Valuing Assets Provided to Low-Income Households in South Sudan

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Abstract

Several previous studies have found that the "graduation" or "Transfers to the Ultra-Poor" (TUP) framework is an effective approach to alleviating the constraints that prevent extremely poor households from increasing their productivity. The framework consists of a sizable transfer of productive physical capital, coupled with training and continuous support over the course of one or two years. A second and related literature suggests that unconditional cash transfers (UCT's) may have a comparable effect on productivity and welfare (with fewer fixed costs). This field experiment, examining the first two years of BRAC's TUP pilot in South Sudan, offers a direct comparison of these very different approaches to alleviating capital constraints. We consider the effect of each on consumption, income, asset holdings, and a number of intangible outcomes. We also consider the TUP program's effect on households' response to the outbreak of violence in 2014, which led to a level of instability in which the Graduation framework has not been previously tested. We find evidence of positive consumption effects from both treatments, but only in the short-run, and a persistent wealth effect only from the TUP. We also elicit suggestive evidence that BRAC's support may have helped TUP beneficiaries cope with the short-term economic effects of the outbreak of violence in 2014. We tentatively conclude that targeted asset transfers can play a constructive role in helping poor, self-employed households when they face economic uncertainty. And while cash increases household consumption, the goal of improving income or wealth is aided by the additional services that the ultra-poor graduation framework offer.

1 Introduction

Poor rural households typically earn money from low-return activities like small-scale cultivation or casual day labor, and face both financial and human capital constraints, keeping them from investing and expanding into more lucrative activities. Experience and research over many years has lead many to believe that households facing particularly acute poverty are unable to solve this problem through the small, high-interest loans typically marketed to them. It was these considerations that lead to the development of the initial "Targeting the Ultra-Poor" (TUP) program in Bangladesh as a supplement or precursor to credit services. First implemented by BRAC in 2007, the program aims to simultaneously alleviate physical and human capital constraints by providing households with a significant transfer of food and productive assets, followed by two years of training and support by extension officers. (Bandiera et al. (2017)) The general framework[1] has since expanded to a wide range of countries, with a general pattern of success in increasing aggregate investment, labor supply, and aggregate consumption. (Banerjee et al. (2015))

A second, older literature has gained new interest in parallel with this literature which examines the effect of offering direct unconditional cash transfers (UCT's) to poor households. (Haushofer and Shapiro (2013) Blattman, Jamison, et al. (2014) Blattman, Fiala, and Martinez (2013)) While this and the TUP framework are both direct capital transfer interventions, they are very different in their approach, with TUP programs guiding and constraining the use of capital towards productive investment while UCT's allow households to invest and consume as they see fit. The natural question that arises is how these additional features and constraints in the TUP framework change how households use their capital transfers.

Here, we examine the experimental evaluation of BRAC's pilot TUP program in South Sudan and compare it to a round of unconditional cash transfers. Our results contribute to the general literature in two important ways. First, South Sudan's political and economic institutions have overwhelmingly politically unstable since this study's inception, which may affect the value of the program for households in important ways. Second, a randomly selected group of households received cash transfers equal in market value to

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[1]known as the "graduation framework" pointing to the original ambition to move households into an activity where they are able to finance further income growth without costly transfers.

the assets provided to the TUP households. While an experimental literature has been established studying the graduation framework in isolation, this is among the first experiments attempting to directly compare it to a obvious alternative investment.

2   The Program

The pilot program itself was similar to the other TUP programs completed by BRAC. It consisted of four phases: targeting and selection, training and enterprise selection, asset transfers, and monitoring.

2.0.1   Targeting, Selection, & Training

The fist phase of the program was to complete a census of households in the area around BRAC's office in the town of Yei in Western Equitoria. This census contained questions to assess eligibility for the program. First, households were excluded if they had a salaried worker in the household, were participating in another NGO program, or had no access to cultivable land (which was in some cases necessary for the program's model). Households were then deemed eligible if they fit at least three criteria in a list of five poverty indicators.[2] The census was completed in April of 2013 and 745 were identified as eligible. Of these, 649 were identified in a baseline survey. These households were stratified on employment, asset ownership, and size and selected into treatment groups. 250 were enrolled in the TUP program, 125 in the UCT group, and the final 274 in a pure control group.

2.0.2   Asset Transfers & Monitoring

The second phase of the program was training and enterprise selection. Unlike most programs of this type, the number of households given each kind of asset was set in advance, with 75 enrolled in agricultural activities (vegetable cultivation), 85 in duck rearing, 45 in goat rearing, and the rest in small trade businesses. While the staff tried to map housheolds' asset types to their respective preferences and skills, a disproportionate number stated

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[2]These criteria were that the household had a head working as a day laborer (generally an occupation with poverty wages), two or more children, at least one child working, fewer than three rooms, or a woman who has not completed secondary school.

a preferences for goats and small trade. Households then atttended training sessions. The first of these were for general business skills around literacy, numercacy, and financial management. The next were sector specific and focused on how to properly raise livestock or gardens.

Once training is completed, asset transfers began in late 2013 and continued through the first few months of 2014. The productive assets related to each enterprise were valued at around $240 per household, with a random subset recieving an additional $60 in assets later in 2014. Shortly thereafter, households started to attend weekly or semi-weekly meetings with other nearby participants to discuss with each other and a BRAC extension officer the details of their businesses. These meetings also included food transfers for a while, which were designed to help get households to the point of receiving revenue from their assets without having to sell them.

