



## **Employment Generation in Rural Africa:**

### **Mid-term Results from an Experimental Evaluation of the *Youth Opportunities Program* in Northern Uganda**

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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 nearly unconditional, unsupervised cash transfers to pay for vocational training, tools, and business start-up costs. Mid-term results after two years suggest four main findings. First, despite a lack of central monitoring and accountability, most youth invest the transfer in vocational skills and tools. Second, the economic impacts of the transfer are large: hours of non-household employment double and cash earnings increase by nearly 50% relative to the control group. We estimate the transfer yields a real annual return on capital of 35% on average. Third, the evidence suggests that poor access to credit is a major reason youth cannot start these vocations in the absence of aid. Much of the heterogeneity in impacts is unexplained, however, and is unrelated to conventional economic measures of ability, suggesting we have much to learn about the determinants of entrepreneurship. Finally, these economic gains result in modest improvements in social stability. Measures of social cohesion and community support improve mildly, by roughly 5 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, 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—a puzzle to be explored in the next phase of the study. These results suggest that increasing access to credit and capital could stimulate employment growth in rural Africa. In particular, unconditional and unsupervised cash transfers may be a more effective and cost-efficient form of large-scale aid than commonly believed. A second stage of data collection in 2012 will collect longitudinal economic impacts, additional data on political violence and behavior, and explore alternative theoretical mechanisms.

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## 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.<sup>1</sup> 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.<sup>2</sup>

To reduce both poverty and instability, policymakers and pundits commonly propose government or aid-funded employment interventions, from finance to skills (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 program in Uganda, the Youth Opportunities Program (YOP) component of the Northern Uganda Social Action Fund (NUSAF), which provided relatively unconditional cash transfers to small groups of young men and women to help them start new vocations and enterprises. In the least developed nations, where firms are rare, aid-based employment interventions commonly provide inputs into self-employment—cash, microfinance, or in-kind skills training or business assets. Such pro-

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

<sup>2</sup> (Kaplan 1994; Fuller 1995; Goldstone 2002; Heinsohn 2003)

grams 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 programs, 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. While the number of data points remains small, there is a growing sense that the poor have high returns to cash and in-kind physical capital. 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). There are two reasons to be cautious, however. One is that the evidence on high returns and market failures is preliminary: the number of studies is small; they deal with particular populations; and the evidence comes largely from observational analysis of heterogeneous treatment responses.

While optimism pervades research on physical capital, the research on returns to human capital investments is less encouraging. Job training programs in developed nations have generally low impacts.<sup>3</sup> Business skills and financial literacy training, which are more common in developing countries, appear to yield only modest returns (Field et al. 2010; Karlan and Valdivia 2011). Technical and vocational training is even more common, representing almost \$3 billion in development assistance from 1990 to 2005—about 7.5% of all education-related aid (World Bank 2010). Here the evidence is especially thin. Three evaluations of job training programs in middle-income Latin American nations suggests mixed impacts overall and little impact on poor

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<sup>3</sup> After dozens of evaluations, meta-analyses 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 concern industrial economies, few are experimental, few try to explain heterogeneity in performance, and almost none explore social-political impacts and related externalities.

males—the most worrisome population from the perspective of social stability.<sup>4</sup> Almost none of these studies examine programs to self-employment, however, which is the main basis of employment in the least developed countries. To our knowledge, there have been no rigorous evaluations of vocational training and employment programs in the least developed nations.

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. We review competing theories that argue for a link from employment programs (and higher incomes) to greater social cohesion, reduced alienation, and lower aggression and potential for instability. Instrumentalist and economic theories of crime and conflict argue that higher incomes and employment raise the opportunity cost of aggression and predatory activities. A large body of psychology, sociology and political science 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.

We look at the evidence for all three propositions through a randomized evaluation of a state development program in northern Uganda, a region just emerging from economic stagnation and political insecurity, including insurgency, banditry, and wars in neighboring states. This paper reports the mid-term (two year) results, with final longitudinal results to become available in 2012.

In 2008 the program provided cash transfers to thousands of young men and women for investment in skills training and capital for self-employment. The focus of the program was vocational training and employment, and applicants were required to form a group of roughly 15 to 25 young adults interested in a vocation and submit a proposal for purchasing skills training, tools, and other materials required to start an enterprise. On average, successful groups received a lump sum cash transfer of \$7,108 to a jointly held bank account—roughly \$374 per group member, at market exchange rates. Groups were otherwise free of supervision or oversight in the actual spending. Not surprisingly, demand for the program far outstripped supply of funds: hundreds of groups, representing tens of thousands of young adults, applied.

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<sup>4</sup> Rigorous evaluations in Argentina and Colombia found significant impacts on female employment only (Aedo and Nuñez 2004; Attanasio et al. 2008) while the positive impacts of a training program in the Dominican Republic comes mainly from highly-educated workers (Card et al. 2007).

Given excess demand for program funds, we worked with the Government to allot 535 groups randomly to treatment (the transfer) or control. We follow a random subset of treatment and control group members over two years.

The mid-term economic and social impacts are substantial. Our results show that program beneficiaries make good use of the transfers. Groups spend the majority of their transfer on skills training fees and durable assets, with the remainder for materials, consumption, transfers and savings. Nearly 80 percent of the ‘treated’—those in groups who receive the government cash transfer—enroll in vocational training, and they acquire and grow business assets. We see some evidence of capture of transfers by the group leaders, but the capture is small and not very significant, and non-leaders still earn substantial returns.

Moreover, the program has large and significant effects on employment and income. Both men and women increase their hours in employment outside the home—by about 25% 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. Finally, economic returns are almost uniformly positive, and are relatively high for a majority of beneficiaries. The average beneficiary increases net income by about \$9 per month, a nearly 50% increase over the control group, representing real returns of roughly 35% per annum. 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 program? A growing body of theory and evidence argues that poor entrepreneurs are constrained by imperfect markets (especially inadequate access to credit, alongside fixed start-up costs to self-employment) and imperfect decision-making (such as self-control problems in spending and saving, or an absence of future focus in general). We develop a simple model that predicts how, under severe credit constraints, YOP-like investments and returns should vary with starting capital, entrepreneurial ability, patience levels, and existing vocations. We have detailed pre-intervention data on ability, access to credit, starting capital, and existing enterprises. The resulting patterns of heterogeneity 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. 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, social integration, and male aggression. The results are most consistent with psychological and anthropological accounts of market success and alienation and aggression. Program participation 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 also produces puzzles, however, such as elevated female aggression, and the absence of a correlation between actual economic performance and aggression for either gender. Both are to be explored in future research, including the 2012 round of data collection.

Overall, the results support a strong role for public and aid-based financing for poor entrepreneurs and employment creation, and suggest that relatively unsupervised and unconditional cash grants, which are cheaper to implement, will also be effectively and responsibly used.

## **2 Context: Northern Uganda**

Uganda is a small, landlocked 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, has concentrated in southern and central Uganda. The north, home to roughly a third of the population, has 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. Their demand for Ugandan products boomed. The Government of Uganda also accelerated efforts to



pacify, control, and develop the north. By 2006, the Ugandan military pushed the rebels out of the country, began to disarm northeastern cattle-raiders, and increased security and political control. The north was peaceful, but sustained peace would require catch-up with the rest of the country in terms of economic opportunities and infrastructure.. With the arrival of democracy in the 1990s and multiparty competition the following decade, the government also began to build political coalitions with northern leaders, encouraged reconciliation with and reintegration of the disaffected and increased public spending.

A national Peace, Recovery and Development Plan (PRDP) set ambitious economic and security goals in the north (Government of Uganda 2007). The centerpiece of this plan was a decentralized development program, NUSAF, the country's second-largest development program at the time. Starting in 2003, communities and groups could apply for government 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), which provided cash transfers to groups of young adults for self-employment in trades.

### **3 The intervention and experiment**

#### **3.1 The intervention**

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

The program was targeted to poor and underemployed "youth"—roughly ages 16 to 35 in local terms. Since technical and vocational schools typically require some education and aptitude, YOP targeted poor youth who had the minimum capacity to benefit from vocational training, and so are not the very poorest. On average, applicants were just slightly wealthier and more educat-

ed than the average Ugandan<sup>5</sup>, but are still poor by any reasonable standard: the average applicant reported weekly cash income of 7,806 Ugandan Shillings (UGX), about US\$4 at 2008 market exchange rates (1,800 UGX to the dollar), or almost exactly at the PPP\$1.25 international poverty line.<sup>6</sup> More than a quarter had not finished primary school. A fifth were engaged in semi-skilled or capital intensive employment and more than two-fifths reported no income or employment in the past month.

Like many participatory development programs, the objective was not only to enrich but also to empower young adults. Groups were responsible for selecting a management committee of five members, choosing the skills and schools, and budgeting, allocating, and spending all funds. Groups self-organized, or were spurred by a facilitator. Such facilitators, often a community leader or local government employee, helped groups identify projects and trainers, budget, and apply, but played no formal role after the proposal was submitted. The group management committee and members were wholly responsible for disbursement and purchases, accountable only to one another. If a group was selected, the government transferred cash in a single tranche to a bank account in the names of the group leadership, with no further supervision.

Thousands of groups applied and hundreds were funded to YOP from 2006 to 2008. Roughly half the groups existed prior to the NUSAF program, as sports or religious or community youth clubs. The rest were formed in response to the call for proposals, organized by group executives or community facilitators.

In 2008, the government determined that it had funding for 265 of 535 eligible groups. The average group had 22 members, and 80% of groups ranged from 13 to 31 members in size, according to pre-intervention group rosters (Table 1). 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

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<sup>5</sup> 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.

<sup>6</sup> The application and review process was inherently selective. Youth who self-selected into the program may be more motivated than the average youth, and may have above average 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 unobserved, but important for understanding external validity. In general, the program reached a huge number of youth with a breadth of skills, means, and war experiences, and impacts and patterns probably apply quite broadly .

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 the time of the baseline survey. 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).

## 3.2 Experimental design

### 3.2.1 Treatment assignment

NUSAF received many times more applications than could be funded, and so the government decided to allocate final disbursements randomly among eligible groups.<sup>7</sup> Funding was stratified by district, and 13 of 18 districts had sufficient YOP funds to participate in an experimental study.<sup>8</sup> Unfortunately, non-participating districts include the three most civil war-affected districts that may have benefited most from the program: Gulu, Kitgum and Pader. Other districts affected less intensely by the insurgency were included.

The central government asked district governments to sift through their (usually vast) pool of existing applications and nominate two to three times as many group applications as there was funding. From this pool the central government screened and audited applications, including physical verification of the groups, to confirm existence and eligibility.<sup>9</sup> The authors received a

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<sup>7</sup> 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.

<sup>8</sup> We use the original 2003 NUSAF districts. Many districts were subdivided after 2003.

<sup>9</sup> 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.

list of the 535 screened groups and randomly assigned 265 groups (5,460 individuals) to treatment and 270 groups (5,828 individuals) to control, stratified by district.<sup>10</sup>

Despite the scale of the program, 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.

### 3.2.2 *Treatment compliance*

We define treatment compliance fairly narrowly: all individuals in the group are coded as treated if the group received a funds transfer (according to administrative records) and if those funds were not diverted or stolen by district officials (according to a post-treatment survey of group members). We consider other forms of “compliance”, such as using the funds for skills training, or equitable distribution, to be intermediate outcomes of study rather than treatment indicators, and discuss them in the results section. In total, 30 groups did not receive funds, for a treatment compliance of 89%. 22 of these groups could not access government funds due to unsatisfactory accounting, complications with their bank account, or delays in collecting the funds. 8 groups reported that they never were given access to the funding due to the intercession of a local official. To our knowledge, no “ghost” groups—fictional groups invented by local leaders used to steal funds—were funded.

