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The Impact of an Adolescent Girls Employment Program

The EPAG Project in Liberia

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Abstract

This paper presents findings from the impact evaluation of the Economic Empowerment of Adolescent Girls and Young Women (EPAG) project in Liberia. The EPAG project was launched by the Liberian Ministry of Gender and Development in 2009 with the goal of increasing the employment and income of 2,500 young Liberian women by providing livelihood and life skills training and facilitating their transition to productive work. The analysis in this paper is based on data collected during two rounds of quantitative surveys in 2010 and 2011, the second of which was conducted six months after the classroom-based phase of the training program ended. Strong impacts are found on the employment and earnings outcomes of program participants, relative to a control group of non-participants. The EPAG program increased employment by 47 percent and earnings by 80 percent. In addition, the impact evaluation documents positive effects on a variety of empowerment measures, including access to money, self-confidence, and anxiety about circumstances and the future. The evaluation finds no net impact on fertility or sexual behavior. At the household level, there is evidence of improved food security and shifting attitudes toward gender norms. These results reinforce the highly positive feedback received from focus group discussions with program participants. Finally, preliminary cost-benefit analysis indicates that the budgetary cost of the EPAG business development training for young women is equivalent to the value of three years of the increase in income among program beneficiaries. These preliminary results provide strong evidence for further investment and research into young women's livelihood programs in Liberia.

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The Impact of an Adolescent Girls Employment Program: The EPAG Project in Liberia

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1. Introduction

Sub-Saharan Africa is the youngest region in the world, and the world's fastest-growing. Between 2010 and 2025, the number of people between 15 and 24 will grow to 250 million – a net increase of nearly 50 percent. Over the next decade, roughly one million young people will enter the labor market each month in Sub-Saharan Africa. However, these young people often enter the labor market too early and unprepared. Although access to education is growing, illiteracy remains high and schooling low: among the 32 Sub-Saharan African countries in the Barro-Lee (2010) data set, nearly 40 percent of women aged 15 and above have received no education at all; and the most recent (2007-2011) statistics in the World Bank's *Edstats* data reveal that female literacy is less than 60 percent, on average.[1]

This lack of preparedness contributes to a growing problem of youth unemployment. Quantifying the level of unemployment is bedeviled by lack of data and measurement issues. Household and labor force surveys throughout Africa usually record unemployment rates of less than 10 percent,[2] but those figures belie the extent of underemployment and vulnerability. Those same surveys indicate that the vast majority of working adults have insecure work in the informal sector, on the family farm, or in less-productive or unremunerated labor. The most recent labor force survey from Liberia mirrors these statistics: there are roughly 1.1 million people in the workforce, of whom 195,000 (about 18 percent) are engaged in wage employment; the remaining 900,000-plus workers (82 percent) are considered in vulnerable employment, working for themselves or working unpaid for their own households (LISGIS 2010).

Among young women (15-24) in Liberia, the unemployment rate is 8 percent, double the rate among young men (LISGIS 2010). Most of these gaps can be explained by differences across individuals, especially in educational attainment, skills training, and years of experience. But segregation, market segmentation, and discrimination do play a role in determining these individual characteristics. Women have fewer opportunities for education or training, less access to credit, a larger share of domestic responsibilities, and less independence and control over their own lives. In Liberia, women comprise half of the employed, but only about one-quarter of paid employment (LISGIS 2011).

Fourteen years of civil war in Liberia devastated the country's infrastructure and institutions, and left a generation of young people with very low levels of education and training. Girls were particularly disadvantaged. In 2003, almost 60% of young girls and 40% of young boys had no formal schooling (ILO/UNICEF 2005). Data from the Demographic and Health survey shows that more than 40 percent of adult women have no education, compared to fewer than 20 percent of men, while 23 percent of women and 44 percent of men have some secondary schooling (DHS 2007). Happily, access to education is rising rapidly, especially for girls: according to the Liberian labor force survey from 2010, the ratio of girls to boys enrolled in primary school has risen from 72 in 2000 to 90 in 2009. Enrollment levels and sex ratios are lower among older children and youth, as they become increasingly engaged in

[1] Both are unweighted averages; Barro-Lee comprises 32 countries with data from 2010; *Edstats* comprises 43 countries with data from 2007-2011.

[2] Defined as without work, available for work, and actively looking for work (LISGIS 2010).

household and productive work. Just over one-third of young (15-24-year-old) Liberians are in the labor force. Young women are more likely than young men to be out of the labor force because they are engaged in household duties (30.4 percent v. 18.9 percent), and young men are more likely to be out of the labor force because they are still in school (75.8 percent v. 63.0 percent) (LISGIS 2010).

Given their initial disadvantage relative to their male peers, and the sources of this disadvantage in social norms, market failures, and poorly functioning institutions, adolescent girls may require targeted policy and program efforts to achieve better outcomes. However, as in many other post-conflict situations, emergency skills training and public works programs in Liberia have targeted male youth ex-combatants, likely reinforcing rather than reducing adolescent girls' disadvantage. The few skills training programs for adolescent girls, run largely by NGOs, have focused on traditional female skills (such as sewing, soap production, tie-dyeing) for which the market is already well-supplied.

Programs designed to enhance employment among young people can focus on the supply side of the labor market, including skills training programs for both wage employment and entrepreneurship training; or programs to augment demand, such as wage subsidies, public works, and community service programs; or programs to help the labor market clear, such as job search assistance and placement services. In addition, it may be that the constraints facing young people are not in the labor market itself, but in other markets, such as for credit. The vast majority of jobs programs have focused on the supply side: training programs make up about 79 percent of over 600 cases included in the World Bank's Youth Employment Inventory database.[3]

Although rigorous and general evidence of success is limited, it seems that successful skills training programs share a few key features: they are responsive to local market conditions, they provide more than just technical skills in a specific area (including, for example, "life skills"), and they include ancillary services that alleviate other constraints preventing successful labor market integration (e.g., access to credit). Among the most celebrated are the *Jovenes* programs that provide demand-driven technical training, plus social skills that help in the labor market, plus internships. These programs have had positive impacts on wages and employment, especially for young women and those from more disadvantaged backgrounds (Ibarrarán and Rosas 2009).

This paper evaluates the first round of the EPAG ("Economic Empowerment of Adolescent Girls and Young Women") skills training program implemented by the Government of Liberia from 2010 to 2011. EPAG was designed to alleviate the barriers to entering the labor market faced by young women, while avoiding the shortfalls of previous skills training programs offered in Liberia. The program combined six months of classroom-based technical and life skills training, with a focus on skills with high market demand, followed by six months of follow-up support to enter wage employment or start a business. Roughly 1200 young women aged 16-27 participated in the first round of EPAG.

[3] See http://www.youth-employment-inventory.org/. Also, although focused on a narrower time frame and using a different selection criterion, the joint ILO/World Bank Inventory of Policy responses to the Financial Crisis (http://www.ilo.org/crisis-inventory) finds that "about 78 percent of reported policy measures focused on the supply side", essentially through training (ILO/WB 2012).