In all, the market value of these food transfers were valued at $110, bringing the total value of all transfers to $350-$410. The 125 households in the UCT group were randomly divided in half to receive cash in these amounts. Unfortunately, political instability disrupted NGO operations throughtout South Sudan, preventing the simultaneous disbursal of the cash and asset transfers. Instead, a second survey was conducted in June of 2014, with the cash transfers being disbursed immediately thereafter. This resulted in a timing difference of 3 to 6 months between the two.

2.1   The Data

The census was conducted in April of 2013 in the area around BRAC's offices in Yei County to identify women eligible for participation. A baseline survey was conducted that Summer, which successfully interviewed 649 of these women and randomly selected them into the TUP, UCT, and control groups. Half of each beneficiary group was randomly selected to receive additional "top-up" transfers with market value of $60 (around 20% of the original transfers).

In response to the outbreak of violence in late 2013 and subsequent closing of the offices in Yei, a midline survey was conducted in June 2014 to try to separate pre- and post-conflict changes in outcomes. For lack of a valid comparison group, we will not speak with any authority about the effect of the conflict on economic conditions in Yei, though we will report estimates of treatment effects on the severity or likelihood of having been effected exposure to the conflict. Some of the original asset transfers were done before

the office closure, which may affect estimates of the difference between programs if rates of return changed in the few intervening months. Finally, an endline survey was conducted in mid-2015 to estimate the effect of program participation on households' financial situation and overall welfare. The key here is that the survey conducted in mid-2014 provides us with *short-term* treatment effects of the TUP program within 6 months of the asset transfers, while providing a second baseline for the Cash transfers. Likewise, the 2015 survey allows us to estimate treatment effects one year after the cash transfers, and 15-18 months after the asset transfers.

This unfortunately left us without data past one year for the cash transfer effects. To get some point estimates on household welfare for this group in the slightly longer term, we conducted a series of five short surveys on a monthly basis from November of 2015 to March of 2016. These collected only a subset of the full consumption modules and a few questions tracking major transactions and shocks. The short length of the survey allowed them to be administered via the mobile network, reducing cost and improving response rate.

2.2   Empirical Strategy

For the main panel, we estimate a single model using interactions between time effects and group assignment, as well as baseline values of the outcome variable where available.

$$Y_{it} = \sum_{t=2014}^{2015} \delta_t + \beta_t^{Cash} I_t * Cash_{it} + \beta_t^{TUP} I_t * TUP_{it} + \gamma Y_{i,2013} + \epsilon_i$$

where δ_t are time fixed effects and I_t is an indicator if the year t, and Y_{it} is an outcome of interest for household i in year t. We take the interactions of TUP assignment with 2014 and 2015 indicators as the treatment effects at 6-8 and 15-17 months respectively. The analagous interactions with the Cash group offer a second baseline and a 12-month treatment effect, respectively. Since those transfers happened after the midline survey, its interaction with *2014* acts as a placebo; there is no *ex ante* reason to expect that they were different from the rest of the control group at that point. Given the slight difference in timing, we report a t-test of the hypothesis $\beta_{\text{TUP,t}}$-$\beta_{\text{Cash,2015}}$=0 for both $t \in 2014, 2015$. Since the difference in timing is much smaller, we consider $\beta_{TUP,2015} - \beta_{Cash,2015} = 0$ to be the central hypothesis of interest.

For the supplementary analysis of the high-frequency panel, we estimate a separate model, since the underlying data is so different. A constant parameter takes the place of the fixed effects. We include 2013 levels as a covariate where possible. Since we collect expenditures on only ten consumption items, we report not only the total value of spending on those goods, but also a more theoretically grounded measure described in Collins and Ligon (2017), which uses the composition of expenditures to derive the marginal utility of expenditures for each household. We chose ten relatively demand-elastic items specifically for this purpose, as those will tend to be the most responsive to changes in welfare.

3   Results

3.1   Randomization Check

A crucial assumption is that the treatment and control groups were selected appropriately. We check this by presenting summary statistics by group on a range of factors related to consumption, asset holdings, and household characteristics. We check for balance on observables in Table 1.

Table 1: Means of some analysis variables at baseline. Asterisks indicate p<.1, .05, and .01 respectively

Consumption	CTL	Δ TUP	Δ CSH	N
Meat	4.21	-0.568	-0.052	378
Fuel	0.76	-0.039	-0.072	456
Clothesfootwear	0.67	-0.026	0.033	595
Soap	0.48	-0.008	-0.026	536
Fish	2.50	-0.154	-0.156	474
Charities	0.03	-0.006	0.0	134
Cereals	9.19	-0.947	0.27	605
Transport	0.18	-0.033	0.002	193
Cosmetics	0.68	0.027	-0.125	468
Sugar	1.71	-0.078	-0.189	604
Egg	1.10	-0.091	0.038	276
Oil	1.36	-0.13	-0.141	613
Ceremonies	0.13	0.006	0.026	152

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Table 1: Means of some analysis variables at baseline. Asterisks indicate p<.1, .05, and .01 respectively