### 3.2.3 *Average treatment effect (ATE) estimation*

Given the small and unsystematic treatment non-compliance, our preferred ATE estimator is a treatment-on-the-treated (TOT) estimate using assignment to treatment,  $A_{ij}$ , as an instrument for treatment  $T_{ij}$  for individual  $i$  in community  $j$ :

$$Y_{1ij} = \theta T_{ij} + \lambda Y_{0ij} + \beta X_{ij} + \alpha_{ij} + \varepsilon_{ij} \quad (1a)$$

$$T_{ij} = \pi A_{ij} + \gamma Y_{0ij} + \delta X_{ij} + \alpha_{ij} + \varepsilon_{ij} \quad (1b)$$

where  $Y_{1ij}$  denotes an outcome variable and  $Y_{0ij}$  is its baseline level. This approach (the ANCOVA estimate) is more efficient than a difference-in-difference estimator (Frison and Pocock

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<sup>10</sup> 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.

1992; McKenzie 2011).  $X_{ij}$  is a pre-specified (optional) set of baseline covariates (principally used to correct for covariate imbalance after random assignment),  $\alpha_{ij}$  is a stratum fixed effect, and  $\varepsilon_{ij}$  denotes the error term. The ATE estimate is  $\theta$ . In the end, different estimators—an intention-to-treat estimate, or one calculated by differences-in-differences—have little material effect on the findings and conclusions (results not shown).

## 4 Economic theory and intended impacts

### 4.1 When will transfers boost employment and income, and for whom?

The simplest interpretation of the intervention is that it 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.

#### 4.1.1 *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 might even decrease—if leisure is a normal good, wealthier entrepreneurs will consume more of it.

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.

#### 4.1.2 *Imperfect markets*

Of course, in developing countries, markets seldom function so smoothly. A growing body of literature suggests that poor people the world round have high potential returns to investment,

especially physical capital, but are unable to realize them because they have few assets and inadequate access to credit (Banerjee and Duflo 2005).

Access to credit was especially poor in northern Uganda in the years after the war. At the time the NUSAF YOP program began, few large 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 more generally. Moneylenders and village savings and loan associations were relatively common, but loan terms seldom extend more than one to two months. These small lenders typically loaned funds at rates of 10% per month, or more than 200% per annum (Levenson 2011).<sup>11</sup>

As a result, at the time of the baseline, just 11% of the 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) and mainly from friends and family. Less than one in ten 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 eleven percent said they believed they could obtain a loan of 1 million UGX (\$555), 20% from family and 80% from institutions.<sup>12</sup>

#### 4.1.3 *Imperfect entrepreneurs*

Entrepreneurs, moreover, are not always forward-looking, time-consistent, and disciplined decision-makers. A growing behavioral economics literature emphasizes the difficulties people have in making complex economic decisions, including bounded rationality, overconfidence bias, time inconsistency, or other self-control problems (Bertrand et al. 2004). And some people are simply less patient than others, and will tend to consume 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 microen-

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<sup>11</sup> 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.

<sup>12</sup> 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.

terprise 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 to support livestock and community infrastructure, concluded that beneficiaries often did not manage the funding well (Golooba-Mutebi and Hickey 2010). Interviews suggested that projects were not well researched, funds were mismanaged, and intra-group disagreements were commonplace. The study argued it is unrealistic to expect poor people to be responsible for their own recovery, and that the program actually had disempowering effects. This study did not focus on the YOP program, but our own observations and interviews with YOP beneficiaries before and during the evaluation revealed many failures and concerns akin to those identified by the qualitative study.

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 empirical evidence to suggest this is the case).

## 4.2 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 “imperfect” individuals (patient and impatient types).<sup>13</sup> The model not only illustrates why cash transfer programs can spur business development and raise incomes, but produces predictions for impact heterogeneity that help illustrate whether these market and behavioral imperfections are binding in the Uganda case.

Individuals start with initial wealth  $w$ . Each can choose to be a laborer, earning an income of  $y$  each period, or to be an entrepreneur, and earning  $f(A, K)$ , 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 one-time fixed cost  $F \geq 0$ ,

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<sup>13</sup> The model was developed by the authors along with Julian Jamison, for a series forthcoming s of collaborative projects and papers. It could be considered a two-period version of the one-period entrepreneurial investment choice model proposed by 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) 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. More risk averse individuals should benefit more from cash transfers.

which does not go into productive capital. Existing entrepreneurs have already paid the fixed cost and are in business with initial capital,  $K_0 \geq 0$ .

Anyone can save amount  $s$  at interest rate  $r$ . To simplify matters, and to reflect actual conditions in places like Uganda, we assume  $r = 0$ . For similar reasons, we also assume that individuals are unable to borrow.<sup>14</sup>

In this setup, everyone chooses  $s$  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  $\delta$  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:

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

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

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  $-45^\circ$  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.<sup>15</sup> The stylized example in Figure 2 depicts a relatively high-ability entrepreneur with consequently high potential returns (a steep production function).

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<sup>14</sup> 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.

<sup>15</sup> 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.



Still focusing on the  $w_L$  case, we can see that different indifference curves (corresponding to different high and low discount rates,  $\delta_H$  and  $\delta_L$ ) will lead to different choices between labor and enterprise, with more patience making entrepreneurship more likely. If  $\delta$  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  $\delta$  for which the agent will choose to be a laborer: patient 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, of course, on  $A$ ). We assume the initial fixed cost  $F$  is small relative to the change in wealth, and  $F$  is less important as  $w$  (and, indeed, the scale of everything) 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 case zero). Given a cash transfer, there will be threshold values of  $w$ ,  $A$  and  $\delta$  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.

### 4.3 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 program 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, there may be increased availability of capital. Most post-program YOP enterprises are individual rather than group-based, so individual production functions probably remain the right framework for thinking about program impacts.<sup>16</sup> But some groups share tools and physical capital (e.g. a building, or high-value tools). It is not obvious whether this increased the potential

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<sup>16</sup> Among the treated, only 14% report coming together for income-generating activities on a daily basis, while 30% report coming together once a week for this purpose. Of the 14% that come together on a daily basis, 75% report sharing tools, while of the 30% that report coming together once a week, 85% report that tools are shared in the group.

returns to capital but, in general, the sharing of high-return capital with high fixed costs probably raises rather than lowers expected 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, depending on context and a large number of characteristics (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 between high and low ability persons).

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 and executive committees were pre-specified in both treatment and control groups. As long as endline measurement error (e.g. underreporting) of investments and earnings is uncorrelated with baseline leader status, we can test for the presence of leader capture.

The other three hypotheses are not directly testable, as NUSAF 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 concepts and tests below.

## **5 Impacts on social cohesion, alienation, and instability: A conceptual framework**

YOP, like many development programs, explicitly aims to promote social cohesion and stability. The underlying logic, however, is seldom as 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 is well beyond the scope of this paper, and thus this discussion is stylized and preliminary.

### **5.1 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, social and community participation, and notions of citizenship. The belief 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 findings are consistent with a large body of social-psychological research that suggests that group work and decision-making can have highly heterogeneous impacts depending on context, composition and other factors (Levine and Moreland 1998) as well as recent evidence from CDD program evaluations (Casey et al. 2011).

This mechanism suggests we should observe increases in social cohesion and, possibly, other forms of community participation as a consequence of treatment. We do not see a clear reason for aggression to be affected through this channel. These effects do not necessarily increase with economic success. They may be greater in groups where the initial quality of the dynamic is greater.

### **5.2 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.<sup>17</sup> In such societies—and northern Uganda is no exception—the transition from being a “youth” to becoming an “adult”, from disregard to social esteem and support, is in part determined by one’s ability to give rather than receive gifts and transfers. To the extent that participation in a YOP-like program increases relative wealth, and the ability to increase net trans-

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<sup>17</sup> See Hoff and Sen (2005) for a review.

fers to kin or the community, we may expect an increase in social support, respect, and opportunities for community leadership and engagement.<sup>18</sup>

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.

### **5.3 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.

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<sup>18</sup> 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.

#### **5.4 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 receipt of the program 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 receipt and non-receipt of the program is widely understood to be random.

#### **5.5 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). As important as injustice and frustrated ambitions may be to violence, a larger body of psychological research since this time emphasizes that aggression is also a highly charged emotional state suggests that aggression and anti-social behavior can be reactions to a variety of adverse stimuli or stress (Berkowitz 1993). This is hypothesized to be one reason for the association between low socio-economic status and anti-social behaviors in developed nations. This mechanism predicts that treatment and the degree of economic success should be associated with lower aggression.

#### **5.6 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.

## 6 Data and measurement

### 6.1 Survey data

The 535 eligible groups contained nearly 12,000 official members, and we follow a panel of five members per group, or 2675 persons. We achieve an effective tracking rate of 87%.<sup>19</sup>

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.<sup>20</sup> 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.)

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 a follow-up survey between August 2010 and March 2011, roughly 24 to 30 months after disbursement and 12 to 18 months after most completed training.

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.<sup>21</sup> Overall the effective attrition rate is 13%. Attrition

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<sup>19</sup> All estimates in the paper are within-sample predictions, and we do not weight for differential selection from the population of 12,000.

<sup>20</sup> 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.

<sup>21</sup> We conducted tracking in three phases. In Phase 1, from August to September 2010, we drew a random 75 percent sample of the groups for tracking. Enumerators sought respondents in their original villages, and located 61%. In

does vary by treatment status—approximately 15% among those assigned to treatment and 9% among controls. But analysis of attrition patterns using baseline data suggests that attrition is relatively unsystematic.<sup>22</sup>

## 6.2 Key outcomes

Primary outcomes are described in Table 2, grouped into eight “families” based on pre-specified conceptual linkages.

### 6.2.1 Economic outcomes

**Investments in vocational skills and capital.** We first examine investments in human and physical capital—both those made upon receiving the cash transfer as well as stocks at the time of the endline survey. In some sense, these investments represent a form of treatment compliance, although we feel they are more properly regarded as “intermediate” outcomes of the treatment—especially because the cash, once received, is relatively unmonitored and unconditional.

Respondents self-report the *Hours of training received* since baseline, the value of *Tools and machines acquired* since baseline (in thousands of Ugandan Shillings, or UGX), and the value of their total *Stock of raw materials, tools and machines*. We censor all UGX-denominated variables at 99<sup>th</sup> percentile (the size but not the significance of treatment effects are sensitive to this censoring, as discussed 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,

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Phase 2, from October to November 2010, we selected a 54% random sample of unfound Phase 1 respondents for tracking, wherever that may be in the country. This sampling technique was designed to use scarce resources to minimize attrition bias from long panels, providing a lower effective attrition weight and reducing potential for bias (Thomas et al. 2001; Gerber et al. 2011). Those selected for Phase 2 tracking are representative of all respondents not found in the first phase, and receive greater weight in all analysis. Those not selected for tracking in the second phase receive zero weight. Enumerators made at least three attempts to track Phase 2 respondents to their current location and found 76%, for an effective attrition rate of 90.6% in the first two phases. Finally, new resources at the end of Phase 2 made possible a Phase 3, from January to February 2011, where enumerators sought the 25% of groups randomly dropped at the outset. Enumerators found 79% of those targeted in Phase 3

<sup>22</sup>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.



and sometimes dispensing cash to members. Groups seldom kept records, and members could not reliably estimate the value of any in-kind transfers. Hence hours of training and durables acquired and owned represent our best (albeit incomplete) investment estimates.