The outcomes of interest for this impact evaluation fall into three categories. First, we are interested in the economic outcomes of EPAG participants in terms of employment, earnings, and savings and investment behaviors. Second, because of the program's focus on young women, a variety of non-economic outcomes are explored. Early evidence suggests that empowerment in one realm (e.g., schooling) can have important impacts on other realms, such as early pregnancy, prevalence of STDs, and risky behaviors such as transactional sex (Baird 2010). Related to these non-economic outcomes are measures of social empowerment, including mobility, decision-making, and self-confidence, which are thought to strengthen women's agency, or capacity to exert choice over decisions involving herself, her family, and her community. Finally, we investigate a third set of outcomes on spillover effects. Evidence suggests that women tend to invest more of their income in their families, especially their children, than do men (e.g. World Bank 2001, Hoddinott 1995, Pitt 1998, Borges 2007). Advocates frequently argue for increased investment in adolescent girls by pointing to the potential for spillovers onto other family members (including future children). Our evaluation explicitly investigated these spillovers by including household-level indicators such as food security and attitudes of the household head toward gender norms.

Our results show strong impacts on economic outcomes, including large and statistically significant increases in employment and earnings of EPAG participants. We show mixed results on empowerment-related outcomes, and very little evidence of spillovers on non-participants. Self-assessed measures of self-confidence show huge gains, as does ownership and control over monetary resources such as savings.

The remainder of the paper is organized as follows: Section 2 describes the EPAG project including some of its innovative design features and implementation details. Section 3 reviews the methodology of the evaluation and Section 4 presents results on the three groups of outcomes discussed above: economic, empowerment, and spillovers. Section 5 includes a short discussion of cost-effectiveness. Section 6 presents a series of robustness checks and Section 7 concludes with a discussion of next steps and policy implications.

2. The EPAG Project

The EPAG project is part of a larger Adolescent Girls Initiative (AGI) administered by the World Bank with support from the Nike Foundation and the Governments of Australia, the United Kingdom, Norway, Denmark, and Sweden. Launched in Washington DC in October 2008, the AGI was spearheaded by President Ellen Johnson Sirleaf, who signed on to undertake the initiative's first pilot project in Liberia. The Liberian pilot was launched in March 2010 and has served as a role model to seven subsequent pilot projects in Rwanda, South Sudan, Nepal, Afghanistan, Haiti, Jordan, and Lao PDR.

Under the global AGI, young women and adolescent girls are given a package of skills training and complementary services in order to facilitate their successful transition to employment. In the case of EPAG, the intervention consisted of a six month phase of classroom-based training, followed by a six

month placement and support phase in which the trainees were supported in their transition to self or wage employment. Upon recruitment, the participants are assigned to a "Job Skills (JS)" track or a "Business Development Services (BDS)" track. When possible, the participant's track preference was honored; however, the demand for the Job Skills track greatly exceeded the supply, so the remaining trainees were placed into the BDS track. In the first round of training, the proportion of Job Skills track places was limited to 35% of the total training places available given the expectation that few wage jobs will be available in the Liberian job market. The Job Skills track provided training in six areas: 1) hospitality, 2) professional cleaning / waste management, 3) office / computer skills, 4) professional house / office painting, 5) security guard services, and 6) professional driving. These areas were determined based on independent labor market assessments, a review of the available market data, and input from EPAG's private sector partners. All Job Skills trainees received training in entrepreneurship skills as well. The BDS training taught young women how to identify micro-enterprise opportunities based on an assessment of market needs, and how to grow and manage any existing businesses they already had. The curriculum included entrepreneurship principles, market analysis, business management, customer service, money management, and record-keeping.

The EPAG program was implemented by four NGOs who were selected by the Liberian Ministry of Gender and Development through a competitive bidding process: the Community Empowerment Program (CEP), Liberia Entrepreneurial and Economic Development (LEED), the International Rescue Committee (IRC), and the American Refugee Committee (ARC). Two of these organizations (ARC and IRC) further subcontracted to four Liberian NGOs.[4] The service providers were responsible for developing training curricula, identifying training venues,[5] making arrangements for childcare services, assisting with the mobilization of the nine target communities, and participating in the recruitment of training participants.

The EPAG program differed from many training programs in a number of ways. First, performance bonuses were awarded to training providers that successfully place their graduates in jobs or micro-enterprises. The bonus was the last payment that the service providers received under their contracts. These were paid about 12 months after the start of training, or around the same time as the midline survey. Second, a variety of contests and competitions were also held among EPAG trainees (such as attendance prizes, quizzing contests, business plan competitions, etc.). Third, the EPAG program was designed around the girls' needs: service providers held both morning and afternoon sessions, to accommodate the participants' busy schedules; trainings were held in the communities where the girls reside; and every site offered free childcare. Fourth, frequent and unannounced monitoring visits by MoGD staff ensured that the service providers created and maintained a high-quality learning

[4] There are: National Adult Education Association of Liberia (NAEAL), Community Empowerment Sustainable Program (CESP), EduCare, and Children's Assistance Program (CAP).

[5] A total of 19 training venues were used during the first round of training. They were chosen with the following considerations in mind: 1. Girls' safety, so that the buildings are not so isolated or otherwise dangerous, raising security concerns for girls. 2. Conducive atmosphere for learning, spacious and sanitary with access to water and latrine facilities. Reasonably outside community noise concentration. 3. Proximity to community center and to security posts such as police depots. 4. Accessible to girls from various parts of the community.

environment. Any issues discovered during these monitoring visits were brought to the attention of service providers and resolved swiftly in conjunction with the project coordination team at MoGD.

Eligibility: The EPAG program was targeted to young women who: i) were age 16 to 27, ii) possessed basic literacy and numeracy skills, iii) were not enrolled in school within several months prior of the program initiation, and iv) resided in one of nine target communities in and around Monrovia.[6] These eligibility criteria stemmed from the project's objectives to reach young women at an early enough age to significantly improve the trajectory of their working years, to focus on girls who already had the basic literacy and numeracy skills needed to succeed in the labor market, and to avoid incentivizing applicants to drop out of school. The literacy requirement in particular, although basic, made the EPAG program out of reach for many of the most vulnerable young Liberian women; the requirement reflected a deliberate choice on the part of program designers in the face of a tradeoff between serving the most vulnerable and serving those who could most readily make use of this relatively short training program.[7]

The team recognized that it was difficult, if not impossible, to require documentation from the applicants to verify each of the eligibility criteria (especially age, since many Liberians do not have any official form of identification). Hence the application process relied primarily on self-reported data. To counter the likelihood that applicants would give false information in order to gain entry into the program, the eligibility criteria were not made public; the mobilization and outreach campaigns did not specify the precise age or education requirements for the program. During the recruitment events, each applicant had to physically present herself, fill out an application form specifying her age, education history, and residence. A simple literacy and numeracy assessment was also administered at the time of application. Beyond these basic eligibility criteria, no further selection criteria were applied, and program managers did not choose whom to train. A “randomized pipeline” design was adopted in which eligible candidates were assigned by lottery to one of two rounds of the program, where those assigned to the second round would serve as a control group for the evaluation. Every applicant who met the eligibility criteria had an equal chance of participating based on the lottery results.

