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Unpacking a Multi-Faceted Program to Build Sustainable Income for the Very Poor

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ABSTRACT

A multi-faceted program comprising a grant of productive assets, training, coaching, and savings has been found to build sustainable income for those in extreme poverty. The researchers focus on two important questions: whether a mere grant of productive assets would generate similar impacts (it does not), and whether access to a savings account and a deposit collection service would generate similar impacts (it does not).

1. Introduction

One of the most exciting ideas in the fight against extreme poverty is the discovery that a focused multi-faceted intervention can durably unleash the productive potential of a group of desperately poor people. Banerjee et al. (2015) and Bandiera et al. (2017) present impact results from seven countries for a multi-faceted "graduation" program that includes at its core a transfer of productive assets, two years of training and coaching, and access to a saving account. This program successfully increased net worth, income and consumption three years after the productive assets were transferred, and in the two sites where analysis is complete, the data shows that the impacts persisted (and indeed grew) after seven years (Banerjee et al. 2016; Bandiera et al. 2017). Based on this evidence, many governments are implementing this program with the goal of understanding what model will work best for them and how to implement it within their ministries.[7]

A better understanding of the underlying mechanisms through which the program works is critical, both for answering key theoretical questions about poverty traps and also for determining the ideal design for social protection programs. From the Ghana site of Banerjee et al. (2015), we explore whether two of the components separately, the transfer of a productive asset and the access to savings, are each sufficient on their own to generate the observed change. The first (asset transfer) component confronts the possibility that the only constraint on the poor is their lack of wealth, which would of course vastly simplify anti-poverty policy. The second (improved access to savings) component captures the possibility that the wealth transfers are unnecessary, as long as the poor have access to a good savings technology and therefore can accumulate their own wealth. Together they capture the two obvious benchmarks that the graduation program needs to measure itself against.

1.1 Background

The interest in multi-faceted approaches comes from the rather weak evidence of long-term impact on earnings from a number of well-thought of interventions. For example, microcredit was thought, for a while, to be an intervention that has a transformative impact on the lives of the poor, but the recent evidence has not been encouraging. Similarly, basic savings accounts have not produced large impacts on income or consumption levels (Dupas et al. 2017), nor have informal savings groups (Karlan et al. 2017). For some people education or skilling is clearly that intervention, but the average returns to primary education are modest—Duflo (2001) reports a year of education increasing earnings by 7%. There are relatively few credible estimates of the return to secondary schooling but a recent study by Duflo et al. (2017) reports that spending three years in the vocational track of secondary schools in Ghana increases earnings by 19%, which is comparable to the returns on primary schooling. However, the returns on the academic track of the secondary schools, in the same study, were indistinguishable from zero. Business training is another related idea that has received a lot of attention in recent years. However, a review of business training interventions by McKenzie and Woodruff (2014) finds little evidence typically of an impact on earnings for micro-entrepreneurs (which overlaps heavily with those

[7] This list includes Afghanistan, Brazil, Burkina Faso, Chad, Colombia, India, Indonesia, Kenya, Lebanon, Mali, Mauritania, Mozambique, Niger, Pakistan, Paraguay, Philippines, and Senegal.

in extreme poverty).[8] The same goes for the related class of interventions which are sometimes described as hand-holding, where the trainee gets one-on-one follow up help on their business projects (Giné and Mansuri 2011).

Capital grants have a similar record. The initial work, by De Mel, McKenzie and Woodruff (2008) finds that capital grants to small business owners in Sri Lanka generate high returns (5-7% per month). Fafchamps et al. (2014) finds even higher returns in Ghana, and Fiala et al. (2014) finds important long term impacts in Uganda. On the other hand, Berge, Bjorvatn and Tungodden (2014) in Tanzania and Karlan, Knight and Udry (2015) in Ghana find no effect of a grants intervention with small business owners. Karlan et al. (2014) also finds no effect of cash grants on the earnings of farmers. Moreover even those studies that find positive effects of the grant on average, like De Mel, McKenzie and Woodruff (2008) and Fafchamps et al. (2014) often fail to find a positive effect on women owned businesses (on the other hand, Fiala et al. (2014) finds positive impacts on both males and females).

There is also some evidence of positive impacts on investment from transfers that are not specifically targeted to business owners. For instance, the Mexican conditional cash transfer program Progresa generated some increase in investment (estimated as 26% of the transferred amount), leading to a longer term impact on consumption (Gertler, Martinez, and Rubio-Codina 2012). Similarly, an evaluation of GiveDirectly, which gifts large amounts of cash (between 400 dollars and 1600, or 868 and 3474 in PPP terms) to low income families in Kenya (not conditional on being business owners) finds significant consumption effects that last beyond the actual period of the payments, but fade out relatively quickly (Haushofer and Shapiro 2016).

Finally, two cash grant studies in Uganda (Blattman, Fiala, and Martinez 2014; Blattman et al. 2016) find a strong and durable positive effect, stronger than most of the above cited studies, but they combine the transfer with some handholding and nudges. One of these (Blattman et al. 2016) separately tests the importance of the ongoing handholding component of the program and finds mixed evidence.

The multi-faceted "graduation" program, is effectively an amalgam of many of the previously mentioned interventions. Interestingly, given the somewhat discouraging track record of the individual interventions, the program combining them does yield consistent and positive long-term results. In six out of seven evaluated sites, the program generated economically meaningful, cost effective, and sustained positive average impacts on earnings, consumption and other welfare measures over at least three years. Moreover, the trajectories of the beneficiaries continue to diverge from that of the control group in the two places, Bangladesh and India, where there are data from a seven-year follow up. The program combines a capital grant in the form of a business asset (typically livestock), some business training/hand-holding, some short-term consumption support, and help with saving through savings

[8] It is possible that there are higher returns to certain more specialized skilling interventions. For example, Attanasio, Kugler, and Meghir (2011) reports high returns to a specific vocational education intervention in Colombia. However, Kugler, Saavedra, and Prada (2015) reports more modest returns, also in Colombia, and Bausch et al. (2016) finds no changes in employment outcomes in Morocco. Furthermore, business training taught with simple rules-of-thumb has been found to be more effective than a more traditional curriculum (Drexler, Fischer, and Schoar 2014). Larger impacts have been found from consulting to small and medium enterprises (Bloom et al. 2012; Bruhn, Karlan, and Schoar 2018).

collection services. While there was no explicit rule that required the beneficiary be a woman, in a number of countries (Bangladesh, Ghana, India, Pakistan) there was some focus on women through eligibility requirements and at least in Ghana, India, and Bangladesh, most of the direct beneficiaries were women.

BRAC, the organization that was instrumental in developing this program, has always argued that there are complementarities between the program's pieces. The consumption support helps the families get through the initial setup phase for their business without feeling the pressure to sell or consume the asset, while the training and the hand-holding helps them not make elementary mistakes and stay motivated during the same period. The savings accounts help them save their earnings, converting them into future lump investments for the household or business.

However, while the complementarity argument is plausible based on the above evidence, it could also be that the locations where these capital grants and business training have been tested were less conducive than the locations for the graduation program in terms of getting households to make long-term investments. Or it could be that the population of the extreme poor targeted by the graduation program is different from the populations targeted by those other interventions. The graduation programs deliberately target the poorest of the poor, whereas the other programs are often more inclusive of a wider set of poor households. It therefore remains logically possible that the individual components would work if they were similarly targeted.

1.2 What we do here

We examine whether, for the population targeted by the graduation program, it is possible to get similar results with just one of the main components of the program. We use two additional experimental arms from the Ghana site of Banerjee et al. (2015) to examine whether the savings component alone or the grant of goats (the most common asset transferred in the graduation program) alone generate long-term improvements in income and consumption comparable to the graduation program in the same population. We first look at a battery of economic and non-economic welfare indices at the two-year and three-year mark. The graduation program has significant positive effects on financial inclusion and income that persist at least three years. The savings-only program has significant positive effects on financial inclusion and consumption at two years, but both effects are much weaker by the three year mark. Finally, there is no evidence of any positive welfare effects of the asset-only treatment after either two years or three years.

We then work to unpack these differences between the treatments. We first ask why the graduation program had such a strong positive effect on income, and find that it is driven mainly by increased business revenues. Next we turn to our detailed savings data in order to understand why participants in the savings-only intervention were not able to save to start similarly profitable businesses. We show that the graduation program with the savings component is much more successful than the savings-only program in generating savings, even when the savings-only program had a 50% match rate. Perhaps this is saying that people need earnings in order to save, or that the coaching and handholding was critical for nudging the savings to be spent on investments. In sum, the savings-only component did not appear to generate savings that enabled households to start profitable businesses, or to generate persistent effects on a financial inclusion index.

We then ask why the households who only received assets were similarly unable to start profitable businesses. We find that although asset-only households do own more goats than control households after both two and three years, they own fewer goats than graduation households, suggesting that they were unable to hold onto or breed their goats the way households in the graduation program were. Moreover, they own less total livestock than graduation households, implying that they were more likely to get rid of other livestock. The evidence suggests that the additional training and consumption support enabled graduation households to accumulate more goats while keeping other livestock as well, ultimately making them more successful in building businesses that persistently generate income.

2. Graduation Program Details

For the multi-faceted program in Ghana, Graduating from Ultra Poverty ("GUP"), implementers first identified poor communities in poor regions of the country. In each identified community, staff members then facilitated a Participatory Wealth Ranking (PWR), in which members of the community worked together to rank households by economic status. Finally, staff members returned for a verification of the households judged to be the poorest. The program was implemented by Presbyterian Agricultural Services, a local nongovernmental organization, in coordination with Innovations for Poverty Action, a non-profit research organization.

The basic GUP program involved the transfer of a productive asset; skills training for the management of the asset as well as life skills training, a weekly cash stipend for consumption support, worth between $6 and $9 PPP depending on family size, lasting for 3-10 months; access to a savings account at a local bank (details below in the experimental design section, as this is one of the components unpacked); and some basic health services and health education. The productive asset was provided at the beginning of the program, and households were permitted to choose a package of assets from a set list. The rest of these services were delivered over two years via regular visits (typically weekly) by a field officer from the implementing organization. See Table 1 for a description of each program component, and see Banerjee et al. (2015) for more details.

3. Experimental Methods

3.1 Unpacking Mechanisms Design

The program included several experimental arms designed to unpack whether specific components were sufficient on their own. First, we introduced variation in the core program at the household level: 50% of sample households within GUP villages were randomly assigned to the graduation program without savings ("GUP without savings"), and 50% received the standard program with collection of savings for deposit into a local bank by the field agent ("GUP with savings").

Second, we introduced two additional treatment groups at the village-level. For each of these two additional treatment groups, a two-level design was maintained, thus creating treatment households in treatment villages, control households in treatment villages, and control households in control villages.

In Asset-Only villages, 50% of sample households were assigned to treatment, and received *only* a productive asset, without skills training on how to use it, or any of the other GUP components. These households were simply given four goats, since this was the most popular asset in GUP (71% of households chose a package of assets that included four goats). Goats were chosen because most households have had or have some goats, and thus would typically be content with receiving more, and

we did not want to interact with the households and give them choices for fear that such engagement itself could change behavior.