**Income, consumption and employment.** To measure employment levels and occupational choice, we measure total *Hours on all economic activities* the past four weeks, which excludes household work and chores but includes subsistence work (e.g. hunting, farming, charcoal making) as well as *Hours on market activities* (all business activities, vocational employment, professions, wage work, or other market work).<sup>23</sup> To calculate incomes, 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)*.<sup>24</sup> Finally, to approximate consumption levels 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).

### 6.2.2 *Alienation and aggression*

**Participation and engagement.** One facet of integration (or, conversely, alienation) is public participation, social and political. 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 *Com-*

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<sup>23</sup> 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.

<sup>24</sup> 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). In addition to measurement, income (like all our UGX-denominated outcomes) has a long upper tail to which any measure of central tendency, including average treatment effects, is sensitive. Outliers are particularly influential. After accounting for outliers beyond the 95<sup>th</sup> or 99<sup>th</sup> percentile, the distribution of net income is roughly log-normal. 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 four steps to conservatively estimate statistics on UGX-denominated measures, especially income. First, we truncate the variable at the 99<sup>th</sup> percentile to account for outliers. Second, 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). Third, because both the level and logged values of income may be misleading, we examine the median and other major quantiles, including treatment effects. We also explore sensitivity to all these assumptions.

*munity 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.

Unfortunately, due to an impending election (and a desire not to politically charge the survey at a sensitive time), we were asked by the government partner to exclude questions on civic attitudes or participation beyond the community level, including political knowledge and attitudes. As a result we can only evaluate participation impacts at the community level, although broader participation data will be gathered in the 2012 round of data collection.

**Social integration.** To assess alienation, we also examine 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.<sup>25</sup> 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 trust. Finally, respect for and quality of relations with elders in the community is an important indicator of social and community 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 and respect for elders, and their authority over youth.

**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.<sup>26</sup>

**Aggression and hostility.** We have three main types of aggression and hostility measures. 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*

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<sup>25</sup> 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.

<sup>26</sup> 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.

*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*.<sup>27</sup> As with political participation, we did not collect data on attitudes towards political violence, or on participation in crime, protests, riots, or communal or armed violence, but more extensive data will be collected in the 2012 round.

### 6.2.3 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”.

## 7 Results

Table 3 displays treatment effects for each outcome family, for the full sample and by gender. Each family is 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). The main reason to look at these aggregates is to guard against the heightened probability of rejecting a true null hypothesis when testing multiple outcomes (Duflo et al. 2007).

The economic impacts of the program are large. On average, being part of a treated group results in a standard deviation increase in investments in vocational skills and capital and a 0.28 standard deviation increase in economic success. Male and female impacts are nearly identical.

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<sup>27</sup> 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.

The impacts on alienation and aggression are smaller and the effects more mixed. On average, there are small improvements in community participation, social integration, distress symptoms, and aggression but these are statistically insignificant. When we differentiate by gender, however, we see that these small average results conceal heterogeneous, divergent impacts. Males show small but significant improvements in social integration (0.11 s.d.), distress symptoms (-0.15 s.d.) and aggression (-0.20 s.d.). Females, on the other hand, generally show small and statistically significant increases in alienation, and a significant increase in self-reported aggression (0.20 s.d.). Here and in all future ATE tables, female ATEs are calculated at the base of the table as the sum of the male ATE and the interaction term.

Finally, overall subjective well-being increases by 0.15 s.d. Anticipated changes in subjective well-being, however, are lower among the treated by a nearly equal amount. The mechanical reason is that members of treated groups estimate the same *levels* of future relative well-being no differently than controls. We discuss potential reasons for the finding below.

While important for testing multiple hypotheses, these standardized family treatment effects conceal a great deal of important variation. There is no theoretical reason, for instance, why economic outcomes like employment levels, earnings and consumption ought to move in the same direction. They do not help us calculate returns to investment, or the determinants of heterogeneity in returns. And patterns of specific forms of aggression and alienation may illuminate the general patterns we see above. The remainder of the paper focuses on individual outcomes.

## **7.1 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 approximately two-thirds of the transfer appears to be spent on fees and durable assets (not including other startup costs or materials), suggesting that the fears over funds mislaid and misspent are confined to a minority of beneficiaries.

### *7.1.1 Skills training*

Table 4 displays the average treatment effects (ATE) for self-reported investments. As in Table 3, we calculate female ATEs at the base of the table. To provide a sense of magnitude, we also report control group means and (except in the case of non-linear transformation) calculate the treatment effect as a proportion of the control group mean.

Seventeen percent of the control group enrolled in some form of vocational training, suggesting a degree of demand and ability to invest. 70 percent of the members of treated groups enrolled in vocational school since baseline. Enrolment levels are similar for men and women.<sup>28</sup> The most common types of vocational training were tailoring (32%), carpentry (21%), metalworking (10%), and hairdressing (6%). On average, this translates to 405 more hours of training than controls, more than 10 weeks of full time training (Table 4, columns 1 and 2). A small few used YOP funds to enroll in secondary school, technically a “misuse” of the funds.<sup>29</sup>

### 7.1.2 *Asset acquisition and stocks*

The average control group member reports acquiring business assets worth UGX 136,500 (\$62) since baseline, and value their stock of tools, machines and raw materials at UGX 348,000 (\$158). Treated individuals report an additional 656,016 UGX (\$298) in acquisitions and UGX 523,318 (\$238) in asset stock, a 481% increase in acquisitions and 150% increase in asset stock relative to the control group. The impact on asset stocks is sensitive to the upper tail and any censoring, however. A log transformation would be less sensitive to outliers, but would treat zeros as missing, introducing selection bias since the probability of acquisitions is affected by treatment. An alternative transformation with similar properties to the log, but defined at zero, is the inverse hyperbolic sine, or IHS (Burbidge et al. 1988). While the coefficient has no easy interpretation, it indicates to what extent the linear treatment effects are sensitive to outliers and functional form. In this case, the treatment effect seems to be robust but the male-female gap is not robust to the IHS transformation. 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.

Because of these potential biases, we also turn to quantile analysis. Figure 5 maps the quantile treatment effects (QTEs) for business assets owned. The median control group member owned just UGX 14,000 (\$6) of business assets at endline. Below the 30<sup>th</sup> percentile, treated group members report virtually zero business assets as well, but the two groups diverge sharply from that point onwards. At the median, the QTE for assets acquired is UGX 164,000 (\$75) for assets

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<sup>28</sup> See Appendix Table 2. Those who dropped out with fewer than 16 hours of training were not counted as enrolled.

<sup>29</sup> 10 percent 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. See Appendix Table 2.

owned, and at the 70<sup>th</sup> and 90<sup>th</sup> percentiles the QTE rises to more than UGX 300,000 and 1,400,000—each one many multiples of the corresponding control quantile.

What proportion of the transfer is used for vocational investments? Treated groups reported that approximately 35% of any YOP transfer was spent on training fees (Table 1). The asset QTE, above, moreover, suggest 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 design of the program—specification of a proposal, auditing prior to disbursement, and group organization and control over funds—may have acted as a commitment device. We return to the role of the group, below, and find little evidence that group quality affected investments.

### 7.1.3 *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 5 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.

## 7.2 Economic impacts

### 7.2.1 *Income, consumption and employment*

Our model predicts a shift from unskilled to skilled employment, and an increase in earnings and consumption. Table 6 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 19,515 (\$9) greater incomes in the last 4 weeks at endline. While seemingly small, the impact is huge relative to the counterfactual—a 45% 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: returns by gender. The linear income results suggest that women earn significant less than men, with the female treatment effect just UGX 5,992, 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 the program, bolstering the IHS results. Figure 6 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<sup>th</sup> 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<sup>th</sup> and 80<sup>th</sup> percentiles and 78,000 at the 90<sup>th</sup>. The female QTE is relative steady until the 80<sup>th</sup> and 90<sup>th</sup> 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 22 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 49% increase.<sup>30</sup>

### 7.2.2 *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 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 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 QTE is UGX 9,185 (\$4) (regressions not shown). These figures correspond to annual rates of return of 30% and 20%.

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<sup>30</sup> 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).

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 money-lender 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 money-lender 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 much as half the time.

### 7.2.3 *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 was 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.

### **7.3 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 8 and 9 look at impact heterogeneity on four key investment and economic outcomes. Table 8 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*<sup>31</sup>, *Working capital index*<sup>32</sup>, and *Patience index*.<sup>33</sup> 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).<sup>34</sup>

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 co-

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<sup>31</sup> 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.

<sup>32</sup> 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.

<sup>33</sup> 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.

<sup>34</sup> 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.

efficient, except in the case of IHS(earnings), where the coefficient has the expected negative sign and is significant at the 10 percent level.

Treated members with higher ability engage in significantly more training hours (equivalent to roughly half the treatment effect) but have no consistent or significant 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, working memory (digit recall), 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 the interaction between patience and treatment is typically negative and not statistically significant.

Table 9 looks at all individuals, but splits the sample into those with a patience index above and below the median (i.e.  $\delta_H$  and  $\delta_L$ ). Within each  $\delta$  subsample, we regress each outcome the *Working capital index*, *Ability index*, an indicator for an *Existing vocation at baseline*. 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 8, 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).

#### **7.4 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 14% increase in perceived wealth levels relative to the control group (Table 11) 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.

## **7.5 Impacts on alienation and aggression**

### *7.5.1 Participation and social integration*

Tables 11 and 12 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, calculated at the base of the table for each outcome.

In terms of community participation and engagement, treated individuals are engaged in 9.3% 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 4.4% more likely to attend community meetings and 7.7% 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 4.7% more social support compared to the control group, and an index measure of depression symptoms is 5% lower among the treated (although only significant for males).

It is difficult to say whether this is a direct consequence of economic success or a result of other program 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).

### 7.5.2 *Aggression*

In Table 3 we saw that collectively our aggression measures decreased by approximately 0.2 standard deviations among males and increased nearly 0.4 standard deviations among females. ATEs for individual dependent variables are reported in Table 13.

The first five dependent variables (and 10 columns) 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 significantly 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 7 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<sup>th</sup> percentile, 4 at the 95<sup>th</sup>, and 6 at the 99<sup>th</sup>—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 14. 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 opportunities for aggression. Women in the marketplace, or who make money, may also be targets of un-



wanted male attention, such as officials or police seeking bribes of a financial or intimate nature. This too will be explored in the next round of data collection.

## **7.6 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 little change 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.

## **8 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 more 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 program 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 explored in future research as well.

