Can employment programs reduce poverty and social instability? Experimental evidence from a Ugandan aid program[*]

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Abstract:

Can cash transfers promote employment and reduce poverty in rural Africa? Will lower youth unemployment and poverty reduce the risk of social instability? We experimentally evaluate one of Uganda's largest development programs, which provided thousands of young people unconditional cash transfers in small groups to pay for vocational training, tools, and business start-up costs. Survey results after two and four years let us assess level and growth effects on economic and social outcomes. We have four broad findings. First, despite a lack of central monitoring and accountability, most youth groups invest the majority of the transfer in individual vocational skills and tools, suggesting that youth groups can be forward-looking investors even with large sums of cash. Second, the economic impacts are large: hours of non-household employment double and cash earnings increase by roughly half relative to the control group. We estimate the transfer yields a real annual return on capital of 35% on average. Third, midterm results suggest that poverty and poor access to credit is a major reason youth cannot start these vocations in the absence of aid. Much of the variation in impact is unexplained, however, and conventional measures of ability have little predictive power, suggesting we have much to learn about entrepreneurship. Finally, these economic gains have small social and security externalities in both the short and long run. Measures of social cohesion and community support within the 2-year horizon improve by roughly 0 to 10%, especially among males, most likely because the youth becomes a net giver rather than a net taker in his kin and community network. Most strikingly, after 2 years we see a 50% fall in interpersonal aggression and disputes among males, but a 50% increase among females. Neither change seems related to economic performance nor does social cohesion. The disappearance after 4 years suggest these may have been aberrations, and is more in line with the modest social effects of this significant poverty reduction. These results suggest that unconditional cash transfers may be a more cost-effective form of large-scale aid than commonly believed, and that increasing access to credit and capital could stimulate employment growth in rural Africa, albeit with more limited positive spillovers to social stability than commonly assserted.

1 Introduction

In the U.S. and Europe, governments channel huge sums towards employment programs to relieve poverty, spur growth, and bolster political support. In developing countries, governments invest in employment and anti-poverty programs with additional motives in mind: to strengthen the sense of citizenship and civic action, and to lessen the risk of social instability.

Roughly two billion people, nearly a third of the world population, are between the ages of 15 and 34 and live in a developing nation.[1] This proportion is continuing to rise and will peak in coming years, creating a global "youth bulge" (World Bank 2007). Fears are bulging even faster. A shortage of educational and job opportunities may heighten inequality and slow poverty alleviation. Moreover, policymakers, the media, and many social scientists worry this bulge of underemployed youth will weaken community and societal bonds and heighten social unrest, including (in extreme cases) crime, riots, and even armed conflict and terrorism.[2]

To reduce poverty and instability, policymakers turn to employment programs that give "inputs" to poor people—especially skills training or capital through grants or microfinance (e.g. Kristof 2010; World Bank 2010). A new breed of decentralized, participatory development programs provides cash or other resources to communities and groups, and allows them to decide how to best use funds. These programs go by different names—social action funds, or community-driven development programs—but are an increasingly common tool of governments and aid agencies. Some of the best known disburse aid to communities for infrastructure or other projects, but unconditional cash transfers are an increasingly common means of spurring employment and enterprise development among the poor.

This paper describes the impacts of a participatory state-supported employment intervention in Uganda: the Youth Opportunities Program (YOP) component of the Northern Uganda Social Action Fund (NUSAF). The intervention provided relatively large, unconditional cash transfers to small groups of young men and women to help them start new vocations and enterprises by paying for skills training and start-up costs. In the least developed nations, where firms are rare,

[1] Based on U.S. Census Bureau international population data: http://www.census.gov/ipc/www/idb/worldpop.php.

[2] (Kaplan 1994; Fuller 1995; Goldstone 2002; Heinsohn 2003)

aid-based employment interventions commonly provide inputs into self-employment—cash, microfinance, or in-kind skills training or business assets.

Such interventions are rooted in at least three assumptions. First, poor people have agency and are capable of making informed economic decisions. Second, the poor have high returns to human and physical capital, often because of a market failure, such as credit constraints. Third, anti-poverty interventions, especially participatory ones, will produce more engaged, less alienated and less violent citizens.

Evidence for all three propositions remains limited. Take the first belief: From a purely practical standpoint, giving a group of young people a lump sum of cash worth several times their annual earnings, with limited supervision, and expecting them to invest it wisely, is at best a risky development strategy. It is a policy approach criticized both generally and in the case of Uganda (Golooba-Mutebi and Hickey 2010; Hickey 2010). A growing body of research in behavioral economics highlighting time inconsistency and limited rationality heightens concern.

There is some evidence for the second belief. There is growing evidence that the poor have high returns to cash and in-kind physical capital due to capital constraints and credit market failures.[3] This evidence is still preliminary, however: the number of studies is small; they deal with particular populations; and the evidence comes largely from observational analysis of heterogeneous treatment responses. Moreover, evidence on the returns to human capital investments (like vocational training) is more pessimistic. The returns are likely lower than that on physical capital, and may not pass a simple cost-benefit test.[4] Few of the skills studies examine developing nations, however, and the returns to an intervention like YOP could be quite high in Africa, es-

[3] Economic theory and some experimental evidence suggest that these returns go unrealized because the poor have little capital of their own to invest and limited access to credit (Banerjee and Duflo 2005; Udry and Anagol 2006; de Mel et al. 2008; Banerjee et al. 2010).

[4] Vocational, business, and financial literacy training programs in developed nations have generally low impacts. Regarding job and vocational training, meta-analyses of dozens of evaluations conclude that job training programs have modest impacts, are sometimes harmful, and seldom pass an economic cost-benefit test (Heckman et al. 1999; Betcherman et al. 2007; Card et al. 2009). Nearly all the underlying studies, however, concern industrial economies. Also, few are experimental, few try to explain heterogeneity in performance, and almost none explore social-political impacts and related externalities. Business skills and financial literacy training are more common in developing countries. Experimental evidence, however, suggests they yield only modest returns (Field et al. 2010; Karlan and Valdivia 2011).

pecially interventions where funds are available for both human and physical capital investments.[5]

Finally, the theory and evidence on the third belief—from poverty to lower alienation and aggression—is especially uncertain, though not for lack of theory. Economic theories of crime and conflict (discussed below) argue that higher incomes and employment raise the opportunity cost of aggression and predatory activities. A large body of psychology, sociology and political science also emphasizes that aggression arises from stress, adversity and frustrated ambitions, each of which may be accentuated by poverty, inequality, and economic marginalization (and hence mitigated by successful employment programs). Field evidence for any of these theories, however, is scarce. Experimental evidence is almost nonexistent.

We look at the evidence for all three propositions through a randomized evaluation of a state development intervention in northern Uganda, a region just emerging from economic stagnation and political insecurity, including insurgency, banditry, and wars in neighboring states. We examine impacts two years and four years after the intervention, allowing us to assess medium term level and growth effects.

In 2008 the intervention provided cash transfers to thousands of young men and women for investment in vocational skills training and capital for self-employment. Applicants were supposed to form a group of 15-25 young adults and submit a proposal for purchasing skills training, tools, and materials. On average, successful groups received a cash transfer of $7,108 to a joint bank account—roughly $374 per group member at market exchange rates. Groups were free of supervision or oversight in grant spending.

Demand for the intervention far outstripped supply: hundreds of eligible groups applied. Given excess demand, we worked with the Government to allot 535 groups randomly to treatment. We follow a subset of treatment and control members two and four years post-intervention.

The economic impacts are substantial. Our results show that the treated make good use of the transfers. Groups spend the majority of their transfer on skills training fees and durable assets. Nearly 80 percent of the treated—those in groups who receive the government cash transfer—

[5] Such technical and vocational training is a routine employment generation strategy in the poorest nations, however, and represented almost $3 billion in development assistance from 1990 to 2005—about 7.5% of all education-related aid (World Bank 2010). To our knowledge, there have been no rigorous evaluations of vocational training and employment programs in the least developed nations.[5]

enroll in training and they acquire business assets. Treatment has large and significant effects on employment and income. Both men and women increase their hours in employment outside the home—by about 26% among males and by 50% among females. Two years after the transfer, roughly two-thirds of the treated are engaged in skilled work, compared to just over one-third of controls. Most likely due to the general development of the country, four years after treatment both treatment and control individuals have increased their time in skilled employment to 70% and 42% respectively. Finally, economic returns are almost uniformly positive, and are high for a majority of beneficiaries. After two years the average beneficiary increased their net income by about $9 per month, a nearly 50% increase over the control group, representing real returns of roughly 35% per annum. Four years after treatment this effect has increased in absolute terms to $13 per month, but decreased in relative terms to 39% over the control group. These returns are higher than the real prime lending rate (5%) and higher than real commercial lending rates to small and medium enterprises (15 to 25% per annum) but lower than the 200% annualized rate available from microfinance institutions or moneylenders.

Why were these returns not realized without the intervention? We use treatment heterogeneity to test the role of credit market failure, fixed start-up costs, ability and time preferences. We develop a simple model that predicts how, under credit constraints and start-up costs, YOP-like investments and returns generate high returns, albeit returns that vary predictably based on starting capital, entrepreneurial ability, time preferences, and existing occupation. We have detailed pre-intervention data on each, and the resulting patterns of heterogeneity for the first two years are consistent with the idea that investments and returns increase with patience, and that the impacts of cash transfer programs are greatest for the poorest and those without existing vocations. The later four year results do not hold, though it is not clear at this point why they do not. We see no evidence that cognitive ability or formal schooling influence success, however, suggesting that, if "entrepreneurial ability" exists, it is made of different matter.

Finally, this increase in income and wealth leads to modest improvements in community participation and social integration for both periods surveyed. Aggression results after two years showed significant improvements for male aggression and an *increase* in female aggression, though these do not hold in the later survey after four years. The results are most consistent with psychological and anthropological accounts of market success and alienation and aggression. Treatment leads to lower levels of psychological stress, as well as increased wealth and ability to provide transfers within and outside the household. Social status increases, stress diminishes, and

aggression falls, at least among males. Our analysis of aggression and social alienation for the two year survey also produces puzzles, however, such as elevated female aggression, and the absence of a correlation between actual economic performance and aggression for either gender. These effects are not present though in the four year follow-up.

Overall, the results support a strong role for public and aid-based financing for poor entrepreneurs and employment creation, and suggest that unconditional and externally unsupervised cash grants, which are significantly cheaper to implement than conditional and supervised transfers, can be responsibly used and have positive social externalities.

2 Context: Northern Uganda

Uganda is a small East African nation. While once a classic example of the dysfunctional African state, growth took off in the late 1980s with the end to a major civil war, a stable new government, and reforms that freed markets and political competition. The economy grew an average of 7% per year from 1990 to 2009. By the end of this period national income per capita was 8.5% ahead of the sub-Saharan average (World Bank 2009).

Growth, however, concentrated in southern and central Uganda. The north, home to roughly a third of the population, lagged behind. Northern Uganda was once the home of the nation's political and military elite, as well as a bread basket for the country, and hence wealthy relative to the rest of the country (Omara-Otunnu 1994). Since the 1980s, however, northern Uganda has held less political influence, received fewer public investments, and has been plagued by insecurity. In the north-central region, an insurgency displaced millions and destroyed assets and production from 1987 to 2006. The northwest and northeast were less affected by rebels, but were subject to other dangers. Conflicts in neighboring south Sudan and Democratic Republic of Congo (DRC) fostered insecurity in the northwest, while cattle rustling and heavily armed banditry persisted in the northeast (Lomo and Hovil 2004).

In 2003 peace came to Uganda's neighbors, South Sudan and (to some extent) the DRC, and demand for Ugandan products boomed. The Government also accelerated efforts to pacify, control, and develop the north. By 2006, the military pushed the rebels out of the country, began to disarm cattle-raiders, and increased security and political control. The centerpiece of Uganda's national security and development plan was a decentralized development program, NUSAF (Government of Uganda 2007). Starting in 2003, communities and groups could apply for gov-

ernment transfers for infrastructure construction or income support and livestock for the ultra-poor. Increasing the number, size and productivity of informal enterprises was also a major policy priority, since the growth of the labor force greatly exceeds the absorption capacity of Uganda's formal sector (World Bank 2009). To stimulate such employment growth, in 2006 the government announced a new NUSAF component: the Youth Opportunities Program (YOP).

3 Intervention

3.1 Objectives

With YOP the government had two main aims: raise youth incomes through vocational employment; and improve community reconciliation and reduce conflict. The intervention required young adults from the same town or village to organize into groups and submit a proposal for a cash transfer to pay for fees at a local technical or vocational educational training institute of their choosing, and tools and materials for practicing the craft.

3.2 Recruitment and participants

The intervention was designed for poor and underemployed "youth"—roughly ages 16 to 35. Any youth was free to apply, but since vocational training often requires some education and aptitude, YOP was intended for youth with at least some primary education. To apply, however, youth had to be a member of (or join) a group and collectively apply. Some members were mobilized by entrepreneurial youths and official "facilitators", often a community leader or local government employee who received a 2% share of any successful proposal from the government in return for helping groups identify projects and trainers, budget, and apply. Hence youth both self-selected into eligibility and were screened in unobserved ways.[6]

Thousands of groups applied between 2006 and 2008. In 2008, the government determined that it had funding for 265 groups in 13 of the 18 northeastern districts.[7] Non-participating districts had insufficient funds, applicants, or administrative capacity to manage the YOP program,

[6] For instance, the youth may be more motivated than average and have more aptitude for skilled vocations. The local and district officials who selected the projects may have been influenced by political or personal ties to the community or the group members, or opportunities for financial gain. These sources of selection are important for external validity.

[7] We use the original 2003 NUSAF districts. Many districts were subdivided after 2003.

(and unfortunately include the three most war-affected districts, although other districts still affected by the insurgency are included).

The central government asked the 13 district governments to sift through their vast pool of applications and nominate two to three times as many groups as there was funding for the district. From this pool the central government audited applications, including a site visit, to confirm existence and eligibility.[8] The government requested that approximately 22 groups of underserved populations (Muslim youth and highly vulnerable youth such as orphans) receive automatic funding, and these are excluded from the study.

535 screened and eligible groups remained. These are described in Table 1. There were no formal restrictions on group size, but the average group had 22 members, and 80% of groups ranged from 13 to 31 members (according to pre-intervention group rosters). Roughly half the groups existed prior to the intervention, as sports or religious or community youth clubs. The rest were formed in response to the call for proposals. The average applicant was slightly above the average wealth and education level in the region.[9] The spread of wealth and education levels was wide, however, and all are poor by any standard: the average applicant reported weekly cash income of 7,806 Ugandan Shillings (UGX)—US$4 at market exchange rates, or almost exactly at the PPP$1.25 international poverty line. More than a quarter had not finished primary school. A fifth was engaged in semi-skilled or capital intensive employment and more than two-fifths reported no income or employment in the past month.

3.3 Intervention

Like many participatory development programs, the objective was not only to enrich but also to empower young adults. At the application stage, groups were responsible for selecting a man-

[8] Applications were screened by several levels of government. A village or town leader had to approve and pass along applications to the District authorities, sometimes executively and other times through a participatory community process. District authorities reviewed applications and nominated projects to the central government. The central NUSAF office verified the existence of the group and reviewed proposals for completeness and compliance. At the central level, applicant groups were eligible if members were mainly of this age range, at least one-third female, had roughly 15 to 30 members, and if their application was accurate and complete.

[9] We compare 2008 baseline data on the eligible population of youth (described below) to representative household surveys: the 2004 Northern Uganda Survey (NUS), the 2006 Demographic Health Survey (DHS), and the 2006 Uganda National Household Survey (UNHS). Among youth eligible for the program, 93% had completed some primary school, 45% completed some secondary, and only 7% had no education. Compared to their age cohort in Uganda, they were four times more likely to have had some secondary and 15 times less likely to have no education. They are also more likely to own assets like mobile phones and radios, implying greater wealth.

agement committee of five members, choosing the skills and institutes, and budgeting, allocating, and spending all funds. The facilitators played no formal role after proposal submission.

Groups selected their own training institute. The institute could be a school, of which there are many hundreds across northern Uganda, of varying formality and quality. The institute could also be a practitioner, who takes on the group as trainees or apprentices for a fee. Most institutes were small, took on no more than one group in the sample, and are very heterogeneous.

If a group was selected, the government made a lump-sum transfer to a bank account in the names of the group leadership. The group management committee and members were wholly responsible for disbursement and purchases, accountable only to one another. Group cash transfers averaged nearly UGX 12.8 million ($7,108), and varied not only by group size but by group request (i.e. transfers were not uniform). The average transfer size was UGX 673,026 ($374) per member—more than 20 times the average monthly income of the youth at baseline. Given the variation in group size and requests, however, transfer size per official group member varied from UGX 200,000 to more than 2 million across groups. Figure 1 displays the distribution of transfers in US dollar equivalents. Assuming no additional persons were added after the transfer, the majority received between UGX 350,000 ($200) and 800,000 ($450).

4 Experimental design and estimation

Given the level of oversubscription to YOP, the government decided to allocate final disbursements randomly among eligible groups to enable a rigorous evaluation.[10] We received a list of 535 groups and randomly assigned 265 groups (5,460 individuals) to treatment and 270 groups (5,828 individuals) to control, stratified by district.[11]

[10] We also attempted to design a second randomization, one that treated a third of the treatment groups with an additional cash balance (worth 2% of the total grant) to hire back their facilitator (or another of their choosing) to help them plan and manage the grant. In another third of groups, the funds would be transferred to the district governments and they would be asked to provide those extension services directly. Our data indicate that this additional design was not properly implemented, and there is no difference in the use of post-grant facilitation across the two types of treatment and the control group. We omit further discussion of this element of the design from this paper.

[11] Each district had a fixed budget. The 535 groups were sorted using a pseudo-random number generator in Microsoft Excel 2003, stratified by district. Applicant groups were awarded funding until the pools of available resources for that district were exhausted. All other projects remained unfunded and were assigned to the control group. Within districts, 30 to 60% of applications were assigned to treatment. All analysis includes district dummies.

Despite the scale of the intervention, we judge spillovers to be unlikely. The 535 eligible groups were spread across 454 towns and villages, in a population of more than 5.4 million.

We define treatment compliance fairly narrowly: all individuals in the group are coded as compliers (treated) if administrative records indicate the group received the transfer and if our endline survey indicates those funds were not diverted or stolen by district officials. We consider other forms of "compliance", such as using the funds for skills training, or equitable distribution, to be outcomes of interest rather than treatment indicators. In total, 29 groups (11%) were not treated. 21 could not access government funds due to unsatisfactory accounting, bank account complications, or delays in collecting the funds. 8 (3%) groups reported that they never were given access to the funding due to some form of diversion.

Given that non-compliance is small and unsystematic, our preferred ATE estimator is the complier average causal effect (CACE, sometimes called the treatment on the treated effect, or TOT) estimate, which uses assignment to treatment, A_{ij}, as an instrument for being treated, T_{ij}, for each individual i in group j and district (stratum) d:

$$Y_{1ijd} = \theta T_{ij} + \lambda Y_{0ij} + \beta X_{ij} + \alpha_d + \underline{\varepsilon}_j + \varepsilon_{ij} \quad (1a)$$

$$T_{ijd} = \pi A_{ij} + \gamma Y_{0ij} + \delta X_{ij} + \alpha_d + \underline{\mu}_j + \mu_{ij} \quad (1b)$$

where Y_{1ij} denotes an outcome variable and Y_{0ij} is its baseline level (when available). This approach (the ANCOVA estimate) is more efficient than a difference-in-difference estimator (McKenzie 2011). X_{ij} is a pre-specified (optional) set of baseline covariates (principally used to correct for covariate imbalance after random assignment), α_d is a stratum fixed effect, $\underline{\varepsilon}_j$ and $\underline{\mu}_j$ are group error terms (i.e. accounting for clustering), and ε_{ij} and μ_{ij} are i.i.d. error terms. The ATE estimate is θ. Alternative estimators—an intention-to-treat estimate, or differences-in-differences—have little material effect on the findings and conclusions.

5 Economic theory and intended impacts

5.1 When will transfers boost employment and income, and for whom?

The intervention provides cash to entrepreneurs for investment in human and physical capital. To understand why transfers might boost employment and incomes (and for whom), it's useful to

remember that, when credit and insurance markets function reasonably well, transfers to the poor will reduce poverty but they will not lead to investment, enterprise, and earnings.

5.1.1 Cash transfers and the unfettered entrepreneur

Consider a simple model of household (entrepreneurial) production with entrepreneurs who can borrow freely and are either risk neutral or can insure themselves against risk (See Bardhan and Udry 1999 for simple examples). These unfettered entrepreneurs will choose their stock of capital (human or physical) so that the marginal return to capital equals the market interest rate. Further investment would push the marginal return below the market interest rate. Given a cash windfall, the entrepreneur would consume some now and save the rest for future consumption. As for employment, labor levels may even decrease if leisure is a normal good.

If the windfall arrives as in-kind capital, or on the condition that it is invested, entrepreneurs would be forced to invest below the market rate of return. In the short run, earnings and employment would rise. But rational entrepreneurs would be worse off than if they received cash, and over time they would draw down their investment until they reach the earlier equilibrium.

