business practices reported by beneficiaries. The impact of this intervention on broader socio-economic measures is much more muted, although this is not entirely surprising given the stifling economic environment left by the conflict and inflation crises.

Social safety nets, including various modalities of cash transfers, can be an effective tool for poverty alleviation and for building resilience among vulnerable populations. A well-designed and efficiently targeted social safety net (SSN) can serve to reduce the impact of shocks and the incidence of negative coping behaviors by providing immediate support for consumption in emergency situations. Such a program can also provide a windfall that can be saved or invested in productive assets, thereby improving future resilience. A SSN could compound on these benefits by bundling in interventions such as skills

[91] McGovern et al, 2017; Heltberg, 2009; Grantham-McGregor, 1995.

[92] World Bank, 2011.

building, business trainings and cognitive behavioral therapy, for example. Most countries in the world now implement some type of non-contributory SSN. A growing body of rigorous empirical evidence continues to show the many benefits that a safe and predictable transfer can have on a range of indicators of welfare.[93] Globally, SSNs are credited for allowing 36 percent of the world's population to escape absolute poverty and reducing the global poverty gap by 45 percent.[94] Establishing such a system through the humanitarian infrastructure already in place and using some of those modalities can improve the efficiency of delivery of such a program, given limited local capacity. In the mid to longer term, this would ease the transition from an environment dominated by emergency crisis response to one of emerging nation-building.

There is a large body of evidence showing that SSNs can help to alleviate relevant needs and target relevant issues, including promoting better diets and reducing the risk of crime or mercenary activities. SSNs increase immediate consumption levels and contribute to more varied diets, linked to better nutritional outcomes for children.[95] Another important issue in achieving stability is reducing insecurity. Participation in non-politically motivated mercenary work and crime has been found to respond to monetary incentives.[96] Thus, additional income in the form of grants, workfare program opportunities, and/or training and entrepreneurship programs can lead to higher rates of employment, potentially reducing insecurity. Indeed, programs implemented in fragile contexts or targeted at high-risk men help to reduce crime and mercenary activities, at least modestly.[97] Furthermore, young people in fragile states have high rates of return to capital. Given that SSNs are strongly linked to investment in productive assets, agricultural inputs and livestock, an SSN in the context of South Sudan could generate a substantial multiplier effect on local economies. [98]

Public works programs are particularly suitable for the South Sudanese context, partly because they can be used to build up the stock of infrastructure. Public works programs generally make cash payments or food distribution conditional on participation in an infrastructure project. Public works programs are advantageous in a context such as South Sudan's because they can help to rebuild and expand infrastructure destroyed in the conflict.[99] Given the extremely low level of infrastructure in South Sudan, any investment in increasing the available stock is likely to generate high positive marginal benefits and

[93] There have been several recent literature reviews conducted to summarize a large and ever-growing body of evidence, including but not limited to: Davis et al., 2016; Ralston, Andrews and Hsiao 2017; Bastagli et al., 2016; Daidone et al., 2016.

[94] World Bank, 2018.

[95] Bastagli et al., 2016; Ralston, Hsiao and Andrews, 2016.

[96] Blattman and Ralston, 2016.

[97] Blattman and Ralston, 2016; Blattman, Annan et al, 2015.

[98] Bastagli et al., 2016; Barca et al. 2015; Ralston, Hsiao and Andrews, 2016; Davis et al., 2016.

[99] World Bank, 2013.

externalities. The type of infrastructure that is built up by public works program is by no means limited to roads and bridges as is typically envisioned. Indeed, public works programs both in South Sudan and elsewhere have served to build up and repair schools or health clinics as well as irrigation infrastructure and other land management projects that may enhance farm productivity. Some public works programs have included explicit skills development modules and other means to improve future labor market outcomes. Furthermore, public works programs tend to garner greater political and public support given the greater visibility and less controversial conditions on payments. These programs may also be used to enhance institutional relations, through bottom-up approaches promoting communities' involvement in the choice and implementation of the project.[100] Programs implemented after a crisis may also result in greater social cohesion, although the evidence base for such a claim is limited.

In addition to SSNs there remains an important role for interventions that directly address the creation of sustainable livelihoods, particularly by supporting agricultural production, which would help to alleviate food insecurity and improve livelihoods in the longer term. South Sudan has enormous agricultural potential given favorable soil, water and climatic conditions, yet most of the food sold in markets is imported from neighboring countries.[101] Prior to the December 2013 conflict, 70 percent of the country's land was deemed suitable for crop production, but only 4 percent was being cultivated.[102] More than 3 in 4 working age adults are involved in agricultural production, overwhelmingly as subsistence farmers. Although the South Sudanese economy is largely agricultural, farm productivity is low relative to neighboring countries. Interventions addressing agricultural productivity will be key to enhancing livelihoods.[103] Improved agricultural production would also promote stability across local markets by decoupling the link between exchange rates and food prices. Such interventions could be accompanied by improvement of rural connectivity, such as road maintenance and repair as well as (prospectively) construction, to alleviate prohibitive costs borne by farms, traders and consumers.[104] Of course, supporting connectivity is contingent on ending the conflict and reducing insecurity at least locally.

Targeting the youth is another crucial aspect of successful interventions promoting long-term development, to avoid the potentially long-lasting consequences of a lost generation made resentful by the conflict. Idle youth can become a risk factor for conflict.[105] Although prioritization is challenging in a fiscally constrained space with ongoing insecurity, it is paramount to focus interventions on avoiding a lost generation and to providing opportunities for high-risk youth. This involves more than (the crucial step of) ensuring adequate nutrition during early years. In order to become a functioning member of society

[100] World Bank, 2013.

[101] HFS Market Price Surveys; Pape et al., 2017.

[102] African Development Bank, 2013.

[103] World Bank, 2015b.

[104] Pape et al., 2017.

[105] World Bank, 2011.

children should receive adequate healthcare and a full education. Healthcare and education in South Sudan have been largely neglected, as evidenced by poor outcomes but also by the small share of government budget allocated to their provision, forcing humanitarian organizations to step in. This situation must be reversed, given the limited reach of humanitarian organizations relative to a country's own government. DFID's GESS initiative illustrates a successful intervention that should be maintained and scaled, to help increase school attendance while also generating a safety net for the recipients' families.

Currently, the institutional social protection landscape in South Sudan is limited and large-scale interventions are primarily donor funded. Large-scale interventions in South Sudan have primarily been humanitarian in nature, accounted for in large part by the WFP's food, vouchers, and cash transfer programs.[106] These consist primarily of transfers in the form of blanket food distribution programs, vouchers and cash transfers for IDPs and returnees, and school feeding programs.[107] Overall, the WFP has been providing food assistance on a regular basis for more than 4.8 million people across South Sudan.[108] The WFP and DFID have also been running conditional assistance programs, Food Assistance for Assets, whereby food distribution and cash transfers are made conditional on community participation in asset building.[109] These consist of public works type programs distributing cash transfers for work on community assets and agricultural infrastructure such as irrigation ditches, with the aim to support agricultural livelihoods and help boost resilience to natural phenomenon. The GESS project, another major SSN program in South Sudan though entirely funded by DFID, provides cash transfers to more than 200,000 school-aged girls to promote attendance and close the gender gap.[110]

Recently, the space for social protection and similar interventions in South Sudan has been evolving to focus more on establishing the building blocks for a national SSN delivery system aimed at bridging the humanitarian-development nexus. This effort has been led in part by the establishment of the Safety Net and Skills Development Project (SNSDP). The SNSDP is managed by the Government of South Sudan and implemented by NGOs (Action Africa Help-International) and UN agencies (United Nations Office for Project Services, or UNOPS) in close cooperation with the World Bank. The long-term objective of the SNDSP is to build up domestic capacity and lay the foundation for a national SSN delivery system owned and led by the government. The SNSDP has thus far provided short-term work opportunities through public

[106] Pape and Pontara, 2015; WFP South Sudan Emergency Page, available at: https://www.wfp.org/node/647764.

[107] Emergency Operation EMOP 200859 for IDPs and returnees.

[108] WFP South Sudan Country Brief (March 2018), available at:

https://docs.wfp.org/api/documents/898ff7c0296f4ab39834bb77d93e504e/download/?_ga=2.264239817.411844286.1527791498-2086361234.1495218006.

[109] WFP: Food Assistance for Assets Fact Sheet (June 2017). Available at: https://reliefweb.int/report/south-sudan/wfp-south-sudan-s-food-assistance-assets-ffa-factsheet-june-2017.

[110] Girls' Education South Sudan website: http://girlseducationsouthsudan.org/; GESS quarterly progress report for Q1 in 2018, available at: http://girlseducationsouthsudan.org/wp-content/uploads/2018/05/GESS-QPR-18-Q1-2018.pdf.

works for approximately 10,865 households in Juba city and Torit County, or close to 85,000 individuals, of which more than 70 percent have been headed by a woman and about 30 percent IDPs.[111] The program is being expanded in Juba and several counties in the states of Jonglei, Warrap and Eastern Equatoria.[112] The total number of beneficiaries at the end of the project is estimated at 52,000 households (up from the originally planned 35,000 households) who will work for 90 days a year at a wage of US$3 a day, thus with potential earnings of up to US$270.[113]

With a total poverty gap of US$900 million in the states covered by the HFS, ending poverty is an expensive endeavor, but nationally implemented social protection programs based on these successful examples can provide a significant first step towards achieving a lasting peace and breaking the cycle of conflict. The aggregate poverty gap in the states covered by the HFS in 2016 was equal to about 120 billion SSP (July 2017) or US$900 million, at the July 2017 commercial exchange rate of 134 SSP per US$. These costs are substantial for a government struggling to meet its payment obligations, and probably an underestimate given the escalation of the conflict since 2016. Nevertheless, poverty alleviation interventions and other programs similar to those described above can help the Government of South Sudan signal a credible commitment to development objectives. This can help achieve greater institutional legitimacy and improve the public's perceptions of their government's performance. However, the implementation of such programs relies on achieving peace and economic stability. A successful and sustainable transition out of poverty requires operational markets so that households are less likely to simply fall back into poverty once the transfers end. Similarly, the impact of investment in productive assets would be muted by aggravated economic conditions. Instability and insecurity also makes owning and sustaining valuable productive assets much more difficult, as evidenced by the observed declining ownership rates as the crisis worsened.

4.3. Targeting the poor and vulnerable

Targeting is a crucial feature of any effective and efficient intervention. This section therefore evaluates the implications of some common types of targeting in a highly volatile context such as South Sudan. The potential for poverty alleviation and targeting efficiency can be evaluated against the hypothetical benchmark of perfect targeting. Under *perfect targeting*, transfers are allocated exactly and only to poor households.[114] The impact of the targeting mechanisms can be measured by changes in poverty headcount,

[111] World Bank South Sudan Country Engagement Note 2017, available at: http://www.worldbank.org/en/news/press-release/2018/01/16/new-country-engagement-note-for-south-sudan-reaffirms-world-bank-groups-commitment-to-supporting-vulnerable-populations.

[112] Bor and Ayod counties in Jonglei, Gogrial West and Tonj South counties in Warrap, Torit and Kapoeta East counties in Eastern Equatoria.

[113] World Bank South Sudan Country Engagement Note 2017.

[114] This is only a theoretical approach as poverty status cannot easily be measured at individual households, especially given a large incentive for misreporting. More information in Appendix E

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poverty depth and poverty severity. *Targeting efficiency* can be evaluated based on targeting error rates. *Inclusion error* occurs if a household or individual is selected into the program that was not intended as a beneficiary. *Exclusion error* occurs if a household or individual that was intended to be a beneficiary is not selected into the program.[115] Three targeting mechanisms are most common:

Econometric targeting: Econometric targeting, or proxy means testing (PMT), involves using proxy variables for consumption levels to determine a household's eligibility for the program. Here, the eligibility is determined at the household level with the transfer amount allocated to each household member.[116] Targeted households include all poor households with per capita consumption lower than the international poverty line of US$1.90 PPP (2011).

Demographic targeting: Demographic targeting (DT) involves targeting transfers directly to individuals based on demographic characteristics. Here, DT includes children under the age of 15 years old, disabled persons, the elderly, and households headed by a widowed woman.[117]

Geographic targeting: Geographic targeting (GT) consists of targeting entire geographical areas and disbursing transfers to all residents. Here, GT includes all residents of the 80 percent poorest counties.[118] Poverty rates at the county level are determined through satellite imputation (Box 2-3 and Appendix B).

Transfers are modeled as a cash-transfer for simplicity but could be implemented as in-kind transfers. Given the context of high inflation, declining exchange rate, low domestic production and high levels of food insecurity, in-kind transfers are possibly a better option than transfers of cash. In the short term they can supplement the low domestic supply and reduce food insecurity, malnutrition or even famine; however, in the long term in-kind transfers risk disrupting local agricultural markets.[119] In the context of a partial equilibrium analysis, a cash transfer has the same impact as an in-kind transfer as both relax households' budget constraints. Thus, transfers will be modeled as cash transfers, with the amount expressed in multiples of the average poverty gap (Box 2-2). The poverty gap is roughly equal to 10,700 SSP (July 2017) per person per year, or about US$80 (July 2017), approximately 40 percent of the average

[115] Exclusion errors are arguably more important than inclusion errors, since inclusion errors generally happen at the margin, and providing assistance to a marginally poor household can be considered better than not assisting a household which is living in poverty.

[116] No effort is made to vary the amount transferred depending on households' depth of poverty, largely because this is hardly ever done in practice. Varying the transfer size in practice is complicated and raises equity and implementation issues.

[117] Since each targeted individual receives the transfer, compared to the other targeting mechanisms that make a uniform per capita transfer per household, it will imply that a larger transfer size is often required to match the total transfers to a household allotted under the other targeting mechanisms. For example, a household with one adult and one child will require twice the transfer size for the amount per household to be equal to the amount that would have been sent had it been targeted through the PMT.

[118] While this number is high, it is chosen in order to maintain a level of coverage that is similar to that of PMT and DT programs.

[119] World Bank, 2016b.

yearly consumption.[120] A transfer of this size is proportionately large, compared to the developing country average of approximately 10% of average consumption.[121] However, given the extremely low consumption levels in South Sudan the real value of these transfers is not out of line with existing programs.[122]

A sizable reduction in poverty may be prohibitively expensive given the constrained fiscal space; it would also require a return to peace and a credible commitment to development objectives by the government. Unless the government could credibly commit to leverage oil revenues for this purpose, given forecasted oil revenues potentially reaching upwards of US$1.5 billion, meaningful poverty alleviation remains a difficult target.[123] Based on static partial equilibrium simulations, assuming an end to the conflict, a well-targeted SSN has the potential to reduce the poverty headcount from 2016 levels back to approximate 2009 levels at the cost of about US$866 million or 116 billion SSP (July 2017) for one year.[124] All simulated targeting mechanisms (PMT, DT and GT) achieve a similar poverty reduction impact relative to perfect targeting for a given range of total transfer costs (Figure 4-5). Given the depth of poverty, such programs would imply a much greater contribution to reducing extreme deprivation. The poverty gap and severity would be reduced by further beyond their 2009 levels, at around 16 to 18 percent for the gap compared to the 2009 gap of 23, and 7 to 8 percent for severity compared to 14 percent in 2009. The greater than proportional impact of SSNs on measures of the depth of poverty is due to most households already living far below the poverty line. At such levels of consumption even the relatively large transfers modeled here may not be enough to push most households above the poverty line.

[120] Assuming the commercial exchange rate of about 134 SSP per US$ prevailing in July 2017.

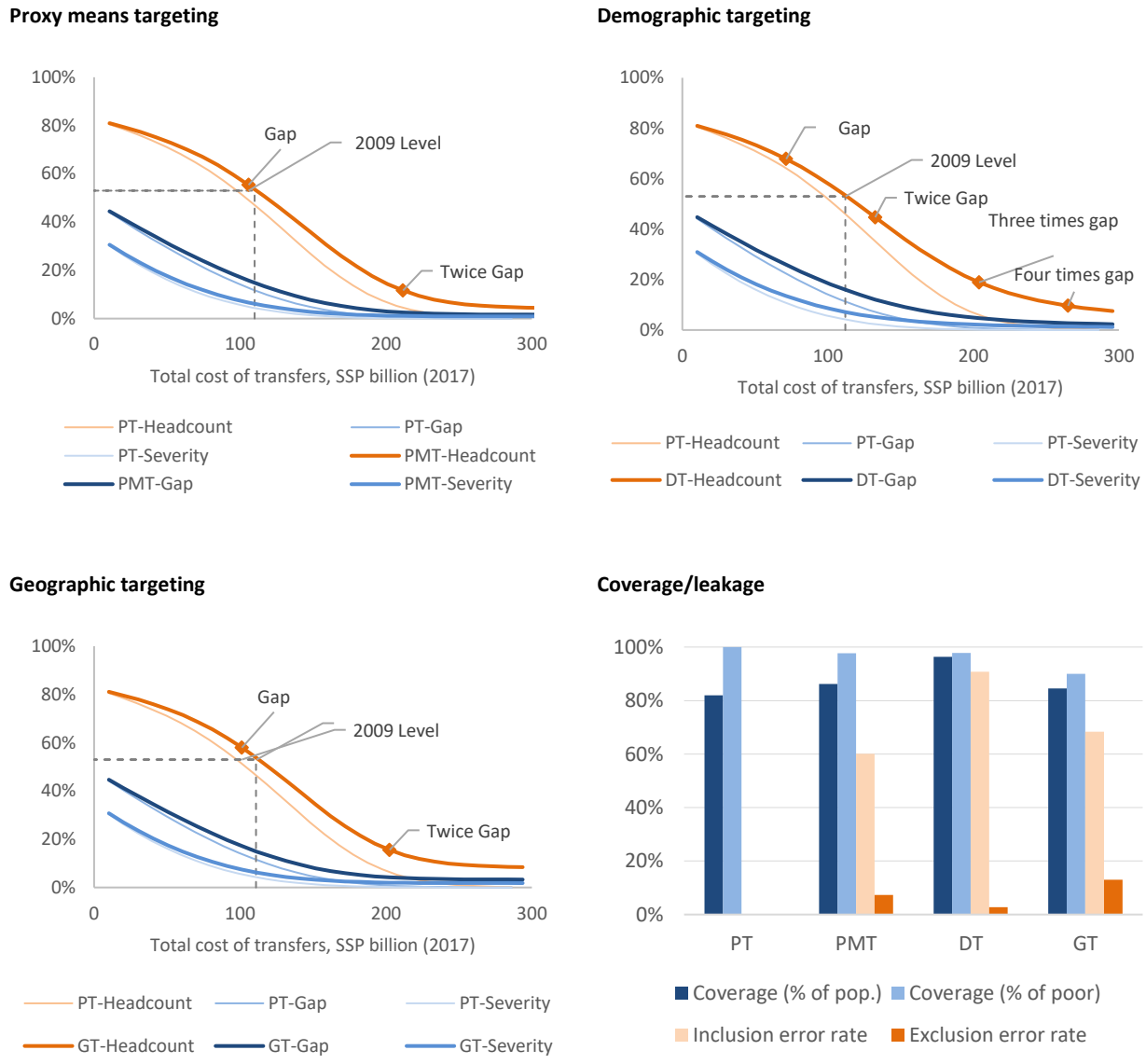
[121] World Bank, 2018.

[122] For example, the SNSDP funds 90 working days a year at a wage rate of US$3 a day, meaning that households can earn up to US$270 per year.

[123] World Bank, 2017c.

[124] It is important to emphasize that this is a static exercise, and the interpretation of the cost of reducing poverty to its 2009 level needs to be nuanced by noting both the large logistical and administrative costs that would be involved in an expanded SSN, as well as the capacity constraints that could impede its implementation.

Figure 4-5: Poverty alleviation per targeting mechanism varying transfer size, 2016



Source: Authors' calculations based on HFS 2015-2017 data.

Interpreting these figures requires careful consideration of the assumption of a return to peace and stability; in practice instability can quickly negate any benefits accrued from transfers. These figures regarding the potential for a SSN program should be interpreted with caution. The estimates consist of partial equilibrium simulations and thus cannot account for the dynamics inherent to a context such as South Sudan, with sporadic escalations of violence and volatile, but consistently high, inflation. The assumption of peace and macroeconomic stability are particularly important to the interpretation of these estimates, especially regarding the potential for a SSN in achieving sustained poverty alleviation. In practice, the beneficial impacts of a safety net in terms of building resilience will be stifled in a context of uncertainty and poorly functioning markets. As long as the country remains in turmoil it is likely that transfers would only act as a stop-gap for further poverty by temporarily raising recipients' consumption;

it is unlikely that they would be productively invested into means of building resilience. Once the transfers stop, it is reasonable to expect that many households would fall back into poverty if they continued facing the same shocks. These figures also only consider the cost of transfers. In the context of South Sudan there may be crucial logistical constraints that would make the delivery of these transfers relatively costly, as has been noted earlier.

Inclusion errors also need to be interpreted within the context of South Sudan, where most non-poor are vulnerable to falling into poverty. Inclusion errors from PMTs are likely to happen at the margin, with many of the households wrongly determined to be eligible for the program usually being almost poor.[125] These households are vulnerable to poverty, and leakage of funds toward these populations is not necessarily a concern, especially if the objectives of an SSN include building resilience. Furthermore, situational poverty diminishes the line between poor and non-poor households.[126] DT also has many advantages beyond poverty alleviation by targeting vulnerable populations, regardless of their poverty status. Targeted transfers can empower women, and transfers given directly to women increase their decision-making power, creating additional positive outcomes for children like increased school attendance. This can be further incentivized by introducing conditionality for the transfer. Furthermore, people in non-poor households can also suffer from non-monetary deprivations like having low health outcomes, like weight-for-height z-scores, or other indicators of malnutrition.[127] Indeed, roughly three-quarters of underweight women and undernourished children are not found in the poorest 20 percent of households, and around half are not found in the poorest 40 percent. DT will be enable the program to also reach those groups as beneficiaries.

Self-targeting mechanisms can increase targeting efficiency, though they may lead to exclusion of marginalized groups. SSNs are often designed with additional self-targeting mechanisms that can help to screen for non-poor households to improve targeting by reducing inclusion errors. These mechanisms can also drastically reduce the administrative burden and related costs. For example, a time-consuming application process reduces the inclusion error rates by deterring non-poor from applying to the program and decreases exclusion error rates by allowing the poor to self-target themselves into the program.[128] Also, public works programs are inherently self-targeting as they are usually designed for low-skilled and labor-intensive activities, which deters households that have better outside options. However, such mechanisms can also lead to the exclusion of marginalized groups. For example, the manual nature of labor will exclude handicapped persons or elderly persons while women might be excluded by certain types of labor that are usually not performed by women in a given cultural context. Self-targeting also requires availability and – for public works – flexibility to work outside the household, which can pose barriers especially to women.

[125] Brown, Ravallion, Van de Walle, 2017; AusAid, 2011.

[126] Ravallion and Jalan, 1996; McKay and Lawson, 2003.

[127] Brown, Ravallion, Van de Walle, 2017.

[128] Alatas et al., 2011.

Political and cultural considerations are likely to play an extremely important role for any program to obtain and maintain legitimacy. The choice of beneficiaries for a SSN program is an inherently political decision that can have significant implications for social cohesion and community satisfaction with the implementing institution. This is true especially in a volatile and fragile context like South Sudan, where perceptions of government performance and corruption are overwhelmingly negative. Thus, targeting of social protection programs should be conducted in a careful and transparent manner to avoid any potential misperceptions of the programs' intention. While targeting through PMT is theoretically a transparent and mechanical means of targeting, it is often not perceived as such by communities.[129] GT may be sensitive to ethnic considerations but given the political context in South Sudan might be prone to being captured and may exacerbate the potential for conflict. Community-based targeting, in contrast, is a bottom-up approach usually leading to increased community satisfaction.[130] However, again, the context of South Sudan is particular given fears of further – potentially ethnic – marginalization within communities. Targeting specific groups through DT, such as women and children, has many advantages beyond poverty alleviation, and is less sensitive to elite capture and ethnic sensitivities. Targeted transfers can empower women, and transfers given directly to women increase their decision-making power, creating additional positive outcomes for children like increased school attendance. This can be further incentivized by introducing conditionality for the transfer. Another option – though less effective – can be universal transfers avoiding the caveats of specific targeting mechanisms.

4.4. Conclusions

There is some scope for a social protection program to generate important benefits in South Sudan, although this is conditional on maintaining a more stable political and macroeconomic situation. The South Sudanese population is highly vulnerable to shocks and has suffered extensively from the conflict and inflation. Estimates of the impact of these shocks on livelihoods are significant in both magnitude and scope. The impact is not limited to consumption levels – broader livelihoods are being destroyed, through declines in employment, school attendance and psychological wellbeing. Already, much of the South Sudanese population is living just above the international poverty line, meaning that further shocks would push significant numbers of the population into poverty and further reduce associated livelihood outcomes. Many South Sudanese are already being forced into increasingly precarious positions, especially the large displaced populations, who have lost the majority of their belongings as well as their land and productive assets. Thus, there is some scope for social protection and related programs that can enhance peoples' resilience. Indeed, assistance in terms of food, cash and assets, and even community-based assets, could help people to both sustain themselves above the poverty line and overcome capital constraints, which will be necessary if they are to gain employment and rebuild their livelihoods.

The most effective social protection program may be designed to include a combination of targeting mechanisms and modalities of delivery. Given the level of deprivation in South Sudan and the various

[129] AusAid, 2011.

[130] Alatas et al., 2011.

dimensions of needs, the most effective approach may consist of a multi-pronged program that includes a combination of several targeting mechanisms, depending on the context. The high rates of malnutrition and potential for widespread stunting require immediate action to avoid significant harm to the future development of the country. In a more secure context, the objective can be shifted to build livelihoods to achieve stability in the long term and avoid a return to conflict. This would require interventions that reach further than feeding programs and that can promote the build-up of developmental potential. Such developmental objectives may be achieved through a public works program such as that implemented as part of the SNSDP. Public works are particularly suited to this context because they would help boost the stock of infrastructure. However, public works programs are not flexible and cannot be rolled out on short notice, such as in response to a crisis, and of course are in danger of being destroyed in the case of renewed conflict.

Part II: Conflict and Displacement

5. Impact of Conflict Exposure on Adolescent Girls

KEY MESSAGES

The conflict in South Sudan affected girls through various channels that should be prioritized for interventions. Measures such as employment opportunities taken up, marriage-related outcomes, anxiety and physical household conditions deteriorated for conflict-affected girls. Most of these impacts, such as anxiety and marriage, are widely documented in the literature. However, in the case of South Sudan the conflict also increased the perception of empowerment and entrepreneurship potential of young women. These economic and social impacts should be leveraged to inform design of policies intending to redress the negative effects of the conflict.

Economic engagement and capacity building interventions for adolescent girls can make use of this increased entrepreneurial potential and empowerment. Economic and business development initiatives should include criteria for incentivizing participation of this specific group in economic activities. Adolescent girls exposed to conflict reported higher entrepreneurship index scores, indicating willingness to work and start businesses in the future. Creating opportunities for girls has the potential to contribute to economic growth and poverty reduction, as well as address pervasive conditions of income inequality among the poor in particular. Targeted programming to support and incentivize girls' economic engagement would further improve household food security and economic welfare.

Mental health services must also be prioritized to improve the long-term wellbeing of girls. Lowered aspirations and high anxiety during early years have been linked to worsening economic outcomes in adulthood. Additionally, the issue of early and likely forced marriage is a prevalent feature of South Sudan, as are other dimensions of gender-based violence. These challenges highlight the need for interventions that focus on the provision of psychosocial and mental health services, and wider prevention programming addressing pervasive gender-based violence and challenging social norms that perpetuate it. Without improved services and protection, it is likely that the impacts of the conflict will continue to be severe particularly for vulnerable groups such as adolescent girls, as well as for their families. Immediate aid and targeted initiatives during the ongoing conflict are needed, but so are measures that improve the long-term wellbeing of vulnerable groups such as adolescent girls.

5.1. Gender and conflict in South Sudan

In addition to its macro impacts, conflict affects livelihood choices and poverty dynamics of households. From civil wars to riots and violent mass protests, conflict results in lost opportunities for development and has significant effects on the welfare, resilience and behavior of individuals, households and communities. Due in part to the field of security studies' traditional focus on the state and its agency, research on violent conflict has tended to rely mostly on standardized macro-level measures of conflict such as the number of battle deaths. Recently, research on household-level impacts has increased. Violence exposure is positively correlated to various measures of deprivation at the household level and traps already poor and economically vulnerable households in chronic poverty.[131] Exposure to violence has different impacts on household welfare depending on the adopted labor and livelihood choices.[132] Households with diverse livelihood opportunities have greater economic resilience to mitigate negative consumption impacts. Conflict exposure also causes households to make difficult trade-off decisions, often negatively affecting child schooling retention and investment in healthcare.[133] Lastly, destruction and impairment of infrastructure, economic opportunities and social services due to conflict increases the likelihood of chronic poverty regardless of pre-existing assets, skills or social capital.[134]

Conflict affects men and women in heterogeneous ways, including differentiated impacts on economic, social, physical and mental wellbeing. Men and sometimes boys often confront direct, first-round effects of conflict, including death and morbidity, with women and girls being affected by varying forms of gender-based violence.[135] In addition, men, women, boys and girls are indirectly impacted by, for example, malnutrition, exposure to disease and lack of access to health services, but also by changes in household and income-earning responsibilities, marriages and aspirations.[136] Violent conflict often changes the demographic composition of households, contributing to a rise in female-headed households due to the extended absence of males either due to conflict. These shifts impact traditional gendered division of tasks through its impacts on household composition, increasing women's participation in labor markets and augmenting their responsibilities within households.[137] Non-material wellbeing, such as marriage outcomes and happiness, has also been negatively impacted by conflict and displacement in some cases.[138]

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[131] Mercier, Ngenzebuke and Verwimp, 2016.

[132] Douarin, Litchfield and Sabates-Wheeler, 2011.

[133] Justino, Leone and Salardi, 2014; Brown and Velásquez, 2015; Minoiu and Shemyakina, 2012; Dabalen and Saumik, 2012.

[134] Bozzoli and Brück, 2009; Bozzoli, Brück and Muhumuza, 2015; Bratti, Mendola and Miranda, 2016.

[135] Annan et al., 2009; Dijkman, Bijleveld and Verwimp, 2014; Ostby, 2016.

[136] Buvinic, Gupta, Casabonne and Verwimp, 2013.

[137] Menon and van der Meulen Rodgers, 2013; Brück and Vothknecht, 2011; Justino et al., 2012; Annan et al., 2009; Brück and Schindler, 2009.

[138] Wang and Zhou, 2016.

Lastly, women are more vulnerable than men to developing anxiety disorders and struggling with psychosocial distress in conflict-affected settings.[139] Economic, social and mental impacts at an early age tend to be long-lasting and should be addressed before they worsen and persist. Identifying and quantifying such impacts can therefore inform appropriate intervention strategies.

Quantitative research on the impact of conflict on women has mostly ignored the experience of adolescent girls. Macro- and micro-level conflict impacts have mainly been explored in adults. Welfare measurements related to children and youth tend to comprise years of schooling and monetary investments in healthcare. While girls have been included in surveys assessing the extent and impact of various forms of gender-based violence and are the subjects of mostly qualitative research on ex-combatants, little systematic empirical research focuses specifically on non-combatant female adolescents.

Gender inequality in South Sudan is evident across several developmental indicators. Women and girls in South Sudan are less healthy, poorer, more food insecure and less educated, among other indicators. South Sudan has the highest maternal mortality rate in the world and one of the highest rates of child marriage.[140] Households headed by a woman experience striking levels of deprivation, and are more likely to be poor than men-headed households (83 vs. 73 percent respectively).[141] Women may also be suffering greater food insecurity, as they pass on food within families, especially in women-headed households, where there are often more dependents.[142] Moreover, there are almost twice as many illiterate women as men in South Sudan.[143] Gender gaps in education attainment are pervasive at every level; for instance, primary school education is significantly lower for adolescent girls and women than their male counterparts (Figure 3-20), with potential long-term impacts in terms of inter-generational transmission of gender inequalities.

Women and children in South Sudan are more often displaced than men, with negative impacts on socio-economic characteristics. In many countries, women and children frequently account for most of the population displaced by conflict. About half of the 2.4 million South Sudanese refugees displaced due to the 2013 conflict are female and 63 percent are under the age of 18.[144] While displacement generally contributes to a critical loss in assets, including housing, land and property as well as other productive assets, women confront particular constraints extending from social norms that restrict their ownership rights over land and other assets, and their frequent exclusion from decision-making processes.[145]

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[139] Ayazi et al., 2014; Luitel et al., 2013; Farhood and Dimassi, 2012; Murthy and Lakshminarayani, 2006; Roberts, Ocaka, Browne, Oyok Sondorp, 2008.

[140] IRIN, 2015.

[141] HFS South Sudan, 2016.

[142] OXFAM, 2016.

[143] Ballon and Duclos, 2015.

[144] UNHCR, 2018.

[145] Brookings, 2013.

Displacement also often gives rise to or exacerbates serious protection challenges including increased exposure to gender-based violence.

Conflict exacerbates already poor baseline outcomes for young women in South Sudan. Women and girls in South Sudan are known to face several developmental challenges. Given the long history of conflict in South Sudan, their current outcomes can partly be explained by the disproportionate impacts of conflict on women. In addition, women in South Sudan face adversities, such as early marriage and low education levels, that are independent from the conflict but often exacerbated by conflict and create additional vulnerabilities to conflict. As the direction of causality for the impact of conflict on women is hard to determine, an analysis comparing changes in outcomes before and after conflict with changes between conflict-exposed and non-exposed individuals can be helpful to attribute the impact of conflict.

Box 5-1: The Adolescent Girls Initiative (AGI) survey

The AGI program aimed to accelerate the economic and social empowerment of adolescent girls and comprised a baseline and endline survey in 2010 and 2015 respectively. To help break the vicious cycle of low human capital accumulation, early marriage and child bearing, which in turn thwart further human capital development, NGO BRAC launched AGI in South Sudan. Through both livelihoods and life skills trainings, the initiative aimed to improve employment and income outcomes of over 3,000 adolescent girls and young women aged 15 to 30 (Figure 5-1) in four counties of South Sudan.[146] The initiative included a baseline and endline survey, which were conducted across the four target counties of Juba, Rumbek, Torit and Yei in 2010 and 2015 respectively (Figure 5-2). In each state, respondents were randomly drawn based on a two-stage selection process using small geographical areas called clusters as primary sampling units. Given the high levels of mobility in South Sudan, these surveys were designed as repeated cross-sections.

[146] The Initiative was launched by the World Bank in October 2008 as a public-private partnership intended to promote the transition of adolescent girls from school to productive employment through innovative interventions that are tested, and then scaled up or replicated if successful. The initiative was piloted in eight countries including Afghanistan, Jordan, Lao PDR, Liberia, Haiti, Nepal, Rwanda and South Sudan.

Figure 5-1: Age distribution of girls surveyed

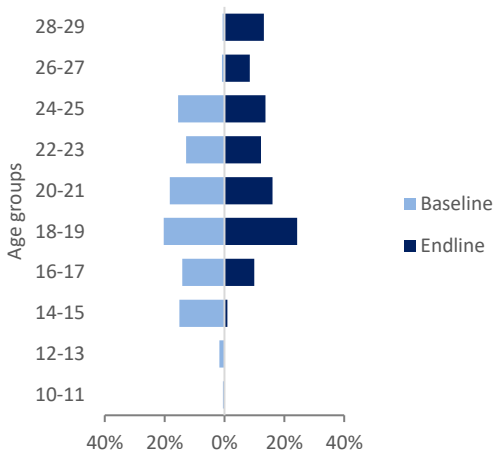
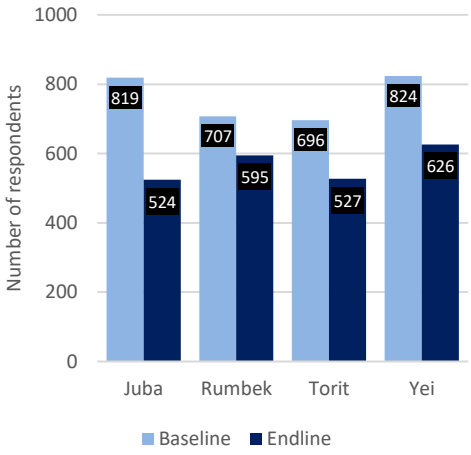


Figure 5-2: Baseline and endline observations per area



Source: Authors' calculations based on AGI 2010 and 2015 data.

The endline survey included an additional conflict exposure module covering a range of questions measuring incidence and severity of nearby violence. The eruption of violence in 2013 impacted and delayed the implementation of the endline survey to early 2015. To measure the extent of this conflict, the endline survey incorporated an additional module on conflict exposure. This module was developed based on similar conflict exposure questionnaires and adapted to the context in South Sudan with special consideration paid to the ethical administration of surveys in conflict-affected populations. The conflict exposure module included key questions related to looting, household damage and physical harm (including death) to members of the household.[147]

5.2. Measuring conflict exposure

Conflict exposure is estimated to analyze the impact on adolescent girls. Conflict exposure is measured internally and externally for robustness. The internal conflict indicator takes into account a set of self-reported conflict experiences from the AGI survey while the external conflict indicator considers proximity to a deadly conflict event. Both measures are constructed at the cluster level of the survey. This allows comparing girls in conflict-affected clusters to girls in clusters not affected across two time-periods.

A significant number of respondents chose not to respond to the conflict module, most of whom were from Rumbek and Torit. Out of 3,137 respondents, 804 respondents (around 25 percent) chose not to respond to the questions in the conflict module (Figure 5-4). While respondents from Juba and Yei mostly consented, the rates of consent across clusters vary considerably in Rumbek and Torit (Figure 5-3). No further biases with respect to responding to the conflict module are detected in terms of age, household

[147] See Appendix F for a description of conflict variables. A subset of these questions has already been used in the High Frequency Pilot conducted by South Sudan's NBS after comprehensive discussions of the impact of these questions on the emotions of the respondent.

size, years at residence, education and number of income opportunities taken up (Table 5-1). All respondents who did not provide consent to respond to the conflict module are excluded from the conflict estimation.

Table 5-1: Characteristics of consenting and non-consenting respondents

Characteristics (mean)	Age	HH size	Years at residence	Years of education	Number of IGAs
Consenting	22.1	10.5	5.6	7.7	0.9
Non-consenting	21.7	9.8	5.5	7.6	1

Source: Authors' calculations based on AGI 2015 data.

Figure 5-3: Density plot of consent by area

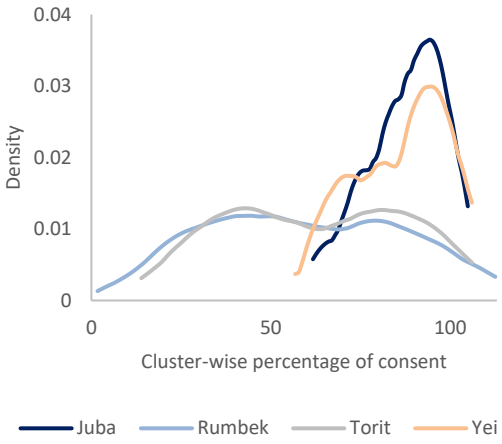


Figure 5-4: Non-consent to the conflict module

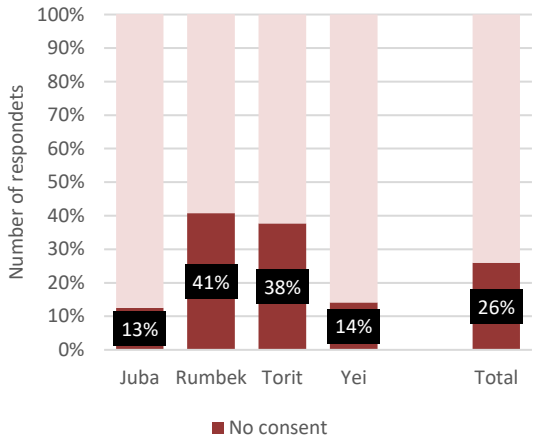


Figure 5-5: Respondents who experienced at least one conflict event

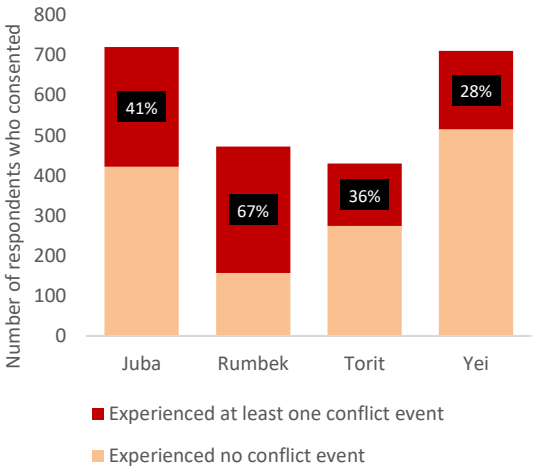
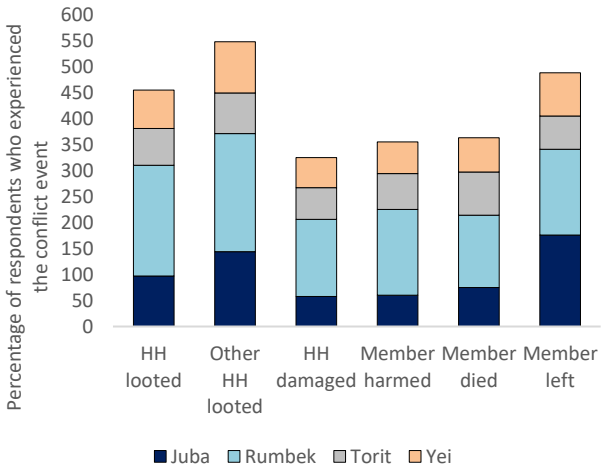


Figure 5-6: Conflict events by area

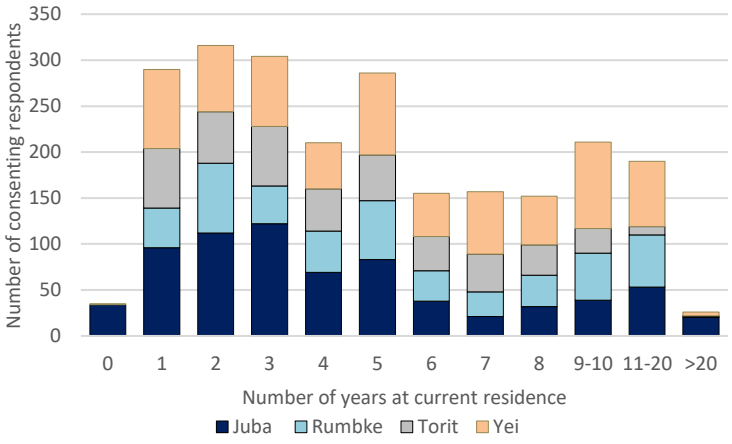


Source: Authors' calculations based on AGI 2015 data.

Girls in Rumbek most often did not consent to report conflict damage, leading to a potential downward bias in conflict exposure. About 40 percent of all consenting individuals had experienced at least one conflict event (Figure 5-5). Additionally, about 30 percent of consenting individuals stated that a member of their household was harmed or died due to the conflict (Figure 5-6). The highest incidence of conflict exposure is found in Rumbek, where about 67 percent of the consenting individuals experienced one or more conflict events, compared to less than 40 percent in the other three areas. Accordingly, Rumbek's residents also reported the majority of conflict events such as a household member dying or being harmed, while both Rumbek and Juba's residents more often reported that members were displaced. As Rumbek also has the highest non-response rate, it is likely that the overall extent of conflict exposure is underestimated.

Respondents who had spent less than 3 years at the current location were excluded from the analysis. The dataset is restricted to respondents who spent at least three years at their current residence. Otherwise cluster indicators for conflict exposure and outcomes would be mixed between the population exposed to conflict at the selected cluster and the population potentially being exposed to conflict in another cluster, who relocated to the selected cluster in the past three years. This excluded 640 consenting respondents, the majority of whom (38 percent) were from Juba (Figure 5-7).

Figure 5-7: Years spent at current residence by area



Source: Authors' calculations based on AGI 2015 data.

Due to non-consent and the possibility of response bias, conflict exposure is also measured externally. The internal measure of conflict exposure is self-reported, and therefore might exhibit potentially large measurement error; e.g. induced by fear or differences in perception. In addition, only 74 percent gave consent to answering the conflict questions, potentially leading to an additional source of bias through self-selection. An external conflict indicator is therefore also used to avoid these potential biases and provide a robustness check to the analysis (see Box 5-2 for details on the conflict indicator construction).

According to the internal conflict indicator, 1 in 3 girls were exposed to the conflict. For ease of interpretation of the analysis results, the continuous conflict exposure indices are converted into binary

values.[148] The cut-off point to identify conflict exposure is the average of the continuous conflict exposure index. Clusters above the mean index (1.93) are categorized as having been exposed to conflict, while clusters below the mean are categorized as not having been exposed to conflict. Using this cut-off, 33 percent of all clusters were exposed to conflict, most of which are from Rumbek (Figure 5-8 and Figure 5-9).

Figure 5-8: Density plot of the internal conflict indicator

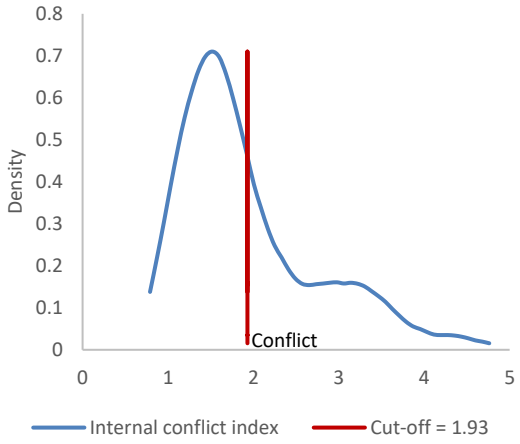


Figure 5-9: Density plot of the internal conflict indicator per area

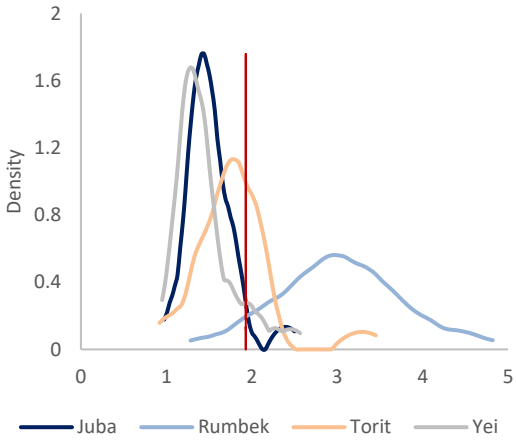


Figure 5-10: Density plot of external conflict indicator

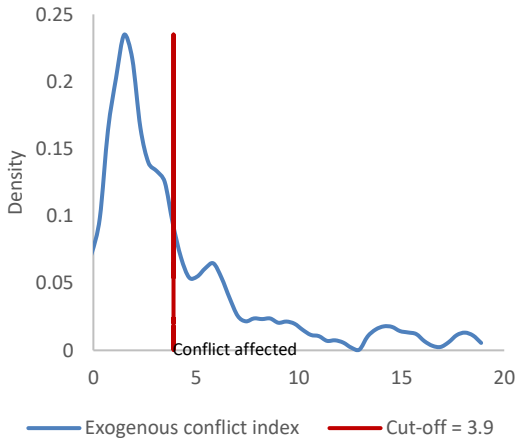
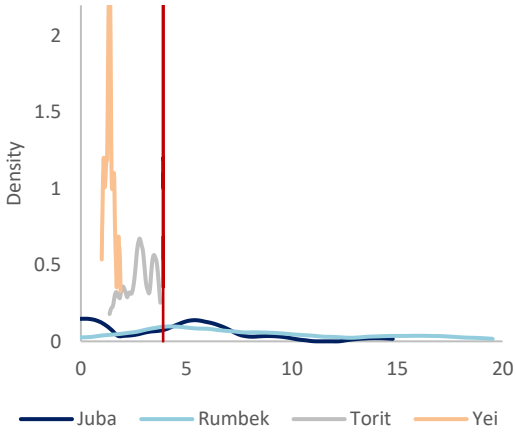


Figure 5-11: Density plot of external conflict indicator by area



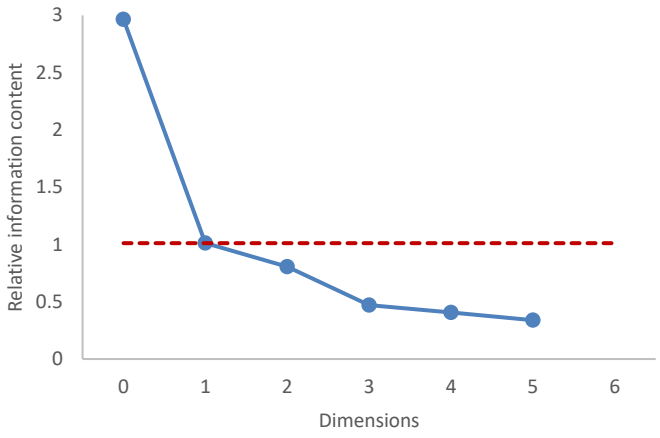
Source: Authors' calculations based on ACLED 2013-2015 data.

[148] The binary variable is more intuitive for a difference-in-differences approach, so results using a continuous variable are reported in Appendix C.

Box 5-2: Construction of conflict exposure indicators

The variables in the conflict exposure module of the questionnaire are used to construct a composite index to measure exposure to the conflict, using principal component analysis (PCA).[149] Constructing an index is useful as it captures key dimensions of multiple variables and makes it easy to use and interpret in regression analyses. As there are 6 conflict exposure variables of interest, PCA can identify key dimensions with the most variability.[150] For the PCA, the endline sample is restricted to respondents who provided consent to answer the questions in the conflict exposure module and have stayed at their current residence for at least 3 years. The scree plot shows a break after the steepness at the second component, where it is evident that the first component captures the most variability. The first component of the PCA is chosen as it captures about half the variation (Figure 5-12). The resulting index obtained for each household is normalized, and standardized to a scale of 1 to 10.

Figure 5-12: Relative information in PCA dimensions



Source: Authors' calculations based on AGI 2015 data.

Distance to a deadly conflict event is used to generate an external conflict exposure variable. The averages of latitude and longitude of all households in a cluster in the AGI survey are used to compute cluster GPS coordinates. By merging the girls' households GPS coordinates with the conflict event GPS coordinates, the distance between each cluster-conflict event pair is calculated. The continuous indicator is the normalized sum of the distances of all fatal conflict events within a radius of five kilometres from the cluster.

Similar to the internal conflict indicator, slightly over a third of the girls were exposed to conflict according to the external indicator. The external conflict indicator is estimated from the Armed Conflict Location & Event Data (ACLED) project.[151] As the ACLED data records reported violent events without interviewing households, it is free from response and self-selection bias. Conflict events can be claimed to be external

to the household and so they can only affect outcomes through the impact of conflict. Like the binary internal indicator, the average of the continuous external indicator is used to identify clusters exposed to conflict. Based on this cut-off, 34 percent of all girls were exposed to conflict (Figure 5-10). This measure only categorized clusters in Juba and Rumbek as conflict exposed (Figure 5-11).

Except for education, average characteristics for girls exposed to conflict and those not exposed are similar for both the internal and external indicator. On average, girls exposed to conflict were slightly younger, had more household members, had lived in their residence longer, and participated in more income generating activities (IGAs) than girls not exposed to the conflict (Table 5-2). Most of the differences are statistically significant but minor, except the household size, with girls exposed to conflict from much larger households than girls who were not exposed to conflict. Household size is also correlated with poverty, so girls exposed to conflict may also be poorer.[152] On average, conflict-exposed girls are less educated when using the internal indicator, but more educated when using the external indicator.

Table 5-2: Characteristics of girls exposed and not exposed to conflict

	Characteristics (mean)	Age	HH size	Years at residence	Years of education	Number of IGAs
Internal	Not exposed	22.4	8.7	5.4	7.9	0.8
	Conflict exposed	21.5	12.6	5.9	7.3	1.1
External	Not exposed	22.3	8.8	5.4	7.4	0.9
	Conflict exposed	21.5	12.5	6.0	8.4	1.0

Source: Authors' calculations based on ACLED 2013-2015 and AGI 2015 data.

While both indicators have some caveats, they are complementary. According to both indicators, about 1 in 3 girls were exposed to the conflict. Rumbek had the highest percentage of conflict-exposed clusters (92 and 78 percent respectively; Figure 5-13) and the highest percentage of non-consent to conflict questions (Figure 5-4). Therefore, households that were most affected may also have been unwilling to respond to conflict questions. The correlation between the internal and external indicator is significant and positive ($P<0.1$). The moderate correlation coefficients further warrant the claim that the self-reported index measures the self-perceived exposure to conflict while the external index provides a more objective but also less nuanced indication of conflict exposure.

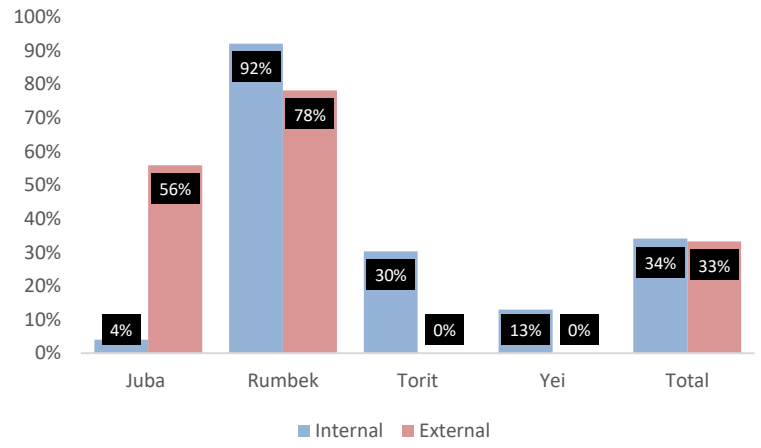
[149] The central idea of principal component analysis (PCA) is to reduce the dimensionality of a data set consisting of a large number of interrelated variables, while retaining as much as possible of the variation present in the data set. For more information please read I. T. Jolliffe, Principal Component Analysis (Springer-Verlag, New York, 1989).

[150] The PCA produced 6 components. The first component has an eigenvalue of close to 3, and captures 49.4% of the total variation, while the second component has an eigenvalue of approximately 1, and captures 16.9% of the total variation.

[151] See Appendix F for more information on this dataset.

[152] The World Bank, 2016a.

Figure 5-13: Percentage of clusters categorized as conflict-affected



Source: Authors' calculations based on AGI 2015 and ACLED 2013-2015 data.

5.3. Impact of conflict on girls' outcomes

A difference-in-differences approach is used to compare changes in outcomes between girls exposed to the conflict and changes in outcomes of girls who were not exposed. A difference-in-differences approach enables measuring changes in outcomes before and after the conflict, and comparing two groups: one that is exposed to the conflict (treatment group), and another that is exposed to the same factors except for the conflict (control group; Box 5-3).[153] This identification approach eliminates pre-treatment differences in the outcome variable and controls for anything that changes over time and affects both groups. Therefore, the difference-in-differences estimates rely on the assumption that the differences in the changes of outcomes between the two groups would be similar across conflict-affected and non-affected clusters had the conflict not happened.