The presence of non-pecuniary private gains, or externalities, could help explain underinvestment by poor entrepreneurs without the program. 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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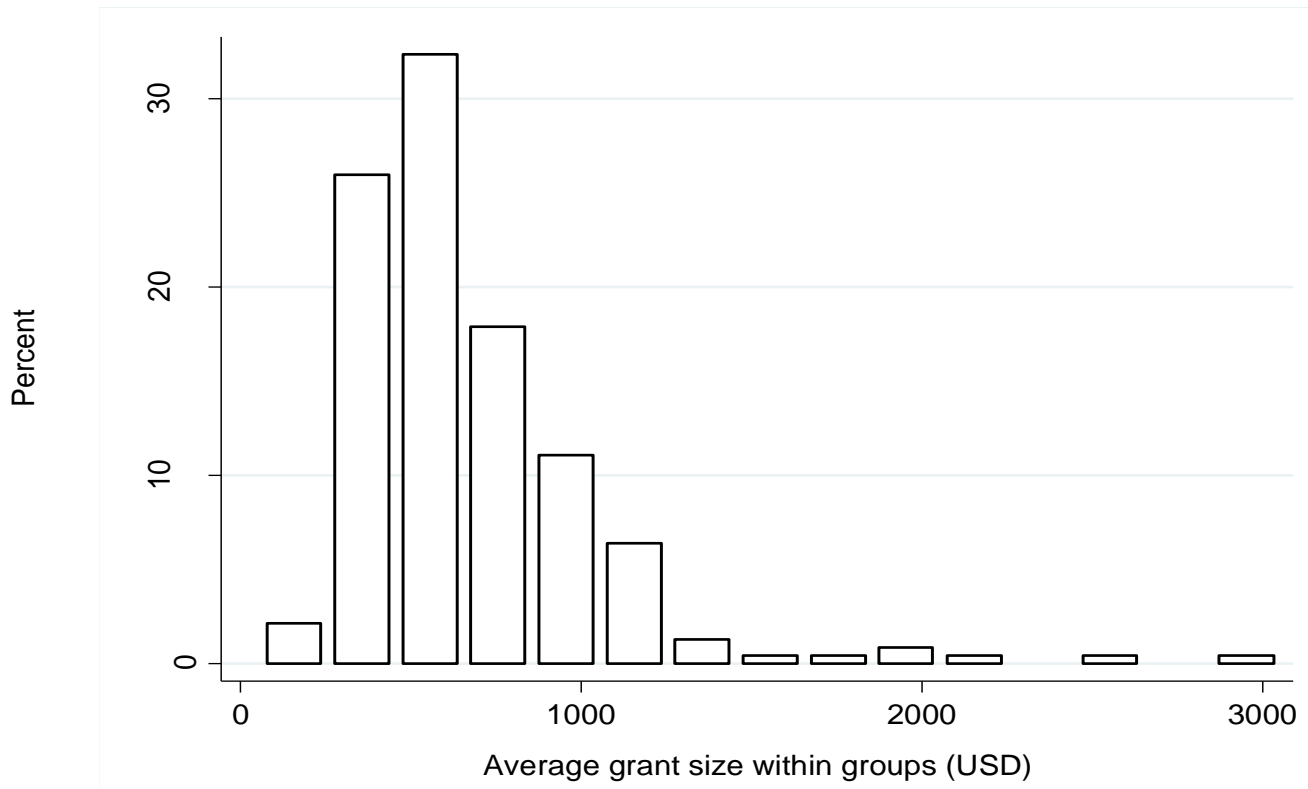
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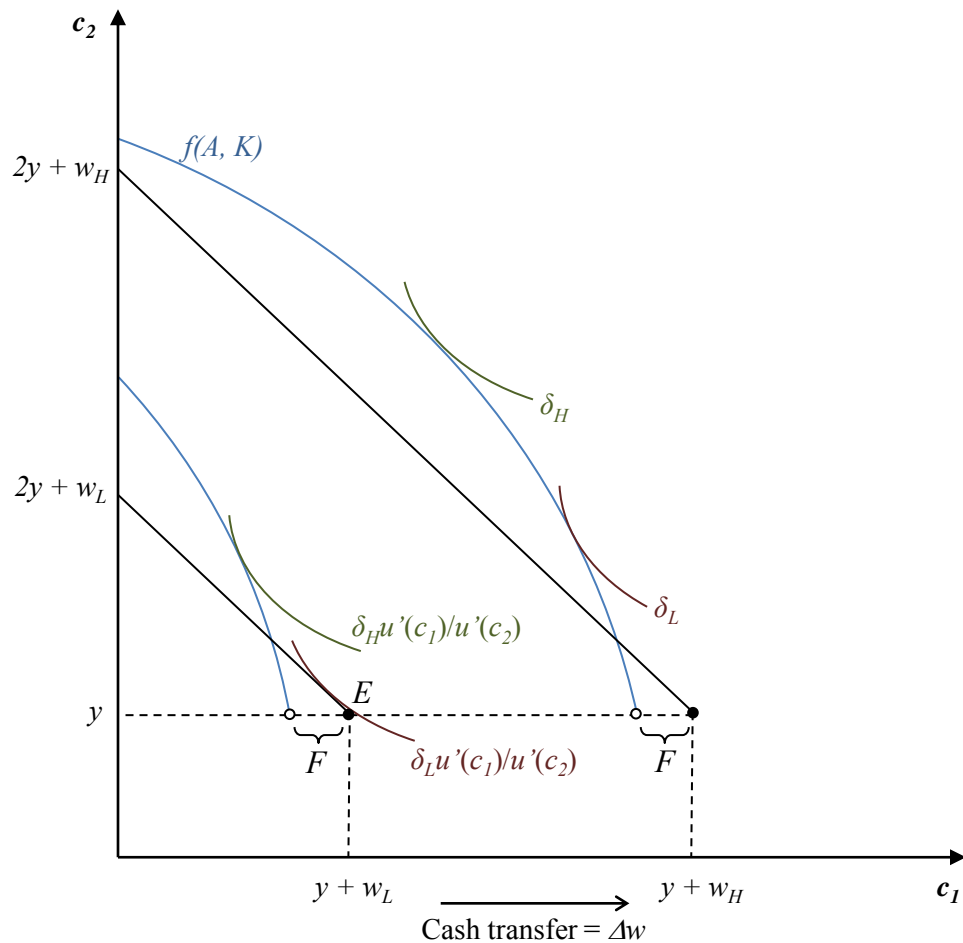
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**Figure 1: Distribution of transfer size per group member (in US dollars)**



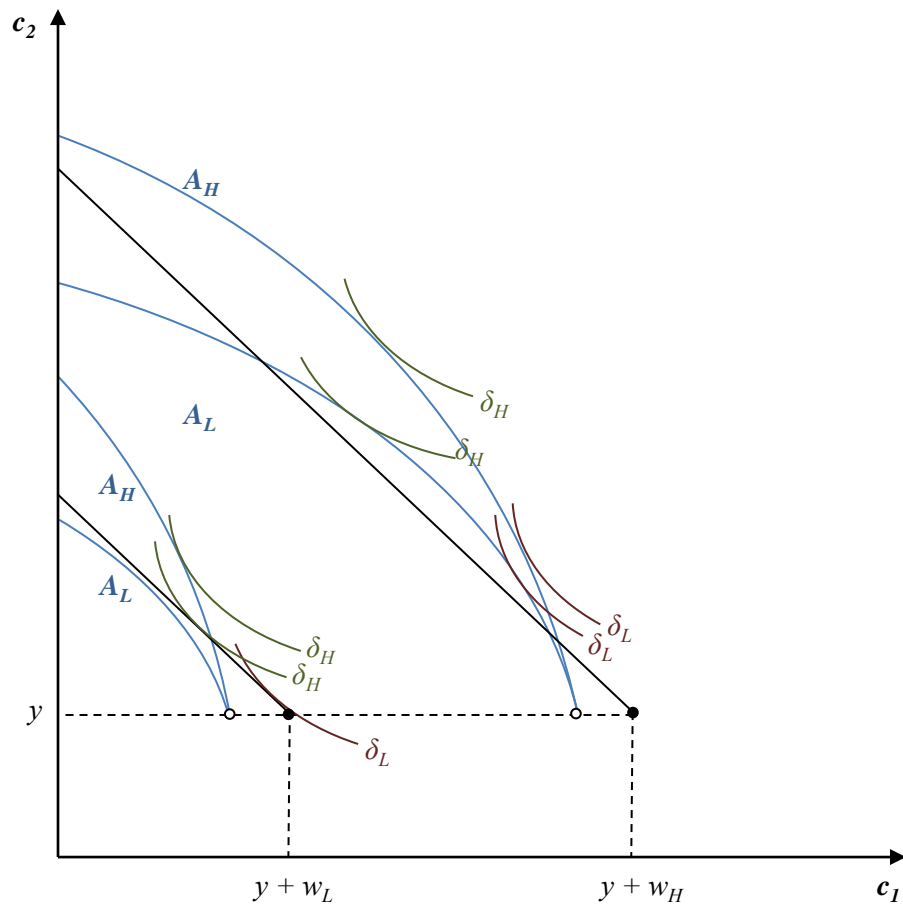




**Figure 2: Impact of cash transfers on occupational choice (No existing entrepreneurs)**

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

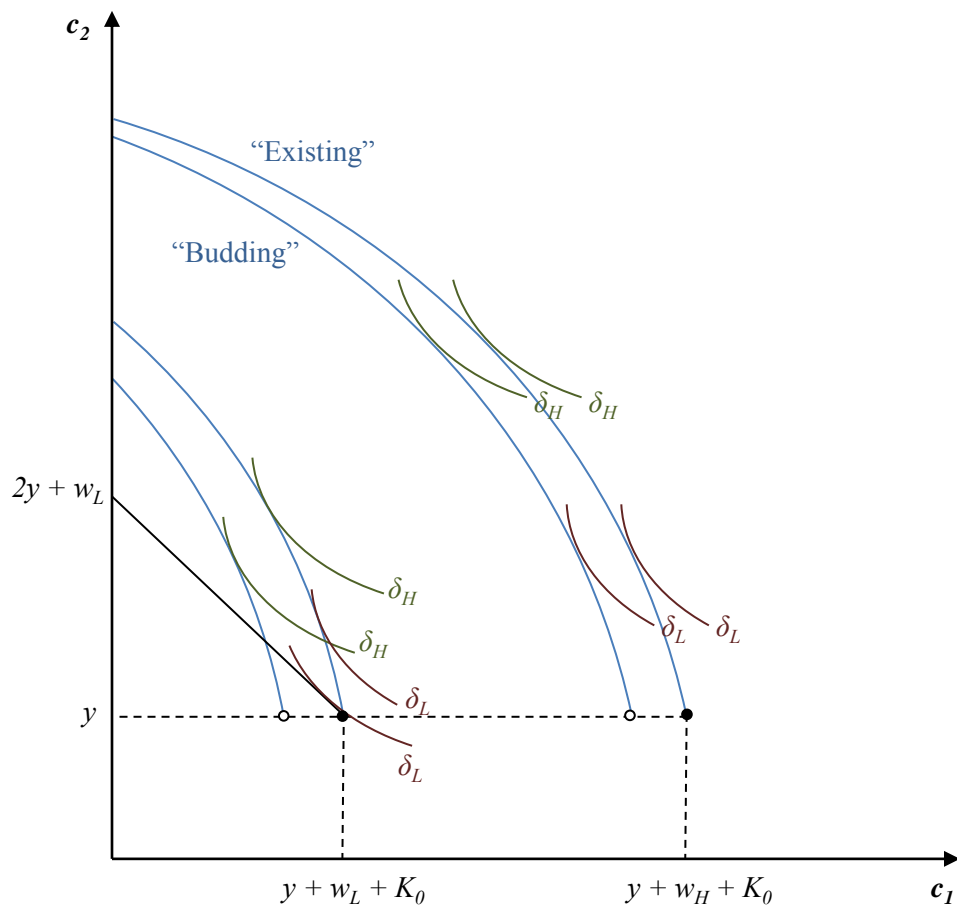
For small  $F$  (relative to  $\Delta w$ ) patient and impatient cash transfer recipients become entrepreneurs. But investment and period 2 income are generally increasing with patience.