5.1.2 Imperfect markets

Of course, in developing countries, markets seldom function so smoothly. Many poor people appear to have high potential returns to investment but are unable to realize them because they have few assets and inadequate access to credit (Banerjee and Duflo 2005). Access to credit is poor in northern Uganda. At baseline, few public or private lenders had a presence in the region, in part because of insecurity, but also because of constraints on the Ugandan finance sector. Moneylenders and village savings and loan associations were common, but loan terms seldom extend more than one to two months with interest rates of roughly 10% per month—more than 200% per annum (Levenson 2011).[12]

As a result, just 11% of the baseline sample had saved funds in formal or informal institution in the previous 6 months, with a median level of savings of 40,000 UGX (or $22). A third of respondents had borrowed funds in the previous 12 months, but these were generally small loans (10,500 UGX, or $5.83, at the median), mainly from friends and family. Less than one in ten

[12] Commercial prime lending rates were approximately 20% per annum in 2008-09, or roughly 5% in real terms, accounting for inflation of approximately 15% (CIA 2011). Our informal assessment suggests that commercial lending rates for small to medium firms were roughly 15% to 25% in real terms.

borrowed from an institution, with the median loan just 30,000 UGX ($17). About 37% said they believed they could get a loan of 100,000 UGX ($55), with 60% saying it would come from family and 40% from institutions. Just 11% said they believed they could obtain a loan of 1 million UGX ($555), 20% from family and 80% from institutions.[13]

5.1.3 Imperfect entrepreneurs

Entrepreneurs, moreover, are not always forward-looking, time-consistent, and disciplined decision-makers. A growing behavioral economics literature emphasizes various human frailties, including bounded rationality, overconfidence, time inconsistency, or self-control problems (Bertrand et al. 2004). Less patient people will tend to consume rather than invest windfalls. Interventions like YOP will not yield high private or social returns if high-return investments are available but not seized. Fafchamps et al. (2011) find some evidence of such self-control problems in a microenterprise program in Ghana, especially among the poor, women, and those who received cash instead of in kind assistance.

Indeed, a qualitative study of the NUSAF components that provided cash for livestock and infrastructure concluded that projects were not well researched, funds were mismanaged, and intra-group disagreements were commonplace (Golooba-Mutebi and Hickey 2010). This study did not focus on the YOP intervention, but our observation of and interviews with YOP beneficiaries during the intervention raised similar concerns.

At the same time, the group organization of YOP, with planning support from facilitators, was partly intended to provide some form of commitment and help overcome self-control problems. Banerjee and Mullainathan (2009) suggest that, in theory, the poor might exhibit more self-control with large lump sums rather than small savings (although there is little evidence to date).

5.2 A simple model of occupational choice and cash transfers

To structure our thinking and predictions we turn to a simple two-period occupational choice model with imperfect markets (no borrowing ability and production non-convexities) and imper-

[13] Over the course of the study, both the security environment and the level of financial development improved in northern Uganda, undoubtedly increasing the availability of credit. The level of financial development remains poor, however, and security (especially peace in neighboring southern Sudan, and the massive boom in trading opportunities) probably raised the returns to capital faster than the availability of internal and external credit. Hence NUSAF ought to provide an excellent example of the returns to grants in a constrained credit environment.

fect individuals (patient and impatient types).[14] The model not only illustrates why cash transfer programs can spur business development and raise incomes, but also produces predictions for impact heterogeneity that test which imperfections constrain this sample.

Suppose individuals have initial wealth w. Each can choose to be a laborer and earn y each period, or to be an entrepreneur, and earn $f(A, K)$, where f is a production function increasing in inherent ability, A, and the stock of capital, K. Entrepreneurs can use their wealth and current income to invest in capital, but becoming an entrepreneur has a fixed cost $F \geq 0$, which we assume does not go into productive capital. Existing entrepreneurs have already paid this fixed cost and are in business with initial capital, $K_0 \geq 0$.

Individuals can save amount s at interest rate r. To simplify the model, and to reflect actual conditions in places like Uganda, we assume $r = 0$ and that individuals are unable to borrow.[15]

In this setup, individuals choose s and K to maximize their (concave) utility function:

$$U = u(c_1) + \delta u(c_2)$$

where c_t is consumption in period t and δ is the individual's discount rate for period 2.

Laborers solve U subject to:

$$c_1 + s = y + w$$

$$c_2 = y + s$$

while budding entrepreneurs solve U subject to:

$$c_1 + s - F - K = y + w$$

$$c_2 = f(A, K) + s$$

and existing entrepreneurs solve U subject to:

$$c_1 + s - K = f(A, K_0) + w$$

$$c_2 = f(A, K + K_0) + s$$

[14] The model was developed by the authors along with Julian Jamison for use in a suite of studies. It could be considered a two-period version of the one-period entrepreneurial investment choice model proposed by de Mel et al. (2008), or a cash transfer version of the two-period microcredit model proposed by Banerjee et al. (2010). Credit constraints are not the only potential market imperfection. One is risk and imperfect insurance. De Mel et al. (2008) also examine a model where households are risk averse and insurance markets are imperfect, and show that the gap between the market interest rate and the marginal return to capital are increasing in the level of risk in business profits and in the level of risk aversion displayed by the household. We ignore risk in this paper, but note that more risk averse individuals should benefit disproportionately from cash transfers.

[15] Indeed, real interest rates in village savings association are generally negative, due to fees and inflation. Allowing short-term borrowing at high rates, as we see in Uganda, would not change the model's conclusions.

We illustrate the major implications of the model in Figures 2 to 4. We start in Figure 2 by ignoring existing entrepreneurs and looking at initially poor individuals (with low w, or w_L) who are laborers in period 1 and must choose whether to be laborers or entrepreneurs in period 2.

Point E represents their starting endowment at $(y + w_L, y)$. Saving corresponds to the -45° line extending from E to the vertical axis. If they choose to start an enterprise, they lose F and invest K, which pays $f(A, K)$ in period 2. We assume $f(\cdot)$ is concave (decreasing returns) and is increasing in both arguments.[16] The stylized example in Figure 2 depicts a relatively high-ability entrepreneur with consequently high potential returns (a steep production function).

Still focusing on the w_L case, we can see that different indifference curves (corresponding to different high and low discount rates, δ_H and δ_L) will lead to different choices between labor and enterprise, with more patience making entrepreneurship more likely. If δ and w are low enough, individuals will consume and produce at E rather than a point of tangency. The larger is A (or the smaller is F), the more attractive is entrepreneurship. This case reasonably applies to the majority of YOP applicants, who are either petty laborers or traders at the outset or, if they are small entrepreneurs, they are not engaged in vocations (and their capital stock is not easily transferred).

Next consider the higher wealth case, w_H, to the right, representing receipt of a cash transfer (though it could also represent any source of liquid wealth or windfall). It is clear from the graph that, fixing A, there is a smaller range of δ for which the agent will choose to be a laborer: patience or ability would have to be relatively low. Intuitively, everyone wants to smooth their consumption (concave utility) unless they're very impatient. The higher is w, the more asymmetric the initial endowment, and hence the more individuals want to smooth. Given that they smooth, capital investment typically gives a better return than saving (depending on A). We assume the initial fixed cost F is small relative to the change in wealth, and F is less important as w grows.

Figure 3 illustrates the difference between high and low ability (A_H and A_L) individuals. While magnitudes depend on the shape of the production and utility functions, we can nevertheless see a few relatively general patterns. In this illustration, we see it is possible even for patient individuals to remain laborers if the returns to their ability are lower than the return from saving (in this

[16] Production could easily be linear without changing conclusions. If the slope of the production function falls below one, the entrepreneur would switch to savings instead of capital investment. This is not a necessary assumption but it seems reasonable given the stylized facts that (i) poor people often have high returns to small amounts of capital, but (ii) very few microenterprises ever increase beyond a small scale, even with access to credit. In our stylized example no entrepreneur optimally hits such a region, and hence we can take $s = 0$ for entrepreneurs.

case zero). Given a cash transfer, there will be threshold values of w, A and δ below which individuals will remain laborers after a cash windfall, though in general these threshold values become lower and lower as the transfer increases. Generally, higher ability and more patient people should see a larger increase in period 2 earnings and consumption.

Finally, Figure 4 considers existing versus budding entrepreneurs, focusing on relatively high ability individuals only. Existing entrepreneurs have paid F and so their production function is shifted to the right, even at initially low wealth levels. The effect of a cash transfer on period 2 earnings and consumption will tend to be greater for budding rather than existing entrepreneurs, especially less patient individuals who would not have chosen to start an enterprise in the absence of the cash transfer.

5.3 What is the role of groups in group-based transfers?

YOP transfers funds to groups rather than individuals. From the Government and World Bank perspective, there were several motivations for the group design. Administratively it is simpler and cheaper to disburse funds to thousands of groups than tens of thousands of people. Designers also viewed the group organization as intrinsically and ideologically important. The NUSAF intervention more broadly was designed to promote decentralized, participatory decision-making. It is representative (and indeed modeled after) other "Community-Driven Development" (CDD) initiatives in other countries, initiatives which spend in the tens or even hundreds of billions of dollars globally (Mansuri and Rao 2011). While the most common CDD programs grant cash to communities for community projects, transfers to groups within communities are not uncommon. The intention of the group and participatory approach is to improve the success of targeting, build social capital, and strengthen accountability—specifically, in the YOP case, the likelihood that cash transfers are invested rather than consumed.

Based on these theories and our qualitative observation of groups before and after the treatment, we see four main hypotheses. First, groups may act as a form of commitment device. For instance, payments for training and some tools are commonly made by the leadership on behalf of all members, and individuals may feel more peer pressure or encouragement to invest rather than consume the transfer. In our model above, this would lead to higher levels of period 1 investment even among low ability and low patience types. In a multi-period setting, these low types might disinvest and return to laboring or less capital intensive entrepreneurship, but in the interim earnings of low patience types would be higher than otherwise.

Second, a group could provide production complementarities. Most post-intervention YOP enterprises are individual rather than group-based, so individual production functions probably remain the right framework for thinking about intervention impacts.[17] But some groups share tools and physical capital (e.g. a building, or high-value tools), which could returns.

Third, low ability types may benefit from high ability peers. This positive effect is not assured; social psychological research on small groups suggests that group-based decision-making and learning can enhance or detract from group performance (Levine and Moreland 1998). But our qualitative observation suggests that there exist opportunities to learn and observe from peers, increasing the returns of low ability people (and narrowing the performance gap).

Fourth, observers of CDD programs in general, and NUSAF in particular, fear the potential for elite or leader capture, leading to unequal distributions, possibly positively correlated with ability. If so, we would observe higher average returns among pre-specified leaders.

Only this last hypothesis is directly testable with our research design, as leaders were pre-specified. The other three hypotheses are not directly testable, as YOP programs rules didn't allow for individual transfers. But we can look for indirect evidence based on baseline data on group quality, cohesion and composition. In particular, we hypothesize that the extent to which groups act as effective commitment devices, effectively share tools and raise shared capital (and returns), and raise the performance of low ability types is increasing in levels of group cohesion and quality. Low types are more likely to benefit from heterogeneous groups (those with higher ability people). We return to these tests below.

6 Impacts on social cohesion, alienation, and instability: A conceptual framework

YOP, like many development interventions, aims to promote social cohesion and stability. The logic, however, is seldom explicit. We highlight six bodies of social theory, each of which plausibly links cash transfers and higher incomes and employment to socio-political outcomes. We are not aware of efforts to discuss or analyze each of these competing theories together, and identify the empirical predictions that can distinguish between them. A comprehensive attempt

[17] 14% of the treated report coming together for income-generating activities on a daily basis, and 30% report coming together once a week for this purpose. 75% of those that come together daily report shared tools. 85% of those that come together weekly report some shared tools.

and test is beyond the scope of this paper and research design, but can provide a framework for interpreting any pattern of results.

6.1 The "participatory" view: Group formation and participatory decision making increase social support and cohesion

The first is an assumption underlying most community-driven and participatory development programs, implicitly and explicitly: group decision making, especially in combination with economic empowerment, promotes social cohesion, community participation, and notions of citizenship. If true, it predicts we should observe increases in social cohesion and community participation among the treated, especially where the initial quality of the group dynamic is better. We do not see a clear reason for aggression to be affected through this channel, and effects do not necessarily increase with economic success.

This mechanism is consistent with sociological theories that associational life is a crucial form of social capital and well-being (Putnam 2001), though the application to development programs assumes that this associational life and cohesion can be induced by state development programs and incentives. Mansuri and Rao (2011) review the theory and evidence of community-driven development programs akin to NUSAF and argue that the rhetoric often exceeds reality. Their pessimism consistent with a large body of social-psychological research that suggests that group work and decision-making have mixed impacts depending on context, composition and other factors (Levine and Moreland 1998). This conclusion is bolstered by tepid evidence from experimental CDD program evaluations (Casey et al. 2011).

6.2 The "social role" view: Increased incomes elevate social position and cohesion

Throughout agrarian societies, and perhaps especially in contemporary rural Africa, communities and social groups act as a mutual insurance system, and the kin system in particular works as a form of mutual assistance among members of an extended family, traditionally from the older to the younger.[18] In such societies, the transition from "youth" to "adult" is a transition from disregard to social esteem and support, and is partly determined by one's ability to give rather than receive gifts and transfers. To the extent that participation in a YOP-like intervention increases wealth and the ability to increase transfers out, we may expect an increase in social sup-

[18] See Hoff and Sen (2005) for a review.

port, respect, and opportunities for community leadership and engagement.[19] Conversely, African anthropological literature stresses that youth who are alienated from this system, and have little means of being net givers at the age when they ought to be "adults" in the social sense of the term, are more likely to engage in anti-social behavior and even insurrection (e.g. Richards 1996; Peters and Richards 1998).

This mechanism suggests we should observe increases in social cohesion and support, and that these changes should be correlated with higher economic success and (perhaps most of all) evidence of transfers. To the extent that lower alienation reduces anti-social behavior, we may also expect to see lower aggression as a result.

6.3 The "materialist" view: Higher incomes raise the opportunity cost of predatory activities

A third, more materialist view, argues that those with low earnings, or nothing to lose, have a lower opportunity cost of aggression, crime and insurrection, and hence are more easily mobilized into predation. By this account, employment programs reduce predatory activities to the extent that they raise incomes and either crowd out or raise the opportunity cost of these activities. This employment-predation link comes from classic economic theories of crime: poverty lowers the opportunity cost of peaceful production, providing incentives for predatory activities (Becker 1968; Freeman 1999). Economists have extended this logic to insurrection, arguing that youth unemployment and adverse economic shocks raise the risk of conflict in developing countries, and a growing body of evidence from cross-country studies is emerging to confirm this (Blattman and Miguel 2010).

This mechanism makes no predictions about alienation or cohesion per se. With respect to anti-social behavior or violence, the materialist view would only apply to predatory or anti-social activities with an opportunity cost of time or funds. None of the measures in the present study have such a cost, and so we will not speak to this view in this paper.

[19] Hoff and Sen (2005) also note, however, that with a large enough gain, individuals might have an incentive to excise themselves from their kin group, to avoid the financial obligations and protect their YOP transfer. There is thus the potential for reduced social support and cohesion.

6.4 The "frustration-aggression" view: Anti-social behavior and conflict are a function of frustrated ambitions, especially relative deprivation

A fourth, more psychological and sociological view is that poverty produces aggression and alienation through frustrated ambitions. Some follow sociologists Durkheim (1893) and Merton (1938) and see poverty and blocked goals as producing strain on the social system, leading to deviance, delinquency and crime. Political scientists also emphasize how, throughout history, these frustrations have been mobilized and led to insurrection, especially where poverty is unequal and unjust, leading some individuals to find intrinsic value in the act of aggression or insurrection itself (Gurr 1971; Scott 1976; Wood 2003). This belief is rooted in early psychological research that argues that aggression is a reaction to external conditions frustrating a desirable outcome (Dollard et al. 1939).

This mechanism makes no obvious predictions about social cohesion or community participation. If treatment rectifies a perceived injustice or inequality, and reduces frustrations, then we might expect to see lower aggression. This may or may not be associated with the degree of economic success. A randomized control trial might not be the ideal test of this view, however, since treatment is understood to be random.

6.5 The "psychological stress" view: Employment and income reduce anti-social behavior due to reduced stress

Frustration-aggression theories of violence and anti-social behavior take a fairly narrow view of psychology and aggression, one that is rooted in psychological research from the 1960s and even 1930s (Dollard et al. 1939). More recent psychological research emphasizes that aggression is a highly charged emotional state and that aggression and anti-social behavior can be reactions to a wider array of adverse stimuli or stressors (Berkowitz 1993). This stress mechanism predicts that treatment and the degree of economic success should be associated with lower aggression.

6.6 The "situationalist" view: Violence is the product of circumstance, which may be (spuriously) associated with poverty

A final view sees violence as the product of circumstance, not calculations or impulses (Collins 2008). For instance, the poor may have less access to justice and security, and so be more vulnerable to victimization or mobilization (Scacco 2008). The view is particularly common in urban settings and communal violence. We do not see a clear role for this mechanism on

the northern Ugandan setting, where there was little obvious variation in risk of insecurity and access to justice within the sample.

7 Data and measurement

7.1 Survey data

The 535 eligible groups contained nearly 12,000 official members. We follow a panel of five members per group, 2675 in total. A baseline survey was conducted in February and March 2008. Enumerators located 522 of the 535 groups and mobilized all available group members—about 95% on average—to complete a group survey that collected demographic data on all members, present or not, as well as group characteristics.[20] Five of the members present were randomly selected for an in-depth questionnaire in their local language. Appendix Table 1 displays summary statistics for key baseline variables and also demonstrates the degree of treatment-control balance. All estimates in the paper are within-sample predictions, and we do not weight for differential selection from the population of 12,000.

The government disbursed YOP funds between July and September 2008, 5 to 7 months after the baseline survey. Groups typically began training shortly thereafter and most had completed training by mid-2009. We conducted the first "2-year" endline survey between August 2010 and March 2011, 24 to 30 months after disbursement. We conducted a second "4-year" endline survey between April and June 2012, 44 to 47 months after disbursement.

We attempted to track and interview all 5 members of the 522 groups found at baseline, plus members of the 13 unfound groups. At least one (and often several) attempts were made to find each individual, and we selected a random sample of migrants and other unfound individuals for intensive tracking, often in another district. The effective response rate for the 2-year endline is 90% and 84% for the 4-year endline.[21] Effective response rates were 4 percentage points higher

[20] In two survey rounds we were unable to locate 12 of the 13 missing groups on follow-up attempts, suggesting that these 12 groups may have been fraudulent "ghost" groups that slipped through the auditing process. Unusually, all 13 missing groups had been assigned to the control group and so received no funding. For logistical reasons related to program operations, treatment had to be randomized prior to baseline, but assignment was only known to the researchers and the central government director. District officials and enumerators also did not know the treatment status of the groups.

[21] We follow a two-phase tracking design. All respondents are sought in Phase 1, where at least one attempt is made to find respondents at their last known location. Phase 2 selects a random sample of unfound respondents and intensively tracks these (in general, at least three further attempts). Phase 2 respondents thus receive greater weight in all

in the treatment group at 2 years and 1 percentage point higher at 4 years. Attrition is relatively uncorrelated with baseline data, suggesting that it is relatively unsystematic.[22]

7.2 Measurement of key outcomes

Primary outcomes at the 2- and 4-year endline are described in Table 2, grouped into eight "families" based on pre-specified conceptual linkages.

7.2.1 Economic outcomes

Investments in vocational skills and capital. Respondents self-report (i) the *Hours of training received* between baseline and the 2-year endline (2Y); (ii) the value of *Tools and machines acquired* between baseline and 2Y and between 2Y and the 4-year endline (4Y) in thousands of Ugandan Shillings (UGX); and, (iii) the value of their total *Stock of raw materials, tools and machines* at 2Y and 4Y. We top-code UGX-denominated variables at 99th percentile (see below).

Unfortunately, we do not know the exact distribution of the transfer within groups, or specific amounts spent on training, raw materials, or start-up costs. Groups divided and disbursed funds among members in diverse and difficult-to-observe ways, sometimes paying for training on behalf of the group, sometimes making bulk tool purchases, and sometimes dispensing cash to members. Groups seldom kept records, and members could not reliably estimate the value of any in-kind transfers. Shared assets could be double-counted or uncounted. Hence hours of training and durables acquired and owned represent our best (albeit incomplete) investment estimates.

Income, consumption and employment. At both 2Y and 4Y, respondents self-report total *Hours on all economic activities* in the past four weeks, excluding household work and chores but including subsistence work (e.g. hunting, farming, charcoal making). We can exclude sub-

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analysis (equal to the inverse of the sampling probability). This sampling technique is designed to use scarce resources to minimize attrition bias (Thomas et al. 2001; Gerber et al. 2011). The effective response rate (ERR) is a weighted average of the response rates in phases 1 and 2: ERR = RR1 + RR2 × (1-RR1) (Orr et al. 2003). In the 2-year endline, RR1 was 60%. We drew a 50% random sample of unfound people, and RR2 for the subsample was 75%, for an ERR of 90%. In the 4-year endline, RR1 was 61%. We drew a 39% random sample of unfound people, and RR2 for the subsample was 59%, for an ERR of 84%.

[22]We assess the probability of being unfound on treatment status, 16 demographic characteristics and indices of lagged dependent variables. Collectively the explanatory power is low (an r-squared of 0.06). We observe three substantive and statistically significant differences: Males were four percentage points less likely to be found; urban persons were 8 percentage points more likely to go unfound; and a standard deviation increase in wealth led to a 2.6 percentage point greater likelihood of not being found.

sistence work for *Hours on market activities*.[23] To estimate income, we ask respondents to estimate their profits from business activities and wages or earnings from other activities in the previous four weeks by activity, and calculate *Total cash earnings in past month (`000s of UGX)*.[24] Finally, to measure poverty we calculate an *Index of wealth* z-score using 7 measures of housing quality, 55 household and business assets, 5 types of landholdings, and 3 measures of personal appearance. The index is the score from the first principal component of these assets—shown to be a relatively reliable proxy for full consumption aggregates (Filmer and Scott 2008). To complement this measure of durable wealth, at 4Y we also develop an abbreviated measure of *Household consumption* in UGX based on 58 forms of non-durable expenditure.

7.2.2 Social alienation and aggression

Participation and engagement. One measure of alienation is community engagement. We ask respondents about their *Number of group memberships* in the community, whether they *Attend community meetings*, and whether they *Speak out at community meetings*. We also ask whether they are a *Community leader* of any form, or a *Community mobilizer*, which is a position commonly filled by youth, who help to organize meetings, gather members, or spread messages. We also ask four questions about their perceived *Locus of control*—a psychological construct that attempts to measure the extent to which individuals believe that they can control events that affect them. See Blattman, Emeriau and Fiala (2012) for an analysis of political outcomes.