The conflict negatively impacts many welfare outcomes of girls. Potential outcomes affected by conflict are categorized into education, household conditions, IGAs, marriage and aspirations (Table 5-3). More than half of the 27 outcomes are significantly affected by either of the two conflict exposure indicators, out of which half are affected by both conflict exposure indicators. Household conditions, marriage-related outcomes and aspirations worsened from the conflict.

[153] Meyer, 1995.

Box 5-3: Difference-in-differences methodology

The difference-in-differences estimator is computed by comparing the first-differenced values of the outcome for the treatment and control groups. The treatment group are the girls in clusters exposed to conflict, while the control group are girls in clusters who were not exposed to conflict. To estimate the difference-in-differences effect, an ordinary least squares (OLS) regression model is used:

$$Y_{it} = \beta_0 + \beta_1 post_t + \beta_2 conflict_i + \beta_3 post_t * conflict_i + \varepsilon_{it} \quad [1]$$

where Y_{it} is the outcome variable of adolescent girl *i* at time *t*. $post_t$ is a binary variable indicating time period *t* (pre- or post-conflict) and $conflict_i$ is the binary or continuous treatment variable, indicating conflict exposure of cluster. *i*. ε_{it} is the error term. β_1 is the expected mean change in outcome from before to after the conflict among the control group. The coefficient of the treatment variable, β_2, is the estimated mean difference in the outcome between the treatment and control groups prior to the conflict: it represents whatever baseline differences existed between the groups before the group was exposed to the conflict. β_3 by itself is the difference-in-differences estimator, and hence, the coefficient of interest. However, the baseline model might still suffer from omitted variable bias as there are other confounding factors affecting the given outcome variables besides time-period and conflict exposure, as a repeated cross-section is used. Therefore, the following model is estimated:

$$Y_{it} = \beta_0 + \beta_1 post_t + \beta_2 conflict_i + \beta_3 post_t * conflict_i + \beta_4 X_{it} + \beta_5 c_{c(i)} + \varepsilon_{it} \quad [2]$$

where X_{it} is a vector of control variables for girl *i* at time *t*, and *cc(i)* is a cluster-level fixed effect to control for variation within clusters.

Figure 5-14: Schematic difference-in-differences methodology

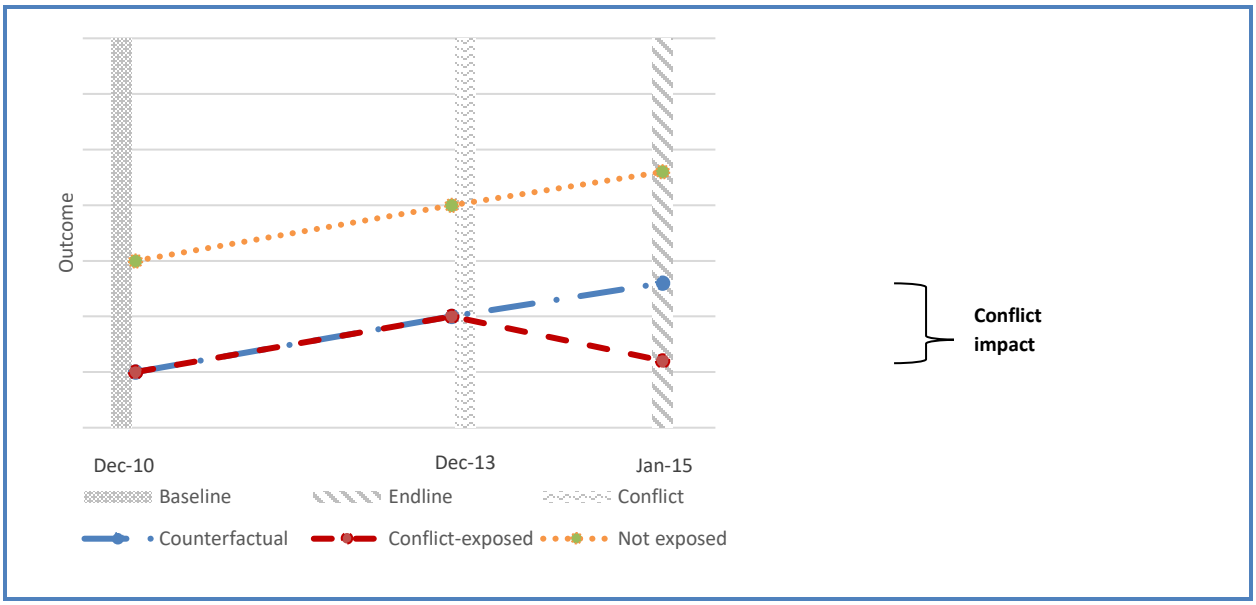


Table 5-3: Impact of the internal and external conflict indicator on outcome indicators

Dimension	Outcome	Internal conflict indicator	External conflict indicator
Education	Enrolled	-0.03	-0.05
	Dropped out	0.01	-0.02
	Years education	0.24	1.13*
	Years before dropping out	-0.04	1.07*
Household characteristics	Current savings	-0.08*	-0.16**
	Savings from 2 weeks	-0.02	-0.01
	Total savings	-0.23	-0.24
	People per room	0.73**	-0.133
	Food scarcity index	0.58*	-0.34
	Household asset index	-3.59***	-1.33
	Toilet	-0.16**	-0.30***
	Good walls	-0.08**	-0.10***
	Good roof	-0.01	0.04
	Household monthly income	0.26	-0.32
Income generating activities (IGAs)	Number of IGAs	0.13	-0.35***
	Individual monthly income	-0.12	0.24
	Control index	0.15	-0.03
	Entrepreneurial potential	1.01***	1.01**
	Satisfaction	0.056	0.02
Marriage	Empowerment	0.14	0.60***
	Married	0.07*	0.20***
	Pregnant	-0.09***	-0.12**
	Daughter optimist	-0.03	-0.07
	Lost pregnancy	-0.05**	-0.12***
	Children	-0.01	0.06
Aspirations	General anxiety	0.52*	0.97***

Ladder position	-1.38***	-1.13***

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

Source: Authors' calculations based on AGI 2010, 2015 and ACLED 2013-2015 data.

5.3.1 Education

While enrollment changes are not affected by conflict, girls in conflict-affected areas completed more years of schooling. Transient education outcomes such as enrollment were not significantly impacted by the conflict; these are often only affected in the short term after a conflict event. However, conflict had a significant positive effect on the number of years in education and the number of years before dropping out. Specifically, girls in conflict-affected areas completed an additional year of education than girls who were not in conflict-affected areas. Juba is the only area for which the conflict significantly increased years of education (Table 5-4).

The increased years of schooling are likely due to a sorting effect from migration. A sorting effect is a likely explanation as most of the girls who had spent less than 3 years at the current residence were from Juba (Figure 5-7). Additionally, most girls who reported a member leaving due to the conflict were also from Juba (Figure 5-6). Thus, families with higher education may have recently migrated to Juba and lower educated girls might have left due to the conflict, resulting in an overall average increase in girls' education after the conflict.

Table 5-4: Impact of the external conflict indicator on years of education by area

Dimension	Outcome	Rumbek	Juba
Education	Years education	0.148	1.321**
	Years before dropping out	1.324	1.491***

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

Source: Authors' calculations based on AGI 2010, 2015 and ACLED 2013-2015 data.

5.3.2 Household characteristics

Monetary damages from the conflict may have led to a decrease in current savings. Girls exposed to the conflict were about 10 percent less likely to report any current savings compared to girls who were not exposed to conflict. This finding is consistent for both the internal and external conflict indicator. In the context of violence, looting and damage to households, savings can be used to complement consumption or repair the damage. However, the impact on total savings, although large and negative, is not statistically significant.

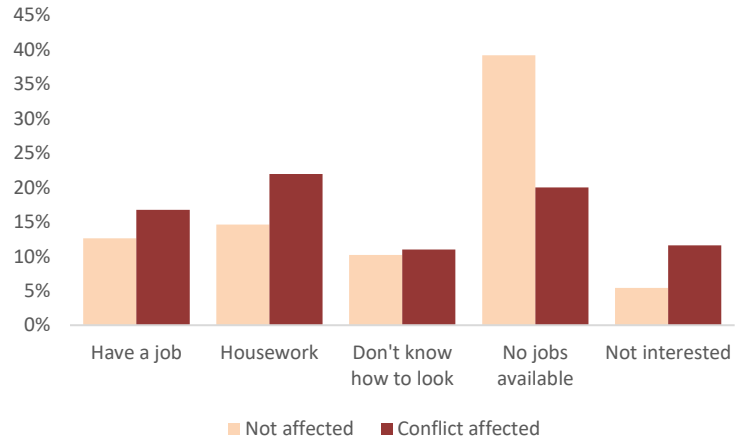
Household conditions worsened for girls in conflict-affected areas due to physical household damage from conflict. The conflict negatively affected household's socio-economic indicators such as food security, assets and the physical condition of the house. The effect on household income is uncertain. Specifically,

girls in conflict-affected areas lost assets, toilets and good walls, had to use fewer rooms for more people and suffered from increased food scarcity after the conflict. The negative impact of conflict on food security generally is widely documented.[154] The effect on toilets and walls is consistent for both the internal and external indicator. The loss of assets, the increased number of people per room and increased food scarcity is consistent for the internal conflict indicator only, potentially because it measured conflict exposure in a more nuanced way than battles but does include looting.

5.3.3 Income generating activities (IGAs)

An increase in household responsibilities may have resulted in girls from conflict-affected areas participating in fewer IGAs. The conflict reduced the number of IGAs taken up by girls; the effect on their individual monthly income is unknown. Heightened insecurity might have constrained girls' mobility and ability to conduct paid work outside the home, resulting in more time spent on domestic tasks. Girls in conflict-affected areas mostly reported housework as the reason for not having a job (23 percent), whereas girls in areas not affected by the conflict mostly reported the unavailability of jobs (38 percent) (Figure 5-15)[155]. Thus, it is likely that an increase in housework may have substituted IGAs for girls in conflict-affected areas.

Figure 5-15: Most common reasons for being unemployed



Source: Authors' calculations based on AGI 2015 data.

Even though the conflict reduced girls' participation in IGAs, it increased their perceived entrepreneurial potential. The entrepreneurial potential index increased for girls in conflict-affected areas for both the internal and external conflict variables. The index is a score from 1 to 10 and comprises self-perceived scores related to various future business opportunities.[156] On average, conflict increased girls'

[154] Cohen, Marc J., and Per Pinstrup-Andersen. (1999).

[155] An accurate comparison cannot be made as the baseline and endline surveys had different questions and answer options regarding unemployment. Furthermore, these responses are the top five most common responses from a range of many.

[156] For more details, consult Entrepreneurial potential index in Appendix F.

entrepreneurship scores by about 10 percent. Conflict may lead to girls perceiving greater business opportunities and to consider entrepreneurial activities as a resilience mechanism. However, the negative impact of conflict on IGAs indicates that the entrepreneurial potential is – currently – not activated. A tension between expectation and reality can explain this disconnect, such that the expectation and interest in taking up employment opportunities increases but the ability and opportunity to undertake IGAs decreases.

5.3.4 Marriage

Girls in conflict-affected areas were more likely to be married, as conflict often increases the likelihood of forced and early marriage. Conflict increased the likelihood of girls being married. Conflict increases uncertainty and insecurity, thereby incentivizing either voluntary or forced marriage as families marry off daughters or girls engage in marriage to increase safety and economic security. This is common practice in the context of displacement.[157] In some circumstances, women and girls who are sexually assaulted are forced to marry their perpetrators to avoid social stigma.[158] In South Sudan, sexual assault and abduction have been used as a means to initiate marriage while circumventing high bride prices.[159] While the questionnaire does not, due to ethical concerns, capture indicators of gender-based violence, the conflict increased gender-based violence.[160]

Pregnancies are reduced by conflict, which is likely due to the absence of men and adverse health conditions common in times of conflict and instability. Conflict-affected girls were less likely to be pregnant than girls not affected by conflict. In the context of South Sudan, high rates of male mortality or morbidity due to conflict, and the general absence of men from home areas due to abnormal migration or engagement in combat are contributing factors. Population statistics indicate the absence of men in the respective age groups are contributing factors (Figure 3-1).[161] Additionally, fertility rates may be impacted by additional factors, including poor nutritional status and maternal stress, which serve to lower fecundity and increase of spontaneous abortions.[162]

Like the entrepreneurship index, empowerment scores increased for girls in conflict-affected areas, also likely due to the absence of men. Conflict-affected girls had higher empowerment scores.[163] With the

[157] International Rescue Committee, 2017.

[158] Elia, 2007a,b.

[159] Amnesty International, 2017.

[160] Scott, et al., 2013.

[161] HFS, South Sudan, 2016.

[162] Blanc, 2004.

[163] The empowerment score considers seven questions relating to gender roles within the household, such as “Who should earn money for the household? – Men, Women, Both”.

absence of men, girls might have recently assumed responsibility as head of household and responsibility for household decision-making. Similarly, men may be spending most of their time outside the house fighting or looking for sources of income, which may have resulted in women taking more control of the household. This result is consistent with girls exposed to the conflict reporting higher entrepreneurship scores. Hence, girls may feel more accountable due to the added responsibilities they face after conflict.

5.3.5 Aspirations

Conflict negatively affects anxiety and the level of satisfaction for girls. The conflict increased general anxiety and lowered the expected ladder position in five years by at least one level.[164] These results are consistent for both the internal and external conflict variable. Women are often more vulnerable than men to post-traumatic stress disorder (PTSD) and anxiety disorders when exposed to the same traumatic event.[165] Similarly, the lowered aspirations could be driven by psychosocial impacts including trauma. As conflict leads to an increase in anxiety levels, this in turn may decrease an individual's expected ladder position standing in the next five years. Additionally, conflict increases uncertainty about the future and increases expectations of future conflict, which can also explain lowered aspirations.

5.4. Conclusions

The conflict in South Sudan affected girls through various channels that should be prioritized for interventions. Measures such as employment opportunities taken up, marriage-related outcomes, anxiety, and physical household conditions deteriorated for conflict-affected girls. Most of these impacts, such as anxiety and marriage, are widely documented in the literature.[166] However, the conflict also increased the empowerment and entrepreneurship potential of young women. These economic and social impacts should be leveraged to inform design of policies intending to remediate the negative effects of conflict.

Economic engagement and capacity building interventions for adolescent girls can make use of the increased entrepreneurial potential and empowerment. Adolescent girls and young women are an important resource for economic engagement. Economic and business development initiatives should include criteria for incentivizing their participation in economic activities. Adolescent girls exposed to conflict reported higher entrepreneurship index scores, indicating willingness to work and start businesses in the future. Depending on the types of activities in which girls choose to engage, an integrated approach that enables a school-to-work transition through both livelihoods and skills development, and includes

[164] Anxiety was measured by constructing an index that incorporates whether a girl worries about her job, husband, money and violence. Ladder position here indicates, on a scale of 1 to 10, how 'good' or 'bad' one's life is, with 10 being the best possible life scenario and 1 the worst. In this case, the question asked what the assumed ladder position would be five years later.

[165] Ayazi et al., 2014; Farhood and Dimassi, 2012; Luitel et al., 2013; Murthy and Lakshminarayani, 2006; Roberts, Ocaka, Browne, Oyok and Sondorp, 2008; Tolin and Foa, 2006.

[166] Heyzer, 2005; Karam, Mneimneh, Karam, et al., 2006; Cardozo, Vergara, Agani and Gotway, 2000; Miller et al., 2002; Thapa and Hauff, 2005.

cognitive and non-cognitive skills training interventions, would prove especially useful. Creating such opportunities for girls would, in turn, have the potential to contribute to economic growth and poverty reduction, as well as address pervasive conditions of income inequality among the poor in particular.[167] Targeted programming to support and incentivize girls' economic engagement further improve household food security and economic welfare.

Mental health services must also be prioritized in addition to increasing economic opportunities to improve the long-term wellbeing of girls. Lowered aspirations and high anxiety during early years have been linked to worsening economic outcomes in adulthood.[168] Additionally, the issue of early and likely forced marriage is a prevalent feature of South Sudan, as are other dimensions of gender-based violence.[169] These challenges highlight the need for interventions that focus on the provision of psychosocial and mental health services, and wider prevention programming addressing pervasive gender-based violence and challenging social norms that perpetuate it. Despite enormous need for it, and especially in terms of addressing issues of trauma and PTSD, there are only a few providers for psychosocial or mental health services in South Sudan.[170] As well as scaling up these services, training of healthcare staff and community workers to provide basic psychosocial care or mental health support should also be considered.[171] Without improved services and protection, it is likely that the impacts of the conflict will continue to be severe particularly for vulnerable groups such as adolescent girls, as well as for their families. Immediate aid and targeted initiatives during the ongoing conflict are needed, but so are measures that improve the long-term wellbeing of vulnerable groups such as adolescent girls.

[167] Acharya, 2008.

[168] Powell and Butterfield, 2003; Riegle-Crumb, Moore and Ramos-Wada, 2011.

[169] Amnesty International, 2017.

[170] The principal delivery mechanism of health services in South Sudan is through a basic package of health services funded by the Government of South Sudan and international donors and provided by nongovernmental organizations.

[171] van Ommeren, Saxena and Saraceno, 2005.

6. Impact of Program Cancellation due to Conflict

KEY MESSAGES

The impact of unintended program cancellations on the economic, psychological and behavioral wellbeing of beneficiaries are not well understood. In highly fragile and insecure countries such as South Sudan there is often a risk that unforeseen circumstances can cause program disruption or cancellation. This can have unintended negative consequences on the socio-economic situation of beneficiaries and their psychological and behavioral wellbeing. Unfortunately, there is not much scientific evidence on the consequences of an unplanned program cancellation, though this could help policy-makers understand the related consequences and potentially guide them to avoiding these. The lack of evidence is partly because studying these effects in a planned setting comes with obvious ethical concerns.

The unplanned and unintended cancellation of the Youth Startup Business Grant Program in 2016 in South Sudan provided the unique possibility to study what happens if a cash transfer is canceled. The program was designed to offer an unconditional cash grant worth US$1,000 to youth in South Sudan, as a new opportunity for beneficiaries who were credit constrained. This compared to traditional and microfinance loans, which are usually accompanied by high interest rates and/or collateral criteria. The cash transfer was accompanied by a business and life skills training in which beneficiaries had to participate before receiving access to the grants. Escalating violence forced the program to terminate the disbursement of the grants prematurely, in early 2016. Only approximately one-third of eligible participants had accessed their grant by that stage. These unfortunate circumstances created a unique case study to assess the impact of a program cancellation on socio-economic, behavioral and psychological outcomes of beneficiaries.

The cancellation of the program caused negative effects on some psychological indicators, particularly among women. The effects on a range of socio-economic, behavioral and psychological indicators were assessed. Due to the large number of outcomes, the individual indicators were grouped in indices, including on employment and income, business skills, life satisfaction and empowerment, risk, trust, etc. The program did not negatively affect most of the indicators. Beneficiaries who received the grant increased their savings, consumption and life satisfaction. However, they also became more prone to risk. Men in particular showed an increased likelihood to engage in cattle raiding, while women showed reduced levels of trust. Women who did not receive the grant displayed strongly reduced trust and a reduced likelihood to migrate.

6.1. Youth Startup Business Grant Program

The Youth Startup Business Grant Program was launched in 2014 in South Sudan to offer an unconditional cash grant to selected youth, and accompanied by a business and life skills training. South Sudan has suffered from political instability and latent conflict since its inception in 2011. In this context, the youth struggled with declining livelihoods and a lack of economic opportunities. This put them at risk of participating or becoming victims of criminal or violent activities. In response, the cash grant program was designed by the World Bank in collaboration with the Ministry of Commerce to offer a cash grant worth US$1,000. Beneficiaries could access the grants denominated in local currency through a commercial bank account. Although the cash grant was aimed towards promoting (self-) employment and business development, it was unconditional, meaning beneficiaries were free to decide on its use. The program also entailed a business and life skills training, which participants had to attend before being eligible to access the grant.

In late 2014, the program randomly selected 1,200 beneficiaries out of a pool of more than 6,000 applications to receive the grant. More than 60 percent of the grants were awarded to young women. A similarly sized control group was selected to enable the assessment of the program in a rigorous impact evaluation. Baseline data from both treatment groups were collected before grant beneficiaries received their business and life skills training in April and May 2015. Almost all selected beneficiaries attended the one-week training. After the training, participants were asked to open a commercial bank account in which the grant would be deposited.

Escalating violence at the end of 2015 forced the program to terminate the disbursement of the grants before all participants had accessed them. Completion of the program was first postponed and finally cancelled to mitigate the perceived risk for beneficiaries to become the target of crime. In addition, there were concerns that the conflict might be exacerbated should grant money get into the wrong hands and be used to purchase arms. Nevertheless, delays in communication and in processing of the grants meant that the timing at which disbursement was stopped varied across regions and bank branches.

This study takes advantage of this quasi-natural experiment to causally identify the socio-economic and behavioral and psychological consequences of projects that fail to be implemented as intended. Interventions in highly fragile and insecure states are often at risk of failing to be implemented as intended. However, it is unclear how a failure to fully deliver on a project affects participants' socio-economic situation and their trust attitudes both towards the government and towards their communities. Obvious ethical objections make it impossible to study this effect in form of a randomized controlled trial. The circumstances under which the Youth Startup Business Grant Program failed to be fully implemented made it possible to causally identify the effects of its failed delivery on socio-economic and behavioral and psychological outcomes of participants. This study distinguishes between two treatments. "Treatment 1" consists of having participated in the business skills training and having received confirmation of pending receipt of the cash grant, but later having this cancelled. To assess the treatment effect, this group is compared to the control group of the original intervention who was informed of not having been selected to receive the grant. In addition, this study also analyzes the effect of the originally planned intervention.

"Treatment 2" consists of having participated in the business and life skills training and successfully having accessed the cash grant.

6.2. Outcomes of interest

First, this study analyzes whether the cancellation of the program had a negative impact on the socio-economic situation of participants. It is possible that the expectation of a gain that is not realized had detrimental effects on the socio-economic situation of participants. For instance, participants might have made purchases or declined employment opportunities in the expectation of receiving the grant. However, it is also possible that the prospect of the cash grant together with the training exercise motivated beneficiaries to take positive steps towards a better future. In that case, even beneficiaries who did not receive the grant would be better off than members of the control group. This study can shed light on this under-researched question and guide policy-makers on how to intervene in volatile and uncertain environments.

Second, this study analyzes whether the cancellation of the program had negative impacts on the psychological and behavioral wellbeing of beneficiaries. Endline data collection invited participants to take part in a number of experimental games. These games were designed to extract risk preferences and trust attitudes of participants. Risk aversion may have increased for participants who did not receive the grant. To assess this effect participants were asked to choose between differently paired lotteries that varied in expected return and variance. In addition, trust attitudes towards the government and towards their communities may have been affected by the failure of the program. Trust towards the World Bank may have been eroded too, should participants hold the World Bank responsible for the (non-)payment of the grants. To obtain a measure of trust participants played several variations of a trust game. In one version, the second player was framed as the World Bank to allow for direct inference of trust attitudes towards the World Bank. The experimental data on trust and risk preferences is complemented with survey data to give a comprehensive understanding of how these indicators have been affected by the cancellation of the program.

Finally, this study seeks to answer whether the failed implementation had an effect on the migration decisions of participants. Due to the conflict about one-quarter of the South Sudanese population are currently internally displaced or have left the country. It is possible that the expectation of receiving the grant incentivized participants to stay in their region of origin. The hypotheses of this study are grouped into two main families of outcomes. Figure 6-1 gives an overview of the individual outcomes of each category.

Figure 6-1: Main outcomes of interest

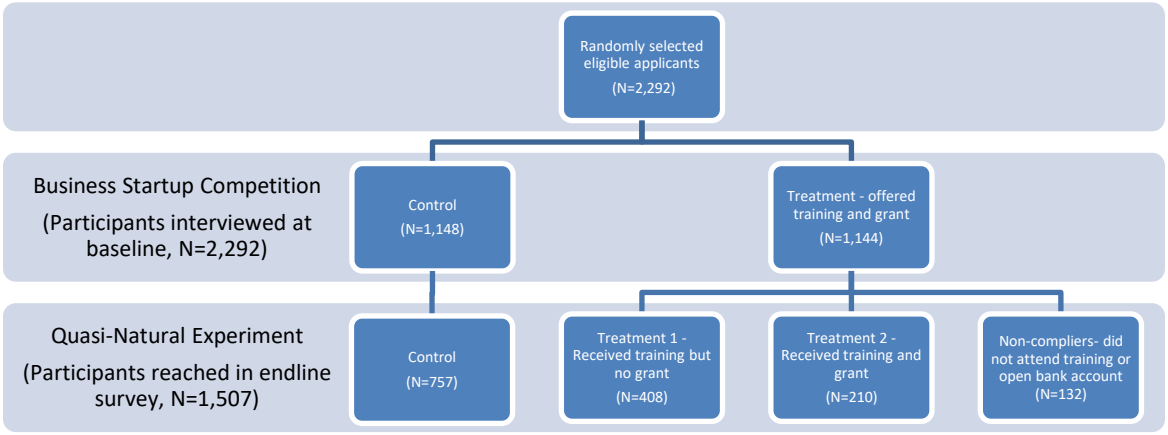
	Outcome	Definition	
Socio-economic outcomes			
1	Employment and income	Self/wage employment (average employment hours per week); number of hours a person spent over the last seven days on activities that generate income for the household; wages earned or revenues from self-employment; productivity for owners of small businesses and expenditure on inputs; number of employees	Individual
2	Consumption	Spending on health and education (medicines, doctor fees, hospital charges, insurance, etc.); spending on cigarettes and alcohol, etc.; spending on selected items of food and non-food consumption	Household
3	Savings, investment and debt	Assets held and investments made from savings (money saved, assets owned, investments in human capital); asset expenditure; outstanding credits, loans and other forms of debt; interest rates available on current loans	Individual/Household
4	Business skills	Good business practices and awareness of business practices; trainings attended in the past year	Individual
Psychological and behavioral outcomes			
5	Life satisfaction and empowerment	Life satisfaction and outlook on life, including locus of control and position at the life satisfaction ladder and empowerment of women participants	Individual
6	Risk preferences	Revealed risk preferences from lottery experiments and stated preferences to engage in risky behavior	Individual
7	Trust	Trust attitudes towards community and institutions (e.g. the World Bank) based on survey responses and trust game	Individual
8	Crime and violence	Stated propensity to engage in crime or violence and experienced violence or crime based on gender	Individual
10	Migration due to conflict	Migration decisions during the last 12 months and their link to experiencing local conflict	Individual/Household

Note: Detailed information on the indicators of each outcome are listed in Appendix G.

6.3. Study design

6.3.1 Sampling frame

Figure 6-2: Treatment streams of original and new intervention



The eligible population of the grant program were youth in six states in South Sudan with a focus on young women. The program was implemented in the least conflict-affected states in South Sudan at the time of its launch: Central Equatoria, Eastern Equatoria, Western Equatoria, Northern Bahr el Ghazal, Western Bahr el Ghazal, and Lakes. Eligible individuals had to be aged between 18 and 34 and be of South Sudanese nationality. Originally, 200 individuals were selected from each of the six states. A share of 60 percent of the grants was targeted at women.

The program selected 1,144 participants to receive the grant and an equal number for the control group out of a total number of 6,000 applicants. Interested applicants had to submit a one-page written proposal of a new business idea. The document had to be written in English, although communication materials were also provided in Juba Arabic. In addition, the applications were required to provide proof of their South Sudanese nationality and certain documents needed to open a bank account. This application process was designed to incentivize positive self-selection into the sample. In this sense, the program participants might be more likely to use the cash grant successfully to improve their business or employment situation than the average population.

The intensification of violence forced many study participants to migrate, reducing the number of participants who could be located for the endline survey to 1,507. About a quarter of the population of South Sudan was displaced during the study period, which made it difficult to locate all participants of the original control and treatment group. Before the endline survey, the World Bank conducted a phone survey that informed the grant beneficiaries of the halt of the program and assessed the feasibility of this new study. The phone survey managed to reach around 55 percent of the intended grant participants (1,264), from which 99 percent agreed to participate in the endline. Due to budget and logistical considerations, the endline survey targeted a sample size of 1,800 randomly chosen from the list of participants after prioritizing the phone survey respondents who had agreed to be interviewed again. Finally, only 1,524 participants were located, with only 1,507 participants completing the interviews. Out of these 1,045 had been reached in the phone survey and 462 had been located through intensive tracking efforts based on information provided in the baseline. There was approximately equal representation between the treatment and control groups, with 391 and 394 attritors from each group respectively.

6.3.2 Assignment to treatment

The treatment 1 group consists of the 408 individuals who had not yet accessed their grants when erupting violence forced the program to terminate in late 2015; the treatment 2 group consists of the 210 individuals who did successfully access the grant. The unplanned termination of the grant disbursement represents an exogenous shock that assigned intended participants quasi at random to the treatment of not receiving a grant despite having been promised its receipt. Participants (N=210) who had already received the grant were in the same manner assigned to the treatment 2 group. Participants who did not attend the training or did not open an account and consequently could not receive the grant are part of the intention-to-treat group. The control group consists of individuals who were informed during the original study that they had not been selected for the grant. Assignment to this group was exogenous based on randomization over all selected program participants stratifying at state level and gender. Balancing test at the endline showed only small differences in educational indicators between the original control and treatment group that will

be controlled for in the analysis. There is no evidence that participants in the control group accessed either the training or the grants.

Participants who successfully accessed the grant had a slightly better educational level at baseline and were more likely to already hold a formal bank account. Although the survey found no substantial difference between the intended beneficiaries who did receive the grant and those who did not, the final sample showed that there are some small differences between the groups that might speak of endogenous assignment to treatment 1 or treatment 2. In particular, after controlling for state differences, participants who received the grants were 11 percent more likely to hold a formal bank account at baseline (Table 7-45). What is more, treatment 2 participants had a 10 percent reduced probability to have no education and 10 percent increased probability to have some secondary education compared to treatment 1 participants. They also had an 11 percent lower probability to be illiterate in both English and Arabic and a 9 percent increased probability to master division calculations. These results suggest that better education made it more likely that participants tried and succeeded in accessing their grants. When analyzing the treatment effects the estimations will therefore address endogenous selection into treatment 2 with an instrumental variable approach outlined in Appendix F.

The state of residence was the main determinant of whether participants received the grant or not. Despite some degree of self-selection as discussed above the main determinant of whether participants had access to the grant was their state of residence. In Lakes and Western Bahr el Ghazal, the majority of the eligible participants received the cash grants, while in Eastern Equatoria and Western Equatoria the majority did not receive the grants. The difference between states can probably be explained by failures in the coordination between different bank branches across the six states. In this respect, the assignment to treatment 1 or treatment 2 is exogenous to participants' characteristics and can be exploited for the causal identification of treatment effects (Appendix F).

6.3.3 Attrition from the sample

Although around 35 percent of the treatment groups did not participate in the endline survey, attrition from the sample was comparable for control and treatment group. First, attrition resulted from migration and internal displacement that made it difficult to locate the original study participants. Second, a significant number of participants refused to participate in the endline survey, both from the treatment and the control groups. Some beneficiaries of the grant were worried that the enumerators were following up on the cash grant to potentially recover it. Some control participants refused to participate because they were upset at not receiving a grant.[172] Both types of attrition are similarly distributed across control and treatment groups, so that for most indicators there was no difference between the treatment arms of the final sample (Table 7-46). However, control group participants of the endline survey were more likely to be male and had slightly better education than treatment group participants. Though the differences are not large, they are controlled for in the analysis.

[172] Anecdotally, in Lakes state, the supervisor overseeing the implementation of the program said KCB bank contacted recipients of the loans and asked to have the money returned. Therefore, grant recipients refused to be interviewed for the endline survey.

Attrition depended on wealth and the geographic location. Participants of the control group and the treatment group who were reached for the phone survey were wealthier than participants of the original sample. This characteristic carried over into the endline survey. Endline participants of the control group for instance reported slightly higher expenditures on food consumption than baseline participants and were more likely to hold a formal bank account. Endline participants of the treatment group were more likely to be women and employed at baseline than attritors from this group. They were also more likely to hold a formal bank account, have lower levels of formal debt and have a larger number of children. In addition, attrition from the treatment group depended on the state of residence. Participants from Lakes were less likely to participate in the endline, while participants from Western Equatoria were more likely to participate in the endline survey. To avoid attrition bias, the analysis controls for observable characteristics of wealth and state at baseline.

6.4. Fieldwork

6.4.1 Instruments

The main instrument of measuring outcome variables is survey data directly reported in face-to-face interviews. In addition, risk preferences and trust attitudes are assessed using experimental data collected from decisions over lotteries and trust games. Finally, information on crime and violence is assessed with the use of list experiments.

6.4.2 Lotteries

This study uses choices over lotteries that vary in expected return and variance to extract risk preferences. In the endline, data collection respondents were asked to choose between two or three alternative lotteries. The design of this experiment involved eight rounds, building on research design by Jakiela and Ozier (2015). The chosen lottery was played as flip of a fair coin (50 percent chance of each outcome). The game started with two practice rounds to make participants familiar with the rules. After that, participants had to play six additional rounds. At the end of the game, one round was selected at random and the lottery chosen by the participants was played and paid out. Participants were informed about these rules in the beginning of the game. The lotteries are set up as described in Table 6-1.

Table 6-1: Pay-outs of lotteries, South Sudanese pounds

	Lottery A		Lottery B		Lottery C	
	Heads	Tails	Heads	Tails	Heads	Tails
Practice						
Decision 1	100	100	150	150		
Decision 2	100	150	200	250		
Game						
Decision 3	100	100	100	120		
Decision 4	100	100	0	400		
Decision 5	30	340	100	100	0	400
Decision 6	100	100	55	240	30	340
Decision 7	30	230	60	170	90	110
Decision 8	10	200	70	160	90	110

The number of times respondents chose the riskiest lottery can be used as a proxy for their risk preferences. Given that respondents in these types of experiments often display choices that are inconsistent with constant relative risk aversion utility a non-parametric approach to measure risk aversion is more appropriate. Thus, following the approach put forward by Jakiela and Ozier (2015), the set of lottery choices can also be used to infer risk preferences in a less stringent and non-theoretical manner. One measure is created by counting how many times respondents choose the riskiest lotteries (i.e. lotteries with the largest spread), or the safest lotteries. In addition, the likelihood to choose the riskier lottery during each decision round was evaluated individually. The results are then compared to survey answers on risk preferences.

Test questions were included to detect biased answers that resulted from a lack of understanding. Due to the relatively low numeracy skills and the complexity of the lotteries the study included three questions to test for monotonicity, i.e. if participants behaved like utility-maximizers.[173] If participants answered more than one of these test questions in a manner inconsistent with utility maximization, it is likely that they simply did not understand the nature of the decision problem.

6.4.3 Trust game

Trust attitudes towards the World Bank were assessed using a trust game. Participants were asked to play several rounds. In the first game Player B was framed as the World Bank to extract a measure of trust toward the World Bank or official institutions in general. Participants may hold the World Bank responsible for the (non-) payment of the business startup grants. This framing of Player B as the World Bank allows for a direct measure of how willing participants are to partake in an interaction with the World Bank that could have financial consequences. Hence, it can act as measure of how not receiving the promised grant influenced their level of trust and their willingness to interact with the World Bank. The reciprocal behavior

[173] Andreoni and Sprenger, 2010.

of Player B was modeled to mirror the probability of non-disbursement of the cash grant. In 34 percent of the cases documented by the phone survey, participants received the grant. This information was used to define the reciprocal behavior of Player B. Player B played fairly 34 percent of the time; i.e. sending back exactly half of what was obtained from the study participant (Player A). Player B acted unfairly 66 percent of the time, keeping everything sent to them, regardless of what the respondent had sent. In the end the participant was paid out of the budget of Player A.

Figure 6-3: Trust games

Two trust games were played during the face-to-face interview, one between the respondents and a player framed as the World Bank, and a second one in which the respondents played each other. The basic structure of a trust game developed by Berg, Dickhaut and McCabe (1995) involves Player A receiving an endowment of *X* and choosing how much of this endowment to send to Player B, $Y \epsilon [0, X]$. Player B receives *3Y* – i.e. three times whatever A sent him – and must decide how much of this endowment to send back to A, $Z \epsilon [0, 3Y]$. Player A receives a payout of *X-Y+Z* and Player B receives a payout of *3Y-Z*. *Y/X* is used as measure of trust. *Z/3Y* is used as a measure of trustworthiness. The table below summarizes payouts for the two players:

Player 1			Player 2		
Endowment	**Sends**	**Payout**	**Endowment**	**Sends**	**Payout**
X	Y	$X - Y + Z$	$3Y$	Z	$3Y - Z$

To obtain a more general measure of the respondents' trust levels, and to accompany the first measure, a second game was played, which pit the participants against each other. The survey respondents were equally and randomly selected as players A and B, stratified by treatment groups and treatment strands. Regarding the implementation of the games and pairing of the players, a lab-in-the-field experimental setup was impossible to organize because respondents had to be interviewed individually. This was primarily due to the complicated logistical circumstances surrounding fieldwork in South Sudan, in no small part due to rapidly deteriorating security conditions, but also due to constraints on the respondents' time. Respondents were therefore playing the games against a pre-loaded hypothetical distribution of responses. Enumerators explained to the respondents that the other player would be another survey respondent elsewhere in South Sudan. The set of possible responses, in terms of the fraction of the endowment sent or returned, was equally distributed between [0.1,1] in increments of 0.1. In no cases was the fraction of endowment sent or returned equal to zero.

6.4.4 List-experiment

Based on the results from the baseline survey, it was determined that the reporting of sensitive behaviors may have been untruthful; methods to elicit more truthful responses were therefore employed in the endline questionnaire. For example, the rates at which respondents reported knowing someone who may have participated in cattle raiding were close to zero, despite 63 percent of respondents reporting cattle raiding in their area in the baseline. Rates of reporting respondents' own sensitive behaviors were even lower. Therefore, a set of list questions – also commonly known as the "item count technique" introduced by Miller (1984) – were added to the endline questionnaire. In these questions, the sample is split into a treatment and control group, and respondents in the control group are given a set of *N* statements and

asked to answer with how many of these statements they agree with/or would say yes to, without explicitly stating which ones. Respondents in the treatment group are given the same *N* statements and a sensitive item. The estimate of the true rate at which respondents agree with the sensitive statements is simply the difference in means, in terms of the number of statements, between the treatment and control groups. In the context of the endline survey, the sensitive behaviors pertained to violent behavior, including domestic violence, as well as cattle raiding. Direct questions were asked to the control group alongside the list question without the sensitive item, so as to compare results obtained through the list method. The full list of sensitive statements included in the experiment can be found in Appendix G.

6.5. Data collection

Baseline data was collected between January and March 2015 in face-to-face interviews. The data collection took place before beneficiaries could take part in the life skills and business skills training program and before they could access the grants. The survey questions included several measures to track participants for the endline survey, including phone numbers, referees and the geographic location measured by a GPS receiver. Due to the escalating violence, the disbursement of the grants was terminated at the end of 2015. Although the share of participants who had received the grants was difficult to assess, it was clear that not all intended beneficiaries had received the grants at that time.

In May 2017, the World Bank conducted phone interviews with the study participants to inform them about the failure of the program and assess the feasibility of the endline data collection. Participants were contacted by telephone using their personal phone number or, if inactive, phone numbers of their referees, since many participants had disconnected their cellphones due to high inflationary increases in prices. Given that up to a quarter of the population of South Sudan has recently been forcibly displaced by the conflict, not all baseline participants could be located for the phone survey. About 55 percent of the beneficiaries were successfully contacted and informed that the grants were not to be disbursed. In addition, the phone survey sought to evaluate if participants were willing to continue participating in the study and share their experiences. In total, 1,270 participants were contacted by phone: 642 from the control group and 628 from the treatment group. Of these, virtually all contacted participants agreed to participate in face-to-face interviews for the endline data collection, but only 1,045 were actually located for the endline interview (530 and 515 from the control and treatment group respectively). The respondents interviewed in the endline survey were also given the opportunity to voice their concerns and opinions about the cash grant program through short video testimonials that will be made publicly available online.[174]

Face-to-face interviews for the endline survey were conducted between September and December 2017. The endline survey managed to interview 1,507 participants despite large challenges to reach respondents with the available information. Many phone numbers turned out to be inactive and GPS coordinates from the baseline were not always tied to the homes of participants. In many cases, participants were

[174] The video testimonials from this survey as well as other surveys conducted in South Sudan during this period are available at: www.thepulseofsouthsudan.com.

interviewed at central locations, such as markets or the Chamber of Commerce, which made GPS locations less useful to locate participants. What is more, information of referees was not uniformly provided in the baseline data. For instance, in Wulu County in Lakes one referee was provided for all 65 participants. When phone numbers and GPS did not suffice to contact participants, enumerators inquired from respondents or local officials at the local Chamber of Commerce or trade unions about the identity and location of other potential respondents. In each case, enumerators made more than five attempts to contact people over several weeks unless they received information that the participant could not be interviewed; e.g. had migrated or refused to participate. A small number of potential respondents who were located refused to participate in the endline survey or failed to show up at several appointments made by enumerators (34). In addition, the ongoing conflict kept enumerators from going to a number of counties due to insecurity.[175]

6.5.1 Data processing

The main outcomes were summarized in indices. Since the study planned to test many potential effects the various indicators were grouped in indices. This approach increases the clarity and robustness of the analysis. To create the indicators, multiple indicators that refer to the same main outcome were added up after converting them to a similar scale. A procedure championed by Kling, Liebman and Katz (2007) was followed. In order to correct for the potential bias from an effect being found by chance, another approach that is adopted is the one proposed by Haushofer and Shapiro (2013) and Anderson (2008).

To identify the causal effect of treatment 1 (receiving the training, but not the grant) and treatment 2 (receiving the training and the grant) we use a quasi-experimental method that controls for self-selection into the treatment arms. Since there is some reason to believe that participants who were able to secure the grant differed in their individual characteristics (such as diligence) from those participants who did not receive the grant, this could bias the estimates of the effect of treatments. Therefore, we employ an instrumental variable approach that makes use of the fact that that cash receipt depended mainly on the distance to the closest KCB bank branch. When we also control for the distance to the closest city center this variable should not be correlated with individual characteristics of the participants. Those who received the grant only because they lived close to a KCB branch can be compared with those who did not receive it because they lived further away from a KCB branch. This comparison makes it possible to calculate the effects of treatment 1 and treatment 2 if they had been assigned randomly. More details on the estimation strategy are outlined in Appendix G.

6.6. Result [176]

6.6.1 Socio-economic outcomes

The intervention had no effect on overall employment. Study participants showed no positive improvement in their employment indicator (Table 7-51). Overall, the outcomes in this indicator were very

[175] In WEQ: Mvolo, Mundri East and Mundri West; in CEQ: Kajo Keji, Morobo and Lainya; in Lakes: Rumbek North (flooding during time of data collection).

[176] Regression results tables can be found in Appendix G.

diverse among all groups. Although the original intention of the cash grant program was to increase wage employment and self-employment, participants who received the training and the grant experienced no improvement in their wage employment, including in their earnings and hours worked. However, failure to receive the grant also had no negative effects on participants. Participants who had attended the training but did not receive the grant performed equally well in terms of wage employment as the control group.

Participants who received the training and the cash grant significantly increased their consumption. On average there was no significant increase in consumption across all participants who were selected for the treatment. However, when we control for the two ex post treatments, participants who received the grant strongly increased their consumption compared to the control group (Table 7-54). This effect is similar between men and women (Table 7-64). Participants who failed to access the grant before the program was frozen did not significantly change their consumption (Table 7-51).

Participants who received the grant improved their savings, investments and debt, but there was no statistically significant improvement for participants who failed to receive the grant. Participants who expected to receive the grant but failed to receive it (treatment 1) did not improve their saving behavior in a statistically significant way. Therefore, it seems that the skills training alone has no positive effect on the savings behavior of participants. Participants who did receive the cash grant (treatment 2) display a strong and statistically highly significant improvement in the savings indicator (Table 7-54). The indicator measures whether and how much participants are saving in a formal bank account, whether they reinvested their savings into professional training and how much they are indebted. The results show that giving participants an incentive to open a bank account and contributing to their first savings with a cash grant has a positive overall effect on their financial behavior. Women benefited to a similar degree as men from this intervention (Table 7-64).

Overall the intervention did not significantly improve the business skills of participants, but participants who received the grant benefited from it. Compared to participants of the control group and the other ex post treatment group, participants who received the grant had better business skills. This effect exists mainly for men, but to a weaker degree also for women (Table 7-64). However, there is strong evidence that this effect is due to self-selection, and the improvement vanished after controlling for self-selection into treatment 2 (Table 7-54). This suggests that business skills improved only for participants who already had a greater propensity to benefit from the intervention and were more likely to receive the grant due to their personal characteristics; e.g. higher business savviness.

6.6.2 Psychological and behavioral outcomes

As a whole, the program had no statistically significant effect on life satisfaction and empowerment, but participants who received the grant showed strong improvements in this indicator. On average there was no improvement in life satisfaction and empowerment. However, participants who received the grant ranked significantly higher than participants of the control group. There was no decrease in life satisfaction for participants who vainly expected to receive the grant. This is true for both men and women (Table 7-65).

Program cancellation did not make participants less prone to risky behavior, but participants who successfully accessed the grant significantly increased their risk preferences. The analysis shows some differences between genders. Women who received the grant were more likely to have low preferences for risk (Table 7-65). This is not true for men of this group. Yet, as a consequence of receiving the grant women increased their preference for risky behavior. For men this effect is weaker and not statistically significant. Due to large variance in this indicator, it is not clear whether the program cancellation had a causal effect on the risk preferences of participants who did not receive the grant money.

Participants suffered a reduction in their general trust level if they were selected for the grant but failed to receive it. Although treatment 1 participants were initially on a similar trust level as the control group, the disappointment of not receiving the cash grant did appear to reduce participants' trust level by half a standard deviation (Table 7-52). This reduction in trust mainly appears among female participants (Table 7-65). The finding confirms that the "broken promise" did create some negative psychological results. More surprisingly, women who received the grant as planned also showed significant reductions in their trust (Table 7-65). Possibly these women had feared that the money might be stolen from them, resulting in a loss of trust.

On average the intervention slightly reduced the propensity to be engaged in crime and violence. The reported levels of crime and violence varied among participants. Nevertheless, neither successful recipients of the grant (treatment 2) nor unsuccessful recipients (treatment 1) engaged more in crime or violent behavior due to the program (Table 7-55). There is some weak evidence that the experience of crime and violence was reduced among women who participated in the training but didn't received the grant (Table 7-65). On the downside, men who received the cash grant were more likely to engage in cattle raiding according to the list experiment. There is also weak evidence that this group became more likely to be involved in aggressive arguments.

Neither the cancellation of the program nor the cash grant altered the migration probability of program participants on average. It is unlikely that the program affected the decision to migrate of program participants. However, women who failed to receive the grant were slightly less likely to migrate than women of the control group and the other ex post treatment streams. In light of the program cancellation, this might imply that anticipation of the grant disbursement induced these women to remain rather than migrating (if they intended to do so). At the same time, it is surprising that the additional financial resources from the grant money did not seem to alter the migration behavior.

6.7. Conclusions

Overall the intervention had mixed effects on the different ex post treatment groups and across gender. On average across all participants the intervention did not significantly most indicators, since most indicators neither worsened nor improved as a net effect. However, when differentiating between ex post treatments, benefits occurred mainly to participants who received the treatment as originally intended. At the same time, some negative impacts occurred both among participants who received both the training and grant and those who received the training but not the grant due to program cancellation.

Participants who received the originally planned treatment (business skills training and cash grant) showed significant improvements in their savings and investment behavior, in an increased consumption level and in higher levels of life satisfaction and empowerment. While employment or business skills were mainly unaffected by the cash grant program, recipients of the cash grant showed significant improvements in their savings indicator. They also showed increases in the consumption indicator and in their life satisfaction. These effects did not appear if participants received the training but not the grant. Therefore, it seems plausible to conclude that the cash grant had a direct positive impact on the economic and psychological wellbeing of beneficiaries. At the same time, the lack of an effect on participants who did not receive the grant can be interpreted as a positive finding, since the unplanned cancellation did not seem to have induced participants to make bad financial decisions.

Receiving the cash grant increased risk preferences among men and women, while only men became more likely to engage in rattle raiding activities. The analysis shows a clear increase in the likeliness to engage in risky behavior based on survey and experimental measures, with a stronger effect among women. Men showed an increase in their likelihood to engage in cattle raiding. At first glance it seems counter-intuitive that the cash grant increased the likelihood to engage in an illegal activity. Yet it is possible that participation in cattle raiding was increased via an increase in risk preferences.

The cancellation of the grant disbursement reduced the general trust level and the willingness to migrate of participants, particularly among women. Life satisfaction and empowerment showed no negative effect of the program cancellation. However, the disappointment of not receiving the cash grant seemed to have reduced the general trust level of participants; this effect is mainly driven by women. However, women who received the cash grant also displayed reduced trust. It is possible that these women had the fear that the money might be stolen from them. What is more, women who failed to access the grant were less likely to migrate. At the same time, participants who received the grant showed no change in their migration behavior.

7. Displacement Profile

KEY MESSAGES

IDPs and South Sudanese refugees in Ethiopia have extremely young population structures, driving high dependency ratios. About 45 percent of IDPs and over 60 percent of South Sudanese refugees in Ethiopia are under 15 years old, as opposed to 32 percent of urban residents in South Sudan. Consequently, fewer IDPs and even fewer refugees are of the working age, between 15 and 64 years old. This translates to higher dependency ratios among the displaced populations. In IDP households, each working age member must look after one non-working age dependent, while in refugee households, each working age member must look after two non-working age dependents.

Both IDPs and refugees have faced a drastic deterioration in living standards, and live in worse conditions than urban residents. In a country with staggering poverty prevalence, IDPs are a particularly marginalized group. More than 9 in 10 IDP households lives in poverty. Refugees in Ethiopia fare slightly better, with 7 in 10 below the poverty line. Before the December 2013 conflict, more than 4 in 10 IDP households had improved housing, and 9 in 10 owned their dwelling. According to most recent estimates, almost all IDPs and refugees live in overcrowded tents or temporary shelters provided by camps. Severe overcrowding in dwellings and toilets reduces sufficient access to hygienic facilities, increases the spread of communicable diseases, and increases the threat of gender-based violence and harassment.

The displaced have also lost IGAs, and rely overwhelmingly on aid. Agricultural land access for the average IDP household has gone from 0.8 acres pre-December 2013 conflict to about 0.2 acres. IDP households lost almost all their livestock holdings over the course of displacement, going from 42 livestock units pre-conflict to 2 units. Refugees also face drastic loss of access to productive assets and livestock. These losses further limit the ability of displaced populations to create employment opportunities for themselves, hampering self-reliance. More than 3 in 4 IDP households and 9 in 10 refugee households rely on humanitarian aid as their chief source of livelihood.

Security is the predominant factor driving future settlement intentions. About 6 in 10 IDP households want to stay in their current location, while 1 in 3 want to return to their origin. Most South Sudanese refugees in Ethiopia want to remain; only 16 percent would prefer to return to South Sudan. Households that want to stay in their current location are motivated by better security, services and assistance in the camps. Households that want to resettle outside the camps are also motivated by better security and access to health and education. In addition, about 4 in 10 IDP households that want to relocate also report access to home, land, livestock or employment as a motivating factor.

7.1. Displacement in South Sudan

While violent conflict causes enormous personal, economic and social damages to individuals and communities in South Sudan, displacement adds further uncertainty, dependence and vulnerability. An analysis based on household surveys (Box 7-1) conducted with the three groups – South Sudanese IDPs, non-displaced urban communities in South Sudan, and South Sudanese refugees in Ethiopia[177] – gives a snapshot of poverty and welfare levels of the forced displaced populations in parallel with non-displaced urban communities. Addressing multiple dimensions of poverty, the analysis draws a displacement profile, and measures living standards, labor market and social outcomes of the displaced. The results show that displacement adds further uncertainty, dependence and vulnerability to affected groups.

IDPs and refugees experience poverty levels that are inextricably linked to their displacement. Sustainably supporting poverty reduction for displaced communities requires addressing displacement factors. The analysis is centered around IDPs and how they fare vis-à-vis non-displaced urban households on several indicators related to livelihoods and employment, access to and quality of services, public participation, and return intentions. The data on South Sudanese refugees in Ethiopia complements the data on IDPs and non-displaced residents in South Sudan, adding further perspectives on the impacts of violent conflict on South Sudanese society. While both IDPs and refugees are forced to abandon their habitual place of residence, they tend to experience different dynamics. The comparison between IDPs and refugees is instructive as it highlights the different development challenges that these two groups face.

The conflict that erupted in South Sudan in December 2013 has displaced nearly 4.5 million people, about a third of the South Sudanese population. About 1.9 million of the displaced are IDPs, located across South Sudan but concentrated in the Greater Upper Nile region – in the pre-war states of Unity (539,000), Jonglei (365,000) and Upper Nile (220,000). More recently, as the war has moved southward, the Equatoria region also has received many IDPs (413,000).[178] Most IDPs live outside of camps. Only 15 percent of IDPs live in camp or camp-like settings where they can easily access humanitarian assistance. This includes 210,000 IDPs in POC sites, 58,000 in collective centers and 28,000 in informal settlements.[179] POC sites are IDP camps inside UNMISS peacekeeping bases. There are currently six POC sites in the towns of Bentiu, Bor, Juba, Malakal and Wau.[180]

[177] The analysis of South Sudanese refugees in Ethiopia is part of a larger study on all refugee groups present in the country. For the purpose of this chapter, the situation of South Sudanese refugees in Ethiopia is analyzed and contextualized with the caveat that this group represents only a fraction (less than 20 percent) of the total number of South Sudanese refugees.

[178] OCHA. 2017a. The Equatoria region includes the former states of Western, Central and Eastern Equatoria.

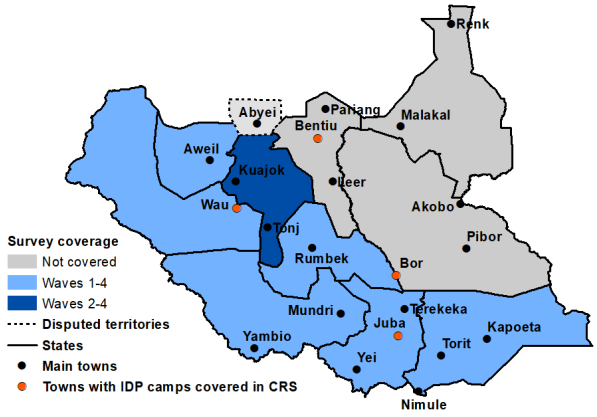
[179] OCHA. 2017b.

[180] There are two POC sites in Wau: one at the UNMISS base and one adjacent to it. UNMISS. 2018. "UNMISS POC Update." 3 February.