**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.



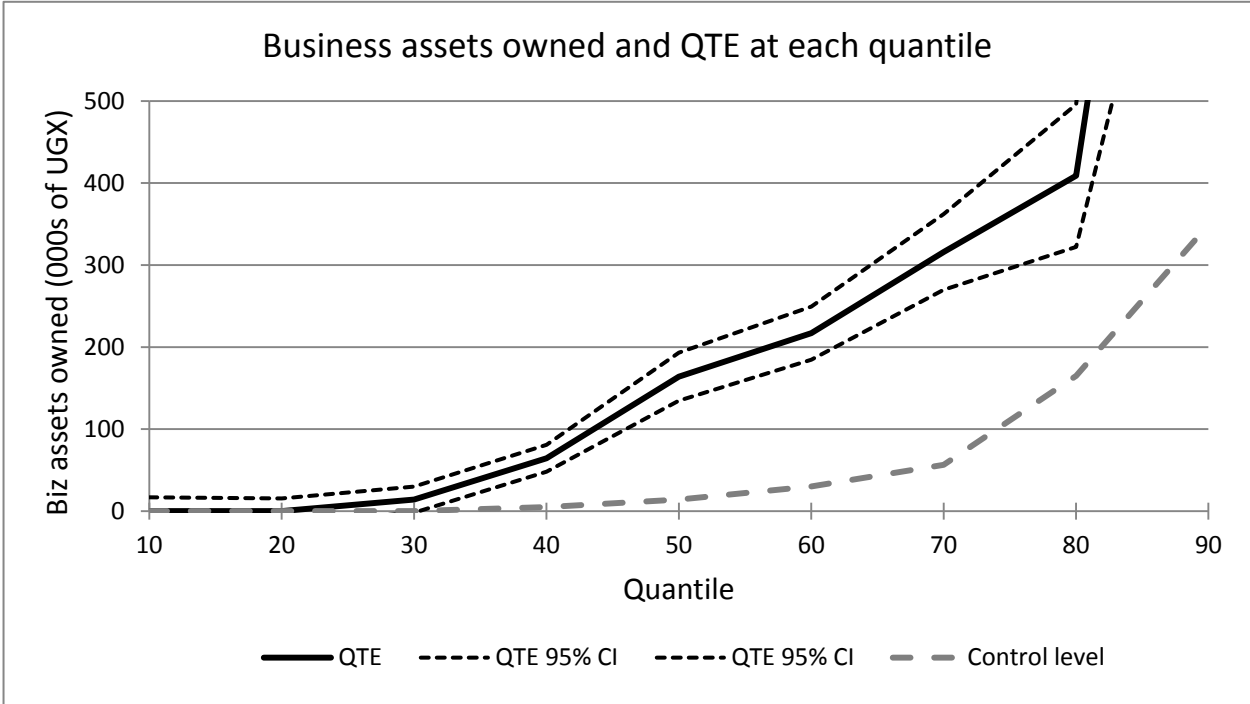
**Figure 4: Existing versus budding entrepreneurs, with equal levels of starting capital**

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

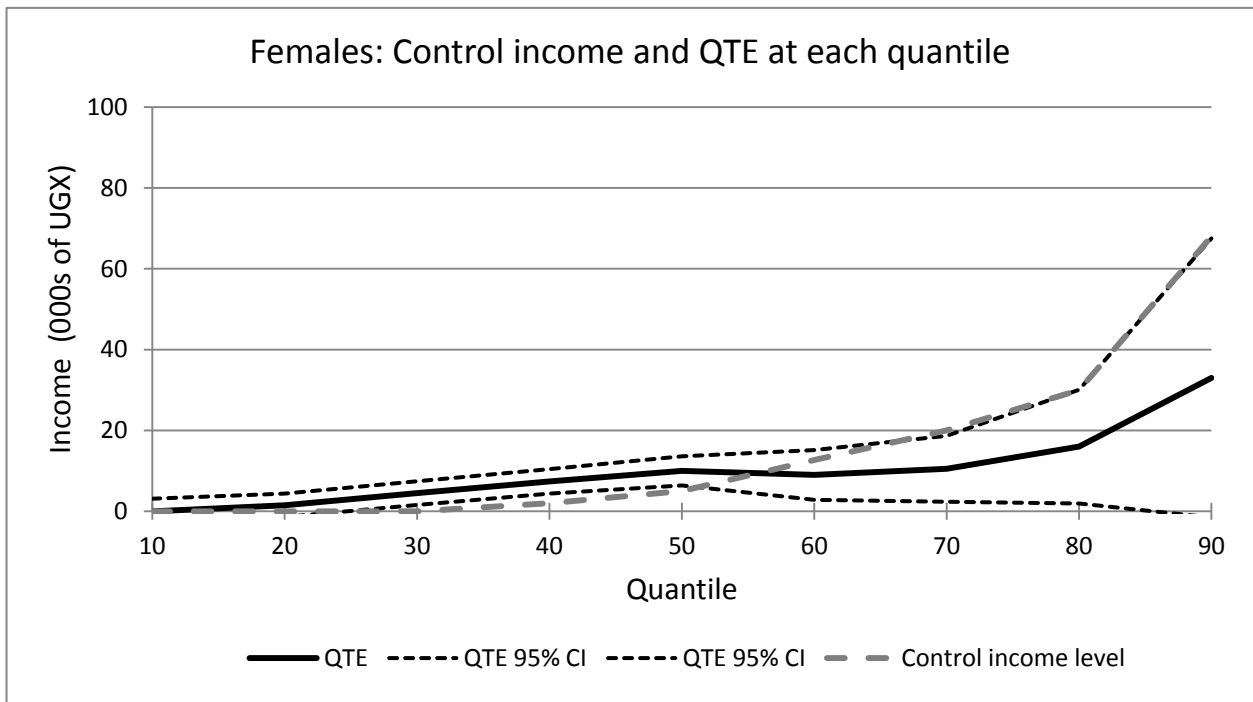
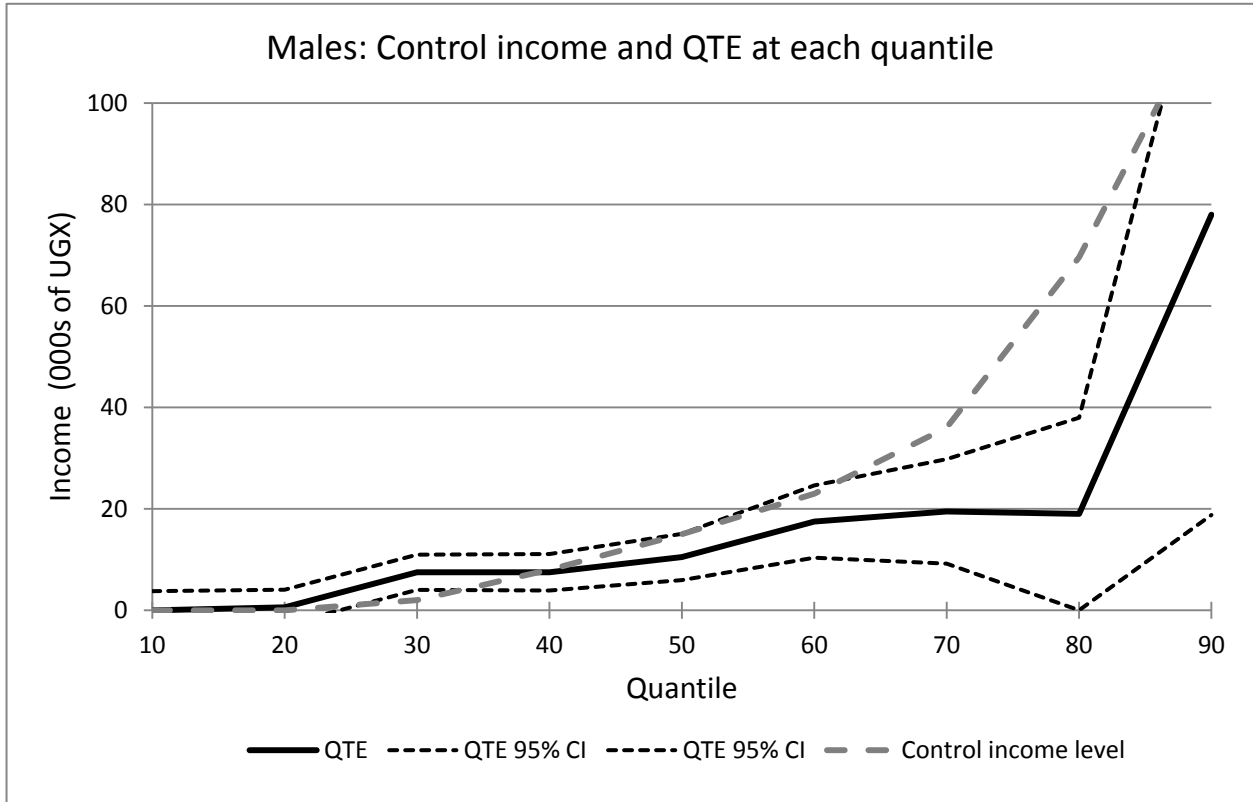
The impact of cash transfers on investment and profits is larger among budding entrepreneurs than existing entrepreneurs.

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

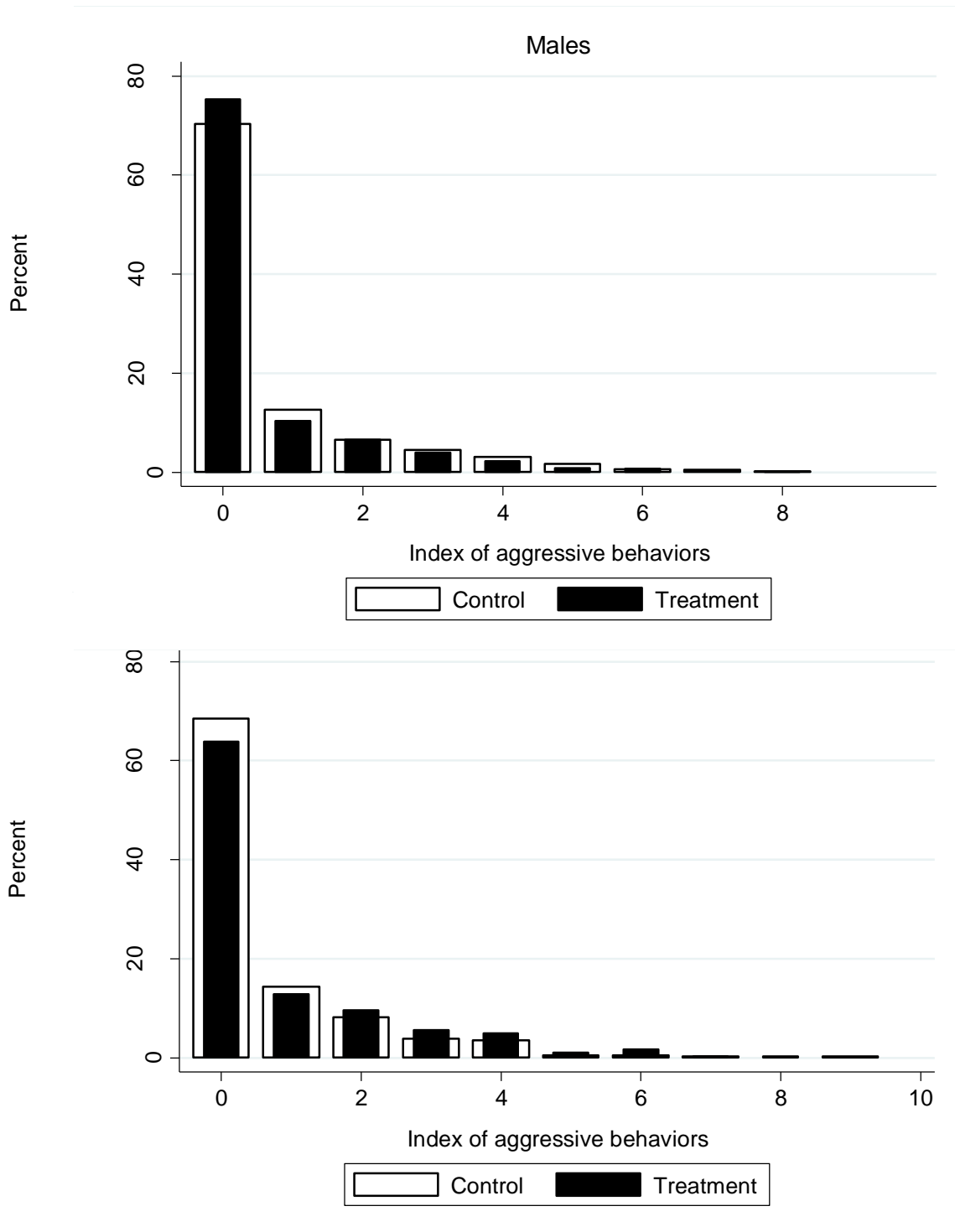
**Figure 5: Quantile treatment effects for business assets acquired and owned**