Consumption	CTL	Δ TUP	Δ CSH	N
Beans	0.70	0.232	0.226	192
Fruit	0.69	-0.089	0.001	272
Textiles	0.16	-0.004	0.056*	376
Utensils	0.25	-0.009	0.008	442
Dowry	1.27	-0.041	0.028	126
Furniture	0.20	-0.014	0.045	368
Salt	0.45	-0.026	0.007	617
Vegetables	1.54	-0.165	-0.18	471
Assets	CTL	Δ TUP	Δ CSH	N
Smallanimals	236.60	-86.068	-123.133	123
Bicycle	109.08	-12.555	-11.414	171
Radio	58.45	-5.968	-16.529	260
Motorcycle	341.74	192.956	353.836**	93
Net	19.16	0.668	0.247	423
Poultry	42.40	-3.365	-8.894	161
Bed	241.27	7.992	32.762	521
Chairtables	206.79	-29.368	3.617	531
Mobile	97.54	12.627	-4.198	414
Netitn	7.82	1.215	1.178	181
Cosmetics	0.68	0.027	-0.125	468
Household	CTL	Δ TUP	Δ CSH	N
Daily Food	25.18	-2.215	-0.261	643
Daily Exp	29.90	-2.167	-0.288	646
No. Houses	2.83	0.031	0.118	543
In Business	0.40	0.038	0.017	265
Cereals	9.19	-0.947	0.27	605
# Child	3.26	0.118	0.108	594
Asset Tot.	1757.05	-44.791	98.654	603
Cash Savings	236.90	28.52	-66.812	431
HH size	7.23	-0.175	0.3	648

This is simply suggestive evidence that the treatment and control groups were similar in observables at baseline, with the exception that the cash group has atypically more motorcycles and clothing. But it does suggests

that our stratified randomization was not too far from creating comparable groups.

3.2 Attrition

Another crucial question is to what extent attrition in 2014 and 2015 was small or balanced. Table 2 reports the total number of households identified in each treatment arm and year for the whole sample. Table 3 reports the same numbers restricting ourselves to households with baseline surveys. In the TUP group, we were unable to find 21 participants in 2014 (8% attrition), but found 5 not identified in the baseline survey. We found 8 additional TUP households with baseline surveys again in 2015 for a final attrition rate of 5%. Of those in the Cash group, 12 were lost (9.6%), then two more in 2015 (11%). The control group saw very high attrition in 2014 (22%), but also found a large number of households not found at baseline, yielding a comparison group only 6% smaller. The high attrition was due largely to the fact that these households did not enjoy the same consitent contact that BRAC had with the TUP group, and the local area lacked infrastructure to easily locate people. This was exacerbated by the uncertain political situation and early harvest. Attrition in 2015 was 6.7%, with a full 85 more households identified who were not in the baseline survey. In order to take advantage of the households not included in the baseline, the main specification below includes an indicator for whether the household was in the baseline.

Table 2: Total number of households in sample by group and round

Full Sample	2013	2014	2015
Cash	124.0	113.0	111.0
Control	281.0	265.0	347.0
TUP	244.0	228.0	236.0
All	649.0	606.0	694.0

Table 3: Number of households in sample with baseline survey by group and round

Balanced Sample	2013	2014	2015
Cash	124.000	112.000	110.000
Control	281.000	219.000	262.000
TUP	244.000	223.000	231.000
All	649.000	554.000	603.000

Next we ask how those who did not turn up in subsequent rounds differed by a range of baseline characteristics. Table 4 reports the average level of various characteristics in 2013. Then we report the coefficient from a linear regression on indicators for whether they were in the midline or endline surveys. Here we see that overall, households found in the mideline survey were larger with more children and larger reported asset stocks. Households found in 2015 seemed to have, at baseline, significantly smaller asset stocks and less consumption.

Table 4: Means of household baseline characteristics and regression coefficients for whether they were ultimately found at baseline or endline. (Note that this does not consider households found only in 2014 or 2015).

HH Features	Mean$_\text{Bsln}$	β_Mid	β_End
HH size	7.223	0.595**	0.428
# Child	3.328	0.656***	0.423
Asset Prod.	512.822	126.360	-369.190
Asset Tot.	1494.324	361.889	-689.174*

Table 4: Means of household baseline characteristics and regression coefficients for whether they were ultimately found at baseline or endline. (Note that this does not consider households found only in 2014 or 2015).

HH Features	Mean$_{\text{Bsln}}$	β_{Mid}	β_{End}
Daily Exp	25.212	1.257	-4.150
Daily Food	24.300	0.299	-4.790*
In Business	0.415	0.038	0.007
Land Access	2.324	0.014	0.305
No. Houses	2.863	0.305	0.367
Cash Savings	178.662	46.322	54.295
Assets			
Bed	250.534	12.649	-51.133
Bicycle	102.174	11.179	4.212
Mobile	101.482	6.336	-13.028
Motorcycle	481.885	213.002	-241.819
Carts	2.751	1.929	2.962
Cows	181.402	67.862	-89.273
Smallanimals	180.716	18.966	-79.014
Consumption			
Cereals	8.882	-0.084	-3.714**
Beans	0.826	0.269	-0.382
Ceremonies	0.141	-0.020	-0.038
Charities	0.027	0.007	-0.001
Clothesfootwear	0.663	0.180*	-0.206
Cosmetics	0.668	0.005	0.229
Dowry	1.263	0.755	-0.399
Egg	1.069	-0.005	0.106
Fish	2.417	-0.132	0.036
Fruit	0.656	0.009	-0.151
Fuel	0.733	0.105	-0.049
Meat	3.981	0.254	0.300
Other	0.0	0.000	0.000
Poultry	39.437	23.634*	-2.243
Salt	0.438	-0.140***	-0.043
Soap	0.475	-0.181*	0.047

Table 4: Means of household baseline characteristics and regression coefficients for whether they were ultimately found at baseline or endline. (Note that this does not consider households found only in 2014 or 2015).