Retention and Attendance: After dividing EPAG trainees into two rounds, or cohorts, for the training, the first round of training was held from March 2010 to February 2011. The classroom training was held from March through August, during which the project achieved a 95% retention rate (far higher than similar programs in Liberia and elsewhere), and an average attendance rate of nearly 90% during the classroom training phase. EPAG trainees were given incentives to participate and to make the most of their training: they signed "Trainee Commitment Forms" at the start of the training, they were paid small stipends and a completion bonus contingent upon attendance, they were offered free childcare at every training site, they were assisted to open a savings account at a local bank in which to save their

[6] Bassa Community, Battery Factory, Bentol, Doe Community, New Kru Town, Old Road, Red Light, and West Point in Montserrado County and Kakata in Margibi County.

[7] To alleviate the burden of this requirement, the second round of the EPAG program included a preliminary basic literacy program to help otherwise eligible young women to improve their literacy and numeracy skills in advance of entering the program.

stipend money, and they were formed into small groups or "EPAG teams", each with a coach or mentor, to foster support networks and boost attendance.

3. Methodology

3.1. Research design

The impact evaluation of the EPAG project uses a randomized controlled trial, in which eligible applicants to the program were randomly assigned to participate in one of two cohorts (or "rounds") of training. The treatment group is defined as those who were offered a space in the first round of training and the control group comprises those assigned to the second round. Selection into the training rounds was performed on a computer (using Excel) and was stratified by the track choice of the applicant (job skills versus business development skills), community, and service provider. Data were collected using three quantitative household surveys (baseline, midline, and endline) and two sets of qualitative focus group discussions (one after each round of training). A timeline of the impact evaluation is depicted in Figure 1. During both the baseline and midline surveys, the head of the household in which the EPAG participant was residing was also interviewed, in order to examine potential spillover effects of the program on non-treated household members. The household head interviews also provided an opportunity to gather useful household-level information (including assets, housing characteristics, and household head characteristics) to be used as control variables in our analysis. The baseline survey was conducted before participants were informed of the outcome of the randomization, and the midline survey was conducted one year after the baseline survey, one month after completion of the first round of training and before the start of the second round.

The results in this paper are based on a panel data set that includes data from the baseline and midline surveys as well as administrative and monitoring data from the program implementation team. Note that although the midline data collection occurred just one month after the completion of the intervention, the intervention itself includes 6 months of post-training follow-up; hence the midline survey captures outcomes of the first cohort 7 months after they exited the classroom-based training. This timing was necessary to prevent too long of a delay between cohorts; the second cohort of trainees started immediately after the midline survey was completed. Future analysis using endline data will examine the trends in outcomes of both groups after Round 1 completion, but will not involve comparison against a pure control group of non-participants.

3.2. Sample and attrition

Following the communications and outreach campaigns in each of the nine target communities, during which 2,106 young women were originally recruited to be a part of the EPAG program,[8] a randomized

[8] The original recruitment effort fell short of the target of enrolling 2500 participants. Hence, before the second round of training, another recruitment effort was launched and an additional 617 girls were enrolled. These girls are not included in the impact evaluation since they were not subject to the initial random assignment.

assignment process was conducted to assign the trainees to the first or second round of training.[9] Of those entered into the random selection, 1273 young women were assigned to the first round of training, with the remaining 808 to serve as a control group (the control group would participate in the second round of training starting in July 2011). Of the 1273 assigned to treatment, 118 women were not found or chose not to participate after they were selected.[10] In order to fill at least some of these slots, 39 young women from the control group were randomly issued as replacements, resulting in a modified control group of 769 individuals. In the end, 1191 young women entered the first round of training.[11] The assignment process and all post-randomization modifications are summarized in Figure 2.

Table 1 reports the baseline and midline survey response rates leading to the sample used for the analysis in this paper. The target sample for both the baseline and midline survey consisted of the original 2106 EPAG recruits, of which 1989 were successfully interviewed during the baseline survey.[12] At midline, 1736 were interviewed, including 56 who were not interviewed at baseline. For our analysis, we drop individuals who were excluded from the randomization or who were manually re-assigned from control to treatment as replacements after the randomization. We also drop individuals for whom we lack household information at baseline,[13] resulting in a final panel of 1601 individuals. In section 6 on "Robustness Checks" we investigate the potential biases introduced by sample attrition.

3.3. Identification

Our identification strategy relies on a straightforward difference-in-difference OLS model, owing to the randomized nature of selection into the program. The analysis will focus on estimating the intention-to-treat (ITT) estimate, which considers all participants initially assigned to the first round of training as part of the "treatment" group, regardless of whether they actually joined or completed the classroom training phase of the program. In the results section we will show that these ITT estimates are identical to the average outcomes among those who actually completed the program (the "ATT" estimates).[14] The main regression model is specified in equation (1) below.

$$Y_{it} = \beta_1(Post_t \times Treat_i) + \beta_2 Post_t + \beta_3 Treat_i + \beta_4 X_{i0} + \varepsilon_{it} \quad (1)$$

[9] Of the 2106, twenty-five were pregnant and late into their pregnancies, so they were assigned to Round 2 directly and not entered into the lottery at all. These 25 were included in the surveys but have been dropped from the analysis because they were not assigned randomly.

[10] The reasons given for not entering the training included: 1) they were back in school, 2) they had moved to a distant location, 3) they were seriously ill, 4) they had found full-time work, 5) they were not interested or able to make such a big time commitment, or 6) they could not be located despite numerous efforts.

[11] This includes 1155 of the original 1273 assigned to treatment, plus 36 out of the 39 "replacements"- young women from the control group who were offered a chance to be reassigned to round 1.

[12] Note that a previously released baseline report for this evaluation was based on 2008 observations. However, after cleaning, 4 were found to be duplicate observations and 15 were not found in the program data and hence were dropped from the midline analysis. This leaves 1989 baseline observations that are included in the midline analysis.

[13] These are cases in which the adolescent girl was interviewed but the household head interview was not conducted because the head was not available, could not be found, or declined to take part.

[14] This suggests that the loss of the 118 young women who were selected but declined to take part, and the 60 who started but did not complete the program, does not bias the results.

Y_{it} is the outcome of interest for individual i and time t. $Treat_i$ is an indicator which is equal to 1 for treated individuals and 0 otherwise. $Post_t$ is an indicator equal to 1 for midline observations and 0 for baseline. X_{it} is a vector of controls at baseline (t=0), including individual characteristics (education, age, current pregnancy, marital, parental, and orphan status) and household characteristics (sex of household head and household size). β_1 is the coefficient of interest that defines the "impact" of the program on individuals in the treatment group. The model also includes dummy variables for the communities where the program was implemented (and where the trainees resided) as well as the program track (business skills or job skills) to which the respondent was assigned. Finally, in order to control for household wealth, we compute an index based on household asset ownership at baseline using multiple component analysis, similar to the method described in Filmer and Pritchett (2001). After constructing the index, which includes thirteen household assets and six indicators of housing conditions, we control for the quintile of household's overall asset position in all regressions. We augment this basic specification with an individual fixed effects model and find that the results are almost identical. For binary dependent variables, we estimate both linear probability models and probit models analogous to the one given in equation (1), again finding that the results are nearly identical across all outcomes. We cluster the standard errors by classroom in all models, and to account for the interaction effect for variables such as ($Post_t$x$Treat_i$) we additionally follow Ai and Norton (2003) to correct the standard error for interaction terms in probit models.