**Figure 6: Quantile treatment effects for monthly income, by gender**



**Figure 7: Distribution of self-reported hostile behaviors**



**Table 1: Group summary statistics**

	<b>Mean</b>	<b>Std. Dev.</b>
<i>Group characteristics</i>		
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]
<i>Group members (all)</i>		
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]
<i>Treatment</i>		
Proportion of funds spent on training	0.35	[0.77]
	<b>Mean [Std. Dev.]</b>	
<b>Do you...</b>	<b>Treatment</b>	<b>Control</b>
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**

	Assigned to control		Assigned to treatment		Obs
	Mean	Std. Dev.	Mean	Std. Dev.	
<b>Investments in vocational skills and capital</b>					
Hours of training received	50	[214]	389	[480]	2,005
Tools and machines acquired since baseline ('000s of UGX)	136	[909]	774	[2218]	2,006
Stock of raw materials, tools and machines ('000s of UGX)	348	[1296]	858	[2143]	1,999
<b>Income, poverty and employment</b>					
Cash earnings from past 4 weeks ('000s of UGX)	43.5	[94.6]	61.6	[114.0]	2,006
Monthly cash earnings adjusted for hourly earnings	24.6	[89.6]	39.6	[107.6]	2,006
Index of wealth z-score (Poverty/consumption proxy)	-0.020	[0.998]	0.094	[1.042]	2,000
Hours spent on all economic activities in past 4 weeks	120.6	[108.2]	138.8	[112.6]	2,006
Hours spent on market activities in past 4 weeks	70.4	[102.7]	90.9	[100.1]	2,006
<b>Community participation and engagement</b>					
Number of group memberships	3.7	[2.8]	3.8	3.0	2,006
Attends community meetings (indicator)	0.67	[0.47]	0.70	[0.46]	2,000
Speaks out at community meetings (indicator)	0.61	[0.49]	0.66	[0.47]	1,997
Is a community leader (indicator)	0.40	[0.49]	0.41	[0.49]	2,000
Is a community mobilizer (indicator)	0.51	[0.50]	0.60	[0.49]	1,996
Locus of control index (1-4)	2.18	[0.31]	2.17	[0.33]	2,000
<b>Social integration</b>					
Family very caring (indicator)	0.75	[0.43]	0.71	[0.46]	2,003
Index of social support (0-16)	9.18	[3.69]	9.81	[3.47]	2,006
Community/neighbor relations index (0-8)	6.81	[1.32]	6.75	[1.27]	2,006
Reverence for elders index (0-9)	6.30	[0.97]	6.33	[0.97]	2,006
<b>Depression and distress symptoms</b>					
Index of depression and distress symptoms (0-19)	6.85	[3.95]	7.07	[3.70]	2,006
<b>Aggressive and hostile behaviors</b>					
Index of disputes with neighbors (0-3)	0.20	[0.57]	0.20	[0.60]	1,995
Index of disputes with family (0-3)	0.29	[0.63]	0.27	[0.63]	1,996
Index of disputes with community leaders (0-3)	0.08	[0.36]	0.06	[0.30]	1,996
Index of disputes with police (0-3)	0.05	[0.30]	0.03	[0.20]	1,992
Involved in physical fights (0-3)	0.04	[0.23]	0.05	[0.27]	1,995
Peers have disputes with local leaders or police (0-3)	0.37	[0.75]	0.35	[0.77]	1,980
Peers involved in physical fights (0-3)	0.34	[0.72]	0.30	[0.70]	1,987
Quarrelsome (0-3)	0.30	[0.62]	0.29	[0.62]	1,986
Takes things without permission (0-3)	0.14	[0.51]	0.12	[0.44]	1,998
Uses abusive language (0-3)	0.12	[0.41]	0.12	[0.43]	1,998
Threatens to hurt others (0-3)	0.15	[0.47]	0.13	[0.45]	1,999
<b>Community participation and engagement</b>					
Wealth: Current position (0-9)	2.73	[1.55]	3.05	[1.65]	1,997
Community respect: Current position (0-9)	4.52	[2.40]	4.44	[2.16]	1,988
Community power: Current position (0-9)	4.45	[2.23]	4.45	[2.12]	1,967
Access to basic services: Current position (0-9)	3.72	[2.11]	4.13	[2.02]	1,984
Asked for advice: Current position (0-9)	5.04	[2.29]	4.86	[2.20]	1,995
<b>Subjective well being (expected future change)</b>					
Expected 5-year change in wealth position	2.85	[1.82]	2.55	[1.73]	1,987
Expected 5-year change in respect position	1.98	[1.76]	1.93	[1.70]	1,976
Expected 5-year change in power position	1.82	[2.00]	1.68	[1.89]	1,951
Optimism index (0-3)	2.57	[0.78]	2.51	[0.82]	1,978

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



**Table 3: Average treatment effect by outcome family**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Outcome family z-score															
	Investments in vocational skills and capital		Employment, cash earnings and poverty		Community participation & engagement		Social integration		Depression and distress symptoms		Aggressive and hostile behaviors		Perceived ranking in community		Expected future change in community ranking	
	All	Male/ Female	All	Male/ Female	All	Male/ Female	All	Male/ Female	All	Male/ Female	All	Male/ Female	All	Male/ Female	All	Male/ Female
Treated	1.025 [0.054]***	1.047 [0.063]***	0.286 [0.054]***	0.290 [0.067]***	0.084 [0.053]	0.075 [0.060]	0.035 [0.049]	0.107 [0.053]**	-0.086 [0.051]*	-0.151 [0.058]***	-0.067 [0.052]	-0.198 [0.064]***	0.154 [0.054]***	0.199 [0.064]***	-0.118 [0.048]**	-0.164 [0.057]***
Treated × Female		-0.066 [0.104]		-0.012 [0.113]		0.027 [0.109]		-0.216 [0.105]**		0.196 [0.115]*		0.396 [0.104]***		-0.135 [0.108]		0.138 [0.110]
Female	-0.023 [0.052]	0.004 [0.058]	-0.254 [0.059]***	-0.249 [0.075]***	-0.354 [0.057]***	-0.365 [0.073]***	-0.208 [0.055]***	-0.119 [0.070]*	0.087 [0.063]	0.006 [0.081]	-0.006 [0.062]	-0.169 [0.077]**	-0.000 [0.053]	0.055 [0.065]	-0.057 [0.053]	-0.114 [0.065]*
Observations	1986	1986	1986	1986	1986	1986	1986	1986	1986	1986	1986	1986	1983	1983	1984	1984
R-squared	0.356	0.356	0.196	0.196	0.243	0.242	0.177	0.178	0.200	0.202	0.203	0.208	0.163	0.163	0.192	0.192
Female Treatment Effect		0.981		0.277		0.102		-0.109		0.044		0.198		0.064		-0.026
p-value		0.000***		0.002**		0.287		0.253		0.655		0.021**		0.487		0.779

*Robust standard errors in brackets, clustered by group and stratified by district.*

*Where an index includes a UGX-denominated dependent variable, the inverse hyperbolic sine (IHS) rather than the linear transformation is used in the index.*

*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 4: Average treatment effects on investments in vocational skills and capital**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Hours of training received		Tools and machines acquired since baseline ('000s of UGX)		IHS(Tools and machines acquired since baseline)		Stock of raw materials, tools, and machines ('000s of UGX)		IHS(Stock of raw materials, tools, and machines)	
Treated	404.904 [24.353]***	400.264 [25.162]***	656.016 [95.806]***	791.904 [130.305]***	2.219 [0.182]***	2.375 [0.215]***	523.318 [103.228]***	658.554 [141.476]***	1.576 [0.164]***	1.651 [0.207]***
Treated × Female		13.996 [46.693]		-409.800 [171.343]**		-0.467 [0.367]		-408.071 [191.037]**		-0.225 [0.351]
Female	33.220 [24.509]	27.474 [25.389]	-218.079 [90.247]**	-49.611 [85.262]	-0.424 [0.171]**	-0.231 [0.193]	-313.111 [87.703]***	-145.331 [103.627]	-0.371 [0.158]**	-0.278 [0.208]
Observations	1985	1985	1986	1986	1986	1986	1985	1985	1985	1985
R-squared	0.278	0.278	0.131	0.135	0.232	0.234	0.114	0.117	0.186	0.186
Control means	49.77		136.5		1.904		348.0		3.628	
All	49.77		136.5		1.904		348.0		3.628	
Males		41.80		159.8		1.987		414.2		3.783
Females		63.34		96.71		1.763		234.9		3.364
Female Treatment Effect		414.3		382.1		1.908		250.5		1.426
p-value		0.000		0.001		0.000		0.046		0.000
ATE as % of control mean	814%		481%				150%			
All	814%		481%				150%			
Males		958%		496%				159%		
Females		654%		395%				107%		

*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: Investments and performance by group characteristics**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Hours of training received		IHS(Tools and machines acquired since baseline)		IHS(Cash earnings)		Index of wealth (z-score)	
	Treated	All	Treated	All	Treated	All	Treated	All
Treated		179.9 [96.3]*		2.745 [0.697]***		0.715 [0.489]		0.477 [0.216]**
Treated × Group existed prior to YOP		83.5 [50.0]*		0.254 [0.380]		0.315 [0.247]		0.098 [0.108]
Group existed prior to YOP (indicator)	58.3 [38.3]	-3.8 [23.3]	0.230 [0.288]	0.011 [0.201]	0.074 [0.170]	-0.200 [0.160]	0.075 [0.072]	-0.023 [0.075]
Treated × Group dynamic index		24.4 [18.5]		0.484 [0.151]***		0.136 [0.105]		-0.062 [0.047]
Group dynamic index	-2.1 [16.6]	-17.0 [9.7]*	0.191 [0.122]	-0.215 [0.097]**	-0.020 [0.076]	-0.131 [0.083]	-0.087 [0.035]**	-0.015 [0.033]
Treated × Group size		3.2 [3.4]		-0.028 [0.025]		0.004 [0.018]		-0.009 [0.008]
Group size	-1.8 [2.7]	-1.5 [1.6]	-0.025 [0.020]	0.014 [0.015]	0.004 [0.012]	0.005 [0.012]	-0.003 [0.006]	0.004 [0.005]
Treated × % of group female		274.1 [96.2]***		-0.076 [0.726]		-0.804 [0.443]*		-0.547 [0.225]**
% of group female	150.3 [93.8]	-82.0 [45.6]*	0.303 [0.705]	0.345 [0.406]	-0.392 [0.348]	0.248 [0.307]	-0.509 [0.152]***	-0.009 [0.154]
Treated × Group heterogeneity index		-40.3 [20.8]*		-0.251 [0.182]		-0.186 [0.116]		-0.053 [0.055]
Group heterogeneity index	-24.0 [17.9]	5.8 [10.4]	-0.026 [0.131]	0.161 [0.130]	-0.066 [0.084]	0.109 [0.086]	0.013 [0.036]	0.051 [0.038]
R-squared	0.1	0.3	0.181	0.241	0.136	0.126	0.337	0.294
Observations	899	1847	900	1848	900	1848	900	1848
Control Mean	49.77	49.77	1.904	1.904	2.704	2.704	-0.0196	-0.0196