Social integration. We also consider interpersonal relationships and integration. We have an indicator for whether respondents indicated their *Families are very caring towards them*. We also calculate a more general *Index of social support*, an additive index running from 0 to 16 based on responses to 8 self-reported questions about concrete forms of social support received in the past four weeks.[25] We also construct a *Neighbor relations index* running from 0 to 8 based on four perceptions (each a 0-2 scale) about the quality of neighbor support, relations, esteem, and

[23] The distinction between subsistence and market work is based on occupation type, and activities were classified as subsistence if less than 15% of persons reported cash earnings from the activity.

[24] Net income is one of the most important measures but also one of the most difficult. While subject to recall and other potential forms of bias, some experimental evidence from microenterprise profit measurement suggests self-reported profits and earnings may be the least biased measure of income, imperfect as it may be (de Mel et al. 2007).

[25] Each is measured on a 0-2 scale from "no support received" to "yes, often"). Examples include whether or not someone: looked after a family member or the possessions of the respondent while they were away, or sat with the respondent when they were feeling distressed or lonely.

trust. Finally, relations with elders is an important indicator of social integration in rural Uganda, and we construct a *Reverence for elders index* running from 0 to 9 based on three questions (each a 0-3 scale) on self-reported helpfulness to, respect for, and legitimacy of elders.

Depression and distress symptoms. We adapt an additive *Index of psychological distress* that runs from 0 to 21, using 7 self-reported symptoms of depression and anxiety, each rated 0 to 3 by frequency.[26]

Aggression and hostility. We have three main aggression measures at 2Y and 4Y. The first measures the frequency of angry disputes on a 0 to 3 scale (for never, rarely, sometimes, or often) with particular parties, giving us an *Index of disputes with neighbors*, an *Index of disputes with family*, an *Index of disputes with community leaders*, an *Index of disputes with police*, and an *Index of physical fights*. The second type measures the aggression of their peer group on the same scale, including whether *Peers have disputes with local leaders or police*, and *Peers involved in physical fights*. Finally, we ask about three self-reported behaviors associated with hostile behavior in the psychological literature, including scales for how frequent they are *Quarrelsome*, *Take things without permission*, *Use abusive language*, or *Threaten to hurt others*.[27]

7.2.3 Subjective well-being

Finally, we measure **current subjective well-being** by asking respondents to place themselves (relative to other community members) on 9-step ladders of *Wealth*, *Community respect*, *Power in community*, *Access to basic services*, and *Asked for advice* (an important social role of respect in northern Uganda). For **future subjective well-being**, we also asked each respondent to give us their expected place on the ranking in 5-years for wealth, respect and power. We also asked a general question on *Optimism*, specifically, on a 0-3 scale, whether they "believe good things will happen in your life".

[26] Symptoms include feelings of isolation, nightmares, difficulty sleeping, hyper-arousal, etc. We adapt our 7-item scale from the 19-item distress scale used by the Survey of War Affected Youth in northern Uganda (Blattman and Annan 2010). All 19 symptoms were collected at baseline, and for the 7-item endline scale we took the 7 most influential items from the rotated first factor of all 19.

[27] Aggression and dispute questions were developed by the authors after extensive pretesting, and the aggression measures are similar in content to psychometric hostility measures used in developed countries, but locally adapted by the authors to the Ugandan context. We are not aware of a validated measure of aggression for Africa.

7.3 Measurement error and ATE estimation

Two forms of potential measurement error deserve discussion. The first comes from self-reported outcome data. If treated individuals over-report well-being from an impulse to please, or control individuals disproportionately under-report outcomes in the hope it will increase their chance of future transfers, we will overestimate the ATE. It is worth noting, however, that some measures (like the expenditure questions for measuring consumption) may not have such obvious welfare implications to the respondent, and may be less subject to potential bias.

The second comes from extreme values. All our UGX-denominated outcomes have a long upper tail to which any measure of central tendency, and hence the ATE, is sensitive. Outliers are particularly influential here, and may either be true outliers, misstatements, or entry errors into handheld devices (e.g. accidental entry of too many zeros). Our main estimates top-code any UGX-denominated variables at the 99^{th} percentile, after which most UGX-denominated variables have a roughly log-normal distribution. But a quarter of respondents report zero net income in the past four weeks, and non-zero earnings are more likely among the treated. We take three steps to conservatively estimate treatment effects. First, we examine both the linear effect and a non-linear transformation—the inverse hyperbolic sine, which is similar to a log transformation but defined at zero (Burbidge et al. 1988). Second, we examine the treatment effect at the median and other major quantiles. We also explore sensitivity to top-coding, and find that other methods of dealing with extreme values generate essentially the same conclusions (results not shown).

8 Results

8.1 Investments in vocational skills and capital

Overall—and rather remarkably—the vast majority of beneficiaries make the investments they proposed: most engage in vocational training and a large proportion of the transfer appears to be spent on fees and durable, suggesting that fears of misused funds may be misplaced.

Table 3 displays the ATEs for self-reported investments in training and assets. We examine 2-year and 4-year ATEs, and the change over time (indicating growth or decay). We also look at the full ATE, ATEs by gender, and the female-male difference.[28] To provide a sense of magni-

[28] The ATEs are calculated using equation 1. To calculate the change from 2 to 4 years, the two surveys are pooled and the coefficient for the change over time comes from an interaction term between treatment and the 4-year

tude, we also report control group means and (except in the case of non-linear transformation, or mean standardization) calculate the treatment effect as a proportion of the control group mean.

The "family" of investment outcomes in Table 3 (column 1 to 3) can also be represented by a mean standardized outcome (a z-score), calculated as the standardized sum of each of the outcomes in the family (themselves mean standardized). Each table examines such a family aggregate in order to guard against rejecting true null hypothesis when testing multiple outcomes (Duflo et al. 2007). One limitation of these family indices is that there is often no theoretical reason why the components should all co-move, and the variation in individual outcomes is often informative. Hence this paper focuses on individual outcomes and our theoretical predictions.

8.1.1 Skills training

Between baseline and the 2-year endline, 74% percent of the treated enrolled in technical or vocational training, compared to 15% of controls. Treated males and females have similar enrolment levels.[29] Among the treated, the most common types of vocational training were tailoring (28%), carpentry (18%), metalworking (10%), and hairdressing (6%), with women more likely to take up tailoring and hairdressing and men more likely to take up construction trades. The majority of control group training is shorter, freely provided by the government (e.g. extension officers) or NGOs, and is more heavily weighted towards business skills and agriculture than choices among the treated. Self- or family-supported training, taken up by only about 5% of controls, is more likely to focus on vocational skills like tailoring.

On average, being treated translates to 389 more hours of training than controls (Table 3, columns 4). 10% of the control and 13% of those in treated groups re-enrolled in formal schooling (usually secondary school) since baseline—small in absolute terms but proportionally-speaking a large (30%) increase. We do have new skills and schooling data at the 4-year endline.

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endline. Since we do not interact the baseline controls and district fixed effects with an indicator for the 4-year endline, the coefficient on the change is not equal to the difference between the individually-estimated 2-year and 4-year coefficients.

[29] Any training lasting less than 16 hours is ignored, in order to avoid including minor community-based trainings by extension officers or NGOs.

8.1.2 Asset acquisition and stocks

Between baseline and the 2-year endline, the average control member reports acquiring business assets worth UGX 137,200 ($62) since baseline (Table 3, columns 5), and value their stock of tools, machines and raw materials at UGX 350,000 ($158) (Table 3, columns 11). Treated individuals report an additional 681,991 UGX ($310) in acquisitions and UGX 566,891 ($258) in asset stock, a 497% increase in acquisitions and 162% increase in asset stock relative to the control group. The impact on asset stocks is sensitive to the upper tail and any top-coding, however. A log transformation would be less sensitive to outliers but would treat zeros as missing, and so we use an inverse hyperbolic sine (IHS). The linear ATE is robust to the transformation but the male-female gap is not. We will see the same with income, below. This suggests that any male-female gap is driven by the upper tails and outliers, and perhaps not so salient.

Between the 2-year and 4-year endlines, we see higher lower levels of business asset acquisition among the treated (Table 3, columns 6). The average control member reports acquiring 45,910 UGX in raw materials, tools and machines, and treated individuals report spending 21,313 UGX less in business assets acquisition, a 46% decrease relative to the control group but this decrease is not significant. We do not see a consistent or statistically significant male-female difference using the linear or HIS ATE.

The average control group member values their stock of business assets at 617,200 UGX at the 4-year endline (an increase of almost 270,000 UGX from the 2-year endline). This stock is 296,900 UGX higher among the treated, a 48% increase over controls. This increase is smaller than the increase observed between baseline and 2-year endline (162%). Nonetheless, in absolute levels, the treated report *similar* stocks at the 2-year endline (916,991 UGX) and 4-year endline (914.100 UGX). Thus the decrease in the magnitude of the ATE is fully explained by the increase in the value of stock of business assets in the control group.

Quantile analysis will mitigate bias from outliers. Figure 5a and Figure 5b maps the quantile treatment effects (QTEs) for business assets owned at 2- and 4-years respectively. The median control group member owned just 36,000 UGX ($15) of business assets after 2 years and 90,000 UGX ($37) after four. Below the 30th percentile, treated group members report virtually zero business assets at two years, but the two groups diverge sharply from that point onwards. The median QTE for assets acquired is UGX 191,000 ($75) for assets owned, and at the 70th and 90th percentiles the QTE rises to more than UGX 367,000 and 1,987,000—each one many multiples of the corresponding control quantile. These levels are lower at 4-years, but not dramatical-

ly so in comparison to 2-year. It suggests there is little gain at the median, and maybe some reduction at the upper tail. Also, it is worth noting that the value of control capital stocks is rising quickly in this time, which may account for the lower longer term treatment effects: in the long run, those with high investment opportunities may begin to reach, however slowly.

8.1.3 How much of the cash transfer was invested in vocational training and tools?

Treated groups reported that approximately 35% of any YOP transfer was spent on training fees (Table 1). The asset QTE, above, moreover, suggests that the median treated individual spent approximately 26 percent of the transfer on assets. This suggests that nearly 61% of transfers were spent on skills training and durable assets alone. While some of the remainder was undoubtedly consumed or transferred, some was likely invested in working capital (such as materials and stock purchases), operating expenses, or held as savings. These results suggest that either self-control issues are not a major constraint on investment (at least with large transfers) or that the intervention design—specification of a proposal, auditing prior to disbursal, and group organization and control over funds—may have acted as a commitment device.

8.1.4 Group dynamics and investment

The group-based disbursement of funds implies that investment may not have been solely an individual decision. Do group characteristics matter? To what extent do better quality or more homogenous groups differ in investments and performance? Is there any evidence that the group disbursement acted as a commitment device?

Table 4 looks at treatment heterogeneity on key investment and economic outcomes, by group characteristics measured at baseline. We interact treatment with: an indicator for whether the *Group previously existed* for other purposes, before they applied for YOP funding; a standardized index of the *Quality of the group dynamic* (based on the average response in a group to five opinion questions, such as trust in group members, the quality of cooperation, or whether they would work with the group again); the *Group size*; the *Proportion female*; and finally a *Group heterogeneity index* (a standardized additive index of the standard deviation of characteristics within the group, including education, starting capital, and age).

If the group plays a large role in investment decisions, commitment to investments, or sharing information and tools, we hypothesize that investments and economic performance should be increasing in group cohesion and quality, indicated by previous existence and the dynamic. The

effect of group size and heterogeneity is theoretically ambiguous, but effectiveness is potentially decreasing in both.

We see only weak evidence for any effect of group characteristics on investments or performance. The coefficient on the *Group previously existed* interaction is positive across all outcomes, but in general small relative to the treatment effect and not statistically significant. Investments and earnings are both increasing in the quality of the group dynamic, but the effect is only statistically significant for capital acquired. This is consistent with the idea that groups operate as commitment devices, but the magnitude is only moderate relative to the treatment effect, and is not reflected in significantly higher earnings or wealth.

We see little relationship between group size and performance—an unusual result, which we return to below, since smaller groups tended to receive larger per capita transfers. Treated groups with a higher proportion of females are more likely to invest in training hours. Strikingly, however, these groups are much less profitable and wealth levels are also much lower. Finally, treated members of more heterogeneous groups do more poorly on average, but the impacts are small and not robust.

Finally, given the absence of upward accountability after the cash transfer, a reasonable concern is that transfers may have been captured by some members, particularly the group executive committee in charge of finances and planning. We see little evidence that transfers were captured by leaders. First, less than 2% of groups assigned to treatment reported that a group leader appropriated most or all of the funds. Second, most group members remain satisfied with their group: more than 90% still work with the group and more than 80% feel the group cooperates well (Table 1). Third, we test for heterogeneous impacts among leaders, but see few significant differences. We look at how self-reported investments vary by leadership position—whether a member of the full executive, or one of the two most senior positions—the committee chair or vice-chair, controlling for ability and wealth. The coefficient on an interaction between treatment and leadership indicates how leaders responded or benefited disproportionately from the transfer. Results are displayed in Appendix Table 3. The sign on the leader interaction is generally positive, implying leaders received more training and capital than the average member. The difference in training hours is large (about a one quarter increase over other group members) and statistically significant. But the coefficients on capital acquired and stocks are closer to zero and not robust. Coefficients on the group chair interaction are actually negative for capital investments.

For group investment, there are very similar patterns between the two year and four year surveys. The results almost exactly the same in terms of sign and stat significance, with just a smaller magnitude at four years.

8.2 Economic Impacts

8.2.1 Midterm (2-year) economic impacts on income, consumption and employment

Our model predicts a shift from unskilled to skilled employment, and an increase in earnings and consumption. Table 5 reports average treatment effects for the full sample and by gender. First, we see a substantial increase in skilled or somewhat capital-intensive work. A third of the control group is engaged in such enterprises at endline, but this rate doubles among treated individuals. The impact is slightly greater for women than men, but the difference is not robust.

Second, we see a substantial increase in net income, both from the linear and IHS transformation. On average, the treated report UGX 20,813 ($9) greater incomes in the last 4 weeks at endline. While seemingly small, the impact is huge relative to the counterfactual—a 47% increase over the control group mean. The size (but not the significance) of linear estimates is sensitive to the upper tail, and so we look at IHS results as well and find them similarly robust.

Linear and IHS average treatment effects differ in one crucial respect: impacts by gender. The linear income results suggest that women earn significantly less than men, with the female treatment effect just UGX 7,824, and not significantly different from zero. The non-linear results, however, suggest that women's average treatment effect is similar (and if anything, greater) than that of men, though the difference is not significant. As with assets acquired and owned, the inconsistency appears to be due to the long upper tail in earnings.

When we turn to quantile treatment effects, we see that women benefit significantly from treatment, bolstering the IHS results. Figure 6a and Figure6b shows the QTE for men and women. The treatment effect at and below the median is similar for both genders: positive and generally significant after the 10^{th} percentile, and nearly equal at the median at UGX 10,500 for males and 10,000 for females. Above the median, male QTEs diverge, jumping to roughly 20,000 at the 70^{th} and 80^{th} percentiles and 78,000 at the 90^{th}. The female QTE is relative steady until the 80^{th} and 90^{th} percentiles, in the latter case only reaching 33,000.

Third, we use a standardized household wealth index to proxy for consumption. The treated exhibit a 0.13 standard deviation increase in housing quality and durable assets, with the increase

concentrated primarily among men. The change in wealth for women is positive but close to zero and not robust. Cash savings show a similar pattern—the treatment effect is large among men, significant at the 1% level, and small and not significant for women (Appendix Table 2).

The model assumes full labor utilization. If we were to relax this assumption, theoretically the cash transfer has an ambiguous effect on employment. Labor hours should increase to the extent that labor and capital are complements, and decrease to the extent that labor is a normal good. Few of our sample, however, are fully employed—the average control group member is engaged in market and household employment just 4.3 hours a day. Hence we expect employment to increase on balance. Indeed, hours in all activities—subsistence and market based—increase among men and women by nearly 20 hours per month. This is principally an increase in market-based activity; treated individuals report 23 more hours of market employment. (The difference—time spent on subsistence activities—changes little for both men and women.) While in absolute terms this amount may seem small—less than an extra hour per day—it represents a 32% increase over the control group. Among women, who tend to engage in less market based work in the absence of treatment, the ATE represents a 50% increase.[30]

8.2.2 Longer term (4-year) economic impacts

The four year results for economic outcomes are similar to the two year results and suggest that the effects of the program have not diminished over time, but for men they have also not increased over time but are instead staying flat. Women, who overall are doing at least as well as men after two years, are actually seeing a growth effect in their incomes after 4 years. From Table 5, we see that after 4 years, men's income ATE is relatively steady in absolute terms, but women's incomes are 86% ahead of control females. It is worth noting that control males seem to have significantly rising incomes over the 4 years, and so the male ATE is falling relative to control group males over time, while the female ATE is rising relative to the control group over time.

Hours of employment is fairly steady and has seen little increase. There is no statistically significant change between 2 year and 4 year endline in the total number of hours worked. The

[30] The amount of time spent at household work and chores falls by 23% among the treated, by 9 hours in the past four weeks (Appendix Table 2). The absolute fall in hours is much larger for women (a fall of 18 hours over the past four weeks compared to a fall of 5 among men).

probably of being engaged in skilled work is still higher among the treated four years after the program, although it represents only 65% increase relative to the control group, which is a slight reduction in the size of the effect.

Looking at welfare, the index of wealth is higher, but is not statistically significant for males. The results for consumption suggest a 13% increase for those treated over controls (Table 5, column 21). The rise is highest for females, however, suggesting that increases in income are translating to increases in durable wealth. We do not have a comparison set of data in the two year data collection to compare for short term non-durable consumption expenditures, so we cannot be sure of the changes over time to this variable. But we see a 13% improvement in this measure of consumption relative to controls, with relatively similar male and female results. Higher female incomes seem to translate into more durable consumption rather than non-durable consumption.

8.2.3 Returns on investment

The average transfer amount was UGX 673,026 ($374) per group member (Table 1), and the median transfer was 545,642 ($303). The monthly earnings ATE is 19,515 ($9) and the median QTE is 10,000 ($5). Ignoring heterogeneity in transfer amounts received and earnings (and any correlation between the two), and assuming earnings in the most recent month are representative of past and future real earnings (i.e. ignoring inflation and any change in enterprise size and productivity) the ATE represents a return of 2.9% per month (35% per annum, non-compounded) and the median QTE represents a return of 1.8% per month (22% per annum).

These returns reflect added inputs, especially added labor. We can calculate an "adjusted" earnings measure that subtracts from each individual's earnings a wage for each of their hours employed. We do not have data on wages, and so predict wages using control group endline data: we use baseline education and demographic data to predict a wage level for each individual and subtract the sum from their earnings. We obtain nearly identical returns: the ATE on these adjusted earnings is UGX 16,614 ($8) (Table 6) and the median QTE is UGX 9,185 ($4) (regressions not shown). These figures correspond to annual rates of return of 30% and 20%.

Do these returns exceed market interest rates? Are they "high"? This depends largely on the real interest rate used. In 2008-09, Uganda's real prime lending rate to banks was just 5%. Short-term microfinance rates, on the other hand, are roughly 200% per annum. While detailed data are

not available, real commercial lending rates of 10 to 20% appear to be common among small firms.

The average returns to capital above also approach the "high" returns of 40 to 60% recorded for microenterprises in Sri Lanka, for firms with moderate amounts of capital in Mexico or for farmers producing traditional crops in Ghana (Udry and Anagol 2006; de Mel et al. 2008; McKenzie and Woodruff 2008).

These results suggest that the average beneficiary possesses moderate to high returns to capital, even when those investments are somewhat constrained to vocational training and tools. These estimates, moreover, focus on earnings alone and ignore any non-pecuniary impacts on physical and mental health, social status or other impacts valued by the beneficiary, and discussed below.

Another means of evaluating returns is to ask a hypothetical question: given the earnings observed, how many months (N) would be needed to repay a loan the size of the average NUSAF cash transfer (T) based on a real interest rate r and a constant payment level P? We calculate the number of months to repay for different T and r in Appendix Table 4. At the median profit level, payback is never reached at high real commercial lending rates (25%) or at typical rural moneylender rates (200%). At the lower end of real commercial rates (15%), payback is reached in 12 years. It may be that the "social" rate of interest is lower (e.g. because a social planner has a lower cost of capital, or lower discount rate in general); payback is achieved in about 6 years at rates of 0 to 5%. Payback times are faster at the mean profit level—roughly 3 years at the hypothetical "social rate of interest", 4 and 5 years at the low and high commercial rates, and never at moneylender rates. Finally, if individuals or social planners value non-pecuniary benefits of the intervention, or externalities, "payback" is considerably faster. In these scenarios the transfer is "repaid" in as little as half the time.

8.2.4 Economic impacts and transfer size

As we saw in Figure 1, per capita transfers vary widely across groups: the majority received between UGX 350,000 ($200) and 800,000 ($450). This is principally because some groups were smaller than others, but tended to request transfers of similar aggregate size. Our model, and common sense, implies that those receiving larger transfers should invest more and earn higher earnings (in absolute terms, even if it is optimal to consume a higher proportion of larger transfers in period 1). Of course, per capita transfer size is unlikely to be exogenous—in principle,

more savvy or more selfish applicants may engineer larger transfers. If correlated with entrepreneurial ability, this would exacerbate the disparity in investment and profit levels.

We regress our key investment and economic outcomes on (potentially endogenous) transfer size in Table 7, for treatment groups only. Strikingly, the correlation between transfer size and both investments and performance is nearly zero. The relationship is positive, but only slightly (and not statistically significantly) so.

This finding presents a puzzle. One possible answer is that de facto group size and distribution was greater than their de jure size. This could be because, once the transfer was obtained, smaller groups tended to attract new members or supplicants. Alternatively, the community leaders who helped the groups receive funding (and were perhaps complicit in the high per capita benefit) extracted rents. We do not have data on either phenomenon, but have an opportunity to collect it retrospectively in the 2012 round of data collection.