Box 7-1: The Crisis Recovery Survey (CRS) collects rich microdata on IDPs to complement the HFS 2017

The CRS represents four of the largest IDP camps in South Sudan. The CRS was conducted in 2017 in the four biggest protection of civilians (POC) camps with defined boundaries. The camps, all in urban areas, are Bentiu POC, Bor POC, Juba POC and Wau POC, located in the pre-war states of Upper Nile, Jonglei, Central Equatoria and Western Bahr el Ghazal respectively (Figure 7-1). The CRS collects rich microdata about consumption, poverty, education and labor outcomes of IDPs in these camps. It also collects details on displacement-specific outcomes, including motivations for displacement, return intentions, social capital, and pre-displacement outcomes in the standard of living, education and labor. Though the CRS covers POCs, where only 15 percent of South Sudan's IDPs are located, the detailed microdata fills important information and knowledge gaps for IDP-focused programming.[179]

Figure 7-1: High Frequency Survey 2017 and Crisis Recovery Survey 2017 coverage



Source: HFS 2017 and CRS 2017.

The fourth wave of the High Frequency Survey (HFS 2017) allows for comparisons of IDPs to urban residents. The HFS 2017 represents urban areas in seven of the 10 pre-war states of South Sudan. As the POC camps covered in the CRS are in urban areas, the HFS 2017 allows for comparisons in the outcomes of IDPs to the outcomes of the residents in these areas. However, the HFS 2017 does not cover two of the pre-war states in which CRS camps are located (Jonglei and Unity). Thus, comparisons are drawn at the overall urban and IDP level rather than for specific camps or pre-war states.

The CRS and HFS 2017 inform how IDPs are different from urban non-IDPs, as well as how different types of IDPs have heterogeneous outcomes. The urban residents present a relevant comparison group since the IDP households surveyed in the CRS are located in urban areas. The urban population provides a benchmark for access to services such as housing, sanitation and health, for IDPs in urban camps. Urban education and labor outcomes establish the human capital and labor market conditions of the areas that IDPs now find themselves in. Finally, the relationship with surrounding communities affects IDPs' socio-economic

integration. This is especially pertinent since many IDPs do not plan to move from their location in the foreseeable future, and a majority of those who plan to move do not know when the opportunity will arise. Among IDPs, specific characteristics of the household reflect different trajectories and needs, creating the potential for more customized program response. Households headed by women can have missing male spouses and larger dependency ratios; poorer households can have lower social and economic capital, which affects integration or moving. Thus, different groups of IDPs are also compared to each other.[181]

As of April 2018, over 2.4 million South Sudanese are refugees in neighboring countries, 440,000 of whom are in Ethiopia. The rest fled to Uganda (1.05 million), Sudan (771,000), Kenya (113,000) and Democratic Republic of Congo (91,000).[182] In Ethiopia, over 90 percent of the South Sudanese refugees are in camps along the southwestern border in Gambella, a traditionally fragile and underserved region with long-standing ethnic tensions between the Nuer and Anuak groups.[183] Here, the South Sudanese refugees (mostly ethnic Nuer) outnumber the host population (307,000 as of a 2007 census), causing enormous strains on food security, service delivery and access to livelihoods. A minority of South Sudanese refugees are also located in Benishangul-Gumuz, which mostly hosts Sudanese refugees.[184]

Box 7-2: The Skills Profile Survey (SPS) allows comparisons to refugees in Ethiopia[185]

Data on South Sudanese refugees in Ethiopia comes from the Skills Profile Survey (SPS) 2017. The survey population consists of refugees (South Sudanese, Eritrean, Somali and Sudanese) living in camps in Ethiopia, and Ethiopian host communities within a five kilometre radius of a camp. The sampling frame was the list of all refugee camps in the four main regions of the country that host refugees: Tigray and Afar (hosting mostly Eritreans), Gambella (hosting South Sudanese), Benishangul-Gumuz (hosting both Sudanese and South Sudanese), and Somali (Somalis). The overwhelming majority of South Sudanese refugees in Ethiopia live in

[181] See Appendix H: Crisis Recovery Survey, South Sudan for details on the surveys and comparison groups.

[182] UNHCR South Sudan Operational Data Portal, https://data2.unhcr.org/en/situations/southsudan [Accessed on May 2, 2018]; UNHCR, 2018c. In 2016, South Sudan had the third largest, after Syria and Afghanistan, and fastest growing refugee population in the world. UNHCR, 2017.

[183] Conflict between Anuak and Nuer across the Sudan/South Sudan-Ethiopia border dates to the 19th century. Civil war in Sudan in the 1980s caused a wave of ethnic Nuer refugees from Sudan to pour into Ethiopia, permanently altering Gambella's ethnic composition. The presence of refugees has exacerbated existing tensions between the two groups over land and water rights. However, the influx of refugees and the associated flow of humanitarian assistance have also benefitted host communities through infrastructure projects, and expanded services and local markets. Girma, 2016; World Bank, 2016; Feyissa, 2014; Asfah Gemechu, 2016.

[184] In 2017, 75,000 new South Sudanese refugees arrived in Ethiopia. Overall, the country has witnessed its refugee population increasing tenfold over the last decade, to almost 1 million refugees. Feyissa, 2014; Asfah Gemechu, 2016; World Bank, 2016; Carter and Rohwerder, 2016; UNHCR 2018a; UNHCR 2018b; UNHCR 2018d; UNHCR Statistics, http://popstats.unhcr.org/en/overview [Accessed on April 23, 2018].

[185] See Appendix H: Skills Profile Survey, Ethiopia for details.

camps, with humanitarian assistance providing services and basic livelihood. Refugees do not enjoy rights of freedom, nor possibility to work. A total of 837 South Sudanese refugee households were surveyed, including 438 in Gambella and 399 in Benishangul-Gumuz. A volatile security situation in Gambella impeded host community households from being surveyed, which is the reason why it is not possible to meaningfully compare South Sudanese refugees there with the respective Ethiopian host community.

7.2. Demographic Profile

IDPs and refugees are significantly younger than urban residents, driving higher dependency ratios. About 45 percent of IDPs and over 60 percent of South Sudanese refugees in Ethiopia are under 15 years old (compared with 32 percent of urban residents in South Sudan, $p<0.01$). Consequently, fewer IDPs and even fewer refugees are working age; i.e. 15 and 64 years old. About 54 percent of IDPs and 38 percent of refugees are working age (compared to 65 percent of urban residents; Figure 7-2). This translates to higher dependency ratios, defined as the number of dependents, under 15 and over 64 years old, compared to the working age population. The dependency ratio of IDP households is 1.2, almost twice the ratio of urban residents (0.7, $p<0.01$). Refugees in Ethiopia have even higher dependency ratios at 1.9 – each working age member has two non-working age members. Refugee households are overwhelmingly woman-headed (91 percent, Table 7-1).

IDPs, refugees and urban residents have fewer adult men than women following years of civil war. South Sudan has fewer men than women. In the adult age group, this disparity is most pronounced among urban residents (18 percent are men and 23 percent are women, $p<0.01$).[186] For IDPs, this disparity is less pronounced among adults (15 percent men and 18 percent women) and is also present among the youth (9 percent are men and 12 percent are women). Most woman-headed households have missing male spouses (83 percent for IDPs and 87 percent for urban). The lack of a male spouse further drives up dependency ratios in woman-headed IDP households (1.4 compared to 0.96 for man-headed households for IDPs, Table 7-1). For refugees in Ethiopia, the gender disparity is widest among adults: 16 percent are women and only 6 percent are men (Figure 7-2). The gender disparity could be the result of women migrating to camps with the family while men stay behind at the original location. Recruitment into armed groups seems to play a minimal role for IDP men, while it is more prevalent for refugee men (Figure 7-9).

IDPs are mostly from the Nuer tribe, which is associated with the main opposition group. The two largest ethnic groups in South Sudan are the Dinka and the Nuer. Other large groups include the Zande, Bari and Shilluk. The conflict sparked off between the government, who are linked with the Dinka, and the opposition, who were affiliated with the Nuer but now also include other groups. About 3 in 4 IDPs are Nuer (compared to less than 1 percent of the urban population), while 1 in 3 urban residents are Dinka (compared to less than 1 percent of the IDP population, $p<0.01$). POCs often shelter IDPs associated with

[186] Age groups are defined as follows: children are under 15 years, youth are between 15 to 24 years, adults are between 25 to 64 years, and elderly are above 64 years old.

the opposition but located in areas controlled by the government.[187] The POCs in Bentiu, Bor and Juba are almost entirely composed of the Nuer tribe. Other studies have also found IDPs in POCs to belong to the same ethnic group.[188] Wau POC is the only multi-ethnic camp, with Balanda Viri and Zande as well as other groups, but few Nuer (Figure 7-3).

Figure 7-2 Population structure for IDPs, refugees and urban residents, by gender and age

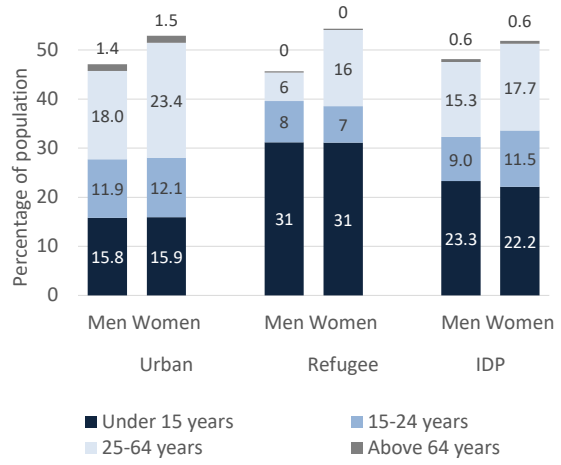
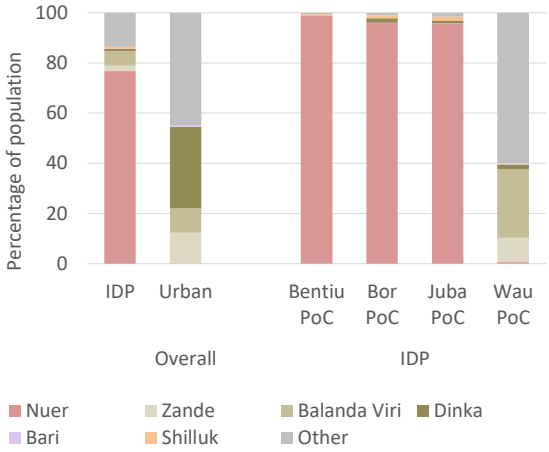


Figure 7-3: Ethnic composition for IDPs and urban residents



Source: Authors' calculations using HFS 2017, SPS 2017 and CRS 2017.

Table 7-1: Household characteristics, by gender of household head

	Urban			Refugee			IDP		
	Man Head	Woman Head	Overall	Man Head	Woman Head	Overall	Man Head	Woman Head	Overall
% of all households	54.5	45.5	100.0	8.5	91.5	100.0	54.4	45.6	100.0
Dependency ratio	0.57	0.79	0.66			1.90	0.96	1.41	1.16
Household size	5.3	4.4	4.9				5.9	5.2	5.6

Source: Authors' calculations using HFS 2017, SPS 2017 and CRS 2017.

7.3. Displacement Profile

South Sudanese overwhelmingly link their displacement to security. IDPs and refugees in Ethiopia predominantly fled their original residences due to armed conflict (79 percent IDP households, and 93

[187] Norwegian Refugee Council, 2017.

[188] REACH. April 2015. "South Sudan Displacement Trends Analysis."

percent refugees).[189] Discrimination and violence in the absence of conflict are also key reasons for IDPs in the Juba POC (21 percent and 15 percent respectively, Figure 7-4). As a result, security outweighs other factors like humanitarian assistance when choosing a camp location (Figure 7-5). In addition, a quarter of South Sudanese refugees stated that access to humanitarian aid drove their decision to settle in a specific area.

The geographic trajectory of the conflict can explain displacement dates for IDPs in specific pre-war states. Displacement dates of the IDPs map closely with conflict intensity.[190] Most IDP households were displaced when violence escalated. About 28 percent of IDPs were displaced around December 2013 when the conflict broke out. Another 17 percent were displaced in July 2016 when the conflict reignited. Trends in conflict and displacement events appear even more clearly when looking at POCs. For example, more than 66 percent of IDPs in Juba POC were displaced in December 2013, when the clashes broke out in Juba. More than 90 percent of POC IDPs in Bor were also displaced at this time, as the opposition seized control of Bor town a week after the clashes in Juba. For Wau POC, 78 percent of the households were displaced in June 2016, when battle broke out between the SPLA and the SPLM following tensions building in the areas since 2015 (Figure 7-6).

Figure 7-4: Reasons for leaving original location

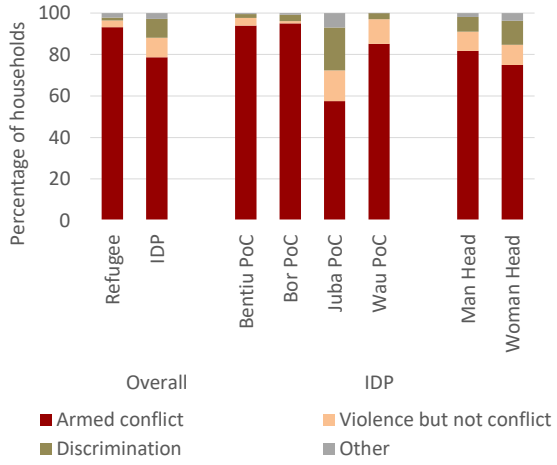
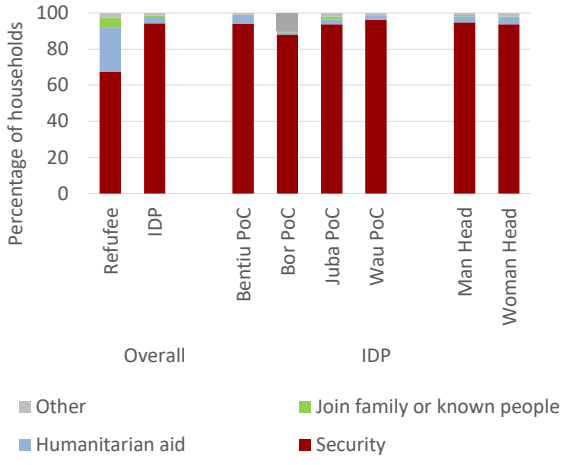


Figure 7-5: Reasons for arriving at current location

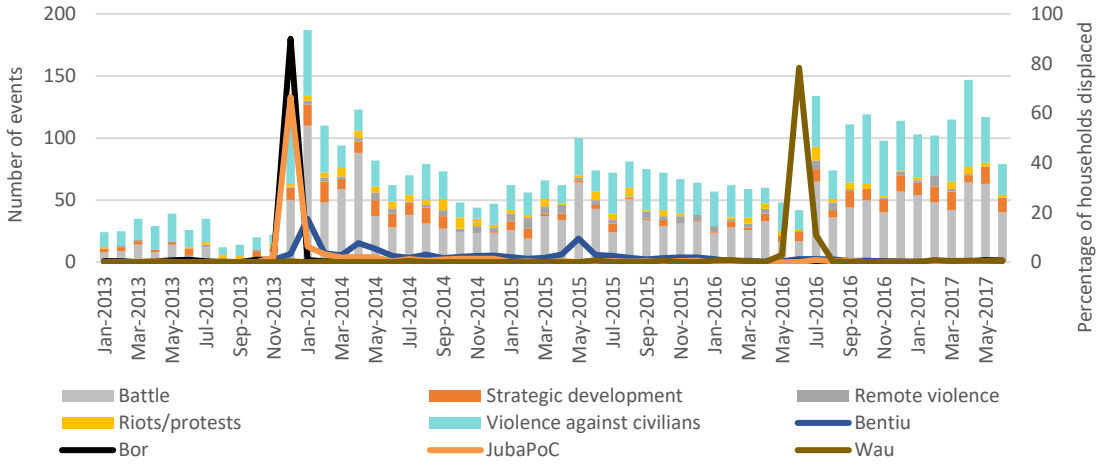


Source: Authors' calculations using HFS 2017, SPS 2017 and CRS 2017.

[189] Analysis for household-level outcomes is done slightly differently for refugees. While household-level weights are used for IDPs and urban residents, individual-level weights are used for refugees. Thus, the interpretation is at the household level for IDPs and urban residents, but at the individual level for refugees. For individual-level outcomes, all groups have individual-level weights.

[190] ACLED data used for conflict events.

Figure 7-6: Conflict events and displacement dates, for IDPs, Jan 2013-July 2017



Source: Authors' calculations using ACLED 2013-2017 and CRS 2017.

Most IDPs are displaced within their state of origin, and have not travelled far. Most IDP households in the HFS sample are from the former states of Unity (31 percent), Western Bahr el Ghazal (26 percent), Jonglei (21 percent) and Central Equatoria (17 percent), where Bentiu, Wau, Bor and Juba POCs, respectively, are located (Figure 7-7). About 7 in 10 IDPs are now displaced in their state of origin, with half of them even in their county of origin (Figure 7-8), indicating that they did not travel far to reach the camps. This also implies that they would not have to cover large distances, security permitting, to check on their dwellings and livelihoods or, eventually, return home.

Figure 7-7: IDPs' place of origin, by state

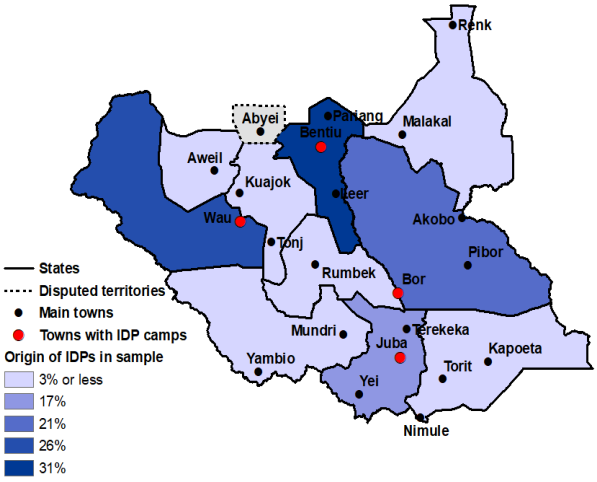
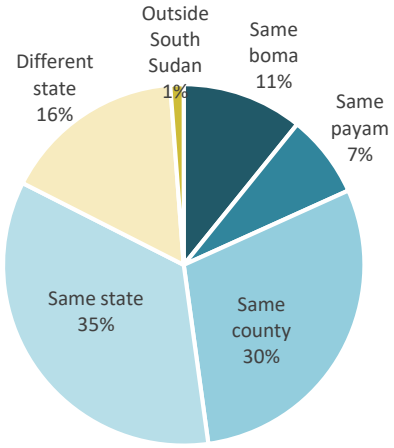


Figure 7-8: Place of origin vs. current location, for IDPs



Source: Authors' calculations using CRS 2017.

IDPs, refugees and those who are not displaced have comparable rates of family separation. About 37 percent of IDP households and 38 percent of refugees in Ethiopia compared with 30 percent of urban households have separated members. IDP households have a slightly larger number of separated members

(3.5 compared to 3.1 for urban households). This trend suggests that separation may be driven by conflict, but exacerbated by displacement. Arguably, the drivers of forced displacement (intense violent conflict in South Sudan and associated concerns) could help explain South Sudanese refugees' higher rates of family separation than other refugee groups in Ethiopia (i.e. Eritreans, Somalis and Sudanese), all of which have also been displaced for longer. Among IDPs, woman-headed households are more likely to have separated members, but they have a somewhat smaller number of separated members. Among the camps, households in Bor are the most likely to have separated members (about 3 in 4) and have the largest number of separated members (almost 5 members). For South Sudanese refugees in Ethiopia, 48 percent of the separated members are adult men and 30 percent are adult women (Table 7-2).

IDP households have less contact with separated members and most do not have access to family reunification mechanisms. Urban households are more able to contact their separated members (about 9 in 10 compared with 6 in 10 IDP households). Among the camps, only 1 in 4 households in Bor can contact their separated members compared with 3 in 4 households in Bentiu. However, about 1 in 3 IDP households have access to family reunification mechanisms. Perhaps because of the considerable number of separated members in Bor (about 5) and the household's inability to contact them, access to reunification mechanisms rises to 42 percent in this camp (Table 7-2).

Table 7-2: Trends in separation, for IDPs and urban residents

	Overall		IDP					
	Urban	IDP	Man head	Woman head	Bentiu POC	Bor POC	Juba POC	Wau POC
% households with separated members	29.9	36.5	34.1	39.3	29.8	76.3	34.9	48.1
Average number of separated members	3.1	3.5	3.6	3.4	3.6	4.9	2.9	3.7
% separated members who were women or girls	49.1	45.3	46.9	43.4	46.3	40.7	47.0	43.3
Average age of separated members	28.1	28.7	28.8	28.5	27.0	25.1	30.0	30.1
% households that can contact separated members	88.4	62.0	69.3	52.9	74.6	26.1	57.2	58.5
% households with access to reunification systems	N/A	32.4	28.4	35.7	25.0	41.5	29.1	41.2

Source: Authors' calculations using HFS 2017 and CRS 2017.

Most IDP and urban separated household members are displaced to another location. Few have stayed behind (10 percent IDPs and 5 percent urban residents) and even fewer have been recruited into armed groups. Among refugees in Ethiopia, 30 percent of the men have been recruited into armed groups. About 58 percent of the household members were left behind in South Sudan at the time of displacement. A quarter of South Sudanese refugees in Ethiopia report that family members were displaced to another location (Figure 7-9).

Figure 7-9 Reasons for separation of household members

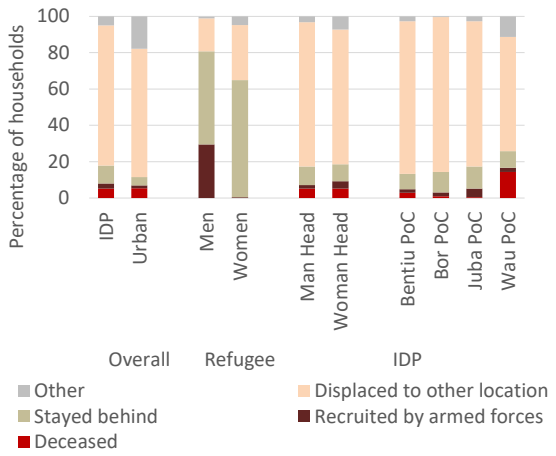
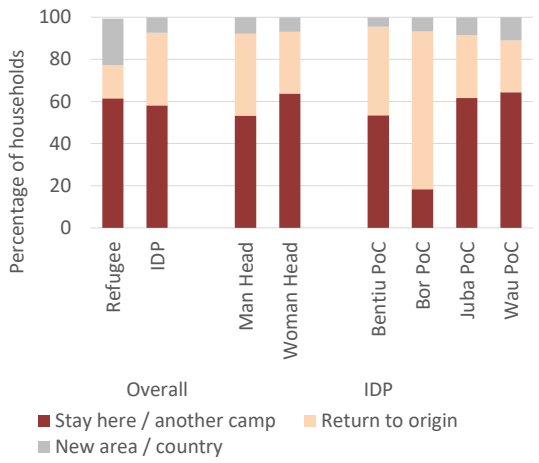


Figure 7-10: Return intentions



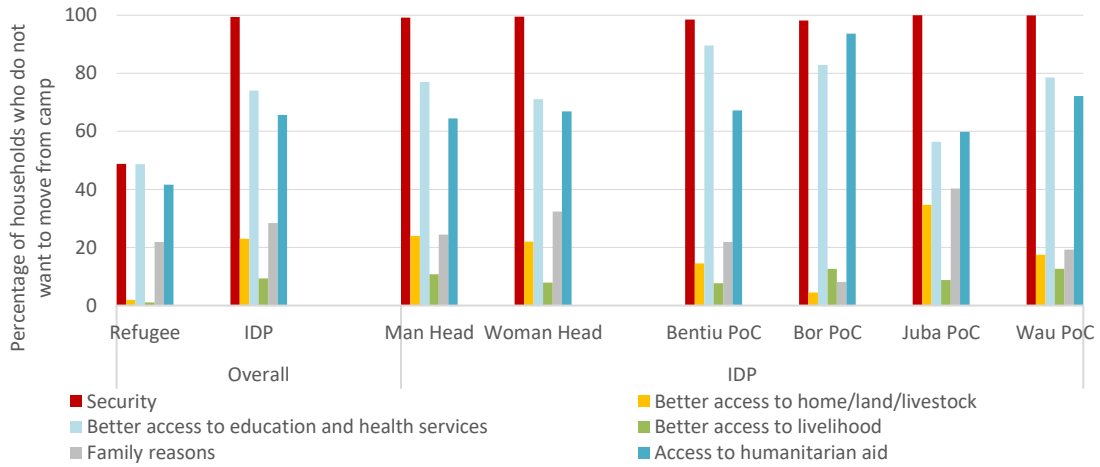
Source: Authors' calculations using HFS 2017, SPS 2017 and CRS 2017.

Only 1 in 3 IDPs want to return to their place of origin and most South Sudanese refugees in Ethiopia want to stay where they are. About 58 percent of IDPs do not want to leave their current location compared with 34 percent who want to return to their place of origin and 7 percent who want to resettle in a new location (Figure 7-10). Most refugees (nearly 60 percent) do not plan to move from their current location in Ethiopia at any point in the future – although they do not specifically mention wanting to integrate locally. Over 20 percent of refugees report wanting to be resettled to another country, while only 16 percent prefer to return to South Sudan. IDP households headed by women are less likely to want to return (29 percent compared to 39 percent for households headed by men). IDPs in Bor POC are the most likely (75 percent) and in Wau POC the least likely (25 percent) to want to return to their place of origin; the reluctance of IDPs in Wau POC may be due to their more recent experience of conflict and displacement.

IDPs who want to stay in their current location are motivated by better security, services and assistance in the camps, and refugees in Ethiopia express similar feelings. The main reasons IDPs do not want to leave the POCs are the provision of security (99 percent), health and education services (74 percent), and humanitarian assistance (66 percent) by the international community. Humanitarian assistance is more important for IDPs in Bor POC, and health and education services in Bentiu POC (Figure 7-11). A 2015 assessment found ongoing violence and insecurity to be barriers to return. In addition, it found the destruction of assets to also discourage return.[191] Similarly, refugees report that better security and better access to health services and education are the two main reasons for not wanting to move, followed by access to humanitarian aid. In contrast, family reasons and other economic indicators (i.e. improved livelihood, access to land and other assets) do not feature prominently.

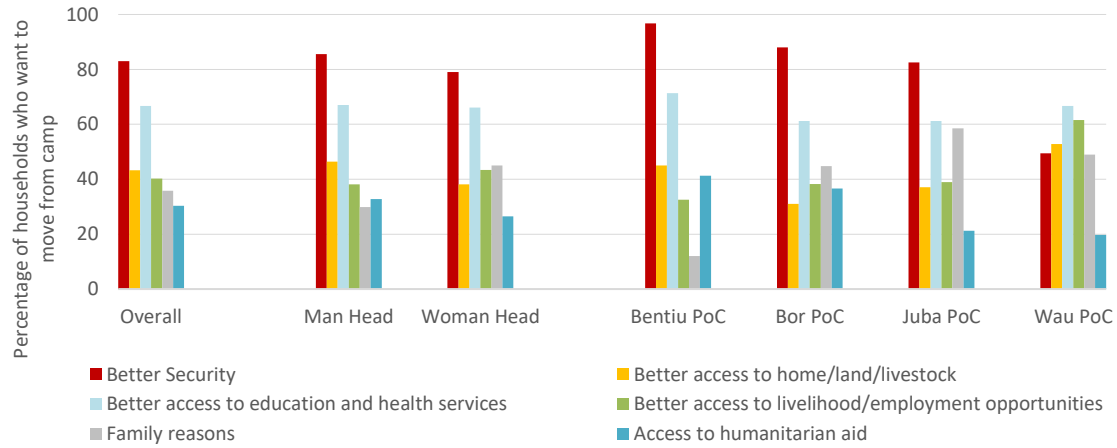
[191] REACH. April 2015. "South Sudan Displacement Trends Analysis."

Figure 7-11: Reasons for staying in current location, for those who do not intend to relocate



Source: Authors' calculations using SPS 2017 and CRS 2017.

Figure 7-12: Reasons for moving to new location, for IDPs who intend to relocate



Source: Authors' calculations using CRS 2017.

Better security and services are also the most important concerns for IDPs who want to leave their current location. The primary reasons IDPs want to return to their place of origin or resettle in a new location are better security (83 percent), and health and education services (67 percent). A study found that IDPs expect the humanitarian community to continue providing assistance and services when they return home.[192] In a contrast to IDPs who want to stay, the IDPs who want to move also report access to home/land/livestock and employment as motivating factors (43 percent and 40 percent respectively;

[192] REACH. March 2016. "South Sudan Intentions Study."

Figure 7-12). Other studies have found the reasons IDPs want to return include security, livelihoods and assets, especially land.[193]

7.4. Standard of living

Nine in 10 IDPs and 7 in 10 refugees are living in poverty. In a country with staggering prevalence of poverty, IDPs are a particularly marginalized group. About 91 percent of IDPs fall under the international poverty line of US$1.90 PPP per capita per day (PCPD) compared with 86 percent of rural residents and 75 percent of urban residents (p<0.01). Refugees in Ethiopia fare slightly better, with 71 percent poverty incidence. Among refugees, poverty incidence of households headed by women is slightly higher than of those headed by men; among IDPs, poverty rates vary considerably across the camps. Bentiu POC has the highest poverty rates, while Bor POC has the lowest poverty rates (96 percent and 76 percent respectively, p<0.01; Figure 7-13).

Figure 7-13: Poverty headcount ratio as per $1.90 PCPD poverty line

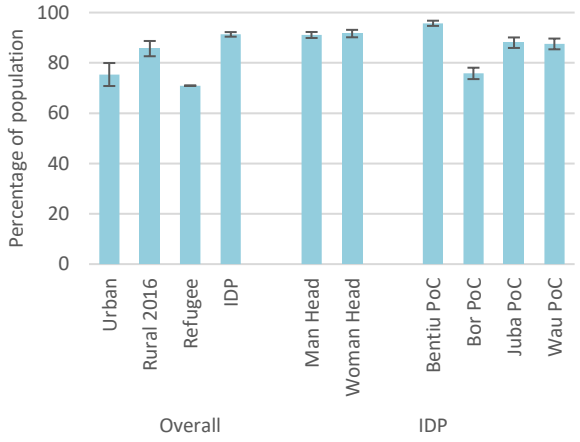
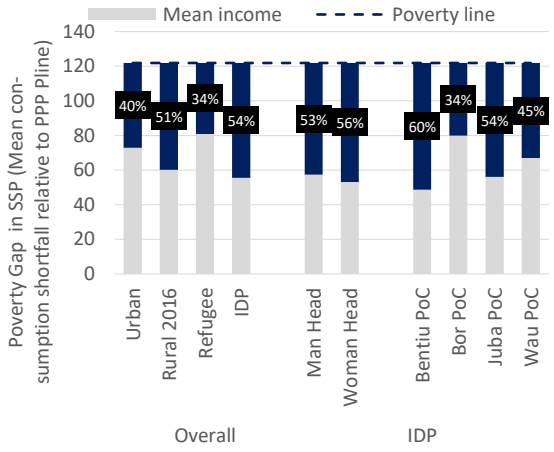


Figure 7-14: Poverty gap relative to $1.90 PCPD poverty line



Source: Authors' calculations using HFS 2016-2017, SPS 2017 and CRS 2017.

Along with higher prevalence, IDPs also have deeper poverty gaps than residents and refugees. The poverty gap, defined as the average consumption shortfall relative to the poverty line, is 54 percent for IDPs compared with 51 percent for rural and 40 percent for urban residents (p<0.01), and 34 percent for refugees in Ethiopia. IDPs and rural residents who are poor live on less than half the income threshold of US$1.90 PPP per capita per day. Where poverty is more prevalent, it is also more severe. Bentiu POC, which has the highest poverty incidence, has the deepest poverty gap (60 percent), while Bor POC, which has the lowest poverty incidence, has the smallest poverty gap (34 percent, p<0.01; Figure 7-14).

Despite being poorer, IDPs are less hungry than urban residents. About 24 percent of IDPs had experienced hunger three or more times during the past four weeks compared with 32 percent of urban

[193] REACH. April 2015. "South Sudan Displacement Trends Analysis."

residents. The lower hunger rates among IDPs may be due a more predictable and stable access to food through aid. On the other hand, South Sudanese refugees in Ethiopia experience widespread food insecurity in camps (82 percent).[194] For IDPs, hunger rates are similar across the consumption quintiles and across gender. Among the camps, Bor POC has the lowest poverty and hunger rates (5 percent), while Bentiu POC, despite being the poorest camp, experiences less hunger (15 percent) than Juba POC (31 percent) and Wau POC (29 percent, p<0.01; Figure 7-15). This can be explained by food aid: Bor POC and Bentiu POC have higher levels of food aid than Juba POC and Wau POC (Figure 7-16).

Figure 7-15: Frequency of hunger in last four weeks

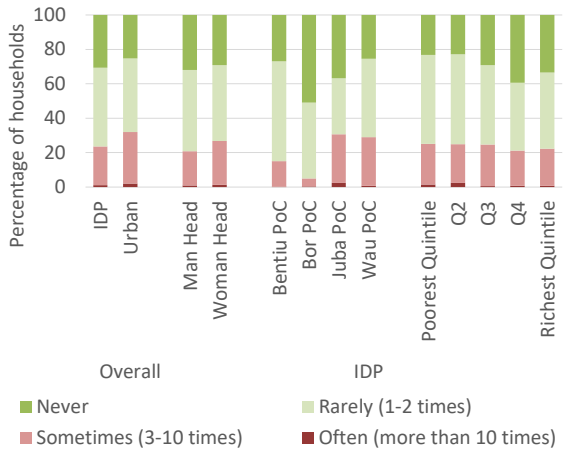
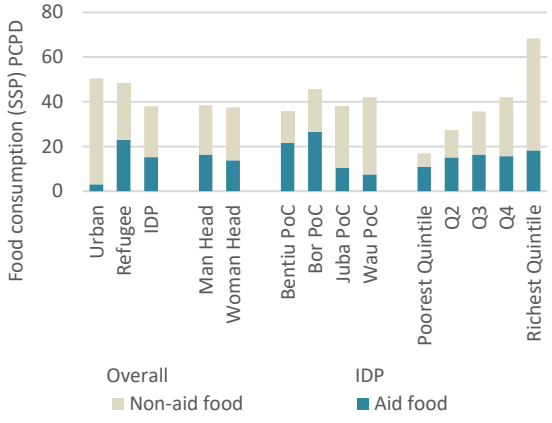


Figure 7-16: Food aid and core food consumption, PCPD



Source: Authors' calculations using HFS 2017, SPS 2017 and CRS 2017.

IDPs receive more food aid than urban residents but still consume less food overall. IDPs receive five times more food aid than urban residents (15 SSP per capita per day compared with 3 SSP per capita per day for urban residents, p<0.01). However, they consume 12 SSP per capita per day less food than urban residents (p<0.01).[195] Refugees in Ethiopia are also highly dependent on food aid: on average, 53 percent of the food consumption of South Sudanese refugees come from food aid. Refugees have higher levels of food aid as well as higher overall food consumption than IDPs. Across the quintiles, IDPs receive similar levels of food aid, though the overall food consumption differs drastically, with the richest quintile

[194] Food insecurity is defined as an individual facing food shortage at least once in the previous seven days and using a combination of coping strategies to overcome the shortage. It is calculated using the Reduced Coping Strategies Index (rCSI) adapted by WFP/VAM (World Food Programme/Vulnerability Analysis Mapping Unit), FAO/FSNAU (UN Food and Agriculture Organization/Food Security and Nutrition Analysis Unit for Somalia), and the Global IPC (Integrated Phase Classification) team, among others. rCSI is a weighted index that combines information on frequency and severity of coping strategies used in a single score for household food security.

[195] Food aid and overall consumption values are calculated using 'core' food items, which reflect about 75 percent of the total food consumption of the sample comprising urban residents and IDPs. However, the total imputed food consumption of IDPs is also less than that of urban.

consuming more than four times the poorest quintile ($p<0.01$, Figure 7-16). This indicates that food aid is not targeted based on income or consumption.

IDPs and refugees had better housing before the conflict but now occupy unimproved housing in temporary camp dwellings.[196] Before the December 2013 conflict, about 43 percent of IDPs stayed in improved housing, and 86 percent owned these dwellings. A recent study confirms that most IDPs living in POCs owned their homes before displacement.[197] The pre-conflict housing conditions of IDPs were better than those of urban residents today; 21 percent of urban residents occupy improved housing and 78 percent own the dwelling. The housing standards of IDPs have fallen severely to levels that are well below the urban residents; less than 1 percent of IDPs live in improved housing today, and 94 percent of the dwellings are temporary shelters provided by NGOs or the UN. This indicates that before displacement, IDPs may have been somewhat better off than urban residents but are now significantly worse off. In Ethiopia, 96 percent of South Sudanese refugees live in unimproved housing and 97 percent of them live in temporary shelters (Figure 7-17 and Figure 7-18). Among all refugee groups in Ethiopia by nationality, South Sudanese refugees are the ones with the highest percentage of refugees living in both overcrowded and unimproved housing.

Figure 7-17: Access to improved housing, now and before displacement

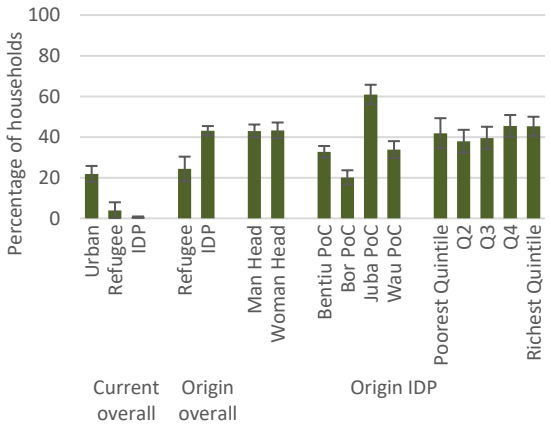
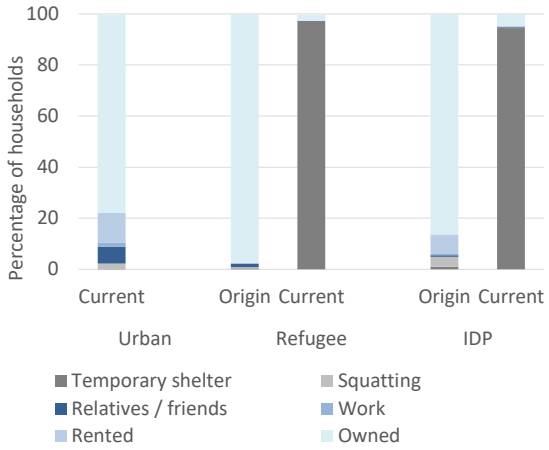


Figure 7-18: Trends in tenure of housing, now and before displacement



Source: Authors' calculations using HFS 2017, SPS 2017 and CRS 2017.

Camps offer improved WASH facilities and closely situated services to IDPs and refugees, while urban residents are farther from services. Both IDPs and refugees in Ethiopia have nearly universal access to improved drinking water sources. IDPs also have higher rates of improved sanitation facilities, defined as toilets with certain types of disposal and drainage systems, than urban residents (78 percent and 56

[196] Improved housing is defined as a structure that is made of wood, concrete or bricks and is intended for habitation.

[197] REACH, March 2016. "South Sudan Intentions Study."

percent respectively; p<0.01; Figure 7-19).[198] Further, IDPs and refugees in Ethiopia are typically much closer to a health facility, food market and water point, than urban residents. Before displacement, IDPs and refugees were much farther from these services, indicating an increased ease of access to these basic amenities (Figure 7-20).

Figure 7-19: Access to improved water and sanitation

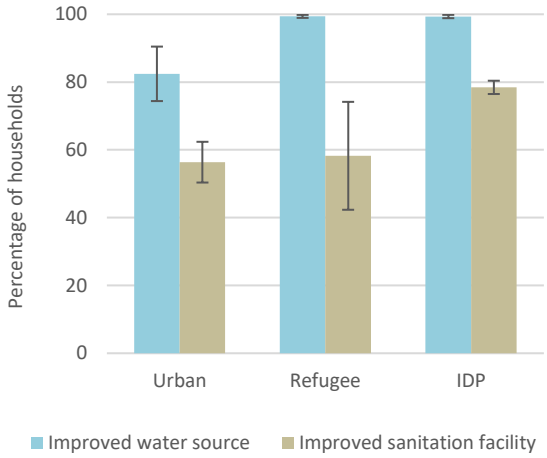
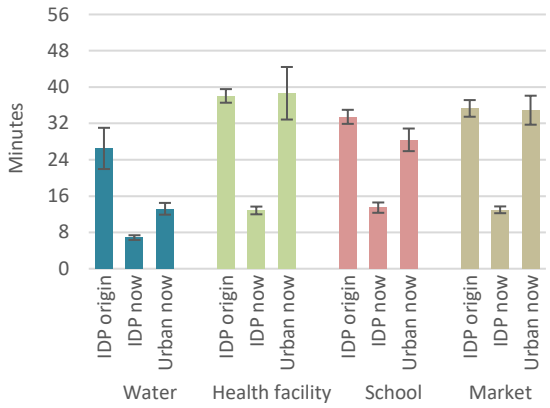


Figure 7-20: Time (one way) to amenities



Source: Authors' calculations using HFS 2017, SPS 2017 and CRS 2017.

However, severe overcrowding in camps effectively decreases access to services. As well as advising on quality of flush and waste disposal in toilets, WASH guidelines on improved sanitation also indicate that toilets should not be shared with other households. However, in IDP camps, multiple households share a toilet; a 2015 assessment of POCs found 57 IDPs per latrine.[199] Thus, even though 78 percent of IDP households have access to a toilet with an 'improved' waste disposal system, virtually none of them have access to improved sanitation after accounting for toilet sharing (Figure 7-21). Overcrowding also affects other living conditions of the displaced, such as housing. The United Nations defines insufficient living space as having 4 or more persons per room.[200] IDP and refugee homes are at least 7 times more likely to be overcrowded than urban resident dwellings (58 percent, 65 percent and 9 percent respectively). Households that are poorer or headed by men are more likely to experience overcrowding (p<0.01; Figure 7-22). A 2015 assessment also found 5 in 7 POCs to be overcrowded.[201] Overcrowding can adversely affect welfare, especially for women and girls. Having insufficient living space contributes to spreading of

[198] WHO and UNICEF, 2006. "Core Questions for Drinking Water and Sanitation for Household Surveys."

[199] IOM/Camp Coordination and Camp Management. February 2015. "South Sudan's Crisis Response Displacement Tracking Matrix."

[200] UN-Habitat. 2016. "Monitoring Framework, SDG Goal 11."

[201] IOM/Camp Coordination and Camp Management. February 2015. "South Sudan's Crisis Response Displacement Tracking Matrix."

communicable diseases such as cholera, diarrhea and malaria. It can also increase psychological distress. Focus groups in Bor POC and Juba POC have found that overcrowded shelters and bathing facilities deprived privacy for women, increasing their exposure to certain forms of gender-based violence such as harassment.[202]

Figure 7-21: Access to improved sanitation accounting for toilet sharing

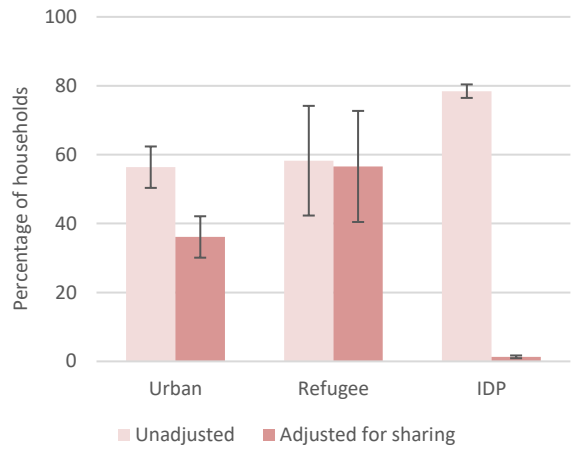
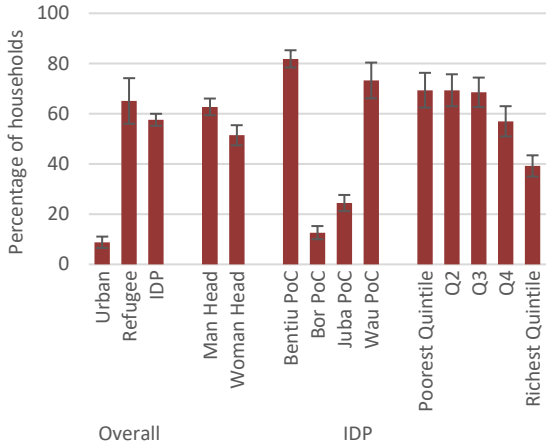


Figure 7-22: Crowding in dwellings



Source: Authors' calculations using HFS 2017, SPS 2017 and CRS 2017.

Figure 7-23: Literacy rates, ages 15+

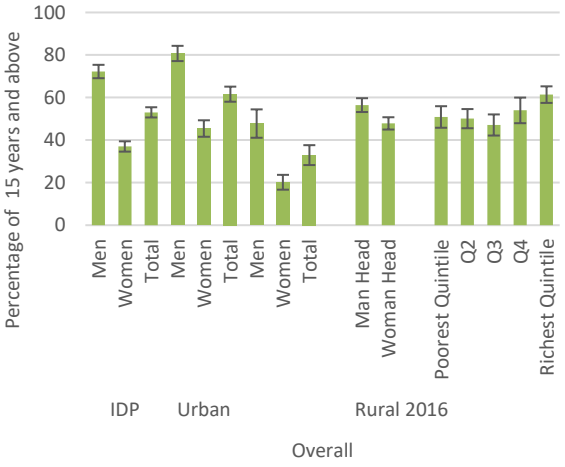
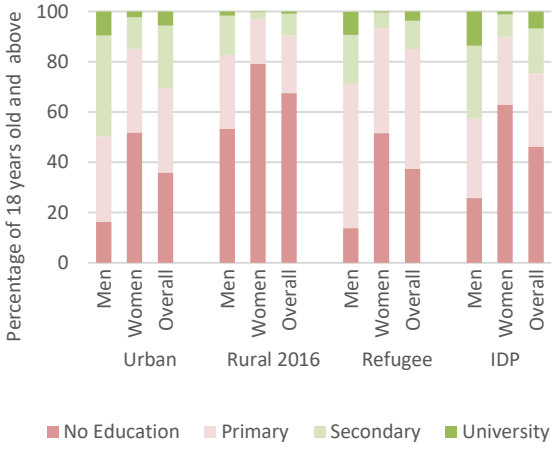


Figure 7-24: Adult educational attainment, by gender



Source: Authors' calculations using HFS 2016-2017 and CRS 2017.

IDPs and refugees have better educational outcomes than rural residents, but worse than urban residents. About 53 percent of IDPs and 63 percent of refugees above 14 years old are literate, compared with 33 percent of rural and 62 percent of urban residents (Figure 7-24). Women are much less likely than

[202] Oxfam. 2017. "South Sudan Gender Analysis." March

men to be literate in all the three groups, with a disparity of about 35 percent for IDPs and urban residents, and 28 percent for rural residents. Among IDPs, members of households headed by men or in the highest quintile are more literate ($p<0.01$ each; Figure 7-23). While more than half of IDPs are literate, few have studied beyond primary school. About 1 in 4 IDPs has a secondary school or university education. This is driven by stark gender differences, with 43 percent of men and only 10 percent of women having studied beyond primary school. Women are also more than twice as likely to have had no education (63 percent and 25 percent respectively). The gender disparity is also remarkable for refugees: 1 in 2 women has not had any education compared to 14 percent of men. In addition, 1 in 4 men has had secondary education or higher (including 9 percent men with university instruction), compared to only 6 percent of women.

IDPs and refugees have lower secondary school attendance than urban residents. About 72 percent of primary school-aged IDP children attend primary school compared with 76 percent of urban children ($p<0.01$, Figure 7-25). While secondary school attendance is low in South Sudan, it is particularly low for IDPs. Only 8 percent of secondary school-aged IDP children attend secondary school (compared to 22 percent of urban children; $p<0.01$). Households headed by women, while having lower literacy rates, have higher primary school attendance rates (79 percent compared with 66 percent for households headed by men; $p<0.01$). Across the quintiles, primary school attendance is similar but secondary school attendance falls as households become poorer. Most secondary school-aged students who are not in secondary school are instead in primary school (81 percent of IDPs, Figure 7-26). South Sudanese refugee children in Ethiopia overwhelmingly attend primary school (83 percent), while enrollment rates for secondary school are remarkably low (14 percent). Nearly all refugee children in school age who reside in the country attend schools that are run by NGOs (96 percent).

Figure 7-25: Net attendance rates, primary and secondary school

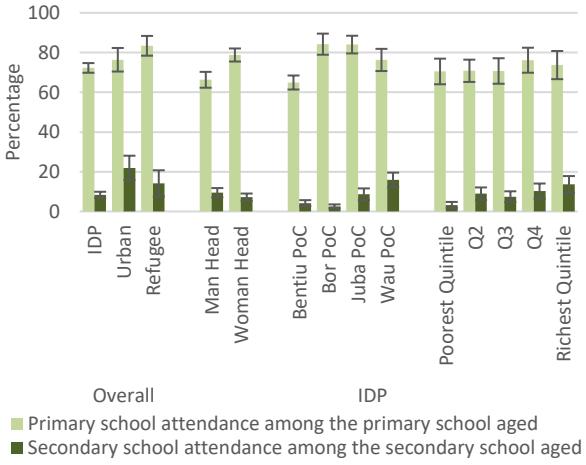
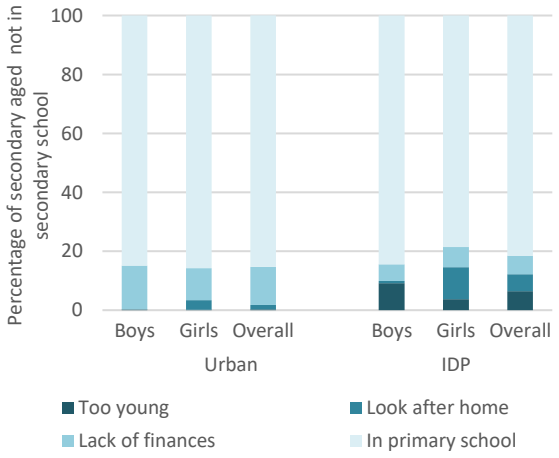


Figure 7-26: Reasons for not attending secondary school, by gender



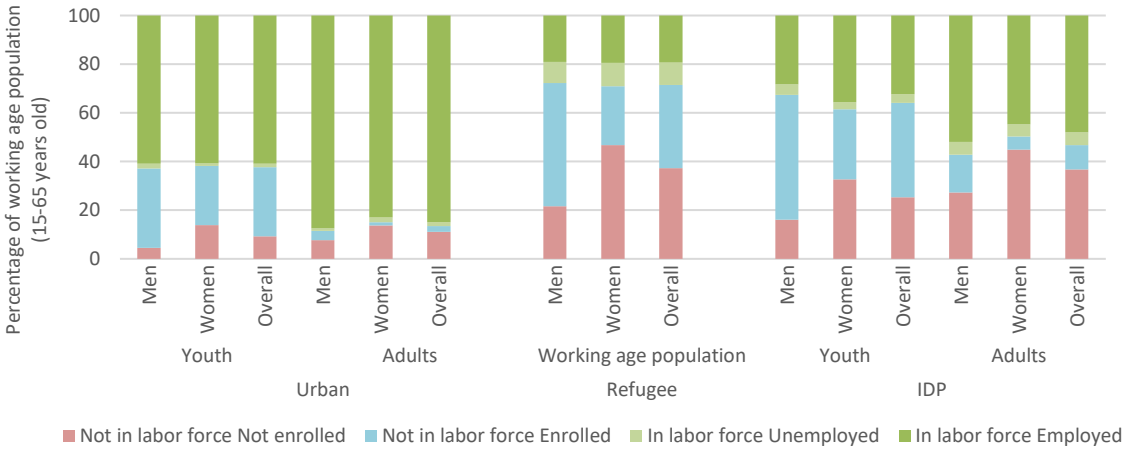
Source: Authors' calculations using HFS 2017, SPS 2017 and CRS 2017.

7.5. Employment and Livelihoods

IDP youth are more likely to be idle than urban youth. In general, youth have lower labor force participation because most of them are enrolled in education.[203] However, IDP youth have lower labor force participation than urban youth (32 percent and 63 percent respectively). Further, the IDP youth who are not in the labor force are much less likely to be enrolled in education (25 percent and 9 percent respectively). Thus, 1 in 4 IDP youth are idle – neither working, nor looking for work, nor studying. While this is more pronounced for women, a significant number of men are also idle (32 percent and 16 percent respectively; Figure 7-27). Idle youth have been linked to increased chances for violence or crime.[204]

Gender disparities in the working age population are much starker for IDPs. Young women have higher labor force participation and lower educational enrollment than young men, suggesting that youth men prioritize education over working. This disparity is not very pronounced for urban residents, but more pronounced for IDPs, where most young men are studying, while young women are either working, looking for work or not studying (51 percent of youth IDP men are in education, compared to 28 percent women). Among adults, the labor force participation trends are reversed. Men are more likely to be active in the labor force while women are idle. This could be explained by the portion of women who work in their youth but are not educated further, thus staying idle in adulthood. This gender disparity is more serious among IDPs than among urban residents (45 percent of adult IDP women are idle, compared to 28 percent adult IDP men, and 14 percent adult urban women; Figure 7-27).

Figure 7-27: Labor force participation and employment for the working age (15-65 years)



Source: Authors' calculations using HFS 2017, SPS 2017 and CRS 2017.

Current labor trends among adults have implications for the large youth force. If the existing labor trends for adults continue, IDP youth may not find work as adults. The proportion of IDP adults who are neither

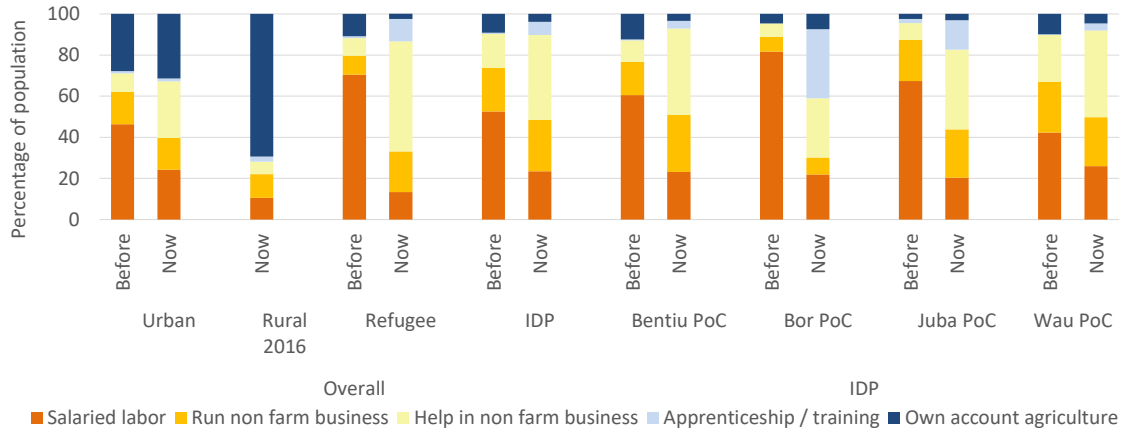
[203] Labor force participation is the sum of working-age individuals who are looking for work (employed or unemployed).