In Saving Out of Ultra Poverty ("SOUP") villages, 59% of sample households were assigned to the SOUP treatment, and received a visit from the field agent to collect savings, just as in the GUP with savings group, but did not receive any other components of the program. Of this 59%, half received savings accounts and deposit collection without a match ("SOUP without match") and half received savings accounts and deposit collection with a 50% match ("SOUP with match"). Specifically, for every GHC 1 deposited, households in this group received a matching contribution of GHC 0.50.[9] The remaining households in SOUP villages were assigned to the SOUP control group.

Appendix Table 1 provides a summary description of the program, Appendix Table 2 presents the nine experimental arms and sample sizes for each arm, and Appendix Table 3 clarifies the program components for each of the nine experimental arms in Ghana.

3.2 Data Collection

We conducted a household survey at baseline, at two years (conducted shortly after the end of the household visits, two years after the assets were transferred and training conducted), and at three years. The intervention lasted two years. We conducted three additional short midline surveys after six months, one year, and one and a half years; we include the latter two in our two-year analysis.

Most measures were collected during the aforementioned household surveys with the primary respondent in the household (typically the female head). However, the health, mental health, political, time use, and gender measures were collected in a separate "adult" survey, typically administered to one adult household member. Respondents were asked about the health of all household members, but only about his or her own mental health, political involvement, time use, and gender norms. In the analysis we pool all of the data that we have for each indicator, which explains why the number of observations sometimes differ across regressions. See Appendix Table 4 for details on the number of observations by outcome and survey round.

3.3 Integrity of the Experiment Design

Appendix Table 5 provides descriptive statistics for key baseline indicators across treatment arms. Although no systematic pattern emerges, in Ghana we reject the joint null hypothesis of orthogonality for three out of 14 variables. In analysis, we will show results with and without controls for baseline variables, as well as the p-value for the difference at baseline, so that specific instances of imbalance can be take into account when interpreting our estimates.

3.4 Analysis Methods

In all regressions, the omitted group is pure control unless otherwise specified. In all regressions, we control for the treatment status of the household and village within an employment program, a separate cross-cutting treatment that is not part of the standard graduation program, and will not be discussed in this paper For regressions that do not involve the Asset-Only treatment group, we also control for the outcome at baseline as well as the baseline variables that we used for re-randomization. For regressions that include the Asset-Only treatment households (households for which we did not

[9] At the onset of the program, there was a maximum match of GHC 1.50 GHC per week (for a GHC 3 deposit) but this cap was eventually removed.

collect baseline data), we also run specifications with controls for three key endline variables that, for the most part, did not change due to GUP or SOUP (though see the discussion below): average household age, household size, and whether or not the house has a metal roof. We report the p- and q-values from those specifications as well.

As mentioned above, there were 3 midline surveys administered to a (fixed) random subset of households, a survey administered to all households at two years (the end of the program), and a survey administered to all households at three years (a year later). We typically either report "two-year," "three-year," or "pooled" outcomes, as indicated in each table. Importantly, our "two-year" outcomes are an average of the outcome measured at two years and the outcomes measured in the 2 midline surveys administered within the previous year. For all regressions that involve survey data, we include interviewer fixed effects, and fixed effects for whether or not the household was surveyed in each midline. When we do pool two-year and three-year outcomes, we include a fixed effect for the survey timing.

The most common specification that we use is the following; any deviations from this specification or additional details will be reported in table notes.

$$Y_{it}^{k} = \alpha + \beta T_i + \gamma Z_i^{k} + W_i^{strat} + V_i^{short\ survey} + \theta_{it}^{interviewer} + \varphi_t + [\mu_{emp}] + \epsilon_{it}$$

Where Y_{it}^{k} is outcome *k* for individual *i* at time *t* (where t is either two years or three years), T_i is a treatment dummy, Z_i^{k} is the baseline value of outcome k for individual i, W_i^{strat} is a vector of controls that consists of the variables we used for stratification, $V_{short\ survey}$ is a vector of dummies for whether or not the household was surveyed in each midline, $\theta_{it}^{interviewer}$ are interviewer fixed effects, and φ_t is a dummy that is equal to 1 if the outcome was measured at three years. In addition we include μ_{emp}, a vector of controls for the employment program treatment arms.

We use the Benjamini-Hochberg step-up method (Benjamini and Hochberg 1995) and procedures put forward in (Anderson 2008) to compute q-values that correct for the multiple hypotheses within each table (and sometimes within panels). We do not extend these corrections beyond the boundary of an individual table (or panel) because the substantive aspects of the hypotheses we test change dramatically across tables.[10] We decided to focus on theoretically related hypotheses, and our tables (panels) are organized exactly on such lines.

4. Results

Section 4.1 begins by looking at final indicators of impact and their changing effects over time. Section 4.2 then uses intermediate outcomes to unpack the differences in effects between the GUP treatment and the SOUP and Asset-Only treatments. In both sections, to pick up the marginal effect of the additional GUP interventions, we pay special attention to the differences in impacts between GUP with savings and SOUP, and between the Asset-Only intervention and GUP without savings.

[10] The boundaries of a set of tests over which one might correct for multiple hypotheses is arbitrary unless one takes a full Bayesian approach.

4.1 Household-Level Outcomes

Tables 1 contains estimates of treatment effects on five indices that capture economic wellbeing two years after the productive asset transfer (i.e., two years after the start of the program, and shortly after the end of the household visits). Table 2 presents estimates of the same outcomes three years after the productive asset transfer. SOUP has a positive effect on the financial inclusion index at the two-year and three-year mark (though the three-year effect is not statistically significant once we account for multiple hypotheses); this effect is driven by higher savings balances. Overall, in the long-run, SOUP does little more than increase savings, and the match does not appear to have made any substantial difference in welfare.[11] Table 2 Panel B shows all null results (in fact, several point estimates are negative) for the treatment effect of the Asset-Only treatment at three years, compared to control households, except for consumption (after controlling for household size, however, the consumption result is null as well[12]).

At the end of the program, GUP without savings shows significant effects on asset value and food security; a year later, households begin to generate higher incomes. Table 3 breaks down income sources at three years[13], and it becomes clear that animal revenue is not driving this effect.[14] GUP with savings shows significant short-run effects on financial inclusion and income, both of which persist a year later. In summary, GUP has long-run effects on income (the effect of having any GUP treatment is 0.187 standard deviations with a q-value of 0.022), and those who can deposit savings on a weekly basis have higher savings as well. Interestingly, even GUP households without deposit collection services appear to save slightly more (though the effect does not survive the multiple hypothesis correction).

Appendix Tables 10 and 11 indicate that at the end of the program there are only a few effects of SOUP, GUP, and the Asset-Only programs on non-economic indices (Appendix Tables 12 and 13 report the same for comparisons of SOUP match to no match, and GUP with savings to GUP without savings). After two-years, there are only four effects that come close to surviving multiple hypothesis correction: GUP with savings on political involvement, Asset-Only on health, and GUP no savings and Asset-Only on time

[11] In Appendix Tables 6-7, we report two and three year estimates, respectively, of differences between SOUP and SOUP match, and GUP and GUP with savings.

[12] Note that while the table shows an improvement in consumption at three years (p-value 0.015, q-value 0.101), we believe this estimate is biased upward. At the time of the two-year survey the Asset-Only households are 18.5% smaller than the control households (shown in Appendix Figure 1). Unfortunately, because the Asset-Only treatment was decided upon after the baseline was completed (due to logistics), we have no baseline measure of family size for Asset-Only households. We can however look at how household size changes in GUP and SOUP, since there we have baseline values. We find no evidence of a significant change in SOUP households, but GUP households show a small but significant increase after controlling for any baseline differences between them and the corresponding control households (Appendix Table 8). This fits with our expectations: these households are richer and probably need more labor, hence growth is plausible. Based on this, we would expect the treatment effect of Asset-Only on household size to also be positive though perhaps smaller. We therefore infer that the negative household size difference in the asset-only group between treatment and control is a pre-existing difference and not a treatment effect, and therefore control for it in our regressions. Critically, we cannot reject a null effect on consumption for Asset-Only once we control for household size. This is consistent with smaller households have higher per capita consumption, ceteris paribus (i.e., returns to scale in consumption). Combined with the fact that we see no effects on income, assets, business revenue, or harvest value, we conclude that the Asset-Only does not improve long-run consumption.

[13] Appendix Table 9 presents the same at two years.

[14] Our monthly income measure is the sum of monthly agricultural income, monthly business income, monthly wage income, and monthly animal revenue, as we do not have expense data for animals.

working. None of these effects persists to the three-year measurement—indeed, the effect of Asset-Only on health appears to turn negative, as does the effect of SOUP no match on mental health. However, GUP savings does emerge with a positive effect on an index of female decision-making within the household at three years. Overall, there is no evidence that either SOUP or Asset-Only had a positive long-term impact on health, mental health, political involvement, time at work, or female empowerment.

4.2 Unpacking Household-Level Outcomes

4.2.1 What is the activity driving the GUP income effect?

With or without the savings component, GUP has persistent effects on income. Table 3 examines the source of these three year effects[15]. The strongest effects are that GUP, with or without savings, led to more business income, persistent at both year two and year three. Table 3, Column 1 suggests that this higher income is driven in part by the creation of new businesses. This indicates that GUP households, irrespective of the inclusion of the savings treatment, were able to build or grow businesses as a result of the program. Why did business income rise for GUP households and not for households in the SOUP or Asset-Only treatments? In Section 4.2.2 we take a closer look at SOUP households, and in Section 4.2.3 we turn to Asset-Only households.

4.2.2 Unpacking the savings process, using transaction data

In Figure 1 we look at the weekly data from our savings collectors, which is, by its very nature, restricted to treatments where there was a savings intervention. We therefore use the pure savings treatment (SOUP no match) as the comparison group. The average SOUP no match household deposited USD 1 in a week on average; this effect rose 9% in the presence of a match, and more than doubled in the presence of GUP. GUP savings participants save much more during the lean season, which could be because they received consumption support during this time (the savings collector was also the individual responsible for bringing them the cash they received as consumption support, so they could immediately save the cash if they wished).

In Appendix Table 14, columns 1-3, we look at the impact of the program over the long run using the deposits data, again using SOUP no match as the comparison group. In column 4, we look at self-reported savings balances from the two-year household survey, conducted between 1-3 months after the end of savings collection. Here, we use pure control households as the comparison group (since we have this data for the full sample) in order to look at the effects of SOUP no match and GUP no savings on savings balances. Households in GUP savings both deposit much more and take out much more than both the SOUP recipients and the SOUP match recipients, and by the end of the program they have 88% more in the "bank" than either group. The match has no additional effect on balances, a fact that is consistent with the self-reported data where we compare the GUP (saving and no savings) and SOUP (match and no match) households to the control group. The last column of Appendix Table 14 also confirms that the GUP no savings intervention approximately double balances relative to the control group, the SOUP treatments triple it, and GUP savings raises it more than fivefold. [16]

[15] Appendix Table 9 reports the corresponding two year results.