8.3 Testing the model: Impact heterogeneity

Our theory is rooted in two related models of credit constraints: a single-period entrepreneurial model with grants from de Mel et al. (2008) and a two-period model of microfinance by Banerjee et al. (2010). Each paper finds some support for their predictions in experimental impact heterogeneity. The former finds that, among the treated, the returns to capital are decreasing in initial household assets and increasing in a measure of cognitive ability (a digit span test) though not in education. The latter finds that, among the treated, microfinance is more likely to be invested among non-existing business owners who have high entrepreneurial potential (calculated from literacy and wage labor of the wife of the household head, the number of prime-aged women in the household, and whether the household owns land).

The YOP experiment has three advantages: a large sample size, an out-of-sample test of existing theories (and ex-ante predictions), and rich data on initial ability, working capital, and patience.

Our model, adapted to a two-period cash transfer context, makes related predictions:

I. Levels of investment, earnings and consumption are increasing in patience, ability, and initial wealth (or working capital);
II. Cash transfers should have a greater impact on investment, earnings and consumption when ability and patience are high;
III. Ability and patience are complements; and

IV. Cash transfers should have a lower impact on investment, earnings and consumption among those with high levels of initial working capital or an existing vocation.

Tables 7 and 8 look at impact heterogeneity on four key investment and economic outcomes. Table 7 looks only at individuals without an existing vocation at baseline (those with non-vocational microenterprises are not excluded). We look at heterogeneity along three main dimensions: a standardized *Ability index*[31], *Working capital index*[32], and *Patience index*.[33] For each outcome, the first column displays the coefficient on the index for the treatment group alone (prediction I). The second column looks at the full sample, and interacts treatment with each index to look for disproportionate effects of treatment based on these baseline characteristics (prediction II).[34]

Looking at the treatment group alone, the coefficient on initial working capital is generally small relative to the treatment effect, changes sign from outcome to outcome, and is not statistically significant. The same is generally true for the treatment and working capital interaction coefficient.

Treated members with higher ability engage in more training hours (equivalent to roughly half the treatment effect) but the result is not significant. Training hours have no consistent or signifi-

[31] The index of ability is a weighted average of baseline measures of educational attainment, a literacy indicator, an indicator for prior vocational training, performance on a digit recall test, a measure of physical disabilities, and a measure of emotional distress and depression. For weights, we use each variable's predictive power of economic success in the control group. We regress a composite measure of the economic impacts on the baseline measures of ability using the control group only. We use the estimated coefficients to predict a "score" for all treatment and control individuals, and standardize the score to have mean zero and unit standard deviation. Hence in the heterogeneity regressions, the level Index is correlated with the dependent variable by construction, but our interest is in the interaction between the Index and treatment.

[32] The index of working capital is a weighted average of baseline measures of savings, loans outstanding, cash earnings, perceived access to a 100,000 UGX loan, perceived access to a 1 million UGX loan, and indices of housing quality and assets (similar to the index of wealth endline measure). Weights are obtained in the same manner as ability.

[33] The patience index is a weighted average of endline measures of 10 self-reported measures of impulsiveness and patience, including self-reported willingness to wait long periods for material goods, to spend money "too quickly", to put off hard or costly tasks, or to resist temptation. Weights are obtained in the same manner as ability. Endline measures are used as no baseline data are available, on the assumption that preferences are time-invariant and are not affected by treatment. As seen in Appendix Table 1, there is no appreciable difference in patience levels between treatment and control groups.

[34] The human and working capital indices are each a weighted average of baseline survey variables, where the weights are not equal but rather depend on each variable's relative predictive power over endline economic outcomes among the control group alone. Hence in the heterogeneity regressions (where the control group is included) the level of each index is correlated with the dependent variable by construction. We are mainly interested in the interaction between the index and treatment in the full regression.

cant relationship with capital investment, earnings or wealth. Treatment and ability interact positively for hours of training, but the coefficient on the interaction is negative or zero for capital investment, earnings and wealth. Since ability undoubtedly affects returns, this suggests that our baseline components of the ability index—education and literacy, and physical and mental health—are not robust determinants of entrepreneurial success (in contrast to the evidence from de Mel et al. 2008). Heckman et al. (2006) and others stress "non-cognitive" skills, and Bruhn et al. (2010) emphasize "managerial capital", but we unfortunately have no baseline data on either.

The patience index is the largest and most robust predictor of capital investments, earnings and wealth, but only at the 2-year endline, and the interaction between patience and treatment is typically negative and not statistically significant.

Table 8 looks at all individuals, but splits the sample into those with a patience index above and below the median (i.e. δ_H and δ_L). Within each δ subsample, we regress each outcome on the *Working capital index*, *Ability index*, and an indicator for an *Existing vocation at baseline*. The treatment effect for high patience individuals should be greater overall (prediction II), and should positively interact with ability (prediction III). Treatment should interact negatively with existing vocations (prediction IV). Consistent with Table 7, treatment effects are no higher among patient than non-patient individuals. Nor do we see the predicted relationship between ability and high patience individuals (although, again, this may be because we have the "wrong" measure of ability). Of those with an existing vocation, however, the signs and magnitudes are all in the expected directions, and are significant for earnings: existing entrepreneurs have high profit levels (because they are larger) but the effect of treatment is lower amongst these existing entrepreneurs (because they are less constrained to begin with).

For the four year endline data collection, none of the midterm correlations with heterogeneity appear to hold up. It is not yet clear if this is due to additional noise in the data, or the importance of these heterogeneities has decreased over time. More analysis on this will be forthcoming.

8.4 Impacts on subjective well being

Consistent with these income and wealth gains, treated subjects perceive themselves as doing economically better than fellow community members. They report a 13% increase in perceived wealth levels relative to the control group (Table 9) and a similarly large and significant increase in access to basic services in their community. They do not perceive themselves to receive more

respect, have more power, or be sought out for advice relative to others in the community. Their gains seem to be purely economic. These perceived economic gains, moreover, are significant only for men. For women the treatment effect is lower by about half, and not significant at conventional levels.

Respondents were asked to rank their position 5 years from now, and we can calculate treatment effects on the future level or the change from today to 5 years from now. Treated individuals, especially males, do not see their relative gains as persistent. Or the untreated are optimistic about their future. There is no substantive or significant difference in reported level of expected economic well-being between the two groups. Mechanically, this means that treatment is associated with a lower expected change in future well-being than controls.

The results for the 4 year endline suggest a higher subjective wellbeing, but this is not statistically significant. Overall, the effect of the program has not changed much between the two endlines.

8.5 Impacts on alienation and aggression

8.5.1 Participation and social integration

Tables 10 and 11 display treatment effects for our measures of community engagement and social integration and participation (or, conversely, alienation). In general, we see modest increases, of the order of 0 to 10%, in common community participation and other indicators of social and community support. We focus on percentage impacts relative to the control mean

In terms of community participation and engagement, treated individuals are engaged in 6% more community groups than controls, an effect unlikely to be a mechanical effect of funding, since the majority of control group members still consider themselves a part of their NUSAF group (Table 1). Treated individuals are 5% more likely to attend community meetings and 8% more likely to speak out at meetings (though only the latter is statistically significant, at the 10% level). Treated individuals are 3.3% more likely to be a community leader and 8.9% more likely to be a (more junior) community mobilizer (again only the latter impact is significant).

Turning to social integration of a more interpersonal nature, we see little significant difference in an indicator of family connectedness (the sign is actually negative), nor do we see any difference in an index of community relations or an index of reverence for elders. However, treated individuals do report 5% more social support compared to the control group, and an index measure of depression symptoms is 1% lower among the treated. It is difficult to say whether this is a

direct consequence of economic success or a result of other intervention impacts, such as the group and participatory process. Economic success is undoubtedly a part of the impact, but not necessarily all. First, while social support and economic success are closely correlated in the overall sample, adding measures of economic success to the treatment regressions (not shown) diminishes social treatment effects by just a third, suggesting other channels of impact are present. Moreover, in northern Uganda, as youth's most important transition is from being a recipient of transfers and assistance to a patron, especially among males, contributions to the household and kin are crucial to social support and status. Indeed, males in the control group are net recipients and treated males are net contributors, but the treatment effect is small in absolute terms (just 11,000 UGX, or $5, in the past 12 months) and not significant (Appendix Table 2).

The results for participation and social integration for the endline are not significantly different for the midterm results and suggest that the impacts for both men and women are not artifacts of the first data collection but do in fact hold for this sample.

8.5.2 Aggression

Collectively our aggression measures decreased by approximately 0.2 standard deviations among males and increased nearly 0.15 standard deviations among females. ATEs for individual dependent variables are reported in Table 12.

The first five dependent variables (column 4 through 18) ask about disputes with different parties. The steepest and most significant declines for males are with community leaders and police—both in substantive terms and statistical robustness. The largest and most significant increase for females, meanwhile, is in physical fights. Physical fights are less common among females than males in absolute terms (5% of males versus 3% of females in the control group) but treated females are twice as likely as control females to report a physical fight, bringing them to roughly the same level of physical fights as males.

Males also report lower disputes with leaders and police, or physical fights, among their peers. Females do the opposite. It is not clear whether this represents a change in the composition of the peer group, or the fact that the peers referred to are fellow group members reacting in similar fashion.

The final four dependent variables look at self-reported hostile behaviors, based on questions asked in the psychosocial section of the questionnaire (along with measures of distress and depression). The signs are consistently negative for males and positive for females. The largest

male decline, and female increase, are seen for quarrelsomeness and threatening others—two of the more serious forms of hostile behavior we measure.

We should note that these treatment effects appear quite large, but in absolute terms the change is relatively small. Overall levels of self-reported hostile behaviors are low; if we add all four hostile behavior measures, for instance, we have an index of 0 to 12 (representing four behaviors and four levels of severity ranging from 0 to 3). The control group mean is just 0.71—implying that the average person says that they "rarely" engage in one of the four behaviors. This level is unsurprising, given that aggression is typically rare. Figure 8 displays a histogram of the hostility measure for males and females and treatment and control separately. Males in the control group, for instance, report an index value of 3 at the 90^{th} percentile, 4 at the 95^{th}, and 6 at the 99^{th}—the latter value corresponding to a response of "often" committing two of the behaviors or "sometimes" committing all four. The effect of treatment is thus to push the average from rarely committing one of the transgressions to even more rarely committing them. We see a similar pattern for an additive index of disputes (not displayed). In absolute terms the treatment effect is small—it suggests moving from a very rare dispute to one even rarer, but the proportional impact is large.

Overall, the proportional effect of treatment appears to hold relatively steadily throughout the distribution. If we combine all three measures additively and create an indicator for being in the highest 5% of self-reported aggression, for instance, 6% of control males are in this top tier but only 4% of treated males are there (regressions not shown). Similarly, 3% of control females are in this top tier but 7% of treated ones are. These differences are highly statistically significant. The results suggest that treatment reduces aggression both among the least and most aggressive males, and increases aggression among females across the distribution.

The reduction in aggression is also greatest for those with the highest initial levels of aggression, and the most exposure to war. We look at impact heterogeneity on the aggregate aggression family index in Table 13. The interaction between treated and baseline aggression levels and exposure to war violence is negative and significant. The least risk averse individuals respond to treatment with higher reported levels of aggression, however.

The reduction in aggression among males is consistent with our predictions, especially those that emphasize reduced psychological stress. The results among females, however, present an unexpected puzzle. One possibility is that women's increase in disputes, quarrels and threats are a consequence of greater market engagement, interaction outside the home, and hence opportuni-

ties for aggression. Women in the marketplace, or who make money, may also be targets of unwanted male attention, such as officials or police seeking bribes of a financial or intimate nature.

The long-term (four year) results do not show the patterns described above. In fact, there are no significant effects from the intervention for males or females on aggression. This lack of lasting significance appears to be driven mostly by changes in the control group. Mean responses from aggression questions in the control group went from 0.0401 to -0.0280, a -0.0681 standard deviation drop. This pattern of change holds for both women and men. Control men report a decrease in aggressive behavior of 0.1205 standard deviations, while control women report an increase of 0.0231 standard deviations. Both of these changes are about as large as the two year difference between treatment and control and appear to displace the effects of the program. This change in aggressive behavior by control men and women could be due to the general decrease in violent activity in northern Uganda, and/or the general development of the area and increased female participation in development.

8.6 Implications for theories of alienation and aggression

We cannot experimentally distinguish between competing theories and mechanisms but, as outlined in the theory section above, certain patterns in the data would be more consistent with some mechanisms over others. The patterns are not strongly consistent with any one view, but the evidence seems to be most consistent with two claims.

First, increases in wealth are associated with greater transfers and higher social support among men, consistent with the "social roles" view. Males especially show a modest increase in social support and community relations (Table 11). These gains are also correlated with economic success. Table 15 displays correlations between our major outcome family indices. Those with higher economic outcomes are more likely to have higher social outcomes. This relationship is not causally identified, but it is consistent with the pattern. Perhaps most important of all, treated males are much more likely to make transfers to others for health and education expenditures—a 31% increase over the control group for education transfer and a 46% increase for health expenditures (Appendix Table 2). The increase is significant for transfers within and outside the household.

Second, evidence is somewhat consistent with the psychological approaches to aggression, through reduced stress or perhaps frustrated ambition. Aggression is strongly and positively correlated with emotional distress symptoms and negatively correlated with social support (Table

15). It is not at all correlated, however, with economic performance. The negative impact on aggression and the positive impact on subjective well-being are in principle consistent with the frustration-aggression hypothesis. There is only a weak correlation between aggression and subjective well-being, however, and virtually no association between actual economic performance and aggression. It may simply be that the act of inclusion, and receipt of a government transfer, is enough to ameliorate feelings of frustrated ambition. The determinants of aggression, however, will be explored in the longitudinal study with more extensive 2012 data on a wider variety of aggression outcomes, as well as more detail on the acts and actors.

Meanwhile, it is worth noting that the patterns are not particularly consistent with the participatory view underlying so many community driven development programs—that participation in a group empowers individuals and therefore leads to social engagement. We see mild changes in community engagement and participation, little change in self-perceived power or respect, and group performance is only weakly correlated with group cohesion, longevity, and the quality of the group dynamic.

9 Discussion and conclusions

The principles that drive NUSAF are common to social action funds and community-driven development programs around the world: a preference for market-based approaches to development; a marginalist view of poverty and poverty alleviation; a sense that individuals or groups are capable of making good, even better decisions, than a planner (and hence favoring decentralized and participatory programs over centralized or paternalistic ones); the idea that this decision-making and its success may even be empowering; and a sense that higher incomes and employment themselves may also directly reduce the risks of aggression or conflict. This optimism is largely borne out in the YOP case, though in different proportions: the economic impacts are generally large, while the social ones are relatively modest.

The results suggest that the relatively unconditional, decentralized cash transfer programs targeted at poor entrepreneurs can translate to high levels of investment. It is possible that the group organization acted as a disciplinary device, and further research on the use of group organization as a commitment device emerges as an important area for future experiments.

Consistent with other studies, we see that many of the poor, especially males, have reasonably high returns to investment when capital is made available and without close supervision or

conditionality from the donor. The findings are also consistent with the prevalence of high underemployment, and suggest that earnings from household production could be increased by simply increasing hours of work without need for raising productivity or reallocating time from subsistence agriculture.

The results also suggest that, whatever the structural or institutional constraints on poverty in northern Uganda, the poor can make substantial gains on the margin. Nevertheless, this is not to say that the intervention helped the poor reach their full capacities. No matter the returns we observe, these were still relatively inexperienced and uneducated youth making decisions over more cash than they have seen in their lifetimes. Information on market opportunities or assistance with project planning and budgeting is probably an important but underexplored input into efficient production. This too is an important area for further research.

If individuals are capable of the same discipline and returns as the youth in NUSAF YOP groups, the results also suggest that credit constraints and the lack of financial development are a substantial impediment to poverty alleviation. To the extent that the poor have access to finance, it is for short horizons and at absurdly high rates, in excess of 200% per annum. There are undoubtedly gains from improved access to finance.

The results also suggest that economic success leads to increased engagement in the community, social support, and (among males) lower levels of aggression. We admittedly cannot disentangle the contribution of higher incomes and employment from the symbolic importance of redistribution, or the experience of planning and engaging with a community group. That there are non-pecuniary private benefits of employment and higher incomes, however, seems clear. The aggression results suggest positive externalities as well, in terms of social stability, a topic to be further researched.

The presence of non-pecuniary private gains, or externalities, could help explain underinvestment by poor entrepreneurs without the intervention. If the cost of capital is 20 or 30%, the median entrepreneur in our sample would not earn sufficient earnings to pay back the investment, and the average entrepreneur would just barely be able to repay. The private returns to employment clearly go beyond earnings, however, and so cash transfers or subsidized credit may be a means to achieve higher levels of stability and freedoms than otherwise available to the poor.

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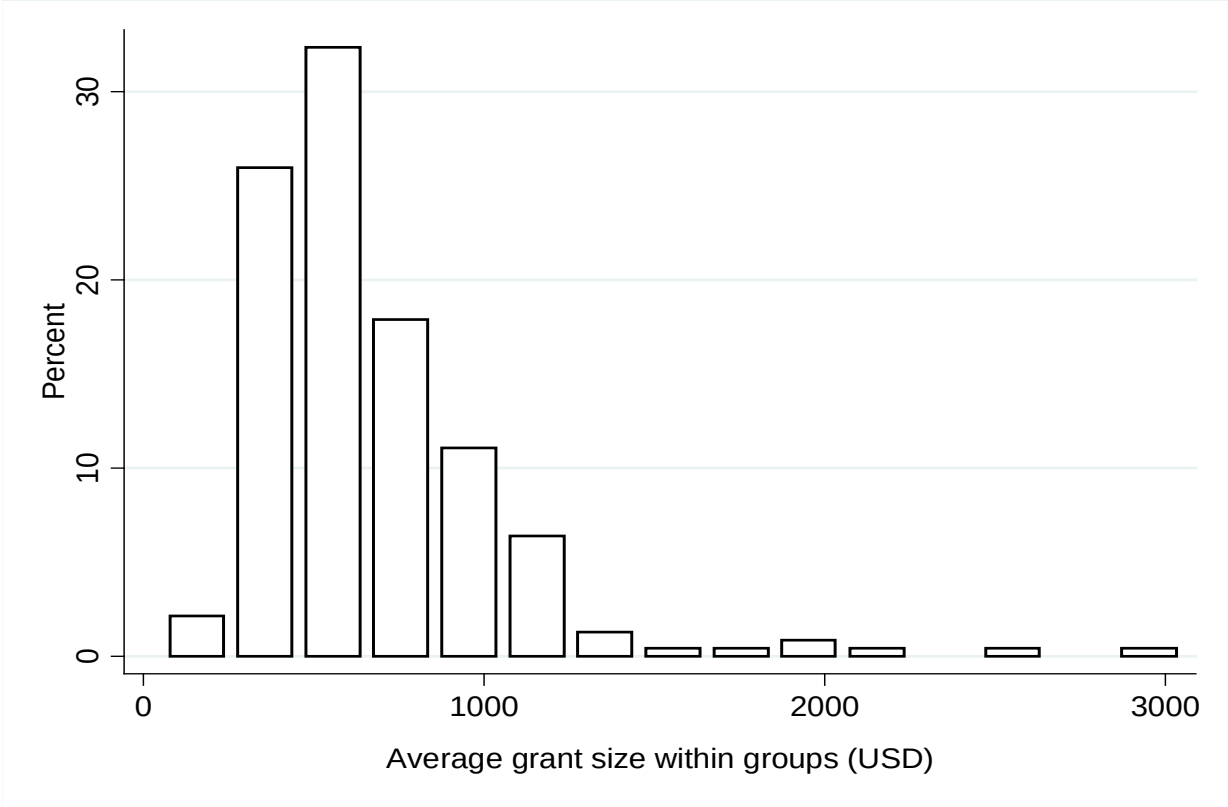
Figure 1: Distribution of transfer size per group member (in US dollars)



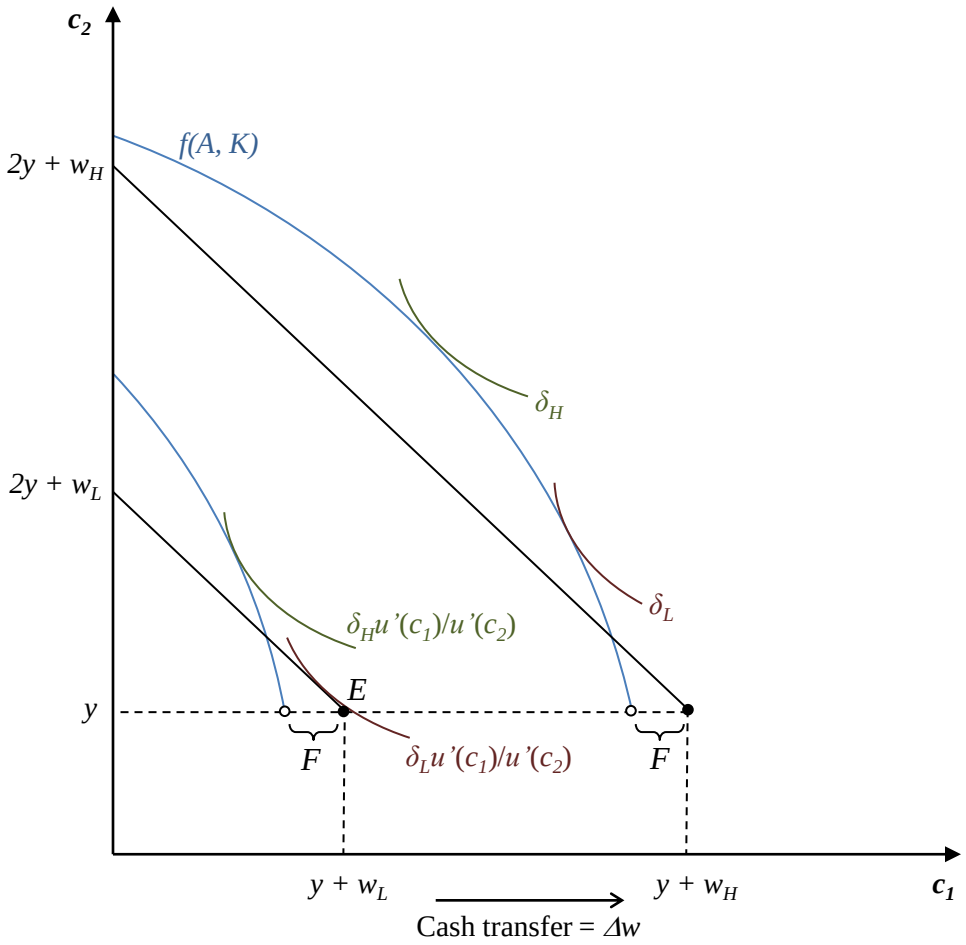


Figure 2: Impact of cash transfers on occupational choice (No existing entrepreneurs)

At w_L, more patient and higher ability people become entrepreneurs while others remain laborers. Highly impatient laborers will have a corner solution at E.