3.4. Baseline characteristics

Table 2 presents baseline balance tests for survey respondents from the treatment and control groups.[15] In addition to confirming the success of the randomization, as judged by the very few significant differences between the two groups, the table provides a vivid profile of the average EPAG participant. The study population has an average age of 23 years, with 55% falling between 20 and 24 years. The majority have never been married, while 29% are cohabiting with a partner and only 5% are married. The majority of the study population has started or completed high school, which is consistent with the program's target group of young women with basic literacy and numeracy, and with the program's goal not to encourage girls to drop out of school. Thirty-eight percent of the sample was already engaged in at least one income-generating activity (IGA) at baseline. This is consistent with the national figures from the 2007 DHS survey, which found labor force participation rates of 34% for women aged 15-19 and 49% for women ages 20-24. It is also consistent with the Liberian 2010 Labor Force Survey, which found labor force participation rates of 25% for women aged 15-19 and 47% for women aged 20-24.For the purposes of this study, to be consistent with program objectives and the Liberian context, our definition of income-generating activity encompasses the full range of activities through which people earn money, including paid employment, either formal or informal, and self-employment in small business or through petty trade. The most common types of IGAs reported at baseline were petty trade, including

[15] The balance tests are run on the same sample as will be used in the impact analysis in Section 4, that is, the subset of individuals for whom we have a panel. Balance tests run on the full sample of baseline survey respondents, regardless of whether they also participated in the midline survey, confirm the same findings. A report summarizing the balance tests on the full sample, including comparisons to nationally representative data, is available upon request from the authors.

street vending (48% of those with at least 1 IGA), food processing for sale, including baking, cooking, and drying (16%), and home production of crops, livestock, and fish (11%).

It is important to note that the EPAG program was not targeted toward the most vulnerable segments of Liberian society, but rather toward young women with enough education to be able to benefit from a training program of this nature. Based on comparisons from the 2007 CWIQ (Core Welfare Indicators Questionnaire) survey, the average EPAG participant is more educated, more literate, more likely to be engaged in an income-generating activity, and owns more assets than the average Liberian women of the same age group: mobile phone ownership was high (63%), as was the proportion reporting that they had some money of their own (79%). Even compared to other similar residents of Monrovia, the EPAG participants are better educated and have higher income.

A strong sense of female empowerment at baseline emerges from the sections of the survey instrument having to do with self-confidence and agency. Survey respondents reported a high degree of freedom of mobility, a high degree of control over money (both earned money and the money needed to pay for items like food and medicine), and a high level of agreement with statements such as "If I had the chance, I would like to become a leader in the community, as I would be a good one". With such high rates of self-confidence at baseline, there was limited scope for improvement on these measures. Their self-confidence was a bit more tempered on issues related to running a business or searching for a job: a composite score based on self-assessed ability to perform a series of tasks[16] yielded a mean of 2.4 out of 4.0 (with standard deviation 0.86) at baseline, leaving room for improvement. Because of concerns about the limited usefulness of the empowerment questions asked at baseline, some questions were dropped and new measures were added for the midline survey only.

Panel 6 of Table 2A summarizes the family background characteristics of the study population, who tend to come from large families and frequently have lost one or both parents. A large majority (78%) were displaced during childhood or adolescence due to the long-running Liberian civil conflict (1989-1996; 1999-2003). Furthermore, about two-thirds of study respondents were already mothers before entering the program, with small but significant differences between the treatment and control groups. Similarly, 7.5% of study respondents were pregnant at baseline, with a slightly higher rate in the control group. Because of these significant differences in parental and pregnancy status, these variables are included as controls in the subsequent analysis presented in Section 4. Panel 7 also investigates sexual behaviors of study participants. Almost all have been sexually active, with a slightly higher age at sexual debut for the control group. Sexual behaviors are very similar across treatment and control groups, with most girls reporting one regular sexual partner, and one-third of respondents reporting ever having a casual sexual partner. Seventy percent have used a condom, with about 55% reporting having used one in their last

[16] The specific questions asked the respondent to rate how well she would be able to perform the following activities: find information about job opportunities in your area, run her own business, save in order to invest in future business opportunities, manage business finances effectively, bargain with a supplier to obtain good prices when purchasing, collect money from someone who owed her for purchases who are not repaying on time. Numerical values were assigned to each response. The score is based on the average across all the activities on which the respondent reported, conditional on having responded to at least half the activities.

sexual encounter. Finally, about 10% of study respondents have experienced a forced sexual encounter in their lifetimes, which is consistent with the national figure of 13% for this age group (DHS 2007).[17]

Table 2B presents baseline balance tests for the household characteristics of respondents in the study sample. More than 40% of households are headed by females, and the average household has slightly fewer than five members. The mothers of EPAG respondents tended to have very low education levels (almost 60% had never been to formal school), while the fathers had more variance in their education (about a quarter had no schooling, but over 60% had at least some secondary education). In both treatment and control households, a high proportion of school-aged children are in fact enrolled in school. Less than half of young people aged 13-30 in study households have any employment. Housing conditions are also similar across experimental groups. Tables 2A and 2B include a representative, but not exhaustive, list of indicators that were tested for balance by the authors. We conclude that the presence of very few significant differences between the individual or household characteristics between the two experimental groups indicates a high degree of internal validity for the study.

3.5. Limitations of the approach

As is always the case for these studies, there are limits to the generalizability (external validity) of these results. First, the roll-out design may not ensure a perfect comparison of "treatment" with "no treatment." Both groups may alter their behavior in response to the presence of the program as well as to their selection into the various experimental groups. The impact of this behavioral change is most likely insignificant. In the case of the roll-out design, the members of the control group know that they will receive the intervention in twelve months or so. This may lead them to exert less effort to find alternative employment outside the program. This will increase the apparent results of the program, if the control group outcomes are depressed in the short run by the expectation of treatment.[18] Ideally, one would have access to several months of data prior to selection into the program and assignment to treatment, in order to see the impact of this expectations-related behavior change. Such data were not available for this evaluation, so it is not possible to ensure that the control group did not modify its behavior in anticipation of the program. However, the program itself was designed to fit within the young women's lives, specifically with regard to their employment, education, and childcare duties. Training schedules were flexible, to allow participants to continue with their pre-existing educational and income-generating activities (and many participants did report continuing with these activities) and free childcare was provided. Hence, at least for these three dimensions of life, there would not have been much incentive to change one's behavior prior to starting the program. While these explanations do not erase concerns about anticipatory behavior, they at least mitigate them.