HH Features	Mean$_\text{Bsln}$	β_Mid	β_End
Sugar	1.647	-0.285	-0.020
Textiles	0.165	0.010	0.011
Transport	0.163	0.004	0.018
Tv	39.915	-16.377	0.845
Utensils	0.247	0.062	-0.023
Vegetables	1.446	0.096	-0.151

3.3 Consumption

The first measure of welfare we consider is household consumption, defined as the market value of goods or services used by the household. A sizable basket of goods were included in the survey module. These are separated into three categories: Food items (with a 3-day recall window), non-durables (a 30-day recall window), and durables and large expenditures (a one-year recall window). This is perhaps the most appropriate measure of the welfare or poverty of a household in our survey.

The results for several important consumption measures are presented in Table 5. Importantly, we do not know about prices for each good in this time, though we can say that inflation was as high as 100% between 2014 and 2015. Nonetheless, we take the sum of all consumption and expenditure questions together as a measure of welfare. In light of the fact that we have data on an incomplete basket, we also follow Collins and Ligon (2015), which details a method for deriving treatment effects on a model-based estimate of households' marginal utility, which we include here as $\log \lambda_{it}$.

The main result is that TUP participants had higher consumption consumption in 2014, several months into the primary monitoring phase after the asset transfers. Similarly, the cash group has higher consumption in 2015, measured just over a year after disbursal. Food transfers had ceased weeks before the 2014 survey was conducted, and the assets had been transferred 6-8 months prior. The TUP group sees no notable effect in 2015. The short-term consumption effects of either program are economically signifi-

cant, representing a roughly 16% increase in average total consumption for both TUP and Cash. These results are consistent with a story in which either sort of transfer has a short-term consumption effect. Importantly, we do not reject the null hypothesis that the two effects are equal to one another. In either group, the increase in total consumption appears to be driven mainly by increased food consumption, with smaller effects on non-food consumption goods and durables. As such, there is no evidence that the share of food consumed falls, as might be predicted by Engel's law.

Table 5: Average treatment effects by Group-Year, controlling for baseline levels.

	Tot	$\log \lambda_{it}$	Food	logTot
CTL mean	115.404	0.159	38.468	4.509***
	(78.750)	(0.967)	(26.250)	(0.756)
CSH*2014	−2.745	0.127	−0.915	0.007
	(8.008)	(0.110)	(2.669)	(0.079)
CSH*2015	18.023**	−0.145	6.008**	0.160**
	(7.831)	(0.108)	(2.610)	(0.077)
TUP*2014	18.590***	−0.365***	6.197***	0.212***
	(6.426)	(0.089)	(2.142)	(0.063)
TUP*2015	4.179	−0.055	1.393	0.045
	(6.130)	(0.084)	(2.043)	(0.060)
2014	76.831***	0.214***	25.610***	3.931***
	(5.318)	(0.062)	(1.773)	(0.113)
2015	105.702***	0.188***	35.234***	4.175***
	(5.001)	(0.057)	(1.667)	(0.111)
Bsln2013	0.081**	0.022	0.081**	0.073***
	(0.038)	(0.029)	(0.038)	(0.026)
Bsln$_{\mathrm{NAN}}$	20.521***	−0.119	6.840***	0.447***
	(6.964)	(0.088)	(2.321)	(0.121)
$\beta_{2014}^{TUP} - \beta^{CSH}$	0.566	−0.220	0.189	0.052
	(9.994)	(0.137)	(3.331)	(0.098)
$\beta_{2015}^{TUP} - \beta^{CSH}$	−13.844*	0.090	−4.615*	−0.115
	(8.125)	(0.111)	(2.708)	(0.080)
F-stat	10.142	4.169	10.142	8.131
N	1291.000	1296.000	1291.000	1291.000

This result leaves open the question of whether the cash treatment had a persistent effect on consumption, or whether the short-term effect found in 2015 is similarly temporary. It was this question that motivated the collection of an additional five rounds of data over a 6-month period in late 2015 and early 2016, in which we asked about ten items, five food and five non-food. We consider the average treatment effect on households sampled for these phone interviews, both for logλ_{it} and for "Total consumption", which in this case we take a simple sum over the goods discussed. We find that, consistent with the TUP program's results in 2015, all evidence of an effect seem to be

gone by 18th months after the transfer date.

Table 6: Average treatment effects using mobile data collection (results are robust to controlling for baseline levels)

	$\log \lambda_{it}$	Tot	logTot
CTL mean	−0.018	30.851	3.158***
	(1.001)	(27.768)	(0.734)
TUP	0.023	−0.624	−0.011
	(0.041)	(1.152)	(0.030)
CSH	0.056	0.776	0.028
	(0.052)	(1.459)	(0.038)
const	−0.018	30.851***	3.158***
	(0.027)	(0.753)	(0.020)
$\beta^{TUP} - \beta^{CSH}$	−0.033	−1.399	−0.039
	(0.055)	(1.524)	(0.040)
F-stat	0.584	0.434	0.475
N	2877.000	2878.000	2878.000

3.4 Food Security

Generally speaking, observed changes in total consumption don't translate into an increase in reported food security. In each year, we ask how often in a given week the respondent has had experiences indicative of food insecurity. Included are (from left to right) going a whole day without eating, going to sleep hungry, being without any food in the house, eating fewer meals than normal at mealtimes, and limiting portions. We report the percentage of people who report experiencing each in a typical week, as well as a standardized composite z-score using all of these questions. There is little evidence of a significant treatment effect at endline in 2015.