For small F (relative to Δw) patient and impatient cash transfer recipients become entrepreneurs. But investment and period 2 income are generally increasing with patience.

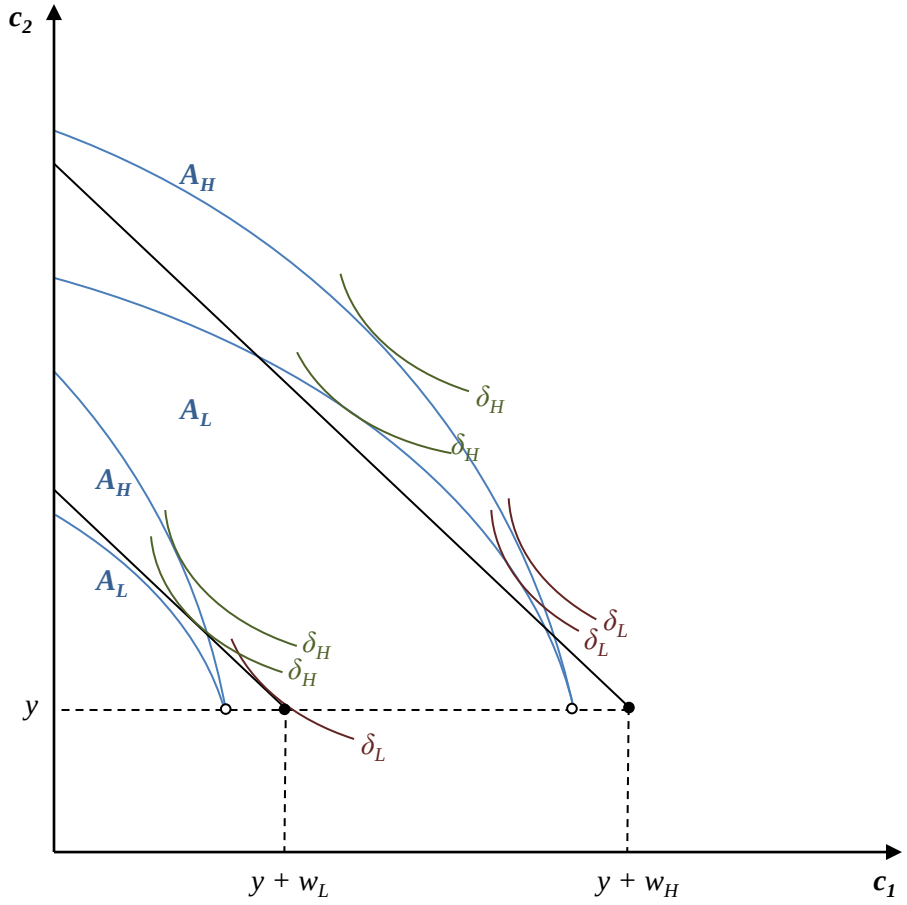


Figure 3: High versus low ability individuals (No existing entrepreneurs)

The impact of a cash transfer is larger among higher ability and more patient individuals. Ability and patience positively interact.

Only highly impatient or very low ability individuals (those who do not have high return earning opportunities) would remain laborers after a cash transfer.

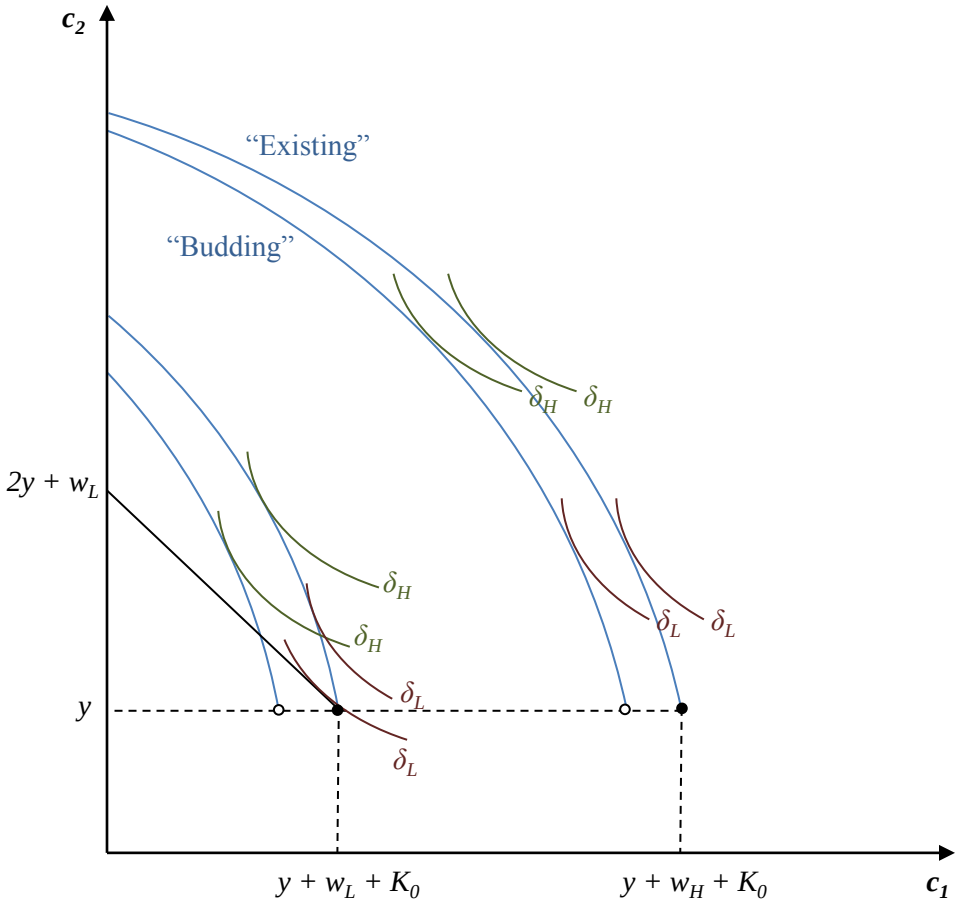


Figure 4: Existing versus budding entrepreneurs, with equal levels of starting capital

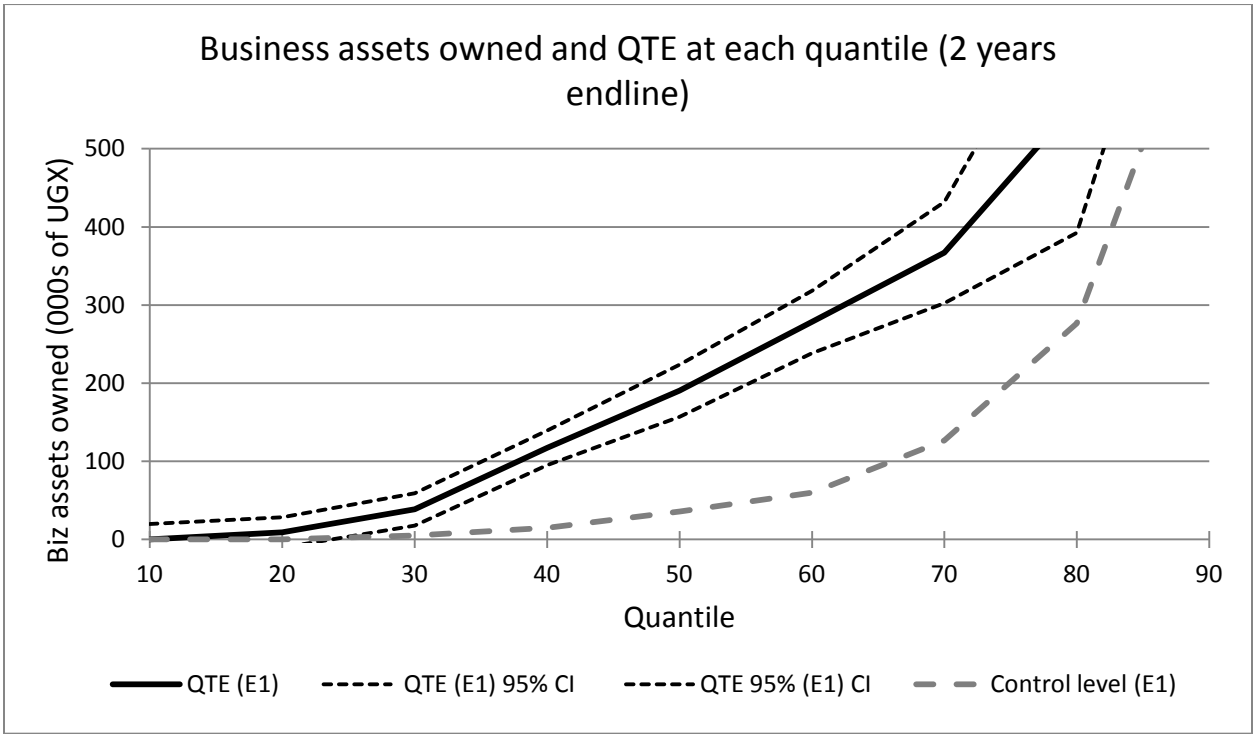
For illustrative simplicity we assume first period entrepreneur income is equal to labor income: $f(A,K_0) = y$.

The impact of cash transfers on investment and profits is larger among budding entrepreneurs than existing entrepreneurs.

The larger thee fixed cost of becoming an entrepreneur, the more impactful the transfer will be on profits (relative to existing entrepreneurs)

Figure 5: Quantile treatment effects for business assets acquired and owned

a. Two Year Endline



b. *Two Year Endline*

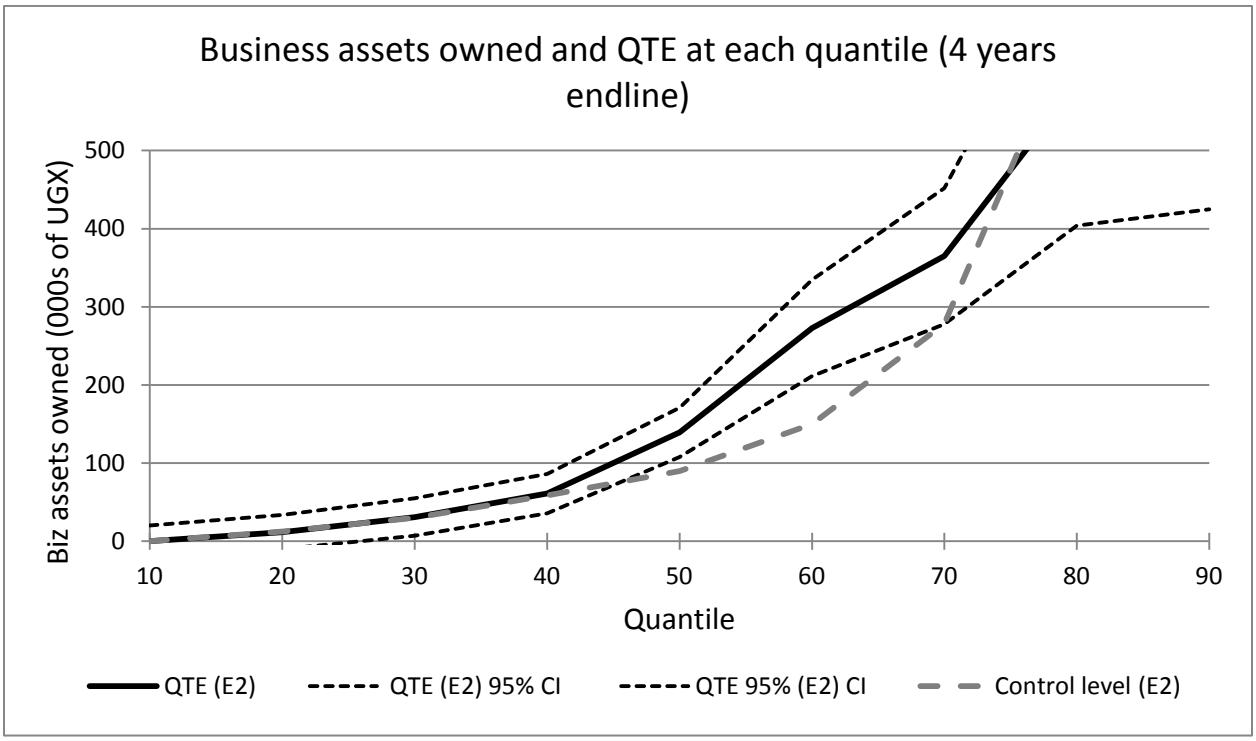
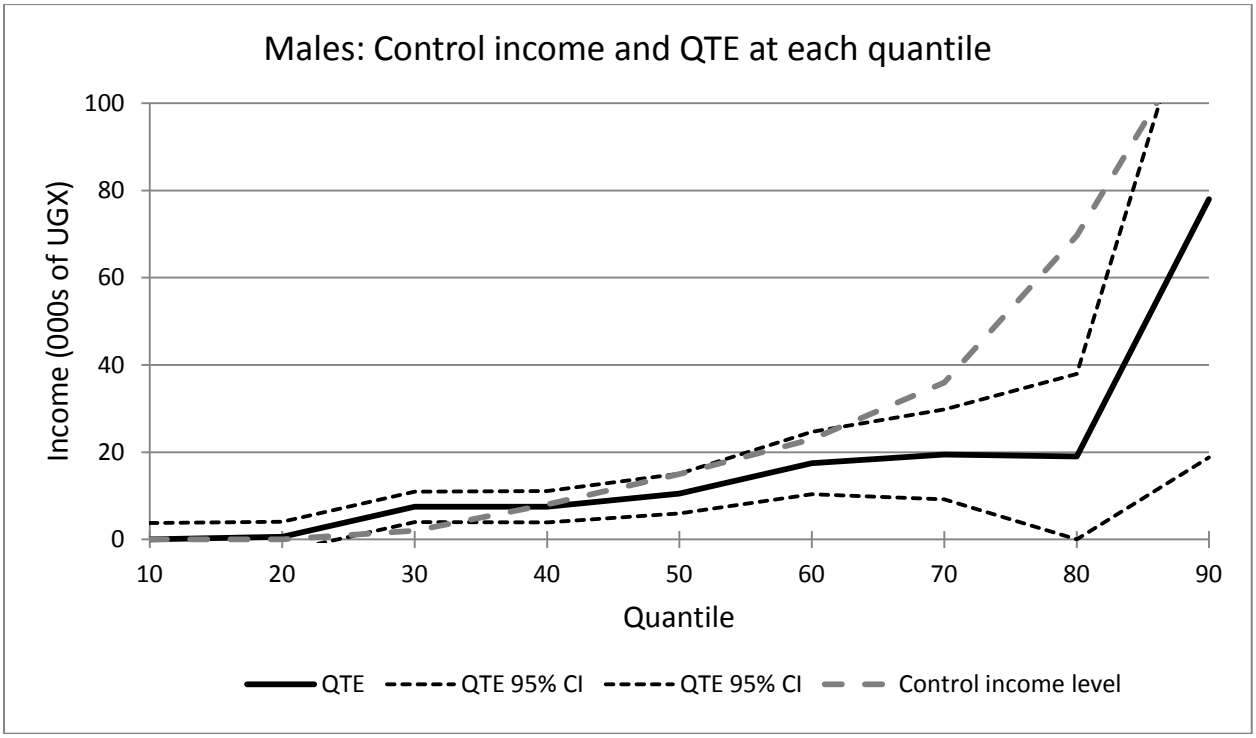


Figure 6: Quantile treatment effects for monthly income, by gender (2 year endline)

a. Males



a. Females

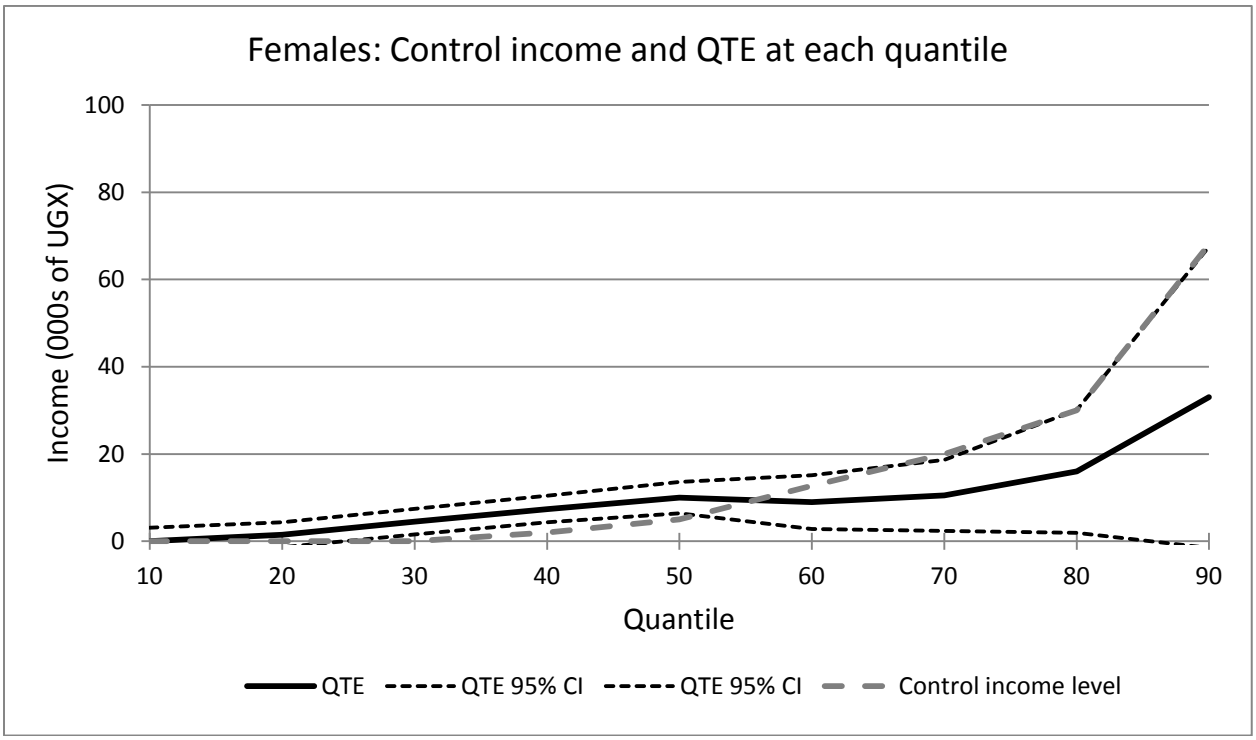
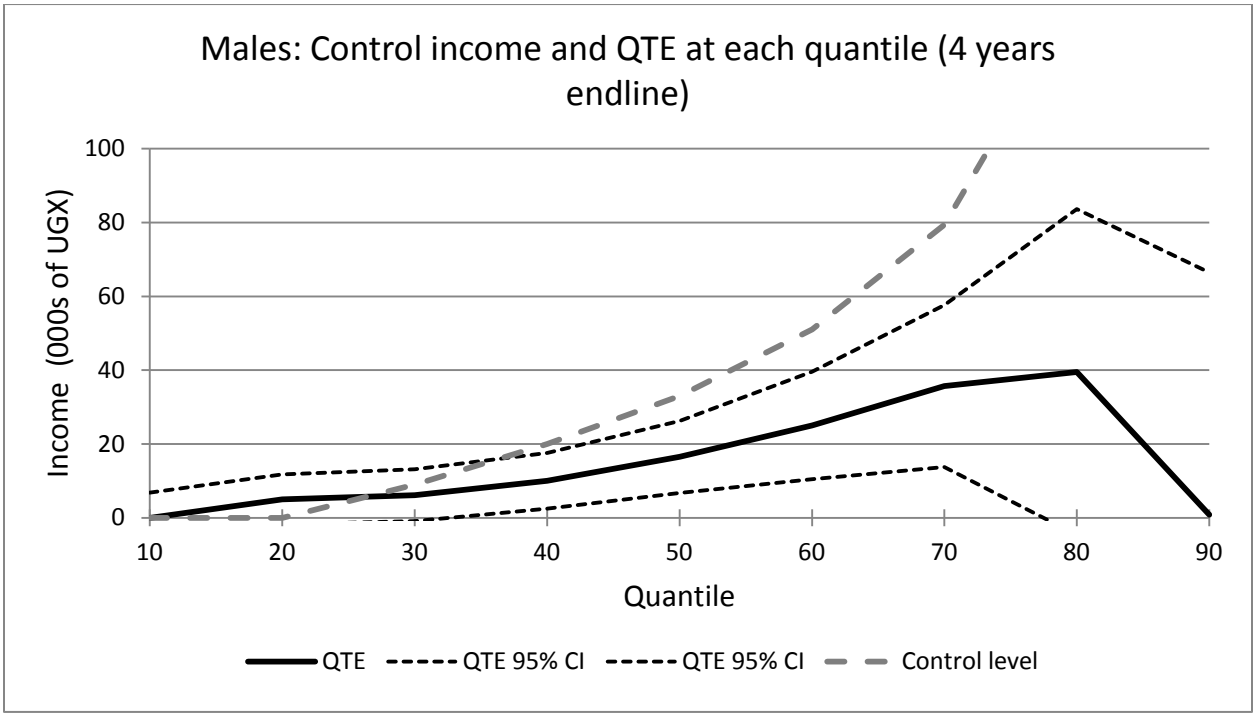