The generalizability of these results is also limited by the differences between the EPAG target group and the population of young women in Liberia. First, a high proportion of adolescent girls and young women in Liberia are illiterate or have very low literacy, while the participants recruited for the EPAG

[17] Gender-based violence questions were administered in line with international ethical protocols, with additional informed consent procedures and referral mechanisms as needed.
[18] See Ashenfelter (1978).

project had to meet a basic minimum literacy level in order to qualify for admission to the program; whereas only half of the 15-29-year-old female respondents to the nationally-representative Core Welfare Indicators Questionnaire (CWIQ) survey report that they can read and write (LISGIS 2007). Fewer than two percent of the girls in the EPAG study responded that they had no education, which is much lower than in the CWIQ survey. Second, the majority of adolescent girls and young women in Liberia reside in rural areas, whereas the survey participants were residing in urban and peri-urban areas, where access to basic social services may be much more improved. Consequently, the results are not representative of adolescent girls and young women in Liberia overall. The results are neither indicative of the average Liberian girl and young woman; nor are they indicative of the average Liberian girl or young woman in the project communities. They are only indicative of the average girl and young woman who are part of the EPAG project.

Finally, many of the variables that we examine in this study are measures of self-assessed levels of satisfaction or belief. These are entirely subjective variables, and are subject to significant measurement error. There is considerable evidence that the wording of these questions can affect the answers given, as can the order in which the questions are asked. Social desirability bias also affects the answers: respondents can interpret from the wording of the questions or the attitudes of the interviewers what sort of answers are more or less acceptable or expected. Behavior that is private or about which there are social strictures is more likely to be misreported. In addition, we are all bad at understanding our own motivations or beliefs, and we are all tempted to report beliefs that justify or at least are consistent with our behavior: if we do not go to the cinema, we can say that it is because we did not want to go, and we discount the reasons or constraints that might have influenced our decision not to go (Bertrand and Mullainathan 2001). That said, these questions do contain real information about attitudes, beliefs, and behavior, and there is no reason *a priori* to expect that the errors differ systematically across treatment and control groups. In fact, ex-ante tests of balance show that these two groups are identical in these observed characteristics.

4. Results

This section provides an overview of the impact of participating in the EPAG program on a variety of outcomes. As described above, "impact" is defined as the change in outcomes observed for the treatment group between the baseline and midline surveys, relative to a control group of respondents who did not participate in the first round of training. We present the results for the primary outcomes of interest – income and employment, and on a range of other outcomes, including savings behavior, various measures of empowerment (including self-efficacy and self-confidence), fertility and sexual behaviors, and, finally, household level outcomes.

4.1. Economic Activities

Table 3 presents the main results of the EPAG program using two sets of estimates. The first are the "Intention to Treat" estimates: these compare the outcomes of everyone who was originally assigned to receive the treatment with those that were assigned to the control group, regardless of whether the participants actually received the training. The second set presents instrumental variables results, in

which receipt of training is instrumented by the initial assignment to treatment. All results are estimated as OLS (or IV); nonlinear estimations (probits) for binary variables are consistent with the OLS results and are available on request.

Recall that at baseline, nearly four in ten (38 percent) young women in the study population – treatment and control – have at least one income-generating activity. At mid-line, the number of participants in the treatment group engaged in activities to earn income increased by 18 percentage points, relative to the control group. Economic activity also increased among members of the control group between the baseline and midline surveys, but the increase was much greater among the treatment group. The estimate of 18 percentage points translates into a 47% increase in employment, from a baseline employment rate of 38%. This is a significantly greater improvement than has been seen in many other similar programs around the world. Other interventions have occasionally found large impacts (e.g. the Chile and Peru *Jovenes* programs), but most programs have yielded relatively modest impacts. Moreover, as one review noted, the successful *Jovenes* programs rely heavily on a positive macroeconomic context – particularly in terms of job creation (Ibarrarán and Rosas 2009). In the absence of robust private employment growth, job skills development programs have generally performed poorly.

Table 3a disaggregates the outcome into those EPAG participants who received job skills training and those who received training and support in enterprise development. This table shows first that the training worked, in the sense that those who received job skills (JS) training were more likely to find wage employment than those in the control group, and more likely to find wage employment than to open their own business. Similarly, those who received business development (BDS) training were more likely to establish their own businesses than those in the control group, and also more likely to open their own business than to find wage employment. This table also shows that own-account employment is more common than wage employment, and that the EPAG program was more successful in enhancing self-employment than wage employment. At baseline, about five percent of the EPAG JS participants were engaged in wage labor; at midline, this increased by 15 percentage points among the JS beneficiaries. At baseline, about 37 percent of the EPAG BDS participants were engaged in own businesses; at midline, this increased by 20 percentage points among the BDS participants. On average, the probability that participants in the BDS track found employment increased roughly twice as much as among those in the JS track. This does not necessarily say anything about the relative quality of the training offered – it most likely reflects the structure of the labor market in urban Liberia. The vast majority of employment is in the informal sector, and in own-account activities. According to the 2010 Labor Force Survey, 68 percent of all employed Liberians, and 75 percent of employed women, work in the informal sector (LISGIS 2011), and nearly 70 percent of employed women are self-employed. Even among participants in the JS track, those with some income-generating activity at midline were equally likely to be self-employed as employed in wage labor. The JS training, although primarily focused on wage employment, did include a short module on self-employment basics in order to equip participants for the possibility that many would not find wage employment.

Tables 3b and 3c disaggregate the results by location and by individual characteristics. Of the nine communities in which the EPAG program was delivered, the training was effective in six. Only in the neighborhoods of Battery Factory and New Kru Town were the impacts not statistically significant. The estimate of the impact of training in the West Point community is negative, suggesting that participants are ten percent *less* likely to be employed than non-participants. This was an exceptionally difficult community to work in, and had unusually high attrition, especially among the control group.[19] Table 3c presents the impact of the EPAG program across education and wealth class. Although significant and positive impacts are seen across the entire wealth distribution, the program was significantly more effective among participants in the middle wealth classes than among the very poorest and very wealthiest. Among the poorest and wealthiest quintiles of our study population, the program had no statistically significant impact, while the impact on the middle wealth quintile is a whopping 34 percentage points. In addition, that the program had a greater impact among those with more education than less, and there is no discernible impact among those with no education (the estimate is large, but statistically insignificant, which may be due to the relatively small number of participants with no education); the greatest impact is found among those who have completed high school. On the one hand, these findings are not surprising, since EPAG was not designed to reach the poorest or most vulnerable; rather, the first round was designed to show a demonstration effect among high-potential girls. Bearing in mind that our study population is better off than the Liberian population as a whole, the relative ineffectiveness of the EPAG program for its poorest and least educated participants in the first round has deep implications for the success of the program if it were to be expanded. Subsequent rounds of EPAG have already begun to address this issue, by adding a preliminary basic literacy training component before the second round of training to better prepare girls with low literacy before starting the program. These results indicate that in order to effectively serve the even poorer and less educated girls outside the capital as EPAG scales up, further adaptation may be needed. Finally, this table shows that the impact among younger (15-19) participants seems to be greater than that among older (20-24 and 25-27) participants.

Beyond employment rates, the EPAG program also increased the intensity of employment among those in the treatment group relative to those in the control group. One can disaggregate the total impact on employment, and on earnings, as the sum of two separate processes: first, it can bring people into employment who were previously not engaged in the labor market (the extensive margin); second, it can increase the productivity or the level of activity among those who are already working (the intensive margin). As table 4 shows, the EPAG did increase the average number of days employed among the entire group of participants, but among those who were employed, it increased the number of days worked in a typical week only from 5.3 to 5.5. Similarly, while EPAG did increase the number of hours worked, on average, it did not increase the number of hours worked among those who had employment. In other words, the program succeeded in enhancing employment primarily on the extensive margin, i.e., by bringing more people into the labor force rather than by enhancing the productivity of those who are already working.