[204] UNDP, 2006.

looking for work nor enrolled is greater than the corresponding proportion for youth. If this trend continues, it is possible that the education enrollment of IDP youth will not translate into labor force participation or employment in adulthood. Rather, a proportion of the youth who are currently enrolled in education will be inactive in the labor force as adults. For urban residents, youth currently enrolled in education would join the labor force as adults. The proportion of adults who are in the labor force is similar to the proportion of youth who are either in the labor force or enrolled in education (Figure 7-27).

The employment structure of IDPs, refugees and urban residents was similar before the conflict, and it is comparable now. Over 70 percent of refugees and about half of IDPs and non-displaced urban populations were receiving salaries, while 1 in 5 for all groups ran their own business before the conflict (Figure 7-28). However, urban residents were more likely to be involved in agriculture than forced displaced people (28 percent compared to 11 percent of refugees and 9 percent of IDPs). After the conflict, all groups have shifted from salaries to helping non-farm businesses – a trend that is more pronounced for IDPs and refugees than urban residents. In fact, more than half of all South Sudanese refugees who are employed in Ethiopia are helping in the non-farm businesses of their families. Across IDP camps, IDPs in Bor POC were most likely to work as salaried labor pre-conflict, while those in Wau POC were least likely (82 percent and 42 percent respectively).

Figure 7-28: Primary employment activity[205]



Source: Authors' calculations using HFS 2016-2017, SPS 2017 and CRS 2017.

With respect to refugees in Ethiopia, only 1 in 5 working-age refugees (15-64) are currently employed. Refugees in that country are not officially allowed to work, which explains the low labor force participation rate – over 70 percent of South Sudanese refugees are inactive (neither employed, nor unemployed, nor actively looking for employment; Figure 7-27). On a positive note, 1 in 3 refugees – though inactive on the labor market – are currently enrolled in school or college. There are some gender differences in the labor force participation among South Sudanese refugees in Ethiopia. Men and women of working age have similar low rates of employment (approximately 20 percent for each group) and high rates of inactivity

[205] *Before* refers to 'before Dec 2013 conflict' for IDPs and urban and rural residents; and 'before displacement' for refugees.

(approximately 70 percent for each group). However, while nearly half the women are inactive and are not pursuing an education opportunity (47 percent), 1 in 2 men is inactive but enrolled in school or college. Therefore, while an equal number of women and men are not currently part of the labor force, it is conceivable that more women than men will not be part of it in the future, as they are not working toward attaining an education.

The livelihood structure of IDPs and urban residents is also similar before the conflict, but currently both IDPs and refugees in Ethiopia overwhelmingly rely on humanitarian assistance. IDPs and urban residents relied mostly on agriculture and salaries (42 and 28 percent of IDPs respectively, and 50 percent and 29 percent of urban residents respectively) before the conflict. Interestingly, IDPs derived a large part (42 percent) of their livelihoods from agriculture although few of them were employed in the sector. After the conflict, urban residents rely slightly less on agriculture and salaries and more on businesses while IDPs largely rely on humanitarian assistance (Figure 7-29). Similarly, the overwhelming majority of South Sudanese refugees in Ethiopia (90 percent) relies on aid (including cash, food and non-food) from the government or humanitarian organizations for their livelihood. Refugees relied primarily on agriculture (49 percent) and wages and salaries (43 percent) for their livelihood before displacement (Figure 7-30).

Figure 7-29: Main source of livelihood, currently and before Dec 2013

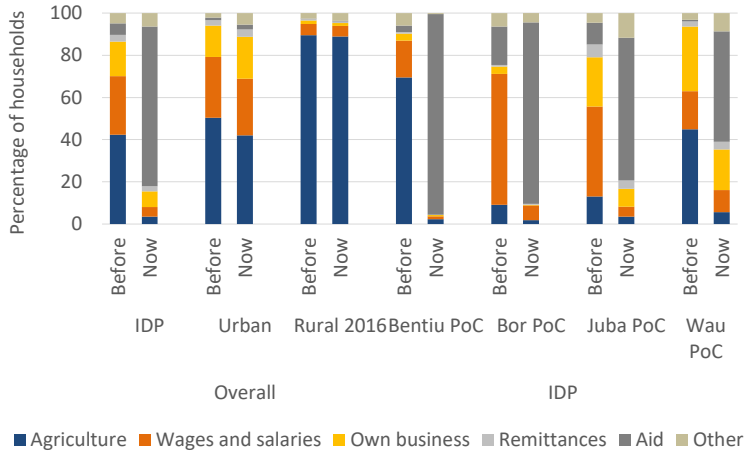
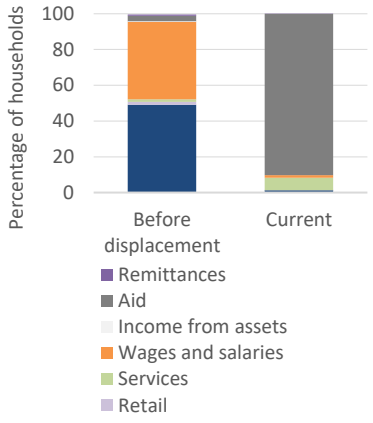


Figure 7-30: Main source of livelihood for refugees



Source: Authors' calculations using HFS 2016-2017, SPS 2017 and CRS 2017.

Currently, IDPs have very little agricultural land and livestock and productive assets. Before the conflict, urban residents had access to more land than IDPs (2 acres and 0.8 acres respectively). While both groups have suffered land losses since the conflict, it has resulted in IDP households holding about 0.2 acres of land on average while urban households hold about 1.4 acres. Households in Bentiu POC have had the largest land loss, from one acre pre-conflict to virtually no land post-conflict (Figure 7-31). IDP households also suffered from a nearly complete loss of livestock holdings, from 42 livestock units before the conflict

to 2 units, a fact that suggests IDPs' involvement in pastoralism rather than agriculturalism.[206] Cattle ownership is an important indicator of social and economic status, and cattle raiding is the source of communal violence in the country. Bentiu POC had access to most livestock before the conflict (70 livestock units) and has access to virtually no livestock now (Figure 7-32). The sharpest losses in land and livestock can explain why Bentiu POC is the poorest and most aid-dependent camp. The loss of productive assets was also much starker for IDPs than urban residents.[207] While 65 percent of IDP households had access to at least one productive asset pre-conflict, only 13 percent have access currently (Figure 7-33). Households in Wau POC are most likely to have access to assets (41 percent), which can explain why it is the least aid-dependent camp.

Figure 7-31: Agricultural land holdings, currently and before Dec 2013

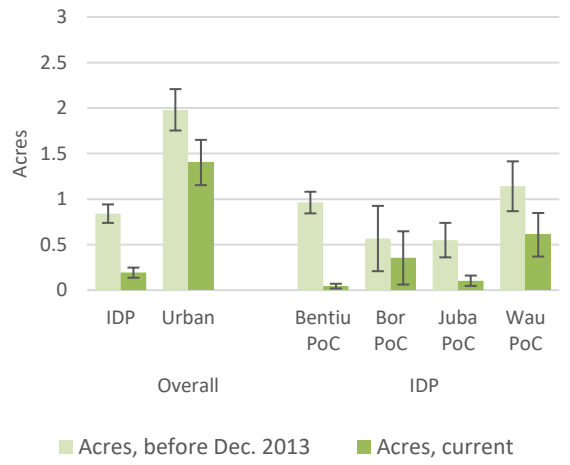
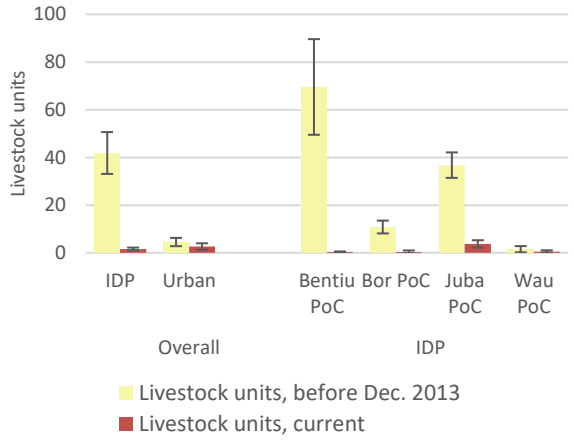


Figure 7-32: Livestock holdings, currently and before Dec 2013



Source: Authors' calculations using HFS 2017 and CRS 2017.

By the same token, South Sudanese refugees in Ethiopia have faced a dramatic decline in their access to assets since the start of displacement. Access to agricultural land dropped from 71 percent to 6 percent; productive assets declined from 94 per cent to 13 percent after displacement; and livestock lowered from 85 to 10 percent (Figure 7-34). This overwhelming lack of access to productive assets further limits the ability of refugees to create employment opportunities for themselves and hampers self-reliance.

[206] Livestock include cattle, horses, donkeys/mules, pigs, sheep, goats, poultry and camels. Livestock units are used to aggregate different types of livestock and allow for regional and global comparisons. They are obtained by converting body weight into metabolic weight. The livestock unit coefficients used here are for the Near East and North Africa region: cattle – 0.70; sheep – 0.10; goats – 0.10; pigs – 0.20; asses – 0.50; horses – 0.40; camels – 0.75; chickens – 0.01. Chilonda and Otte. August 2006. "Indicators to monitor trends in livestock production at national, regional and international levels." Livestock Research for Rural Development, Vol 18.

[207] Productive assets include car, truck, motorcycle, rickshaw, bicycle, boat, plough, computer, refrigerator and hoe, spade or axe.

Figure 7-33: Ownership of at least one productive asset, currently and before Dec 2013

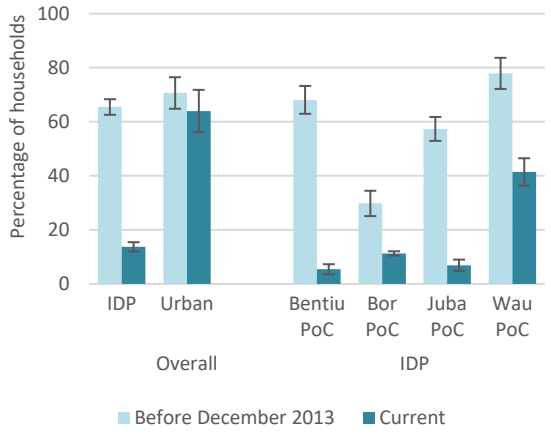
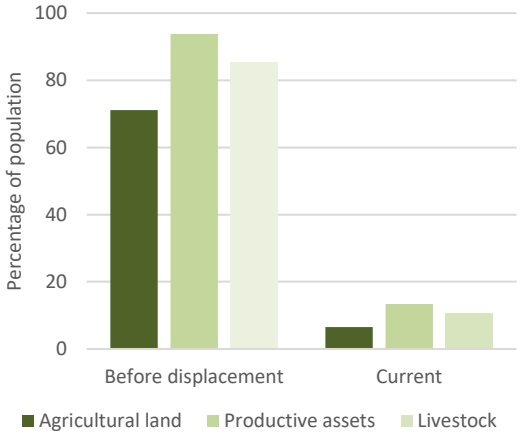


Figure 7-34: Percentage of refugees owning various assets



Source: Authors' calculations using HFS 2017, SPS 2017 and CRS 2017.

7.6. Security and social capital

Many IDPs do not feel safe in the camps, and perceptions of safety are quite low among South Sudanese refugees in Ethiopia too. Almost half of IDPs feel unsafe or very unsafe in POCs despite the presence of United Nations peacekeepers (Figure 7-36). This is particularly true at night when 68 percent do not feel safe compared to 22 percent during the day (Figure 7-35). While 1 in 2 refugees feel neither safe nor unsafe, 1 in 4 feels unsafe at home or walking around in the refugee camps during day or night, and only 1 percent feels very safe.[208] For IDPs, households headed by women are more likely to feel unsafe (51 percent compared with 42 percent for households headed by men). According to qualitative reports, widows or separated women are more likely to face gender-based violence in the absence of husbands.[209] Many POCs, including Bor POC, have been attacked by armed groups.[210] IDPs have directly or indirectly experienced considerable violence. More than 3 in 4 households have members who have been threatened with a weapon. About half have been robbed, kidnapped or extorted. And 2 in 5 households have members who have been forced to join armed groups (Figure 7-37). These findings show that displacement in South Sudan is accompanied by the threat and/or use of violence.

[208] Skills Profile Survey (2017) asked three questions: "In general, how safe from crime and violence do you feel when you are alone at home?", "How safe do you feel when walking around alone after dark?"and "How safe do you feel walking around during the day?". A combined scale for safety was created using these questions. Cronbach's alpha for the scale is 0.70.

[209] Oxfam, 2017.

[210] Norwegian Refugee Council, 2017.

Figure 7-35: Trends in perceived safety indicators, for IDPs

Figure 7-36: Trends in perceived safety[211]

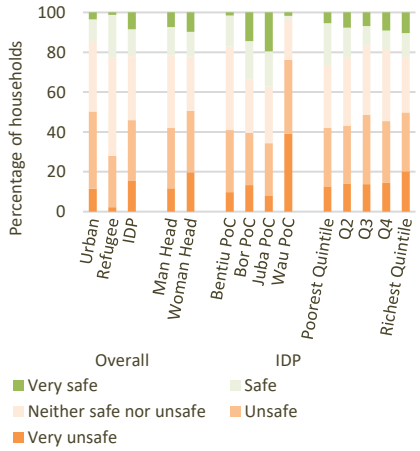
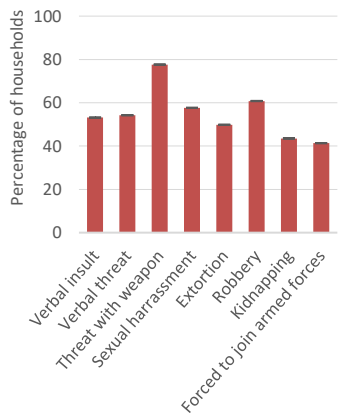


Figure 7-37: Trends in exposure to violence after Dec 2013, for IDPs



Source: Authors' calculations using HFS 2017, SPS 2017 and CRS 2017.

The different nature of risk that men and women face can explain why women-headed households feel less safe inside camps. Men face a higher threat of being killed or recruited into armed groups, which is elevated outside the camp setting. Women face the threat of gender-based violence, which is prevalent not only outside the camp but also inside camps by the police or civilian strangers. In a 2016 study, men reported feeling constricted from visiting the forest outside of camps for collecting firewood or cutting poles for construction, for fear of being killed. In the same study, women and girls were identified as having significantly higher exposure to gender-based violence, even inside camps and settlements. The key perpetrators of sexual violence or rape in POCs were identified as police, soldiers and civilian strangers. In addition, overcrowding of dwellings and sanitation facilities translates to a lack of privacy, creating the potential for certain forms of gender-based violence, especially for women and girls.[212]

Social capital of IDPs can be analyzed using a bonding, bridging and linking lens.[213] The social relations and networks that IDPs form within and across communities has a direct impact on durable solutions (return, local integration and resettlement). IDPs experience strong bonding social capital: in fact, most IDPs have positive relations with their current neighbors in the camps (59 percent very good and 24 percent good). This is true also in Wau POC, which unlike the other camps is multi-ethnic. Intra-camp relations are

[211] The safety indicator here is a combined scale of three measures: safety from violence, safety in walking in the day, and safety in walking at night. Cronbach's alpha for the scale is 0.65.

[212] Oxfam, 2017.

[213] "Bonding social capital refers to relationships among members of a network who are similar in some form (Putnam, 2000). Bridging social capital refers to relationships among people who are dissimilar in a demonstrable fashion, such as age, socio-economic status, race/ethnicity and education (Szreter and Woolcock, 2004). Linking social capital is the extent to which individuals build relationships with institutions and individuals who have relative power over them (e.g. to provide access to services, jobs or resources) (Woolcock, 2001; Szreter and Woolcock, 2004)." Hawkins and Maurer, 2010.

better in Bor POC and worse in Bentiu POC. Richer households have better relations with their neighbors than poorer households, indicating that they have more social as well as financial capital (Figure 7-38).

Figure 7-38: Relations with neighbors within the camp, for IDPs

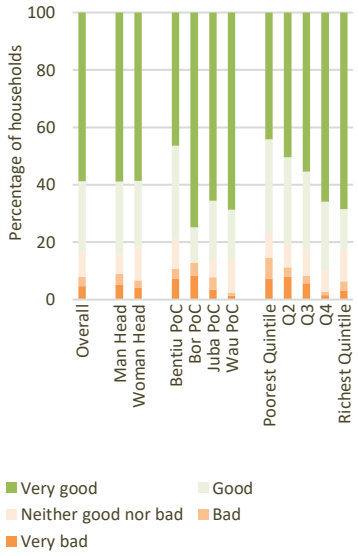


Figure 7-39: Relations with host communities outside the camps, for IDPs

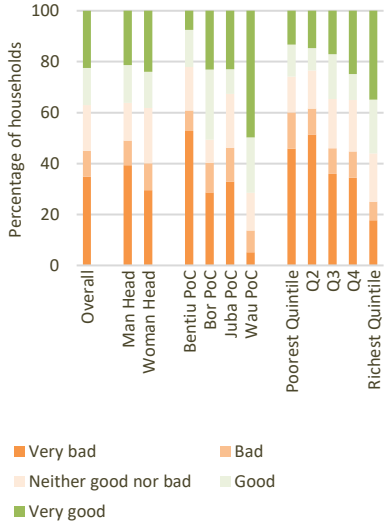
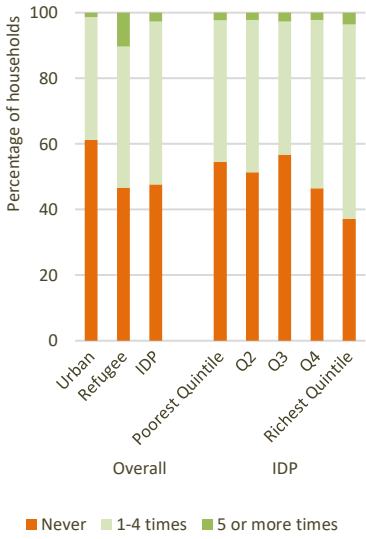


Figure 7-40: Frequency of attending public meetings



Source: Authors' calculations using HFS 2017, SPS 2017 and CRS 2017.

On the other hand, IDPs have significantly less bridging social capital. Many IDPs do not have good relations with the communities outside the camps. Only 37 percent describe their relationships as good or very good. This could be because most IDPs are from the Nuer tribe and associated with the opposition, while the host communities are largely from the Dinka tribe and supporters of the government.[214] A 2015 study found that more than 1 in 3 South Sudanese did not trust someone from another ethnic group.[215] The IDPs in Bentiu POC suffer from the worst relations (only 22 percent have good or very good relations), while those in Wau POC enjoy the best relations (over 72 percent have good or very good relations, Figure 7-39). Poverty and conflict dynamics help explain these different trajectories; for example, Bentiu POC is one of the most conflict-affected areas and has changed hands several times; IDPs in Wau POC experienced the least change in employment activity from before the conflict, are most likely to have access to assets, and are the least aid-dependent.

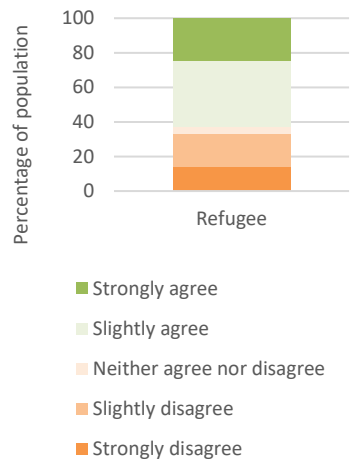
Among all refugees in Ethiopia, the South Sudanese have the lowest bridging social capital. For refugees, bridging social capital comes with its own challenges, as the displaced are from a different country than the surrounding host community. While only 1 in 4 "strongly agrees" that relations between refugees and host community population are good**,** 1 in 3 thinks that refugees and host community population have bad

[214] Norwegian Refugee Council, 2017.

[215] South Sudan Law Society and UNDP, 2015.

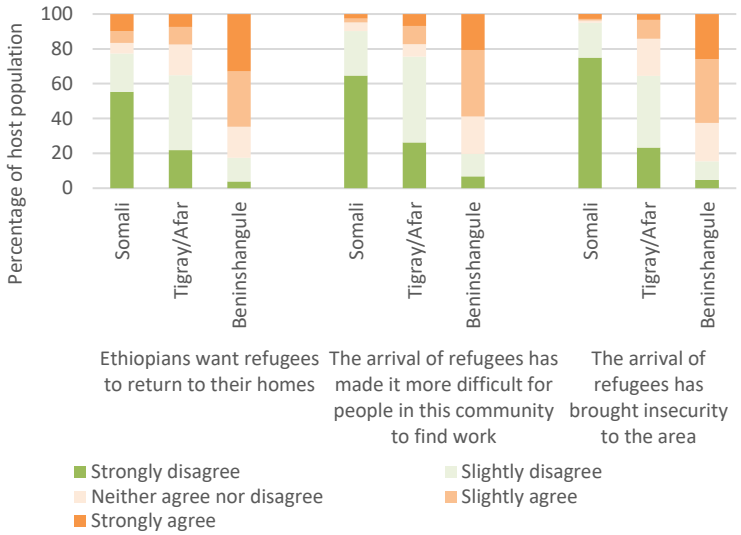
relations with each other (Figure 7-41). Such refugee perceptions mirror those of host communities in Benishangule region (which hosts 75 percent Sudanese and 25 percent South Sudanese refugees): approximately 60 percent of host community members in Benishangule report that Ethiopians feel that refugees should be repatriated, that crime has risen, and it is more difficult to secure employment (Figure 7-42). By comparison, the other two Ethiopian regions that were surveyed have remarkably more positive sentiments by host communities toward the refugees. As South Sudanese are the newest group, they have not yet fully adapted, and degrees of integration are low. Arguably, the temporal factor may explain differences in perceptions with respect to other refugee groups.

Figure 7-41: Perceptions on "Host communities and refugees have good relations"



Source: Authors' calculations using SPS 2017.

Figure 7-42: Host community perceptions of relations with refugees



Source: Authors' calculations using SPS 2017.

IDPs and refugees have a moderate amount of linking social capital as compared to urban residents. IDPs and refugees are more likely to attend public meetings than urban residents (52 and 53 percent compared with 39 percent, respectively). This could be because there are more opportunities in camps run by the international community. Among IDPs, richer households are more likely to attend meetings than poorer households (Figure 7-40). However, among refugee groups in Ethiopia, South Sudanese have the lowest participation in public meetings. This negative trend mirrors the slightly negative feelings between South Sudanese refugees and host communities, lending support to the assumption that the shorter the length of displacement the lower the level of integration.

7.7. Conclusions

Violent conflict drives poverty, which is further exacerbated by displacement. The chapter provides findings on several measures of poverty at the household level, putting in relationship South Sudanese IDPs, non-displaced communities in South Sudan, and South Sudanese refugees in Ethiopia. To different degrees, these three groups have been negatively impacted by the civil war that broke out in late 2013.

Predictably, however, the household-level data highlights that displaced people (especially IDPs, but also refugees) are currently worse off compared to non-displaced communities. Not only have IDPs and refugees witnessed trauma and life disruption (e.g. family separation) and incurred material losses during displacement, but they are also highly dependent on external aid for their standard of living, livelihood and access to services.

Economic, physical and social capital of displaced populations is extremely low, but their human capital is moderate thanks to humanitarian assistance. In terms of access to services, IDPs and refugees in Ethiopia fare similarly (or even better in some cases) than non-displaced communities. On availability of drinking water, access to improved sanitation and health facilities and primary school attendance, displaced people have similar levels to non-displaced urban residents. Proximity to services has also improved for IDPs and refugees compared to pre-displacement and compared to current non-displaced communities in South Sudan. Poverty incidence and poverty gap – or average consumption shortfall relative to the poverty line – are high for all groups, but IDPs fare worse than urban residents and South Sudanese refugees in Ethiopia. Relegated to camps, housing situations for IDPs and refugees are dire: tenure is unstable and dwellings are chronically overcrowded.

By all measures, IDPs, non-displaced urban residents and refugees in Ethiopia fare worse now than before the conflict, but urban residents cope better. In terms of livelihood and employment, non-displaced urban residents have substantially higher rates of labor force participation compared to refugees and IDPs, although the latter groups are involved in education activities. In addition, both displaced and non-displaced people experienced a substantial shift from mainly salaried labor before the war to currently more generic and less remunerative help in non-farm business. Regarding access to land, livestock and other assets, urban residents experienced a slight decline since the war broke out. On the other hand, IDPs and refugees suffered from nearly complete loss of livelihood means. Data also points out that, on some indicators, IDPs before displacement were slightly better off than current non-displaced urban residents.[216]

Prospects for displaced people are completely uncertain, but security is the greatest priority. Uncertainty dominates IDPs and refugees' feelings. The inability to plan for the future – a key feature that the broader literature on forced displacement acknowledges but does not sufficiently state – is evident from the data. Despite suffering from declined standard of living, depleted assets and a condition of dependence, nearly 60 percent of IDPs and refugees in Ethiopia prefer to stay in the current location above any other option. As the main driver of displacement was personal security, it is not surprising that IDPs and refugees single out security as the most important factor in their intention to either stay in the current place or move to a different location. Uncertainty is also derived from the lack of knowledge about the fate of, for example, family members, housing, land and other patrimonial assets – a situation exacerbated when combined with a widespread lack of documentation and unavailability of restoration mechanisms.

[216] One can speculate that when violence takes place, those with more means are able to flee first. While who gets to flee depends on other factors too (like immediate proximity to violence), the economic dimension usually plays a role too. Nonetheless, there is no evidence for this point from the data collected here on the South Sudan case.

References

Acharya, Sanjaya. (2008). Poverty Alleviation and the Industrial Employment of Women (The Case of Nepal). Journal of International Development 20 (5): 670-85

African Union. (2015). Final Report of the African Union Commission of Inquiry on South Sudan and the UN Panel of Experts Report to the UN Security Council, S/2016/70, January 2016; UN Secretary General (UNSG) Report (November 2016)

African Development Bank. (2013). Infrastructure Action Plan in South Sudan: A Program for Sustained Strong Economic Growth.

Akresh, Bhalotra, Leone, Osili. (2012). War and Stature: Growing Up during the Nigerian Civil War. AER Papers and Proceedings.

Akresh, de Walque. (2011) "Armed Conflict and Schooling: Evidence from the 1994 Rwandan Genocide.

Alatas, V., A. Banerjee, A. G. Chandrasekhar, B. Olken, and R. Hanna. (2011). Identifying the Poor: Social Networks and the Aggregation of Information. MIT Working Paper.

Annan, Jeannie, Christopher Blattman, Dyan Mazurana, and Khristopher Carlson. (2009). Women and Girls at War: "Wives", Mothers, and Fighters in the Lord's Resistance Army. HiCN Working Paper 63. Brighton: Households in Conflict Network, The Institute of Development Studies - at the University of Sussex.

Asfah Gemechu, E. 2016. "The Recent Attack in Gambela and its Implications for Humanitarian Operations." Horn of Africa Bulletin (March-April), Volume 28 Issue 2, Life and Peace Institute.

Ayazi et al. (2014). Association between exposure to traumatic events and anxiety disorders in a post-conflict setting: a cross-sectional community study in South Sudan. BMC Psychiatry 2014 14:6.

Bastagli, F., Hagen-Zanker, J., Harman, L., Barca, V., Sturge, G., Schmidt, T., & Pellerano, L. (2016). Cash transfers: what does the evidence say. A rigorous review of programme impact and the role of design and implementation features. London: ODI.

Berg, J., Dickhaut, J., & McCabe, K. (1995). Trust, reciprocity, and social history. Games and economic behavior, 10(1), 122-142.

Blanc, Ann. (2004). "The Role of Conflict in the Rapid Fertility Decline in Eritrea and Prospects for the Future." Studies in Family Planning 35(4): 236–24.

Blattman, C., & Ralston, L. (2015). Generating employment in poor and fragile states: Evidence from labor market and entrepreneurship programs.

Blattman, C., Annan, J., Green, E. P., Lehmann, C., & Jamison, J. (2015). The returns to microenterprise development among the ultra-poor: A field experiment in post-war Uganda. forthcoming in American Economic Journal: Applied Economics.

Blattman, Christopher and Jeannie Annan. (2007). The Consequences of Child Soldiering. HiCN Working Paper 22. Brighton: Households in Conflict Network, The Institute of Development Studies - at the University of Sussex.

Boothby, Neil, Jennifer Crawford, and Jason Halperin. (2006). Mozambique child soldier life outcome study: Lessons learned in rehabilitation and reintegration efforts. Global Public Health, 1(1), pp. 87-107. Abingdon: Taylor & Francis Group.

Bozzoli, Carlos & Tilman Brück. (2009). 'Agriculture, Poverty, and Postwar Reconstruction: Micro-Level Evidence from Northern Mozambique', Journal of Peace Research 46(3): 377-397.

Bozzoli, Carlos and Tilman Brück. (2009). Identifying Conflict and its Effects Using Micro-Level Surveys. HiCN Research Design Note 13. Brighton: Households in Conflict Network, The Institute of Development Studies - at the University of Sussex.

Bozzoli, Carlos, Tilman Brück and Tony Muhumuza. (2015). Activity Choices of Internally Displaced Persons and Returnees: Quantitative Evidence from Post-War Northern Uganda. Bulletin of Economic Research. Weinheim: Wiley-VCH.

Bozzoli, Carlos, Tilman Brück, ad Nina Wald. (2011). Self-Employment and Conflict in Colombia. Journal of Conflict Resolution 57(1). Ann Arbor: University of Michigan.

BRAC. (2013). AGI Comprehensive report 2010-2012.

BRAC (undated), Fact Sheet, Excerpts from Midline Tracer Survey of Adolescent Girls Initiative Evaluation in South Sudan.

Bratti, Massimiliano, Mariapia Mendola, and Alfonso Miranda. (2016). Hard to forget: The long-lasting impact of war on mental health. HiCN WP 206. Brighton: Households in Conflict Network, The Institute of Development Studies - at the University of Sussex.

Brown, C. S., Ravallion, M., & Van de Walle, D. (2017). Are poor individuals mainly found in poor households? evidence using nutrition data for Africa (No. w24047). National Bureau of Economic Research.

Brown, Ryan, and Andrea Velásquez. (2015). The Effect of Violent Crime on the Human Capital Accumulation of Young Adults. Presented at the 2015 Population Association of America Annual Meeting, San Diego, CA.

Brück, Tilman and Kati Schindler. (2009). The Impact of Violent Conflicts on Households: What Do We Know and What Should We Know about War Widows?. Oxford Development Studies 37(3): 289-309.

Brück, Tilman and Marc Vothknecht. (2011). Impact of Violent Conflicts on Women's Economic Opportunities, in Women and War: Power and Protection in the 21st Century. Kathleen Kuehnast, Chantal de Jonge Oudraat, and Helga Hernes (eds). Washington, D.C.: United States Institute of Peace Press, pp. 85-114.

Brück, Tilma. (2004). The Welfare Effects of Farm Household Activity Choices in Post-War Mozambique. HiCN WP04. Brighton: Households in Conflict Network, The Institute of Development Studies - at the University of Sussex.

Brück, Tilman, Patricia Justino, Philip Verwimp, and Alexandra Avdeenko. (2010). Identifying Conflict and Violence in Micro-Level Surveys. IZA Discussion Paper No. 5067. Bonn: Institute for the Study of Labor (IZA).

Brück, Tilman, Patricia Justino, Philip Verwimp, and Andrew Tedesco. (2013). Measuring Conflict Exposure in Micro-Level Surveys. Washington, DC: World Bank Group.

Bundervoet, T. and Verwimp, A. (2009). Health and Civil War in Rural Burundi. Journal of Human Resources.

Buvinic, M., Gupta, M. D., Casabonne, U., & Verwimp, P. (2013). Violent conflict and gender inequality: An overview. The World Bank.

Calderón, Valentina, Margarita Gáfaro, and Ana M. Ibáñez. (2011). Forced Migration, Female Labor Force Participation, and Intra-Household Bargaining: Does Conflict Empower Women?. MICROCON Research Working Paper 56. Brighton: Institute of Development Studies.

CARE. (2014). 'The Girl Has No Rights': Gender-Based Violence in South Sudan : May 2014.

Carter, B. and Rohwerder, B. 2016. "Rapid Fragility and Migration Assessment for Ethiopia." Rapid Literature Review. Birmingham, UK: GSDRC, University of Birmingham.

Cameron, A. C., & Miller, D. L. (2015). A practitioner's guide to cluster-robust inference. Journal of Human Resources, 50(2), 317-372.

Castro, M. C. (2010). Poverty in Southern Sudan: Estimates from the NBHS 2009. Southern Sudan Centre for Census Statistics and Evaluation.

Che, Chi Primus and Henrik Urdai. (2013). War and Gender Inequalities in Health: The Impact of Armed Conflict on Fertility and Maternal Mortality. International Interactions: Empirical and Theoretical Research in International Relations, 39 (4), pp. 489-510.

Che, Primus Chi. (2015). Impact of armed conflict on maternal and reproductive health in sub-Saharan Africa.

Chilonda, P. and J Otte. 2006. "Indicators to Monitor Trends in Livestock Production at National, Regional and International Levels." Livestock Research for Rural Development, v.18, n.8. http://www.lrrd.org/lrrd18/8/chil18117.htm

Dabalen, Andrew and Paul Saumik. (2012). Estimating the Causal Effects of Conflict on Education in Côte d'Ivoire, HiCN Working Paper 120. Brighton: Households in Conflict Network, The Institute of Development Studies - at the University of Sussex.

de Vries, L., & Schomerus, M. (2017). Fettered Self-determination: South Sudan's Narrowed Path to Secession. Civil Wars, 19(1), 26-45.

Deaton, A., & Zaidi, S. (2002). Guidelines for constructing consumption aggregates for welfare analysis (Vol. 135). World Bank Publications.

Dihel, N; Pape, U. (2017). South Sudan - economic update: taming the tides of high inflation - policy options. Washington, D.C.: World Bank Group.

Dijkman Nathalie, Catrien Bijleveld, and Philip Verwimp. (2014). Sexual Violence in Burundi: Victims, perpetrators, and the role of conflict. HiCN Working Paper 172. Brighton: Households in Conflict Network, The Institute of Development Studies - at the University of Sussex.

Douarin, Elodie, Julie Litchfield and Rachel Sabates-Wheeler. (2011). Poverty, Livelihoods and War Legacies: The Case of Post-War Rural Kosovo. IDS Working Paper, 2011(380). Brighton: Institute of Development Studies - at the University of Sussex.

Douglas, J. (2012). The root causes of Sudan's civil wars: Peace or truce. African Issues. Cape Town Publishers.

Dupas, Robinson. (2012). The (hidden) costs of political instability: Evidence from Kenya's 2007 election crisis. Journal of Development Economics.

Dwyer, Leslie and Rufa Cagoco-Guiam. (2011). Gender and conflict in Mindanao. New York: The Asia Foundation.

Elia L. (2007a). Fighting gender-based violence in South Sudan. Accessed on 11-12-2011.

Elia L. (2007b). Sexual violence: weapon of war, impediment to peace. Accessed on 11-12-2011.

FAO and WFP. (2017). Crop and Food Security Assessment.

FAO. (2017). South Sudan Situation Report.

Farhood L., Dimassi H. (2012). Prevalence and predictors for posttraumatic stress disorder, depression and general health in a population from six villages in South Lebanon. Soc Psychiatry Psychiatr Epidemiol 2012, 47:639–649. Food Security and Poverty".

Feyissa, D. 2014. "The Spillover Effect of South Sudan in Gambella." Horn of Africa Bulletin (September-October), Life and Peace Institute.

Foster, James, Joel Greer, and Erik Thorbecke. "A class of decomposable poverty measures." Econometrica: Journal of the Econometric Society (1984): 761-766.

Foster, James, Joel Greer, and Erik Thorbecke. "The Foster–Greer–Thorbecke (FGT) poverty measures: 25 years later." The Journal of Economic Inequality 8.4 (2010): 491-524.

Girma, E. 2016. "Assessing the Impact of South Sudanese Refugees on the Host Communities of Itang Woreda." Addis Ababa University.

Global Partnership for Education. (2016). Education Cluster Assessment South Sudan.

Goodwin, R. M. (1950). A non-linear theory of the cycle. The Review of Economics and Statistics, 316-320.

Grantham-McGregor, S. (1995). A review of studies of the effect of severe malnutrition on mental development. The Journal of nutrition, 125(suppl_8), 2233S-2238S.

Haushofer, J., & Shapiro, J. (2016). The short-term impact of unconditional cash transfers to the poor: experimental evidence from Kenya. The Quarterly Journal of Economics, 131(4), 1973-2042.

Hawkins, R.L., and Maurer, K. 2010." Bonding, Bridging and Linking: How Social Capital Operated in New Orleans following Hurricane Katrina." The British Journal of Social Work, Volume 40, Issue 6, Pages 1777–1793

Heltberg, R. (2009). Malnutrition, poverty, and economic growth. Health Economics, 18(S1).

Heyzer, N. (2005). Women, war and peace: Mobilizing for security and justice in the 21st century. Human & environmental security: An agenda for change, 50-67.

Human Rights Watch. (2015). We Can Die Too, Recruitment and Use of Child Soldiers in South Sudan.

ICRC. (2001). Women Facing War. Geneva: International Committee of the Red Cross.

International Peace Institute. (2015). “State Formation, Humanitarianism, and Institutional Capabilities in South Sudan”.

International Rescue Committee. (2017). Famine in South Sudan, March 2017.

IOM/Camp Coordination and Camp Management. February 2015. “South Sudan's Crisis Response Displacement Tracking Matrix."

Jakiela, P., & Ozier, O. (2015). “The impact of violence on individual risk preferences: evidence from a natural experiment.” The World Bank. Policy Research Working Paper, 7440.

Jolliffe D., Seff I. and Fuente A. (2016). Food Insecurity and Rising Food Prices: What do we learn from experiential measures? Draft Manuscript.

Johnson, D. H. (2003). The root causes of Sudan's civil wars (Vol. 5). Bloomington: Indiana University Press.

Johnson, D. H. (2014). Briefing: the crisis in South Sudan. African Affairs, 113(451), 300-309.

Justino, Patricia and Philip Verwimp. (2013). Poverty Dynamics, Violent Conflict and Convergence in Rwanda. The Review of Income and Wealth, 59(1). Weinheim: Wiley-VCH.

Justino, Patricia, Ivan Cardona, Becky Mitchell and Catherine Müller. (2012). Women Working for Recovery: The Impact of Female Employment on Family and Community Welfare after Conflict, in UN Women, UN Women Sourcebook on Women, Peace and Security. New York: United Nations Entity for Gender Equality and the Empowerment of Women.

Justino, Patricia, Marinella Leone, and Paola Salardi. (2014). Short and Long-Term Impact of Violence on Education: The Case of Timor Leste, World Bank Economic Review, vol. 28, no. 2, pp. 320-353.

Justino, Patricia. (2009). Poverty and Violent Conflict: A Micro-Level Perspective on the Causes and Duration of Warfare. Journal of Peace Research 46(3). Oslo: Peace Research Institute Oslo (PRIO).

Kaiser, H. F. (1960). The application of electronic computers to factor analysis. Educational and psychological measurement, 20(1), 141-151.

Kaplan, S. Fixing Fragile States: A Country-Based Framework–Analysis.

Karam EG, Mneimneh ZN, Karam AN, et al. (2006). Prevalence and treatment of mental disorders in Lebanon: a national epidemiological survey. Lancet. 367:1000.

Keairns, Yvonne E. (2003). The Voices of Girl Soldiers. New York: Quaker United Nations Office.

Kling, J. R., Liebman, J. B., & Katz, L. F. (2007). Experimental analysis of neighborhood effects. Econometrica, 75(1), 83-119.

Koenker, R., & Bassett, G. (1978). Regression Quantiles. Econometrica, 46(1), 33-50. doi:10.2307/1913643

Laccino, Ludovica. (2016). "South Sudan Conflict: Five Reasons Why the Civil War Is Happening." International Business Times, 28 Jan. 2016. Web.

Lopes Cardozo B, Vergara A, Agani F, Gotway CA. (2000). Mental health, social functioning, and attitudes of Kosovar Albanians following the war in Kosovo. JAMA. 284(5):569–577.

Luitel NP, Jordans MJ, Sapkota RP, Tol WA, Kohrt BA, Thapa SB, Komproe IH,Sharma B. (2013). Conflict and mental health: a cross-sectional epidemiological study in Nepal. Soc Psychiatry Psychiatr Epidemiol 2013,48(2):183–193.

McGovern, M. E., Krishna, A., Aguayo, V. M., & Subramanian, S. V. (2017). A review of the evidence linking child stunting to economic outcomes. International journal of epidemiology, 46(4), 1171-1191.

McKay, A., & Lawson, D. (2003). Assessing the extent and nature of chronic poverty in low income countries: issues and evidence. World Development, 31(3), 425-439.

McKay, Susan, Malia Robinson, Maria Gonsalves, and Miranda Worthen. (2006). Girls Formerly Associated with Fighting Forces and their Children: Returned and Neglected. Coalition to Stop the Use of Child Soldiers. London: Coalition to Stop the Use of Child Soldiers.

Menon, Nidhiya and Yana van der Meulen Rodgers. (2013). War and Women's Work: Evidence from the Conflict in Nepal. Journal of Conflict Resolution. Philadelphia: Peace Science Society (International).

Mercier, Marion, Rama Lionel Ngenzebuke, and Philip Verwimp. (2016). The Long-Term Effects of Conflict on Welfare: Evidence from Burundi. HiCN Working Paper 198.

Meyer, Bruce. (1995). “Natural and Quasi-Experiments in Economics,” Journal of Business and Economic Statistics 13 (2):151-161.

Miguel, Roland. (2011) “The long-run impact of bombing Vietnam” Journal of Development Economics.

Miller KE, Weine SM, Ramic A, Brkic N, Bjedic ZD, Smajkic A. (2002). The relative contribution of war experiences and exile related stressors to levels of psychological distress among Bosnian refugees. J Traumatic Stress.15:377.

Minoiu, Camelia and Olga Shemyakina. (2012). Armed Conflict, Household Victimization, and Child Health in Côte d'Ivoire. HiCN Working Paper 115. Brighton: Households in Conflict Network, The Institute of Development Studies - at the University of Sussex

Miranda, Alison. (2003). Cogs in the Wheel? Women in the Liberation Tigers of Tamil Eelam. Civil Wars, 6(4), pp. 37-54.

Miranda, Alison. (2003). Cogs in the Wheel? Women in the Liberation Tigers of Tamil Eelam. Civil Wars, 6(4), pp. 37-54.

Moya, Andres. (2015). Violence, mental trauma, and induced changes in risk attitudes among the internally displaced population in Colombia. Working Paper, Agricultural and Resource Economics, UC Davis. Sacramento: University of Southern California-Davis.

Murthy SR, Lakshminarayani R. (2006). Mental health consequences of war: a brief review of research findings. World Psychiatr 2006, 5:25–32.

Mvukiyehe, Eric and Cyrus Samii. (2008). Laying a foundation for peace? A quantitative impact evaluation of united nations operations in Cote d'Ivoire (with technical appendix). Retrieved 07/04/2010, from UN Office of Internal Oversight Services (December 2008). Basis of UN-OIOS report to the UN General Assembly A/63/713 (February 2009).

Nasir, Muhammad, Marc Rockmore, Chih Ming Tan. (2015). It's No Spring Break in Cancun: The Effects of Exposure to Violence on Risk Preferences, Pro-Social Behavior, and Mental Health in Mexico. Rimini: the Rimini Centre for Economic Analysis.

Norwegian Refugee Council. 2017. “Protection of Civilian Sites: Lessons from South Sudan for Future Operations.” 31 May.

OCHA. 2017a. “Humanitarian Snapshot.” November

OCHA. 2017b. “Humanitarian Needs Overview 2018.” November

Osborne, A. (2014). South Sudan: Donor response to the crisis.

Ostby, Gudrun. (2016). Violence Begets Violence: Armed conflict and domestic sexual violence in Sub-Saharan Africa. presented at SVAC (Sexual Violence and Armed Conflict) Workshop, Harvard University, Cambridge, 2–3 September.

Oxfam. 2017. “South Sudan Gender Analysis.” March

Pape, U. Benson, M. Ebrahim, M. Lole, J. (2017). Reducing poverty through improved agro-logistics in a fragile country: findings from a trader survey in South Sudan. Washington, D.C. : World Bank Group.

Pape, U., & Mistiaen, J. (2015). Measuring household consumption and poverty in 60 minutes: The Mogadishu high frequency survey. World Bank.

Pape, U., & Pontara, N. (2015). Alternative Social Safety Nets in South Sudan.

Pinaud, C. (2014). South Sudan: Civil war, predation and the making of a military aristocracy. African Affairs, 113(451), 192-211.

Powell, G. N., & Butterfield, D. A. (2003). Gender, gender identity, and aspirations to top management. Women in Management Review, 18(1/2), 88-96.

Ralston, L., Andrews, C., & Hsiao, A. J. Y. (2017). The impacts of safety nets in Africa: what are we learning?

Ravallion, M., & Jalan, J. (1996). Growth divergence due to spatial externalities. Economics Letters, 53(2), 227-232.

REACH. 2015. "South Sudan Displacement Trends Analysis." April.

REACH. 2016. "South Sudan Intentions Study." March.

Republic of South Sudan. (2017). National Multi-Hazard Early Warning.

Riegle-Crumb, C., Moore, C., & Ramos-Wada, A. (2011). Who wants to have a career in science or math? Exploring adolescents' future aspirations by gender and race/ethnicity. Science Education, 95(3), 458-476.

Roberts B, Ocaka KF, Browne J, Oyok T, Sondorp E. (2008). Factors associated with post-traumatic stress disorder and depression amongst internally displaced persons in northern Uganda. BMC Psychiatry 2008, 8:38.

Sen, A. (1995) 'The Political Economy of Targeting', in D. van de Walle and K. Nead (eds), Public Spending and the Poor: Theory and Evidence. Baltimore: Johns Hopkins University Press.

Shankleman, J. (2011). Oil and State Building in South Sudan. United States Institute of Peace. Special Report, 282.

Shaver, Andrew and Shapiro Jacob. N. (2016). The Effect of Civilian Casualties on Wartime Informing Evidence from the Iraq War. HiCN WP 210. Brighton: Households in Conflict Network, The Institute of Development Studies - at the University of Sussex.

South Sudan Law Society and United Nations Development Programme (UNDP). (2015). Search for a New Beginning: Perceptions of Truth Justice Reconciliation and Health.

Southwick SM, Morgan CA III, Nicolaou AL, Charney DS. (1997). Consistency of memory for combat-related traumatic events in veterans of operation desert storm. Am J Psychiatr 1997, 154:173–177.

Thapa SB, Hauff E. (2005). Psychological distress among displaced persons during an armed conflict in Nepal. Soc Psychiatry Psychiatr Epidemiol. 40(8):672–679.

The World Bank. (2014a). "South Sudan Poverty Note: Impact of a Continued Internal Conflict on Food Security and Poverty". Washington, DC. World Bank.

The World Bank. (2014e). "Trade, Poverty, and Economic Diversification in South Sudan". Washington, DC. World Bank.

The World Bank. (2011). "World Development Report 2011: Conflict, Security, and Development." Washington, DC. World Bank.

The World Bank. (2013). "Public Works as a Safety Net: Design, Evidence, and Implementation." Washington, DC. World Bank.

The World Bank. (2014b). "South Sudan Trade Strategy Report: Economic Diversification, Regional Integration, and Growth". Washington, DC. World Bank.

The World Bank. (2014c). "South Sudan Jobs & Livelihoods Report". Washington, DC. World Bank.

The World Bank. (2014d). "South Sudan: Fostering Competitiveness and Growth". Washington, DC. World Bank.

The World Bank. (2015a). "The Fiscal Impact of Declining Oil Prices in South Sudan". Washington, DC. World Bank.

The World Bank. (2015b). "Monitoring Welfare and Perceptions in South Sudan 2012 – 2014". Washington, DC. World Bank.

The World Bank. 2016. "Social Assessment Report: Development Response to Displacement Impact Project in the Horn of Africa (P152822)." SFG1888. Ministry of Agriculture and Natural Resources, Government of Federal Republic of Ethiopia.

The World Bank. (2016a). "South Sudan Poverty Profile 2015". Washington, DC. World Bank.

The World Bank. (2016b). "The other side of the coin: the comparative evidence of cash and in-kind transfers in humanitarian situations." Washington, DC. World Bank.

The World Bank. (2017a). "South Sudan Macroeconomic Brief." Washington, DC. World Bank.

The World Bank. (2017b). "World Bank Macro Poverty Outlook for Sub-Saharan Africa." Washington, DC. World Bank.

The World Bank. (2017c). "South Sudan Economic Update, 2017: Taming the Tides of High Inflation." Washington, DC. World Bank.

The World Bank. (2018). "The State of Social Safety Nets 2018." Washington, DC: World Bank.

Tirivayi, N., Knowles, M., & Davis, B. (2016). The interaction between social protection and agriculture: A review of evidence. Global Food Security, 10, 52-62.

Tiwari, S., Daidone, S., Ruvalcaba, M. A., Prifti, E., Handa, S., Davis, B., & Seidenfeld, D. (2016). Impact of cash transfer programs on food security and nutrition in sub-Saharan Africa: A cross-country analysis. Global Food Security, 11, 72-83.

Tolin DF, Foa EB. (2006). Sex differences in trauma and posttraumatic stress disorder: a quantitative review of 25 years of research. Psychol Bull, 132:959.

UN-Habitat. 2016. “Monitoring Framework, SDG Goal 11.”

UNDP. 2006. "Youth and Violent Conflict: Society and Development in Crisis."

UNESCO, IIEP and South Sudan Ministry of General Education and Instruction. (2016). South Sudan education sector analysis, 2016: planning for resilience. Paris, UNESCO-IIEP, 2017

UNFPA. (2002). The Impact of Conflict on Women and Girls. Geneva: United Nations Population Fund (UNFPA).

UNHCR Statistics. http://popstats.unhcr.org/en/overview.

UNHCR. 2017. “Global Trends: Forced Displacement in 2016.”

UNHCR. 2018a. “Ethiopia Fact Sheet (February 2018).”

UNHCR. 2018b. “Ethiopia Fact Sheet (December 2017).”

UNHCR. 2018c. “South Sudan Situation (31 December 2017).”

UNHCR. 2018d. “South Sudan Situation: Refugee Population in Gambella Region.” 31 January.

UNHCR South Sudan Operational Data Portal, https://data2.unhcr.org/en/situations/southsudan [Accessed on May 2, 2018]UNICEF. (2005). The Impact of Conflict on Women and Girls in West and Central Africa and the UNICEF Response. Geneva: UNICEF.

United Nations OHCHR. (2018). Report of the Commission on Human Rights in South Sudan.

UNMISS. 2018. "UNMISS POC Update.” 3 February.

van Ommeren M, Saxena S, Saraceno B. (2005). Mental and social health during and after acute emergencies: emerging consensus?. Bull World Health Organ. 83 (1): 71-75; discussion 75–76.

Wang, Shun and Weina Zhou. (2016). The Unintended Long-term Consequences of Mao's Mass Send-Down Movement: Marriage, Social Network, and Happiness. KDI School of Pub Policy & Management Paper No. 15-03. KDI School of Pub Policy & Management Paper No. 15-03, Seoul: KDI School of Public Policy & Management.

Wessells, Michael. (2006). Child Soldiers: From Violence to Protection. Cambridge: Harvard University Press.

Wild, H. Jok Madut Jok, and Patel, R. (2018). The militarization of cattle raiding in South Sudan: how a traditional practice became a tool for political violence. Journal of International Humanitarian Action 3.1 (2018): 2.

World Health Organization and UNICEF. 2006. "Core Questions on Drinking Water and Sanitation for Household Survey."

Appendices

A. The High Frequency South Sudan Survey

This appendix describes the data and sample design of the High Frequency South Sudan Survey, for more information on the NBHS 2009 we refer the reader to several reports prepared by the South Sudan National Bureau of Statistics and others. The NBHS 2009 data was processed by the South Sudan National bureau of Statistics – or the Southern Sudan Centre for Census Statistics and Evaluation as it was known before independence (SSCCSE) – in cooperation with Statistics Norway, UNDP, and funded by the African Development Bank. This process was extensively documented in several reports, including the *Poverty in South Sudan: Estimates from the NBHS 2009* report by the SSCCSE published in March 2010.[217] The cleaned data shared by the SSCCSE was used in this report.

The HFS was designed with the intent of maintaining comparability with the NBHS 2009, and much of the questionnaire and categories employed throughout were maintained as similar as possible. Specifically, the food and non-food consumption items were kept almost exactly the same.[218] In order to make the consumption data comparable, the only real required adjustment was to deflate the consumption aggregates from the NBHS 2009. To do so, the spatially deflated NBHS 2009 values were deflated from their April-May 2009 nominal values upwards to July 2017 prices. The NBS CPI comprised a long enough time series to allow this process. July 2017 was used as the reference month for consumption data from the HFS waves because it marks the end of the last wave of the HFS.

Sample

The High Frequency Survey conducted four waves of almost nationally representative survey across South Sudan between 2015 and 2017. The HFS was based on a pilot which collected six waves of panel data across 4 of the largest urban centers between 2012 and 2014. The pilot was scaled up in 2015 to a representative wave covering 6 of the 10 former states of South Sudan, Greater Bahr el Ghazal, Greater Equatoria, Lakes (Figure 7-1). The 10 former states are used instead of the 28 more recent ones because the sample was built based on the sampling frame derived from the 5th Sudan Housing and Population Census from 2008.[219] Waves 1 and 3 covered both urban and rural strata across the 6 and 7 states, respectively. Waves 2 and 4 were limited to urban areas but included a panel component, revisiting households interviewed in previous waves. Unfortunately, despite the initial intention to extend the survey to the North-Eastern states of Jonglei, Unity, Upper Nile, this could never be done because of enduring situation of insecurity.

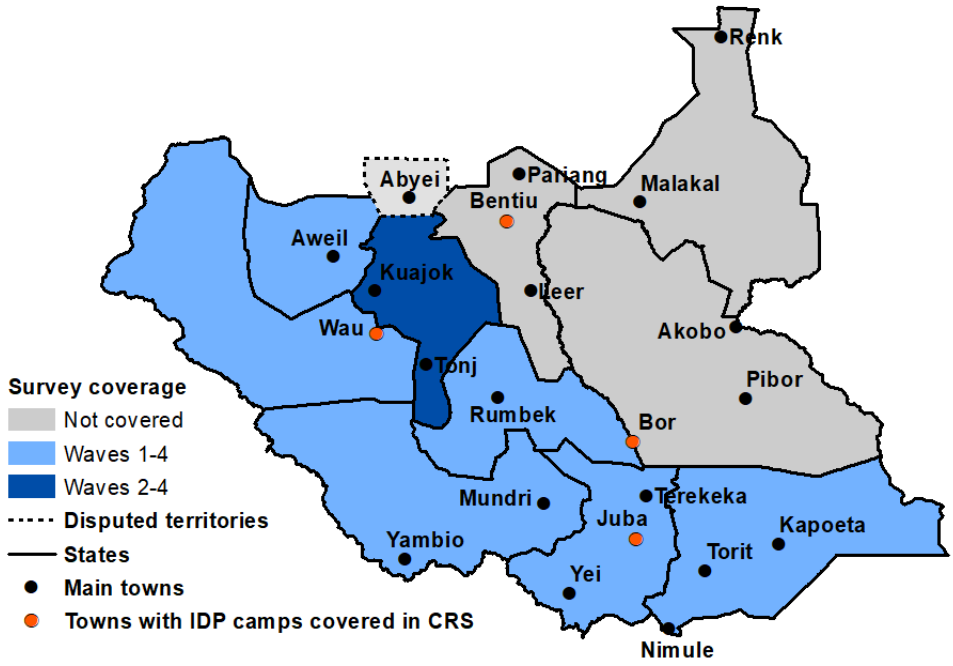
[217] A detailed treatment of the data cleaning is also available from Demombynes, 2011; NBS, 2012.