Figure 7: Quantile treatment effects for monthly income, by gender (4 year endline)

a. Males



a. Females

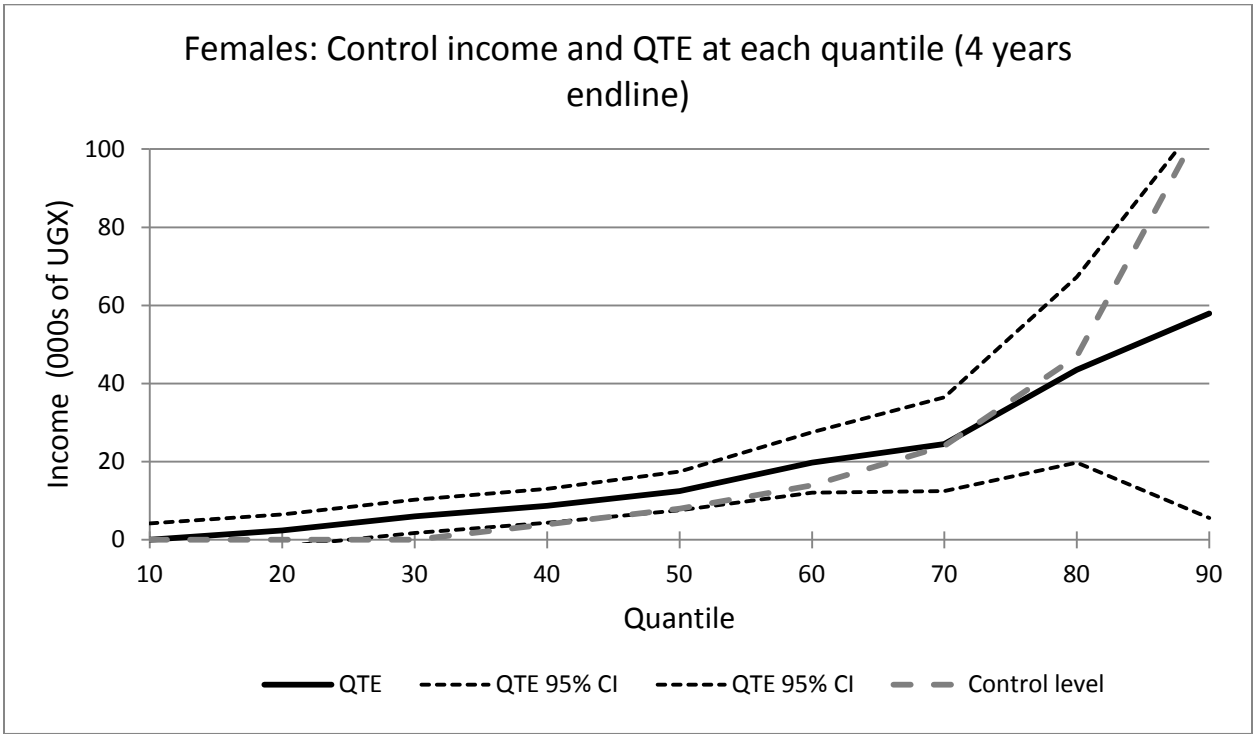


Figure 8: Distribution of self-reported hostile behaviors

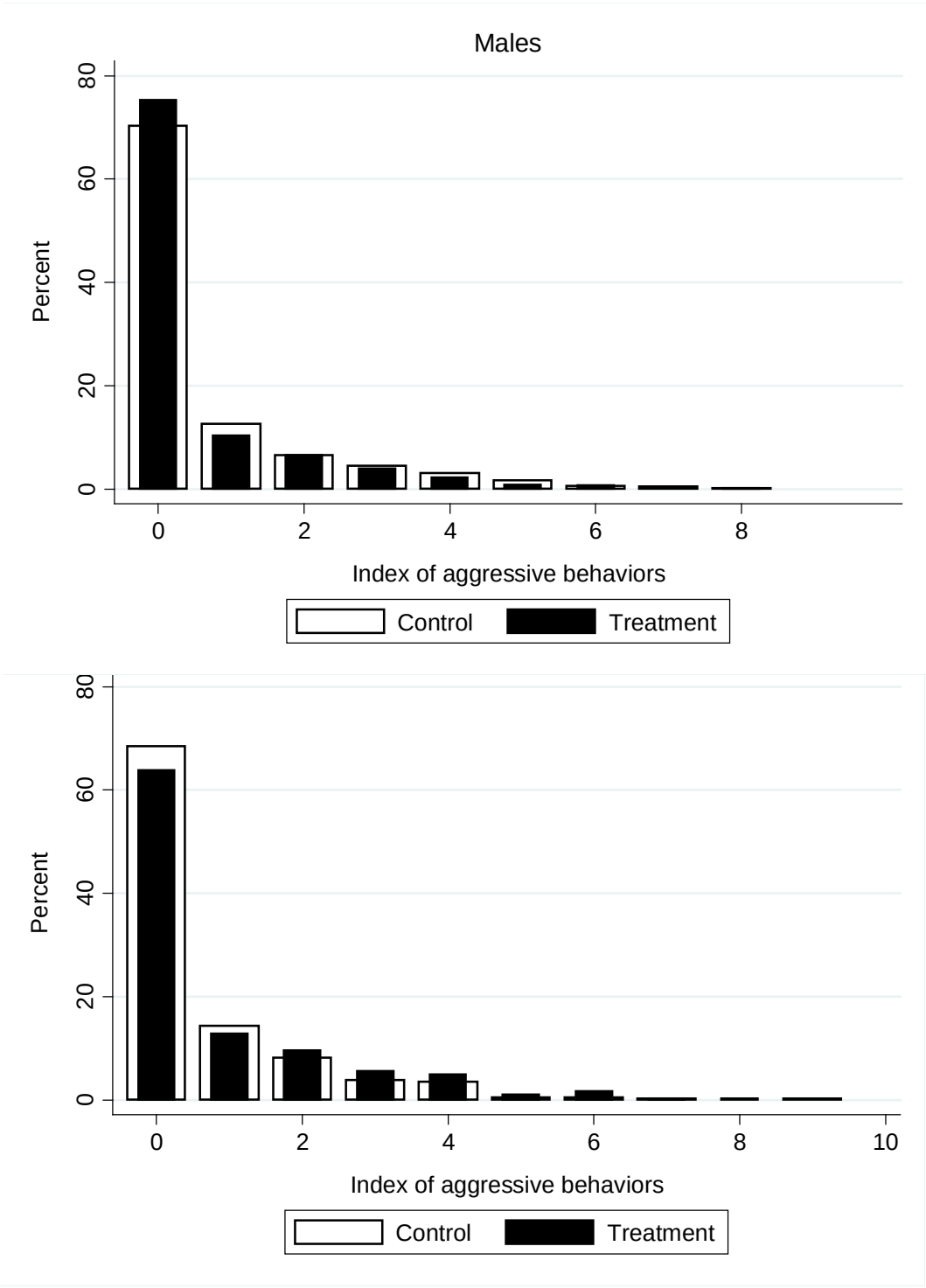


Table 1: Group summary statistics

	Mean	Std. Dev.
Group characteristics		
Group existed prior to NUSAF	0.463	*[0.0]*
Age of group at baseline	3.814	*[0.1]*
Size of group	21.8	*[7.0]*
Proportion female	0.40	*[0.25]*
Grant size (UGX)	12,794,279	*[3258832]*
Grant size (USD)	7,108	*[2080]*
Grant size per member (UGX)	673,026	*[371697]*
Grant size per member (USD)	374	*[206]*
Group members (all)		
Age	24.1	*[26.8]*
Committee Member	0.38	*[0.24]*
Officer	0.14	*[0.12]*
Treasurer	0.05	*[0.04]*
Secretary	0.04	*[0.04]*
Vice Chair	0.01	*[0.01]*
Chair	0.04	*[0.04]*
Muslim	0.10	*[0.09]*
Literate	0.76	*[0.18]*
Speak some English	0.31	*[0.21]*
Disabled	0.04	*[0.04]*
Treatment		
Proportion of funds spent on training	0.35	*[0.77]*

	Mean [Std. Dev.]	
Do you…	**Treatment**	**Control**
Still consider yourself a part of the group?	0.952 *[0.21]*	0.981 *[0.14]*
Still work with this group?	0.91 *[0.28]*	0.96 *[0.19]*
Feel the group cooperates well	0.82 *[0.39]*	0.85 *[0.36]*

Table 2: Key outcomes and summary statistics

	2 Year Endline			4 Year Endline		
	Mean	**Std. Dev.**	**Obs**	**Mean**	**Std. Dev.**	**Obs**
Investments in vocational skills and capital						
Hours of training received	211.01	401.59	2,000	.	.	.
Tools and machines acquired since baseline ('000s of UGX)	451.54	1,718.40	2,000	59.32	200.28	1,869
Stock of raw materials, tools and machines ('000s of UGX)	602.38	1,798.14	1,999	769.21	1,953.52	1,865
Income, poverty and employment						
Hours spent on market activities in past 4 weeks	80.76	102.05	1,999	92.11	111.64	1,865
Hours spent on all economic activities in past 4 weeks	129.98	110.70	1,999	158.68	123.02	1,865
Cash earnings from past 4 weeks ('000s of UGX)	53.26	109.18	1,999	90.92	160.89	1,865
Monthly cash earnings adjusted for hourly earnings	33.23	103.67	1,999	.	.	.
Index of wealth (z-score)	0.04	1.02	2,000	0.03	1.01	1,844
Currently engaged in skilled work (indicator)	0.49	0.50	1,999	0.54	0.50	1,865
Value of total household consumption	.	.	.	350.95	291.78	1,869
Value of household consumption per capita	.	.	.	51.55	46.26	1,863
Value of household consumption per capita (Deaton Method)	.	.	.	87.49	65.09	1,863
Community participation and engagemennt						
Number of group memberships	3.80	2.88	1,998	1.77	2.01	1,860
Attends community meetings (indicator)	0.68	0.47	2,000	0.92	0.27	1,859
Speaks out at community meetings (indicator)	0.64	0.48	1,997	.	.	.
Is a community leader (indicator)	0.41	0.49	2,000	.	.	.
Is a community mobilizer (indicator)	0.55	0.50	1,996	0.61	0.49	1,856
Locus of control index (1-4)	2.18	0.32	2,000	.	.	.
Social integration						
Family very caring (indicator)	0.73	0.45	2,003	0.76	0.43	1,867
Index of social support (0-16)	9.53	3.56	1,999	.	.	.
Community/neighbor relations index (0-8)	6.80	1.24	2,000	.	.	.
Reverence for elders index (0-9)	6.33	0.91	2,000	.	.	.
Depression and distress symptoms						
Index of depression and distress symptoms (0-19)	6.98	3.81	2,000	6.97	3.46	1,869
Aggressive and hostile behaviors						
Index of disputes with neighbors (0-3)	0.20	0.58	1,995	0.11	0.41	1,859
Index of disputes with family (0-3)	0.28	0.63	1,996	0.09	0.40	1,852
Index of disputes with community leaders (0-3)	0.07	0.33	1,996	0.01	0.12	1,858
Index of disputes with police (0-3)	0.04	0.26	1,992	0.01	0.16	1,856
Involved in physical fights (0-3)	0.05	0.25	1,995	0.03	0.23	1,857
Peers have disputes with local leaders or police (0-3)	0.36	0.76	1,980	0.21	0.55	1,854
Peers involved in physical fights (0-3)	0.32	0.71	1,987	0.20	0.54	1,849
Quarrelsome (0-3)	0.30	0.62	1,986	0.33	0.62	1,859
Takes things without permission (0-3)	0.13	0.47	1,998	0.07	0.30	1,856
Uses abusive language (0-3)	0.12	0.42	1,998	0.08	0.34	1,859
Threatens to hurt others (0-3)	0.14	0.46	1,999	0.09	0.39	1,862
Community participation and engagemennt						
Wealth: Current position (0-9)	2.89	1.61	1,997	3.51	1.76	1,862
Community respect: Current position (0-9)	4.48	2.28	1,988	5.68	2.15	1,857
Community power: Current position (0-9)	4.45	2.17	1,967	.	.	.
Access to basic services: Current position (0-9)	3.92	2.07	1,984	.	.	.
Asked for advice: Current position (0-9)	4.95	2.25	1,995	.	.	.
Subjective well being (expected future change)						
Expected 5-year change in wealth position	2.70	1.78	1,987	2.69	1.80	1,850
Expected 5-year change in respect position	1.95	1.73	1,976	1.70	1.72	1,841
Expected 5-year change in power position	1.75	1.94	1,951	.	.	.
Optimism index (0-3)	2.54	0.80	1,978	.	.	.

All UGX-denominated outcomes were censored at the 99th percentile to contain potential outliers

Table 3: Average treatment effects on investments in vocational skills and capital

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Investments family (z-score)			**Hours of training received**	**Value of tools and machines acquired since baseline (000s of UGX)**			**Hst: Total value of business assets acquired since baseline**			**Value of raw materials tools and machines currently owned (000s of UGX)**			**Hst: Biz assets tools and raw materials currently owned**		
	2Y	**4Y**	**4Y - 2Y**	**2Y**	**2Y**	**4Y**	**4Y - 2Y**	**2Y**	**4Y**	**4Y - 2Y**	**2Y**	**4Y**	**4Y - 2Y**	**2Y**	**4Y**	**4Y - 2Y**
ATE (All)	1.003	0.209	-0.794	388.657	681.991	-21.313	-703.304	3.958	0.498	-3.460	566.891	296.9	-269.991	2.549	1.289	-1.260
Std. Err.	[0.055]***	[.066]***	[0.085]***	[23.865]***	[96.583]***	[33.806]	[109.633]***	[0.380]***	[.343]	[0.530]***	[105.565]***	[110.822]***	[138.211]*	[0.316]***	[.29]***	[0.425]***
Control mean	-0.421	-0.0706	0.3504	48.65	137.2	45.91	-91.29	4.802	4.276	-0.526	350.1	617.2	267.1	8.513	10.37	1.857
ATE as % of mean				799%	497%	-46%					162%	48%				
Male ATE	1.013	0.152	-0.861	382.350	849.319	-55.138	-904.457	4.216	0.154	-4.062	712.329	299.543	-412.786	2.591	1.077	-1.514
Std. Err.	[0.063]***	[.081]*	[0.103]***	[24.347]***	[131.830]***	[45.824]	[148.303]***	[0.431]***	[.405]	[0.611]***	[140.729]***	[158.277]*	[184.957]**	[0.378]***	[.349]***	[0.509]***
Control mean	-0.408	0.0523	0.4603	40.82	160.2	59.20	-101	5.004	4.892	-0.112	415.0	852.0	437	8.746	10.79	2.044
ATE as % of mean				937%	530%	-93%					172%	35%				
Female ATE	0.984	0.32	-0.664	401.411	344.924	43.442	-301.482	3.44	1.165	-2.275	273.609	291.098	17.489	2.464	1.698	-0.766
Std. Err.	[.096]***	[.105]***	[.14]***	[44.296]***	[106.752]***	[39.544]	[108.881]***	[.678]***	[.548]**	[.886]**	[127.859]**	[84.379]***	[150.651]	[.576]***	[.484]***	[.746]
Control mean	-0.443	-0.276	0.167	62.23	97.38	23.64	-73.74	4.452	3.245	-1.207	237.4	224.7	-12.7	8.107	9.659	1.552
ATE as % of mean				645%	354%	184%					115%	130%				
Female - Male ATE	-0.029	0.168	0.197	19.061	-504.395	98.58	602.975	-0.776	1.011	1.787	-438.720	-8.445	430.275	-0.127	0.621	0.748
Std. Err.	[0.109]	[.13]	[0.170]	[46.487]	[168.048]***	[59.832]	[176.238]***	[0.777]	[.644]	[1.020]*	[185.706]**	[172.225]	[224.543]*	[0.690]	[.583]	[0.895]
Observations	2000	1540	3540	2000	2000	1871	3871	2000	1870	3870	1999	1867	3866	1999	1867	3866

Robust standard errors in brackets, clustered by group and stratified by district.
Omitted regressors include an age quartic, district indicators, and baseline measures of employment and human and working capital.
All UGX denominated variables censored at the 99th percentile. All inverse hyperbolic sine (IHS) variables are calculated as ln(x + ((x^2) + 1)^.5).
**** p<0.01, ** p<0.05, * p<0.1*

Table 4: Investments and performance by group characteristics

	(1)	(2)	(7)	(8)	(9)	(10)	(11)	(12)	(17)	(18)	(19)	(20)	(21)	(22)
	2 Year Endline								4 Year Endline					
VARIABLES	Hours of training received		IHS(Tools and machines acquired since baseline)		IHS(Cash earnings)		Index of wealth (z-score)		IHS(Tools and machines acquired since baseline)		IHS(Cash earnings)		Index of wealth (z-score)	
	Treated	All	Treated	All	Treated	All	Treated	All	Treated	All	Treated	All	Treated	All
Treated		167.9		3.938		0.869		0.377		0.248		1.894		0.055
		[96.8]*		[1.487]***		[1.162]		[0.225]*		[1.185]		[1.169]		[0.236]
Treated × Group existed prior to YOP		97.5		0.101		0.528		0.085		-0.748		0.265		0.038
		[49.9]*		[0.801]		[0.594]		[0.110]		[0.668]		[0.592]		[0.122]
Group existed prior to YOP (indicator)	74.7	0.1	0.214	0.169	0.162	-0.333	0.107	0.008	0.290	0.780	0.503	0.111	0.153	0.062
	[36.7]**	[24.0]	[0.558]	[0.466]	[0.373]	[0.408]	[0.072]	[0.077]	[0.423]	[0.442]*	[0.360]	[0.393]	[0.082]*	[0.077]
Treated × Group dynamic index		15.8		0.964		0.528		-0.043		0.763		0.438		-0.009
		[18.4]		[0.327]***		[0.258]**		[0.048]		[0.293]***		[0.286]		[0.056]
Group dynamic index	-5.5	-12.4	0.431	-0.397	0.086	-0.342	-0.074	-0.023	0.533	-0.076	-0.193	-0.505	0.002	0.019
	[15.9]	[9.2]	[0.244]*	[0.213]*	[0.177]	[0.200]*	[0.034]**	[0.034]	[0.199]***	[0.207]	[0.182]	[0.222]**	[0.043]	[0.037]
Treated × Group size		3.1		-0.033		0.035		-0.008		0.022		-0.008		0.006
		[3.4]		[0.053]		[0.043]		[0.008]		[0.046]		[0.041]		[0.008]
Group size	-4.0	-3.0	-0.044	0.004	0.021	-0.009	-0.003	0.001	0.020	-0.000	-0.017	0.004	0.003	-0.006
	[2.7]	[1.6]*	[0.040]	[0.035]	[0.026]	[0.030]	[0.006]	[0.006]	[0.033]	[0.035]	[0.026]	[0.029]	[0.006]	[0.006]
Treated × % of group female		252.0		1.049		-0.947		-0.375		0.783		-0.605		-0.048
		[89.7]***		[1.445]		[1.074]		[0.232]		[1.232]		[1.098]		[0.266]
% of group female	92.8	-88.9	1.255	0.661	-0.704	0.641	-0.331	0.011	0.646	0.005	-0.876	0.445	-0.041	0.104
	[82.2]	[45.0]**	[1.271]	[0.876]	[0.639]	[0.801]	[0.154]**	[0.155]	[0.791]	[0.910]	[0.629]	[0.746]	[0.197]	[0.159]
Treated × Group heterogeneity index		-37.5		-0.271		-0.468		-0.025		-0.019		-0.206		0.046
		[20.9]*		[0.367]		[0.279]*		[0.055]		[0.290]		[0.275]		[0.061]
Group heterogeneity index	-22.0	6.4	0.093	0.264	-0.111	0.269	0.021	0.036	-0.046	-0.158	-0.149	-0.003	-0.006	-0.039
	[18.5]	[10.8]	[0.256]	[0.273]	[0.189]	[0.222]	[0.035]	[0.041]	[0.193]	[0.226]	[0.175]	[0.219]	[0.039]	[0.048]
R-squared	0.1	0.3	0.192	0.206	0.104	0.095	0.332	0.287	0.177	0.143	0.125	0.098	0.258	0.246
Obs	868	1774	868	1774	868	1773	868	1774	814	1643	815	1644	805	1622
Control Mean	47.81	47.81	4.309	4.309	8.186	8.186	-0.0594	-0.0594	4.309	4.309	8.186	8.186	-0.0594	-0.0594

Robust standard errors in brackets, clustered by group and stratified by district.
Omitted regressors include an age quartic, district indicators, and baseline measures of employment and human and working capital.
All UGX denominated variables censored at the 99th percentile. All inverse hyperbolic sine (IHS) variables are calculated as ln(x + ((x^2) + 1)^.5).
**** p<0.01, ** p<0.05, * p<0.1*