[19] These are the OLS results; the probit results for West Point are not statistically significant.

Panel 2 of Table 4 shows that the program was also highly successful in increasing the incomes of EPAG participants. Participants in the program saw their incomes rise by 80%, relative to those in the control group, from a mean of LD 700 (about US$10) per week to LD 1260 per week (about US$18). This result was obtained using a simple OLS model that compares the income of the treatment and control groups without regard to current employment status: individuals without employment, and hence have zero income, are also included in the comparison. The same regression using logged earnings as the dependent variable yields an even higher estimate of a 130% increase in earnings.

This table also shows the impact of the program on earnings for those individuals who are actually working. Earnings are determined in a two-step process: first the individual makes a decision of whether or not to engage in employment: conditional on that choice, the final outcome of earnings is realized. We use a Tobit model to examine the impact of EPAG on earnings conditional on having some income. In the first stage, the Tobit model estimates a 16 percentage point impact on the likelihood of having earnings greater than zero, compared to the 18 percentage point coefficient in Table 3 on the likelihood of employment. Conditional on having non-zero earnings, the Tobit model predicts an increase of 418 LD in weekly earnings, which is only a bit less than the estimate of 563 LD obtained in the unconditional OLS regression. We interpret these results to indicate that EPAG improved earnings through two channels: by increasing the number of people with non-zero earnings by bringing more people into employment, and by increasing the productivity of those who were already engaged in income-generating activities. These effects are significant, both statistically and economically, and much larger in magnitude compared to other vocational training programs that have been rigorously evaluated.

As was discussed earlier, self-employment is much more common than wage employment: graduates of the BDS program are more likely than graduates of the JS program to have found employment, and about half of those who went through the job skills training and found subsequent employment are self-employed. These results are confirmed by a disaggregation of the earnings results, shown in Table 4A. Although those in the JS track have higher earnings at baseline, there appears to have been no significant impact on earnings (unconditional) among JS beneficiaries, whereas the BDS graduates see their earnings more than double. Happily, even though the impact of the program on employment seems to vary across the wealth spectrum, the impact of the program on earnings seems relatively equitably distributed. The increase in earnings appears to be progressively distributed across education classes, apart from those with no education, for whom the program does not appear to have had any significant benefit. Those with primary education only saw their incomes increase by 700 LD, double the increase experienced by beneficiaries with a high-school education. Finally, similar to the results on employment, younger (16-19) EPAG participants experienced a larger increase in earnings than older (20-27) participants.

4.2. Savings and Loans

Much has been written about the importance of monetary and other assets, especially for young women, as a way to smooth consumption, improve bargaining power, invest in productive activities, and

cope with the emergencies that arise all too often.[20] To facilitate successful coping and provide a safe place to save, the EPAG program assisted each participant to set up a savings account at a local bank if she did not already have one. Table 5 presents midline survey results that indicate that the treatment group were nearly 50 percentage points more likely to have savings than the control group, and were saving on average LD 2500 (nearly US$35) more than the control group. EPAG graduates were also twice as likely as the control group to have outstanding loans (six percent v. three percent), and have loans from formal lenders (five percent v. two percent),[21] although the overall rate of obtaining credit remains extremely low.

4.3. Empowerment

The Adolescent Girls' Initiative is based on the hypothesis that livelihood and life skills training for young women will improve their lives in more than just narrowly-defined economic dimensions. In addition, evidence is increasing that these soft skills are also essential for success in employment (Borghans et al. 2008). Surveys of employers consistently find that more than hard, technical skills, employers value these harder-to-quantify skills of honesty and integrity, problem-solving ability, work ethic, communication skills, the ability to work productively with others, responsibility and dependability (Blom and Hobbs 2007). The AGI program has focused on the development and measurement of these softer attributes that matter for employment as well as those that matter more to the individual, such as self-confidence and empowerment. Despite the challenges of measuring such subjective outcomes, the survey instruments included panels of questions designed to elucidate a nuanced picture of the personality and psychosocial characteristics that are most relevant for labor market success.

Table 6A presents results on empowerment and decision-making. The first series of questions have to do with control over resources, spending decisions and earnings. Respondents were asked how much control they had over how to spend their own earnings; also, whether they had money of their own for basic uses that they alone could decide how to use, without having to ask for permission. The EPAG baseline survey found that respondents reported a high degree of control over resources even before the program started. Because of this, the program impacts on control over resources were small, albeit statistically significant: 80 percent of respondents at baseline said they controlled their own resources, with a seven percentage point increase for the treatment group (relative to control). Similarly, 80 percent of those engaged in income-generating activities said that they controlled the money they earned. The midline results indicated that among the treatment group, this had increased by roughly eight percentage points. As shown in the second panel, EPAG graduates report that they worry less than those in the control group. They are less likely to worry about their jobs or incomes or that they won't be able to pay for basic necessities, and those with partners are less worried about their relationships breaking up. The impact on subjective well-being, as measured by a series of questions about the respondent's satisfaction with various dimensions on her life, indicate that EPAG was most

[20] See for example Ashraf et. al. (2010); Morcos and Sebstad (2010); and Austrian and Ghati (2010).

[21] "Formal" loans are those from banks, credit groups, susu, or money lenders; "informal loans" are those from parents, friends, relatives, or business partners.

successful in improving the degree of satisfaction with one's job or business, in line with the program's primary objective.

Measures such as self-confidence, self-control, and assessments of own capabilities were already remarkably high among the young women in the study population at baseline, so we didn't expect to see a great improvement among the treatment group at midline. Nonetheless, two measures of non-cognitive skills were administered at baseline and midline, and results are presented in the fourth panel of Table 6A. The first indicator is a measure self-regulation:[22] whether the young woman can formulate a goal, make a plan, stay on course despite setbacks, modulate intense emotions, and so on. Self-regulation and self-control have been shown to be strong correlates of labor market success. Respondents were asked whether they agreed with a set of eleven statements about themselves; these responses were then aggregated into a single score reflecting the proportion of responses indicating an ability to self-regulate. The impact of the program on this aggregate measure of self-regulation is not statistically significant. This may reflect the relative stability of these characteristics over time. In contrast, the self-assessed entrepreneurial score is based on questions asking how well the respondent believes she could perform a series of six tasks related to starting or running a business, and can be considered a task-oriented measure of self-efficacy. The aggregate measure of entrepreneurial ability increased by roughly nine percentage points among EPAG beneficiaries relative to those in the control group, equivalent to a quarter of a standard deviation. Enhancing participants' self-confidence to perform these tasks was one of the main immediate objectives of the BDS training program.