[16] The self-reported savings balance data do not match precisely with the transaction data, as demonstrated by the differences between columns Appendix Table 14 columns 3 and 4. Note that the survey data were collected between one and three months after the end of the transaction data, thus some of the discrepancy could be due

The main takeaways seems to be that the availability of savings collectors matters a lot, but the rate of return on savings less so. There also seems to be an income effect—GUP by itself almost doubles savings, even in the absence of savings collectors. There is also an interaction effect between income and savings collection services— GUP savings households save USD 12.9 more than the sum of the independent treatments of GUP no savings and SOUP no match, a difference that is significant at the 1% level (p = 0.003).

4.2.3 Why didn't Asset-Only households succeed in starting a business?

In Table 4 we compare GUP no savings with the Asset-Only treatment to pinpoint the differences in asset accumulation that they generate. The main difference between the two treatments was the combination of handholding and consumption support, both of which were intended to encourage the recipient to further invest in the asset rather than consume it. The handholding both provided knowhow on how to take care of the asset (such as when to vaccinate it, given that goats were the most commonly chosen asset by for GUP households) and nudges to help the household to focus on building productive assets to generate positive change in long-term outcomes. The consumption support was explicitly intended to help this process in the short-run, by helping to absorb short-run shocks that could lead to households consuming the transferred assets.

The question of interest here is whether there are differences in the investment patterns. We report livestock value, pooling two-year and three-year results. We see that both treatments significantly raise the value of goats owned by the household, though the effect of GUP is higher by $23 (though this difference drops to $12 and is not significant when we add two-year controls). This is despite the fact that, unlike the Asset-Only treatment, not at all GUP households had received goats—they were given a choice between several asset bundles that included goats, fowl, pigs, inputs for maize farming, inputs for rice farming, inputs for sorghum farming, and inputs to begin a shea-butter business. It seems that the GUP households were better at holding onto or growing their goats.[17]

Both GUP and Asset-Only households reduced the number of sheep, but Asset-Only households also reduced the number of cows. Ultimately, GUP increases the total value of livestock by $95 more than the Asset-Only intervention without controls and by $51 with controls, though the latter only has a p-value of 0.14.

Thus, it seems that graduation households were able to use the additional training and consumption support to accumulate more goats while keeping other livestock as well. This accumulation of goats generated only a modest increase in animal revenues, but a substantial increase in business creation and income, perhaps by enabling households to undertake riskier projects and investments.[18]

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to withdrawals in that period; but no doubt some of this is also due to accuracy challenges when collecting self-reported savings data. The difference is consistent across all three treatment groups for which we have transaction data.

[17] In Appendix Table 15 we look at the flows of goats between rounds conditional on owning goats in the current round, and find that GUP households have more goat births, deaths, sales, and purchases than Asset-Only. We cannot construct stock estimates from the flows, in part because we only collected flow data for households that owned at least one goat at the time of each survey.

[18] In Appendix Table 16 we examine productive assets, household assets, and agricultural stocks, but find no GUP treatment effect on productive assets.

5. Discussion

While earlier work (Banerjee et al. 2015; Bandiera et al. 2017) found that a multi-faceted program was sufficient for generating economically meaningful and sustainable impacts for those in extreme poverty, the analysis did not establish whether the multi-faceted approach was necessary. Here we show that neither transferring a productive asset (in this case, goats) nor providing access to a savings account, on their own, generate similar economically meaningful and sustainable impacts in the same population. This is a critical finding: identifying simpler programs, i.e. ones with reduced implementation complexity and lower costs, that work would be ideal as one plans for a nationwide social protection policy.

Many questions remain that are important both for understanding more about the underlying mechanisms of poverty traps, and for forming the optimal policy for social protection at scale. For example, cash transfers are a natural alternative (because of lower transaction costs, lower probability of moving prices when implemented at scale, and higher flexibility the cash affords the recipient to choose their own investment). However cash transfers also have been shown to be less likely to be invested (Fafchamps et al. 2014). Lump-sum cash transfers do better than constant smaller streams of cash flow for encouraging investment (rather than immediate consumption), but still much of the funds get used for durable consumption goods, such as home improvements (Haushofer and Shapiro 2016). These may generate long-term benefits for households, but perhaps not higher long-term income. More is needed to understand whether cash transfers implemented in other locations or alongside some form of behavioral intervention, e.g. a "nudge" in which individuals form a simple non-binding plan before receiving the cash, would lead to higher levels of investment and thus longer term impact on income.

The household visits serve multiple roles, including providing information and behavioral support. At scale, these pose a real challenge, as they require a vast network of field agents who are both well informed about the range of productive assets that might be transferred to help households when problems arise, and also well versed in how to engage households in life coaching, to help build hope and encourage the aspirations of the households and guide them to stay on track with a long term plan of building productive assets. Some have suggested technological solutions to this problem, for example a mobile device that provides videos with information and mobile applications which facilitate communication between households and field agents (for example, that generate a regular stream of text messages at predefined or appropriately triggered times). Such a technology may make it easier to implement the program at scale without losing implementation fidelity, yet may put at risk the impact if direct human interaction is necessary.

On the other hand, perhaps rather than looking for components to shed, an even richer program would be more effective. Despite the success on average, not everyone benefits from the program. Those in extreme poverty suffer from high levels of depression (Sipsma et al. 2013). Perhaps those with poor mental health are not able to embrace the opportunity fully, and thus a mental health intervention that precedes the multi-faceted program would generate even bigger impacts. Among a highly selected population of youth engaged in street crime in Liberia, cognitive behavioral therapy in conjunction with cash has led to important positive economic changes a year later (Blattman, Jamison, and Sheridan 2015). In Ghana, this is now being tested in a new sample frame of ultra-poor households similar to the population studied here.

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Table 1: Two-Year Ghana Effects of GUP, SOUP, and Asset Only on Household-Level Economic Indices

		asset value index	consumption index	financial inclusion index	food security index	income index
PANEL A: GUP vs. SOUP						
SOUP no match	itt	0.130	0.106	0.453	0.023	0.011
	se	(0.061)	(0.063)	(0.095)	(0.049)	(0.061)
	p-val	0.033**	0.096*	0.000***	0.642	0.861
	q-val	0.105	0.236	0.001***	0.730	0.921
	bsl p-val	0.563	0.368	0.086*(+)	0.011**(+)	0.269
SOUP match	itt	0.075	0.143	0.566	0.076	0.093
	se	(0.059)	(0.062)	(0.112)	(0.048)	(0.062)
	p-val	0.204	0.021**	0.000***	0.112	0.131
	q-val	0.320	0.086*	0.001***	0.236	0.251
	bsl p-val	0.078*	0.628	0.605	0.387	0.775
GUP no sav.	itt	0.119	0.105	0.072	0.158	0.084
	se	(0.057)	(0.066)	(0.094)	(0.050)	(0.065)
	p-val	0.039**	0.113	0.444	0.002***	0.197
	q-val	0.109	0.236	0.591	0.012**	0.320
	bsl p-val	0.256	0.319	0.022**	0.562	0.102
GUP sav.	itt	0.037	0.060	1.015	0.027	0.171
	se	(0.052)	(0.061)	(0.131)	(0.050)	(0.065)
	p-val	0.479	0.328	0.000***	0.587	0.008***
	q-val	0.599	0.483	0.001***	0.699	0.040**
	bsl p-val	0.177	0.784	0.490	0.751	0.775
GUP sav. - SOUP no match	diff	-0.093	-0.046	0.562	0.004	0.161
	se	(0.065)	(0.072)	(0.152)	(0.057)	(0.075)
	p-val	0.150	0.525	0.000***	0.941	0.032**
	bsl p-val	0.492	0.326	0.361	0.013**	0.502
	obs	3787	3707	3678	3706	3788
PANEL B: GUP vs. Asset Only						
asset	itt	-0.004	0.012	-0.065	0.087	-0.139
	se	(0.079)	(0.081)	(0.085)	(0.059)	(0.065)
	p-val	0.961	0.884	0.448	0.141	0.033**
	q-val	0.962	0.921	0.591	0.251	0.105
	itt, ctrls	0.048	-0.094	-0.046	0.078	-0.094
	p-val, ctrls	0.521	0.217	0.594	0.183	0.151
	q-val, ctrls	0.595	0.362	0.595	0.362	0.362
GUP no sav. - asset	diff	0.122	0.066	0.155	0.073	0.230
	se	(0.088)	(0.092)	(0.109)	(0.064)	(0.078)
	p-val	0.166	0.472	0.155	0.249	0.003***
	itt, ctrls	0.013	0.252	0.117	0.085	0.138
	p-val, ctrls	0.879	0.004***	0.285	0.181	0.079*
	obs	4107	4006	3977	4005	4108

Estimates from OLS regressions of household-level economic indices at year two (averaging over two-year outcome and midline outcomes that were collected at least one year after treatment start) on treatments. The omitted group is control households in control villages. The regression in Panel A excludes the asset only villages and includes controls for re-randomization variables and the baseline value of the outcome. The regression in Panel B includes the asset only villages (without baseline controls). Both panels include controls for employment program treatments. We also include interviewer fixed effects and fixed effects for whether or not the household was surveyed in each midline. Standard errors clustered at unit of randomization (village for pure control, individual otherwise). We use the Benjamini-Hochberg step-up method to compute q-values, considering the 25 independent hypotheses in the table. For regressions that include asset households, we also report p-values and q-values for a specification with three two-year variables as controls, since we have no baseline controls. (See appendix for evidence that these variables were mostly not affected by the GUP or SOUP treatments.) Finally, we report p-values for the same specification using the baseline value of each outcome. We use a superscript (+) to indicate a positive t-statistic. See appendix for detailed descriptions of each variable.