Table 7: Percentage of respondents reporting a food security problem occurs at least once a week.

	Z-score	Whole Day	Hungry	No Food	Fewmeals	Portions
CTL mean	−0.01	0.21	0.21	0.28	0.32	0.36

Table 7: Percentage of respondents reporting a food security problem occurs at least once a week.

	Z-score	Whole Day	Hungry	No Food	Fewmeals	Portions
	(1.00)	(0.41)	(0.40)	(0.45)	(0.47)	(0.48)
TUP*2014	-0.10	-0.02	-0.05	-0.03	0.01	0.01
	(0.09)	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
TUP*2015	-0.02	0.03	-0.01	-0.03	0.05	-0.02
	(0.09)	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
CSH*2014	-0.05	-0.00	-0.04	-0.01	-0.03	-0.00
	(0.11)	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)
CSH*2015	0.03	0.06	0.03	-0.01	-0.00	-0.04
	(0.11)	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)
Bsln2013	0.07^{**}	-0.00	0.02	0.03	0.06^{**}	-0.02
	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
2014	0.07	0.09^{*}	0.10^{*}	0.09^{*}	0.17^{*}	0.22^{*}
	(0.06)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)
2015	0.03	0.22^{*}	0.21^{*}	0.26^{*}	0.30^{*}	0.39^{*}
	(0.06)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Bsln$_{\text{NAN}}$	-0.17^{*}	-0.02	-0.03	0.03	-0.02	-0.08^{*}
	(0.09)	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
F-stat	1.45	9.34	8.36	10.84	6.70	5.91
N	1299.00	1282.00	1297.00	1293.00	1297.00	1292.00
$\beta_{2014}^{TUP} - \beta^{CSH}$	-0.13	-0.08	-0.08^{*}	-0.01	0.01	0.05
	(0.14)	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)
$\beta_{2015}^{TUP} - \beta^{CSH}$	-0.06	-0.03	-0.04	-0.02	0.06	0.02
	(0.12)	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)

3.5 Assets

Turning now to asset holdings for the households, we estimate treatment effects for total value of assets owned, total value of potentially productive assets, as well as land and financial assets.

3.5.1 Total Asset Holdings

The cash group does not appear to have seen an increase in the value of assets measured, with negative and imprecise point estimates. The most important

result is that the TUP group has significantly more asset wealth than the cash or control groups in both 2014 and 2015, 18 months after receipt of transfers. The TUP group has a change of 536 SSP on average (43% increase over controls, p<.01). So-called "Productive" assets include anything that could plausibly be used in productive activity. [3] Here we see the TUP group has 320 SSP (95%) more in this area over the control group, with a similar magnitude at midline.

Importantly, this is not due to a preciptous increase in assets reported over this time. Note also that the effect on total assets is higher in absolute value than the effect on productive asset value, suggesting that the increased wealth cannot be explained purely by households holding onto asset transfers for the length of the program's monitoring phase. Instead, the TUP group is the only one for whom total measured asset holdings did not fall on average over these two years, which saw hyperinflation and a significant aggregate economic downturn. This asset effect (including the savings effect below) is the only feature of households' financial situation on which we we see a persistent effect.

Table 8: Average treatment effects by group-year on total value (in SSP) of all assets measured and of productive assets measured

	Total	Productive
CTL mean	1225.61	337.60
	(1502.46)	(605.57)
TUP*2014	535.79***	361.80***
	(154.02)	(74.19)
TUP*2015	624.79***	320.74***
	(146.01)	(68.68)
CSH*2014	−125.86	18.50
	(191.31)	(95.80)
CSH*2015	−49.99	−5.00
	(187.32)	(88.40)
Bsln2013	$ 0.08^{*}$	$ 0.00$
	(0.02)	(0.01)

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[3]For now, we include in this list: small and large livestock, farm equipment, mobiles, carts, sewing equipment, sheds, and shop premises.

Table 8: Average treatment effects by group-year on total value (in SSP) of all assets measured and of productive assets measured

	Total	Productive
2014	1259.75***	465.53***
	(112.68)	(55.96)
2015	1124.61***	392.97***
	(103.46)	(50.21)
Bsln$_{\text{NAN}}$	21.30	-131.14**
	(146.51)	(51.35)
N	1305.00	1247.00
F-stat	8.53	10.19
$\beta_{2014}^{TUP} - \beta^{CSH}$	585.78**	366.79***
	(239.76)	(114.58)
$\beta_{2015}^{TUP} - \beta^{CSH}$	674.78***	325.74***
	(194.72)	(92.26)

3.5.2 Savings

Both treatment arms had significant impact on the average value of cash savings within households in 2015. The TUP households are strongly encouraged to pay into a savings account maintained by BRAC each time they meet. Anecdotally, this has discouraged some women from attending the meetings, but it results in TUP participants being 44% (20 pp) more likely to report having any savings at all. It's worth noting though that since the TUP households also regard their savings behavior as much more transparent to BRAC (and have received pressure to save from them) than the other groups, these households may simply be more likely to reveal that they are saving when asked. Among those who have savings, TUP households report having roughly 43% (81 SSP) more in value.