[218] The only difference being that some "other …" items were consolidated for use in the rapid consumption methodology, more details provided below.

[219] The more recent states have largely been drawn based on the counties subdivision of the form states, the geographical boundaries have therefore largely remained intact.

The survey was designed to be representative for each combination of the former states and the urban-rural strata. The sample design employs a stratified two-stage clustered design. Within each of the 12 or 14 strata (6 or 7 states and urban-rural distinction), the primary sampling units are enumeration areas (EAs) that were drawn randomly proportional to size. The EAs were drawn by the National Bureau of Statistics for the 2008 census exercise. In order to balance the fieldwork across teams, the number of EAs and households was equalized across states. Within the EAs, 12 household were drawn randomly as the unit of observation based on a listing exercise. The number of households per EA was determined to be 12 to allow an equal split into 4 groups per EA to facilitate the implementation of the rapid consumption methodology. Furthermore, since the implementation plan calls for teams of one supervisor and four enumerators only cluster sizes that were multiples of four were considered.[220]

Figure 7-1: HFS survey coverage 2015-2017



Source: Authors' calculations based on HFS 2015-2017 data.

The survey was implemented using tablets as survey devices (CAPI). The data collection system consisted of Samsung Galaxy Tablet computers equipped with SIM cards, mobile data plans, microSD cards (16 GB capacity), and external battery packs. The tablets were secured with Android's native encryption and protected by a password. The Android application AirDroid was used to remotely manage devices, GPS tracker helped to track all devices using a web interface (www.gps-server.net), Barcode Scanner allowed to use barcodes for the identification of enumerators and a parental control application provided a safe working environment for enumerators. Interviews were conducted using SurveyCTO Collect on the tablet with data transmitted to a secure SurveyCTO server in a cloud

[220] The specific options of 8, 12, and 16 were considered. Eight households per cluster was deemed as too small as the number of EAs necessary and the associated travel time could not be done within the fieldwork calendar. Sixteen resulted in very high design effects, over 3 in most cases and as high as 5 for some strata, and was therefore deemed too large. Twelve is therefore selected as the cluster size.

computing environment. Teams of four enumerators and one supervisor were provided with a mobile generator using fuel to ensure that tablets can be charged overnight. Data collection was monitored daily taking advantage of near real-time availability of the data in the cloud.[221] Systematic entry errors by enumerators or teams were identified and corrective action was taken.

Table 7-1: No. of enumeration areas and households per HFS wave and urban-rural strata[222]

	Wave 1 Feb-Oct 2015			Wave 2 Feb-Apr 2016	Wave 3 Sep 2016-Feb 2017			Wave 4 May-Jul 2017
EAs/HH	**Rural**	**Urban**	**Total**	**Urban**	**Rural**	**Urban**	**Total**	**Urban**
Warrap	-			**15/173**	8/95	5/40	**13/135**	**15/144**
Northern Bahr el Ghazal	40/480	10/120	**50/600**	**15/177**	20/239	5/60	**25/299**	**15/126**
Western Bahr el Ghazal	20/225	30/360	**50/585**	**11/126**	14/166	12/144	**26/310**	**15/137**
Lakes	40/478	10/120	**50/598**	**15/180**	19/172	5/60	**24/232**	**15/133**
Western Equatoria	34/406	16/192	**50/598**	**15/176**	18/216	7/84	**25/300**	**15/156**
Central Equatoria	16/192	34/408	**50/600**	**15/177**	16/192	10/119	**26/311**	**15/95**
Eastern Equatoria	40/453	10/116	**50/569**	**15/180**	20/201	5/60	**25/261**	**15/153**
Total	190/2,234	110/1,316	**300/3,550**	**101/1,189**	115/1,281	49/567	**164/1,848**	**105/944**

Source: Authors' calculations based on HFS 2015-2017 data.

Data collection was implemented in 2 phases by randomly splitting each stratum into two equal-sized parts. The advantage of a two-phased approach was early availability of representative data after half of the survey was implemented. This reduced the risk that an eruption of violence at the end of field work would invalidate representativeness of the survey. EAs were replaced if security rendered field work unfeasible. Replacements were approved by the project manager. Replacement of households were approved by the supervisor after a total of three unsuccessful visits of the household. The final sample of EAs and households collected in each of the survey waves and the date of data collection for each survey is detailed in Table 7-1. This proved useful during Wave 3 of the HFS, since violence erupted right before fieldwork and many EAs had to be replaced because of insecurity. More information is provided below.

Sample design process

This section details how the number of EAs per strata was chosen within each wave and how the EAs were selected in planning fieldwork. The objective of the sample design process was to balance the research interests of achieving acceptable levels of precision for a given set of domains of interest while also assembling a design that was straightforward to implement in the field. The data used for the sample size calculations was the National Baseline Household Survey, collected by the National Bureau of Statistics (NBS) in 2009. That dataset contains 3015 household level observations for the six

[221] In areas without 3G activities, enumerators saved conducted interviews on the tablet and submitted data once they had 3G connectivity.

[222] Note that the date of data collection refers to the period where most of the interviews were collected. In some cases a few interviews were conducted in the month after the end of fieldwork as part of follow ups to improve data quality.

study states. The indicator used for the sample size calculations was the real total per capita household expenditure. While this variable is one of several of interest in the HFS, consumption/expenditure is generally strongly positively correlated with other indicators of interest. The top and bottom one percent of outlier observations were trimmed for the sample size calculations.

Several types of designs were considered to allocate the sample between urban and rural areas within states: equal, proportional, optimal, and practical. An equal allocation selects an equal number of urban and rural areas, proportional selects the number of areas in proportion to the population of the stratum, and optimal allocation is based on the size of the strata and the standard deviation of the indicator of interest. The formulas are:

Equal **Proportional** **Optimal**

$$n_h = \frac{n}{H} \qquad n_h = n \times \frac{N_h}{N} \qquad n_h = \frac{N_h S_h}{\sum_{h=1}^{H} N_h S_h}$$

where n_h is the sample size in stratum *h, n* is the total sample size, *H* is the total number of strata, N_h is the total population of stratum *h*, *N* is the total overall population, and S_h is the standard deviation in stratum *h.* A practical allocation does not exactly follow a standard formula but is instead a compromise between the above. Though a near-infinite number of practical allocations exist for a given set of circumstances, for these purposes we considered optimal designs with a minimum number of urban clusters of 10 and 15. For the purposes of comparison, the relative standard error (complex standard error / mean) is used. The general guideline for this measure is that it should be kept below 10 percent for a stratum to be considered representative. All five designs considered have overall relative standard errors around 3 percent, meaning that the overall precision is not substantially affected by the choice of design.

Table 7-2: Results from sample calculations

	equal across 12 strata			equal / proportional			equal / optimal		
	Urban	rural	rel. err.	urban	rural	rel. err.	urban	Rural	rel. err.
Central Equatoria	25	25	0.04	16	34	0.033	34	16	0.029
Eastern Equatoria	25	25	0.061	5	45	0.045	10	40	0.044
Western Equatoria	25	25	0.112	9	41	0.085	16	34	0.081
Western Bahr el Ghazal	25	25	0.047	22	28	0.046	30	20	0.044
Northern Bahr el Ghazal	25	25	0.101	3	47	0.092	5	45	0.092
Lakes	25	25	0.061	4	46	0.046	6	44	0.046
Rural	--	150	0.053	--	241	0.025	--	199	0.027
Urban	150	--	0.013	59	--	0.052	101	--	0.038
Total	150	150	0.027	64	236	0.025	101	199	0.024

	equal/optimal (10 min)			equal/optimal (15 min)		
	urban	rural	rel. err.	urban	rural	rel. err.
Central Equatoria	34	16	0.029	34	16	0.029
Eastern Equatoria	10	40	0.044	15	35	0.045
Western Equatoria	16	34	0.081	16	34	0.081
Western Bahr el Ghazal	30	20	0.044	30	20	0.044
Northern Bahr el Ghazal	10	40	0.096	15	35	0.102
Lakes	10	40	0.047	15	35	0.05
Rural	--	190	0.027	--	175	0.028
Urban	110	--	0.038	125	--	0.037
Total	110	190	0.024	125	175	0.025

Source: Authors' calculations based on NBHS 2009 data

The results show that a practical allocation best served the requirements of the survey. Equal allocation was eliminated because it would not provide representative estimates at the state level for all states given the required level of precision. Proportional allocation shows relative standard errors of 2.5 and 5.2 percent for rural and urban areas, respectively, but only 59 EAs would be allocated to urban areas. States with low percentages of urban population would have only 3 to 5 EAs selected (Eastern Equatoria, Northern Bahr el Ghazal, and Lakes). The low number of observations might hinder an analysis of urban areas, particularly at the state level. Since the optimal allocation formula takes into account both the variance (in the form of the standard deviation) and the population size, this allocation shifts slightly more sample into urban areas. However, the urban sample in Lakes and Northern Bahr el Ghazal would still both include less than 10 EAs. To ensure adequate coverage in urban areas, these options were also eliminated. The practical allocations follow the optimal allocation formula but set a minimum of 10 and 15 EAs per stratum respectively. Both provide estimates that are representative at the national, urban/rural, and state level. These designs also have the advantage that the higher density of EAs in urban areas facilitates to completion of fieldwork according to the project field calendar. Finally, the design with a minimum of 10 EAs was kept since it would result in slightly higher accuracy for Northern Bahr el Ghazal.

Wave 1:

Wave 1 consisted of a representative survey wave in rural and urban areas across six of the ten former states. The first wave covered rural and urban areas across six of the ten former states of South Sudan, the seven states covered in Wave 2 (Eastern Equatoria, Western Equatoria, Central Equatoria, Northern Bahr el Ghazal, Western Bahr el Ghazal, and Lakes). Based on the results described above, the final formula for the recommended design is within each equally allocated stratum of 50 EAs is:

$$\begin{cases} if\ n_u \geq 10 & n_u & n_r \\ if\ n_u < 10 & 10 & 40 \end{cases} \text{ where } n_u = n\left(\frac{N_u S_u}{N_u S_u + N_r S_r}\right), n_r = n\left(\frac{N_r S_r}{N_u S_u + N_r S_r}\right), \text{ and } n = n_u + n_r = 50$$

Table 7-3: Wave 1 sample design calculations

Strata	No. HH (Census)	Urban (%)	Mean (Cons.)	std dev	equal/optimal (10 min) Urban EAs	Rural EAs	rel. err.
Central Equatoria	175,962	31.2%	133.0	90.0	34	16	0.031
Eastern Equatoria	151,199	9.9%	107.3	80.2	10	40	0.035
Western Equatoria	115,595	17.1%	126.1	99.9	16	34	0.028
Western Bahr el Ghazal	57,487	44.7%	122.1	144.6	30	20	0.028
Northern Bahr el Ghazal	130,832	6.3%	61.1	52.1	10	40	0.053
Lakes	90,315	7.2%	119.3	119.0	10	40	0.043
Rural	591,267	--	94.3	74.0	--	190	0.010
Urban	130,123	--	152.4	155.1	110	--	0.073
Total	721,390	18.0%	103.5	90.1	110	190	0.027

Source: Authors' calculations based on NBHS 2009 data

Wave 2:

Wave 2 was designed as an urban wave with a panel component and was expanded to a seventh state. The second wave covered the urban areas that were covered during Wave 1 and was extended to cover urban areas in a seventh state, Warrap. For the second wave, the number of enumeration areas was extended to 15 per state, with 5 replacements. For the states with enough enumeration areas selected in Wave 1 – i.e. Western Bahr el Ghazal, Central Equatoria – all the enumeration areas were randomly selected from the enumeration areas of Wave 1. For the remaining states, enumeration areas were initially selected from the Wave 1 enumeration areas and additional ones were then randomly drawn from the complete list of enumeration areas, to make up a total of 15 enumeration areas and 5 possible replacement enumeration areas per state.

About half of the interviews included in the final sample are panel interviews for households interviewed in Wave 1. In the enumeration areas that were revisited in Wave 2, the households interviewed in Wave 1 were prioritized. For each enumeration area to be revisited in Wave 2, replacement households were drawn from the listing of those enumeration areas. For the enumeration areas that were selected randomly for Wave 2 and had not been visited earlier in Wave 1, all the households in the enumeration areas were listed. The supervisors then randomly assigned households to be interviewed (as well as replacement households) to the enumerators.

Wave 3:

Wave 3 consists of a second representative survey wave of urban and rural areas across the seven states surveyed in Wave 2. The third wave covered rural and urban areas across seven of the ten former states of South Sudan, the seven states covered in Wave 2 (Eastern Equatoria, Western Equatoria, Central Equatoria, Warrap, Northern Bahr el Ghazal, Western Bahr el Ghazal, and Lakes).

The methodology employed for the sample design was the same as that used in Wave 1 of the HFS. In a change from the previous round, in the second round the expected design effect is explicitly taken into consideration when allocating between urban and rural areas, increasing overall precision.

$$n_u = \begin{cases} if\ n_u \geq 10 & n_u \quad n_r \\ if\ n_u < 10 & 10 \quad 40 \end{cases}, n\left(\frac{N_u S_u * deff}{N_u S_{u*deff} + N_r S_r * deff}\right), n_r = n\left(\frac{N_r S_r * deff}{N_u S_u * deff + N_r S_r * deff}\right), n = n_u + n_r = 50$$

where n_h is the sample size in stratum *h, n* is the total sample size, *H* is the total number of strata, N_h is the total population of stratum *h*, *N* is the total overall population, and S_h is the standard deviation in stratum *h.* The results are shown in Table 7-4.

Table 7-4: Wave 3 sample design calculations

	No. HH (Census)	Urban (%)	Mean (Cons.)	std dev	equal/optimal (10 min) Urban EAs	Rural EAs	rel. err.
Central Equatoria	175,962	31.2%	133.0	90.0	13	37	0.032
Eastern Equatoria	151,199	9.9%	107.3	80.2	10	40	0.045
Western Equatoria	115,595	17.1%	126.1	99.9	13	37	0.028
Warrap	167,654	7.6%	73.3	49.8	12	38	0.043
Western Bahr el Ghazal	57,487	44.7%	122.1	144.6	33	17	0.029
Northern Bahr el Ghazal	130,832	6.3%	61.1	52.1	10	40	0.049
Lakes	90,315	7.2%	119.3	119.0	10	40	0.019
Rural	746,136	--	94.3	74.0	--	249	0.003
Urban	142,908	--	152.4	155.1	101	--	0.098
Total	889,044	16.1%	103.5	90.1	101	249	0.026

Source: Authors' calculations based on NBHS 2009 data.

Unfortunately, South Sudan relapsed into conflict in July 2016 just as Wave 3 was beginning to roll out. Consequently, the final sample fell short of the intended sample. The World Bank staff were not able to remain in South Sudan and were forced to leave the country. Support was provided remotely from the Washington D.C. and Nairobi offices. When the NBS carried out the third wave of the survey independently relying only on remote support, a multitude of challenges had to be met including large inflation, fuel unavailability, electricity shutdowns, insecurity, delay in payment of staff salaries, high NBS staff volatility, cash flow limitations and many others. While NBS and the World Bank project team managed to mitigate a number of those challenges, field work got delayed and documentation was negatively affected. Due to these difficulties in management, World Bank staff were unable to procure complete documentation about the sequence of replacements of enumeration areas rendered inaccessible due to insecurity. Replacements were done in three batches. Replacement sequence was developed later, and replacement enumeration areas were randomly assigned to the original enumeration areas, maintaining the order of the original enumeration areas as in the original sample.

The final sample that was collected during Wave 3 only reaches about 50 percent of the intended sample size. 100 EAs were surveyed out of the 350 EAs in the original sample. The rest of the 64 EAs were replacement enumeration areas. The final sample is described in Table 7-1 where it should be noted that the balance across the states is maintained, and about half of the intended enumeration

areas were sampled in each state, except for Warrap. Given the low number of interviews completed in Warrap, the state was excluded from the analysis in the Poverty Assessment. There are fears that the survey was not representative due to potential selection bias given the incomplete fieldwork, although the phased implementation approach should have mitigated such concerns. The team ran extensive checks to ensure that the set of EAs surveyed do not systematically differ from a random sample. However, this process was complicated by the fact that that the conflict and displacement crisis as well as near hyperinflationary price increases represent incredibly disruptive shocks, and many of the usual indicators that would be used in such a context do not apply anymore (e.g. demographics, asset ownership, infrastructure, etc.).

Wave 4

Wave 4 was designed as a second urban panel wave and exclusively revisited households interviewed in Waves 1 and 2. Similarly to Wave 2, Wave 4 will survey 15 enumeration areas in each of the 7 States (Warrap, Northern Bahr el Ghazal, Western Bahr el Ghazl, Lakes, Western Equatoria, Central Equatoria and Eastern Equatoria). In the selected enumeration areas, Wave 4 surveyed all the households interviewed in Wave 1 and Wave 2. A minimum of 12 households were interviewed per enumeration area. A few urban enumeration areas from Wave 1 were not interviewed in Wave 2 because they had to be replaced, in these cases the Wave 2 replacement enumeration areas were selected for Wave 4. Replacement enumeration areas were drawn from the additional sampled enumeration areas in Waves 1 and 2. If additional replacements are required but there are no additional enumeration areas from Waves 1 and 2 available then the enumeration area will not be replaced.

The households were located using telephone numbers and GPS coordinates collected during the previous waves. If this information was not sufficient, enumerators were instructed to ask neighbors and other community members where the household could be located. If a household could not be found it would not be replaced. Of the selected enumeration areas, there were three enumeration areas with less than 12 households interviewed through Wave 1 and Wave 2. For these enumeration areas, households were randomly selected from the listing of the enumeration areas and brought into the sample to make up to at least 12 households per Enumeration Area.

Sampling weights

Sampling weights are used to make survey observations representative for the sample. The sampling weight is the inverse probability of selection. The selection probability P for a household can be decomposed into the selection probability P_1 of the EA and the selection probability P_2 of the household within the EA:

$$P = P_1 P_2$$

The selection probability P_1 of an EA k is calculated as the number of households within the EA divided by the number of households within the stratum multiplied by the number of selected EAs in the stratum:

$$P_1 = \frac{|K|\hat{n}_k}{\sum_{k\prime \in K} \hat{n}_{k\prime}}$$

where $\hat{n}_k$ denotes the number of households in EA *k* estimated using the Census 2008 data and K is the set of EAs selected in the corresponding stratum. Replacement enumeration areas were assigned the sampling weight of the of the enumeration area that they were replacing. In Wave 3, the number of enumeration areas surveyed in each stratum differed from the original sample. The weights were therefore scaled to correct for the change in the value of K.

The selection probability P_2 for a household within an EA *k* is constant across households and can be expressed as:

$$P_2 = \frac{|H|}{n_k}$$

where $|H|$ is the number of households selected in the EA and n_k denoting the number of listed households in EA *k*. Usually, the number of households per EA is 12 while a few exceptions exist due to invalid interviews.

Sampling weights were scaled to equal the number of households per strata using the Census 2008 data. Thus, the sampling weight *W* can be written as:

$$W = \frac{c}{P} \text{ with } c = \frac{\sum_{k\in K} \hat{n}_k}{\sum_{k\in K} n_k}$$

Consumption Aggregate

The nominal household consumption aggregate is the sum of three components, i) expenditures on food items, ii) expenditures on non-food items, and iii) the value of the consumption flow from durable goods:

$$y_i = y_i^f + y_i^n + y_i^d$$

This next section describes in detail the cleaning of the recorded data for each of three components. Subsequently, the construction of the consumption aggregate using the rapid consumption methodology is explained as well as the estimation of the consumption flow for durables.

Deflator

Prices fluctuated considerably between 2015 and 2017 and while each survey waves were being conducted. Thus, prices need to be adjusted to make consumption comparable across months of fieldwork and across waves of the HFS. Deflation consisted of a two-step process: i) the consumption aggregates were deflated within wave across the months of data collection and rural-urban strata; and ii) the within wave deflated consumption aggregates were deflated across waves using the NBS CPI.

Within each survey wave, the deflator is calculated by month of data collection for urban and rural areas based on the price data collected by the HFS. The Laspeyres index is chosen as a deflator due to its moderate data requirements. The Laspeyres index reflects the item-weighted relative price differences across products. Item weights are estimated as household-weighted average consumption share across all households before imputation. Based on the democratic approach, consumption shares are calculated at the household level. Core items use total household core consumption as reference while items from optional modules use the total assigned optional module household consumption as reference. The shares are aggregated at the national level (using household weights) and then calibrated by average consumption per module to arrive at item-weights summing to 1. The item-weights are applied to the relative differences of median item prices for each urban/rural and month pair. Missing prices are replaced by the item-specific median over all households. The reference strata was chosen as the urban strata for one specific month of data collection. The month with the most data points was generally chosen for the reference time period.

Across waves, the data was deflated using the NBS CPI. The NBS CPI collects data on a wide range of goods that are very similar to the item lists used in both the NBHS and HFS. Thus, it was deemed appropriate to use as a deflator across waves. The NBS CPI is primarily collected in urban centers, and hence is also appropriate to use to deflate the consumption aggregates that were already denominated in terms of urban prices within the waves. The final consumption values are denominated in July 2017 prices because it marks the final time period of the HFS, with the conclusion of Wave 4.

Cleaning

Food expenditure data is cleaned in a three-step process. First, units for reported quantities of consumption and purchase are corrected. Second, quantities consumed and purchased converted into kilograms are cleaned, where potential data entry errors and outliers are detected and corrected. Third, prices per kilogram calculated using the cleaned quantities are corrected in a similar manner. The cleaning rules were maintained across the 4 survey waves to ensure comparability. More details on the specific cleaning rules is provided below:

- *Rule 1* (data entry errors for units): For records that have the same figure in quantity purchased and consumed but have different units, it is assumed that the correct unit is the one that takes the quantity (consumed or purchased, converted into kilograms) closer to the weighted median value for the same item.
- *Rule 2* (mistakes in reported units): Items that are likely to be reported in the wrong unit are corrected following generic rules. An example of a typical mistake is to report consumption of 100 kilograms of a product (like salt) where the supposed correct unit is grams. In this case, all quantities given in kilograms that exceed 100 would be corrected so as to be given in grams instead.

- *Rule 3* (missing quantities): Items that were consumed but have a missing quantity, consumed or purchased, are replaced with the item-specific median quantity.
- *Rule 4*: (quantities beyond 'hard' constraints): Quantities consumed and purchased that are below or above the item-unit quantity constraints are replaced with the item-specific median.
- *Rule 5* (data entry errors for quantities or prices): Records with the same value for quantity consumed or quantity purchased and price, or with the same value for all three, are assumed to have a data entry error in the price or quantity. They are replaced with the item-specific medians.
- *Rule 6* (missing prices): Items that were consumed but have zero or missing prices are replaced with the item-specific median prices.
- *Rule 7* (price outliers): Prices in the item-specific price per kilogram distribution that lie above the 95th percentile are replaced with item-specific medians.

All medians are estimated at the EA level if a minimum of 5 observations are available. If the minimum number of observations is not met, weighted medians are estimated at the strata-level requiring a minimum number of 10 observations before proceeding to the item level. Medians are estimated excluding zero values and tagged values so as not to replace reported values with zeroes or invalid values.

The non-food dataset only contains price values without quantities and units, the cleaning process was therefore much simpler. Two cleaning rules are applied and tagged observations are replaced with item-specific medians at the EA, state, and survey level as is done for food consumption. The cleaning rules are the following:

- *Rule 1* (price outliers): Prices that are beyond the hard constraints, above or below, are replaced with item-specific medians. Given the high inflation over the subsequent HFS waves, the value of the hard constraints used in Wave 1 were adjusted for inflation using the national NBS CPI.
- *Rule 2* (zero or missing prices): Zero and missing prices for consumed items are replaced with item-specific medians.

The medians are calculated following exactly the same process as in food cleaning. All medians are estimated at the EA level if a minimum of 5 observations are available. If the minimum number of observations is not met, weighted medians are estimated at the strata-level requiring a minimum number of 10 observations before proceeding to the item level. Medians are calculated excluding zero values and tagged values so as not to replace reported values with zeroes or invalid values.

For durables, the cleaning process involved cleaning ownership statistics as well as the calculated depreciation rates. The quantity of an item is replaced by the item-specific survey median (due to paucity of data) if the reported quantity is unrealistically high assessed by manual inspection. The purchase value of durables is recorded in the year and currency of purchase. Outliers of purchase values in the reported currency are identified by hard constraints and replaced by the item-specific survey median. Items with at least 3 observations purchased in the same year are replaced by the respective item-year specific median. Alternatively, the item-state-level median prices are used if at least 5 observations are given. Hypothetical selling prices are replaced by the item-state level median if at least 5 observations are available. Without the minimum number of observations available, the item-specific median is used. All prices reported in foreign currencies are converted into SSP through conversion to US$.

- *Rule 1* (quantity outliers): Quantities above 100 units of an asset are replaced with the item-specific median.
- *Rule 2* (price outliers): (i) Prices above hard constraints are replaced with the item-specific median. (ii) For specific assets where outliers are identified that fall below the hard constraints and for which we have enough observations to estimate a distribution, the top 5 percent of observations are replaced with item-specific medians.
- *Rule 3* (missing prices and quantities): Missing quantities and prices are replaced with the item-specific median.
- *Rule 4* (missing vintages): Items with missing vintages are replaced with the item-specific median.

Rapid Consumption Methodology: Food and Non-Food Aggregates

The survey used the new rapid consumption methodology to estimate consumption. A detailed description including an ex post assessment of the methodology is available in a separate document.[223] The rapid survey consumption methodology consists of five main steps. First, core items are selected based on their importance for consumption. Second, the remaining items are partitioned into optional modules. Third, optional modules are assigned to groups of households. Fourth, after data collection consumption of optional modules is imputed for all households. Fifth, the resulting consumption aggregate is used to estimate poverty indicators.

First, core consumption items are selected. Consumption in a country bears some variability but usually a small number of a few dozen items captures the majority of consumption. These items are assigned to the core module, which will be administered to all households. Important items can be identified by its average food share per household or across households. Previous consumption surveys in the same country or consumption shares of neighboring / similar countries can be used to

[223] Pape and Mistiaen, 2015.

estimate food shares.[224] In the worst case, a random assignment results in a larger standard error but does not introduce a bias.

Second, non-core items are partitioned into optional modules (four modules in the case of the South Sudan HFS; Table 7-5). Different methods can be used for the partitioning into optional modules. In the simplest case, the remaining items are ordered according to their food share and assigned one-by-one while iterating over the optional module in each step. A more sophisticated method takes into account correlation between items and partitions them into orthogonal sets per module. This leads to high correlation between modules supporting the total consumption estimation. Conceptual division into core and optional items is not reflected in the layout of the questionnaire. Rather, all items per household will be grouped into categories of consumption items (like cereals) and different recall periods. Using CAPI, it is straight-forward to hide the modular structure from the enumerator.

Table 7-5: Core vs. module shares

	Food Consumption				Non-Food Consumption			
	Number of items	Share NBHS 2009	Share HFS 2016	Share HFS 2016 (imputed)	Number of items	Share NBHS 2009	Share HFS 2016	Share HFS 2016 (imputed
Core	33	80%	92%	73%	26	65%	89%	61%
Module 1	27	5%	3%	12%	21	8%	2%	8%
Module 2	26	5%	2%	6%	20	9%	4%	14%
Module 3	26	5%	2%	6%	18	7%	3%	10%
Module 4	28	5%	1%	3%	25	11%	2%	7%
Total	**140**	**100**	**100**	**100**	**110**	**100**	**100**	**100**

Source: Authors' calculations based on NBHS 2009 and HFS 2015 data

Third, optional modules will be assigned to groups of households. Assignment of optional modules will be performed randomly stratified by enumeration areas to ensure appropriate representation of optional modules in each enumeration area. This step is followed by the actual data collection.

Fourth, household consumption will be estimated by imputation. The average consumption of each optional module can be estimated based on the sub-sample of households assigned to the optional module. In the simplest case, a simple average can be estimated. More sophisticated techniques can employ a welfare model based on household characteristics and consumption of the core items. The results presented in this note uses a multiple imputation technique based on a multi-variate normal approximation. Food and non-food consumption for household *i* are estimated by the sum of expenditures for a set of items:

$$y_i^f = \sum_{j=1}^{m} y_{ij}^f \text{ and } y_i^n = \sum_{j=1}^{m} y_{ij}^n$$

[224] As shown later, the assignment of items to modules is very robust and, thus, even rough estimates of consumption shares are sufficient to inform the assignment without requiring a baseline survey.

where y_i^f and y_i^f denote the food and non-food consumption of item *j* in household *i*. As the estimation for food and non-food consumption follows the same principles, we neglect the upper index *f* and *n* in the remainder of this section. The list of items can be partitioned into M+1 modules each with m_k items:

$$y_i = \sum_{k=0}^{M} y_i^{(k)} \text{ with } y_i^{(k)} = \sum_{j=1}^{m_k} y_{ikj}$$

For each household, only the core module $y_i^{(0)}$and one additional optional module $y_i^{(k^*)}$are collected.

The item assignment to the modules are based on the NBHS 2009 survey with manual modifications especially to treat 'other' items correctly.[225] The core module was designed to maximize its consumption share based on NBHS 2009 consumption. Optional modules are constructed using an algorithm to assign items iteratively to optional modules so that items are orthogonal within modules and correlated between modules. In each step, an unassigned item with highest consumption share is selected. For each module, total per capita consumption is regressed on household size, the consumption of all assigned items to this module as well as the new unassigned item. The item will be assigned to the module with the highest increase in the R2 relative to the regression excluding the new unassigned item. The sequenced assignment of items based on their consumption share can lead to considerable differences in the captured consumption share across optional modules. Therefore, a parameter is introduced ensuring that in each step of the assignment procedure the difference in the number of assigned items per module does not exceed *d*. Using *d=1* assigns items to modules (almost) maximizing equal consumption share across modules.[226] Increasing *d* puts increasing weight on orthogonality within and correlation between modules. The parameter was set to *d=3* balancing the two objectives.

In each enumeration area, 12 households were interviewed with an ideal partition of three items per optional module.[227] The assignment of optional modules must ensure that a sufficient number of households are assigned to each optional module. Household consumption was then estimated using the core module, the assigned module and estimates for the remaining optional modules:

[225] Items 'other' are often found to capture remaining items for a food category. Using the rapid consumption methodology, this creates problems as 'other' will include different items depending on which optional module is administered. This can lead to double-counting after the imputation. Therefore, 'other' items are re-formulated and carefully assigned so that double counting cannot occur.

[226] Even with *d=1*, equal consumption share across modules is not maximized because among the modules with the same number of assigned items, the new item will be assigned to the module it's most orthogonal to; rather than to the module with lowest consumption share.

[227] Field work implementation aimed to achieve a balanced partition among optional modules but due to challenges in following the protocol exactly some enumeration areas are not completely balanced. In addition, collection of optional module 4 was unusable due to a technical glitch. Therefore, presented results in the note estimate the consumption of module 4 based on the share of the module in NBHS 2009 adjusted for the average differences in the shares of the observed optional modules 1, 2 and 3 relative to core.

$$\hat{y}_i = y_i^{(0)} + y_i^{(k^*)} + \sum_{k \in K^*} \hat{y}_i^{(k)}$$

where $K^* := \{1, \dots, k^* - 1, k^* + 1, \dots, M\}$ denotes the set of non-assigned optional modules. Consumption of non-assigned optional modules is estimated using multiple imputation techniques taking into account the variation absorbed in the residual term.

Multiple imputation was implemented using multi-variate normal regression based on an EM-like algorithm to iteratively estimate model parameters and missing data. This technique is guaranteed to converge in distribution to the optimal values. An EM algorithm draws missing data from a prior (often non-informative) distribution and runs an OLS to estimate the coefficients. Iteratively, the coefficients are updated based on re-estimation using imputed values for missing data drawn from the posterior distribution of the model. The implemented technique employs a Data-Augmentation (DA) algorithm, which is similar to an EM algorithm but updates parameters in a non-deterministic fashion unlike the EM algorithm. Thus, coefficients are drawn from the parameter posterior distribution rather than chosen by likelihood maximization. Hence, the iterative process is a Monte-Carlo Markov-Chain (MCMC) in the parameter space with convergence to the stationary distribution that averages over the missing data. The distribution for the missing data stabilizes at the exact distribution to be drawn from to retrieve model estimates averaging over the missing value distribution. The DA algorithm usually converges considerably faster than using standard EM algorithms:

$$\hat{y}_i^{(k)} = \beta_0^{(k)} y_i^{(0)} + x_i^T \beta^{(k)} + u_i^{(k)}$$

The performance of the estimation technique was assessed based on an ex post simulation using the NBHS 2009 data and mimicking the rapid consumption methodology by masking consumption of items that were not administered to households. The results of the simulation were compared with the estimates using the full consumption from NBHS 2009 as reference. The simulation results distinguish between different levels of aggregation to estimate consumption.[228] The methodology generally does not perform well at the household level (HH) but improves considerably already at the enumeration area level (EA) where the average of 12 households is estimated. At the national aggregation level, the rapid consumption methodology slightly over-estimates poverty by 1.6 percent Assessing the standard poverty measures including poverty headcount (FGT0), poverty depth (FGT1) and poverty severity (FGT2), the simulation results show that the rapid consumption methodology retrieves almost unbiased estimates (Figure 7-2). Generally, the estimates are robust as suggested by the low standard errors (Figure 7-3).

[228] The performance of the estimation techniques is presented using the relative bias (mean of the error distribution) and the relative standard error. The relative error is defined as the percentage difference of the estimated consumption and the reference consumption (based on the full consumption module, averaged over all imputations). The relative bias is the average of the relative error. The relative standard error is the standard deviation of the relative error. The simulation is run over different household-module assignments while ensuring that each optional module is assigned equally often to a household per enumeration. The relative bias and the relative standard error are reported across all simulations.

Figure 7-2: Relative bias of simulation results using rapid consumption estimation

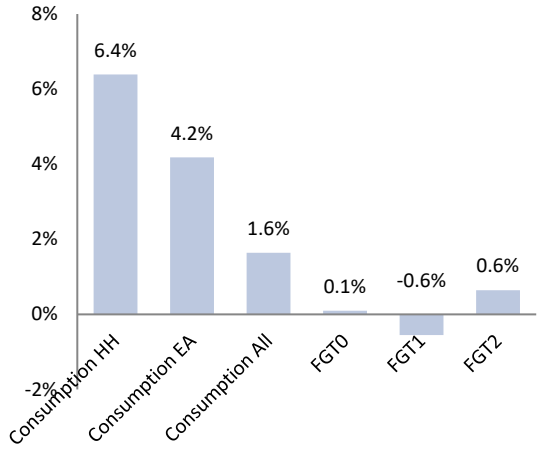
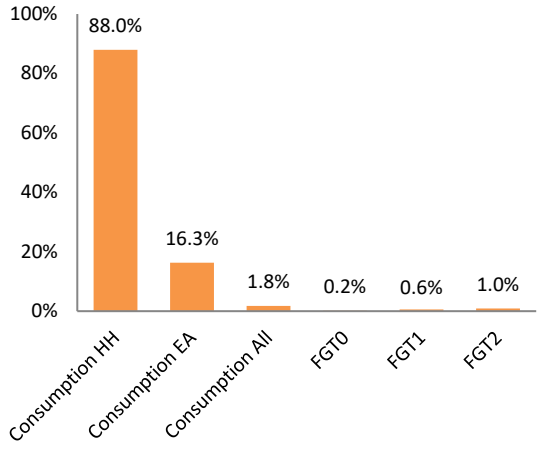


Figure 7-3: Relative standard error of simulation results using rapid consumption estimation



Source: Authors' calculations based on NBHS 2009 data.

Durable consumption flow

The consumption aggregate includes the consumption flow of durables calculated based on the user-cost approach. The consumption flow distributes the consumption value of the durable over multiple years. The user-cost principle defines the consumption flow of an item as the difference of selling the asset at the beginning and the end of the year as this is the opportunity cost of the household for keeping the item. The opportunity cost is composed of the difference in the sales price and the forgone earnings on interest if the asset is sold at the beginning of the year. The current price of the durable is p_t. If the durable item would have been sold one year ago, the household would have received the market price for the item twelve months ago plus the interest on the revenue for one year. The market price from twelve months ago is calculated by adjusting for inflation π_t and annual physical or technological depreciation rate δ arriving at[229]

(1) $$\frac{p_t(1+i_t)}{(1+\pi_t)(1-\delta)}$$

with the nominal interest rate denoted as i_t. Alternatively, the household can use the durable and sell it after one year of usage for the current market price p_t. The difference between these two values is the cost that the household is willing to pay for using the durable good for one year. Hence, the consumption flow is:

(2) $$y^d = \frac{p_t(1+i_t)}{(1+\pi_t)(1-\delta)} - p_t$$

[229] Assuming a constant depreciation rate is equivalent to assuming a "radioactive decay" of durable goods (see Deaton and Zaidi, 2002).

By assuming that $\delta \times \pi_t \cong 0$, the equation simplifies to:

(3) $$y^d = \frac{p_t(r_t + \delta)}{(1 + \pi_t - \delta)}$$

where r_t is the real market interest rate $i_t - \pi_t$ in period t. Therefore, the consumption flow of an item can be estimated by the current market value p_t, the current real interest rate r_t, the inflation rate π_t and the depreciation rate δ. Assuming an average annual inflation rate π, the depreciation rates δ can be estimated utilizing its relationship to the market price[230]:

(4) $$p_t = p_{t-k}(1 + \pi)^k(1 - \delta)^k$$

The equation can be solved for δ obtaining:

(5) $$\delta = 1 - \left(\frac{p_t}{p_{t-k}}\right)^{\frac{1}{k}} \frac{1}{(1 + \pi)}$$

Based on this equation, item-specific median depreciation rates are estimated assuming an inflation rate of 0.5 percent, a nominal interest rate of 5.5 percent and, thus, a real interest rate of 5 percent (Table 7-6).

[230] In particular π solves the equation $\prod_{i=t-k}^{t}(1 + \pi_i) = (1 + \pi)^k$

Table 7-6: Estimated median depreciation rates [231]

Asset	Depreciation Rate	Asset	Depreciation rate
Cars	0.05	Radio or transistor	0.17
Trucks	0.02	Mobile phone	0.21
Motorcycle/motor	0.12	Computer or laptop	0.03
Rickshaw	0.12	Refrigerator	0.05
Bicycle	0.04	Fan	0.16
Canoe or boat	0.04	Mattress or bed	0.10
Plough	0.21	Mosquito net	0.11
Television	0.04	Electric ironer	0.07
Satellite dish	0.12	Hoe, spade or axe	0.12
DVD or CD player	0.16		

Source: Authors' calculations based on HFS 2015.

For all households owning a durable but did not report the current value of the durable, the item-specific median consumption flow is used. For households that own more than one of the durable, the consumption flow of the newest item is added to the item-specific median of the consumption flow times the number of those items without counting the newest item.[232]

The depreciation rates estimated for Wave 1 were used to calculate the consumption flow in all subsequent waves. The reason being that the user cost approach can be inaccurate in a context of high inflation. One potential source of bias being that the value placed by respondents on durable goods may be inflated given high levels of uncertainty regarding the future of the currency. Furthermore, the volatility of inflation across time periods is problematic. Therefore, given that there is no reason to expect depreciation rates vary drastically over such a short period of time, it was deemed more appropriate to use the Wave 1 depreciation rates for all subsequent waves.

Literacy and educational attainment

Literacy: literacy is the ability to read and write a simple sentence about every-day life. In the HFS South Sudan, the ability to read and the ability to write were self-reported in two separate questions (ILO, 2015).

Educational attainment: The five categories of educational attainment are: No education/Less than primary, primary and intermediate education, secondary, tertiary education, and other. This definition is in line with the International Standard Classification of Education (ISCED) of the UN. Note that 'primary' includes primary education as well as lower, incomplete secondary education; 'secondary'

[231] Washing machines and air conditioners were not bought.

[232] The 2015 HFS questionnaire provides information on a) the year of purchase and b) the purchasing price only for the most recent durable owned by the household.

includes upper secondary and non-tertiary post-secondary education; and tertiary covers all levels of tertiary education (UNESCO, 2012). Educational attainment is determined by means of self-classification of respondents in levels of schooling in line with the education system. The 'other' category includes non-formal education as well as the option 'other' as chosen by respondents. The 'tertiary' category contains first university degree, master's degree, PhD, and post-secondary technical education.

Labor statistics

The labor market statistics presented in this poverty profile follow closely the international standard set as per the International Labour Organisation's (ILO) Key Indicators of the Labour Market (KILM). There are two key reference periods: (a) the short observation period defined as 7 days, and (b) the long observation period defined as 12 months. Following ILO guidelines, most statistics are reported for the short observation period. All persons aged 15-64 are defined as being of working age.

Labor force activity: Labor force status comprises three mutually exclusive and exhaustive categories. In the HFS data they are defined as follows:

1. Employment: A person is employed if he/she is of working age and has engaged, over the previous 7 days (short reference period), or over the past 12 months (long reference period), in one of the following work activities:

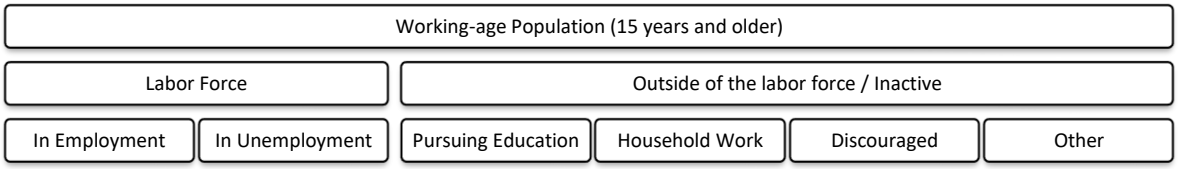
    - Working as an apprentice
    - Working on the household's farm, raising livestock, hunting or fishing
    - Conducting paid or commissioned work
    - Running a business of any size for oneself or for the household
    - Helping in a household business of any size

    The definition further includes persons who are temporarily absent from their work due to training or working time arrangements such as overtime leave, and paid interns. Note that the definition excludes household work.

2. Unemployment: A person is unemployed if he/she is of working age, not in employment during the short reference period, and has been seeking employment within the past four weeks.
3. Outside the labor force or inactivity: A person is outside the labor force (or "inactive") if he/she is of working-age and neither employed nor unemployed, according to the preceding definitions. An inactive person is not necessarily idle, especially in the context of a developing economy. The data breaks this group down into those who are inactive because they do household work, those who are enrolled in education, those who are discouraged, etc.

The labor force refers to the sum of persons in employment and in unemployment. It is the counterpart of the group of inactive persons, i.e. the labor force plus the inactive sum up to the entire working-age population (ILO, 2013).

Figure 41: Labor force, inactivity, and employment status.



Source: Definitions based on ILO, 2013

Labor Force Participation and Inactivity: The labor force participation rate (LFPR) is the ratio of the labor force to the working age population, expressed as percentages. That is:

$$LFPR_{t,a,s} = \frac{LF_{t,a,s}}{POP_{t,a,s}},$$

where LF is labor force, POP is working age population, t is the reference period, a refers to age groups, and s to sex.

Unemployment rate: The unemployment rate (UR) is the number of persons in unemployment as a percentage of the total labor force. With unemployment defined as above and EMP being the number of persons in employment, the unemployment rate is given by:

$$UR_{t,a,s} = \frac{LF_{t,a,s} - EMP_{t,a,s}}{LF_{t,a,s}}.$$

Employment by sector. In line with the International Standard Industrial Classification of all Economic Activities (ISIC) Revision 4 of 2008, sectors are defined as:

- Agriculture (A)
- Industry / Manufacturing (M)
- Services (S)
- Education (E)
- Defense/Security (D)

In the HFS South Sudan, sectors are collapsed from a list of narrower categories according to which each respondent is classified to either Agriculture (A), Manufacturing (M), Services (S), Education (E) or Defense/Security (D):

- Mainly crop production (A)
- Mainly livestock production (A)
- Mainly forestry (A)
- Mainly fishing (A)
- Mining and quarrying (A)
- Manufacturing (M)
- Electricity, gas, steam and air (M)

- Water and waste (M)
- Construction (M)
- Whole sale, retail and repair of motor (S)
- Transportation and storage (S)
- Accommodation and food service (S)
- Information and communication (S)
- Financial and insurances (S)
- Professional, scientific, technical (S)
- Administrative and support (S)
- Education (E)
- Human health and social work (S)
- Arts, entertainment and recreation (S)
- Other service activities (S)
- Household work as employers and for own (S)
- Activities for extraterritorial organizing (S)
- Defense / Security (D)

Employment by type: In the survey, status in employment is determined by respondents' direct self-classification of their main activity over the previous 7 days into one of the below 5 categories. While the first category describes employees, all others are self-employed workers:

- Salaried labor or labor paid in kind
- Run a non-farm business
- Helping in any kind of non-farm business
- Apprenticeship
- Farming or hunting or fishing at own account

Employment by occupation: The International Standard Classifications of Occupations of 2008 (ISCO08) defines the major employment groups, along with suggested levels of skill, as follows:

Table 7-7: Employment by occupation classification

ISCO08 Major Groups	ISCO Skill Level
Managers	3 + 4
Professionals	4
Technicians and Associate Professionals	3
Clerical support workers	2
Service and sales workers	2
Skilled agricultural, forestry and fishery workers	2
Craft and related trade workers	2
Plant and machine operators and assemblers	2
Elementary occupations	1

Armed forces occupations	1+ 2 + 4
Non-classifiable workers.	-

Source: Occupation classification as set by ISCO08.

ISCO skill levels are defined as: (1) primary education; (2) first stages of secondary education; (3) completed secondary education, and training not equivalent to a university degree; (4) university degree or equivalent. Employment by Occupation is informative of levels and composition of skills in the economy (ILO, 2008). In the survey, ISCO-08 occupations are determined via self-classification of respondents aged 15 and older.

B. Satellite Imputation

Recent advances in the processing and availability of satellite imagery and geo-spatial data have led to a growing field of research on predicting a range of outcomes based on diverse such data sources. This technology was leveraged by the HFS team to extend to poverty analysis to the non-covered states. The estimation process employed for this exercise was simpler than some of the more prominent recent pieces of research in making predictions based on satellite imagery, given that the objective of creating reliable and transparent poverty measures rather than exploring the potential of satellite imagery. The poverty imputation method relies on the fact that household-survey derived indices of poverty often correlate with many geographic features that can be observed from space or derived from ground-based data.

The method relies on first discovering these correlations either from existing datasets or custom-derived data, then combining these datasets in a model that is used to obtain coefficient values for each covariate based on the training data in the household surveys. The model is then validated using a cross-validation approach. Finally, the model coefficients are used to predict into all areas of the country where survey data were not available. After testing a large range of variables, the final correlates employed in the model included: the distance to urban centers, the IPC phase, average temperatures and precipitation, distance to the electricity grid, an urban-rural-unsettled dummy, as well as a Juba and WEQ dummy.

The econometric model estimates were used to predict poverty at the 100m*100m level, the estimates were then weighted using data on settlements to the improve accuracy of predictions. The econometric model allows predicting poverty at a high level of disaggregation. However, it does not make much sense to estimate poverty for the vast uninhabited rural expanses. Furthermore, because rural areas are more likely to be poor this would drive average predicted poverty levels to unrealistically high levels. Therefore, the estimates are limited to settled areas.

Data and processing

The response variable representing poverty is the probability of a household being poor resulting from the multiple imputation. Given that the variance of the probability of being poor was greater across EAs than within EAs, the choice was made to average the probability of poverty per EA. In this manner, a greater degree of spatial variation could be observed, thus increasing the potential to observe meaningful correlations between the probability of poverty and the predictors, i.e. the geo-spatial variables.

The first step of the estimation process consisted of generating maps of urban and rural settlements, given initial tests showing a large correlation between urban/rural status and poverty. The map of settled areas in South Sudan was built by processing and regrouping the datasets shown in Table 7-8. While drawing the map the datasets were manually checked against Google Satellite imagery for the presence of settlements. Other variables were tested but not used for the creation of the map of

settled areas (Table 7-9). This includes night-time lights, which are commonly used in studies predicting outcomes from satellite data. There is an extensive literature showing how night time lights are related to general economic development, both within and across nations (notably Jean et al., 2016). However, given that only about 3 percent of households in South Sudan have access to a stable source of electricity, there is very little variation to exploit in trying to identify within country correlations between deprivation and electric light. The map of settled areas was created as a binary map (1=settled, 0=not settled) at 100m resolution.

Table 7-8: Variables used to create a map of settled areas

Variable name	Processing step
Global Urban Footprint	Dilated 100m
OSM residential areas	Rasterized
OSM buildings	Rasterized, dilated 100m
OSM residential roads	Rasterized, dilated 100m, then eroded to keep residential areas
OSM road intersection	Rasterized, Dilated 100m
OSM health sites	Rasterized, Dilated 200m
WB health facilities	Rasterized, Dilated 200m
Schools	Rasterized, Dilated 200m
WB survey point coordinates, wave 1 and 3	Rasterized, Dilated 100m

Source: Global Urban Footprint, Open Street Maps, HFS 2016.

Table 7-9: Variables rejected for use in map of settled areas

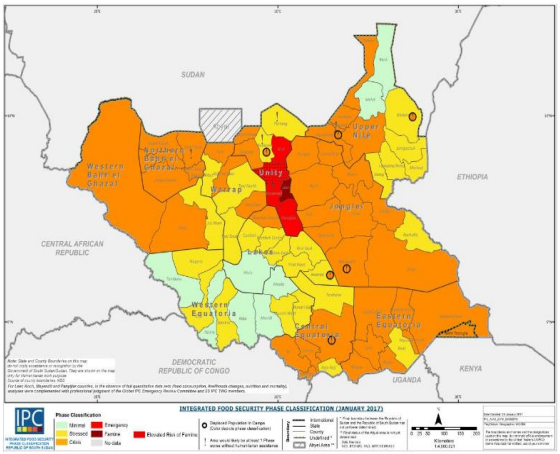
Variable name	Reason not used
Night time lights DMSP	Brightest for power plants and oil fields in the north. Otherwise doesn't bring more information on settled areas
Night time lights VIIRS	Often high level in areas that do not appear to be settled on satellite imagery
Waterpoints	Many water points were not in settlements - perhaps because dataset is dated (<2012)

Source: NASA, NOAA, and Ministry of Water Resources and Irrigation.

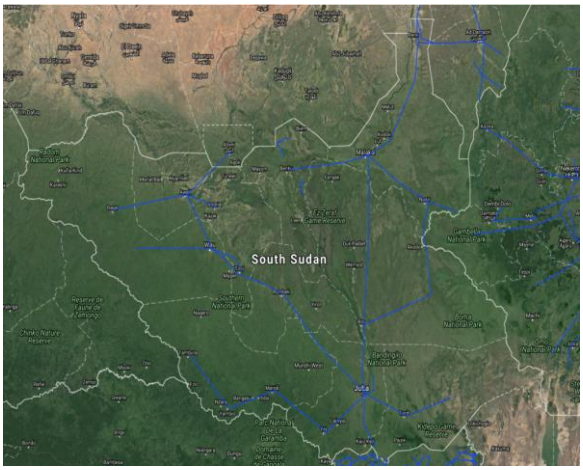
From the map of settled areas and the distance to major roads an 'urban gradient' variable was derived, classifying each pixel as city, city extent, town, town extent, large village, small village, villages far from major roads. Distinction between villages and towns was based on the presence of major road intersection and size. A simpler urban/rural settlements map with only 3 classes: unsettled, rural, urban (towns and cities). All HFS survey points labelled as 'urban' fall in the urban category. Finally, a map of 'distance to urban centers' was created based on the generated urban/rural settlements map.

Figure 7.1: Maps of variables used in the estimation

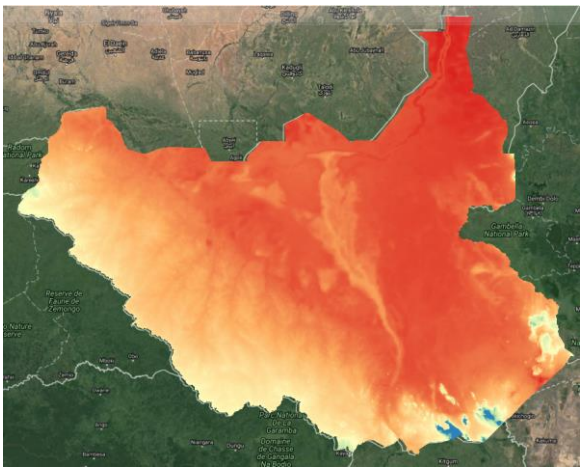
IPC phase classification in January 2017



Electricity grid

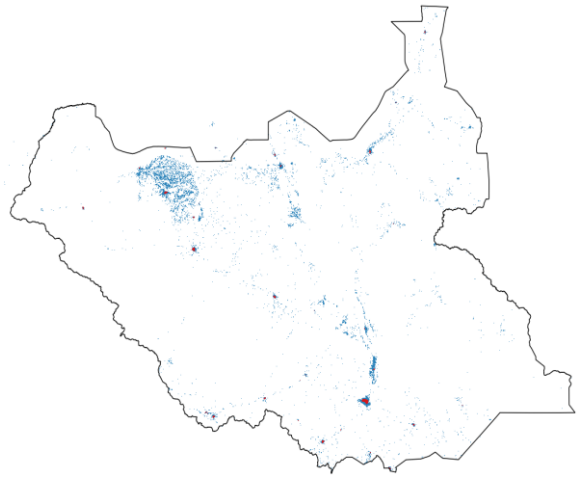


Annual temperatures

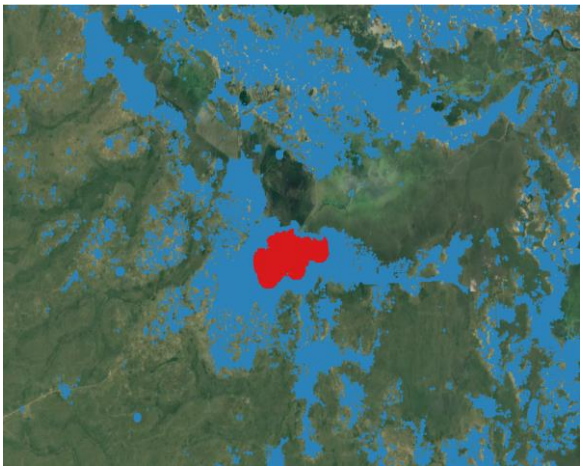


Annual precipitation

Map of urban (red) and rural (blue) settlements.



Urban-rural settlements – zoom on Aweil region.