Table 2: Three-Year Ghana Effects of GUP, SOUP, and Asset Only on Household-Level Economic Indices

		asset value index	consumption index	financial inclusion index	food security index	income index
PANEL A: GUP vs. SOUP						
SOUP no match	itt	0.105	-0.066	0.155	0.035	-0.012
	se	(0.069)	(0.056)	(0.072)	(0.044)	(0.066)
	p-val	0.127	0.239	0.032**	0.430	0.856
	q-val	0.265	0.426	0.128	0.633	0.892
	bsl p-val	0.563	0.368	0.086*(+)	0.011**(+)	0.269
SOUP match	itt	0.126	0.042	0.133	0.062	0.041
	se	(0.062)	(0.062)	(0.067)	(0.045)	(0.068)
	p-val	0.044**	0.495	0.046**	0.168	0.549
	q-val	0.128	0.654	0.128	0.323	0.654
	bsl p-val	0.078*	0.628	0.605	0.387	0.775
GUP no sav.	itt	0.111	0.147	0.132	0.050	0.177
	se	(0.060)	(0.073)	(0.076)	(0.044)	(0.074)
	p-val	0.063*	0.042**	0.082*	0.255	0.016**
	q-val	0.158	0.128	0.186	0.426	0.101
	bsl p-val	0.256	0.319	0.022**	0.562	0.102
GUP sav.	itt	0.148	0.020	0.420	0.049	0.197
	se	(0.067)	(0.060)	(0.096)	(0.048)	(0.076)
	p-val	0.026**	0.736	0.000***	0.304	0.010***
	q-val	0.128	0.800	0.001***	0.476	0.101
	bsl p-val	0.177	0.784	0.490	0.751	0.775
GUP sav. - SOUP no match	diff	0.042	0.086	0.265	0.014	0.210
	se	(0.080)	(0.067)	(0.111)	(0.056)	(0.083)
	p-val	0.598	0.198	0.016**	0.795	0.012**
	bsl p-val	0.492	0.326	0.361	0.013**	0.502
	obs	3755	3597	3603	3603	3763
PANEL B: GUP vs. Asset Only						
asset	itt	-0.003	0.209	0.047	-0.025	-0.051
	se	(0.070)	(0.086)	(0.075)	(0.061)	(0.078)
	p-val	0.964	0.015**	0.527	0.682	0.517
	q-val	0.965	0.101	0.654	0.776	0.654
	itt, ctrls	0.069	0.146	0.093	-0.033	0.003
	p-val, ctrls	0.325	0.095*	0.219	0.599	0.970
	q-val, ctrls	0.542	0.475	0.542	0.749	0.970
GUP no sav. - asset	diff	0.126	-0.066	0.088	0.074	0.244
	se	(0.082)	(0.100)	(0.095)	(0.067)	(0.090)
	p-val	0.126	0.508	0.355	0.269	0.007***
	itt, ctrls	-0.001	0.041	0.021	0.084	0.137
	p-val, ctrls	0.992	0.683	0.825	0.219	0.129
	obs	4076	3883	3893	3893	4084

Estimates from OLS regressions of household-level economic indices at year two (averaging over two-year outcome and midline outcomes that were collected at least one year after treatment start) on treatments. The omitted group is control households in control villages. The regression in Panel A excludes the asset only villages and includes controls for re-randomization variables and the baseline value of the outcome. The regression in Panel B includes the asset only villages (without baseline controls). Both panels include controls for employment program treatments. We also include interviewer fixed effects and fixed effects for whether or not the household was surveyed in each midline. Standard errors clustered at unit of randomization (village for pure control, individual otherwise). We use the Benjamini-Hochberg step-up method to compute q-values, considering the 25 independent hypotheses in the table. For regressions that include asset households, we also report p-values and q-values for a specification with three two-year variables as controls, since we have no baseline controls. (See appendix for evidence that these variables were mostly not affected by the GUP or SOUP treatments.) Finally, we report p-values for the same specification using the baseline value of each outcome. We use a superscript (+) to indicate a positive t-statistic. See appendix for detailed descriptions of each variable.

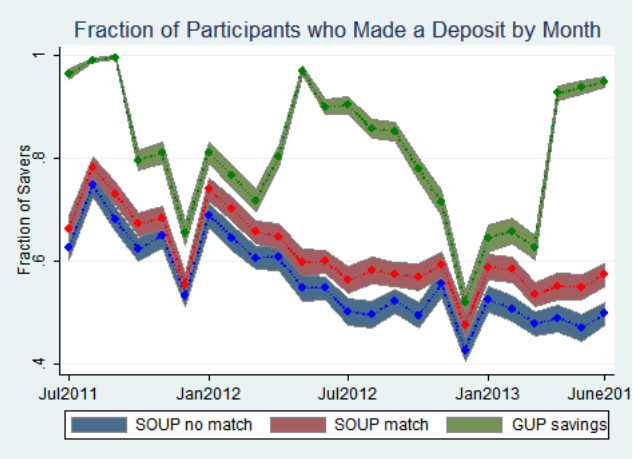
Table 3: Three-Year Ghana Effects of GUP, SOUP, and Asset Only on Income Sources

		household has business	business income, monthly (USD)	crop income, monthly (USD)	animal revenue, monthly (USD)	wage income, monthly (USD)
PANEL A: GUP vs. SOUP						
SOUP no match	itt	-0.006	-0.171	0.643	-0.538	-0.839
	se	(0.027)	(1.278)	(3.041)	(0.840)	(0.388)
	p-val	0.821	0.893	0.832	0.522	0.031**
	q-val	0.993	0.993	0.993	0.933	0.154
	bsl p-val	0.929	0.794	0.071*	.	0.257
SOUP match	itt	-0.011	-0.207	3.320	-0.389	-0.266
	se	(0.027)	(1.237)	(3.172)	(0.918)	(0.459)
	p-val	0.698	0.867	0.295	0.672	0.562
	q-val	0.993	0.993	0.739	0.993	0.937
	bsl p-val	0.086*(+)	0.266	0.219	.	0.814
GUP no sav.	itt	0.073	4.166	3.915	1.647	0.023
	se	(0.030)	(1.601)	(3.256)	(1.104)	(0.439)
	p-val	0.016**	0.009***	0.229	0.136	0.957
	q-val	0.099*	0.089*	0.638	0.425	0.993
	bsl p-val	0.326	0.470	0.330	.	0.022**
GUP sav.	itt	0.087	4.129	4.957	1.997	0.035
	se	(0.029)	(1.614)	(3.250)	(1.092)	(0.496)
	p-val	0.003***	0.011**	0.127	0.068*	0.943
	q-val	0.076*	0.089*	0.425	0.282	0.993
	bsl p-val	0.318	0.234	0.943	.	0.191
GUP sav. - SOUP no match	diff	0.093	4.300	4.314	2.535	0.875
	se	(0.033)	(1.915)	(3.568)	(1.149)	(0.481)
	p-val	0.005***	0.025**	0.227	0.027**	0.069*
	bsl p-val	0.402	0.196	0.093*(+)	.	0.853
	ctrl mean	0.26	6.25	35.72	8.23	1.86
	ctrl sd	0.44	18.98	44.61	15.69	6.94
	obs	3605	3604	3675	3682	3604
PANEL B: GUP vs. Asset Only						
asset	itt	-0.026	0.552	-2.433	-0.887	0.006
	se	(0.034)	(1.565)	(3.245)	(1.169)	(0.644)
	p-val	0.440	0.725	0.453	0.448	0.992
	q-val	0.872	0.993	0.872	0.872	0.993
	itt, ctrls	-0.010	1.627	-1.179	-0.152	-0.237
	p-val, ctrls	0.766	0.311	0.713	0.899	0.706
	q-val, ctrls	0.900	0.900	0.900	0.900	0.900
GUP no sav. - asset	diff	0.109	3.447	7.109	2.898	0.023
	se	(0.039)	(2.078)	(3.786)	(1.410)	(0.646)
	p-val	0.005***	0.097*	0.061*	0.040**	0.971
	itt, ctrls	0.087	2.092	3.762	1.746	0.245
	p-val, ctrls	0.027**	0.321	0.320	0.227	0.700
	ctrl mean	0.26	6.25	35.72	8.23	1.86
	ctrl sd	0.44	18.98	44.61	15.69	6.94
	obs	3896	3895	3976	4003	3895

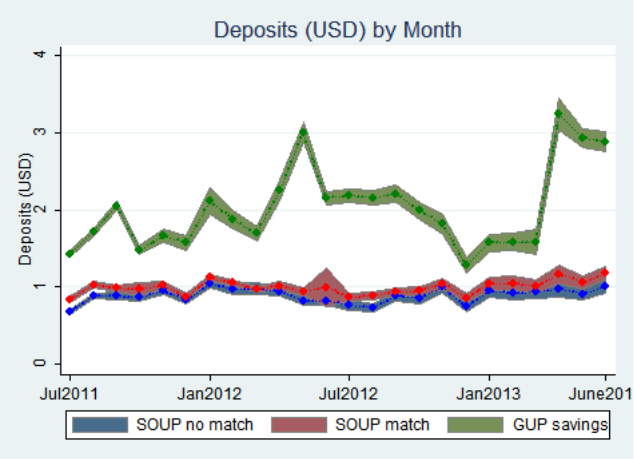
Estimates from OLS regressions of household-level economic indices from year two (averaging over two-year outcome and midline outcomes that were collected at least one year after treatment start) on treatments. The omitted group is control households in control villages. The regression in Panel A excludes the asset only villages and includes controls for re-randomization variables and the baseline value of the outcome. The regression in Panel B includes the asset only villages (without baseline controls). Both panels include controls for employment program treatments.. We also include interviewer fixed effects and fixed effects for whether or not the household was surveyed in each midline. Standard errors clustered at unit of randomization (village for pure control, individual otherwise). We use the Benjamini-Hochberg step-up method to compute q-values, considering the 25 independent hypotheses in the table. For regressions that include asset households, we also report p-values and q-values for a specification with three two-year variables as controls, since we have no baseline controls. (See appendix for evidence that these variables were mostly not affected by the GUP or SOUP treatments.) Finally, we report p-values for the same specification using the baseline value of each outcome. We use a superscript (+) to indicate a positive t-statistic. See appendix for detailed descriptions of each variable.

Figure 1: Monthly Deposits (for Treatment Groups with Savings Component)

(a)



(b)



(c)

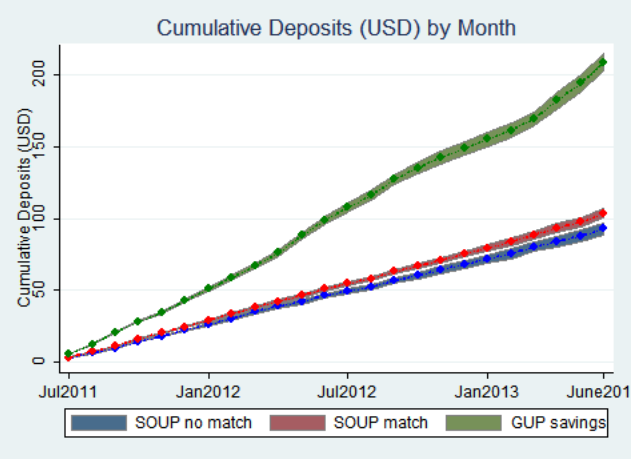


Table 4: Pooled Two-Year and Three-Year Ghana Effects of GUP and Asset Only on Household-Level Livestock Values

		goat value (USD)	fowl value (USD)	pig value (USD)	sheep value (USD)	cow value (USD)	total livestock value (USD)
GUP no sav.	itt	63.211	6.216	4.067	-19.072	-13.840	51.653
	se	(8.213)	(3.790)	(1.999)	(8.961)	(14.257)	(30.708)
	p-val	0.000***	0.101	0.042**	0.033**	0.332	0.093*
	q-val	0.001***	0.135	0.085*	0.081*	0.362	0.135
	itt, ctrls	59.776	4.785	3.796	-23.745	-18.151	33.075
	p-val, ctrls	0.000***	0.211	0.060*	0.009***	0.201	0.281
	q-val, ctrls	0.001***	0.317	0.144	0.036**	0.317	0.344
asset	itt	40.006	-7.640	0.446	-23.642	-36.967	-43.360
	se	(10.036)	(4.211)	(2.035)	(9.566)	(14.482)	(30.080)
	p-val	0.000***	0.070*	0.827	0.014**	0.011**	0.150
	q-val	0.001***	0.120	0.827	0.041**	0.041**	0.180
	itt, ctrls	47.569	-4.448	0.279	-14.272	-32.189	-17.745
	p-val, ctrls	0.000***	0.286	0.878	0.130	0.032**	0.556
	q-val, ctrls	0.001***	0.344	0.878	0.261	0.098*	0.607
GUP no sav. - asset	diff	23.205	13.855	3.621	4.570	23.127	95.014
	se	(10.993)	(4.672)	(2.670)	(10.761)	(15.738)	(34.578)
	p-val	0.035**	0.003***	0.175	0.671	0.142	0.006***
	itt, ctrls	12.207	9.232	3.517	-9.473	14.038	50.819
	p-val, ctrls	0.271	0.047**	0.167	0.379	0.379	0.136
	ctrl mean	85.0	50.8	4.0	77.8	46.4	289.1
	ctrl sd	115.2	63.5	23.6	158.9	219.0	520.0
	obs	8025	8086	7929	7976	7931	8118