Cash households appear no more likely than the control households to report having cash savings (around 45% in each group), but households that report having any savings at all report having 47% (91.4 SSP) more in value. This is significantly less than was given to these households, but combined with the short-term consumption results, goes some distance in explaining the lack of effect on physical asset wealth. The cash seems to have gone primarily to consumption and savings.
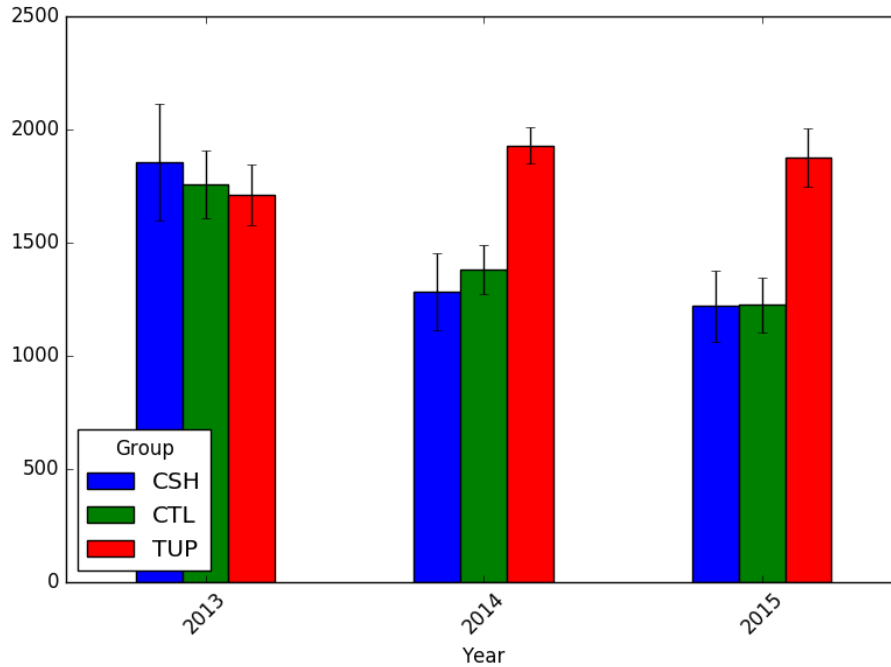
Figure 1: Measured asset wealth by group-year

It is common in this community (and most in the region) to store non-perishable food like maize, cassava, or millet as a form of savings. This would seem particularly reasonable in a high-inflation context, where the price of grain had doubled in the previous year. At least as many households report saving in food (53%) as in cash (46%), with an average market value of 106 SSP. However, we find no evidence that either treatment group increased food savings. [4]

Neither do we find evidence that either treatment increased the size or likelihood of giving or receiving interhousehold transfers, either in cash or in kind. These results are omitted since only 35 and 60 households reported giving and recieving transfers respectively, with no difference in group means.

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[4]Note that food savings was not measured at baseline, so these controls are omitted.

Table 9: Average treatment effects by group-year on percentage of households reporting any savings or land access

% > 0	Savings	Food Sav	LandCult	LandOwn
CTL mean	$ 0.45$	$ 0.82$	$ 0.82$	$ 0.90$
CSH*2014	−0.06	$ 0.00$	−0.04	−0.01
	(0.06)	(0.04)	(0.04)	(0.04)
CSH*2015	$ 0.03$	$ 0.02$	$ 0.05$	$ 0.02$
	(0.05)	(0.04)	(0.04)	(0.04)
TUP*2014	$ 0.22^*$	−0.02	−0.03	−0.00
	(0.04)	(0.03)	(0.03)	(0.03)
TUP*2015	$ 0.21^*$	−0.03	$ 0.01$	−0.01
	(0.04)	(0.03)	(0.03)	(0.03)
2014	$ 0.43^*$	$ 1.00^*$	$ 0.83^*$	$ 0.82^*$
	(0.04)	(0.02)	(0.06)	(0.05)
2015	$ 0.39^*$	$ 0.82^*$	$ 0.77^*$	$ 0.84^*$
	(0.04)	(0.02)	(0.05)	(0.05)
Bsln2013	$ 0.05$		$ 0.05$	$ 0.07$
	(0.04)		(0.05)	(0.04)
Bsln$_{\text{NAN}}$	$ 0.08^*$		$ 0.05$	$ 0.05$
	(0.04)		(0.06)	(0.05)
$\beta_{2014}^{TUP} - \beta^{CSH}$	$ 0.19$	−0.04	−0.07	−0.02
$\beta_{2015}^{TUP} - \beta^{CSH}$	$ 0.18$	−0.05	−0.03	−0.03
F-stat	$ 8.83$	15.60	$ 0.79$	$ 0.76$
N	1259.00	870.00	1231.00	1251.00

Table 10: Average treatment effects by group-year on total value (in SSP) of all cash and food savings and area (in fedan) of land being cultiviated by the household (including rented or temporary-use) and owned by the household.

Amt.	Savings	Food Sav	LandCult	LandOwn
CTL mean	191.19	114.78	61.88	46.00
CSH*2014	28.74	$ 0.22$	10.18	10.50
	(42.93)	(15.38)	(15.07)	(12.57)

Table 10: Average treatment effects by group-year on total value (in SSP) of all cash and food savings and area (in fedan) of land being cultiviated by the household (including rented or temporary-use) and owned by the household.