Source: World Bank, HFS 2016, IPC Info, NOAA, HumData Exchange, and Africa Infrastructure Country Diagnostic (AICD).

Variable selection and estimation model

The variables in Table 7-10 have been tested for correlation against the probability of poverty averaged per EA. The variables tested were grouped into 3 main categories prior to building the final model: large correlation, small correlation, large but chance correlation.

The concept of chance correlation is born due to the observation that lower poverty rates are observed in the state of Western Equatoria (WEQ) and in the capital city, Juba. 'Chance correlation' occurs when a variable tends to take a different range of values in Western Equatoria and Juba than in the rest of the country, but no trend between the variable in question and poverty can be observed neither within WEQ and Juba nor outside WEQ and Juba. In this case, the correlation between the variable in question and poverty rates may be large simply because poverty levels in WEQ and Juba are significantly lower than in the rest of the country. However, if no correlation is observed then the variable is unlikely to be causally related to poverty, and the different values in WEQ and Juba and the rest may be due to chance.

No variable tested alone could explain the lower levels of poverty observed in WEQ or Juba. The urban gradient alone didn't work either as other large towns such as Wau had very high average poverty rates. Therefore, a spatial variable indicating WEQ and Juba was created, with its values smoothed for 200km across the WEQ border and smoothed 2km around the city center of Juba. The resulting map takes the value of 1 in WEQ and in the Juba center, the value of 0 outside these two regions, and a gradient of values between 0 and 1 across its border. This variable doesn't help explaining variation in poverty, but merely reflects observations from the survey and helps to account for chance correlations in the prediction. In other words, this avoids predicting a low poverty in the whole western part of the country based on the low poverty rates observed around WEQ and Juba.

Table 7-10: Variables tested for correlation with poverty

Variable name	Correlation with poverty	Category
IPC phase (01/2017)	0.34	large
Seasonal cloud cover variations	0.28	~Large - chance(?)
Annual cloud cover	-0.37	Large - chance(?)
OCHA number of people in need	0.02	small
Mean conflict fatalities 2011-2016	-0.49	Large - chance
Mean conflict fatalities 2014-2016	-0.51	Large - chance
Distance to 1,2,3 roads	0.02	small
Distance to cultivated areas 2014	0.17	small
Distance to urban centres	0.5	large
annual temperature	0.41	Large - chance (?)
Distance to electricity grid	0.36	large

Distance to schools	0.25	~small
Distance to water points	0.10	small
Distance to national roads	0.25	~small
Annual precipitation	-0.61	Large - chance (?)
Urban gradient	-0.41	large
Urban / rural / unsettled	-0.45	large
In WEQ	-0.62	large
In Juba	-0.44	large
In WEQ or Juba	-0.81	largest

Source: Authors' calculations.

Out of the variables having a (relatively) large correlation with poverty, some are redundant, some are clearly due to 'chance' as explained above – and some show a trend both within WEQ/Juba and in the rest of the country and hence are deemed as reliable correlations. More detail on the variables employed in the estimation for the entire country, all settled areas, and for the sample areas are available in Appendix B.

The following variables were selected in the final model.

- IPC phase
- Distance to urban centers (obtained from urban/rural settlement classification)
- Annual temperatures
- Distance to electricity grid
- Annual precipitation
- Urban/rural/unsettled areas
- In WEQ or Juba

Several models were tested using the Matlab regression learner app. The app iteratively tests a suite of possible models, then compares different measures of model fit side-by-side. Because of the smaller number of enumeration areas used in this study (156), focus was placed on a simple linear model. Furthermore, comparisons against polynomial and more complex models indicated that a linear model retained the largest R^2 (=0.7). The level of predictive power was confirmed using an out-of-sample cross validation. In the cross-validation exercise the model was first built using 75 percent of the survey data. Then, the remaining 25 percent was used to predict EA-level poverty values and check the predictive power of the model, therefore confirming the efficiency and validity of the results.

Table 7-11: Estimated coefficients for best-fit linear model

Variable name	Coefficient Estimate
(Intercept)	0
IPC phase	0.04
Distance to urban centres	4.7e-4
Annual temperature	0.03
Distance to electricity grid	3.6e-4
Annual precipitation	2.0e-4
urban/rural/unsettled	-0.13
In WEQ or Juba	-0.46

Source: Authors' calculations.

Limitations

The results presented here are an attempt to make the best use of available data given a number of limitations. First, no spatial random effect was used in the present model largely due to the fact that EAs were mostly sampling in a North-South gradient, with little information available on the East-West spatial structure. In the present case, geographic covariates have provided sufficient predictive power that this lack of spatial autocorrelation is not necessarily an issue. However, further data from other regions in the country would provide significant advantages for defining this spatial random component.

Second, there is a very poor understanding of the population distribution in South Sudan and no reliable sampling frame against which to extrapolate our predictions. The implications of this are that while the model can predict into geographic pixels based on the existing data, it is difficult to aggregate by county without knowing how to weight each pixel according to the population present within it. Thus, poverty maps aggregated by area are likely to over-estimate poverty rates as most areas within each county are likely to be unsettled and therefore have high poverty. The solution to this problem is to define a new sampling frame for the country, then re-calculate county-level predictions based on this sampling frame.

This was done in this study using population density data from the WorldPop dataset.[233] However some of this data is likely to be out of date given the lack of traditional statistics collected by the NBS and the enormous movement of people caused by the conflict. Building newer and more up to date population sample frames should be a priority for researchers interested in South Sudan. This could

[233] http://www.worldpop.org.uk/

be achieved either by conducting a traditional census, or by leveraging the recently available satellite imagery using and machine-learning based methods. These could be used to help define settled areas and their associated population density to create a predictive population surface. Based on this new sample frames can be built to use for future data collection work, which is badly needed in the context of South Sudan.

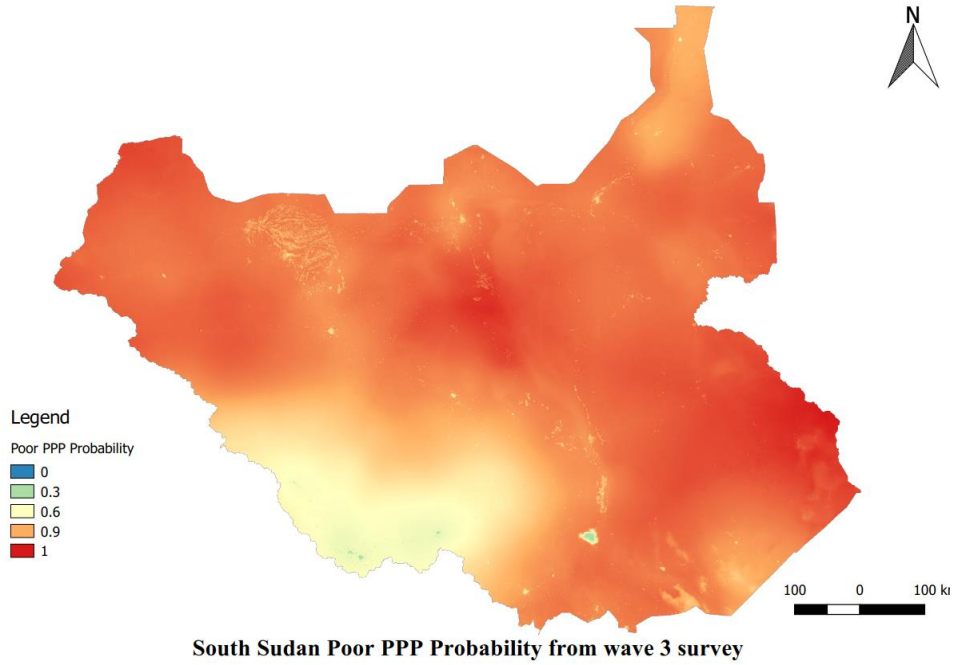
Obviously, the model constructed is quite simplistic and represents only an initial step into the potential for imputing poverty to supplement poverty data. Furthermore, although where these techniques may have the most value, which is where there might have been a crisis or emergency or where safety is a concern, these techniques are also the most difficult to apply. Indeed, the link between poverty and such variables is much more likely to be structural than transient, as is much of poverty in South Sudan. Indeed, a set of issues that arise in this estimation method is the difficulty of dealing with dynamics of poverty and shocks, especially with respect to the conflict. Many of the areas where the enumerators could not go were inaccessible because of recent conflict and it is difficult to account for this in a cross-sectional model as such because of the sometimes endogenous nature of conflict and poverty, whereby some conflict events are concentrated around wealthier areas. One of the areas for future research might be to leverage the time series that area available for various types of geo-spatial data to try and account for some of the dynamics of poverty.

Nevertheless, it remains a useful exercise to see that poverty projections can be made relatively successfully. Although they will not replace survey data entirely they can be used to supplement data collection and provide information either at more frequent intervals or for hard to reach areas. Indeed, small area estimation is a field where much research has already gone into, and which is likely to benefit enormously from the recent availability of cheaper and more encompassing datasets.

Calibration of model predictions to observed values

Imputing poverty headcount ratios in the states not covered by the HFS based on satellite and geo-spatial data indicate potentially extremely high levels of poverty in those regions as well. Poverty was estimated for every square kilometer across South Sudan, resulting in the map shown in Figure 7.2. The poverty map obtained reflects the variations of the in WEQ or Juba variable (lower poverty in WEQ and Juba), and variations of the IPC phase. The influence of the Distance to urban centers can be seen e.g. around Raga, and the distance to the electricity grid can also be seen but to a lesser extent. Influence of temperature and precipitations can be seen along the Nile and in the South East. At a smaller geographic scale predicted poverty follows the urban/rural/unsettled classification (Figure 7.2). The results indicate high poverty rates in the Greater Upper Nile region, which is expected given the predominantly rural nature of the region and its state of instability (Table 2-1). Given the higher incidence of conflict in the states with predicted poverty compared to the states covered by the HFS, it is likely that the poverty prediction underestimates poverty.

Figure 7.2: Predicted poverty map.



Source: Authors' calculations.

Because the model was used to predict pixel-level values of poverty, the aggregation of poverty estimates to county and state levels needed to be calibrated against suitable population estimates. Simply aggregating poverty rates would result in extremely high poverty rates given vast uninhabited expanses isolated from the rest of the country, which would have had a high predicted level of poverty. Indeed South Sudan is sparsely populated relative even to most other large African countries, in 2008 South Sudan had a population density of approximately 13 persons per kilometer squared compared to the Sub-Saharan Africa average of 35.[234] Thus, the spatial distribution of settlements was used as a proxy for population density to weight poverty estimates. These measures of population density were used to construct measures for the number of settlements at the county and state level, which were finally used in weighting the calculation of average poverty predictions (Figure 7-4).

Table 7-12: State-level predictions of poverty headcount (percent)

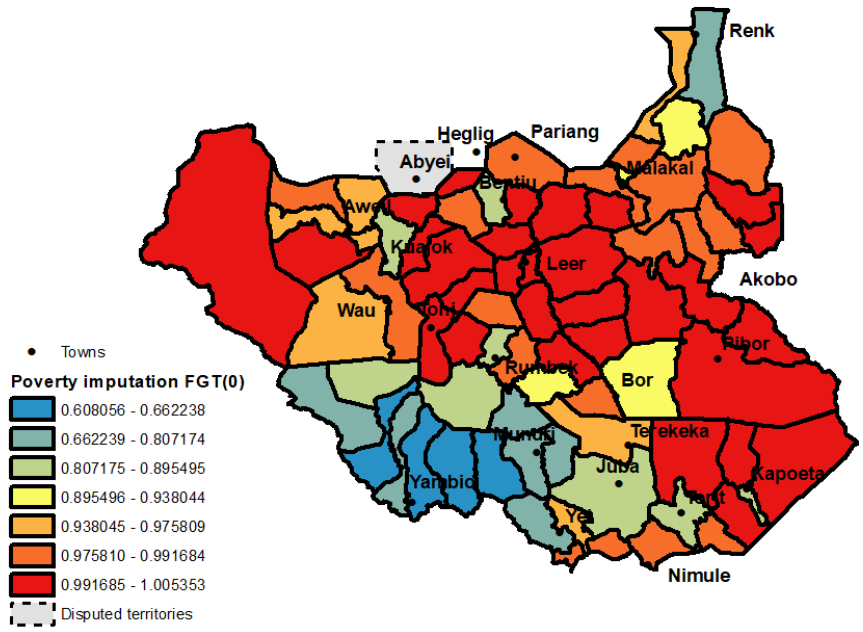
	Poverty (survey)	Poverty (predicted)	Poverty Rural (survey)	Poverty Rural (predicted)	Poverty Urban (survey)	Poverty Urban (predicted)
Central Equatoria	80	76	84	84	17	63
Eastern Equatoria	95	91	97	94	28	42
Jonglei		92		95		17
Lakes	84	86	86	89	29	47

[234] World Development Indicators.

Northern Bahr el Ghazal	90	90	91	93	12	68
Unity		92		95		17
Upper Nile		92		95		36
Warrap	86	89	90	92	43	65
Western Bahr el Ghazal	90	88	95	92	38	70
Western Equatoria	53	68	61	74	39	31
Total	**83**	**92**	**86**	**92**	**66**	**77**

Source: Authors' calculations.

Figure 7-4: Satellite imputations by county weighted by settlement populations, 2016



Source: Authors' calculations.

C. Conflict Estimation

Motivation and strategy

The impact of conflict exposure on households' livelihoods is estimated to provide a basis upon which to simulate the impact of a further escalation of violence. Due to difficulties surrounding data collection in fragile contexts there is relatively little evidence on the short-term direct effects of conflict. The availability of HFS data collected right after the escalation of violence in 2016 allows filling this evidence gap. More specifically, the intention of this exercise is to estimate the short-term impact of conflict exposure on consumption, and then make use of the estimates to simulate the impact of the continuation of the fighting across the country. While we acknowledge that there are obvious and important difficulties in defining the relevant mechanisms and concepts underlying this exercise – for example what is intended by conflict exposure or in identifying the specific mechanisms through which exposure affects consumption – having a sense of the magnitude of the impact can help to guide interventions. The idea is that these estimates can be used to guide humanitarian or developmental interventions that may be trying to fill the consumption gap caused by exposure to the violence, or any other measures of wellbeing.

Data availability before and after the conflict confers a few important advantages that can be leveraged to more accurately estimate the impact of conflict exposure between 2009 and 2016. Combining the HFS data from 2016 with the NBHS 2009 data allows estimating a difference-in-differences specification of conflict exposure. Difference-in-differences consists of comparing average changes in welfare of households living in areas that are exposed and not-exposed to the conflict, before and after exposure. By assuming that households living in exposed and non-exposed regions would have experienced the same trends in outcomes had the exposed group not been exposed to the conflict, then the difference between the within-group changes in outcomes can be attributed to the exposure. Conditional on controlling for additional control variables and fixed effects. By comparing changes, difference-in-differences estimation can control for group-specific characteristics and by comparing the differences in the changes it allows controlling for overall time-trends. Both of these potential confounding factors are highly relevant in the context of this estimation.[235]

A projection of the effect of further escalation of violence can utilize these estimates. The estimated coefficients of the average impact of conflict exposure between 2009 and 2016 can be used to model further escalation of conflict by applying the identified effect to household welfare in 2016. Therefore, the estimation focuses on the average effect of conflict exposure broadly interpreted as the impact of

[235] A simple comparison of outcomes between conflict-exposed households and non-exposed at one point in time would yield counter-intuitive results, because many of the more severe conflict events have occurred in or near more urbanized areas. Though by no means were they only concentrated in urban areas and a large enough portion of conflict-exposed households are rural so as not to have power issues. Furthermore, the estimated effect is independent of whether outcomes increased or decreased for the entire sample as they would have done due to the devaluation of the SSP and subsequent bouts of inflation.

residing in a conflict affected area, rather than that of having suffered direct harm from a violent incident.[236] This reflects the experience of the majority of households while it also includes the average impact of direct harm, except for households that were forcibly displaced outside the covered population.[237] Furthermore, the impact of conflict exposure has been heterogenous across households, with wealthier households having experienced greater relative losses during the conflict. Thus, to make the projections more accurate while accounting for data limitations, the impact of conflict exposure is estimated by weighing the effect at every percentile of consumption expenditure.[238] In this manner, the impact of unobserved characteristics that affect income and welfare can be taken into account implicitly without making the projections too burdensome, given data limitations.

The estimation results suggest that conflict-exposed households experienced an additional decline in consumption of about one third, with wealthier households experiencing largest relative losses. Households who were still residing in a Payam with at least one severe conflict event since the beginning of the conflict in 2013 had levels of consumption reduced by approximately 32 percent. The conflict impact is heterogenous across the distribution of consumption expenditure with a stronger impact on wealthiest households. Consumption levels of conflict-exposed households in the bottom quintile of consumption were approximately 11 percent lower, while for those in the top quintile were 39 percent lower. The estimated percentile specific weighted effect is smoothed using locally weighted regression to generate a non-linear function of the potential shock impact at every percentile. The upper and lower bounds defined by the 95 percent confidence intervals of the estimated coefficients allow modelling different scenarios with minimum and maximum values of the shock. Simulations suggest that a country-wide escalation of the conflict would increase poverty by 14 percentage points, reaching a poverty headcount of up to 96 percent, with a lower bound estimate of 92 percent and upper bound estimate of 99 percent.

Data

Household data is obtained from the NBHS 2009 and the 2016 wave of the HFS. The NBHS conducted a representative household survey of Southern Sudan in 2009, before the region gained independence from the Republic of Sudan. The NBHS collected consumption data to measure poverty across the 10 former states of South Sudan, stratified at the state level which maps to the states of the Republic of South Sudan. The HFS conducted a representative survey wave in 2016 which covered 6 of the 10 former states in South Sudan (Figure 7-5). Combined with the NBHS 2009 data from the same 6 states, this provides a repeated cross-sectional sample of 4,726 households interviewed prior to and during

[236] Naturally, the interpretation of the estimated impact will be limited to the households still residing in conflict affected areas after the fact, given that the outcomes of the displaced cannot be directly observed.

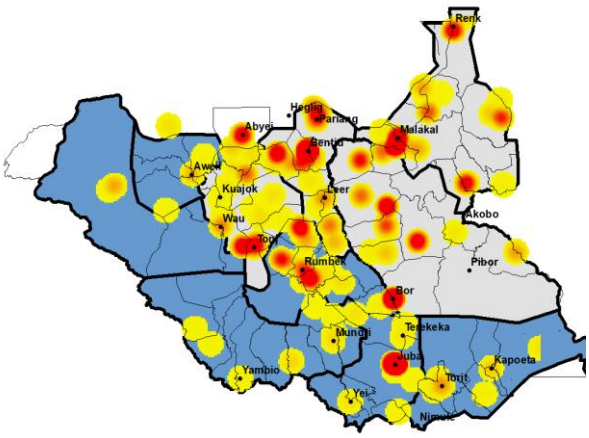
[237] Data on direct harm experienced by households can be problematic because it is difficult to distinguish between conflict events and violent crime that is unrelated to the conflict. In addition, even though the survey questionnaires in the HFS did include conflict exposure modules, their optional nature meant that many households refused to share their experiences and only a relatively small sample did experience direct harm. The resulting small sample size may therefore introduce issues with achieving sufficient statistical power.

[238] Based on quantile regression methods as in Koenker and Basset (1978).

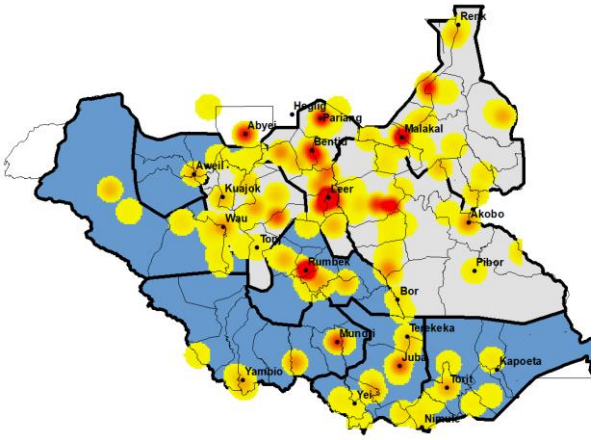
the most recent conflict which began in December 2013. Total consumption and common control variables are chosen from the NBHS and the HFS. The HFS was designed to maintain a high degree of comparability with the NBHS, and all variables used in the analysis are directly comparable.[239] Within each survey, data are weighted to be representative at the strata level, which consists of each combination of one of the six former states and the urban/rural distinction.

Figure 7-5: Heatmap of conflict fatalities, Dec 2013-Oct 2017[240]

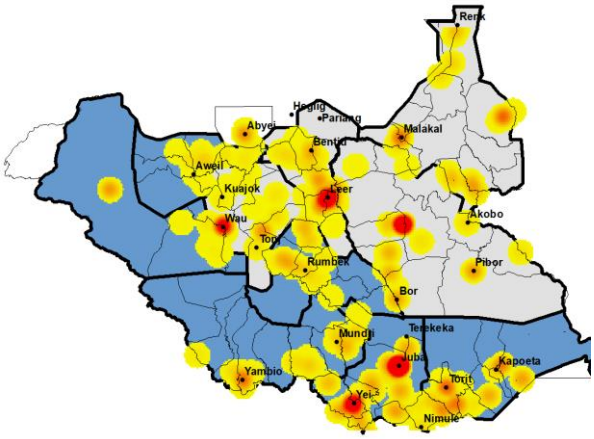
Dec 2013-Dec 2014



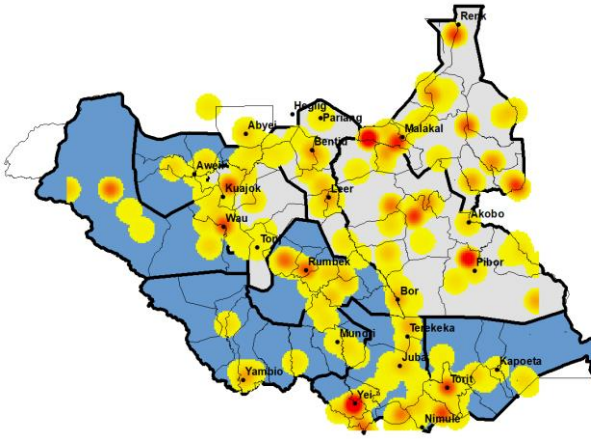
Jan-Dec 2015



Jan-Dec 2016



Jan-Oct 2017



Source: Authors' calculations based on ACLED data.

The estimation is limited to the Greater Bahr el Ghazal and Greater Equatoria regions, given security constraints hindering fieldwork in Greater Upper Nile. The Southern and Western regions of Greater Equatoria, Greater Bahr el Ghazal, and Lakes, were less hard-hit by the conflict between 2013 and

[239] Only core food and non-food items are used in the estimation, durables consumption flow cannot be estimated with 2009 data, so they are not included in this analysis.

[240] All densities in maps above are color-labelled on the same scale; counties lying outside of the state boundaries are disputed territories.

2015, which allowed rolling out the first wave of the HFS in 2015. The HFS conducted several waves of data collection between 2015 and 2017, but never expanded to the Greater Upper Nile. While the conflict was concentrated in Greater Upper Nile prior to 2015, by 2016 it had spread also to Greater Equatoria. Indeed, the third wave of the HFS in 2016 was rolled out while the conflict was still ongoing, and often interviewed households in areas shortly after the occurrence of violent conflict events (Figure 7-5).[241] The estimation will therefore focus on the 2016 wave of the HFS, in order to capture the more recent and more intense phase of the conflict with the most up to date data possible.

As the estimation might be influenced by displaced households and migration, the regression models are estimated excluding households that have migrated after the last conflict event. Migration may have two potential effects on the estimation. On the one hand, displaced households might lead to an underestimation of the impact of conflict exposure, because they are likely to have suffered more from conflict than households that had already built their livelihoods in the area. On the other hand, some of the conflict affected areas in the sample are geographically closer to states that are not covered in the data and where the conflict between 2013 and 2015 was more intense. Those areas have received large numbers of IDPs fleeing the violence. In this case the conflict effect may be overestimated because the change in consumption of a household would be due to its experiences in the previous region of residence compounded by a mixing effect in case the household's previous area of residence was generally poorer. Therefore, household that have moved from outside the current county into their current place of residence after the beginning of the conflict in December 2013 are dropped. This leads to the removal of 145 households and leaves 4,581 households for the estimation (Table 7-13). Including these households in the estimation does not affect results and the estimations results with the households will be shown.

Table 7-13: Households per survey samples by urban/rural strata

Survey	Fieldwork	Rural	Urban	Total
NBHS	Mar-Apr 2009	1,944	1,071	3,015
Wave3	Sep 2016-Feb 2017	1,083	483	1,566
Total		**3,027**	**1,554**	**4,581**

Conflict indicators are based on conflict data from the Armed Conflict Location & Event Data (ACLED) project. The ACLED database records events of various types of conflict reported by different news media outlets, with emphasis placed on the outlet's reputation when compiling data. The types of events covered range from battles between major actors, strategic developments and changes in territory, violence against civilians perpetrated by armed forces, spontaneous riots and protests, etc..[242] Each observation in the ACLED database consists of an event which is linked to a location and date, and contains information on the type of event, the actors involved, and a conservative estimate of the number of casualties. ACLED codifies the type of event for each observation, including violent

[241] For reasons of security, the HFS was limited to 6 of the 10 former states, this was primarily due to large portions of the North-Eastern states being under rebel control. However, even though the bulk of the fighting before 2016 occurred in the non-covered states, there prevailed a substantial level of violence even in the covered states (Figure 7-5).

[242] More information on the coding and methodology can be obtained from https://www.acleddata.com/.

type of events such as battles, riots and protests, remote violence (i.e. IEDs, bombings, mortar attacks, etc.), and violence against civilians (all of which make up 92 percent of all events). It also includes other potentially less violent events such as strategic developments, changes in territory, establishment of bases and headquarters, as these events are sometimes associated with casualties. Events of all types are considered.

Households interviewed during the conflict are considered conflict exposed if there has been at least one severe fatal conflict events in their area of residence since December 2013. Conflict exposure is defined at the Payam level, Payams where there has been at least one conflict event with at least 10 casualties are considered conflict exposed.[243] Only events that occurred between December 2013 and the last month of interviews of Wave 3 of the HFS[244] are considered in order to take into account only events relevant to the recent power struggle. The coverage of the Payams is not exact between the two surveys. Therefore, to test whether the set of households living in conflict-exposed Payams in 2016 are comparable to those in 2009 and thus consist of an appropriate baseline comparison group, we run chi-squared tests between conflict and non-conflict affected households of several variables that are less likely to vary over time. Given the very low level of broad development in South Sudan between 2009 and 2016 there exists a set of many variables which are unlikely to have changed significantly over time and within specific regions. These characteristics can thus be useful to test whether groups of households are fundamentally different. These tests are non-significant for all the indicators we tested: the education of the household head, the adult literacy rate (25+), access to electricity, sources of livelihood, car ownership, household size, whether there are more than 2.5 members per sleeping room, and ownership rates of TVs and satellite dishes.

Table 7-14: Control and conflict-exposed assignment by wave of data collection

	Control		Conflict		
	Obs.	Weighted %	Obs.	Weighted %	Total
NBHS - 2009	2,493	88	522	12	3,015
Wave3 - 2016	973	68	593	32	1,589
Total	3,466	79	1,115	21	4,604

*Reported percentages are weighted by population weights (i.e. household weights*household size).*

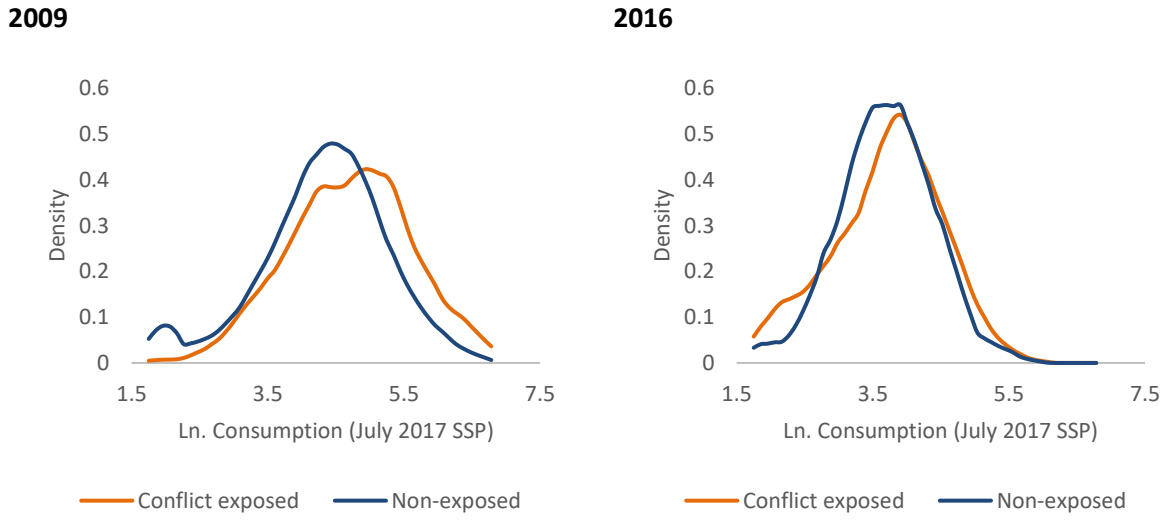
Conflict-exposed households are better off on average than non-exposed households in many respects. The conflict affected more populous and urbanized areas, implying that conflict-exposed and non-exposed groups of households are different in many socio-economic characteristics. In 2009, more than two-thirds of the conflict-exposed households are urban, compared to about a quarter of non-exposed households (67 and 24 percent respectively, $p<0.001$). The levels of consumption of the conflict-exposed households in 2009 are higher, they have higher levels of educational attainment, their children are more likely to be attending school, and they have lower dependency ratios, greater

[243] Payam in South Sudan are equivalent to Admin level 3. There are about 540 Payams in South Sudan.

[244] The last month of interviews for Wave 3 of the HFS was February 2017. A small number of interviews were carried out in March but because of their small number February is more appropriate as the final month.

access to improved sanitation. Therefore, a comprehensive set of control variables will be used to control for those differences. The controls include relevant interactions terms of the unbalanced covariates with the conflict exposure dummy. This will help to avoid wrongly attributing correlation between these variables with the outcome of interest to the conflict. Despite the average differences, conflict-exposed households still do feature along the entire distribution of consumption levels (Figure 7-6). The observed large range of common support, at least in terms of consumption levels, relieves some concerns with potential violations of the common trends assumption.

Figure 7-6: Log consumption density by conflict exposure, 2009 and 2016



Source: Authors' calculations based on NBHS 2009, HFS 2016 and ACLED data.

Table 7-15: Balance table, 2009

	Control	Conflict	Difference (T-C)	Difference, p-value
Consumption per capita per day, July 2017 SSP	137.060	184.394	47.334	0.000
Urban	0.270	0.761	0.491	0.000
Household size	6.207	6.648	0.441	0.006
Household head is a woman	0.349	0.305	-0.044	0.052
Ratio of working age to dependents	1.055	1.265	0.21	0.000
At least one child is not attending school, ages 6-14	0.476	0.318	-0.158	0.000
HH head education: No education	0.704	0.536	-0.168	0.000
HH head education: Primary	0.185	0.207	0.022	0.235
HH head education: Secondary/Tertiary	0.111	0.257	0.146	0.000
Livelihood: Agriculture	0.736	0.326	-0.41	0.000
Livelihood: Wages/Own business	0.180	0.508	0.328	0.000
Livelihood: Remittances/Aid/Other	0.084	0.167	0.083	0.000
Household has access to improved sanitation	0.284	0.519	0.235	0.000

Source: Authors' calculations based on NBHS 2009 data.

Results

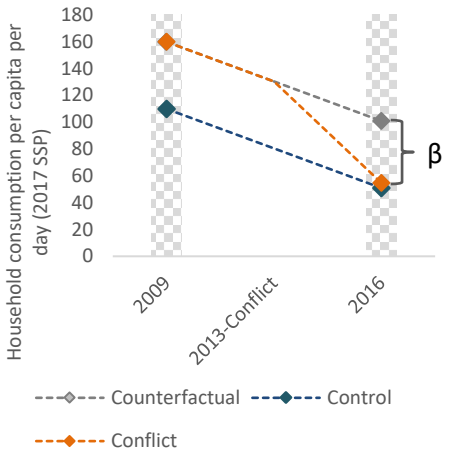
Simple difference-in-differences

The conflict has a profound impact on livelihoods, with conflict affected households experiencing a reduction in consumption that is almost twice as large than that of non-affected households. Based on results of the simple difference-in-differences estimator, consumption fell drastically between 2009 and 2016 for all groups of households. Furthermore, households living in 2009 in the areas that will be conflict affected had higher levels of consumption than households who do not. Finally, conflict exposure has a significant impact on consumption levels, with the decline of the conflict affected households being larger than that of the non-conflict affected households. Starting with a consumption level of about 160 SSP in 2009, conflict-exposed households experienced an additional decline of 46 SSP, or 29 percent, compared to non-exposed households. The conflict caused the consumption levels of affected households to effectively catch up with that of non-exposed households and the difference in consumption levels between conflict affected and non-conflict affected households disappears in the post-conflict beginning period (Figure 7-7).

Figure 7-7: Basic difference-in-differences estimation of conflict exposure on consumption

Period	Control	Conflict	Difference (Control-Conflict)
Pre-conflict, 2009	109.96	159.98	-50.03***
	(3.80)	(15.16)	(15.80)
Post-conflict, 2015-17	50.92	54.75	-3.84
	(2.35)	(3.98)	(4.74)
Difference (post-pre)	59.04***	105.23***	**-46.19*** **
	(4.60)	(15.69)	(16.50)

*All estimates are weighted by population weights, standard errors estimated through linear regression in parentheses; estimation excludes migrant households; *** p<0.01; ** p<0.05; * p<0.1*



Source: Authors' calculations based on NBHS 2009, HFS 2016 and ACLED data.

Regression difference-in-differences

The baseline specification takes the following form:

$$(1) \qquad Y_{i,t} = \gamma_t + \lambda_i + \beta T_{i,t} + X_{i,t}\delta + \varphi_c + \varepsilon_{i,t}$$

$Y_{I,t}$ denotes the natural log of food and non-food core consumption value per capita per day of household i in conflict period t, $t \in \{0,1\}$ and denotes the pre- and post-conflict periods, respectively. γ_t is a post-conflict dummy which takes the value 1 for households interviewed in period $t = 1$ after the conflict began. λ_i is a conflict exposure dummy which takes the value of 1 if a household resides in an area that was exposed to the conflict. $T_{i,t}$ is the interaction term between the post-conflict period and conflict exposure, β is therefore the difference-in-differences coefficient of interest. The specification includes approximately 40 county fixed effects denoted by φ_c. County fixed effects are important to control for the large regional disparities observed in South Sudan, caused by a variety of factors including the levels of infrastructure, local labor markets conditions, and importantly the distance to foreign countries and potential trading partners.

This specification includes control variables which will be interacted with the conflict exposure dummy to take into account the imbalance of conflict exposure. $X_{i,t}$ in specification (1) denotes a matrix of time-varying household specific control variables commonly associated with consumption. Control variables include: an urban dummy, household size, household head gender, working age (15-64) to dependents ratio, household head education, whether at least one child is not attending school, main source of livelihood, and access to improved sanitation facilities. These variables are correlated with

conflict exposure across all waves, which supports the notion that urban and wealthier areas are more likely to be targeted in the fighting (Figure 7-5). In order to control for the bias that this may introduce in estimating the impact of the conflict, the controls that are strongly correlated with conflict exposure will be interacted conflict exposure dummy.[245]

Table 7-16: Estimation results from model (1)

	(1)	(2)	(3)	(4)	(5)
Difference-in-Differences	-0.377**	-0.276*	-0.443***	-0.320**	-0.317**
	(0.154)	(0.156)	(0.138)	(0.138)	(0.136)
Observations	4,581	4,581	4,581	4,581	4,726
R-squared	0.144	0.246	0.257	0.337	0.337
County FE	NO	NO	YES	YES	YES
Controls+Interactions	NO	YES	NO	YES	YES
Including migrant households	NO	NO	NO	NO	YES

*All estimates are weighted by population weights, standard errors estimated through linear regression in parentheses; the dependent variable in all estimations is consumption of core food and non-food items in July 2017 SSP; *** p<0.01; ** p<0.05; * p<0.1*

Results indicate a strong impact of the conflict on consumption that is robust to controlling for various factors. Estimating model 1 indicates that the impact of the conflict is large and negative (Table 7-16). The estimated D-in-D coefficients approximate a decline of approximately 32 percent for households exposed to the conflict (column 4 of Table 7-16). These results are robust to controlling for various household characteristics and their interaction with the conflict exposure dummy, as well as a set of county fixed (columns 2,3 and 4 in Table 7-16). Controlling for the controls and county fixed effects also serves to increase the precision of the estimated coefficients, narrowing their standard errors. The estimated coefficients are remarkably stable across the different specifications and are relatively similar to the results from the simplified model in Figure 7-7. It is interesting to note that the inclusion of migrant households has a minimal impact on the estimation, as shown in column 5 of Table 7-16.

Quantile difference-in-differences

The impact of the conflict is heterogenous across consumption quantiles. Households are likely to respond differently to being exposed to the conflict depending on their consumption in addition to being determined by many characteristics related to welfare and resilience, such as the household's demographic composition, the source of livelihood, etc. These characteristics are in large part controlled for in the econometric model 1 through the inclusion of controls and their interactions.

[245] In order to determine which controls to interact with treatment, we run bivariate regressions of the controls on the conflict exposure dummy controlling for county-wave fixed effects, we run a F-test on the estimated coefficients and interact controls that are significantly correlated with conflict exposure. This includes all variables in Table 7-15 that are unbalanced between control and conflict exposed.

However, there might be many other unobserved characteristics that cannot be directly controlled for and which might be related to each households' consumption expenditure. With the lack of a sufficiently large panel dataset covering the period before and after the conflict, household specific unobserved heterogeneity cannot explicitly be accounted for.

Estimating the model by weighing responses to conflict exposure across the consumption distribution incorporates heterogeneities correlated with consumption. A quantile-specific impact of conflict exposure can be estimated based using quantile regression methods from Koenker and Basset (1978). Quantile regression has the advantage of estimating a more specific impact for each quantile that a priori takes into account at least in part the characteristics that affect a households' consumption. The estimated model can be stated as such:

$$(2) \qquad Q_\theta\left(Y_{i,t}|X_{i,t}\right) = X'_{i,t}\delta_\theta$$

where $Q_\theta\left(Y_{i,t}|X_{i,t}\right)$ denotes the θ conditional quantile of $Y_{i,t}$, and $X'_{i,t}\delta_\theta$ corresponds essentially to model (1) defined for quantile θ. The solution for δ_θ at each quantile θ is obtained through the following minimization problem:

$$\min_{\boldsymbol{\delta_\theta}} \sum_{i:y_{i,t}>X'_{i,t}\delta_\theta} \theta\left|y_{i,t} - X'_{i,t}\delta_\theta\right| + \sum_{i:y_{i,t}\leq X'_{i,t}\delta_\theta} (1-\theta)\left|y_{i,t} - X'_{i,t}\delta_\theta\right|$$

Table 7-17: Estimation results from model 2 at each decile of consumption

Quantile	(1)	(2)	(3)	(4)	(5)
Q: 0.1	-0.500***	-0.502***	-0.241*	-0.251***	-0.193**
	[0.155]	[0.106]	[0.140]	[0.0853]	[0.0835]
Q: 0.2	-0.407***	-0.201**	-0.345***	-0.229***	-0.196**
	[0.129]	[0.0983]	[0.0997]	[0.0773]	[0.0962]
Q: 0.3	-0.281**	-0.200**	-0.121	-0.168**	-0.216***
	[0.114]	[0.0828]	[0.0869]	[0.0656]	[0.0730]
Q: 0.4	-0.174*	-0.255***	-0.237**	-0.191**	-0.147**
	[0.104]	[0.0794]	[0.113]	[0.0823]	[0.0685]
Q: 0.5	-0.285***	-0.245***	-0.262***	-0.267***	-0.179**
	[0.104]	[0.0865]	[0.0848]	[0.0753]	[0.0862]
Q: 0.6	-0.307***	-0.201**	-0.350***	-0.329***	-0.217***
	[0.0951]	[0.0806]	[0.0914]	[0.0644]	[0.0819]
Q: 0.7	-0.279***	-0.295***	-0.432***	-0.319***	-0.258***
	[0.0913]	[0.0714]	[0.0984]	[0.0664]	[0.0598]
Q: 0.8	-0.266**	-0.241***	-0.460***	-0.290***	-0.331***
	[0.117]	[0.0771]	[0.0701]	[0.0592]	[0.0878]
Q: 0.9	-0.278*	-0.149	-0.437***	-0.422***	-0.430***
	[0.148]	[0.0955]	[0.141]	[0.0905]	[0.0634]
Observations	4,604	4,604	4,604	4,604	4,726
County FE	NO	NO	YES	YES	YES
Controls+Interactions	NO	YES	NO	YES	YES
Including migrant HH	NO	NO	NO	NO	YES

*All estimates are weighted by population weights, robust standard errors in parentheses; the dependent variable in all estimations is ln consumption of core food and non-food items in July 2017 SSP; *** p<0.01; ** p<0.05; * p<0.1*

Based on quantile regression results, conflict exposure has a stronger impact on the richest households.

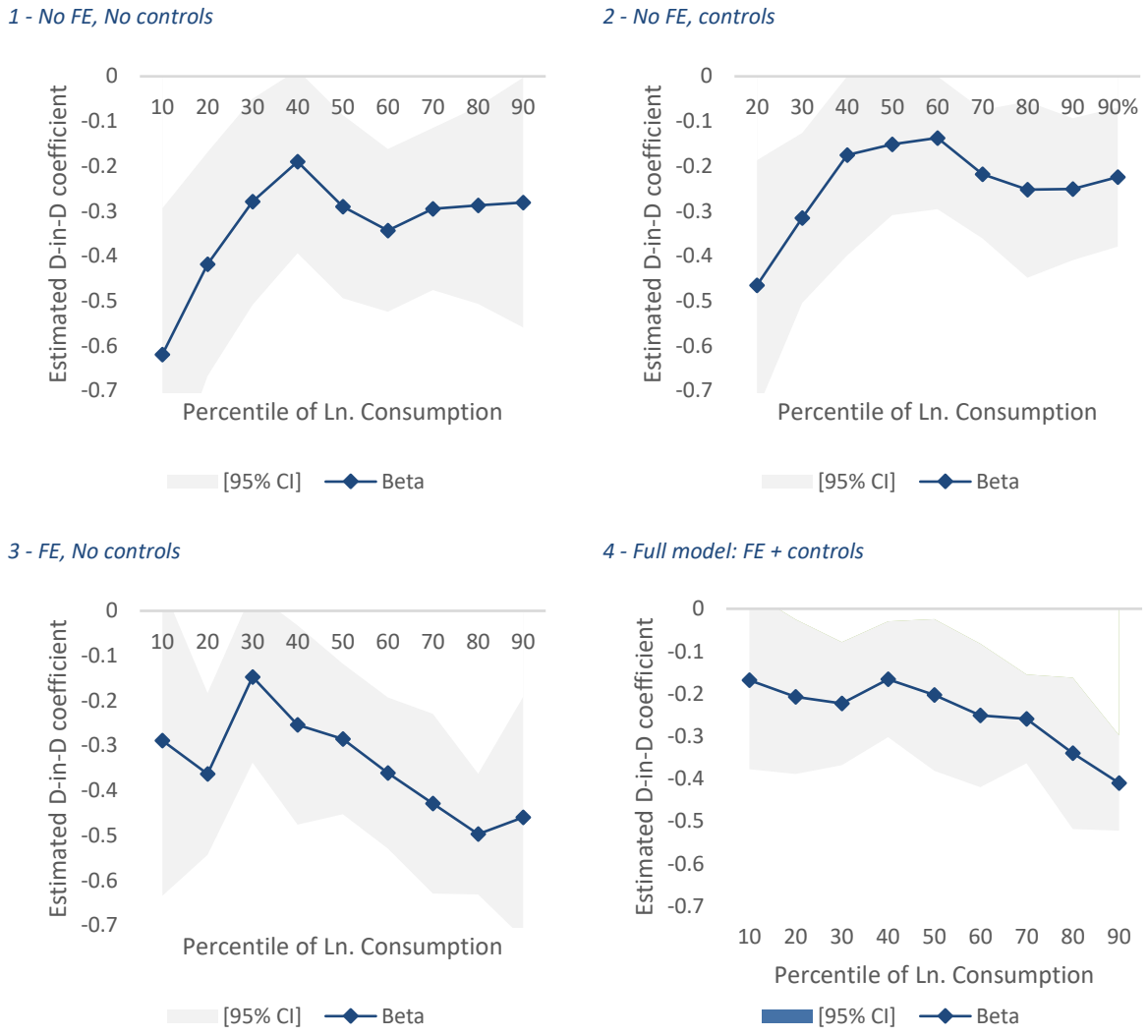
Table 7-17 shows the estimates from model 2 at each decile of consumption. The effect of conflict exposure is stronger for households at higher levels of welfare after controlling for county fixed effects and control variables as shown by estimates in column 4 and graph 4 of

Table 7-17 and Figure 4-3, respectively. A statistically significant effect is observed along most of the consumption expenditure distribution, except for the lowest decile. The effect is gently sloped downwards, and its size is negatively correlated with the percentile of the consumption expenditure distribution, ranging from -17 up to -41 for the lowest and highest deciles. Again, including migrant households or not does not significantly affect the estimates (column 5 in

Table 7-17). Estimates without control as in column 1 in

Table 7-17 and estimates graph 1 in Figure 4-3 are much larger at low levels of consumption. However, this is misleading and might attribute to the conflict inter-state differences in consumption. Controlling for county fixed effects reduces the size of the estimated coefficients at lower levels of consumption, but including only control variables does not.

Figure 7-8: Estimation results from model 2 as shown in Table 7-17



Source: Authors' calculations based on NBHS 2009, HFS 2016 and ACLED data.

The impact of further escalation of the conflict is based on estimating the full specification, model 2, for every percentile of consumption and smoothing the coefficients. The quantile regression shown in column 4 of

Table 7-17 is estimated for each percentile of the consumption distribution, resulting in 100 estimated coefficients. The estimated coefficients will then be used to model a hypothetical consumption percentile-specific shock that would be caused by escalation of the conflict. In order to model the shock, the coefficients are first smoothed across percentiles using a locally weighted regression (Figure 4-3). This is done to avoid large fluctuations in the estimated effect across similar percentile, which might be caused by sampling variability. Furthermore, quantile regression at the extremes of the distribution results in less efficient estimates, smoothing the results can thus help to clean the results. The smoothed 95 percent confidence interval around the estimated coefficients are used to estimate the upper and lower bounds of the effect of this hypothetical shock. The shock and its bounds are forced to be strictly negative.

D. Inflation estimation

Model specification

This section models the impact of inflation on household livelihoods in urban areas of South Sudan. As inflation escalated in 2016 relative to 2015 and continued to rise in 2017, this presents us with a natural experiment to analyze its impact. As noted earlier, we are using panel data collected in 2015, 2016 and 2017. We use a difference-in-differences (double difference) approach to exploit both the time dimension and differences in the exposure to inflation. This approach is powerful as it can distinguish between secular effects and the impact of inflation on the outcome variables, although it relies on sufficient variation of exposure to inflation. This identification will eliminate pre-inflation differences in the outcome variable and controls for anything that also changes over time and affects both groups. Hence, the assumption will be made that changes in outcomes from households in areas with high and in areas with low inflation would have been the same in the absence of the inflation shock:

$$\hat{\beta}_1^{DD} = (\bar{y}_1^{H} - \bar{y}_0^{H}) - (\bar{y}_1^{L} - \bar{y}_0^{L})$$

More specifically, the difference-in-differences estimator β_1 is computed by comparing the first-differenced values of the outcome for the high- (H) and low-inflation (L) groups. Hence, the outcome differences for the low-inflation group are differenced from the high-inflation group after taking the simple difference, which gives us the difference-in-differences estimate. The purpose of a difference-in-differences approach is to analyze whether the estimate β_1 is statistically and significantly different from zero.

To estimate the difference-in-differences effect, we use an ordinary least squares (OLS) regression model including the control vector:

$$Y_{its} = \beta_0 + \beta_1 (post_t * inflation_{st}) + \beta_X X_{its} + \gamma_s + \delta_t + \varepsilon_{its}$$

where Y_{its} is an outcome measured for the individual or household *i* living in Boma *s* at time *t*; $post_t$ is a binary variable indicating time period *t* (pre- or post-inflation); $post_t$ = 1 for each of waves 2 and 4 and zero otherwise (i.e. we treat waves 2 and 4 as having occurred at different times, with wave 1 being the reference period). $inflation_s$ is a continuous variable measuring the inflation rate of the Boma *s*; *inflation* is computed as the first difference of the log price index at the Boma level. To avoid an omitted variable bias (as there are other confounding factors affecting the given outcome variables besides time-period and exposure to inflation), a control vector X_{its} for household *i* living in Boma *s* at time *t* is introduced; γ_s and δ_t are respectively the Boma fixed effects and the time fixed effects.

Standard errors will be clustered at the Boma level to allow for within cluster correlation.[246] β_1 is the difference-in-differences estimator.

To identify factors that make households resilient to the inflation shock, we estimate the following triple difference equation where h_i is a potential resilience factor:

$$Y_{its} = \beta_0 + \beta_1 (post_t * inflation_{st}) + \beta_2 (post_t * h_i) + \beta_3 (post_t * inflation_{st} * h_i) + \beta_X X_{its} + \gamma_s + \delta_t + \varepsilon_{its}$$

In this triple difference setting, β_1 is the diff-in-diff estimate for the reference group (h=0). It Captures average differential change in *y* from the pre- to post-treatment period for the reference group in the treatment group *relative* to the change in *y* for the reference group (h=0) in the untreated group.

β_3 is the triple diff estimate; it tells us how much larger the effect is for the 2nd group (h=1). β3 captures how different the difference-in-differences estimate is for observations considered in the 2nd group (h=1). The total Treatment effect for both groups is $\beta_1 + \beta_3$

Data Sources

Household survey data

This paper makes use of three waves of panel survey data from the High Frequency Survey (HFS) South Sudan. The first wave was carried out from February to September of 2015, in six out of 10 states covering both rural and urban areas (Table D1). The four missing states are the ones most affect by the conflict and were excluded because of insecurity. Thus, the poverty estimates from the survey are a lower bound. The second wave was fielded from February to June of 2016. An additional state was surveyed in this wave, making it seven out of 10 states, revisiting urban households from Wave 1. Conducted from September 2016 to March 2017, Wave 3 covered rural and urban households that are different from previous waves. Wave 4 was carried out from May to August of 2017, revisiting urban households interviewed in Waves 1 and 2. Repeated time varying data for a sample of households is invaluable in understanding the changes they undergo during such difficult periods as between 2015 and 2017. Wave 1 of the HFS was conducted largely before prices exploded, while waves 2 and 3 were implemented in the period of high inflation, and wave 4 was conducted when prices had escalated. We use location- and time-specific price differences to quantify the impact of high inflation on poverty and other livelihood indicators. The panel analysis in this paper is restricted to urban households, as it aims to identify factors that make households resilient (hence wave 3 is excluded from the analysis). While the restriction to urban areas limits the scope of this paper, the panel analysis allows to gain better understanding of the impact of inflation. For urban areas, wave 1, 2 and 4 provide household panel data. The panel data will be used to analyze within household dynamics in times of high inflation.

[246] Default standard errors can greatly overstate estimator precision. Instead, if the number of clusters is large, statistical inference after OLS should be based on cluster-robust standard errors. Failure to control for within-cluster error correlation can lead to very misleadingly small standard errors, and consequent misleadingly narrow confidence intervals, large t-statistics and low p-values (Cameron and Miller, 2015).

The models will be applied to changes in livelihood and determinants of the impact mainly at the household level. Since different causes affected livelihoods in this period of instability in South Sudan, the difference-in-differences approach will identify the effect of inflation on livelihoods by correlating changes in prices with changes in livelihood indicators.

Table D1: High Frequency South Sudan Survey (HFS), survey dates and coverage

	Data collection dates	Geographic coverage	Rural/Urban coverage
Wave 1	February 2015 - September 2015	6 out of 10 states: Western Equatoria, Central Equatoria, Eastern Equatoria, Northern Bahr el Ghazal, Western Bahr el Ghazal, and Lakes state.	Covered urban and rural households
Wave 2	February 2016 - June 2016	7 out of 10 states: wave 1 + Warrap state. The other three former states (Jonglei, Unity, and Upper Nile) could not be surveyed due to security concerns.	Revisited urban households interviewed in Wave 1
Wave 3	September 2016 - March 2017	7 out of 10 states: Same as Wave 2	Covered urban and rural households
Wave 4	May 2017 - August 2017	7 out of 10 states: Same as Waves 2 and 3.	Revisited urban households interviewed in Waves 1 and 2

Source: HFS 2015-2017 data.

The High Frequency South Sudan Survey, funded by DFID, was conducted by the World Bank in collaboration with South Sudan's National Bureau of Statistics, to monitor welfare and perceptions of citizens in all accessible areas of South Sudan. The datasets contain information on security, economic conditions, education, employment, access to services, and perceptions. They also include comprehensive information on assets and consumption, to allow estimation of poverty based on the rapid consumption survey methodology as detailed in Pape and Mistiaen (2018)[247].

Price data sources

There are three sources of price data that can potentially be used for the analysis in this paper. The following paragraphs describes each of the sources as well as their strengths and weaknesses.

Consumer Price Index (CPI)

This CPI data is collected and published by the National Bureau of Statistics (NBS). National CPI has been published for South Sudan since July 2011. The index is rebased to June 2011=100. It includes all twelve major consumption groups in the Classification of Individual Consumption by Purpose

[247] The rapid consumption survey methodology reduces the number of items per household by assigning different modules of items to different households. Instead of assigning all consumption items to all households, important items are assigned to a core module, while the remaining items are split into four or more optional modules. Each household reports on the core module and one of the optional modules. The missing information for the household (from the remaining optional modules) is estimated based on the information collected from other households, on those modules.

(COICOP), with weights calculated from the 2009 National Baseline Household Survey (NBHS). The item basket has been revised and updated according to the results from the NBHS 2009. Focusing on three major cities (Juba, Malakal and Wau), the price collection covers all three regions of South Sudan. However, it has not been possible to collect data from Malakal since February 2014 due to insecurity, so all prices for Malakal are imputed based on proxies from Juba and Wau. So, CPI is currently only collected in Juba and Wau once a month. Data collection is paper-based and includes purchase of all goods in the consumer basket to obtain realistic market prices (National Bureau of Statistics). CPI data is collected for 118 items.[248] A key strength of the CPI is the availability of monthly data for a comprehensive list of items that helps NBS to calculate CPI on a monthly basis. This allows to show the volatility and extent of changes in prices in the country. The weaknesses of the CPI are that: (i) it covers only two cities, (ii) NBS is no longer able to buy all items because they become more expensive due to near hyperinflation, and lack of cooperation from market vendors with the enumerators,

High-Frequency Price Index (HPI)

In addition to collecting household data with high frequency, the HFS also collected weekly market price data (as well as daily exchange rate of US$ in SSP - buying, selling and midpoint prices). The Market Price Survey (MPS) was expanded to 15 towns in South Sudan (World Bank, 2016a).[249] The weekly market price data is aggregated as price index (HPI), and is comparable to monthly CPI from the National Bureau of Statistics. It allows to observe relative changes in the price index (monthly and annual) and shortages of products in markets. The MPS collects weekly price data for 20 consumer items in South Sudan using handheld tablets and uploaded directly to a cloud-based server. The precise weight of the products is determined with a digital scale allowing for the calculation of comparable unit prices. Market traders are asked the prices they are offering for a typical quantity of their goods. Unlike the CPI (monthly data collection), for the weekly MPS the goods are not purchased, and thus money does not change hands as part of the MPS. This will induce an upward bias for the HPI since the first price asked is often considerably larger than a bargained price at the time of purchase (Pape et al., 2017.