*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  $\ln(x + (x^2 + 1)^{0.5})$ .*

*\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$*

**Table 6: Average treatment effects on income, poverty and employment**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Cash earnings in last 4 weeks						Poverty/Consumption proxy		Employment levels					
VARIABLES	Level (000s of UGX)		IHS(Cash earnings)		Adjusted for hourly earnings ('000s of UGX)		Index of wealth (z-score)		Hours spent on market activities in past 4 weeks		Hours spent on all economic activities in past 4 weeks		Currently engaged in skilled work (indicator)	
Treated	19.515 [5.319]***	26.225 [7.326]***	0.675 [0.119]***	0.664 [0.143]***	16.614 [5.157]***	23.435 [7.066]***	0.131 [0.055]**	0.182 [0.067]***	22.239 [5.708]***	20.473 [7.118]***	19.705 [6.009]***	17.596 [7.287]**	0.340 [0.029]***	0.314 [0.035]***
Treated × Female		-20.234 [11.317]*		0.033 [0.256]		-20.571 [10.698]*		-0.156 [0.106]		5.328 [11.293]		6.362 [12.330]		0.078 [0.057]
Female	-17.859 [6.083]***	-9.547 [7.379]	-0.383 [0.124]***	-0.397 [0.165]**	-11.013 [5.618]*	-2.557 [6.917]	-0.071 [0.052]	-0.006 [0.066]	-24.913 [6.160]***	-27.102 [7.736]***	-26.073 [6.849]***	-28.686 [8.207]***	-0.092 [0.030]***	-0.124 [0.036]***
Observations	1986	1986	1986	1986	1986	1986	1986	1986	1986	1986	1986	1986	1986	1986
R-squared	0.130	0.133	0.110	0.110	0.102	0.105	0.280	0.282	0.108	0.108	0.109	0.109	0.168	0.169
Control means	43.45		2.704		24.61		-0.0196		70.36		120.6		0.343	
All	43.45		2.704		24.61		-0.0196		70.36		120.6		0.343	
Males	50.01		2.907		27.66		-0.00328		80.69		132.9		0.404	
Females	32.27		2.359		19.42		-0.0476		52.76		99.60		0.241	
Female Treatment Effect	5.992		0.697		2.864		0.0261		25.80		23.96		0.392	
p-value	0.447		0.00121		0.700		0.762		0.00435		0.0187		0	
ATE as % of control mean	45%				68%				32%		16%		99%	
All	45%				68%				32%		16%		99%	
Males	52%				85%				25%		13%		78%	
Females	19%				15%				49%		24%		163%	

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 7: Grant size per person as treatment**

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	IHS(Tools and machines acquired since baseline)		IHS(Stock of raw materials, tools, and machines)		IHS(Cash earnings in the past 4 weeks)	
Grant size per group member	0.001 [0.000]**		0.001 [0.000]*		-0.000 [0.000]	
IHS(Grant size per group member)		0.449 [0.335]		0.274 [0.293]		0.108 [0.189]
R-squared	0.226	0.224	0.206	0.204	0.118	0.119
Control Mean	1.904	1.904	3.628	3.628	2.704	2.704
Obs	835	835	835	835	835	835

*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  $\ln(x + ((x^2) + 1)^{.5})$ .*

*\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$*

**Table8: Impact Heterogeneity among those without an existing vocation**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Hours of training received		IHS(Tools and machines acquired)		IHS(Cash earnings in last 4 weeks)		Index of wealth (z-score)	
	Treated	All	Treated	All	Treated	All	Treated	All
Treated		401.1 [25.5]***		2.329 [0.190]***		0.786 [0.125]***		0.173 [0.059]***
Working capital index	-58.9 [53.9]	-26.8 [22.8]	0.182 [0.435]	0.027 [0.202]	-0.076 [0.304]	0.191 [0.137]	0.085 [0.155]	0.166 [0.077]**
Treated × Working capital		-35.7 [24.6]		0.086 [0.222]		-0.195 [0.144]		-0.045 [0.081]
Ability index	191.8 [85.4]**	-19.7 [57.6]	-0.745 [0.649]	-0.567 [0.521]	-0.380 [0.467]	-0.014 [0.332]	-0.142 [0.234]	-0.185 [0.189]
Treated × Ability		61.0 [27.2]**		-0.040 [0.237]		-0.106 [0.175]		0.001 [0.082]
Patience index	20.3 [35.4]	13.1 [20.7]	0.851 [0.260]***	0.546 [0.188]***	0.370 [0.162]**	0.280 [0.136]**	0.165 [0.082]**	0.236 [0.067]***
Treated × Patience index		-19.6 [33.9]		-0.014 [0.260]		0.003 [0.172]		-0.056 [0.087]
R-squared	0.2	0.3	0.204	0.243	0.135	0.123	0.317	0.290
Obs	862	1769	863	1770	863	1770	863	1770
Control Mean	49.77	49.77	1.904	1.904	2.704	2.704	-0.0196	-0.0196

*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  $\ln(x + (x^2 + 1)^{0.5})$ .*

*\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$*

**Table9: Impact Heterogeneity by Patience**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	<b>Hours of training received</b>				<b>IHS(Tools and machines acquired)</b>				<b>IHS(Cash earnings in last 4 weeks)</b>				<b>Index of wealth (z-score)</b>			
	<b>Low patience</b>		<b>High patience</b>		<b>Low patience</b>		<b>High patience</b>		<b>Low patience</b>		<b>High patience</b>		<b>Low patience</b>		<b>High patience</b>	
	<b>Treated</b>	<b>All</b>	<b>Treated</b>	<b>All</b>	<b>Treated</b>	<b>All</b>	<b>Treated</b>	<b>All</b>	<b>Treated</b>	<b>All</b>	<b>Treated</b>	<b>All</b>	<b>Treated</b>	<b>All</b>	<b>Treated</b>	<b>All</b>
Treated		424.7 [41.6]***		370.3 [38.5]***		2.352 [0.313]***		2.168 [0.289]***		0.834 [0.213]***		0.691 [0.204]***		0.238 [0.096]**		0.189 [0.085]**
Working capital index	-73.2 [90.3]	-21.4 [23.9]	-60.5 [55.1]	-26.5 [34.2]	-0.422 [0.628]	-0.237 [0.213]	0.736 [0.518]	0.336 [0.292]	-0.286 [0.508]	-0.218 [0.158]	-0.127 [0.338]	0.329 [0.195]*	0.346 [0.254]	0.222 [0.059]***	-0.055 [0.144]	0.149 [0.118]
Treated × Working capital		-45.5 [33.0]		-16.0 [29.9]		-0.157 [0.329]		-0.022 [0.261]		-0.276 [0.215]		-0.267 [0.179]		0.103 [0.100]		-0.230 [0.094]**
Ability index	-771.3 [391.1]*	-256.6 [28.1]***	261.2 [90.5]***	-33.7 [81.5]	-2.297 [1.479]	-0.039 [0.212]	0.269 [0.603]	0.026 [0.821]	-2.091 [0.811]**	-0.410 [0.153]***	0.140 [0.458]	-0.178 [0.502]	-0.819 [0.510]	-0.606 [0.066]***	0.144 [0.195]	-0.098 [0.309]
Treated × Ability		78.5 [35.0]**		51.6 [34.7]		0.053 [0.334]		0.099 [0.308]		-0.092 [0.210]		0.038 [0.212]		-0.045 [0.085]		0.059 [0.097]
Existing vocation indicator	-46.4 [96.6]	53.4 [63.4]	-7.6 [69.4]	73.2 [33.2]**	-0.918 [0.732]	0.783 [0.570]	0.485 [0.490]	0.915 [0.595]	-0.219 [0.463]	0.888 [0.430]**	-0.156 [0.349]	0.934 [0.391]**	-0.049 [0.214]	-0.122 [0.227]	0.020 [0.153]	0.499 [0.193]**
Treated × Existing vocation		-32.9 [112.4]		-78.9 [73.2]		-1.196 [0.943]		-0.460 [0.788]		-1.384 [0.616]**		-1.123 [0.520]**		-0.028 [0.303]		-0.420 [0.244]*
R-squared	0.2	0.3	0.2	0.2	0.296	0.293	0.200	0.222	0.156	0.137	0.173	0.118	0.409	0.296	0.290	0.274
Obs	492	967	458	969	492	967	459	970	492	967	459	970	492	967	459	970
Control Mean	49.77	49.77	49.77	49.77	1.904	1.904	1.904	1.904	2.704	2.704	2.704	2.704	-0.0196	-0.0196	-0.0196	-0.0196

*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 10: Impacts on Subjective well-being**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Current position relative to community in					Future expected changes			
	Wealth	Power in community	Respect in community	Access to basic services	Being sought for advice	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)	Believes good things will happen in their life (0 to 3)
Treated	0.486 [0.105]***	0.176 [0.145]	0.204 [0.141]	0.470 [0.130]***	0.003 [0.143]	-0.415 [0.104]***	-0.168 [0.107]	-0.141 [0.128]	-0.024 [0.048]
Treated x Female	-0.270 [0.176]	-0.223 [0.267]	-0.161 [0.247]	-0.125 [0.228]	-0.192 [0.254]	0.326 [0.199]	0.249 [0.208]	-0.055 [0.231]	0.051 [0.083]
Female	0.176 [0.112]	0.141 [0.179]	-0.088 [0.157]	0.095 [0.155]	0.046 [0.153]	-0.121 [0.127]	-0.207 [0.128]	0.049 [0.148]	-0.105 [0.052]**
Observations	1983	1974	1953	1970	1981	1973	1962	1937	1964
R-squared	0.125	0.134	0.111	0.110	0.116	0.113	0.120	0.101	0.206
Control means									
All									
Males	2.750	4.608	4.615	3.817	5.124	2.868	1.971	1.736	2.600
Females	2.685	4.363	4.178	3.552	4.883	2.815	1.983	1.970	2.510
Female Treatment Effect	0.217	-0.0473	0.0432	0.345	-0.189	-0.0889	0.0811	-0.196	0.0262
p-value	0.132	0.836	0.840	0.0812	0.379	0.601	0.643	0.303	0.711
ATE as % of control mean									
All									
Males	18%	4%	4%	12%	0%	-15%	-9%	-8%	-1%
Females	8%	-1%	1%	10%	-4%	-3%	4%	-10%	1%