Amt.	Savings	Food Sav	LandCult	LandOwn
CSH*2015	91.40**	−14.34	−39.18***	−32.37***
	(40.89)	(14.98)	(14.90)	(11.95)
TUP*2014	−27.09	17.16	−4.76	−3.02
	(29.76)	(12.33)	(11.94)	(10.04)
TUP*2015	81.33***	$ 1.13$	−17.38	−12.56
	(29.32)	(12.26)	(11.65)	(9.41)
2014	106.72***	62.03***	11.37	17.31**
	(24.85)	(8.36)	(9.94)	(8.56)
2015	163.04***	114.78***	61.52***	51.89***
	(24.13)	(7.60)	(9.54)	(7.88)
Bsln2013	$ 0.05**$		$ 0.94$	−2.43
	(0.02)		(3.07)	(1.95)
$Bsln_{NAN}$	40.07*		−1.60	−6.02
	(21.24)		(9.92)	(8.29)
$\beta_{2014}^{TUP} - \beta^{CSH}$	−118.49	31.50	34.42	29.35
$\beta_{2015}^{TUP} - \beta^{CSH}$	−10.07	15.47	21.79	19.80
F-stat	$ 7.41$	$ 7.14$	$ 4.91$	$ 3.72$
N	671.00	777.00	1042.00	1114.00

3.5.3 Land Holdings

We also examine land ownership and cultivation in each year. We find no evidence that either group is more or less likely to report owning or cultivating at least some land, though this may be in part because land ownership and cultivation is already very common. Anecdotaly, divesting from land ownership entirely could be seen as a relatively drastic decision. However, members of the cash group who are involved in agriculture are found to be cultivating significantly less land after the fact, which reports cultivating 65% less and owning 70% less land than the control group. This raises the interesting question of whether the cash group was likely to switch occupations from farming to non-farm self-employment. It could also raise questions around

the underlying logic of the more agrarian transfer in the TUP program, if unconstrained transfers prompt households to divest from these opportunities. This concern may be validated somewhat by the fact that TUP participants primarily stated a preference for small retail training and transfers over small animal husbandry or vegetable gardening.

3.6 Income

Income was reliably measured only in 2015, and so our estimates do not control for baseline values. The control group in 2015 has a measured income of roughly 4325 SSP per year, or roughly $540 US (assuming an exchange rate of around 8). The TUP group sees a 327 SSP ($41 US, 7%) increase in annual average income, but with a fairly skewed distribution and high standard errors. The related figure shows that total income is not particularly different among groups. Perhaps the main lesson is that the TUP group has measurably more reported livestock-related income, and less farm income, indicating a shift away from farming. The cash group may exhibit some substitution away from farm and livestock, but as is evident graphically, we do not observe sizable changes in total income for either treatment group.

Table 11: Average treatment effects by group-year on total value (in SSP) of income reported in 2015 by sector.

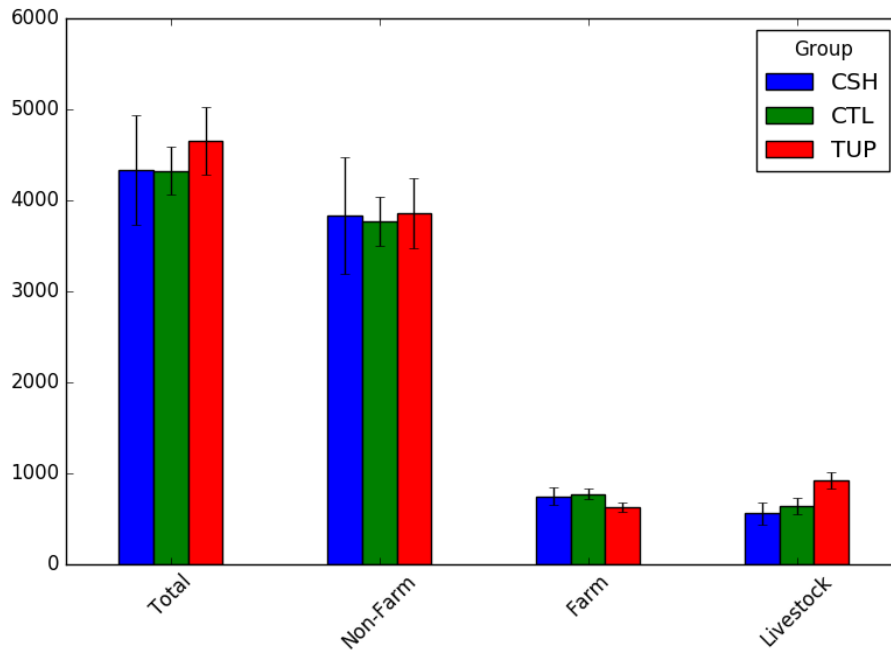|	Farm	Livestock	Non-Farm	Total
CTL mean	773.05	640.33	3774.49	4325.54
TUP	-142.20^{*}	281.12^{**}	86.24	327.83
	(77.21)	(126.30)	(469.48)	(455.95)
CSH	-26.15	-83.81	61.80	$ 7.92$
	(100.82)	(177.25)	(620.53)	(600.43)
N	531.00	380.00	606.00	671.00
F-stat	$ 1.75$	$ 3.48$	$ 0.02$	$ 0.28$
$\beta^{TUP} - \beta^{CSH}$	-116.05	364.94^{**}	24.44	319.91
	(105.79)	(174.74)	(651.27)	(629.93)