Table 5: Average treatment effects on income, poverty and employment

	(1)	(2)	(3)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(17)	(18)	(19)	(23)
	Employment and earnings family (z-score)			**Total hours of employment in past 4 weeks**			**Total profits from last 4 weeks (000s of UGX)**			**Hst: Total profits from last 4 weeks**			**Index of wealth (z-score)**			**Cons: Non-durable HH consumption per capita (Deaton method)**
	2Y	**4Y**	**4Y - 2Y**	**2Y**	**4Y**	**4Y - 2Y**	**2Y**	**4Y**	**4Y - 2Y**	**2Y**	**4Y**	**4Y - 2Y**	**2Y**	**4Y**	**4Y - 2Y**	**4Y**
ATE (All)	0.299	0.284	-0.015	20.703	24.99	4.287	20.813	30.438	9.625	1.627	1.481	-0.146	0.129	0.198	0.069	10.833
Std. Err.	[0.055]***	[.062]***	[0.070]	[6.031]***	[6.82]***	[8.206]	[5.912]***	[8.819]***	[9.391]	[0.279]***	[.29]***	[0.353]	[0.055]**	[.06]***	[0.066]	[4.254]**
Control mean	-0.115	-0.111	0.004	120.9	147.0	26.1	44.05	77.12	33.07	7.460	8.235	0.775	-0.0174	-0.0536	-0.0362	83.80
ATE as % of mean				17%	17%		47%	39%								13%
Male ATE	0.291	0.194	-0.097	19.646	18.303	-1.343	27.255	27.88	0.625	1.392	0.97	-0.422	0.178	0.166	-0.012	10.833
Std. Err.	[0.067]***	[.075]**	[0.086]	[7.327]***	[8.311]**	[10.023]	[7.995]***	[11.699]**	[12.835]	[0.320]***	[.326]***	[0.415]	[0.068]***	[.072]**	[0.080]	[4.254]**
Control mean	-0.0133	0.0914	0.1047	133.0	169.8	36.8	50.40	98.76	48.36	7.808	9.130	1.322	5.92e-05	-0.0133	-0.0133592	87.29
ATE as % of mean				15%	11%		54%	28%								12%
Female ATE	0.316	0.457	0.141	22.836	37.917	15.081	7.824	35.352	27.528	2.103	2.469	0.366	0.033	0.261	0.228	13.122
Std. Err.	[.091]***	[.096]***	[.118]	[9.977]**	[11.537]***	[14.391]	[8.380]	[12.955]***	[14.174]*	[.508]***	[.512]***	[.665]	[.088]	[.099]***	[.115]**	[5.381]**
Control mean	-0.291	-0.450	-0.159	99.92	108.9	8.98	33.00	40.94	7.94	6.855	6.740	-0.115	-0.0476	-0.121	-0.0734	77.98
ATE as % of mean				23%	35%		24%	86%								17%
Female - Male ATE	0.025	0.263	0.238	3.190	19.614	16.424	-19.431	7.472	26.903	0.711	1.499	0.788	-0.145	0.095	0.240	2.289
Std. Err.	[0.112]	[.116]**	[0.143]*	[12.129]	[14.053]	[17.557]	[11.867]	[17.574]	[19.857]	[0.589]	[.586]**	[0.787]	[0.108]	[.118]	[0.137]*	[6.722]
Observations	2000	1538	3538	1999	1867	3866	1999	1867	3866	1999	1867	3866	2000	1846	3846	1865

Robust standard errors in brackets, clustered by group and stratified by district.
Omitted regressors include an age quartic, district indicators, and baseline m
All UGX denominated variables censored at the 99th percentile. All inverse hyperbolic sine (IHS) variables are calculated as ln(x + ((x^2) + 1)^.5).
**** p<0.01, ** p<0.05, * p<0.1*

Table 6: Grant size per person as treatment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	2 Year Endline						4 Year Endline					
VARIABLES	IHS(Tools and machines acquired since baseline)		IHS(Stock of raw materials, tools, and machines)		IHS(Cash earnings in the past 4 weeks)		IHS(Tools and machines acquired since baseline)		IHS(Stock of raw materials, tools, and machines)		IHS(Cash earnings in the past 4 weeks)	
Average grant size per person	0.001		0.001		-0.000		-0.000		0.001		0.000	
	[0.001]**		[0.001]*		[0.001]		[0.001]		[0.001]		[0.001]	
Group Index	-1.294	-1.229	-1.589	-1.543	-0.298	-0.312	-0.523	-0.534	-0.061	-0.050	0.087	0.094
	[0.612]**	[0.612]**	[0.671]**	[0.670]**	[0.566]	[0.558]	[0.546]	[0.546]	[0.472]	[0.469]	[0.290]	[0.288]
Hst: Average grant size per person		0.923		0.545		-0.023		-0.328		0.516		0.545
		[0.691]		[0.564]		[0.417]		[0.505]		[0.458]		[0.421]
R-squared	0.219	0.218	0.187	0.185	0.090	0.089	0.177	0.177	0.228	0.228	0.127	0.129
Control Mean	4.834	4.834	8.502	8.502	7.449	7.449	4.309	4.309	10.33	10.33	8.186	8.186
Treatment Effect Percentage	0.000310	0.191	0.000127	0.0642	-4.80e-05	-0.00314	-0.000108	-0.0762	5.34e-05	0.0499	4.90e-05	0.0666
Obs	796	796	796	796	796	796	740	740	740	740	741	741

Robust standard errors in brackets,

Omitted regressors include an age quartic, district indicators, and baseline measures of employment and human and working capital.

All UGX denominated variables censored at the 99th percentile. All inverse hyperbolic sine (IHS) variables are calculated as ln(x + ((x^2) + 1)^.5).

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

Table 7: Impact Heterogeneity among those without an existing vocation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	2 Year Endline										4 Year Endline			
VARIABLES	Hours of training received		Hst: Total value of business assets acquired since baseline		Hst: Total profits from last 4 weeks		Index of wealth (z-score)		Hst: Total value of business assets acquired since January 2011		Hst: Total profits from last 4 weeks		Index of wealth (z-score)	
	Treated	All	Treated	All	Treated	All	Treated	All	Treated	All	Treated	All	Treated	All
Treated		393.2		3.893		1.774		0.168		0.871		1.292		0.193
		[25.5]***		[0.396]***		[0.289]***		[0.061]***		[0.369]**		[0.331]***		[0.069]***
Working capital index	-50.5	3.3	0.403	0.274	0.364	0.977	0.332	0.364	-0.395	-0.023	0.038	0.335	0.277	0.263
	[21.6]**	[12.5]	[0.388]	[0.292]	[0.200]*	[0.240]***	[0.058]***	[0.065]***	[0.363]	[0.310]	[0.331]	[0.304]	[0.071]***	[0.054]***
Treated X Working capital index		-31.1		0.123		-0.506		-0.054		-0.199		-0.110		-0.018
		[25.1]		[0.502]		[0.325]		[0.086]		[0.530]		[0.468]		[0.090]
Ability index	36.7	7.0	-0.514	-0.123	-0.227	-0.017	0.295	0.293	0.143	0.075	0.280	-0.054	0.313	0.290
	[26.3]	[12.3]	[0.374]	[0.299]	[0.257]	[0.280]	[0.073]***	[0.046]***	[0.359]	[0.327]	[0.288]	[0.321]	[0.058]***	[0.060]***
Treated X Ability index		46.4		-0.326		-0.242		0.009		0.015		0.232		0.021
		[28.0]*		[0.478]		[0.386]		[0.084]		[0.506]		[0.469]		[0.088]
Patience index	14.0	10.8	1.959	1.069	0.570	0.447	0.141	0.240	0.211	-0.269	0.529	0.557	0.039	0.178
	[38.5]	[17.4]	[0.518]***	[0.379]***	[0.381]	[0.318]	[0.094]	[0.059]***	[0.552]	[0.384]	[0.451]	[0.387]	[0.090]	[0.059]***
Treated X Patience index		-14.9		-0.070		-0.220		-0.077		-0.111		-0.818		-0.155
		[35.0]		[0.559]		[0.395]		[0.093]		[0.524]		[0.486]*		[0.093]*
R-squared	0.2	0.3	0.208	0.198	0.078	0.089	0.286	0.261	0.157	0.135	0.075	0.079	0.265	0.235
Obs	758	1751	758	1751	758	1750	758	1751	573	1351	572	1349	565	1332
Control Mean	48.65	48.65	4.802	4.802	7.460	7.460	-0.0174	-0.0174	4.276	4.276	8.235	8.235	-0.0536	-0.0536

Robust standard errors in brackets, clustered by group and stratified by district.
Omitted regressors include an age quartic, district indicators, and baseline measures of employment and human and working capital.
All UGX denominated variables censored at the 99th percentile. All inverse hyperbolic sine (IHS) variables are calculated as ln(x + ((x^2) + .
**** p<0.01, ** p<0.05, * p<0.1*

Table 8: Impact Heterogeneity by Patience

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)
	2 Year Endline																4 Year Endline											
VARIABLES	Hours of training received				IHS(Tools and machines acquired)				IHS(Cash earnings in last 4 weeks)				Index of wealth (z-score)				IHS(Tools and machines acquired)				IHS(Cash earnings in last 4 weeks)				Index of wealth (z-score)			
	Low patience		High patience		Low patience		High patience		Low patience		High patience		Low patience		High patience		Low patience		High patience		Low patience		High patience		Low patience		High patience	
	Treated	All	Treated	All	Treated	All	Treated	All	Treated	All	Treated	All	Treated	All	Treated	All	Treated	All	Treated	All	Treated	All	Treated	All	Treated	All	Treated	All
Treated		416.8		375.8		3.774		3.844		1.925		1.462		0.297		0.174		0.383		0.873		2.486		0.791		0.307		0.162
		[41.5]***		[39.2]***		[0.704]***		[0.609]***		[0.520]***		[0.464]***		[0.108]***		[0.086]**		[0.605]		[0.654]		[0.596]***		[0.534]		[0.112]***		[0.091]*
Working capital index	-59.3	3.6	-18.8	5.3	0.764	1.220	-0.147	-0.161	0.443	1.489	0.019	0.648	0.445	0.360	0.227	0.413	-0.933	0.493	0.352	-0.227	0.501	-0.025	0.196	0.352	0.279	0.312	0.253	0.298
	[30.2]*	[18.0]	[26.6]	[14.3]	[0.544]	[0.464]***	[0.472]	[0.322]	[0.327]	[0.394]***	[0.261]	[0.274]**	[0.082]***	[0.077]***	[0.059]***	[0.082]***	[0.453]**	[0.418]	[0.483]	[0.385]	[0.374]	[0.518]	[0.348]	[0.287]	[0.102]***	[0.079]***	[0.081]***	[0.078]***
Treated X Working capital index		-33.2		-11.5		-0.506		-0.119		-0.812		-0.561		0.090		-0.213		-1.037		0.495		0.575		-0.200		-0.048		-0.087
		[34.7]		[29.0]		[0.718]		[0.559]		[0.533]		[0.388]		[0.110]		[0.102]**		[0.659]		[0.664]		[0.690]		[0.474]		[0.135]		[0.113]
Ability index	32.5	1.6	5.6	1.7	-0.094	-0.325	0.286	0.434	0.171	0.090	-0.120	0.176	0.360	0.315	0.282	0.266	0.396	0.298	0.489	0.533	0.471	0.015	0.121	0.529	0.198	0.188	0.362	0.390
	[35.4]	[15.2]	[29.4]	[14.8]	[0.607]	[0.383]	[0.420]	[0.398]	[0.367]	[0.369]	[0.305]	[0.318]	[0.097]***	[0.059]***	[0.082]***	[0.062]***	[0.460]	[0.417]	[0.497]	[0.442]	[0.393]	[0.457]	[0.344]	[0.359]	[0.076]***	[0.064]***	[0.070]***	[0.080]***
Treated X Ability index		58.4		22.9		0.041		-0.193		-0.224		-0.121		-0.006		0.020		-0.054		-0.335		0.172		-0.270		0.038		-0.082
		[35.5]		[31.4]		[0.677]		[0.588]		[0.504]		[0.441]		[0.094]		[0.096]		[0.594]		[0.652]		[0.615]		[0.517]		[0.100]		[0.112]
Existing vocation indicator	57.6	56.8	4.6	48.8	0.871	2.300	0.514	0.822	-0.041	2.662	-1.227	1.266	-0.225	0.022	-0.043	0.345	2.076	-0.445	1.453	1.753	1.006	1.484	0.346	0.264	-0.228	0.257	-0.065	0.303
	[94.2]	[53.5]	[59.2]	[24.6]**	[1.370]	[1.032]**	[0.861]	[1.041]	[1.009]	[0.803]***	[0.744]	[0.695]*	[0.217]	[0.165]	[0.147]	[0.188]*	[1.369]	[1.382]	[1.045]	[1.016]*	[0.770]	[1.157]	[0.712]	[0.776]	[0.201]	[0.187]	[0.167]	[0.252]
Treated X Existing vocation		-25.2		-94.1		-1.475		-0.470		-3.439		-2.279		-0.211		-0.457		3.639		-0.869		-0.780		0.510		-0.484		-0.376
		[118.5]		[65.5]		[1.932]		[1.467]		[1.442]**		[1.110]**		[0.293]		[0.265]*		[2.417]		[1.623]		[1.750]		[1.212]		[0.321]		[0.340]
R-squared	0.2	0.3	0.2	0.2	0.224	0.216	0.211	0.214	0.084	0.093	0.124	0.088	0.292	0.247	0.266	0.237	0.192	0.163	0.154	0.098	0.106	0.072	0.114	0.063	0.217	0.183	0.298	0.247
Obs	439	960	392	955	439	960	392	955	439	960	392	954	439	960	392	955	324	733	305	739	324	733	304	736	322	727	298	725
Control Mean	47.81	47.81	47.81	47.81	4.753	4.753	4.753	4.753	7.298	7.298	7.298	7.298	-0.0722	-0.0722	-0.0722	-0.0722	4.276	4.276	4.276	4.276	8.235	8.235	8.235	8.235	-0.0536	-0.0536	-0.0536	-0.0536

Robust standard errors in brackets, clustered by group and stratified by district.
Omitted regressors include an age quartic, district indicators, and baseline measures of employment and human and working capital.
All UGX denominated variables censored at the 99th percentile. All inverse hyperbolic sine (IHS) variables are calculated as ln(x + ((x^2) + 1)^.5).
**** p<0.01, ** p<0.05, * p<0.1*

Table 9: Impacts on Subjective well-being

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
	Self-perception of current standing family (z-score)			**Current position on wealth ladder: 1 to 9**			**Current position on respect ladder: 1 to 9**			**Current position on power ladder: 1 to 9**	**Current position on access to basic services ladder: 1 to 9**	**Current position on asked for advice ladder: 1 to 9**	**Self-perception of future change in standing family (z-score)**			**5-year change on wealth ladder: -8 to 8**			**5-year change on respect ladder: -8 to 8**			**5-year change on power ladder: -8 to 8**	**Do you believe good things will happen in your life: 0 to 3**
	2Y	**4Y**	**4Y - 2Y**	**2Y**	**4Y**	**4Y - 2Y**	**2Y**	**4Y**	**4Y - 2Y**	**2Y**	**2Y**	**2Y**	**2Y**	**4Y**	**4Y - 2Y**	**2Y**	**4Y**	**4Y - 2Y**	**2Y**	**4Y**	**4Y - 2Y**	**2Y**	**2Y**
ATE (All)	0.145	0.289	0.144	0.364	0.526	0.162	0.060	0.259	0.199	0.171	0.454	-0.023	-0.140	-0.185	-0.045	-0.338	-0.372	-0.034	-0.047	-0.169	-0.122	-0.154	-0.017
Std. Err.	[0.055]***	[.066]***	[0.084]*	[0.087]***	[.099]***	[0.128]	[0.125]	[.125]**	[0.175]	[0.121]	[0.112]***	[0.120]	[0.050]***	[.066]***	[0.084]	[0.093]***	[.105]***	[0.139]	[0.094]	[.104]	[0.138]	[0.105]	[0.040]
Control mean	-0.0344	-0.110	-0.0756	2.727	3.292	0.565	4.523	5.657	1.134	4.452	3.715	5.029	0.0646	0.121	0.0564	2.844	2.847	0.003	1.963	1.759	-0.204	1.820	2.573
ATE as % of mean				13%	16%		1%	5%		4%	12%	0%				-12%	-13%		-2%	-10%		-8%	-1%
Male ATE	0.191	0.372	0.181	0.473	0.607	0.134	0.149	0.428	0.279	0.216	0.478	0.031	-0.178	-0.277	-0.099	-0.442	-0.512	-0.070	-0.134	-0.262	-0.128	-0.126	-0.030
Std. Err.	[0.065]***	[.078]***	[0.101]*	[0.106]***	[.116]***	[0.150]	[0.148]	[.153]***	[0.211]	[0.139]	[0.129]***	[0.142]	[0.058]***	[.078]***	[0.099]	[0.108]***	[.12]***	[0.163]	[0.110]	[.118]**	[0.156]	[0.127]	[0.047]
Control mean	0.0205	-0.117	-0.1375	2.748	3.297	0.549	4.604	5.686	1.082	4.603	3.814	5.112	0.0700	0.145	0.075	2.865	2.864	-0.001	1.967	1.765	-0.202	1.739	2.602
ATE as % of mean				17%	18%		3%	8%		5%	13%	1%				-15%	-18%		-7%	-15%		-7%	-1%
Female ATE	0.052	0.13	0.078	0.145	0.368	0.223	-0.122	-0.069	0.053	0.078	0.405	-0.131	-0.063	-0.01	0.053	-0.129	-0.101	0.028	0.128	0.013	-0.115	-0.211	0.011
Std. Err.	[.094]	[.119]	[.143]	[.147]	[.188]*	[.229]	[.228]	[.208]	[.295]	[.213]	[.196]**	[.216]	[.095]	[.116]	[.148]	[.172]	[.191]	[.251]	[.178]	[.19]	[.257]	[.191]	[.07]
Control mean	-0.129	-0.0998	0.0292	2.691	3.284	0.593	4.381	5.608	1.227	4.189	3.543	4.885	0.0553	0.0802	0.0249	2.807	2.817	0.01	1.956	1.748	-0.208	1.959	2.524
ATE as % of mean				5%	11%		-3%	-1%		2%	11%	-3%				-5%	-4%		7%	1%		-11%	0%
Female - Male ATE	-0.139	-0.242	-0.103	-0.328	-0.239	0.089	-0.271	-0.497	-0.226	-0.138	-0.073	-0.162	0.115	0.267	0.152	0.313	0.411	0.098	0.262	0.275	0.013	-0.085	0.041
Std. Err.	[0.111]	[.142]*	[0.172]	[0.180]*	[.222]	[0.270]	[0.269]	[.255]*	[0.357]	[0.245]	[0.226]	[0.255]	[0.111]	[.138]*	[0.175]	[0.201]	[.222]*	[0.296]	[0.209]	[.218]	[0.294]	[0.232]	[0.082]
Observations	1997	1534	3531	1997	1864	3861	1988	1859	3847	1967	1984	1995	1998	1529	3527	1987	1852	3839	1976	1843	3819	1951	1978

Robust standard errors in brackets, clustered by group and stratified by district.
Omitted regressors include an age quartic, district indicators, and baseline measures of employment and human and worki
****p<0.01, **p<0.05, *p<0.1*

Table 10: Average treatment effects on community participation & engagement

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Participation family (z-score)			Number of group memberships			Attends community meetings (indicator)	Attended community meeting in past 12m	Speaks out at community meetings (indicator)	Is a community leader (indicator)	Is a community mobilizer (indicator)			Locus of control index: 1 to 3.4
	2Y	4Y	4Y - 2Y	2Y	4Y	4Y - 2Y	2Y	4Y	2Y	2Y	2Y	4Y	4Y - 2Y	2Y
ATE (All)	0.061	0.063	0.002	0.231	0.22	-0.011	0.033	-0.001	0.050	0.014	0.048	-0.036	-0.084	-0.023
Std. Err.	[0.056]	[.066]	[0.086]	[0.159]	[.131]*	[0.209]	[0.027]	[0.018]	[0.026]*	[0.027]	[0.026]*	[.026]	[0.035]**	[0.018]
Control mean	-0.0624	-0.0305	0.0319	3.759	1.743	-2.016	0.668	0.913	0.615	0.404	0.509	0.599	0.09	2.185
ATE as % of mean				6%	13%		5%	0%	8%	3%	9%	-6%		-1%
Male ATE	0.042	0.087	0.045	0.272	0.329	0.057	0.020	-0.001	0.038	0.026	0.046	-0.014	-0.060	-0.041
Std. Err.	[0.063]	[.09]	[0.108]	[0.193]	[.169]*	[0.248]	[0.030]	[0.018]	[0.029]	[0.033]	[0.031]	[.03]	[0.042]	[0.023]*
Control mean	0.128	0.0584	-0.0696	3.996	1.783	-2.213	0.740	0.910	0.701	0.462	0.574	0.658	0.084	2.207
ATE as % of mean				7%	18%		3%	0%	5%	6%	8%	-2%		-2%
Female ATE	0.097	0.018	-0.079	0.15	0.011	-0.139	0.059	0.04	0.074	-0.008	0.052	-0.08	-0.132	0.015
Std. Err.	[.1]	[.098]	[.131]	[.263]	[.234]	[.355]	[.051]	[.022]*	[.05]	[.044]	[.048]	[.046]*	[.061]**	[.03]
Control mean	-0.393	-0.178	0.215	3.350	1.677	-1.673	0.543	0.919	0.465	0.302	0.396	0.500	0.104	2.147
ATE as % of mean				4%	1%		11%	4%	16%	-3%	13%	-16%		1%
Female - Male ATE	0.055	-0.069	-0.124	-0.122	-0.318	-0.196	0.039	0.041	0.036	-0.034	0.006	-0.066	-0.072	0.056
Std. Err.	[0.113]	[.137]	[0.166]	[0.318]	[.302]	[0.421]	[0.058]	[0.028]	[0.056]	[0.055]	[0.056]	[.054]	[0.073]	[0.036]
Observations	2000	1532	3532	1998	1862	3860	2000	1861	1997	2000	1996	1858	3854	2000

Robust standard errors in brackets, clustered by group and stratified by district.
Omitted regressors include an age quartic, district indicators, and baseline measures of employment and human and working capital.
*** p<0.01, ** p<0.05, * p<0.1*