*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 community participation & engagement**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Number of group memberships		Attends community meetings (indicator)		Spoke out at a community meeting (indicator)		Is a community leader (indicator)		Is a community mobilizer (indicator)		Locus of control index: 1 to 3.4	
Treated	0.348 [0.150]**	0.407 [0.189]**	0.030 [0.027]	0.021 [0.030]	0.048 [0.026]*	0.039 [0.029]	0.013 [0.027]	0.034 [0.033]	0.045 [0.026]*	0.044 [0.029]	-0.019 [0.017]	-0.030 [0.021]
Treated x Female		-0.176 [0.304]		0.026 [0.058]		0.027 [0.056]		-0.062 [0.055]		0.003 [0.055]		0.036 [0.034]
Female	-0.418 [0.150]***	-0.346 [0.192]*	-0.160 [0.030]***	-0.170 [0.038]***	-0.179 [0.030]***	-0.190 [0.037]***	-0.117 [0.028]***	-0.092 [0.037]**	-0.113 [0.030]***	-0.114 [0.038]***	-0.015 [0.017]	-0.029 [0.021]
Observations	1986	1986	1986	1986	1983	1983	1986	1986	1982	1982	1986	1986
R-squared	0.224	0.225	0.099	0.099	0.149	0.149	0.146	0.147	0.192	0.192	0.121	0.121
Control means	3.742		0.669		0.614		0.402		0.507		2.208	
All	3.742		0.669		0.614		0.402		0.507		2.208	
Male		3.980		0.741		0.702		0.459		0.571		2.224
Female		3.337		0.546		0.464		0.305		0.398		2.180
Female Treatment Effect		0.231		0.0470		0.0656		-0.0279		0.0473		0.00522
p-value		0.337		0.357		0.191		0.532		0.318		0.849
ATE as % of control mean	9%		4%		8%		3%		9%		-1%	
All	9%		4%		8%		3%		9%		-1%	
Males		10%		3%		6%		7%		8%		-1%
Females		7%		9%		14%		-9%		12%		0%

*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 social integration**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	<b>Family very caring (indicator)</b>		<b>Index of social support: 0 to 16</b>		<b>Index of Community/ Neighbor Relations: 0 to 8</b>		<b>Index of Reverence for Elders: 0 to 7</b>		<b>Index of depression and distress symptoms (additive bad): 0 to 19</b>	
Treated	-0.036 [0.026]	-0.030 [0.028]	0.430 [0.180]**	0.498 [0.210]**	0.015 [0.066]	0.127 [0.076]*	0.035 [0.050]	0.091 [0.057]	-0.312 [0.194]	-0.551 [0.220]**
Treated x Female		-0.017 [0.053]		-0.205 [0.378]		-0.339 [0.147]**		-0.169 [0.117]		0.719 [0.437]
Female	-0.054 [0.027]**	-0.047 [0.034]	-0.680 [0.197]***	-0.596 [0.249]**	-0.183 [0.073]**	-0.044 [0.096]	-0.064 [0.056]	0.005 [0.071]	0.345 [0.238]	0.050 [0.304]
Observations	1986	1986	1986	1986	1986	1986	1986	1986	1986	1986
R-squared	0.116	0.116	0.176	0.176	0.135	0.137	0.101	0.100	0.210	0.211
Control means	0.748		9.179		6.808		6.296		6.845	
All	0.748		9.179		6.808		6.296		6.845	
Males		0.780		9.449		6.822		6.307		6.767
Females		0.693		8.721		6.783		6.276		6.979
Female Treatment Effect		-0.0471		0.293		-0.212		-0.0781		0.168
P Values		0.324		0.365		0.0953		0.443		0.655
ATE as % of control mean	-5%		5%		0%		1%		-5%	
All	-5%		5%		0%		1%		-5%	
Males		-4%		5%		2%		1%		-8%
Females		-7%		3%		-3%		-1%		2%

*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: Average treatment effects on aggressive and hostile behaviors**

	(1)	(2)	(3)	(4)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Intensity and frequency of disputes					Peers		Hostile behaviors			
	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)
Treated	-0.041 [0.040]	-0.033 [0.041]	-0.049 [0.023]**	-0.042 [0.021]**	-0.012 [0.016]	-0.089 [0.053]*	-0.110 [0.048]**	-0.047 [0.037]	-0.030 [0.031]	-0.028 [0.028]	-0.097 [0.031]***
Treated x Female	0.067 [0.057]	0.111 [0.075]	0.057 [0.039]	0.017 [0.025]	0.071 [0.032]**	0.212 [0.082]***	0.149 [0.073]**	0.150 [0.070]**	0.053 [0.055]	0.081 [0.050]	0.197 [0.054]***
Female	-0.024 [0.037]	-0.016 [0.051]	-0.052 [0.028]*	-0.039 [0.023]*	-0.034 [0.018]*	-0.145 [0.052]***	-0.155 [0.050]***	0.028 [0.045]	-0.009 [0.047]	0.017 [0.034]	-0.068 [0.034]*
Observations	1981	1982	1982	1978	1981	1966	1973	1972	1984	1984	1985
R-squared	0.229	0.076	0.055	0.055	0.054	0.218	0.236	0.093	0.069	0.112	0.104
Control means											
All											
Males	0.222	0.287	0.103	0.0655	0.0514	0.423	0.389	0.289	0.146	0.110	0.176
Females	0.169	0.285	0.0540	0.0294	0.0293	0.272	0.259	0.324	0.133	0.127	0.109
Female Treatment Effect	0.0261	0.0778	0.00801	-0.0248	0.0597	0.123	0.0390	0.103	0.0234	0.0533	0.0996
p-value	0.547	0.202	0.794	0.139	0.0341	0.0753	0.497	0.0957	0.641	0.212	0.0414
ATE as % of control mean											
All											
Males	-18%	-11%	-48%	-64%	-23%	-21%	-28%	-16%	-20%	-25%	-55%
Females	15%	27%	15%	-85%	204%	45%	15%	32%	18%	42%	91%

*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 14: Aggression Heterogeneity**

	(1)	(2)
	<b>Aggression and Hostility Family (z-score)</b>	
	<b>Treated</b>	<b>Full sample</b>
Treated		-0.086 [0.050]*
Treated X Aggressive behaviors index		-0.372 [0.116]***
Aggressive behaviors index	0.018 [0.072]	0.332 [0.079]***
Treated X War violence index		-0.282 [0.141]**
War violence index	-0.077 [0.105]	0.155 [0.092]*
Treated X Risk index		0.719 [0.188]***
Risk index	0.180 [0.180]	-0.416 [0.136]***
Treated X Patience index		-0.106 [0.124]
Patience index	0.346 [0.074]***	0.420 [0.077]***
R-squared	0.310	0.252
Obs	921	1881
Control Mean	0.0358	0.0358

*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 15: Correlation Matrix of Outcome Families

<u>A. MALES</u>	Investments	Employment and income	Community participation	Social integration	Depression and distress	Aggression and hostility	Perceived ranking
Investments <i>p-value</i>	1.000						
Employment and income <i>p-value</i>	<b>0.317</b> <i>0.000</i>	1.000					
Community participation <i>p-value</i>	<b>0.225</b> <i>0.000</i>	<b>0.212</b> <i>0.000</i>	1.000				
Social integration <i>p-value</i>	<b>0.136</b> <i>0.000</i>	<b>0.096</b> <i>0.001</i>	<b>0.173</b> <i>0.000</i>	1.000			
Depression and distress <i>p-value</i>	-0.034 <i>0.212</i>	-0.016 <i>0.550</i>	-0.020 <i>0.473</i>	<b>-0.147</b> <i>0.000</i>	1.000		
Aggression and hostility <i>p-value</i>	<b>-0.065</b> <i>0.017</i>	0.028 <i>0.310</i>	0.006 <i>0.829</i>	<b>-0.238</b> <i>0.000</i>	<b>0.346</b> <i>0.000</i>	1.000	
Current subjective well being <i>p-value</i>	<b>0.157</b> <i>0.000</i>	<b>0.195</b> <i>0.000</i>	<b>0.256</b> <i>0.000</i>	<b>0.214</b> <i>0.000</i>	<b>-0.068</b> <i>0.013</i>	<b>0.046</b> <i>0.096</i>	1.000
<u>B. FEMALES</u>	Investments	Employment and income	Community participation	Social integration	Depression and distress	Aggression and hostility	Perceived ranking
Investments <i>p-value</i>	1						
Employment and income <i>p-value</i>	<b>0.342</b> <i>0.000</i>	1.000					
Community participation <i>p-value</i>	<b>0.234</b> <i>0.000</i>	<b>0.287</b> <i>0.000</i>	1.000				
Social integration <i>p-value</i>	<b>0.091</b> <i>0.019</i>	0.040 <i>0.302</i>	<b>0.156</b> <i>0.000</i>	1.000			
Depression and distress <i>p-value</i>	-0.026 <i>0.506</i>	-0.033 <i>0.402</i>	0.018 <i>0.637</i>	<b>-0.144</b> <i>0.000</i>	1.000		
Aggression and hostility <i>p-value</i>	-0.022 <i>0.576</i>	0.042 <i>0.282</i>	0.048 <i>0.216</i>	<b>-0.305</b> <i>0.000</i>	<b>0.357</b> <i>0.000</i>	1.000	
Current subjective well being <i>p-value</i>	<b>0.095</b> <i>0.014</i>	<b>0.212</b> <i>0.000</i>	<b>0.217</b> <i>0.000</i>	<b>0.201</b> <i>0.000</i>	-0.014 <i>0.720</i>	0.003 <i>0.939</i>	1.000

**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		Other transfers received from Govt/NGOs since baseline ('000s of UGX)
	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	
Treated	0.026 [0.021]	0.607 [0.030]***	-5.1 [2.4]**	-2.3 [4.4]	0.611 [0.183]***	0.109 [0.049]**	-11.099 [7.007]	105.650 [51.976]**	16.169 [5.005]***	0.395 [0.206]*	-0.199 [0.093]**	94.466 [30.652]***
Treated x Female	0.015 [0.034]	0.033 [0.046]	-12.5 [8.1]	0.393 [7.7]	-0.563 [0.311]*	-0.097 [0.088]	13.163 [10.471]	-106.643 [78.197]	-10.093 [7.160]	-0.714 [0.283]**	-0.059 [0.132]	-23.984 [44.385]
Female	-0.062 [0.023]***	-0.014 [0.031]	67.8 [5.0]***	-2.7 [4.6]	0.095 [0.185]	-0.045 [0.060]	-7.226 [6.968]	74.759 [54.312]	3.379 [4.107]	-0.238 [0.179]	0.192 [0.094]**	-47.153 [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)
	<b>Hours of training received</b>		<b>IHS(Tools and machines acquired since baseline)</b>		<b>IHS(Stock of raw materials, tools, and machines)</b>	
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 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 4: Payback / Return on investment analysis**

		Months to repay (N)				
		Real annual interest rate (r)				
		None	Commercial prime	Other comercial	Other comercial	Moneylender
		0%	5%	15%	25%	200%
<b>A. Cash earnings QTE - Median</b>						
Per person cost of NUSAF grant	<b>673,026</b>					
QTE, real monthly cash earnings	<b>10,000</b>	67.3	79.1	148.2	inf	inf
	<b>0.1</b>	61.2	70.8	116.5	inf	inf
Nonpecuniary value as % of cash earnin	<b>0.5</b>	44.9	49.8	66.2	132.4	inf
	<b>1</b>	33.7	36.3	43.9	58.6	inf
<b>B. Cash earnings ATE</b>						
Per person cost of NUSAF grant	<b>673,026</b>					
ATE on real monthly cash earnings	<b>19,515</b>	34.5	37.3	45.4	61.5	inf
	<b>0.1</b>	31.4	33.7	40.0	51.4	inf
Nonpecuniary value as % of cash earnin	<b>0.5</b>	23.0	24.2	27.3	31.6	inf
	<b>1</b>	17.2	17.9	19.5	21.6	inf
<b>C. All, but including estimated program costs of 30%</b>						
Per person cost of NUSAF grant	<b>874,933</b>					
ATE on real monthly cash earnings	<b>19,515</b>	44.8	49.7	66.2	131.9	inf
	<b>0.1</b>	40.8	44.8	57.3	1.1	inf
Nonpecuniary value as % of cash earnin	<b>0.5</b>	29.9	32.0	37.7	1.5	inf
	<b>1</b>	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  $\ln(x + (x^2 + 1)^{.5})$ .*

*\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$*