Estimates from OLS regressions of asset-related outcomes on GUP and asset treatments. The omitted group is control households in control villages. We pool outcomes from the two-year (averaging over the two-year outcome and midline outcomes that were collected at least one year after treatment start) and three-year surveys. We control for employment program treatments. We also include interviewer fixed effects, survey round fixed effects (two-year or three-year), and fixed effects for whether or not the household was surveyed in each midline. Standard errors clustered at unit of randomization (village-level for pure control, individual-level otherwise). We use the Benjamini-Hochberg step-up method to compute q-values, considering the 12 independent hypotheses in the table. We also report p-values and q-values for a specification with three two-year variables as controls (average age, metal roof, household size), since we have no baseline controls. See appendix for detailed descriptions of each variable.

Appendix Table 1: Program Details

	Ghana
Location	Northern and Upper East regions
Implementing NGO	Presbyterian Agricultural Services (PAS) and Innovations for Poverty Action (IPA)
Type of NGO	Local NGO
Financial instituion partner	Services provided by PAS
Eligibility requirements	Exclusion criteria included: (i) ownership of >30 small ruminants or >50 fowl; (ii) member found to be alcoholic or drug addict; (iii) no strong, able-bodied adult; (iv) did not have a female member; (v) did not have a member between the ages of 18 and 65
Method of identifying participants	Participatory Wealth Ranking at Village Level
Savings component	Half of GUP households received savings accounts (savings collected during weekly visits by field agents, households receive passbooks to log deposits)
Health component	Health and nutrition education. Beneficiaries were enrolled in the National Health Insurance Scheme.
Asset transfer	July 2011-July 2012
Value of asset transfer	GHS 300 (PPP US$451.38)
Most common asset chosen	Goats and hens (44%)
2nd most common asset chosen	Goats and maize inputs (27%)
3rd most common asset chosen	Shea nuts and hens (6%)
Consumption support	Treatment households received weekly cash transfers of GHS 4 to 6 (PPP US$6.02 to 9.03) (amount dependent on household size) during lean season
Freq. household visits	Weekly over 24 months

Appendix Table 2: Experiment Design

	Households	Villages
control villages	1299	76
GUP control	642	
GUP without savings	333	78
GUP with savings	333	
SOUP control	510	
SOUP without match	371	77
SOUP with match	362	
asset only control	163	45
asset only	164	
TOTAL	4177	276

In control villages, none of the households received any treatment. In GUP (Graduation from Ultra Poverty) villages, GUP control households received no treatment, GUP without savings households received the full GUP program, and GUP with savings households received the full GUP program plus the opportunity to deposit savings during weekly visits. In SOUP (Savings out of Ultra Poverty) villages, SOUP control households received no treatment, SOUP without match households received the opportunity to deposit savings during weekly visits, and SOUP with match households received SOUP with a 50% match. In asset only villages, asset only control households received no treatment, and asset only households received goats.

Appendix Table 3: Program Components by Treatment, Ghana

	Transfer of asset, chosen by household (w/ goats as option)	Transfer of four goats	Consumption support, training, coaching, etc.	Access to savings deposit collector	Savings deposits matched at 50%	No services provided to household	Others in village received "GUP"	Others in village received "SOUP"	Others in village received four goats
GUP with savings	x		x	x					
GUP without savings	x		x						
GUP Control						x	x		
SOUP with match				x	x				
SOUP without match				x					
SOUP Control						x		x	
Asset Only		x							
Asset Only Control						x			x
Pure Control						x			

Appendix Table 4: Number of Non-Missing Observations by Outcome Variable, Country, and Survey Round

	Ghana Year 2	Ghana Year 3
animal revenue, monthly (USD)	3953	4003
asset value index	4107	4076
business income, monthly (USD)	3973	3895
coeff. var. monthly per cap food cons.		4058
consumption index	4006	3883
cow value (USD)		
crop income, monthly (USD)	4010	3976
female empowerment index	3721	3675
financial inclusion index	3977	3893
fish value (USD)		
food security index	4005	3893
fowl value (USD)	4071	4015
goat value (USD)	4040	3985
guinea pig value (USD)		
health index	28132	27294
household has business	3980	3896
income index	4108	4084
mental health index	3752	3682
monthly transfers received (USD)	3972	3893
pig value (USD)	4000	3929
political involvement index	3739	3683
time at work index	3725	3665
value of loans last year (USD)	3972	3893
wage income, monthly (USD)	3973	3895

In some regressions we include both two-year and three-year measures, with a fixed effect (see table notes). Most measures were collected during household surveys with the primary respondent in the household (typically the female head). The health, mental health, political, time use, and gender measures were collected during a separate "adult" survey taken by a member of the household. Health measures were collected for all household members; hence the large number of observations for these measures.

Appendix Table 5: Descriptive Statistics for Baseline Indicators, Ghana (Excluding Asset Only and Asset Only Control)

	ctrl villages	GUP savings	GUP no savings	GUP ctrl	SOUP no match	SOUP match	SOUP ctrl	p-value, F-test joint sig
household size	7.16	7.27	7.54	7.21	7.11	7.37	7.16	.75
	3.74	3.86	3.82	4.04	3.28	3.81	3.82	
average age, household	25.14	24.4	24.91	25.07	23.47	24.59	25.35	.14
	10.75	9.49	10.47	10.65	9.86	9.72	10.19	
land area (acres)	4.71	4.97	4.65	4.57	4.67	4.96	4.73	.83
	4.73	4.44	3.98	4.41	4.04	4.84	4.65	
monthly per cap cons. (USD)	55.97	56.49	54.59	58.37	57.2	58.54	58.13	.72
	37.34	39.36	34.43	39.85	37.98	39.33	37.57	
monthly income (USD)	41.58	45.98	40.39	42.2	41.44	47.15	40.7	.51
	56.2	55.96	50.83	56.36	50.72	55.58	49.61	
savings balances (USD)	2.02	3.79	1.04	2.77	3.4	2.48	2.6	.01
	10.95	14.42	6.77	12.85	16.02	11.82	13.34	
food security index	0	.15	.09	.11	.21	.2	.1	.13
	1	1.1	1.11	1.08	1.13	1.15	1.15	
asset value index	0	-.02	-.03	-.05	-.04	-.06	.02	.93
	1	.89	.83	1.04	.87	.89	1.14	
financial inclusion index	0	.13	-.07	.05	.18	.11	.06	.01
	1	1.13	.71	.99	1.34	1.17	1.09	
health index	0	.02	.01	-.08	-.04	.04	-.06	.02
	1	.99	1	1.07	1.04	.96	1.04	
mental health index	0	.03	-.01	-.01	.15	.08	.06	.24
	1	.97	.93	1	1.02	.96	1.01	
political involvement index	0	.01	-.03	-.03	-.16	-.01	-.05	.33
	1	1	1	1	1.01	1	1.01	
female empowerment index	0	.05	.01	-.04	-.02	-.05	.06	.59
	1	1.05	1.04	1.01	1.03	1	1.02	

We report means and standard deviations for key indicators at baseline. The last column contains the p-value from an F-test of joint significance of all treatments. In the results section, we report p-values from each specification using baseline outcomes to check balance on the key pairwise comparisons. We exclude Asset Only and Asset Only Control households for whom we do not have baseline data. See Appendix for components of all indices.

Appendix Table 6: Two-Year Ghana Effects of GUP, SOUP, and Asset Only on Household-Level Economic Indices

		asset value index	consumption index	financial inclusion index	food security index	income index
SOUP match - SOUP no match	diff	-0.056	0.038	0.113	0.053	0.083
	se	(0.065)	(0.068)	(0.130)	(0.055)	(0.070)
	p-val	0.394	0.580	0.387	0.333	0.236
	bsl p-val	0.232	0.718	0.262	0.141	0.437
GUP sav. - GUP no sav.	diff	-0.082	-0.045	0.943	-0.131	0.087
	se	(0.059)	(0.067)	(0.141)	(0.052)	(0.074)
	p-val	0.167	0.503	0.000***	0.011**	0.237
	bsl p-val	0.821	0.252	0.011**(+)	0.793	0.230
	obs	3787	3707	3678	3706	3788

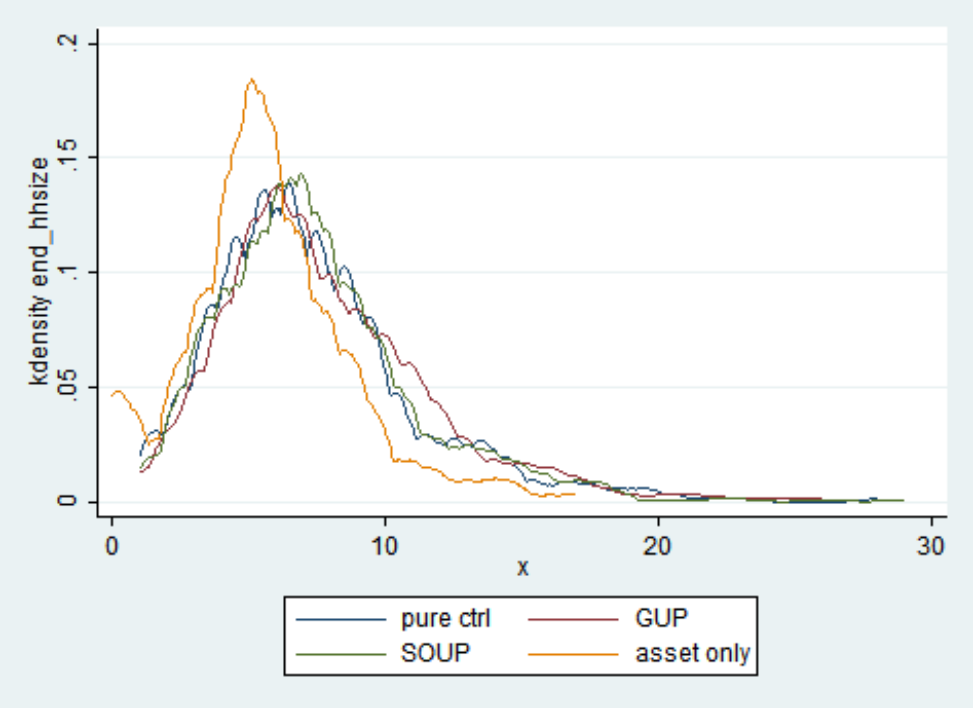
Estimates from OLS regressions of household-level economic indices from year two (averaging over two-year outcome and midline outcomes that were collected at least one year after treatment start) on treatments. The omitted group is control households in control villages. We exclude the asset only villages and include controls for re-randomization variables and the baseline value of the outcome. We include controls for employment program treatments. We also include interviewer fixed effects and fixed effects for whether or not the household was surveyed in each midline. Standard errors clustered at unit of randomization (village for pure control, individual otherwise). Finally, we report p-values for the same specification using the baseline value of each outcome. We use a superscript (+) to indicate a positive t-statistic. See appendix for detailed descriptions of each variable.