Table 6B summarizes the results on a series of questions on attitudes and self-confidence that were added during the midline survey only (hence no panel analysis is possible). EPAG graduates report a more positive attitude: they feel more in control and more comfortable, and they have greater confidence in their own business abilities as well as in their personal and social lives. They are also more confident than the control group in their personal relationships with spouses and partners, consistent with the findings in Table 6A. Both treatment and control group respondents report equally high confidence in their ability to return to school "should [she] decide to do so."

These findings from the quantitative impact evaluation complement the results from a set of qualitative focus group discussions that were held with participants at the end of the 6 months of classroom training. Twenty-five percent of the trainees from Round 1 participated in a total of 34 focus group discussions that covered a variety of topics including their satisfaction with the program and their empowerment in both social and economic realms. The trainees overwhelmingly voiced a high degree of satisfaction with the training, and trainers commented on how the motivation or "seriousness" of the participants grew over the 6 month period. The trainees credited the transport allowance and free childcare in particular as features that facilitated their full participation; as one trainee commented,

[22] Questions adapted from the Adolescent Self-Regulation Inventory, developed and validated for youth in the United States by Moilanen, 2006. The questions were revised and translated into an 11-item for the Liberian context. In the future, we plan to conduct basic testing on this scale on internal consistency and reliability.

"The [childcare] service made it difficult to have any excuse for missing class."[23] In terms of empowerment, the most striking finding concerned the participants' aspirations and visions for the future that seemed to spring from their participation in EPAG. Far from being content with the vocations in which they were being trained, the participants expressed repeatedly their goal to use these vocations as a "stepping stone" to higher goals, citing professions such as medicine, business, nursing, and politics. The trainees appeared to understand fully that these professions would require formal education; many girls stated their primary goal in pursuing employment was to save money to be able to return to formal education. Although educational enrolment was not detected as a significant impact in the quantitative survey (at midline, the treatment group was not more likely to be enrolled in school, including night school, than the control group), the high aspirations of both the treatment and control groups, consistent with the qualitative results, is apparent in their positive responses on the question regarding their perceived ability to return to school (Table 6B). Other qualitative findings related to empowerment, particularly with regard to self-confidence and improved social skills, were extremely positive, consistent with the findings of the quantitative work.

4.4. Fertility and Personal Behaviors

Fertility in Liberia is among the highest in the world, although it has declined from a total fertility rate of more than six children per woman in 1990 to 5.2 in 2010. Observed fertility has many underlying determinants including biological and behavioral factors (e.g., frequency of intercourse, contraceptive use) as well as economic and social factors (e.g., norms, opportunity costs, and access to family planning). Although reducing fertility was not a primary objective of EPAG, the program did include a strong focus on the empowerment and independence of young women to exert control over their lives, as well as lessons on reproductive health and family planning methods. The interrelated nature of young women's reproductive health decisions and the economic conditions in which they live is well established in the public health literature, with poverty being a significant risk factor for risky sexual behavior (Dunbar 2010, Ssewamala 2010). Table 7 explores outcomes related to fertility and sexual behaviors. The first outcome concerns the desired number of children, which was roughly 3.5 at baseline among both the treatment and control groups, with no significant change between baseline and midline.

In spite of the lack of impact on desired fertility, the EPAG program does appear to have an impact on realized fertility. We use three outcomes to explore fertility: whether or not the respondent currently has at least one living child, the number of children she has, and whether or not she is currently pregnant at the time of her interview. For the first outcome, the basic specification yields a significant decline of four percentage points. However, this basic specification may include a purely mechanical result because the control group was more likely to be pregnant at baseline (ten percent compared to six percent among the treatment group, as shown in Table 2). The second specification interacts treatment with an indicator for not being pregnant at baseline. This regression yields a smaller two percentage point reduction in the likelihood of being a mother. The impact on number of children further elucidates this finding. Among those women who have at least one child already, there are no

[23] Exit Poll Report from Round 1. SBA and GOPA consultants. December 2010.

impacts on the number of children the woman has. However, among all women, the unconditional measure of number of children does fall among the treated relative to the control group. The results also show a large and significant increase in pregnancies among the treatment group. Once again, this may be a purely mechanical result of the control group's higher pregnancy rate at baseline (making it less likely that they would be pregnant again just one year later). For this reason, we once again interact treatment with an indicator of not being pregnant at baseline. This interacted regression yields a smaller but still large and significant increase of two percentage points in the likelihood of being pregnant. Taking the three outcomes together (a weak reduction in the likelihood of having any children, a significant reduction in the number of children, and a significant increase in pregnancy among the treated), it appears that EPAG did not have any net impact on actual fertility. A simple cross-sectional comparison of the likelihood of being a mother and the likelihood of being pregnant, excluding those who were pregnant at baseline, confirms that there are no significant differences in either indicator at midline. This may not represent a true reduction in lifetime fertility: the treatment group may simply be delaying pregnancy for the duration of their participation in the program (although this may demonstrate empowerment over the timing of pregnancy).

Aside from fertility-related outcomes, the EPAG program does not appear to have affected sexual behaviors among its participants. Although control over income is often emphasized as a determinant of women's sexual empowerment and control, there appears to be no impact, at least in this short run, on the number of sexual partners or the decision to use a condom. On average, these young women have one regular partner, and use condoms about half the time. There is no distinction by treatment group. Reported condom use, in particular, is much higher in this survey than among similar age groups in nationally representative surveys such as DHS, and it is not clear whether the non-result is driven by measurement error or simply the already high baseline rate of condom usage.

On the one hand, the lack of impacts on fertility and sexual behaviors are not surprising, since one might expect that behavior changes of this sort more specific and longer-term interventions. Reducing fertility was not, after all, an objective of the EPAG program. On the other hand, recent studies have shown a causal link between cash transfers conditioned on school attendance and reduced fertility (Baird 2010) and economic empowerment and reduced fertility (Bandiera 2012, Ibarrarán 2012), even in the short run. The lack of impact in this study points to a need for further research on the conditions under which economic empowerment may lead to reduced fertility, the mechanisms of change, and the length of time required to affect change.

4.5. Effects on the household

A central question of this impact evaluation is to what extent any improvements in the employment of young women spill over onto the household in which she resides. Numerous studies have found that increased monetary resources in the hands of women lead to improved well-being of other household members, especially children,[24] leading researchers to hypothesize that women are more likely to spend

[24] See for example Pitt 1998, Hoddinott 1995, and King 2001. Borges 2007, in particular, has a frequently cited claim that women reinvest 90% of their income in their household compared to 30-40% for men.

their earnings on household expenses than men. Most of these studies have focused on adult women, specifically married women with children. It is not known whether the same holds true for young women, who may have other spending priorities, have less experience in managing households, and have younger children. Given the large increases in employment and earnings documented above, the EPAG program serves as a good setting to examine these types of spillovers.

The evaluation included detailed interviews with the heads of the household in which EPAG participants were residing. The purpose of the household questionnaires was precisely to examine the hypothesis that investing in young girls would benefit her household. A secondary hypothesis was that EPAG participation may change gender-related attitudes in the participants' households. Household data was collected for 1601 out of the 1622 individuals who were interviewed at both baseline and midline; this same sample of 1601 individuals serves as the basis for both the individual and household level analysis in this paper.