The HPI only includes 20 items representing 55 percent of the CPI weights. The HPI ignores price movements in the other products, making it more volatile than the CPI which includes a larger number of substitutes and reflects better substitution effects. The HPI adopts the weights from the CPI and then adjusts them to account for items in the CPI that are not included in the MPS. Therefore, price data from the MPS are aggregated to create a High-Frequency Price Index (HPI) similar to the CPI. This explains why the HPI resembles the CPI. A detailed description of the HPI methodology, how to construct weights and the cleaning procedure for outliers can be found at www.thepulseofsouthsudan.com.

[248] The full index series for South Sudan and the regional indices are available online at www.ssnbs.org.

[249] The data collection could not yet be resumed in Malakal due to security constraints.

Household-reported prices

The consumption section of the household survey (HFS) collects information on items' unit prices and quantities. As with all data collected from sample surveys, the household-reported prices are subject to sampling errors. Item non-response and measurement error will also lead to biased estimates (Dahlhamer *et al*., 2003; Garner *et al*., 2009). However, household-reported prices have a key strength: knowing precisely the prices paid by households who make expenditures themselves has an advantage in that it captures the parallel exchange rates, showing households' real purchasing power. This is particularly important in the context of South Sudan with a strong parallel exchange market.

Calculating inflation

We have the luxury of being presented with three options for price data to choose from, which is not typically the case for many poor countries, talk less of countries with ongoing conflicts. Based on the strengths and weaknesses of the three price data sources, we decided to use household-reported prices because it covers the entire sample, and has prices information for all items consumed by the household. Thus, for our analysis, inflation is calculated based on unit price household survey data (using Laspeyres price index). In addition to using the total inflation variable, we also break it down into food price inflation and non-food price inflation to explore which of the two might be driving the results.

Conflict indicator

Given the ongoing conflict in South Sudan, conflict will likely be one of the confounding factors affecting household livelihoods. We control for this by including a conflict variable in the regressions. We construct an exogenous conflict variable based on conflict event data from the Armed Conflict Location & Event Data (ACLED)[250] project for the period of our study. The dataset codes the exact location of all political violence incidents that was reported during this time. We use proximity to a deadly conflict event to generate a continuous conflict exposure variable (i.e. the number of fatalities).

Outcome Indicators

To analyze the impact of inflation on household livelihoods, our dependent variables are household level (and individual level) outcome indicators. The variables cover a range of household social and economic indicators, which can be calculated based on the panel data (waves 1, 2 and 4). The outcome variables are selected from the following five categories: poverty, education, labor, hunger, and perceptions of welfare (Table D2).

[250] Information about ACLED methodology can be found at https://www.acleddata.com/.

Table D2: Outcomes variables

Variable	Description
Poverty	
Poor or non-poor	Whether the household is poor or not based on the $1.90 2011 PPP poverty line
Consumption	Household consumption expenditure in real terms
Education	
School attendance (6-13)	Whether children aged between 6-13 years and between 14-18 years are currently attending school
Labor[251]	
Labor force participation rate	The ratio of the active in the labor force to the total working age population (15-64 years)
Employment rate	A person is employed if he/she is of working age and has engaged in one form of employment activity.[252] The employment rate is the number of persons in employment as a percentage of the total labor force.
Unemployment rate	A person is unemployed if he/she is of working age, is not in employment during the reference period, and has been seeking employment over the past 4 weeks. The unemployment rate is the number of persons in unemployment as a percentage of the total labor force.
Outside the labor force/or inactivity	A person is outside the labor force (or "inactive") if he/she is of working-age and neither employed nor unemployed, according to the preceding definitions. An inactive person is not necessarily idle, especially in the context of a developing economy. The data breaks this group down into those who are inactive because they do household work, those who are enrolled in education, those who are discouraged, etc.
Hunger	
Hunger	How often households lacked food or lacked resources to buy food at least once in the past month
Perceptions of welfare	
Satisfaction with life	The extent to which households are satisfied with life
Living conditions	Households views about their present and future living conditions
Economic conditions	Households views about the present, past and future economic situation of South Sudan.
Control over life	The extent to which households feel that they have control over their life
Future of South Sudan	Households biggest fear about the future of South Sudan

Note: The labor force refers to the sum of persons in employment and in unemployment. It is the counterpart of the group of inactive persons, i.e. the labor force plus the inactive sum up to the entire working-age population (ILO, 2013).

[251] The labor market statistics presented in this paper follow closely the international standard set as per the International Labour Organisation's (ILO) Key Indicators of the Labour Market (KILM). There are two key reference periods: (a) the short observation period defined as 7 days, and (b) the long observation period defined as 12 months. Following ILO guidelines,

Table D.3: Regression results for poverty and consumption

	(1) Poor (below US$1.90 PPP)	(2) Poor (below US$1.90 PPP)	(3) Log(real consumption)	(4) Log(real consumption)
Survey year: 2016	-0.487**	-0.662***	0.141	0.360
	(0.239)	(0.245)	(0.361)	(0.343)
Survey year: 2017	-0.134	-0.222	-1.976***	-1.878***
	(0.204)	(0.219)	(0.292)	(0.298)
Inflation*Post	0.369***	0.421***	-1.257***	-1.328***
	(0.129)	(0.133)	(0.193)	(0.184)
inflation*Household head_University education *Post	0.009	-0.289	0.985***	1.321***
	(0.251)	(0.241)	(0.304)	(0.273)
Household head_University education*Post	0.088	0.405	-1.527***	-1.844***
	(0.259)	(0.254)	(0.380)	(0.351)
Conflict	0.001	0.001	-0.005***	-0.006***
	(0.001)	(0.001)	(0.001)	(0.002)
Female household head	0.147***	0.183***	-0.172***	-0.199**
	(0.048)	(0.058)	(0.064)	(0.079)
Household head University education	-0.571**	-0.480**	0.640**	0.535***
	(0.249)	(0.185)	(0.250)	(0.193)
Land Ownership	-0.121***	-0.126***	0.184**	0.202***
	(0.045)	(0.042)	(0.073)	(0.069)
Household head age	-0.020	0.005	0.044*	0.015
	(0.017)	(0.012)	(0.025)	(0.016)
Household head age-squared	0.000	-0.000	-0.001*	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Household size	0.099***	0.107***	-0.178***	-0.183***
	(0.012)	(0.013)	(0.019)	(0.020)
Household size-squared	-0.002***	-0.003***	0.004***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)
Household head Unemployed	0.051		-0.263	
	(0.146)		(0.232)	
Household head employment: Manufacturing		0.010		-0.080
		(0.101)		(0.104)
Household head employment: Services		-0.185***		0.221***
		(0.056)		(0.069)

statistics are reported for the short observation period unless explicitly stated. All persons aged 15-64 are defined as being of working age.

[252] The five employment activities are: (i) working as an apprentice, (ii) working on the household's farm, raising livestock, hunting or fishing, (iii) conducting paid or commissioned work, (iv) running a business of any size for oneself or for the household, (v) helping in a household business of any size. The definition further includes persons who are temporarily absent from their work due to training or working time arrangements such as overtime leave, and paid interns. Note that the definition excludes household work.

Household head employment: Education		0.086		-0.081
		(0.172)		(0.130)
Household head employment: Defense/Security		-0.076		0.156*
		(0.078)		(0.092)
Household head employment: Public Administration		0.157		-0.019
		(0.116)		(0.190)
Constant	0.176	-0.263	2.051***	2.565***
	(0.392)	(0.273)	(0.573)	(0.406)
Observations	772	733	772	733
R-squared	0.352	0.375	0.864	0.880

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

Table *D4: Regression results for currently attending school, girls only*

	(1) Currently Attending School	(2) Currently Attending School	(3) Currently Attending School
Survey year: 2016	0.035	0.100***	-0.048
	(0.142)	(0.033)	(0.139)
Survey year: 2017	-0.026	0.158**	-0.076
	(0.113)	(0.062)	(0.080)
Inflation*Post	-0.024		
	(0.080)		
Inflation*distance to school more than 5 hours*Post	-0.202***		
	(0.034)		
Food Inflation*Post		-0.134***	
		(0.039)	
Food inflation* distance to school more than 5 hours*Post		-0.712***	
		(0.098)	
Non-food Inflation*Post			0.017
			(0.059)
Non-food inflation* distance to school more than 5 hours*Post			-0.157***
			(0.024)
Conflict	-0.000	-0.001	-0.001
	(0.000)	(0.000)	(0.001)
Distance to school: More than 5 hours (Ref: < 30 minutes)	0.086***	0.076***	0.089***
	(0.026)	(0.025)	(0.025)
Female household head	-0.039**	-0.042**	-0.039**
	(0.019)	(0.019)	(0.019)
Education level of household head_Primary	-0.052	-0.050	-0.052
	(0.059)	(0.058)	(0.058)
Education level of household head_Secondary	0.112***	0.110***	0.112***
	(0.039)	(0.037)	(0.038)
Education level of household head_University	0.149**	0.154***	0.148**
	(0.057)	(0.053)	(0.060)
Education level of household_Other	-0.387***	-0.345***	-0.390***
	(0.030)	(0.026)	(0.031)
Constant	0.422***	0.423***	0.423***
	(0.040)	(0.040)	(0.039)
Observations	3,284	3,284	3,284
R-squared	0.063	0.066	0.063

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

E. Proxy Means Test Targeting

Proxy means tests are a commonly used method of targeting social protection programs to the poor in contexts where administrative income data is patchy and unreliable. In developed countries where administrative capacity is greater, eligibility for social protection programs is determined through *means testing,* whereby a household is deemed eligible for benefits based on their declared income. This method is often impossible to apply in developing country contexts, where administrative data on income does not exist and where most households would have an incentive to misreport their income to improve their chances of receiving assistance. Furthermore, defining income earned from small informal businesses or subsistence agricultural employment is complicated. PMT methods therefore seek to calculate a predicted measure of welfare based on a set of characteristics that are good predictors of welfare, effectively proxying for the households' means.

The first step to employing a PMT to target a program consists of selecting a good set of proxy variables. The variables used as proxies for income are constrained to be easily identifiable and verifiable, in order to facilitate fieldwork and improve reporting accuracy, while minimizing the potential for cheating. These characteristics are also selected based on their observed and conceptual correlations with poverty and welfare deprivation, given that their explanatory power of consumption levels will directly determine targeting accuracy. The variables used to build the PMT in this exercise include determinants of: (i) demographics, such as the number of children, the share of elderly, the marital status of the household head; (ii) access to services and amenities, including the type of toilet, whether there is running water or electricity, the building materials or housing type; (iii) education of the household head; (iv) the primary source of livelihood; (v) ownership of a set of selected durable goods. The regression results are presented in Table 7-18.

The second step consists of determining how the proxy variables are related to welfare and obtaining a set of weights to build a scorecard, which is then used during fieldwork to determine a households' eligibility in the third and final step. This is generally done by regressing a set of proxy variables on a welfare indicator – the indicator in the context of this exercise is total measured consumption per capita per day in SSP.[253] The regression model yields a set of coefficients for the observed characteristics, these coefficients which are used to build the scorecard. In the third and final step, enumerators will visit the households considered for the program, observe the households' characteristics, and calculate the households' score based on the coefficients obtained in the econometric model. TO determine eligibility, each households' score is compared to an eligibility threshold which is generally based on the relevant poverty line or on a certain percentile of consumption expenditure.

[253] The model uses core consumption only rather than the total imputed consumption measure because many household characteristics are used in the multiple imputation model used to derive total consumption. Hence, total imputed consumption is endogenous with respect to these household characteristics, and the regression would result in an artificially good fit.

Table 7-18: Regression results for proxy means test

OLS regression on Ln Total core consumption			
HH lives in urban area	-0.00320	HH lives in concrete/brick house	0.182***
	(0.0532)		(0.0631)
Head is a woman	-0.0380	Head education: primary	0.00464
	(0.0362)		(0.0436)
Household size	-0.0984***	Head education: secondary	-0.00252
	(0.00630)		(0.0562)
Share of children aged 0-5	-0.329***	Head education: tertiary	0.212***
	(0.0887)		(0.0816)
Share of children aged 6-14	-0.310***	Livelihood: Agricultural production	-
	(0.0903)		
Share of elderly aged 65+	0.0984	Livelihood: wages and salaries	0.0408
	(0.114)		(0.0588)
Head marital status: married	-	Livelihood: own business	0.137
			(0.0873)
Head marital status: widowed/divorced	-0.0418	Livelihood: remittances/aid/other	-0.118*
	(0.0491)		(0.0667)
Headmarital status: never married	0.129	Owns at least one car/truck	0.388***
	(0.101)		(0.131)
HH owns dwelling of residence	0.0939*	Owns at least one TV/satellite dish/CD-DVD player	0.0327
	(0.0507)		(0.103)
Cellular network at the household	0.113***	Owns at least one motorbike/rickshaw	0.209***
	(0.0380)		(0.0706)
Household has access to electricity	-0.174**	Owns at least one radio/transistor	0.166
	(0.0841)		(0.106)
HH toilet type: none	-	Owns at least one mobile phone	0.109**
			(0.0451)
HH toilet type: pit Latrine	0.245***	Owns at least one mattress/bed	0.164***
	(0.0585)		(0.0448)
HH toilet type: flush toilet	0.283	Owns at least one mosquito net	-0.0214
	(0.253)		(0.0373)
HH has water piped into dwelling	0.132	Owns at least one hoe/spade/axe	0.00343
	(0.0847)		(0.0413)
Observations	1,711		
R-squared	0.393		
State FE	YES		

*All estimates are weighted by population weights, robust standard errors in parentheses; the dependent variable in all estimations is ln consumption of core and durable items in July 2017 SSP; *** p<0.01; ** p<0.05; * p<0.1*

F. Impact of Conflict on Adolescent Girls

Conflict variables

Table 7-19: Conflict variables

Variable	Description
Household looted	Was your household looted during the conflict?
Other household looted	Was any household in your neighborhood looted in the conflict?
Household damaged	Was your household damaged in the conflict?
Household member harmed	Was any member of your household harmed in the conflict?
No of Household members harmed	How many members of your household were harmed in the conflict?
Household member died	Did any member of your household die due to the conflict?
No of Household members died	How many members of your household die due to the conflict?
Member left	Did any member of your household leave due to the conflict?

Source: AGI 2015.

Analysis of Variance (ANOVA) results for conflict variables

A one-way Analysis of Variance (ANOVA) is used to test whether conflict index means and input variable means are statistically significant across clusters (Table 7-20).[254] The results suggest a significantly larger variation between clusters than within clusters for each of the measured variables.[255] Thus, the conflict exposure indicators reflect the geospatial exposure of conflict where nearby households are usually co-exposed to conflict. Given that the conflict affected some areas a lot more than others, this is not surprising. In addition, this is encouraging for a cluster-level difference-in-differences approach.

[254] ANOVA uses the F-test to statistically test the equality of means. The F statistic is based on the ratio of the variation between cluster means against the variation within the clusters. To reject the null hypothesis that the cluster means are equal, a high F-value or a P-value below 0.05 is needed.

[255] The results are confirmed by a simulation with cluster being randomly assigned to respondents.

Table 7-20: Results of one-way ANOVA for Conflict Index and other input variables

	W/t Group Squared Sum (SS)	W/t Group Degrees of Freedom (DOF)	B/w Group Squared Sum (SS)	B/w Group Degrees of Freedom (DOF)	F Stat	P Value
Conflict Index	840.76	90	2548	1601	5.868	<0.01
Household Looted	54.807	90	196.49	1601	4.962	<0.01
Other Household Looted	64.954	90	218.45	1601	5.289	<0.01
Household Damaged	31.553	90	156.13	1601	3.595	<0.01
Number of Members Harmed	1.562	90	10.088	1601	2.754	<0.01
Number of Members Died	1.231	90	9.13	1601	2.398	<0.01
Members Left	40.639	90	221.32	1601	3.266	<0.01

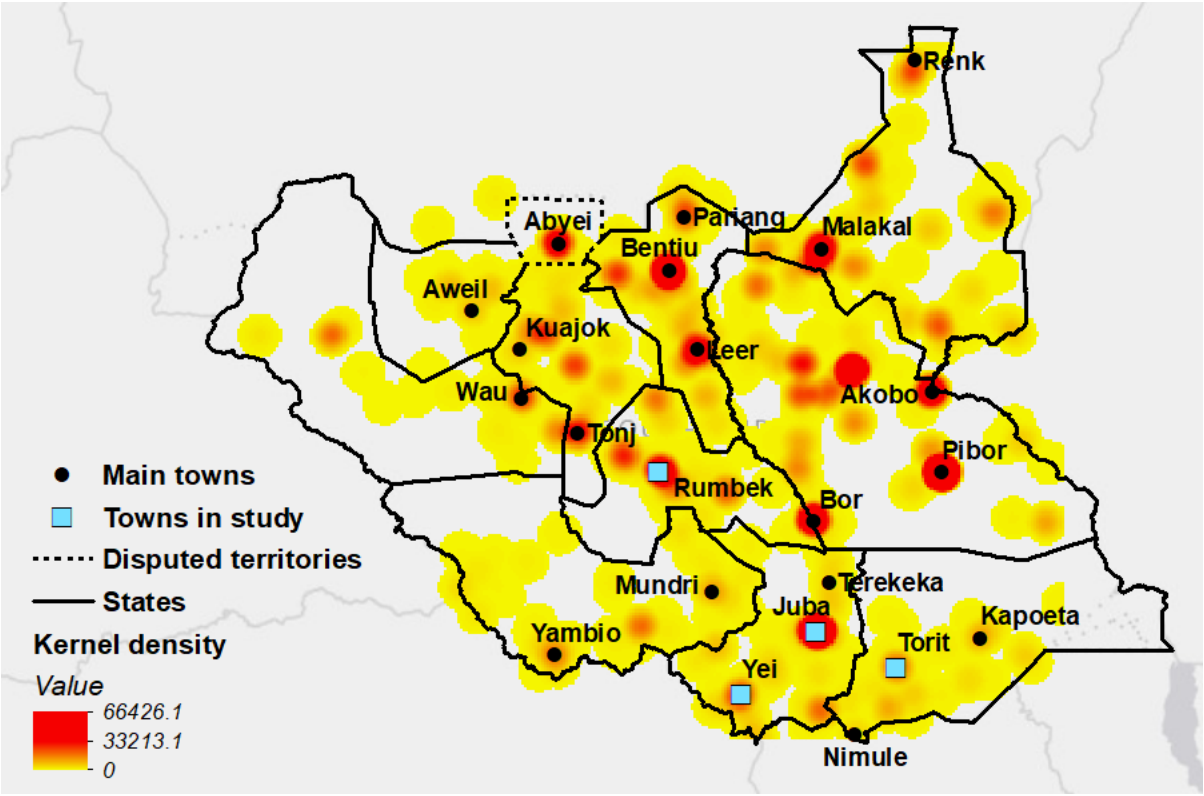
Source: Authors' calculations based on AGI 2010, 2015 and ACLED 2013-2015 data.

ACLED data

The external indicator is based on conflict event data from the ACLED Project between December 2013 and January 2015. The dataset codes the exact location of all political violence incidents that were reported during this time period.[256] For the selected time period there were 1,200 reported conflict events in South Sudan with a total of 9,209 fatalities. Most of the conflict is concentrated in the Northern part of South Sudan, particularly around Rumbek (Figure 7-9). This is consistent with Rumbek's high conflict exposure index average.

[256] Political violence is the use of force by a group with a political purpose or motivation. ACLED defines political violence through its constituent events, the intent of which is to produce a comprehensive overview of all forms of political conflict within and across states. A politically violent event is a single altercation where often force is used by one or more groups to a political end, although some instances – including protests and non-violent activity – are included in the dataset to capture the potential pre-cursors or critical junctures of a conflict.

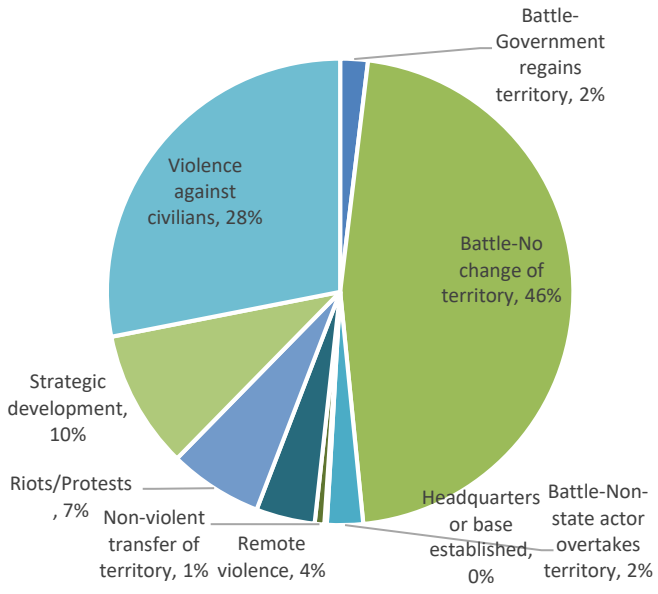
Figure 7-9: Location of conflict events in South Sudan between Dec 2013 and Jan 2015



Source: ACLED 2013-2015.

The ACLED data shows that 465 of the reported conflict events (36 percent) were deadly and resulted in at least one fatality. Almost half of all reported conflict events (48 percent) were battles between the government and non-government forces. Violence against civilians was committed in 28 percent of all events (Figure 7-10).

Figure 7-10: Type of conflict events



Source: ACLED 2013-2015.

Table 7-21: Number of fatalities per conflict event, 2013-2015

Conflict event	Fatalities
Battle-Government regains territory	11
Battle-No change of territory	4862
Battle-Non-state actor overtakes territory	280
Headquarters or base established	0
Non-violent transfer of territory	0
Remote violence	63
Violence against civilians	3987

Source: ACLED 2013-2015.

Outcome variables

Table 7-22: Outcome variables

Variable	Description
Education	
Enrolled	Whether respondent is currently enrolled in school
Dropped out	Whether respondent dropped out from school
Years dropped out	Number of years of schooling completed by those in school
Years Education	Number of years of education completed by respondent
Savings	
Current savings	Whether respondent has current savings
Savings from 2 weeks	Whether respondent has savings from the past 2 weeks
Total savings	Log of total savings at multiple locations
Household Characteristics	
People per room	Number of occupants per room in household
Food scarcity index	Standardized index of food scarcity in household
Household asset index	First dimension MCA of household asset ownership variables
Toilet	Quality of toilet facilities
Good walls	Quality of walls' construction material
Good roof	Quality of roof construction material
Household monthly income	Log of total income from all IGAs in the last month for the household
IGA	
Number of IGAs	Number of income generating activities currently being undertaken
Individual monthly income	Log of total income from all IGAs in the last month for the individual
Aspirations	
General anxiety	Summative index of respondents to variables related to feelings of anxiety
Ladder position	Standardized index of difference between ladder position now vs. expected position 5 years in future
Empowerment	
Control Index	First dimension of MCA of variables relating to control over resources
Entrepreneurial freedom	Summative index of binary variables relating to entrepreneurial freedom
Satisfaction	Summative index of ordinal variables relating to level of satisfaction with status quo
Marriage	
Empowerment	Standardized index of empowerment post marriage

Married	Whether respondent is currently married
Pregnant	Whether respondent is currently pregnant
Daughter optimist	Whether respondent sees a better future for their daughter
Lost pregnancy	Whether respondent has lost a pregnancy
Children	Whether respondent has a child

Source: AGI 2015.

ANOVA results for outcome variables

Table 7-23: Education outcome indicators in the baseline survey

	W/t Group SS	W/t Group DOF	B/w Group SS	B/w Group DOF	F Stat	P Value	Levenes P Value	Brown-Forsythe P Value
Enrolled	110.081	95	654.855	3070	5.432	0.01	0.01	0.01
Dropped Out	145.844	95	617.229	3070	7.636	0.01	0.01	0.01
Years Dropped out	1345.189	94	8974.607	1050	1.674	0.01	0.01	0.66
Years Education	5176.14	95	83146.01	2526	1.655	0.01	0.01	0.01

Source: Authors' calculations based on AGI 2010 and 2015 data.

Table 7-24: Education outcome indicators in the endline survey

	W/t Group SS	W/t Group DOF	B/w Group SS	B/w Group DOF	F Stat	P Value	Levenes P Value	Brown-Forsythe P Value
Enrolled	36.679	90	568.977	3046	2.182	0.01	0.01	0.01
Dropped Out	66.276	90	327.884	1488	3.342	0.01	0.01	0.054
Years Dropped out	2699.402	90	16236.45	1587	2.932	0.01	0.06	0.568
Years Education	2809.585	90	23010.52	2407	3.265	0.01	0.117	0.368

Source: Authors' calculations based on AGI 2010 and 2015 data.

Table 7-25: Income generating outcome indicators in the baseline survey

	W/t Group SS	W/t Group DOF	B/w Group SS	B/w Group DOF	F Stat	P Value	Levenes P Value	Brown-Forsythe P Value
Number of IGAs	259.78	95	1728.461	3123	4.941	0.01	0.01	0.01
Log of Last Month Income (Ind)	1775.793	95	14014.28	3115	4.155	0.01	0.01	0.01

Source: Authors' calculations based on AGI 2010 and 2015 data.

Table 7-26: Income generating outcome indicators in the endline survey

	W/t Group SS	W/t Group DOF	B/w Group SS	B/w Group DOF	F Stat	P Value	Levenes P Value	Brown-Forsythe P Value
Number of IGA	415.69	90	1643.674	3046	8.559	0.01	0.01	0.01
Log of Last Month Income (Ind)	4304.374	90	19612.96	3028	7.384	0.01	0.01	0.01

Source: Authors' calculations based on AGI 2010 and 2015 data.

Table 7-27: Savings outcome indicators in the baseline survey

	W/t Group SS	W/t Group DOF	B/w Group SS	B/w Group DOF	F Stat	P Value	Levenes P Value	Brown-Forsythe P Value
Log of Total Savings	1523.374	95	12453.6	2913	3.751	0.01	0.01	0.01
Savings	76.855	95	604.839	3035	4.059	0.01	0.01	0.01
Saved (last 2 Weeks)	55.314	95	191.983	903	2.739	0.01	0.01	0.428

Source: Authors' calculations based on AGI 2010 and 2015 data.

Table 7-28: Savings outcome indicators in the endline survey

	W/t Group SS	W/t Group DOF	B/w Group SS	B/w Group DOF	F Stat	P Value	Levene's P Value	Brown-Forsythe P-Value
Log of Total Savings	2094.889	90	23342.35	3046	3.037	0.01	0.01	0.126
Savings	74.481	90	700.718	3046	3.597	0.01	0.01	0.043
Saved (last 2 Weeks)	54.076	90	666.052	3046	2.748	0.01	0.01	0.001

Source: Authors' calculations based on AGI 2010 and 2015 data.

Table 7-29: Marriage-related outcome indicators in the baseline survey

	W/t Group SS	W/t Group DOF	B/w Group SS	B/w Group DOF	F Stat	P Value	Levenes P Value	Brown-Forsythe P Value
Empowerment Index	1549.454	95	10211.77	3123	4.988	0.01	0.01	0.01
Married	96.578	95	619.706	3050	5.003	0.01	0.01	0.01
Loss of Pregnancy	5.162	95	75.652	3055	2.194	0.01	0.01	0.01
Children	90.438	95	596.643	3063	4.887	0.01	0.01	0.01
Pregnant	29.498	95	291.167	2765	2.949	0.01	0.01	0.01
Daughter's Future	50.101	95	706.791	3123	2.33	0.01	0.01	0.005

Source: Authors' calculations based on AGI 2010 and 2015 data.

Table 7-30: Marriage-related outcome indicators in the endline survey

	W/t Group SS	W/t Group DOF	B/w Group SS	B/w Group DOF	F Stat	P Value	Levene's P Value	Brown-Forsythe P-Value
Empowerment Index	1693.787	90	12830.28	3046	4.468	0.01	0.01	0.003
Married	48.409	90	717.224	3045	2.284	0.01	0.01	0.514
Loss of Pregnancy	14.202	90	192.946	3046	2.491	0.01	0.01	0.01
Children	44.175	90	715.71	3045	2.088	0.01	0.01	0.844
Pregnant	11.423	90	268.735	3045	1.438	0.005	0.01	0.005
Daughter's Future	26.717	90	290.427	3046	3.113	0.01	0.01	0.01

Source: Authors' calculations based on AGI 2010 and 2015 data.

Table 7-31: Aspirations outcome indicators in the baseline survey

	W/t Group SS	W/t Group DOF	B/w Group SS	B/w Group DOF	F Stat	P Value	Levenes P Value	Brown-Forsythe P Value
Ladder position	1860.859	95	16113.65	3078	3.742	0.01	0.01	0.01
Anxiety Index	1799.872	95	8487.459	3123	6.971	0.01	0.01	0.01

Source: Authors' calculations based on AGI 2010 and 2015 data.

Table 7-32: Aspirations outcome indicators in the endline survey

	W/t Group SS	W/t Group DOF	B/w Group SS	B/w Group DOF	F Stat	P Value	Levene's P Value	Brown-Forsythe P-Value
Ladder position	2491.977	90	14846.88	3045	5.679	0.01	0.01	0.01

Anxiety Index	1146.942	90	8140.725	3046	4.768	0.01	0.01	0.006

Source: Authors' calculations based on AGI 2010 and 2015 data.

Table 7-33: Empowerment outcome indicators in the baseline survey

	W/t Group SS	W/t Group DOF	B/w Group SS	B/w Group DOF	F Stat	P Value	Levenes P Value	Brown-Forsythe P Value
Control Index	4324.301	95	38185.11	3084	3.676	0.01	0.01	0.01
Entrepreneurship Index	1728.217	95	11119.66	3080	5.039	0.01	0.01	0.01
Satisfaction Index	4582.776	95	11335.69	3034	12.911	0.01	0.01	0.01

Source: Authors' calculations based on AGI 2010 and 2015 data.

Table 7-34: Empowerment outcome indicators in the endline survey

	W/t Group SS	W/t Group DOF	B/w Group SS	B/w Group DOF	F Stat	P Value	Levene's P Value	Brown-Forsythe P-Value
Control Index	3673.948	90	42138.6	3046	2.951	0.01	0.01	0.01
Entrepreneurship Index	2833.924	90	8990.101	3045	10.665	0.01	0.01	0.01
Satisfaction Index	1942.864	90	5928.676	3045	11.087	0.01	0.01	0.01

Source: Authors' calculations based on AGI 2010 and 2015 data.

Table 7-35: Household characteristics outcome indicators in the baseline survey

	W/t Group SS	W/t Group DOF	B/w Group SS	B/w Group DOF	F Stat	P Value	Levenes P Value	Brown-Forsythe P Value
People per room	1567.146	95	7182.065	2702	6.206	0.01	0.01	0.01
Good Roof	177.802	95	490.126	3051	11.651	0.01	0.01	0.01
Good Walls	52.282	95	370.449	3056	4.54	0.01	0.01	0.01
Toilet	83.993	95	533.509	3062	5.074	0.01	0.01	0.01
Food Scarcity Index	5724.042	95	34024.02	3041	5.385	0.01	0.01	0.01
HH Asset Index	57028.213	95	98049.49	3110	19.041	0.01	0.01	0.01
Log of Household monthly income	2784.587	95	18911.19	3109	4.819	0.01	0.01	0.01

Source: Authors' calculations based on AGI 2010 and 2015 data.

Table 7-36: Household characteristics outcome indicators in the endline survey

	W/t Group SS	W/t Group DOF	B/w Group SS	B/w Group DOF	F Stat	P Value	Levene's P Value	Brown-Forsythe P-Value

People per room	3827.57	90	19328.79	3040	6.689	0.01	0.01	0.01
Good Roof	228.645	90	550.473	3044	14.048	0.01	0.01	0.01
Good Walls	28.638	90	328.48	3044	2.949	0.01	0.01	0.01
Toilet	217.427	90	545.5	3044	13.481	0.01	0.01	0.01
Food Scarcity Index	7568.646	90	39438.33	3043	6.489	0.01	0.01	0.01
HH Asset Index	4996.458	90	5524.153	3044	30.591	0.01	0.01	0.01
Log of Household monthly income	4304.374	90	19612.96	3028	7.384	0.01	0.01	0.01

Source: Authors' calculations based on AGI 2010 and 2015 data.

Entrepreneurial potential index

Read aloud: "Now we will talk about different tasks. You will rank your ability on how well you can do these activities on a scale of 0 to 10? 0 means you cannot do this activity and 10 is you definitely can"

1. Run your own business
2. Identify business opportunities to start up new business
3. Obtain credit to start up new business or expand existing business
4. Save in order to invest in future business opportunities
5. Make sure that your employees get the work done properly
6. Manage financial accounts
7. Bargain to obtain cheap prices when you are selling anything for business (outputs)
8. Bargain to obtain high prices when selling
9. Protect your business assets from harm by others
10. Collecting the money someone owes you

Regression results

Table 7-37: Impact of conflict on education

Variables	Enrolled	Dropped out	Years education	Years dropped out
Internal binary	-0.0259	0.0112	0.244	-0.0416
	(0.0378)	(0.0548)	(0.355)	(0.455)
	3,358	2,235	4,107	2,195
Internal continuous	-0.0410*	0.0510	0.147	-0.00931
	(0.0227)	(0.0341)	(0.287)	(0.323)
	3,358	2,235	4,107	2,195
External binary	-0.0510	-0.0225	1.127*	1.070*
	(0.0415)	(0.0605)	(0.638)	(0.573)

	2,365	1,569	1,808	1,160
	-0.00752	0.00397	0.107	0.151**
External continuous	(0.00503)	(0.00784)	(0.0810)	(0.0757)
	2,365	1,569	1,808	1,160

Robust standard errors in parentheses

Number of observations below standard errors

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

Source: Authors' calculations based on AGI 2010, 2015 and ACLED 2013-2015 data.

Table 7-38: Impact of conflict on savings

Variables	Current savings	Saved two weeks ago	Total savings
	-0.0837*	-0.0236	-0.237
Internal binary	(0.0450)	(0.0528)	(0.171)
	4,165	2,557	1,453
	-0.0410*	-0.0212	-0.186*
Internal continuous	(0.0227)	(0.0342)	(0.107)
	4,165	2,557	1,453
	-0.163**	-0.0128	-0.236
External binary	(0.0619)	(0.0854)	(0.255)
	1,847	1,356	896
	-0.0137	-0.00155	-0.0110
External continuous	(0.00883)	(0.0100)	(0.0257)
	1,847	1,356	896

Robust standard errors in parentheses

Number of observations below standard errors

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

Source: Authors' calculations based on AGI 2010, 2015 and ACLED 2013-2015 data.

Table 7-39: Impact of conflict on household conditions

Variables	People per room	Food scarcity index	Household asset index	Toilet	Good walls	Good roof	Monthly household income
Internal binary	0.729**	0.584*	-3.593***	-0.159**	-0.0807**	-0.00499	0.257

	(0.304)	(0.347)	(0.664)	(0.0734)	(0.0376)	(0.0363)	(0.301)
	4,908	5,235	5,303	4,687	4,716	4,713	4,719
Internal continuous	0.502***	0.284	-2.372***	-0.154***	-0.0455**	0.00842	0.201
	(0.178)	(0.222)	(0.332)	(0.0414)	(0.0222)	(0.0249)	(0.168)
	4,908	5,235	5,303	4,687	4,716	4,713	4,719
External binary	-0.133	-0.341	-1.330	-0.302***	-0.0958***	0.0428	-0.322
	(0.430)	(0.456)	(0.929)	(0.0571)	(0.0349)	(0.0379)	(0.186)
	2,336	2,428	2,454	4,687	4,716	4,713	2,272
External continuous	0.0194	-0.0568	-0.198**	-0.0261***	-0.00947**	0.00764*	-0.0659***
	(0.0435)	(0.0458)	(0.0893)	(0.00566)	(0.00457)	(0.00438)	(0.0180)
	2,336	2,428	2,454	4,687	4,716	4,713	2,272

Robust standard errors in parentheses

Number of observations below standard errors

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

Source: Authors' calculations based on AGI 2010, 2015 and ACLED 2013-2015 data.

Table 7-40: Impact of conflict on income generating activities (IGAs)

Variables	Number of IGAs	Individual monthly income
	0.134	-0.123
Internal binary	(0.0933)	(0.181)
	2,277	2,277
	0.0327	-0.0715
Internal continuous	(0.0518)	(0.115)
	2,277	2,277
	-0.352***	0.237
External binary	(0.0835)	(0.227)
	1,192	1,065
External continuous	-0.0217	0.0240

	(0.0136)	(0.0290)
	1,192	1,065

Robust standard errors in parentheses

Number of observations below standard errors

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

Source: Authors' calculations based on AGI 2010, 2015 and ACLED 2013-2015 data.

Table 7-41: Impact of conflict on aspirations

Variables	General anxiety	Ladder position
	0.521*	-1.378***
Internal binary	(0.285)	(0.344)
	2,420	2,416
	0.476***	-0.882***
Internal continuous	(0.124)	(0.222)
	2,420	2,416
	0.973***	-1.134***
External binary	(0.251)	(0.378)
	2,420	2,416
	0.0914***	-0.106**
External continuous	(0.0319)	(0.0408)
	2,420	2,416

Robust standard errors in parentheses

Number of observations below standard errors

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

Source: Authors' calculations based on AGI 2010, 2015 and ACLED 2013-2015 data.

Table 7-42: Impact of conflict on empowerment

Variables	Control index	Entrepreneurial freedom	Satisfaction
	0.153	1.014***	0.0563
Internal binary	(0.303)	(0.272)	(0.211)
	4,092	4,100	4,065
	0.150	0.643***	-0.000584
Internal continuous	(0.194)	(0.195)	(0.135)
	4,092	4,100	4,065

	-0.0340	1.011***	0.0183
External binary	(0.360)	(0.279)	(0.302)
	1,806	1,805	1,791
	-0.0156	0.0657	-0.0301
External continuous	(0.0423)	(0.0453)	(0.0330)
	1,806	1,805	1,791

Robust standard errors in parentheses

Number of observations below standard errors

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

Source: Authors' calculations based on AGI 2010, 2015 and ACLED 2013-2015 data.

Table 7-43: Impact of conflict on marriage-related outcomes

Variables	Empowerment	Married	Pregnant	Daughter optimist	Lost pregnancy	Children
	0.141	0.0726*	-0.0864***	-0.0342	-0.0455**	-0.00444
Internal binary	(0.242)	(0.0383)	(0.0299)	(0.0359)	(0.0223)	(0.0424)
	4,209	4,201	4,010	4,250	4,210	4,216
	0.235*	0.0678***	-0.0621***	-0.0309*	-0.0475***	0.00830
Internal continuous	(0.128)	(0.0257)	(0.0180)	(0.0184)	(0.0124)	(0.0259)
	4,209	4,201	4,010	4,250	4,210	4,216
	0.603***	0.197***	-0.123**	-0.0730	-0.117***	0.0618
External binary	(0.212)	(0.0576)	(0.0513)	(0.0506)	(0.0294)	(0.0601)
	4,209	1,843	1,752	1,854	1,836	1,840
	0.0476**	0.0201***	-0.0149**	0.00357	-0.00949***	0.00230
External continuous	(0.0230)	(0.00594)	(0.00661)	(0.00847)	(0.00306)	(0.00525)
	4,209	1,843	1,752	1,854	1,836	1,840

Robust standard errors in parentheses

Number of observations below standard errors

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

Source: Authors' calculations based on AGI 2010, 2015 and ACLED 2013-2015 data.

G. Program Cancellation

Operationalization of key outcome variables

Table 7-44 gives an overview over the individual outcomes we studied in each category.

Table 7-44: Main outcomes of interest

	Outcomes Name	Details
Socio-economic outcomes – survey based		
1	Employment index	Standardized weighted average of the number of hours spend on wage employed activities in the past 7 days, (log) cash wage received in the past 7 days, (log) outstanding wage from the past 7 days, (log) total wage in past 7 days, number of activities on wage employment in the past 7 days, number of hours spend on self-employed activities in past 7 days, (log) self-employed cash earnings in the past 7 days, (log) self-employed in-kind earnings in the past 7 days, (log) outstanding earnings from the past 7 days, (log) total self-employed earnings in the past 7 days, number of self-employed activities in the past 7 days, total number of employees, (log) business revenue during the past 4 weeks, (log) business sales yesterday, (log) aggregated business costs in the past 4 weeks
2	Consumption index	Standardized weighted average of the number of different food items consumed in the past 7 days, (log) total food expenditure in the past 7 days, (log) value of self-produced food in the past 7 days, (log) expenditure on non-food items in past 1 month, (log) expenditure on assets in past 1 month
3	Savings, investment and debt index	Standardized weighted average of having or sharing a formal bank account, currently saving any money, (log) amount held at bank account, (negatively coded) number of formal loans received, (negatively coded) other debt, (negatively coded) number of informal loans received in the past 1 month, (negatively coded) (log) total amount of formal loans, (negatively coded) (log) total amount of informal loans, business ownership, participation in training during the past 12 months, number of trainings done in the past 12 months
4	Business skills index	Standardized weighted average of frequency of visiting competitors, frequency of asking customers about other products they would like to be sold, frequency of setting sales targets, frequency of comparing targets to performance, frequency of recording purchase and sales, knowledge of the business register, knowledge of fees to register a business at cashier's office of the Business Register, knowledge of operating license from State government, knowledge of inspections from payam authorities, knowledge of taxes, knowledge of bribes (rashua), knowledge of paying an intermediate person to take care of taxes, registration of company name at business register, registration at cashier's office of the Business Register, obtainment of operation license from the State government, experienced inspection by payam authorities, payment of formal taxes, payment of bribes (rashua), payment of intermediary person to take care of taxes
Psychological and behavioral outcomes		

5	Life satisfaction and empowerment index	Standardized weighted average of happiness with education level, with family, with job and work, with earnings or income, with house they live in, with life as a whole, with community they live in, with security and with friends, ladder of life rating self now, ladder of life rating household now, ladder of life rating self in 5 years, ladder of life rating household in 5 years, internal locus of control score on the possibility to become a leader based on ability, on general events in life, on influencing the number of friends, on control over future events, on feeling protected, on planning ahead, on pleasing people above to get ahead, on (negatively coded) dependence on luck to become a leader, on working hard to get ahead, on the belief that own actions matter most, empowered decisions on food/clothing purchases for children, on opening a business, on taking a loan, on visiting a friend, on traveling to another town, on staying overnight at another town, on getting a child vaccinated, on purchasing small items, on paying school fees for relatives
6	Risk index	Standardized weighted average of (negatively coded) likelihood of sleeping under a mosquito net, likelihood to walk alone at night, (negatively coded) likelihood to spend an afternoon waiting for a medical exam, likelihood to take a boda boda if the driver is unknown, likelihood to engage in unprotected sex, (negatively coded) likelihood to invest into a safe business accepting low profits, likelihood to invest into a business that has high profits but equal chance of failing, likelihood to take a loan if there were no restrictions, experimental data on number of times the more risky lottery was chosen
7	Trust index	Standardized weighted average of 13 trust items: trust to people in general, trust that people are helpful, (negatively coded) believe that people seek their own advantage, willingness to lend money, willingness to lend possessions, trust in family, trust in friends, trust in neighbours, trust in police, trust in NGO, trust in elders, trust in local government, trust in state government, experimental data on amount send to the WB in trust game and amount send to other player in the trust game
8	Crime and violence index	Standardized weighted average of participation in a security group, frequency of participation in a security group, hours participated in a security group last week, experience of own cattle been stolen, number of times own cattle had been stolen in past 1 year, knowledge of a least 1 home/market stall robbery, number of known home/market stall robberies, experience of harassment during past 1 month, number of times been harassed during past 1 month, experience of having been physically punished or beaten, feeling concerned that receiving money might foster crime or violence
10	Migration index	Standardized weighted average of having moved since baseline, living outside South Sudan in the past 1 year, living in a refugee camp in the past 1 year, living in an IDP camp in the past 1 year, having the wish to move
11	List experiment cattle index	Standardized average of the two list experiment questions on cattle raiding
12	List experiment argument index	Standardized average of the two list experiment questions on arguments

Estimation strategy:

Impact of not getting grants vs. control

Intent to Treat (ITT)

The specification for the intention-to-treat effect is as follows:

$$(1)\ y_{ij} = \beta Z_i + X_i'\gamma + s_j + \varepsilon_{ij}$$

where y_{it} is a vector of outcomes for individual *i* in strata *j*, Z_i is a dummy variable that takes a value of 1 if individual *i* was originally selected for the cash grant program, s_j are strata fixed effect and ε_{ij} is the error-term clustered at boma level. X_i' are individual-level covariates that were collected at baseline and might affect outcome variables. The effect of interest is estimated by parameter β. The effect is causally identified if the offer to participate in the grant program was randomly assigned which was the case due to study design.

List experiment estimators

Estimators for the list experiment paralleled the intention-to-treat estimator and the local average treatment effect. However, rather than directly regressing the outcome on treatment, the estimator consisted in an interaction between original treatment and treatment in the list experiment. The specification for the intention-to-treat effect is as follows:

$$(4)\ y_{ij} = \beta Z_i + X_i'\gamma + T_i Z_i'\delta + s_j + \varepsilon_{ij}$$

where y_{it} is a vector of outcomes for individual *i* in strata *j*, Z_i is a dummy variable that takes a value of 1 if individual *i* was originally selected for the cash grant program, T_i is a dummy variable that takes a value of 1 if individual *i* was selected for the treatment in the list experiment, s_j are strata fixed effect and ε_{ij} is the error-term clustered at boma level. X_i' are individual-level covariates that were collected at baseline and might affect outcome variables. The effect of interest is estimated by parameter δ.

Impact of training vs. training+grants vs. control

Treat on the Treated (TOT)

The specification for the treatment on the treated effect is as follows:

$$(1)\ y_{ij} = \alpha Treatment1_i + \beta Treatment2_i + X_i'\gamma + s_j + \varepsilon_{ij}$$

where y_{it} is a vector of outcomes for individual *i* in strata *j*, s_j are strata fixed effect, X_i' are individual-level covariates that were collected at baseline, ε_{ij} is the error-term clustered at boma level, $Treatment1_i$ is a dummy variable that takes a value of 1 if individual *i* received treatment 1, i.e. they participated in the business skills training, but did not receive the grant due to the cancellation of the program and $Treatment2_i$ is a dummy variable that takes a value of 1 if individual *i* participated in the training and also received their grant (treatment 2). Thus, participants who received no treatment because they were either part of the control group or were invited but did not attend the training build the baseline of this estimation. TOT effects of treatment 1 and treatment 2 will be estimated by parameters α and β respectively.

Local average treatment effect (LATE)

Since assignment between treatment 1 and 2 was partly due to self-selection, we address endogeneity an instrumental variable approach. Since non-compliers also self-selected into not participating at the workshop, assignment to treatment 1 is also partly endogenous. Therefore, we run additional regression with two endogenous regressors. The specification for the local average treatment effects are then as follows.

Second stage equation:

$$(1)\ y_{ij} = \alpha \widehat{Treatment1}_i + \beta \widehat{Treatment2}_i + X_i'\gamma + s_j + \varepsilon_{ij}$$

First stage equations:

$$(3)\ \widehat{Treatment1}_i = \alpha Treatment_i + Z_i \times KCB\ Distance_i'\sigma + \delta KCBDistance_i + X_i'\gamma + s_j + \varepsilon_{ij}$$

$$(4)\ \widehat{Treatment2}_i = \alpha Treatment_i + Z_i \times KCB\ Distance_i'\sigma + \delta KCBDistance_i + X_i'\gamma + s_j + \varepsilon_{ij}$$

where y_{it} is a vector of outcomes for individual *i* in strata *j*, s_j are strata fixed effect, X_i' are individual-level covariates that were collected at baseline, ε_{ij} is the error-term clustered at boma level, and $Treatment1_i$ and $Treatment2_i$ are dummy variables indicating treatment streams as describes above. Equation (3) displays the first-stage equation, which instruments $Treatment1_i$ with the original assignment to treatment $\#Z_i$. Equation (4) displays the first-stage estimation for $Treatment2_i$which is instrumented by the interaction between original assignment to treatmentZ_i and a vector of state dummies $State_i$. Similar to the TOT estimation the LATE of treatment 1 and treatment 2 will be estimated by parameters α and β respectively.

Balancing tests

Table 7-45: Balancing original control and treatment group at baseline

		Control group		ITT group		Difference in means	p-value
		N	Mean	N	Mean		
Individual and household characteristics							
Age		1,148	27.417	1,144	27.683	0.265	0.2001
Gender		1,148	0.602	1,144	0.611	0.009	0.6559
Married		1,148	0.666	1,143	0.649	-0.016	0.4103
Employment status		1,148	0.612	1,144	0.624	0.012	0.5626
Business ownership		1,148	0.642	1,144	0.659	0.017	0.3907
Consumption food		1,148	5.330	1,144	5.400	0.070	0.1740
Consumption non-food		1,148	2.418	1,144	2.429	0.010	0.8547
Formal bank account		1,148	0.373	1,144	0.369	-0.004	0.8452
(Log) amount formal loans		1,139	-0.332	1,141	-0.367	-0.036	0.6339
(Log) amount informal loans		1,134	-1.329	1,124	-1.225	0.104	0.4432
Education level	No education	1,148	0.191	1,144	0.206	0.016	0.3517
	Some Primary	1,148	0.315	1,144	0.330	0.015	0.4401
	Some Secondary	1,148	0.404	1,144	0.373	-0.031	0.1289
	Some University or Higher	1,148	0.090	1,144	0.090	0.000	0.9791
Literacy	No English	1,148	0.247	1,144	0.263	0.016	0.3882
	Some English	1,148	0.273	1,144	0.295	0.022	0.2443
	Good English	1,148	0.480	1,144	0.442	-0.038*	0.0706
Numeracy	Low	1,148	0.238	1,144	0.247	0.010	0.5931
	Medium	1,148	0.160	1,144	0.198	0.037**	0.0199
	High	1,148	0.602	1,144	0.555	-0.047**	0.0231
Household size		1,148	7.310	1,144	7.260	-0.050	0.7257
Number of children		1,148	3.107	1,144	3.241	0.134	0.1635
Number of elderly		1,148	0.109	1,144	0.087	-0.021	0.1292
Number of rooms		1,148	3.180	1,144	3.087	-0.093	0.1935
Number of buildings		1,148	3.676	1,144	3.538	-0.138*	0.0830
(Log) distance to KCB branch		1,130	2.395	1,126	2.396	0.001	0.9871
State at baseline							
Central Equatoria		1,148	0.169	1,144	0.167	-0.002	0.8966

Eastern Equatoria	1,148	0.160	1,144	0.152	-0.008	0.5898
Lakes	1,148	0.158	1,144	0.159	0.001	0.9256
Northern Bahr el Ghazal	1,148	0.170	1,144	0.176	0.006	0.7118
Western Bahr el Ghazal	1,148	0.172	1,144	0.171	-0.000	0.9861
Western Equatoria	1,148	0.172	1,144	0.175	0.003	0.8386

*Note: All indicators were measured at baseline. * (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level.*

Table 7-46: Balancing between "training, no grant" vs. "training and grant"

		"training, no grant"		"training and grant"		N
		Mean	SD	Coeff.	SE	
Individual and household characteristics						
Age		27.570	4.691	5.594***	1.280	626
Married		0.606	0.489	0.160***	0.053	626
Employment status		0.656	0.476	0.134**	0.058	626
Business ownership		0.642	0.480	0.215***	0.049	626
Consumption food		5.390	1.150	0.908***	0.216	626
Consumption non-food		2.398	1.322	0.676***	0.137	626
Formal bank account		0.421	0.494	0.137***	0.047	626
(Log) amount formal loans		-0.338	1.756	-0.140	0.171	625
(Log) amount informal loans		-0.972	2.892	-0.522*	0.267	614
Education level	No education	0.173	0.379	-0.056	0.044	626
	Some Primary	0.308	0.462	0.078*	0.044	626
	Some Secondary	0.399	0.490	0.164***	0.046	626
	Some University or Higher	0.120	0.326	-0.002	0.029	626
Literacy	No English	0.233	0.423	-0.080*	0.042	626
	Some English	0.269	0.444	0.131***	0.041	626
	Good English	0.498	0.501	0.133**	0.056	626
Numeracy	Low	0.192	0.395	-0.022	0.036	626
	Medium	0.216	0.412	-0.006	0.040	626
	High	0.591	0.492	0.212***	0.058	626
Household size		7.058	3.215	1.648***	0.508	626
Number of children		3.171	2.239	0.628**	0.284	626
Number of elderly		0.072	0.332	0.039	0.036	626
Number of rooms		3.240	1.698	0.533***	0.191	626
Number of buildings		3.639	2.029	0.783***	0.293	626
(Log) distance to KSB branch		2.749	2.089	0.078	0.170	617
State at baseline						
Central Equatoria		0.188	0.391	0.019**	0.009	626
Eastern Equatoria		0.240	0.428	0.000***	0.000	626
Lakes		0.063	0.242	0.000***	0.000	626

Northern Bahr el Ghazal	0.125	0.331	0.178***	0.043	626
Western Bahr el Ghazal	0.091	0.288	-0.004	0.004	626
Western Equatoria	0.293	0.456	-0.009*	0.006	626

Note: Differences between treatment group participants who received that grant and those who did not using baseline characteristics. Column (1) reports mean values of baseline covariates for participants who received "training but no grant". Column (2) reports OLS estimates on receiving "training and grant" and strata fixed effect. Standard errors are clustered at boma level and reported below coefficients in parenthesis. (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level.*

Table 7-47: Attrition – difference in attrition probability between original treatment and control group

	Control mean (SD)	Treatment	N
Attrition	0.335	0.002	2,292
	(0.472)	(0.018)	

*Note: Difference in attrition probability between original treatment vs. control group, estimated with an OLS regression of the attrition dummy on the treatment dummy and strata fixed effects. Standard errors of the treatment dummy are clustered at boma level and reported in parentheses. * (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level.*

Table 7-48: Attrition – baseline difference between attritors and non-attritors

		Non-attritors		Attritors		N
		Mean	SD	Coeff.	SE	
Individual and household characteristics						
Age		27.632	4.826	-0.281	0.236	2,292
Married		0.661	0.473	-0.025	0.026	2,291
Employment status		0.619	0.486	0.004	0.020	2,292
Business ownership		0.649	0.478	0.011	0.018	2,292
Consumption food		5.405	1.170	-0.108**	0.051	2,292
Consumption non-food		2.432	1.325	0.004	0.063	2,292
Formal bank account		0.397	0.489	-0.068***	0.021	2,292
(Log) amount formal loans		-0.290	1.626	-0.183**	0.088	2,280
(Log) amount informal loans		-1.360	3.323	0.275**	0.132	2,258
Education level	No education	0.210	0.408	-0.035*	0.019	2,292
	Some Primary	0.307	0.462	0.059***	0.019	2,292
	Some Secondary	0.379	0.485	0.019	0.022	2,292
	Some University or Higher	0.104	0.305	-0.042***	0.011	2,292
Literacy	No English	0.261	0.440	-0.012	0.020	2,292
	Some English	0.286	0.452	0.003	0.020	2,292
	Good English	0.453	0.498	0.009	0.023	2,292
Numeracy	Low	0.252	0.434	-0.026	0.018	2,292
	Medium	0.173	0.378	0.028	0.017	2,292
	High	0.575	0.494	-0.002	0.020	2,292
Household size		7.384	3.342	-0.299**	0.144	2,292
Number of children		3.248	2.294	-0.211**	0.104	2,292
Number of elderly		0.098	0.344	-0.002	0.014	2,292
Number of rooms		3.179	1.691	-0.125	0.078	2,292
Number of buildings		3.611	1.989	-0.016	0.077	2,292
(Log) distance to KCB branch		2.338	1.938	0.227*	0.132	2,256
State at baseline						
Central Equatoria		0.171	0.376	0.008	0.007	2,292
Eastern Equatoria		0.154	0.361	-0.001	0.001	2,292

Lakes	0.147	0.354	0.001	0.001	2,292
Northern Bahr el Ghazal	0.175	0.380	-0.005	0.004	2,292
Western Bahr el Ghazal	0.171	0.376	-0.002	0.003	2,292
Western Equatoria	0.183	0.387	-0.001	0.003	2,292

*Note: Differences between attritors and non-attritors in baseline characteristics estimated by OLS on the attrition dummy and strata fixed effects. Standard errors are clustered at boma level. * (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level.*

Table 7-49: Attrition – baseline difference between attritors from original control vs. attritors original treatment group

		Control group		ITT group		N
		Mean	SD	Coeff.	SE	
Individual and household characteristics						
Age		27.226	5.186	0.387	0.363	769
Married		0.670	0.471	-0.026	0.031	768
Employment status		0.644	0.479	-0.050	0.036	769
Business ownership		0.670	0.471	-0.022	0.031	769
Consumption food		5.223	1.334	0.136	0.086	769
Consumption non-food		2.447	1.287	-0.043	0.099	769
Formal bank account		0.322	0.468	0.016	0.030	769
(Log) amount formal loans		-0.386	1.859	-0.176	0.148	765
(Log) amount informal loans		-1.017	2.913	-0.220	0.212	758
Education level	No education	0.190	0.393	-0.023	0.024	769
	Some Primary	0.340	0.474	0.034	0.031	769
	Some Secondary	0.410	0.493	-0.017	0.029	769
	Some University or Higher	0.060	0.237	0.006	0.015	769
Literacy	No English	0.249	0.433	-0.009	0.032	769
	Some English	0.249	0.433	0.062**	0.030	769
	Good English	0.501	0.501	-0.052	0.033	769
Numeracy	Low	0.231	0.422	-0.012	0.026	769
	Medium	0.190	0.393	0.008	0.030	769
	High	0.579	0.494	0.003	0.035	769
Household size		7.182	3.463	-0.143	0.258	769
Number of children		3.026	2.301	0.069	0.168	769
Number of elderly		0.117	0.360	-0.036	0.023	769
Number of rooms		3.091	1.784	-0.070	0.099	769
Number of buildings		3.670	1.836	-0.111	0.112	769
(Log) distance to KCB branch		0.174	0.380	-0.012	0.011	769
State at baseline						
Central Equatoria		0.169	0.375	-0.000	0.000	769
Eastern Equatoria		0.164	0.370	0.003	0.003	769

Lakes	0.174	0.380	0.008	0.007	769
Northern Bahr el Ghazal	0.148	0.356	0.000	0.004	769
Western Bahr el Ghazal	0.171	0.377	0.000	0.004	769
Western Equatoria	0.169	0.375	-0.000	0.000	769

*Note: Differences between the original control vs. ITT group in baseline characteristics estimated by OLS on the ITT group dummy and strata fixed effects. Standard errors are clustered at boma level. * (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level.*

Main outcomes

Table 7-50: Summary statistics of outcome variables for the control group

VARIABLES	N	mean	sd	min	max
Main outcomes (survey-based)					
Employment index	763	0	1	-2.314	6.401
Consumption index	763	0	1	-1.580	5.037
Savings, investment and debt index	763	0	1	-4.013	2.984
Business skills index	763	0	1	-2.971	2.569
Life satisfaction and empowerment index	763	0	1	-2.625	3.606
Risk index	763	0	1	-2.789	3.142
Trust index	763	0	1	-2.982	3.147
Crime and violence index	763	0	1	-1.214	5.667
Migration index	763	0	1	-0.838	3.740
List experiment cattle index	763	0	1	-3.360	3.095
List experiment argument index	763	0	1	-3.666	4.163

Note: Higher values of all indicators refer to higher scores in the respective outcome. For instance, higher values in the risk index imply a higher preference for risky behavior. Higher values in the list experiment cattle index imply a higher propensity to engage in cattle raiding, while higher values in the list experiment argument index imply a higher propensity to engage in arguments. Higher values of the migration index mark a higher propensity of having or planning to migrate.