Appendix Table 7: Three-Year Ghana Effects of GUP, SOUP, and Asset Only on Household-Level Economic Indices

		asset value index	consumption index	financial inclusion index	food security index	income index
SOUP match - SOUP no match	diff	0.020	0.108	-0.021	0.028	0.053
	se	(0.073)	(0.067)	(0.083)	(0.052)	(0.073)
	p-val	0.783	0.105	0.798	0.599	0.471
	bsl p-val	0.232	0.718	0.262	0.141	0.437
GUP sav. - GUP no sav.	diff	0.037	-0.127	0.288	-0.001	0.020
	se	(0.068)	(0.073)	(0.108)	(0.052)	(0.082)
	p-val	0.586	0.083*	0.008***	0.984	0.806
	bsl p-val	0.821	0.252	0.011**(+)	0.793	0.230
	obs	3755	3597	3603	3603	3763

Estimates from OLS regressions of household-level economic indices from year two (averaging over two-year outcome and midline outcomes that were collected at least one year after treatment start) on treatments. The omitted group is control households in control villages. We exclude the asset only villages and include controls for re-randomization variables and the baseline value of the outcome. We include controls for employment program treatments. We also include interviewer fixed effects and fixed effects for whether or not the household was surveyed in each midline. Standard errors clustered at unit of randomization (village for pure control, individual otherwise). Finally, we report p-values for the same specification using the baseline value of each outcome. We use a superscript (+) to indicate a positive t-statistic. See appendix for detailed descriptions of each variable.

Figure 1: Distribution of Household Size at Two Years



Appendix Table 8: Do Two-Year Variables Used as Controls Change with GUP and SOUP?

		average age in HH	HH size	HH has metal roof
SOUP	itt	0.093	-0.000	0.002
	se	(0.269)	(0.079)	(0.023)
	p-val	0.730	0.997	0.939
GUP	itt	-0.463	0.274	0.003
	se	(0.279)	(0.095)	(0.027)
	p-val	0.097*	0.004***	0.916
	ctrl mean	23.7	7.3	0.3
	ctrl sd	10.6	3.8	0.5
	obs	2698	2698	2698
asset	itt	0.046	-1.262	0.065
	se	(1.129)	(0.290)	(0.042)
	p-val	0.967	0.000***	0.124
	ctrl mean	23.7	7.3	0.3
	ctrl sd	10.6	3.8	0.5
	obs	2862	2862	2862

Estimates from OLS regressions of two-year variables to be used as controls for analysis of asset drop, which has no baseline data, on pooled treatments. The omitted group is control households in control villages. We control for re-randomization variables, the baseline value of the outcome, and employment program treatments. We include interviewer fixed effects. Standard errors clustered at unit of randomization (village for pure control, individual otherwise).

Appendix Table 9: Two-Year Ghana Effects of GUP, SOUP, and Asset Only on Income Sources

		household has business	business income, monthly (USD)	crop income, monthly (USD)	animal revenue, monthly (USD)	wage income, monthly (USD)
PANEL A: GUP vs. SOUP						
SOUP no match	itt	0.051	0.200	1.819	-1.741	-0.199
	se	(0.028)	(1.159)	(2.041)	(0.956)	(0.475)
	p-val	0.068*	0.863	0.373	0.069*	0.675
	q-val	0.215	0.995	0.778	0.215	0.852
	bsl p-val	0.929	0.794	0.071*	.	0.257
SOUP match	itt	-0.015	-0.200	3.981	0.046	0.262
	se	(0.027)	(1.276)	(1.957)	(1.063)	(0.558)
	p-val	0.571	0.875	0.042**	0.966	0.639
	q-val	0.852	0.995	0.176	0.999	0.852
	bsl p-val	0.086*(+)	0.266	0.219	.	0.814
GUP no sav.	itt	0.069	2.427	2.220	-0.870	-0.250
	se	(0.030)	(1.412)	(2.160)	(1.098)	(0.507)
	p-val	0.023**	0.086*	0.304	0.428	0.622
	q-val	0.115	0.239	0.692	0.824	0.852
	bsl p-val	0.326	0.470	0.330	.	0.022**
GUP sav.	itt	0.079	3.535	3.486	0.699	-0.197
	se	(0.029)	(1.498)	(2.282)	(1.092)	(0.479)
	p-val	0.007***	0.018**	0.127	0.522	0.681
	q-val	0.082*	0.115	0.317	0.852	0.852
	bsl p-val	0.318	0.234	0.943	.	0.191
GUP sav. - SOUP no match	diff	0.028	3.334	1.667	2.440	0.002
	se	(0.033)	(1.643)	(2.586)	(1.246)	(0.599)
	p-val	0.401	0.043**	0.519	0.050*	0.998
	bsl p-val	0.402	0.196	0.093*(+)	.	0.853
	ctrl mean	0.30	6.35	23.88	8.21	1.83
	ctrl sd	0.43	17.79	31.35	17.83	7.53
	obs	3681	3674	3712	3655	3674
PANEL B: GUP vs. Asset Only						
asset	itt	-0.080	-0.737	-0.087	-5.151	0.001
	se	(0.035)	(1.687)	(2.105)	(0.808)	(0.635)
	p-val	0.022**	0.662	0.967	0.000***	0.998
	q-val	0.115	0.852	0.999	0.001***	0.999
	itt, ctrls	-0.065	-0.362	0.784	-4.247	0.120
	p-val, ctrls	0.059*	0.832	0.708	0.000***	0.850
	q-val, ctrls	0.147	0.850	0.850	0.001***	0.850
GUP no sav. - asset	diff	0.163	3.327	2.186	4.671	-0.173
	se	(0.039)	(1.927)	(2.501)	(1.201)	(0.753)
	p-val	0.000***	0.084*	0.382	0.000***	0.819
	itt, ctrls	0.136	2.561	0.233	3.325	-0.357
	p-val, ctrls	0.001***	0.188	0.927	0.005***	0.638
	ctrl mean	0.30	6.35	23.88	8.21	1.83
	ctrl sd	0.43	17.79	31.35	17.83	7.53
	obs	3980	3973	4010	3953	3973

Estimates from OLS regressions of household-level economic indices from year two (averaging over two-year outcome and midline outcomes that were collected at least one year after treatment start) on treatments. The omitted group is control households in control villages. The regression in Panel A excludes the asset only villages and includes controls for re-randomization variables and the baseline value of the outcome. The regression in Panel B includes the asset only villages (without baseline controls). Both panels include controls for employment program treatments.. We also include interviewer fixed effects and fixed effects for whether or not the household was surveyed in each midline. Standard errors clustered at unit of randomization (village for pure control, individual otherwise). We use the Benjamini-Hochberg step-up method to compute q-values, considering the 25 independent hypotheses in the table. For regressions that include asset households, we also report p-values and q-values for a specification with three two-year variables as controls, since we have no baseline controls. (See appendix for evidence that these variables were mostly not affected by the GUP or SOUP treatments.) Finally, we report p-values for the same specification using the baseline value of each outcome. We use a superscript (+) to indicate a positive t-statistic. See appendix for detailed descriptions of each variable.

Appendix Table 10: Two-Year Ghana Effects of GUP, SOUP, and Asset Only on Household-Level Non-Economic Indices

		health index	mental health index	political involvement index	time at work index	female empowerment index
PANEL A: GUP vs. SOUP						
SOUP no match	itt	0.031	0.096	-0.024	0.106	-0.058
	se	(0.037)	(0.050)	(0.064)	(0.063)	(0.054)
	p-val	0.411	0.053*	0.712	0.091*	0.286
	q-val	0.542	0.245	0.774	0.284	0.468
	bsl p-val	0.671	0.475	0.016**	.	0.285
SOUP match	itt	-0.011	0.081	-0.066	0.072	-0.029
	se	(0.039)	(0.058)	(0.065)	(0.062)	(0.056)
	p-val	0.776	0.164	0.311	0.242	0.609
	q-val	0.809	0.374	0.468	0.466	0.693
	bsl p-val	0.185	0.389	0.657	.	0.888
GUP no sav.	itt	-0.008	0.103	0.129	0.184	0.047
	se	(0.038)	(0.055)	(0.065)	(0.072)	(0.061)
	p-val	0.830	0.062*	0.047**	0.010**	0.445
	q-val	0.830	0.245	0.245	0.130	0.557
	bsl p-val	0.628	0.310	0.813	.	0.574
GUP sav.	itt	0.041	0.050	0.202	0.105	0.082
	se	(0.040)	(0.052)	(0.065)	(0.069)	(0.059)
	p-val	0.311	0.333	0.002***	0.131	0.164
	q-val	0.468	0.468	0.047**	0.363	0.374
	bsl p-val	0.848	0.905	0.977	.	0.228
GUP sav. - SOUP no match	diff	0.010	-0.046	0.226	-0.001	0.140
	se	(0.048)	(0.062)	(0.074)	(0.079)	(0.069)
	p-val	0.832	0.457	0.002***	0.986	0.044**
	bsl p-val	0.840	0.603	0.038**(+)	.	0.818
	obs	26427	3482	3468	3456	3454
PANEL B: GUP vs. Asset Only						
asset	itt	0.113	-0.068	-0.106	0.189	0.051
	se	(0.050)	(0.070)	(0.088)	(0.104)	(0.082)
	p-val	0.023**	0.337	0.232	0.069*	0.529
	q-val	0.195	0.468	0.466	0.245	0.631
	itt, ctrls	0.143	-0.067	-0.085	0.209	0.050
	p-val, ctrls	0.004***	0.343	0.336	0.043**	0.538
	q-val, ctrls	0.018**	0.430	0.430	0.109	0.539
GUP no sav. - asset	diff	-0.136	0.181	0.229	-0.037	0.015
	se	(0.055)	(0.079)	(0.094)	(0.112)	(0.091)
	p-val	0.014**	0.023**	0.015**	0.740	0.873
	itt, ctrls	-0.176	0.178	0.196	-0.064	0.018
	p-val, ctrls	0.001***	0.026**	0.036**	0.563	0.840
	obs	28132	3752	3739	3725	3721

Estimates from OLS regressions of household-member-level non-economic indices at year two (averaging over two-year outcome and midline outcomes that were collected at least one year after treatment start) on treatments. The omitted group is control households in control villages. The regression in Panel A excludes the asset only villages and includes controls for re-randomization variables and the baseline value of the outcome. The regression in Panel B includes the asset only villages (without baseline controls). Both panels include controls for employment program treatments. We also include interviewer fixed effects and fixed effects for whether or not the household was surveyed in each midline. Standard errors clustered at unit of randomization (village for pure control, individual otherwise). We use the Benjamini-Hochberg step-up method to compute q-values, considering the 25 independent hypotheses in the table. For regressions that include asset households, we also report p-values and q-values for a specification with three two-year variables as controls, since we have no baseline controls. (See appendix for evidence that these variables were mostly not affected by the GUP or SOUP treatments.) Finally, we report p-values for the same specification using the baseline value of each outcome. We use a superscript (+) to indicate a positive t-statistic. See appendix for detailed descriptions of each variable.