Figure 2: Distribution of total observed income by group

3.7 Exposure to Conflict

In 2014, households were surveyed shortly after the NGO's offices had re-opened in the wake of the outbreak of widespread armed conflict. Respondents were asked a short set of questions about whether they were directly affected, and if so, in what way. There has only been a few incidents of violence near Yei town at that point, and the most directly involved ethnic groups made up a small portion of the local population. There is no clear comparison group to which we might compare our sample, and the economic climate changed over this same period in several ways that were probably not directly caused by the violence. As such, we have no clear means of identifying the effect of the conflict itself on household welfare. Nonetheless, it is interesting to consider correlates with self-reported exposure to the conflict, and to see if program assignment had any effect on households' exposure or response.

Our main outcomes of interest are whether individuals say they were "worried" or "directly affected" by the violence, unable to invest in a farm

or business as a result, migrated as a cautionary measure, or did something else to protect the lives of family members. A final question among those who took no cautionary measures was whether this because they did not have the means (i.e. "NoMeans"). TUP participants are 24% (13 pp.) less likely to report having been "affected" by the conflict, and 38% (6 pp.) less likely to report that they were affected specifically by being unable to plant crops or invest in their business. This was the second most common way in which households reported being affected behind "needed to relocate or migrate", where respondents are not clearly different. Nonetheless, this raises the possibility that having received a significant asset transfer and the expectation of NGO support around the outbreak of conflict may have helped mitigate the conflict's negative effect on investment and protect households from being affected overall.
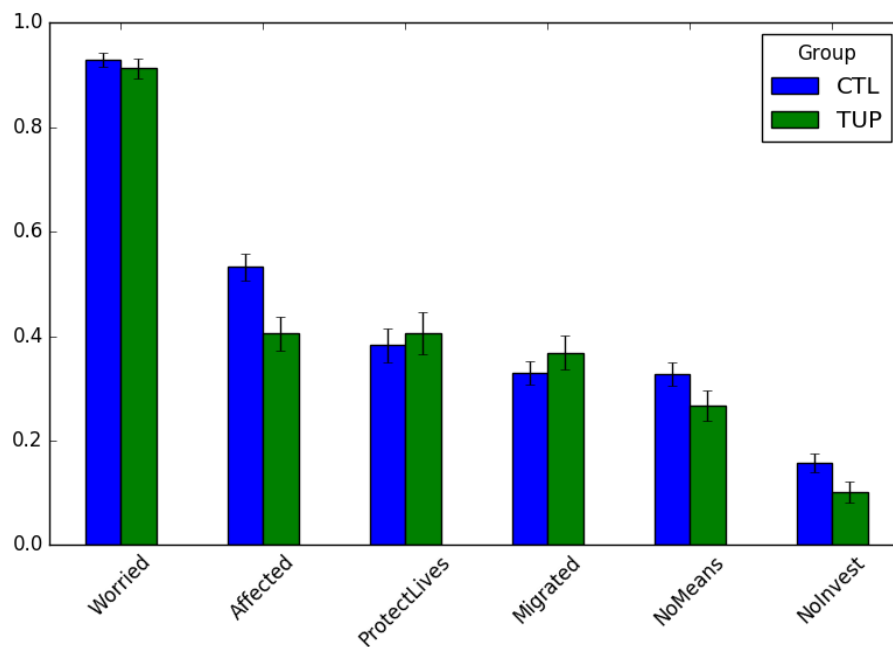

Figure 3: % of Sample reporting exposure to conflict by group.

Table 12: Average treatment effects by group-year on the probability of having been affected in a significant way by the outbreak of violence in late 2013

	Affected	Migrated	NoInvest	NoMeans	ProtectLives	Worried
CTL mean	$ 0.53^*$	$ 0.33^*$	$ 0.16^*$	$ 0.33^*$	$ 0.38^*$	$ 0.93^*$
	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.01)
TUP	-0.13^{***}	$ 0.04$	-0.06^{**}	-0.06	$ 0.02$	-0.02
	(0.04)	(0.04)	(0.03)	(0.04)	(0.05)	(0.02)
F-stat	$ 9.20$	$ 0.96$	$ 3.95$	$ 2.55$	$ 0.19$	$ 0.49$
N	601.00	655.00	655.00	655.00	585.00	603.00

4   Concluding Remarks

BRAC's South Sudan pilot of the TUP program represents the only such test of the ultra-poor graduation framework conducted in an area of significant political and economic instability. It also represents among the only direct comparisons of this model to a similarly expensive unconditional cash transfer, arguably its most sensible benchmark for success. As such, it provides suggestive evidence as to the best way of transfering wealth in order to help poor and vulnerable households.

Cash transfers appear to increase consumption and possibly shift investment from agriculture to non-farm activities, without a related increase in wealth or income. Conversely, the TUP program increased wealth and directly shifted work from agriculture to livestock, with increased consumption in the short run. We also find that having received asset transfers dampened the negative investment effects following the outbreak of violence. [5] We tentatively conclude that targeted asset transfers can play a constructive role in helping poor, self-employed households when they face economic uncertainty. And while cash increases household consumption, the goal of improving income or wealth is aided by the additional services that the ultra-poor graduation framework offer.

5   References

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[5] Whether a cash transfer would have had a similar mitigating effect is hard to say.

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