Table 7-51: Intention-to-treat effects of the original intervention on main socio-economic outcomes

	(1) ITT (no controls)	(2) ITT (controls)
Main outcomes – socio-economic		
Employment index	0.063	0.066
	(0.281)	(0.249)
	[0.375]	[0.332]
Consumption index	0.094	0.088
	(0.120)	(0.145)
	[0.240]	[0.291]
Savings, investment and debt index	0.274***	0.271***
	(0.000)	(0.000)
	[0.001]	[0.001]
Business skills index	0.016	0.020
	(0.747)	(0.703)
	[0.748]	[0.703]
Observations	1,523	1,495

*Note: P-values are in parenthesis displayed below the estimated coefficients. * (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level. Adjusted Benjamini-Hochberg p-values are reported in square brackets.All regression control for gender-state fixed effects. Control variables of column (2) include all baseline controls that were significant determinants of attrition and of selection between receiving "training and grant" vs. "training, but no grant". In particular these are: age, marital status, employment status, business ownership, food consumption, non-food consumption, formal bank account, formal loans, informal loans, education level, literacy level, numeracy level, household size, number of children, number of rooms, number of buildings at baseline.*

Table 7-52: Intention-to-treat effects of the original intervention on main psychological and behavioral outcomes

	(1) ITT (no controls)	(2) ITT (controls)
Main outcomes – psychological and behavioral		
Life satisfaction and empowerment index	-0.009	0.002
	(0.845)	(0.957)
	[0.845]	[0.958]
Risk index	-0.043	-0.053
	(0.501)	(0.374)
	[0.692]	[0.523]
Trust index	-0.035	-0.058
	(0.482)	(0.252)
	[0.692]	[0.442]
Crime and violence index	-0.080	-0.089*
	(0.119)	(0.087)
	[0.343]	[0.307]
Migration index	-0.026	-0.013
	(0.593)	(0.809)
	[0.692]	[0.944]
List experiment cattle index	0.172*	0.169*
	(0.075)	(0.050)
	[0.343]	[0.307]
List experiment argument index	-0.135	-0.136
	(0.147)	(0.138)
	[0.343]	[0.322]
Observations	1,523	1,495

*Note: P-values are in parenthesis displayed below the estimated coefficients. * (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level. Adjusted Benjamini-Hochberg p-values are reported in square brackets. All regression control for gender-state fixed effects. Control variables of column (2) include all baseline controls that were significant determinants of attrition and of selection between receiving "training and grant" vs. "training, but no grant". In particular these are: age, marital status, employment status, business ownership, food consumption, non-food consumption, formal bank account, formal loans, informal loans, education level, literacy level, numeracy level, household size, number of children, number of rooms, number of buildings at baseline.*

Table 7-53: First stage results from LATE estimation for Table 7-51 and Table 7-52

		(1)	(2)	(3)	(4)	(5)	(6)
		„Training, no grant“	„Training and grant“	„Training, no grant“	„Training and grant“	„Training, no grant“	„Training and grant“
Instrument 1	Treatment	0.4226***	0.3860***	0.4200***	0.3863***	0.4837***	0.3343***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Instrument 2	Treatment x (log) distance to KCB branch	0.0517***	-0.0450***	0.0522***	-0.0439***	0.0772***	-0.0643***
		(0.002)	(0.001)	(0.003)	(0.001)	(0.000)	(0.000)
	(log) Distance to KCB branch	-0.0032	0.0050	-0.0053	0.0089	-0.0183*	0.0204***
		(0.661)	(0.454)	(0.530)	(0.224)	(0.070)	(0.004)
	Strata FE	Yes	Yes	Yes	Yes	Yes	Yes
	Individual controls	No	No	Yes	Yes	Yes	Yes
	Geography controls	No	No	No	No	Yes	Yes
	Observations	1,500	1,500	1,474	1,474	1,474	1,474

*Note: This table displays first stage results for LATE estimates of Table 11. Columns (1) and (2) correspond to LATE estimates of column (3) in Table 11. Column (3) and (4) correspond to LATE estimates in column (4) in Table 11 and columns (5) and (6) to column (5) respectively. We report the effect of our two instrumental variables – original assignment to the treatment group and its interaction with distance to the closest KCB bank branch – on our two main regressors of interest. All regression control for gender-state fixed effects and for the level effect of distance to the closest KCB bank branch. Control variables of column (3)-(6) include all baseline controls that were significant determinants of attrition and of selection between receiving "training and grant" vs. "training, but no grant". In particular these are: age, marital status, employment status, business ownership, food consumption, non-food consumption, formal bank account, formal loans, informal loans, education level, literacy level, numeracy level, household size, number of children, number of rooms, number of buildings at baseline. Column (5) and (6) also controls for geographic features since the estimation strategy relies on distance to the closest KCB bank branch, which might correlate with other geographic characteristics. Geography controls include distance to the closest city, distance to the closest road, average land gradient and their interactions with selection to the original treatment group. P-values are in parenthesis displayed below the estimated coefficients. * (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level.*

Table 7-54: Effects of the "training and grant" vs. "training, but no grant" on main socio-economic outcomes

		(1)	(2)	(3)	(4)	(5)	(6)
		TOT (no controls)	TOT (controls)	TOT (controls + geography controls)	LATE (no controls)	LATE (controls)	LATE (controls + geography controls)
Main outcomes – socio-economic							
Employment index	Training, no grant	0.087	0.086	0.080	-0.069	-0.046	0.038
		(0.149)	(0.136)	(0.431)	(0.766)	(0.832)	(0.900)
		[0.238]	[0.218]	[0.691]	[0.968]	[0.891]	[0.984]
	Training and grant	0.057	0.061	0.052	0.369	0.326	0.213
		(0.580)	(0.559)	(0.709)	(0.384)	(0.409)	(0.553)
		[0.595]	[0.665]	[0.808]	[0.655]	[0.683]	[0.984]
Consumption index	Training, no grant	0.046	0.038	0.026	-0.389**	-0.360**	-0.111
		(0.489)	(0.582)	(0.808)	(0.019)	(0.026)	(0.718)
		[0.595]	[0.665]	[0.808]	[0.071]	[0.177]	[0.984]
	Training and grant	0.178**	0.158**	0.172	1.042**	0.962**	1.002**
		(0.023)	(0.046)	(0.156)	(0.027)	(0.026)	(0.011)
		[0.046]	[0.092]	[0.313]	[0.071]	[0.177]	[0.046]
Savings, investment and debt index	Training, no grant	0.221***	0.205***	0.125	-0.166	-0.169	-0.221
		(0.000)	(0.000)	(0.151)	(0.275)	(0.286)	(0.445)
		[0.001]	[0.001]	[0.313]	[0.572]	[0.625]	[0.984]
	Training and grant	0.434***	0.420***	0.339***	1.282***	1.265***	1.120***
		(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.002)
		[0.001]	[0.001]	[0.006]	[0.006]	[0.014]	[0.017]
Business skills index	Training, no grant	-0.031	-0.021	0.025	-0.113	-0.006	0.040
		(0.594)	(0.739)	(0.806)	(0.520)	(0.974)	(0.877)
		[0.595]	[0.739]	[0.808]	[0.974]	[0.974]	[0.984]
	Training and grant	0.240***	0.222***	0.296**	0.267	0.072	-0.007
		(0.004)	(0.009)	(0.018)	(0.442)	(0.846)	(0.983)
		[0.012]	[0.025]	[0.072]	[0.968]	[0.891]	[0.984]
Observations		1,523	1,495	1,474	1,500	1,474	1,474

F-stat	23.88	21.43	44.04

*Note: P-values are in parenthesis displayed below the estimated coefficients. * (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level. Adjusted Benjamini-Hochberg p-values are reported in square brackets. All regression control for gender-state fixed effects. Control variables of column (2) include all baseline controls that were significant determinants of attrition and of selection between receiving "training and grant" vs. "training, but no grant". In particular these are: age, marital status, employment status, business ownership, food consumption, non-food consumption, formal bank account, formal loans, informal loans, education level, literacy level, numeracy level, household size, number of children, number of rooms, number of buildings at baseline. Column (3) also controls for geographic features since the estimation strategy relies on distance to the closest KCB bank branch which might correlate with other geographic characteristics. Geography controls include distance to the closest city, distance to the closest road, average land gradient and their respective interactions with selection to the original treatment group.*

Table 7-55: Effects of the "training and grant" vs. "training, but no grant" on main psychological and behavioral outcomes

		(1) TOT (no controls)	(2) TOT (controls)	(3) TOT (controls + geography controls)	(4) LATE (no controls)	(5) LATE (controls)	(5) LATE (controls + geography controls)
	Main outcomes – psychological and behavioural						
Life satisfaction and empowerment index	Training, no grant	0.029	0.035	0.127	-0.238	-0.085	0.194
		(0.585)	(0.488)	(0.140)	(0.151)	(0.589)	(0.381)
		[0.745]	[0.621]	[0.326]	[0.389]	[0.754]	[0.667]
	Training and grant	0.027	-0.014	0.071	0.397	0.146	0.775**
		(0.716)	(0.851)	(0.456)	(0.229)	(0.636)	(0.011)
		[0.795]	[0.917]	[0.640]	[0.389]	[0.754]	[0.151]
Risk index	Training, no grant	0.016	-0.000	0.105	-0.441	-0.403	-0.121
		(0.839)	(0.997)	(0.329)	(0.103)	(0.109)	(0.772)
		[0.840]	[0.997]	[0.640]	[0.389]	[0.382]	[0.772]
	Training and grant	-0.068	-0.077	0.033	0.702	0.592	0.696*
		(0.365)	(0.321)	(0.740)	(0.194)	(0.241)	(0.086)
		[0.640]	[0.463]	[0.807]	[0.389]	[0.483]	[0.300]
Trust index	Training, no grant	-0.077	-0.097	-0.037	-0.020	-0.014	-0.474*
		(0.182)	(0.102)	(0.749)	(0.920)	(0.947)	(0.083)
		[0.365]	[0.377]	[0.807]	[0.921]	[0.9467]	[0.300]
	Training and grant	0.128	0.129	0.197	-0.098	-0.171	-0.284
		(0.122)	(0.115)	(0.120)	(0.792)	(0.666)	(0.439)
		[0.365]	[0.377]	[0.326]	[0.853]	[0.754]	[0.684]
Crime and violence index	Training, no grant	-0.051	-0.061	0.007	-0.470*	-0.557*	-0.310
		(0.414)	(0.330)	(0.927)	(0.100)	(0.063)	(0.313)
		[0.645]	[0.463]	[0.927]	[0.389]	[0.382]	[0.627]
	Training and grant	-0.104	-0.103	-0.073	0.578	0.701	0.410
		(0.170)	(0.188)	(0.456)	(0.250)	(0.180)	(0.266)
		[0.365]	[0.377]	[0.640]	[0.389]	[0.421]	[0.620]
		-0.080	-0.077	-0.149*	-0.258	-0.301	-0.318

Migration index	Training, no grant	(0.150)	(0.175)	(0.094)	(0.119)	(0.102)	(0.228)
		[0.365]	[0.377]	[0.326]	[0.389]	[0.382]	[0.620]
	Training and grant	0.029	0.020	-0.043	0.449	0.568	0.152
		(0.738)	(0.803)	(0.671)	(0.223)	(0.148)	(0.623)
		[0.795]	[0.917]	[0.807]	[0.389]	[0.414]	[0.727]
List experiment cattle index	Training, no grant	0.207*	0.222**	0.249**	0.108	0.113	0.175
		(0.052)	(0.040)	(0.026)	(0.666)	(0.687)	(0.536)
		[0.365]	[0.377]	[0.326]	[0.777]	[0.754]	[0.727]
	Training and grant	-0.089	-0.103	-0.080	0.410	0.393	0.325
		(0.565)	(0.215)	(0.375)	(0.457)	(0.518)	(0.589)
		[0.745]	[0.377]	[0.640]	[0.582]	[0.754]	[0.727]
List experiment argument index	Training, no grant	-0.157	-0.132	-0.169*	-0.431*	-0.340*	-0.342*
		(0.112)	(0.183)	(0.094)	(0.060)	(0.090)	(0.081)
		[0.365]	[0.377]	[0.326]	[0.389]	[0.382]	[0.300]
	Training and grant	-0.224	-0.260	-0.242	0.400	0.189	0.153
		(0.148)	(0.114)	(0.134)	(0.432)	(0.700)	(0.754)
		[0.365]	[0.377]	[0.326]	[0-582]	[0.754]	[0.772]
Observations		1,523	1,495	1,474	1,500	1,474	1,474
F-stat					23.88	21.43	44.04

*Note: P-values are in parenthesis displayed below the estimated coefficients. * (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level. Adjusted Benjamini-Hochberg p-values are reported in square brackets. All regression control for gender-state fixed effects. Control variables of column (2) include all baseline controls that were significant determinants of attrition and of selection between receiving "training and grant" vs. "training, but no grant". In particular these are: age, marital status, employment status, business ownership, food consumption, non-food consumption, formal bank account, formal loans, informal loans, education level, literacy level, numeracy level, household size, number of children, number of rooms, number of buildings at baseline. Column (3) also controls for geographic features since the estimation strategy relies on distance to the closest KCB bank branch which might correlate with other geographic characteristics. Geography controls include distance to the closest city, distance to the closest road, average land gradient and their respective interactions with selection to the original treatment group.*

Robustness Checks Tables

Table 7-56: Lee bounds for the intention-to-treat effects on main socio-economic outcomes

	(1) Lower bound	(2) Upper bound
Main outcomes – socio-economic		
Employment index	0.045	0.047
	(0.610)	(0.810)
Consumption index	0.093	0.098
	(0.173)	(0.538)
Savings, investment and debt index	0.261**	0.268**
	(0.031)	(0.047)
Business skills index	0.007	0.009
	(0.942)	(0.926)
Observations	2292	

*Note: Outcome variables are listed on the left. Column (1) reports the lower bound. Column (2) reports the upper bound. P-values are in parenthesis displayed below the estimated coefficients. * (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level.*

Table 7-57: Lee bounds for the intention-to-treat effects on main psychological and behavioral outcomes

	(1)	(2)
	Lower bound	Upper bound
Main outcomes (survey-based) – psychological and behavioral		
Life satisfaction and empowerment index	-0.005	-0.002
	(0.961)	(0.989)
Risk index	-0.052	-0.049
	(0.595)	(0.645)
Trust index	-0.055	-0.050
	(0.590)	(0.641)
Crime and violence index	-0.253***	-0.105
	(0.000)	(0.553)
Migration index	-0.027	-0.027
	(0.641)	(0.826)
Observations	2292	

*Note: Outcome variables are listed on the left. Column (1) reports the lower bound. Column (2) reports the upper bound. P-values are in parenthesis displayed below the estimated coefficients. * (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level.*

Table 7-58: Weighted intention-to-treat effects of the original intervention on main socio-economic outcomes

	(1) ITT (no controls)	(2) ITT (controls)
Main outcomes – socio-economic		
Employment index	0.065	0.073
	(0.285)	(0.225)
Consumption index	0.095	0.096
	(0.146)	(0.139)
Savings, investment and debt index	0.266***	0.264***
	(0.000)	(0.000)
Business skills index	0.012	0.020
	(0.814)	(0.711)
Observations	1523	1507

*Note: Observations are weighted by their inverse likelihood to be in the final sample, based on who was easy to reach during the phone survey. All regression control for gender-state fixed effects. Control variables of column (2) include all baseline controls that were significant determinants of attrition and of selection between receiving "training and grant" vs. "training, but no grant". In particular these are: age, marital status, employment status, business ownership, food consumption, non-food consumption, formal bank account, formal loans, informal loans, education level, literacy level, numeracy level, household size, number of children, number of rooms, number of buildings at baseline. P-values are in parenthesis displayed below the estimated coefficients. * (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level.*

Table 7-59: Weighted intention-to-treat effects of the original intervention on main psychological and behavioral outcomes

	(1) ITT (no controls)	(2) ITT (controls)
Main outcomes – psychological and behavioral		
Life satisfaction and empowerment index	-0.036	-0.022
	(0.476)	(0.649)
Risk index	-0.054	-0.065
	(0.394)	(0.273)
Trust index	-0.013	-0.036
	(0.811)	(0.520)
Crime and violence index	-0.110**	-0.119**
	(0.029)	(0.023)
Migration index	-0.045	-0.034
	(0.363)	(0.520)
List experiment cattle index	0.215**	0.209**
	(0.034)	(0.038)
List experiment argument index	-0.125	-0.125
	(0.179)	(0.186)
Observations	1523	1507

*Note: Observations are weighted by their inverse likelihood to be in the final sample, based on who was easy to reach during the phone survey. All regression control for gender-state fixed effects. Control variables of column (2) include all baseline controls that were significant determinants of attrition and of selection between receiving "training and grant" vs. "training, but no grant". In particular these are: age, marital status, employment status, business ownership, food consumption, non-food consumption, formal bank account, formal loans, informal loans, education level, literacy level, numeracy level, household size, number of children, number of rooms, number of buildings at baseline. P-values are in parenthesis displayed below the estimated coefficients. * (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level.*

Table 7-60: Weighted TOT and ATE estimates of the "training and grant" vs. "training, but no grant"

		(1) TOT (no controls)	(2) TOT (controls)	(3) TOT (controls + geography controls)	(4) LATE (no controls)	(5) LATE (controls)	(6) LATE (controls + geography controls)
	Main outcomes – socio-economic						
Employment index	Training, no grant	0.090	0.094*	0.058	-0.011	0.020	-0.024
		(0.126)	(0.097)	(0.597)	(0.957)	(0.923)	(0.934)
	Training and grant	0.040	0.049	0.017	0.277	0.237	0.135
		(0.717)	(0.665)	(0.913)	(0.506)	(0.545)	(0.721)
Consumption index	Training, no grant	0.009	0.005	-0.059	-0.434**	-0.385**	-0.270
		(0.889)	(0.943)	(0.610)	(0.019)	(0.035)	(0.391)
	Training and grant	0.194**	0.176**	0.136	1.145**	1.047**	1.022**
		(0.029)	(0.049)	(0.330)	(0.026)	(0.025)	(0.018)
Savings, investment and debt index	Training, no grant	0.200***	0.185***	0.106	-0.194	-0.200	-0.289
		(0.000)	(0.001)	(0.209)	(0.219)	(0.236)	(0.315)
	Training and grant	0.460***	0.443***	0.358***	1.349***	1.335***	1.137***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)
Business skills index	Training, no grant	-0.038	-0.024	0.043	-0.122	-0.008	0.107
		(0.524)	(0.701)	(0.686)	(0.528)	(0.969)	(0.701)
	Training and grant	0.294***	0.276***	0.368***	0.275	0.078	0.037
		(0.000)	(0.001)	(0.005)	(0.453)	(0.844)	(0.921)
Observations		1,500	1,495	1,474	1,500	1,474	1,474
F-stat					20.62	18.22	34.41

Note: Observations are weighted by their inverse likelihood to be in the final sample, based on who was easy to reach during the phone survey. All regression control for gender-state fixed effects. Control variables of column (2) include all baseline controls that were significant determinants of attrition and of selection between receiving "training and grant" vs. "training, but no grant". In particular these are: age, marital status, employment status, business ownership, food consumption, non-food consumption, formal bank account, formal loans, informal loans, education level, literacy level, numeracy level, household size, number of children, number of rooms, number of buildings at baseline. Column (3) also controls for geographic features since the estimation strategy relies on distance to the closest KCB bank branch which might correlate with other geographic characteristics. Geography controls include distance to the closest city, distance to the closest road, average land gradient and their respective interactions with selection to the original treatment group. P-values are in parenthesis displayed

*below the estimated coefficients. * (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level.*

Table 7-61: Weighted TOT and ATE estimates of the "training and grant" vs. "training, but no grant" on main outcomes

		(1) TOT (no controls)	(2) TOT (controls)	(3) TOT (controls + geography controls)	(4) LATE (no controls)	(5) LATE (controls)	(6) LATE (controls + geography controls)
Main outcomes (survey-based) – psychological and behavioral							
Life satisfaction and empowerment index	Training, no grant	0.018	0.020	0.112	-0.285	-0.106	0.183
		(0.751)	(0.700)	(0.212)	(0.115)	(0.560)	(0.421)
	Training and grant	-0.005	-0.044	0.054	0.400	0.109	0.793**
		(0.945)	(0.556)	(0.570)	(0.268)	(0.753)	(0.015)
Risk index	Training, no grant	0.007	-0.015	0.054	-0.425	-0.368	-0.161
		(0.925)	(0.854)	(0.624)	(0.127)	(0.162)	(0.685)
	Training and grant	-0.097	-0.107	-0.028	0.625	0.472	0.585
		(0.211)	(0.176)	(0.782)	(0.264)	(0.363)	(0.167)
Trust index	Training, no grant	-0.059	-0.076	-0.015	-0.070	-0.070	-0.477*
		(0.337)	(0.233)	(0.897)	(0.752)	(0.764)	(0.077)
	Training and grant	0.174**	0.173**	0.251**	0.072	0.009	0.002
		(0.041)	(0.038)	(0.042)	(0.856)	(0.983)	(0.997)
Crime and violence index	Training, no grant	-0.094	-0.105*	-0.030	-0.514*	-0.606*	-0.275
		(0.118)	(0.091)	(0.713)	(0.097)	(0.066)	(0.412)
	Training and grant	-0.123*	-0.128*	-0.095	0.557	0.692	0.436
		(0.091)	(0.085)	(0.302)	(0.290)	(0.211)	(0.275)
Migration index	Training, no grant	-0.083	-0.083	-0.133	-0.246	-0.296	-0.387
		(0.125)	(0.136)	(0.115)	(0.183)	(0.146)	(0.169)
	Training and grant	-0.006	-0.014	-0.064	0.355	0.484	0.009
		(0.947)	(0.856)	(0.491)	(0.369)	(0.251)	(0.980)
List experiment cattle index	Training, no grant	0.247**	0.257**	0.282**	0.108	0.113	0.175
		(0.021)	(0.031)	(0.020)	(0.666)	(0.687)	(0.536)
	Training and grant	-0.032	-0.045	-0.018	0.410	0.393	0.325
		(0.832)	(0.589)	(0.843)	(0.457)	(0.518)	(0.589)

List experiment argument index	Training, no grant	-0.134	-0.113	-0.152	-0.431*	-0.340*	-0.342*
		(0.190)	(0.288)	(0.157)	(0.060)	(0.090)	(0.081)
	Training and grant	-0.208	-0.239	-0.217	0.400	0.189	0.153
		(0.186)	(0.154)	(0.188)	(0.432)	(0.700)	(0.754)
Observations		1,500	1495	1474	1,500	1,474	1,474
F-stat					20.62	18.22	34.41

*Note: Observations are weighted by their inverse likelihood to be in the final sample, based on who was easy to reach during the phone survey. All regression control for gender-state fixed effects. Control variables of column (2) include all baseline controls that were significant determinants of attrition and of selection between receiving "training and grant" vs. "training, but no grant". In particular these are: age, marital status, employment status, business ownership, food consumption, non-food consumption, formal bank account, formal loans, informal loans, education level, literacy level, numeracy level, household size, number of children, number of rooms, number of buildings at baseline. Column (3) also controls for geographic features since the estimation strategy relies on distance to the closest KCB bank branch which might correlate with other geographic characteristics. Geography controls include distance to the closest city, distance to the closest road, average land gradient and their respective interactions with selection to the original treatment group. P-values are in parenthesis displayed below the estimated coefficients. * (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level.*

Gender heterogeneity

Table 7-62: Intention-to-treat effects of the original intervention on main socio-economic outcomes by gender

	(1)	(2)	(3)	(4)	(5)
	ITT for males		**ITT for females**		Coefficient
	(no controls)	(controls)	(no controls)	(controls)	equality (2) vs. (4)
Main outcomes – socio-economic					
Employment index	0.034	0.019	0.080	0.083	0.064
	(0.764)	(0.856)	(0.203)	(0.181)	(0.591)
Consumption index	0.056	0.029	0.116*	0.115	0.086
	(0.574)	(0.777)	(0.098)	(0.101)	(0.456)
Savings, investment and debt index	0.387***	0.349***	0.210***	0.210***	-0.139
	(0.000)	(0.000)	(0.001)	(0.001)	(0.172)
Business skills index	0.082	0.092	-0.022	-0.021	-0.113
	(0.263)	(0.232)	(0.736)	(0.753)	(0.245)
Observations	555	547	968	948	

*Note: P-values are in parenthesis displayed below the estimated coefficients. * (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level. All regression control for gender-state fixed effects. Control variables of column (2) include all baseline controls that were significant determinants of attrition and of selection between receiving "training and grant" vs. "training, but no grant". In particular these are: age, marital status, employment status, business ownership, food consumption, non-food consumption, formal bank account, formal loans, informal loans, education level, literacy level, numeracy level, household size, number of children, number of rooms, number of buildings at baseline. Column (5) reports tests for coefficient equality between estimates from males and females in column (2) and (4). Displayed are differences of coefficient p-values of the test in parenthesis.*

Table 7-63: Intention-to-treat effects of the original intervention on main psychological and behavioral outcomes by gender

	(1)	(2)	(3)	(4)	(5)
	ITT for males		ITT for females		Coefficient
	(no controls)	(controls)	(no controls)	(controls)	equality (2) vs. (4)
Main outcomes – psychological and behavioral					
Life satisfaction and empowerment index	0.099	0.081	-0.071	-0.046	-0.127
	(0.204)	(0.298)	(0.216)	(0.401)	(0.181)
Risk index	0.004	-0.006	-0.069	-0.061	-0.055
	(0.960)	(0.940)	(0.391)	(0.436)	(0.586)
Trust index	0.038	-0.005	-0.076	-0.110	-0.105
	(0.653)	(0.958)	(0.235)	(0.101)	(0.375)
Crime and violence index	0.007	0.006	-0.129**	-0.150**	-0.156*
	(0.939)	(0.939)	(0.024)	(0.012)	(0.093)
Migration index	-0.050	-0.004	-0.013	-0.015	-0.011
	(0.478)	(0.960)	(0.845)	(0.827)	(0.917)
Main outcomes (experiments) – psychological and behavioral					
List experiment cattle index	0.269*	0.259	0.108	0.117	-0.142
	(0.094)	(0.168)	(0.382)	(0.206)	(0.506)
	0.140	0.135	-0.303**	-0.315**	-0.450**

List experiment argument index	(0.378)	(0.419)	(0.017)	(0.011)	(0.033)
Observations	555	547	968	948	

*Note: P-values are in parenthesis displayed below the estimated coefficients. * (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level. All regression control for gender-state fixed effects. Control variables of column (2) include all baseline controls that were significant determinants of attrition and of selection between receiving "training and grant" vs. "training, but no grant". In particular these are: age, marital status, employment status, business ownership, food consumption, non-food consumption, formal bank account, formal loans, informal loans, education level, literacy level, numeracy level, household size, number of children, number of rooms, number of buildings at baseline. Column (5) reports tests for coefficient equality between estimates from males and females in column (2) and (4). Displayed are differences of coefficient p-values of the test in parenthesis.*

Table 7-64: Effects of the "training and grant" vs. "training, but no grant" on main socio-economic outcomes by gender

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
		TOT for males			**LATE for males**			**TOT for females**			**LATE for females**			
		(no controls)	(controls)	(controls + geo controls)	(no controls)	(controls)	(controls + geo controls)	(no controls)	(controls)	(controls + geo controls)	(no controls)	(controls)	(controls + geo controls)	Coeff equality (6) vs. (12)
Main outcomes – socio-economic														
Employment index	Training, no grant	-0.025	-0.063	-0.410*	0.105	0.007	-0.517	0.145**	0.151**	0.272***	-0.131	-0.053	0.449	0.967
		(0.850)	(0.604)	(0.070)	(0.781)	(0.984)	(0.435)	(0.017)	(0.011)	(0.010)	(0.581)	(0.799)	(0.144)	(0.171)
	Training and grant	-0.095	-0.104	-0.467*	-0.040	0.053	-0.399	0.158	0.168	0.285*	0.637	0.468	0.734	1.133
		(0.542)	(0.492)	(0.074)	(0.952)	(0.929)	(0.480)	(0.258)	(0.231)	(0.087)	(0.191)	(0.287)	(0.109)	(0.123)
Consumption index	Training, no grant	0.069	0.058	0.182	-0.323	-0.327	0.340	0.032	0.022	-0.064	-0.374*	-0.321	-0.516	-0.855
		(0.524)	(0.607)	(0.331)	(0.307)	(0.319)	(0.469)	(0.674)	(0.786)	(0.645)	(0.067)	(0.118)	(0.261)	(0.223)
	Training and grant	0.058	0.029	0.161	0.616	0.541	0.812*	0.264***	0.251**	0.249*	1.241**	1.135**	0.842*	0.031
		(0.623)	(0.808)	(0.477)	(0.302)	(0.349)	(0.092)	(0.008)	(0.011)	(0.052)	(0.025)	(0.033)	(0.083)	(0.964)
Savings, investment and debt index	Training, no grant	0.373***	0.303***	0.116	-0.429	-0.449	-0.565	0.140**	0.137**	0.105	-0.049	-0.022	-0.282	0.283
		(0.001)	(0.006)	(0.443)	(0.203)	(0.174)	(0.199)	(0.014)	(0.018)	(0.342)	(0.768)	(0.893)	(0.428)	(0.584)
	Training and grant	0.408***	0.389***	0.206	1.715***	1.600***	1.021**	0.460***	0.439***	0.422***	0.975**	0.908**	0.927*	-0.094
		(0.002)	(0.001)	(0.208)	(0.008)	(0.007)	(0.029)	(0.000)	(0.000)	(0.001)	(0.013)	(0.022)	(0.064)	(0.890)
		0.042	0.025	0.083	-0.046	-0.042	0.554	-0.070	-0.056	-0.008	-0.167	-0.028	0.071	-0.483

Business skills index	Training, no grant	(0.660)	(0.795)	(0.619)	(0.895)	(0.915)	(0.172)	(0.313)	(0.441)	(0.947)	(0.406)	(0.900)	(0.872)	(0.450)
	Training and grant	0.285**	0.292**	0.352**	0.340	0.338	0.132	0.212*	0.185	0.272*	0.250	-0.049	0.242	0.110
		(0.019)	(0.022)	(0.044)	(0.551)	(0.580)	(0.839)	(0.061)	(0.102)	(0.071)	(0.584)	(0.917)	(0.630)	(0.909)
Observations		555	547	541	547	541	541	968	948	933	953	933	933	
F-stat					8.410	7.772	18.73				17.84	16.86	26.36	

*Note: P-values are in parenthesis displayed below the estimated coefficients. * (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level. All regressions control for gender-state fixed effects. Control variables of column (2) include all baseline controls that were significant determinants of attrition and of selection between receiving "training and grant" vs. "training, but no grant". In particular these are: age, marital status, employment status, business ownership, food consumption, non-food consumption, formal bank account, formal loans, informal loans, education level, literacy level, numeracy level, household size, number of children, number of rooms, number of buildings at baseline. Column (3) also controls for geographic features since the estimation strategy relies on distance to the closest KCB bank branch, which might correlate with other geographic characteristics. Geography controls include: distance to the closest city, distance to the closest road, average land gradient and their respective interactions with selection to the original treatment group. Column (13) reports tests for coefficient equality between estimates from males and females in column (6) and (12). Displayed are differences of coefficient p-values of the test in parenthesis.*

Table 7-65: Effects of the "training and grant" vs. "training, but no grant" on main psychological and behavioral outcomes by gender.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
		TOT for males			**LATE for males**			**TOT for females**			**LATE for females**			Coeff equality (6) vs. (12)
		(no controls)	(controls)	(controls + geo controls)	(no controls)	(controls)	(controls + geo controls)	(no controls)	(controls)	(controls + geo controls)	(no controls)	(controls)	(controls + geo controls)	
Main outcomes – psychological and behavioral (survey-based)														
Life satisfaction and empowerment index	Training, no grant	0.108	0.078	0.165	-0.013	0.083	-0.153	-0.012	0.011	0.128	-0.370**	-0.158	0.295	0.447
		(0.303)	(0.478)	(0.379)	(0.969)	(0.814)	(0.734)	(0.814)	(0.825)	(0.149)	(0.042)	(0.330)	(0.427)	(0.514)
	Training and grant	0.154	0.123	0.170	0.257	0.089	0.489	-0.059	-0.100	0.010	0.527	0.147	0.767*	0.279
		(0.146)	(0.222)	(0.265)	(0.618)	(0.863)	(0.254)	(0.538)	(0.290)	(0.930)	(0.290)	(0.729)	(0.074)	(0.676)
Risk index	Training, no grant	-0.117	-0.122	-0.151	-0.371	-0.427	0.250	0.088	0.077	0.208	-0.470	-0.373	-0.493	-0.743
		(0.197)	(0.223)	(0.327)	(0.306)	(0.249)	(0.594)	(0.389)	(0.490)	(0.117)	(0.113)	(0.144)	(0.367)	(0.176)
	Training and grant	0.087	0.068	0.066	0.577	0.611	0.498	-0.186**	-0.170*	-0.031	0.792	0.628	0.708*	0.209
		(0.468)	(0.561)	(0.665)	(0.333)	(0.310)	(0.289)	(0.044)	(0.078)	(0.803)	(0.235)	(0.287)	(0.092)	(0.712)
Trust index	Training, no grant	-0.001	-0.062	0.211	-0.095	-0.135	0.409	-0.117*	-0.133*	-0.110	-0.012	-0.032	-0.915***	-1.324**
		(0.992)	(0.558)	(0.355)	(0.792)	(0.723)	(0.462)	(0.096)	(0.081)	(0.381)	(0.948)	(0.862)	(0.006)	(0.045)
	Training and grant	0.257**	0.238*	0.492**	0.210	0.183	0.691	0.041	0.031	0.045	-0.277	-0.350	-0.855*	-1.546**
		(0.047)	(0.074)	(0.030)	(0.679)	(0.724)	(0.228)	(0.716)	(0.768)	(0.755)	(0.557)	(0.468)	(0.060)	(0.033)
		0.093	0.083	-0.014	-0.371	-0.428	-0.319	-0.127**	-0.149**	-0.039	-0.543*	-0.661**	-0.608	-0.288

Crime and violence index	Training, no grant	(0.499)	(0.504)	(0.946)	(0.332)	(0.311)	(0.550)	(0.034)	(0.020)	(0.697)	(0.092)	(0.046)	(0.124)	(0.643)
	Training and grant	-0.180	-0.177	-0.260	0.625	0.653	0.379	-0.042	-0.047	0.007	0.614	0.813	0.182	-0.197
		(0.126)	(0.160)	(0.222)	(0.324)	(0.294)	(0.478)	(0.663)	(0.634)	(0.947)	(0.340)	(0.231)	(0.680)	(0.771)
Migration index	Training, no grant	-0.147*	-0.097	-0.212	0.048	0.012	0.154	-0.045	-0.061	-0.114	-0.376**	-0.432**	-0.652	-0.806
		(0.081)	(0.290)	(0.153)	(0.866)	(0.970)	(0.748)	(0.552)	(0.408)	(0.314)	(0.040)	(0.025)	(0.102)	(0.239)
	Training and grant	0.051	0.046	-0.068	-0.181	-0.014	-0.041	0.009	0.005	-0.033	0.835	0.949*	0.134	0.175
		(0.653)	(0.692)	(0.659)	(0.693)	(0.977)	(0.924)	(0.937)	(0.959)	(0.787)	(0.126)	(0.088)	(0.768)	(0.798)
Main outcomes – psychological and behavioral (experimental)														
List experiment cattle index	Training, no grant	0.111	0.129	0.145	-0.577	-0.612	-0.619	0.097	0.124	0.142*	0.360	0.435	0.496	1.115
		(0.227)	(0.186)	(0.140)	(0.325)	(0.335)	(0.417)	(0.363)	(0.204)	(0.088)	(0.197)	(0.201)	(0.152)	(0.207)
	Training and grant	-0.184	-0.197***	-0.183**	1.745*	1.743	2.101*	-0.148	-0.175	-0.135	-0.403	-0.476	-0.558	-2.659*
		(0.239)	(0.009)	(0.015)	(0.078)	(0.103)	(0.096)	(0.497)	(0.141)	(0.180)	(0.579)	(0.563)	(0.498)	(0.092)
List experiment argument index	Training, no grant	-0.020	-0.003	-0.031	-1.133	-0.786	-0.473	0.009	0.021	-0.013	-0.322	-0.292	-0.251	0.222
		(0.798)	(0.966)	(0.697)	(0.139)	(0.295)	(0.404)	(0.906)	(0.783)	(0.873)	(0.124)	(0.202)	(0.255)	(0.738)
	Training and grant	-0.088	-0.132	-0.105	2.195**	1.660	1.307	-0.217	-0.247	-0.182	-0.512	-0.659	-0.747	-2.054*
		(0.506)	(0.339)	(0.449)	(0.044)	(0.111)	(0.140)	(0.249)	(0.208)	(0.352)	(0.372)	(0.318)	(0.269)	(0.079)
Observations		555	547	541	547	541	541	968	948	933	953	933	933	
F-stat					8.410	7.772	18.73				17.84	16.86	26.36	

*Note: P-values are in parenthesis displayed below the estimated coefficients. * (**, ***) indicates statistical significance at the ten-percent (five-percent, one-percent) level. All regression control for gender-state fixed effects. Control variables of column (2) include all baseline controls that were significant determinants of attrition and of selection between receiving "training and grant" vs. "training, but no grant". In particular these are: age, marital status, employment status, business ownership, food consumption, non-food consumption, formal bank account, formal loans, informal loans, education level, literacy level, numeracy level, household size, number of children, number of rooms, number of buildings at baseline. Column (3) also controls for geographic features since the estimation strategy relies on distance to the closest KCB bank branch which might correlate with other geographic characteristics. Geography controls include distance to the closest city, distance to the closest road, average land gradient and their respective interactions with selection to the original treatment group. Column (13) reports tests for coefficient equality between estimates from males and females in column (6) and (12). Displayed are differences of coefficient p-values of the test in parenthesis.*

H. Displacement Data

Forced displacement in South Sudan is studied using surveys on IDPs, refugees and urban residents. Displacement profiles for South Sudan are drawn using data from the Crisis Recovery Survey (CRS) 2017 for IDPs, and the Skills Profile Survey (SPS) 2017 for refugees in Ethiopia. Displaced populations are also compared to urban resident populations in seven of the ten pre-war states of South Sudan, using the High Frequency Survey (HFS) 2017.[257] Comparisons are drawn among IDPs, refugees and urban residents to draw the differences between the displaced and non-displaced. Heterogeneity among IDPs is analyzed using sub-groups based on the gender of the household head, the camp where the IDPs are located, and the consumption quintiles, for household level outcomes (Table 7-66). Gender and age cuts are made for analysis at the individual level.

Table 7-66: Heterogeneity among IDP households

Comparison Group	Percentage of CRS sample
Man-headed household	54
Woman-headed household	46
Bentiu POC	40
Bor POC	2
Juba POC	37
Wau POC	21
Poorest quintile	20
Quintile 2	20
Quintile 3	20
Quintile 4	20
Richest quintile	20

Source: Authors' calculations using CRS 2017.

Crisis Recovery Survey, South Sudan[258]

Sample design

South Sudan is a fragile country with several security constraints for field work. The sampling methodology was adapted to the context by excluding several inaccessible areas. The Crisis Recovery

[257] For High Frequency Survey South Sudan, see Appendix A.

[258] This appendix covers sample design, weights and the questionnaire for the CRS. The Consumption Aggregation, Labor Statistics, Literacy and Educational Attainment and Tables for Cleaning Rules for the CRS are identical to the HFS. See Appendix A.

Survey was designed to be representative at the camp-level for protection of civilian (POC) camps. Databases and registries for IDP camps are often outdated given the widespread and continuing displacement. Satellite imagery of the camps was therefore used as the sampling frame. Four of the largest POC camps with defined boundaries were selected. Visible camp boundaries were essential to identify how many households were in each camp. The four camps are Bentiu POC, Bor POC, Juba POC and Wau POC, located in the pre-war states of Upper Nile, Jonglei, Central Equatoria and Western Bahr el Ghazal respectively. All the four camps are in urban areas.

The sample follows a stratified two-stage clustered design. Within each stratum, the primary sampling unit is the Enumeration Area (EA) and within each EA, 12 households were selected as the unit of observation. Each camp was selected as a stratum, with a target of 600 interviews per stratum. Satellite imagery of the camps was used to determine the number of structures in the camp. The strata were divided into EAs and from each stratum, 50 EAs were selected proportional to size. Each EA was further divided into 12 blocks. One structure was selected per block, and if the structure had more than one household, one household was selected from the structure for interview. Thus, 12 households were interviewed per EA. The exception was Bor POC, where a census was conducted as there were only 611 households and 8 EAs in the camp (Table 7-67)

Table 7-67: Sample characteristics: Crisis Recovery Survey South Sudan

	Overall	Bentiu POC	Bor POC	Juba POC	Wau POC
Sample size (households)	2396	597	611	589	599
Covered households	31093	12414	611	11463	6605
Sample size (individuals)	12571	3832	2474	2479	3786
Covered individuals	173339	80321	2474	48895	41649
Number of EAs	158	50	8	50	50

Source: Authors' calculations using CRS 2017.

Along with satellite imagery, a micro-listing approach was employed to maximize accuracy of the sampling frame. After identifying strata, EAs and blocks using satellite imagery, enumerators conducted a micro-listing of the block, counting and listing the number of structures in the block. One of the structures was then randomly selected (using the CAPI software). If the structure had only one household, the household was interviewed. If the structure had more than one household, the enumerator listed the number of households in the structure, and one household was randomly selected (by the CAPI software) for interview.

Sampling weights

Sampling weights are used to make sampled observations representative of the entire survey population. Observations from all camps were weighted with the exception of Bor POC, the smallest camp, where a census was conducted. The sampling weight is the inverse probability of selection. The selection probability P for a household can be decomposed into the selection probability P_1 of the EA and the selection probability P_2 of the household within the EA:

$$P = P_1 P_2$$

The selection probability P_1 of an EA k is calculated as the number of households within the EA divided by the number of households within the stratum multiplied by the number of selected EAs in the stratum:

$$P_1 = \frac{|K|\hat{n}_k}{\sum_{k \in K} \hat{n}_k}$$

where $\hat{n}_k$ denotes the number of households in EA k estimated using satellite imagery data and K is the set of EAs selected in the corresponding stratum.

The selection probability P_2 for a household within an EA k is constant across households and can be expressed as:

$$P_2 = \frac{|H|}{n_k}$$

where $|H|$ is the number of households selected in the EA and n_k denoting the number of listed households in EA k based on the micro-listing. For each EA, 12 households were interviewed.

Sampling weights were scaled to equal the number of households per strata using the satellite imagery data. Thus, the sampling weight W can be written as:

$$W = \frac{c}{P} \text{ with } c = \frac{\sum_{k \in K} \hat{n}_k}{\sum_{k \in K} n_k}$$

Questionnaire

The CRS and HFS were designed to be comparable. The questionnaire design is identical. Modules on food, non-food, and durable goods are used to compute consumption based poverty statistics. Modules on household and individual characteristics are used to chart demographic characteristics like age, sex, and dependency ratios, as well as education and labor outcomes. Modules on welfare include living standard based on access to services as well as respondents' sense of wellbeing and opinions. In addition, households identified as displaced have a section on displacement, guided by the IASC framework, to understand reasons for displacement, return intentions, sense of security, relations with the surrounding community and a variety of pre-displacement outcomes in the standard of living, education and labor.[259]

[259] The Brookings Institution – University of Bern Project on Internal Displacement. April 2010. "IASC Framework on Durable Solutions for Internally Displaced Persons."

Skills Profile Survey, Ethiopia

Sample design

Outcomes of South Sudanese refugees in Ethiopia are analyzed using the Skills Profile Survey (SPS). The SPS is a household survey administered in and around refugee camps in Ethiopia in 2017. It surveyed South Sudanese, Somali, Eritrean and Sudanese refugees in Ethiopia, and the Ethiopian host communities located close to the refugee camps. About 33 percent of refugee households[260] in Ethiopia are outside camps, and are primarily Eritrean. These households were excluded from the sampling frame due to feasibility constraints. The SPS is therefore only representative of refugees living in camps. The list of refugee camps, sites and locations provided by UNHCR-Ethiopia as of January 2017 was used as the sample frame (Table 7-68). Four strata were drawn based on four regions Tigray Afar (primarily Eritrean refugees), Gambella (primarily South Sudanese), Benishangul Gumuz (primarily Sudanese, with a quarter of South Sudanese), and Somali (primarily Somali). While South Sudanese refugees mostly populate the Gambella region, they are also present in Benishangul Gumuz (Table 7-69). Since each region hosts a majority of one refugee nationality, the stratification is implicitly based on refugee nationality (Table 7-70).

Table 7-68: Camps with South Sudanese refugees in the sampling frame

Region	Camp
Gambella *(South Sudanese)*	Jewi Kule Nguenyyiel Okugo Pugnido Pugnido II Tierkidi
Benshangul-Gumuz *(25% South Sudanese; 75% Sudanese)*	Bambasi Sherkole (*primarily South Sudanese*) Tongo Tsore

Source: Authors' calculations using SPS 2017.

[260] Household is here defined as all people living in the same dwelling and sharing all meals and finance.

Table 7-69: Number of refugee and host community households interviewed by stratum

Stratum	Tigray Afar	Gambella	Benishangul Gumuz	Somali	Total
Refugees	894	439 *(438 South Sudanese)*	1423 *(399 South Sudanese)*	871	3627 *(837 South Sudanese)*
Host Community	412	0	975	303	1690

Source: Authors' calculations using SPS 2017.

The sample design uses a multi-stage stratified random sample. Camps in each stratum were divided into EAs of 150 by 150 meters using GIS technology. The number of EAs to be selected from each camp was obtained proportional to the size of the camp. In this way, all the camps in the sample frame were selected in the sample and were surveyed. Within camps, EAs were selected using equal probability to make up the required number of EAs for that camp. In total, 82 enumeration areas were selected from each stratum. All the households in the selected EAs were listed and 12 households were randomly selected and surveyed per enumeration area making up to a total of 900 refugee households per stratum.

Households within a 5-km radius of a camp were classified as host community households. Areas within 5 km radius of camps were divided into EAs of 300 by 300 meters using GIS technology. Of these, EAs marked as residential by Open Street Maps were included in the sample frame. EAs within a stratum were then selected using proportional probability sampling with the probability of selection of an EA equal to the area of the Enumeration Area outside the camp. In total, 42 EAs were selected for each stratum. Like EAs within camps, all the households in the EAs selected for host community sampling were listed and 12 households were selected randomly and surveyed per EA making up to a total of 500 host community households per stratum.

Table 7-70: Sampled population by country of nationality

Nationality	Number of households surveyed	Percentage of households in surveyed population
South Sudanese	837	16%
Somali	871	16%
Eritrean	893	17%
Sudanese	1016	19%
Ethiopian (host community)	1690	32%
Other Country	10	0%
Total	**5317**	**100%**

Source: Authors' calculations using SPS 2017.

Due to security concerns, major revisions were made to the Gambella sample during fieldwork. Enumerators in Gambella region faced repeated security threats and could survey only 439 of the intended 900 refugee households in the region. As the survey team was withdrawn from Gambella region, host community in Gambella region was not surveyed at all. The remaining interviews with refugees in Gambella region were substituted by oversampling enumeration areas in Benishangul Gumuz, as 25 percent of the refugee population in this region is South Sudanese. However, since no host community was surveyed in Gambella and the host community in Benishangul Gumuz (mostly) refers to Sudanese refugees rather than South Sudanese, it is not possible to accurately compare South Sudanese refugees with host communities.

Conflict in Oromia and Somali regions also necessitated sampling modifications. In early September 2017, violent conflict in Oromia and Somali regions escalated, rendering some of the camps in Somali stratum inaccessible. The enumeration areas of Jijiga sub-region were replaced by enumeration areas in non-violent areas of Somali stratum. Also, as most refugee camps are in remote areas with sparse host population, the final number of host households surveyed fell short of the original intended sample of 500 host households per stratum. However, despite the changes in sample, the survey captured roughly similar number of refugee households of the four main refugee nationalities.

Weights

Sampling weights are applied to survey observations to make them representative of refugee populations in different regions and of the overall camp-refugee population in Ethiopia. Weights for host population are constructed to be representative of the host households living within 5 km radius of refugee camps. The selection probability *P* for a household can be decomposed into the selection probability P_1 of the EA and the selection probability P_2 of the household within the EA:

$$P = P_1 P_2$$

As refugee population in the different strata lived in different camps, the selection probability P_1 of an EA *k* is calculated as the number of households within the EA divided by the number of households within the stratum multiplied by the number of selected EAs in the stratum

$$P_1 = \frac{\hat{n}_k * K}{N}$$

where $\hat{n}_k$ denotes the number of households in EA *k* (obtained by multiplying the percentage of camp area covered by the EA with the number of households in the camp as information on number of households in an EA was not available prior to listing), *K* is the number of EAs selected in the corresponding stratum and *N* is the total number of households in the stratum. For host community sampling, as information on number of host households living within 5 km of camps in a stratum was not available, the selection probability of an EA for host sampling is calculated as the number of EAs selected divided by the total number of EAs in the stratum.

$$P_1 = \frac{K}{T}$$

where K is the number of EAs selected in a stratum and T is the total number of EAs in the corresponding stratum. Replacement enumeration areas were assigned the sampling weight of the enumeration area that they were replacing. Due to changes in sample during fieldwork the number of enumeration areas surveyed in each stratum differed from the original sample. The weights were therefore scaled at the end to correct for the change in the value of K.

The selection probability P_2 for a household within an EA k is constant across households and can be expressed as

$$P_2 = \frac{|H|}{n_k}$$

where $|H|$ is the number of households selected in the EA and n_k denoting the number of listed households in EA k. Usually, the number of households per EA is 12 while a few exceptions exist due to invalid interviews.

Sampling weights were scaled to equal the number of households per strata using the information for number of households provided by UNHCR. There was no source of information on number of host households living within 5 km distance of the camps. The weights for host community surveys were therefore not scaled.