Appendix Table 11: Three-Year Ghana Effects of GUP, SOUP, and Asset Only on Household-Level Non-Economic Indices

		health index	mental health index	political involvement index	time at work index	female empowerment index
PANEL A: GUP vs. SOUP						
SOUP no match	itt	-0.034	-0.133	0.107	0.077	-0.072
	se	(0.032)	(0.052)	(0.063)	(0.063)	(0.056)
	p-val	0.283	0.011**	0.087*	0.220	0.198
	q-val	0.644	0.100	0.451	0.644	0.644
	bsl p-val	0.671	0.475	0.016**	.	0.285
SOUP match	itt	-0.045	-0.060	0.034	0.064	0.027
	se	(0.036)	(0.056)	(0.068)	(0.065)	(0.060)
	p-val	0.208	0.277	0.612	0.320	0.652
	q-val	0.644	0.644	0.885	0.666	0.885
	bsl p-val	0.185	0.389	0.657	.	0.888
GUP no sav.	itt	0.005	-0.110	0.004	0.005	0.053
	se	(0.036)	(0.065)	(0.069)	(0.067)	(0.064)
	p-val	0.897	0.090*	0.959	0.946	0.407
	q-val	0.959	0.451	0.959	0.959	0.782
	bsl p-val	0.628	0.310	0.813	.	0.574
GUP sav.	itt	0.016	0.036	0.076	0.025	0.156
	se	(0.038)	(0.062)	(0.068)	(0.066)	(0.062)
	p-val	0.678	0.556	0.265	0.708	0.012**
	q-val	0.885	0.885	0.644	0.885	0.100
	bsl p-val	0.848	0.905	0.977	.	0.228
GUP sav. - SOUP no match	diff	0.050	0.169	-0.031	-0.052	0.228
	se	(0.039)	(0.069)	(0.075)	(0.072)	(0.071)
	p-val	0.198	0.014**	0.677	0.471	0.001***
	bsl p-val	0.840	0.603	0.038**(+)	.	0.818
	obs	25738	3403	3404	3389	3396
PANEL B: GUP vs. Asset Only						
asset	itt	-0.144	-0.041	-0.027	-0.006	-0.040
	se	(0.054)	(0.072)	(0.086)	(0.084)	(0.080)
	p-val	0.008***	0.566	0.755	0.941	0.617
	q-val	0.100	0.885	0.899	0.959	0.885
	itt, ctrls	-0.113	-0.034	-0.007	-0.001	-0.048
	p-val, ctrls	0.037**	0.640	0.935	0.986	0.555
	q-val, ctrls	0.183	0.986	0.986	0.986	0.986
GUP no sav. - asset	diff	0.145	-0.075	0.048	0.004	0.106
	se	(0.057)	(0.085)	(0.092)	(0.090)	(0.095)
	p-val	0.011**	0.381	0.601	0.965	0.263
	itt, ctrls	0.105	-0.092	0.021	0.003	0.128
	p-val, ctrls	0.066*	0.287	0.817	0.974	0.181
	obs	27294	3682	3683	3665	3675

Estimates from OLS regressions of household-member-level non-economic indices at year two (averaging over two-year outcome and midline outcomes that were collected at least one year after treatment start) on treatments. The omitted group is control households in control villages. The regression in Panel A excludes the asset only villages and includes controls for re-randomization variables and the baseline value of the outcome. The regression in Panel B includes the asset only villages (without baseline controls). Both panels include controls for employment program treatments. We also include interviewer fixed effects and fixed effects for whether or not the household was surveyed in each midline. Standard errors clustered at unit of randomization (village for pure control, individual otherwise). We use the Benjamini-Hochberg step-up method to compute q-values, considering the 25 independent hypotheses in the table. For regressions that include asset households, we also report p-values and q-values for a specification with three two-year variables as controls, since we have no baseline controls. (See appendix for evidence that these variables were mostly not affected by the GUP or SOUP treatments.) Finally, we report p-values for the same specification using the baseline value of each outcome. We use a superscript (+) to indicate a positive t-statistic. See appendix for detailed descriptions of each variable.

Appendix Table 12: Two-Year Ghana Effects of GUP, SOUP, and Asset Only on Household-Level Non-Economic Indices

		health index	mental health index	political involvement index	time at work index	female empowerment index
SOUP match - SOUP no match	diff	-0.042	-0.016	-0.042	-0.034	0.029
	se	(0.046)	(0.066)	(0.071)	(0.072)	(0.064)
	p-val	0.365	0.811	0.556	0.636	0.647
	bsl p-val	0.140	0.150	0.073*(+)	.	0.318
GUP sav. - GUP no sav.	diff	0.049	-0.053	0.073	-0.079	0.035
	se	(0.044)	(0.060)	(0.068)	(0.075)	(0.068)
	p-val	0.261	0.379	0.281	0.292	0.605
	bsl p-val	0.529	0.308	0.844	.	0.546
	obs	26427	3482	3468	3456	3454

Estimates from OLS regressions of household-member-level non-economic indices from year two (averaging over two-year outcome and midline outcomes that were collected at least one year after treatment start) on treatments. The omitted group is control households in control villages. We exclude the asset only villages and include controls for re-randomization variables and the baseline value of the outcome. We include controls for employment program treatments. We also include interviewer fixed effects and fixed effects for whether or not the household was surveyed in each midline. Standard errors clustered at unit of randomization (village for pure control, individual otherwise). Finally, we report p-values for the same specification using the baseline value of each outcome. We use a superscript (+) to indicate a positive t-statistic. See appendix for detailed descriptions of each variable.

Appendix Table 13: Three-Year Ghana Effects of GUP, SOUP, and Asset Only on Household-Level Non-Economic Indices

		health index	mental health index	political involvement index	time at work index	female empowerment index
SOUP match - SOUP no match	diff	-0.010	0.073	-0.073	-0.013	0.099
	se	(0.037)	(0.061)	(0.074)	(0.070)	(0.067)
	p-val	0.779	0.237	0.321	0.857	0.143
	bsl p-val	0.140	0.150	0.073*(+)	.	0.318
GUP sav. - GUP no sav.	diff	0.011	0.146	0.073	0.020	0.102
	se	(0.038)	(0.073)	(0.072)	(0.074)	(0.073)
	p-val	0.773	0.045**	0.315	0.783	0.161
	bsl p-val	0.529	0.308	0.844	.	0.546
	obs	25738	3403	3404	3389	3396

Estimates from OLS regressions of household-member-level non-economic indices from year two (averaging over two-year outcome and midline outcomes that were collected at least one year after treatment start) on treatments. The omitted group is control households in control villages. We exclude the asset only villages and include controls for re-randomization variables and the baseline value of the outcome. We include controls for employment program treatments. We also include interviewer fixed effects and fixed effects for whether or not the household was surveyed in each midline. Standard errors clustered at unit of randomization (village for pure control, individual otherwise). Finally, we report p-values for the same specification using the baseline value of each outcome. We use a superscript (+) to indicate a positive t-statistic. See appendix for detailed descriptions of each variable.

Appendix Table 14: Ghana Effects of Savings Treatments on Stocks

VARIABLES	(1) cum. deposits (USD)	(2) withdrawals (USD)	(3) balances (USD)	(4) self-reported balances (USD)
SOUP no match				12.06***
				(2.40)
SOUP match	7.70	12.53***	-4.84	14.15***
	(5.89)	(3.78)	(4.93)	(2.80)
GUP no savings				4.07*
				(2.33)
GUP savings	114.93***	54.40***	60.49***	28.97***
	(9.33)	(5.63)	(7.14)	(3.51)
Observations	1,064	1,063	1,063	3,670
Control mean	92.7	24.4	68.4	5.25

Columns 1-3 use administrative data (from savings collectors) on cumulative deposits, withdrawals, and total balances for treatment groups that participated in a savings component. The omitted group is SOUP no match. We include station fixed effects and report heteroskedasticity robust standard errors. Column 4 uses two-year survey data on total savings balances. The omitted group is pure control. We include include interviewer fixed effects and fixed effects for whether or not the household was surveyed in each midline. We cluster standard errors at the unit of randomization (village for pure control, individual otherwise). In all columns, we control for employment program treatment assignment.

Appendix Table 15: Pooled Two-Year and Three-Year Ghana Effects of GUP and Asset Only on Household-Level Livestock Flows

		number of goats born	number of goats died	number of goats sold	number of goats bought	number of goats eaten	number of goats slaughtered
GUP no sav.	itt	0.848	0.631	0.182	0.018	-0.032	-0.027
	se	(0.139)	(0.141)	(0.083)	(0.028)	(0.031)	(0.030)
	p-val	0.000***	0.000***	0.028**	0.520	0.292	0.371
	q-val	0.001***	0.001***	0.073*	0.535	0.439	0.457
	itt, ctrls	0.799	0.592	0.173	0.017	-0.037	-0.032
	p-val, ctrls	0.000***	0.000***	0.037**	0.559	0.232	0.297
	q-val, ctrls	0.001***	0.001***	0.110	0.672	0.464	0.509
asset	itt	-0.091	-0.157	-0.121	-0.067	-0.025	-0.025
	se	(0.147)	(0.179)	(0.047)	(0.031)	(0.021)	(0.021)
	p-val	0.534	0.380	0.011**	0.030**	0.232	0.220
	q-val	0.535	0.457	0.045**	0.073*	0.398	0.398
	itt, ctrls	0.013	-0.065	-0.095	-0.063	-0.014	-0.015
	p-val, ctrls	0.932	0.722	0.046**	0.043**	0.504	0.458
	q-val, ctrls	0.933	0.788	0.110	0.110	0.672	0.672
GUP no sav. - asset	diff	0.939	0.787	0.303	0.085	-0.007	-0.002
	se	(0.171)	(0.187)	(0.077)	(0.036)	(0.031)	(0.031)
	p-val	0.000***	0.000***	0.000***	0.019**	0.818	0.952
	itt, ctrls	0.786	0.657	0.268	0.080	-0.023	-0.017
	p-val, ctrls	0.000***	0.001***	0.000***	0.030**	0.450	0.581
	ctrl mean	1.8	1.8	0.4	0.2	0.1	0.1
	ctrl sd	2.0	2.2	0.9	0.5	0.4	0.4
	obs	5466	5689	5615	5606	5603	5601

Estimates from OLS regressions of asset-related outcomes on GUP and asset treatments. The omitted group is control households in control villages. We pool outcomes from the two-year (averaging over the two-year outcome and midline outcomes that were collected at least one year after treatment start) and three-year surveys. We control for employment program treatments. We also include interviewer fixed effects, survey round fixed effects (two-year or three-year), and fixed effects for whether or not the household was surveyed in each midline. Standard errors clustered at unit of randomization (village-level for pure control, individual-level otherwise). We use the Benjamini-Hochberg step-up method to compute q-values, considering the 12 independent hypotheses in the table. We also report p-values and q-values for a specification with three two-year variables as controls (average age, metal roof, household size), since we have no baseline controls. See appendix for detailed descriptions of each variable.