Table 11: Average treatment effects on social integration

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Social integration family (z-score)			Family very caring (indicator)			Index of social support: 0 to 16	Community/neighbor Relations index: 0 to 8	Reverence for Elders index: 0 to 7	Index of depression and distress symptoms (additive bad): 0 to 19		
	2Y	4Y	4Y - 2Y	2Y	4Y	4Y - 2Y	2Y	2Y	2Y	2Y	4Y	4Y - 2Y
ATE (All)	0.069	-0.004	-0.073	-0.029	-0.007	0.022	0.465	0.012	0.033	-0.073	-0.207	-0.134
Std. Err.	[0.055]	[.067]	[0.084]	[0.025]	[.025]	[0.033]	[0.178]***	[0.066]	[0.049]	[0.201]	[.209]	[0.281]
Control mean	-0.0398	-0.00911	0.03069	0.750	0.773	0.023	9.194	6.817	6.307	6.840	6.915	0.075
ATE as % of mean				-4%	-1%		5%	0%	1%	-1%	-3%	
Male ATE	0.140	-0.022	-0.162	-0.026	-0.018	0.008	0.518	0.131	0.095	-0.273	-0.293	-0.020
Std. Err.	[0.060]**	[.077]	[0.094]*	[0.028]	[.028]	[0.038]	[0.207]**	[0.075]*	[0.055]*	[0.227]	[.235]	[0.321]
Control mean	0.0291	0.0831	0.054	0.782	0.818	0.036	9.471	6.828	6.314	6.750	6.643	-0.107
ATE as % of mean				-3%	-2%		5%	2%	2%	-4%	-4%	
Female ATE	-0.074	0.032	0.106	-0.035	0.014	0.049	0.357	-0.228	-0.092	0.329	-0.04	-0.369
Std. Err.	[.104]	[.128]	[.163]	[.047]	[.047]	[.065]	[.317]	[.126]*	[.101]	[.387]	[.374]	[.506]
Control mean	-0.159	-0.163	-0.004	0.694	0.699	0.005	8.714	6.798	6.294	6.997	7.371	0.374
ATE as % of mean				-5%	2%		4%	-3%	-1%	5%	-1%	
Female - Male ATE	-0.214	0.054	0.268	-0.009	0.032	0.041	-0.161	-0.359	-0.187	0.602	0.253	-0.349
Std. Err.	[0.115]*	[.147]	[0.187]	[0.054]	[.055]	[0.076]	[0.370]	[0.145]**	[0.116]	[0.445]	[.423]	[0.582]
Observations	2003	1538	3541	2003	1869	3872	1999	2000	2000	2000	1871	3871

Robust standard errors in brackets, clustered by group and stratified by district.
Omitted regressors include an age quartic, district indicators, and baseline measures of employment and human and working capital.
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 12: Average treatment effects on aggressive and hostile behaviors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)

Table 12: Average treatment effects on aggressive and hostile behaviors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)
				Intensity and frequency of disputes															Peers						Hostiles behaviors												
	Aggression and hostile behavior family (z-score)			With neighbors (0 to 3)			With family (0 to 3)			With community leaders (0 to 3)			With police (0 to 3)			Physical fights(0 to 3)			Have disputes with leaders or police (0 to 3)			Involved in physical fights (0 to 3)			Quarrelsome (0 to 3)			Steals (0 to 3)			Curses/uses abusive language (0 to 3)			Threatens to hurt others(0 to 3)		
	2Y	4Y	4Y - 2Y	2Y	4Y	4Y - 2Y	2Y	4Y	4Y - 2Y	2Y	4Y	4Y - 2Y	2Y	4Y	4Y - 2Y	2Y	4Y	4Y - 2Y	2Y	4Y	4Y - 2Y	2Y	4Y	4Y - 2Y	2Y	4Y	4Y - 2Y	2Y	4Y	4Y - 2Y	2Y	4Y	4Y - 2Y	2Y	4Y	4Y - 2Y
ATE (All)	-0.078	0.013	0.091	-0.011	0.059	0.070	-0.022	-0.025	-0.003	-0.029	0.002	0.031	-0.040	-0.009	0.031	0.003	0.016	0.013	-0.027	0.035	0.062	-0.057	0.031	0.088	0.025	0.017	-0.008	-0.003	-0.001	0.002	0.005	-0.008	-0.013	-0.028	0.022	0.050
Std. Err.	[0.055]	[.061]	[0.084]	[0.032]	[.026]**	[0.045]	[0.034]	[.023]	[0.040]	[0.018]	[.007]	[0.020]	[0.016]**	[.008]	[0.017]*	[0.014]	[.013]	[0.019]	[0.047]	[.036]	[0.061]	[0.039]	[.035]	[0.054]	[0.034]	[.034]	[0.047]	[0.028]	[.018]	[0.034]	[0.024]	[.021]	[0.033]	[0.028]	[.021]	[0.034]
Control mean	0.0401	-0.0280	-0.0681	0.203	0.0872	-0.1158	0.288	0.106	-0.182	0.0846	0.00985	-0.07475	0.0538	0.0143	-0.0395	0.0457	0.0264	-0.0193	0.368	0.192	-0.176	0.341	0.186	-0.155	0.302	0.342	0.04	0.138	0.0725	-0.0655	0.116	0.0808	-0.0352	0.150	0.0826	-0.0674
ATE as % of mean				-5%	68%		-8%	-24%		-34%	20%		-74%	-63%		7%	61%		-7%	18%		-17%	17%		8%	5%		-2%	-1%		4%	-10%		-19%	27%	
Male ATE	-0.195	-0.016	0.179	-0.026	0.081	0.107	-0.054	-0.014	0.040	-0.044	-0.003	0.041	-0.050	-0.005	0.045	-0.019	0.01	0.029	-0.086	0.003	0.089	-0.089	0.037	0.126	-0.018	0.028	0.046	-0.017	-0.016	0.001	-0.021	-0.024	-0.003	-0.087	0.008	0.095
Std. Err.	[0.067]***	[.073]	[0.102]*	[0.041]	[.032]**	[0.055]*	[0.041]	[.025]	[0.048]	[0.022]**	[.009]	[0.025]*	[0.022]**	[.011]	[0.024]*	[0.016]	[.014]	[0.021]	[0.054]	[.045]	[0.072]	[0.049]*	[.043]	[0.067]*	[0.039]	[.039]	[0.056]	[0.031]	[.02]	[0.038]	[0.028]	[.024]	[0.037]	[0.031]***	[.027]	[0.041]**
Control mean	0.0977	-0.0228	-0.1205	0.221	0.0793	-0.1417	0.289	0.0861	-0.2029	0.102	0.0129	-0.0891	0.0677	0.0171	-0.0506	0.0551	0.0315	-0.0236	0.422	0.231	-0.191	0.387	0.201	-0.186	0.288	0.295	0.007	0.142	0.0729	-0.0691	0.111	0.0856	-0.0254	0.175	0.0850	-0.09
ATE as % of mean				-12%	102%		-19%	-16%		-43%	-23%		-74%	-29%		-34%	32%		-20%	1%		-23%	18%		-6%	9%		-12%	-22%		-19%	-28%		-50%	9%	
Female ATE	0.157	0.069	-0.088	0.018	0.016	-0.002	0.042	-0.048	-0.09	0.002	0.012	0.01	-0.02	-0.019	0.001	0.049	0.029	-0.02	0.092	0.098	0.006	0.005	0.017	0.012	0.113	-0.002	-0.115	0.026	0.029	0.003	0.057	0.025	-0.032	0.092	0.05	-0.042
Std. Err.	[.09]*	[.104]	[.131]	[.046]	[.044]	[.068]	[.061]	[.045]	[.075]	[.031]	[.012]	[.034]	[.015]	[.011]*	[.018]	[.028]*	[.026]	[.036]	[.076]	[.056]*	[.097]	[.055]	[.056]	[.082]	[.062]*	[.066]	[.081]	[.051]	[.032]	[.062]	[.045]	[.032]	[.058]	[.049]*	[.038]	[.061]
Control mean	-0.0596	-0.0365	0.0231	0.171	0.100	-0.071	0.287	0.139	-0.148	0.0545	0.00480	-0.0497	0.0296	0.00957	-0.02003	0.0295	0.0179	-0.0116	0.274	0.128	-0.146	0.261	0.161	-0.1	0.326	0.420	0.094	0.131	0.0719	-0.0591	0.125	0.0728	-0.0522	0.107	0.0786	-0.0284
ATE as % of mean				11%	16%		15%	-35%		4%	250%		-68%	-199%		166%	162%		34%	77%		2%	11%		35%	0%		20%	40%		46%	34%		86%	64%	
Female - Male ATE	0.352	0.085	-0.267	0.044	-0.065	-0.109	0.096	-0.034	-0.130	0.046	0.015	-0.031	0.030	-0.014	-0.044	0.068	0.019	-0.049	0.178	0.095	-0.083	0.094	-0.02	-0.114	0.131	-0.03	-0.161	0.043	0.045	0.002	0.078	0.049	-0.029	0.179	0.042	-0.137
Std. Err.	[0.109]***	[.123]	[0.159]*	[0.060]	[.053]	[0.085]	[0.075]	[.051]	[0.090]	[0.039]	[.015]	[0.042]	[0.027]	[.016]	[0.030]	[0.032]**	[.028]	[0.042]	[0.087]**	[.069]	[0.113]	[0.071]	[.069]	[0.102]	[0.070]*	[.077]	[0.097]*	[0.057]	[.037]	[0.070]	[0.052]	[.036]	[0.065]	[0.056]***	[.047]	[0.073]*
Observations	2000	1535	3535	1995	1861	3856	1996	1854	3850	1996	1860	3856	1992	1858	3850	1995	1859	3854	1980	1856	3836	1987	1851	3838	1986	1861	3847	1998	1858	3856	1998	1861	3859	1999	1864	3863

Robust standard errors in brackets, clustered by group and stratified by district.
Omitted regressors include an age quartic, district indicators, and baseline measures of employment and human and working capital.
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 13: Aggression Heterogeneity

	(1)	(2)	(3)	(4)
	2 Year Endline		4 Year Endline	
	Aggression and Hostility Family (z-score)		Aggression and Hostility Family (z-score)	
VARIABLES	Treated	Full sample	Treated	Full sample
Treated		-0.072		-0.062
		[0.057]		[0.058]
Treated X Aggressive behaviors index		-0.368		-0.061
		[0.099]***		[0.143]
Aggressive behaviors index	-0.019	0.313	-0.101	0.019
	[0.063]	[0.067]***	[0.097]	[0.081]
Treated X War violence index		-0.230		0.033
		[0.128]*		[0.136]
War violence index	-0.096	0.142	-0.115	-0.011
	[0.097]	[0.084]*	[0.094]	[0.095]
Treated X Risk index		0.494		-0.055
		[0.152]***		[0.170]
Risk index	-0.042	-0.272	-0.639	-0.021
	[0.144]	[0.104]***	[0.268]**	[0.103]
Treated X Patience index		0.033		0.093
		[0.110]		[0.157]
Patience index	0.322	0.299	0.159	0.141
	[0.070]***	[0.067]***	[0.108]	[0.073]*
R-squared	0.253	0.217	0.162	0.117
Obs	863	1753	652	1336
Control Mean	0.0313	0.0313	-0.0271	-0.0271

Robust standard errors in brackets, clustered by group and stratified by district. Omitted regressors include an age quartic, district indicators, and baseline measures of employment and human and working capital.

Appendix Table 1: Baseline summary statistics and test of balance

	(1)	(2)	(3)
	Treatment	**Control**	**Difference (controlling for district)**
Age	25.1 [5.3]	24.8 [5.3]	-0.006 [-0.021]
Female	0.317 [.465]	0.361 [.481]	-0.032 [-1.1]
Educational attainment	8.0 [3.1]	8.0 [3.0]	0.098 [0.577]
Literate	0.723 [.448]	0.741 [.438]	-0.012 [-0.517]
Prior vocational training	0.08 [.276]	0.07 [.263]	0.021 [1.7]*
Activities of Daily Living Index (additive bad; 0-32)	8.6 [2.3]	8.7 [2.7]	-0.203 [-1.3]
Index of emotional distress (additive bad; 0-43)	18.9 [8.0]	18.4 [8.0]	-0.249 [-0.613]
Human capital index (z-score)	-0.010 [1.0]	0.023 [.947]	-0.032 [-0.541]
Index of housing quality (-1.1-2.4)	0.023 [1.0]	0.000 [1.0]	0.007 [0.119]
Index of assets (-2.7-3.5)	0.038 [1.1]	0.010 [1]	0.046 [0.785]
Indicator for loans	0.350 [.477]	0.327 [.469]	0.014 [0.569]
Total value of outstanding loans (UGX)	18731 [90713]	19872 [90068]	-188 [-0.046]
Savings indicator	0.133 [.340]	0.107 [.310]	0.012 [0.786]
Total savings in past 6 months	22092 [113374]	15297 [92338]	6,788 [1.4]
Can obtain a 100000 UGX loan if needed	0.405 [.491]	0.340 [.474]	0.046 [1.9]*
Can obtain a 1m UGX loan if needed	0.122 [.328]	0.091 [.288]	0.020 [1.3]
Working capital index (z-score)	0.041 [1.1]	-0.001 [.977]	0.031 [0.514]
Total revenue in past 4 weeks	30284 [63201]	26031 [53111]	4,547 [1.4]
Days of household work in past 4 weeks	6.6 [11.4]	5.9 [11.0]	0.722 [1.2]
Days of nonhousehold work in past 4 weeks	17.1 [16.0]	16.3 [16.3]	0.933 [0.909]
Total hours spent on non-household activities in past week	10.5 [19.5]	10.6 [20.1]	-0.104 [-0.103]
Patience index (z-score)	-0.017 [1.0]	0.023 [.965]	-0.065 [-1.0]
Had vocation at baseline (indicator)	0.085 [.2796]	0.074 [.262]	0.008 [0.606]
Aggressive behaviors index (z-score)	0.00 [1.0]	0.02 [.978]	-0.018 [-0.377]
War violence index (z-score)	-0.004 [1.0]	-0.001 [.965]	0.001 [0.013]
Observations	1323	1278	2,599

Standard errors in brackets, clustered in column 3 by group and stratified by district.
**** p<0.01, ** p<0.05, * p<0.1*

Appendix Table 2: Impacts on other (secondary) outcomes

	Skill investments		Other employment		Savings and credit		Transfers			Business formality		
	Returned to school since baseline (indicator)	Enrolled in vocational training since baseline (indicator)	Hours spent on chores in past 4 weeks	Hours spent on subsistence work in past 4 weeks	IHS(Current savings)	Access to credit index	Net household transfers ('000s of UGX)	Total education expenditures in past 12 months ('000s of UGX)	Total health expenditures in past 12 months ('000s of UGX)	Number of employees	Index of business formality	Other transfers received from Govt/NGOs since baseline ('000s of UGX)
Treated	0.026	0.607	-5.1	-2.3	0.611	0.109	-11.099	105.650	16.169	0.395	-0.199	94.466
	[0.021]	[0.030]***	[2.4]**	[4.4]	[0.183]***	[0.049]**	[7.007]	[51.976]**	[5.005]***	[0.206]*	[0.093]**	[30.652]***
Treated x Female	0.015	0.033	-12.5	0.393	-0.563	-0.097	13.163	-106.643	-10.093	-0.714	-0.059	-23.984
	[0.034]	[0.046]	[8.1]	[7.7]	[0.311]*	[0.088]	[10.471]	[78.197]	[7.160]	[0.283]**	[0.132]	[44.385]
Female	-0.062	-0.014	67.8	-2.7	0.095	-0.045	-7.226	74.759	3.379	-0.238	0.192	-47.153
	[0.023]***	[0.031]	[5.0]***	[4.6]	[0.185]	[0.060]	[6.968]	[54.312]	[4.107]	[0.179]	[0.094]**	[29.956]
Observations	1985	1985	1986	1986	1984	1986	1986	1986	1986	1986	1986	1986
R-squared	0.118	0.389	0.380	0.138	0.188	0.112	0.039	0.126	0.083	0.052	0.085	0.052
Control means												
Males	0.124	0.169	11	53.9	2.456	0.904	8.785	345.6	35.08	1.753	5.634	31.74
Females	0.0663	0.157	88.5	47.2	2.153	0.726	3.385	324.9	33.20	1.312	5.841	21.60
Female Treatment Effect	0.0407	0.640	-17.6	-1.9	0.0472	0.0125	2.064	-0.993	6.076	-0.320	-0.258	70.48
p-value	0.138	0	0.0229	0.769	0.848	0.866	0.785	0.987	0.253	0.122	0.0126	0.0747
ATE as % of control mean												
Males	21%	359%	-46%	-4%		12%	-126%	31%	46%	23%	-4%	298%
Females	61%	407%	-20%	-4%		2%	61%	0%	18%	-24%	-4%	326%

Robust standard errors in brackets, clustered by group and stratified by district.
Omitted regressors include an age quartic, district indicators, and baseline measures of employment and human and working capital.
All UGX denominated variables censored at the 99th percentile. All inverse hyperbolic sine (IHS) variables are calculated as ln(x + ((x^2) + 1)^.5).

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

Appendix Table 3: Leader Heterogeneity

	(1)	(2)	(3)	(4)	(5)	(6)
	Hours of training received		**IHS(Tools and machines acquired since baseline)**		**IHS(Stock of raw materials, tools, and machines)**	
Treated	368.6 [28.6]***	387.2 [25.7]***	2.141 [0.204]***	2.269 [0.192]***	1.509 [0.192]***	1.609 [0.173]***
Treated X Member of executive committee	92.7 [42.4]**		0.317 [0.336]		0.286 [0.340]	
Member of executive committee	-8.3 [16.5]		-0.102 [0.197]		-0.008 [0.202]	
Treated X Group chair or vice-chair		67.3 [50.5]		-0.313 [0.449]		-0.158 [0.478]
Group chair or vice-chair		1.5 [21.0]		0.221 [0.260]		0.416 [0.296]
Treated X Human capital index	43.2 [24.3]*	47.8 [23.9]**	-0.082 [0.206]	-0.051 [0.205]	-0.271 [0.187]	-0.252 [0.187]
Human capital index	-16.1 [20.5]	-15.0 [20.7]	-0.018 [0.203]	-0.031 [0.204]	0.440 [0.190]**	0.433 [0.191]**
Treated X Working capital index	-44.7 [21.3]**	-42.7 [21.2]**	-0.042 [0.201]	-0.026 [0.200]	-0.165 [0.191]	-0.145 [0.189]
Working capital index	-26.1 [35.8]	-29.1 [35.6]	0.141 [0.274]	0.137 [0.275]	-0.050 [0.251]	-0.058 [0.251]
R-squared	0.3	0.3	0.235	0.234	0.193	0.194
Obs	1985	1985	1986	1986	1985	1985
Control Mean	49.77	49.77	1.904	1.904	3.628	3.628

Robust standard errors in brackets, clustered by group and stratified by district.
Omitted regressors include an age quartic, district indicators, and baseline measures of employmnet and human and working capital.
All UGX denominated variables censored at the 99th percentile. All inverse hyperbolic sine (IHS) variables are calculated as ln(x + ((x^2) + 1)^.5).
**** p<0.01, ** p<0.05, * p<0.1*

Appendix Table 4: Payback / Return on investment analysis

		Months to repay (N)				
		Real annual interest rate (r)				
A. Cash earnings QTE - Median		**None**	**Commercial prime**	**Other comercial**	**Other comercial**	**Moneylender**
Per person cost of NUSAF grant	**673,026**	**0%**	**5%**	**15%**	**25%**	**200%**
QTE, real monthly cash earnings	**10,000**	67.3	79.1	148.2	inf	inf
	0.1	61.2	70.8	116.5	inf	inf
Nonpecuniary value as % of cash earnings	**0.5**	44.9	49.8	66.2	132.4	inf
	1	33.7	36.3	43.9	58.6	inf
B. Cash earnings ATE						
Per person cost of NUSAF grant	**673,026**					
ATE on real monthly cash earnings	**19,515**	34.5	37.3	45.4	61.5	inf
	0.1	31.4	33.7	40.0	51.4	inf
Nonpecuniary value as % of cash earnings	**0.5**	23.0	24.2	27.3	31.6	inf
	1	17.2	17.9	19.5	21.6	inf
C. All, but including estimated program costs of 30%						
Per person cost of NUSAF grant	**874,933**					
ATE on real monthly cash earnings	**19,515**	44.8	49.7	66.2	131.9	inf
	0.1	40.8	44.8	57.3	1.1	inf
Nonpecuniary value as % of cash earnings	**0.5**	29.9	32.0	37.7	1.5	inf
	1	22.4	23.6	26.5	2.0	inf

Notes: Panel A considers the median transfer and QTE for all beneficiaries for five different real interest rates: 0, 5, 15, 25 and 200%. Panel B does the same for mean profits. Finally, Panel C considers the case where program implementation costs 30% of the transfer itself. A zero interest rate may be relevant from the perspective of a social planner who does not discount future welfare over present welfare. The 5% rate corresponds to the real prime lending rate, and could also be considered a social or state discount rate. Higher interest rates are closer to those available on the commercial market, up to the microfinance rate of 200%.

Payback equation: $N = -\log[1 - (r/12 \times A/P)] / \log(1 + r/12)$, where N is the number of months, r is the real interest rate, A is the loan amount and P is the repayment.

Appendix Table 5: Sensitivity analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Cash earnings in last 4 weeks (without individual covariates)		**Cash earnings in last 4 weeks (with full list of individual covariates)**		**Cash earnings in last 4 weeks (no censoring)**		**ln(Cash earnings)**		**IHS(Cash earnings)**	
Treated	20.260 [5.831]***	26.608 [7.960]***	20.003 [5.320]***	27.034 [7.434]***	32.462 [11.296]***	52.351 [21.260]**	0.874 [0.153]***	0.825 [0.180]***	0.675 [0.119]***	0.664 [0.143]***
Treated × Female		-19.118 [11.685]		-21.164 [11.390]*		-59.865 [34.758]*		0.147 [0.330]		0.033 [0.256]
Female	-23.135 [5.093]***	-15.217 [6.671]**	-13.834 [5.587]**	-5.115 [7.173]	-22.284 [10.615]**	2.379 [10.549]	-0.442 [0.158]***	-0.502 [0.213]**	-0.383 [0.124]***	-0.397 [0.165]**
Observations	2011	2011	1986	1986	1986	1986	1986	1986	1986	1986
R-squared	0.051	0.053	0.122	0.124	0.069	0.072	0.099	0.099	0.110	0.110
Control means										
All	43.45		43.45		49.04		8.419		2.704	
Males		50.01		50.01		57.53		8.658		2.907
Females		32.27		32.27		34.56		8.013		2.359
Female Treatment Effect		7.489		5.870		-7.514		0.971		0.697
p-value		0.356		0.450		0.651		0.001		0.001
ATE as % of control mean										
All	47%		46%		66%					
Males		53%		54%		91%				
Females		23%		18%		-22%				

Robust standard errors in brackets, clustered by group and stratified by district.
Omitted regressors include an age quartic, district indicators, and baseline measures of employment and human and working capital.
All UGX denominated variables censored at the 99th percentile. All inverse hyperbolic sine (IHS) variables are calculated as ln(x + ((x^2) + 1)^.5).
**** p<0.01, ** p<0.05, * p<0.1*