Appendix Table 16: Pooled Two-Year and Three-Year Ghana Effects of GUP and Asset Only on Household-Level Asset Indices by Category

		productive asset index	agric stock value index	household asset index
GUP no sav.	itt	-0.009	0.083	0.078
	se	(0.062)	(0.068)	(0.068)
	p-val	0.887	0.226	0.246
	q-val	0.887	0.434	0.434
	itt, ctrls	-0.045	0.035	0.023
	p-val, ctrls	0.445	0.586	0.720
	q-val, ctrls	0.889	0.889	0.889
asset	itt	-0.041	-0.075	-0.089
	se	(0.069)	(0.070)	(0.062)
	p-val	0.547	0.289	0.152
	q-val	0.657	0.434	0.434
	itt, ctrls	0.009	-0.012	-0.023
	p-val, ctrls	0.888	0.849	0.693
	q-val, ctrls	0.889	0.889	0.889
GUP no sav. - asset	diff	0.033	0.157	0.167
	se	(0.078)	(0.070)	(0.076)
	p-val	0.676	0.024**	0.029**
	itt, ctrls	-0.055	0.047	0.046
	p-val, ctrls	0.470	0.483	0.525
	ctrl mean	0.0	-0.0	0.0
	ctrl sd	1.0	1.0	1.0
	obs	7823	8118	7892

Estimates from OLS regressions of asset-related outcomes on GUP and asset treatments. The omitted group is control households in control villages. We pool outcomes from the two-year (averaging over the two-year outcome and midline outcomes that were collected at least one year after treatment start) and three-year surveys. We control for employment program treatments. We also include interviewer fixed effects, survey round fixed effects (two-year or three-year), and fixed effects for whether or not the household was surveyed in each midline. Standard errors clustered at unit of randomization (village-level for pure control, individual-level otherwise). We use the Benjamini-Hochberg step-up method to compute q-values, considering the 6 independent hypotheses in the table. We also report p-values and q-values for a specification with three two-year variables as controls (average age, metal roof, household size), since we have no baseline controls. See appendix for detailed descriptions of each variable.

Appendix: Variable Definitions

	Ghana
crop price index	In the village survey (baseline) and the household agricultural surveys (endline, follow-up) we ask about crops cultivated in the village or household. If a particular crop is cultivated and sold, we ask the sale unit and the current price. (For the household agricultural surveys and endline and follow-up, we then take the median current price for that crop-unit within the village.) For each crop-unit combination cultivated and sold in the village, we compute the mean price for control villages at baseline, and then compute, for each village, the price ratio (village price / control baseline mean price). We then take the mean of this price ratio over all crop-unit combinations to get an agricultural price index for each village.
livestock price index	In the village survey (baseline) and the household agricultural surveys (endline, follow-up) we ask about livestock owned in the village or household. If a particular type of livestock is owned, we ask the price. (For the household agricultural surveys and endline and follow-up, we take the median buy price, sale price, and hypothetical value across households for each animal within the village. We then take the mean of all three prices as the village price for that animal.) For each animal owned in the village, we compute the mean price for control villages at baseline, and then compute, for each village, the price ratio (village price / control baseline mean price). We then take the mean of this price ratio over all animals to get an animal price index for each village at each round.
asset value index	We ask about all of the assets owned by the household. We calculate the price in goats for each asset by using price data from other countries, as in Science paper. We then sum the total asset value in goats, and standardize it into an index around pure control within each round.
average age in household	Average age among household members
cow value (USD)	We take the median buy price and the median sell price across villages, and then take the average of the two. We then multiple this price by the number of cows owned.
cuy value (USD)	We take the median buy price and the median sell price across villages, and then take the average of the two. We then multiple this price by the number of cuy owned.
expenditure on inputs (USD)	We ask about expenditures on manure, fertilizer, labor, herbicide, insecticide, and other inputs in the last year, and then sum over all categories to get expenditure on inputs.
female empowerment index	Standardized index of five variables, centered around pure control within each round. Each variable is the answer to the question ""To what extent do you believe yourself able to make your own decisions concerning _____?" The categories are food, school expenses, health expenses, visiting friends, and purchases. They are measured on a scale from 1 to 3.
financial inclusion index	Standardized index of two variables, centered around pure control within each round. The first variable is the total amount received in loans by the household in the last year. The second variable is the total savings balances at the time of the survey.
fish value (USD)	We take the median buy price and the median sell price across villages, and then take the average of the two. We then multiple this price by the number of fish owned.
food security index	Standardized index of three variables, centered around pure control within each round. The first two variables equal 0 if the household answered "all year" or "during the lean season only" to the following questions, about adults and kids, respectively: "Did adults/kids ever reduce number of meals per day or reduce portions over the past year?" The third variable equals 0 if the household answered "all year" or "during the lean season only" to the question "Did adults ever skip entire days without eating?"
fowl value (USD)	We take the median buy price and the median sell price across villages, and then take the average of the two. We then multiply this price by the number of fowl owned.
goat value (USD)	We take the median buy price and the median sell price across villages, and then take the average of the two. We then multiply this price by the number of goats owned.
harvest sale value (USD)	We ask about the quantity of each crop harvested (whether or not they were sold) in the last 9 months. If the units of harvested crops are the same as the units of sold crops and we have the sale price, then we use this price to compute the sale value of each crop, and then sum over crops. Otherwise, we use the median price for that crop.
harvest value (USD)	We ask about the quantity of each crop sold in the last year. If the units of harvested crops are the same as the units of sold crops and we have the sale price, then we use this price to compute the sale value of each crop, and then sum over crops. Otherwise, we use the median price for that crop.
health index	Standardized index of two variables, centered around pure control within each round. The first is the average daily living score, which is the mean of four variables: capacity_bathing, capacity_lifting, capacity_walking, capacity_working (each measured on a scale from 1 being easily done to 4 being unable to do). The second is sick_day, which is 1 if the member did not miss a day of work due to illness in the last year, 0 otherwise.

	Ghana
household size	The number of people who (a) live under the same roof and (b) eat from the same pot
income index	Standardized index of four variables, centered around pure control within each round: monthly business income, monthly crop income, monthly wage income, and monthly animal revenue.
wage index	In the adult survey, we ask about whether household members engage in paid labor, the type of labor, the days worked in the last year, and the daily wage. We take the median agricultural and non-agricultural wage for each village. We compute the mean agricultural and non-agricultural wage for control villages at baseline, and then compute, for each village, the price ratio (village wage / control baseline mean wage). We then take the mean of this price ratio across the agricultural and non-agricultural wage to get a labor price index for each village at each round.
land area (acres)	Total area of plots cultivated in acres
mental health index	Standardized index of three variables, centered around pure control within each round. The first is satisf_life, which is economic satisfaction measure on a scale from 1 to 5. The second is index_not_stress, which is a standardized index of five measures: feeling sad, crying, not eating, not working, and feeling restless, measured on a scale from not at all, hardly ever, some of the time, or most of the time. The third is not_worried, which is 0 if the member experienced a period of worry in the last year, 1 otherwise.
monthly animal revenue (USD)	We ask about revenue from animal sales, births, slaughters, and animal product sales in the last 6 months. Each revenue stream is computed by multiplying the reported number of animals or products sold/born/slaughtered for revenue and multiplying it by the reported sale price (if available) or the median sale price. We sum over all four animal revenue streams and then divide by six.
monthly business expenses (USD)	For each business within the household, we ask about how many months in the last year the business was operating, how many months were "normal" (neither higher nor lower than last month), how many months were "high profit," and how many months were "low profit." We ask about expenses in the last month, as well as profits in normal, high, and low months. We use the ratio of last month's profits to high and low profits to impute expenses in high and low profit months, compute total expenses in the last year by summing over sales in normal, high, and low months, and divide by the number of months the business was operating to get monthly expenses.
monthly business income (USD)	Monthly business revenue minus monthly business expenses
monthly business revenue (USD)	For each business within the household, we ask about how many months in the last year the business was operating, how many months were "normal" (neither higher nor lower than last month), how many months were "high profit," and how many months were "low profit." We ask about sales in the last month, as well as profits in normal, high, and low months. We use the ratio of last month's profits to high and low profits to impute sales in high and low profit months, compute total sales in the last year by summing over sales in normal, high, and low months, and divide by the number of months the business was operating to get monthly revenue.
monthly crop income (USD)	Harvest sale value minus expenditure on inputs (annual), divided by twelve
monthly income (USD)	Sum of monthly business income, monthly crop income, and monthly wage income.
monthly per capita consumption	Monthly expenses on goods and services and food consumption in dollars. We ask about infrequent expenditures on housing, durable goods, social events, and personal objects in the last nine months, and we ask about frequent expenditures on household goods, transport, communication, and utilities in the last seven days. We scale and aggregate these two measures, and then divide by household size, to get monthly per capita non-food expenditure, and then add this to monthly per capita food expenditure.
monthly per capita food consumption (USD)	Per capita household consumption of food in dollars. In our household survey we asked about all the food consumed by the household in the last week. We multiply each food quantity by its median price (as measured in the baseline market survey), sum over all foods, scale to the month, and divide by the number of household members.
monthly transfers received (USD)	The total amount of transfers received in the last month from other households (cash or food)
monthly wage income (USD)	We ask about each instance of paid labor in the last nine months within the household, the quantity of time worked, and the total earnings from that activity. We sum the total earnings and divide by nine to get monthly household wage income.
other value (USD)	For all other animals, we take the median buy price and the median sell price across villages, and then take the average of the two. We then multiply this price by the number of animals owned. We then sum this across all other animals not accounted for (horses, bulls, cows, etc.)
pig value (USD)	We take the median buy price and the median sell price across villages, and then take the average of the two. We then multiply this price by the number of pigs owned.

	Ghana
political involvement index	Standardized index of meeting_village, which is 1 if the person attended a village meeting in the last 12 months, 0 otherwise.
savings balances (USD)	Total savings balances across all locations (private bank, home, with a friend, etc.)
time work index	Standardized index of four variables, centered around pure control within each round: minutes spent yesterday in the fields, on animals, on business, and on other paid labor.
total livestock value (USD)	For all animals, we take the median buy price and the median sale price across villages, and then take the average of the two. We then multiply this price by the number of animals owned. We then sum this across all animals.
value of loans last year (USD)	The total amount received in loans by the household in the last year.
variance of food consumption (USD)	For each household we compute the variance of consumption_food (see above) over all midlines, endlines, and follow-up surveys for which we have data