The estimated impact of the program on a broad range of household outcomes is summarized in Tables 8 and 9. Panel A of Table 8 examines the household size. The household and family dynamics in Liberia, as in other African settings, can be complex, with families often sending their children to live with relatives who are more able to provide for their schooling and basic needs. Young parents, in particular, often leave home to migrate for work, leaving their children back home with relatives until they are able to establish themselves and send for their children. If the economic success of the EPAG participant allowed her to bring non-resident family members into her household (including but not limited to her own children), then overall household size may have been expected to increase as a result of the program. This does not appear to have happened, at least in the short term. The results in Table 8 show that overall household size was not affected by the program. It is possible that the increase in earnings due to EPAG was too small, or too short-lived, to have induced the kinds of migrations described above.

Other measures of household well-being, including food security and asset ownership, reflect shorter-term investments that might be influenced by the economic success of EPAG participants. Panel B of Table 8 shows the impact of EPAG on a broad range of food security measures. Household food security was measured using two methods: dietary frequency of high-value protein-rich foods, and two subjective questions on food shortages adapted from USAID's FANTA questions (Coates 2007). On two of the four of the dietary frequency questions and on both of the food shortage questions, the treatment groups' dietary situation improved as a result of the EPAG program. Weekly consumption of fish and meat rose significantly by four percentage points in treatment households (from a high baseline value of 84% for meat/chicken and 90% for fish), and weekly consumption of dairy and eggs did not change significantly. Household heads report worrying less about insufficiency of household food supplies, and the reported incidence of household members going to bed hungry also decreased in treatment households relative to control. Combined, the impacts across these indicators portray a situation of improved food security and dietary composition, consistent with the hypothesis that the increased earnings of the EPAG participants were spent in part on food.

Apart from questions of resource allocation, a secondary hypothesis of this evaluation was that participation in EPAG might shift gender norms and attitudes among the participants' household members. This could theoretically occur if the participant actively shares the knowledge from the life skills trainings that she receives in the program, or if the household head, upon observing the realized productivity of the EPAG participant, revises his/her expectations about young women in general. To investigate this, a series of questions regarding various gender norms were posed to the household head, including the suitable age of marriage, the division of labor of various household tasks, and appropriate types of work and socializing for young unmarried women. The results, presented in Table 9, show no impact of the program on opinions of the suitable age of marriage. This is not surprising given the high prevalence of cohabitation and the absence of strict norms regarding age of marriage in Liberia. The results do show some changes in attitudes toward gender equality in household duties, which fall predominantly to women in Liberia. Respondents were asked who should be responsible for a series of five household tasks, with response choices of "men", "women", or "both". Responses were coded as "1" for "both" (meaning that the task ought to be shared), and "0" otherwise. From a baseline share of 12%, there was a 6 percentage point impact in the likelihood of respondents reporting that both men and women should be responsible for washing, cooking, and cleaning. Similarly, from a baseline share of 16%, there was a 4 percentage point increase in responses of "both" for the task of feeding and bathing children. There were no significant impacts in the responses for other categories, including earning money, fetching water, and helping children with studies. By summing the responses across categories (again with a "1" indicating a gender-neutral response and a "0" indicating either men or women alone), a "gender equality score" of 0 to 5 was computed. The impact of the program on this score was an increase of 0.2 standard deviations, meaning that household heads of EPAG participants experienced a small but significant shift toward more egalitarian attitudes related to the division of household labor. Finally, respondents were asked to rate (hypothetically) whether they would approve of the young unmarried female household members participating in a variety of activities. The first set of activities had to do with socializing with friends and dating, while a second set dealt with various types of employment, education, and training. Other than a small reduction in the approval rate for socializing with friends, there were no impacts of the program on any of the indicators, probably owing mostly to the high rate of approval at baseline for the majority of these activities.

Overall, the results in Table 9 indicate that the EPAG program did not have a significant impact on the attitudes of household heads toward the economic or social activities of young women living in their households, but did have a small significant impact on their attitudes toward gender norms regarding domestic duties. This might be driven by the distinction between asking about the respondent's household members directly versus asking about men and women generally. When asked about specific activities in relation to the young women in their household, the household heads' responses did not change over time, but when asked about sharing of household duties in theory (not in relation to their particular household), there was a significant difference by treatment group. Given that the EPAG participants themselves, whether or not they are engaged in income-generating activities, do not report

any change in the amount of time spent on domestic work,[25] we have no evidence that these shifting norms have affected the division of labor in practice. Further research would be needed to disentangle the issues of changing gender norms in theory versus practice, and attitudes toward norms in general versus those at play in one's own household.

5. Cost Effectiveness

Although the first task of any evaluation is to demonstrate the effectiveness of an intervention – that is, whether or not the program actually has a measurable and attributable impact – this is not enough to recommend the program to policymakers. This requires also that the program can show that it is worth spending scarce public resources to do it. Ideally, a program worth doing will be both effective and cost-effective. One can measure cost-effectiveness in terms of the number of physical outputs produced or outcomes achieved, e.g. the number of people employed per dollar spent, or one can measure achievements in terms of the value of the benefits acquired relative to the amount of money spent. In the case of the EPAG, the unit cost of training in Round 1 was roughly $1200 for the Business Skills track and $1650 for the Job Skills track. The EPAG Job Skills track consisted of more hours of training, and required purchasing practical equipment for each trade area. Some Job Skills trainers, especially those with more specialized skills and experience, were also more costly. The estimated unit costs cover trainer salaries (EPAG has mostly college-educated trainers), training materials (not including curriculum development), training venue rental, administrative and overhead costs of the training provider, childcare costs, event costs (job fairs, etc.), stipends to mentors, trainee transport allowances and completion bonuses. The costs also cover the withheld incentive payment to the training provider, based on how many trainees find employment.

Although high relative to most developing-country budgets, these costs are well within the range of the *Jovenes* youth training programs implemented in Latin America (cf. Ibarrarán and Rosas 2009). The *Jovenes* programs were estimated to cost between $700 and $2000 per participant, depending on the country (Betcherman 2007). Not only were the costs of the EPAG program within international norms, the program itself is also cost-effective. Given the large earnings gains demonstrated in this study (44 USD per month for Business Skills, and 11 USD per month for Job Skills, as shown in Table 4A), and assuming the gains persist at the same level, the cost of the Business Skills training is recouped within three years.[26] For the Job Skills training, given the higher costs and lower benefits, it would take approximately 12 years to recoup the training costs, making it less cost-effective. The project has revamped the Job Skills training substantially in light of these findings, condensing the training timetable and seeking formal agreements in advance with employers to hire EPAG graduates.

[25] A limited number of time use questions were included in the survey of EPAG participants, but the results are not reported in this paper.

[26] In addition to the assumption of persistence of earnings gains, other assumptions include income accruing from month 7, no discounting, and an exchange rate of 70 LD= 1USD. With an annual discount rate of 5%, the Business Skills training costs are still recouped within 3 years while the Job Skills training costs would take 17 to 20 years to recover.

6. Robustness Checks

6.1. *Sample attrition*

Many challenges were encountered during survey implementation, due to the context – the densely populated and impoverished communities in and around Monrovia are difficult settings in which to find and track respondents—as well as the transience of a young study population. Despite vigorous efforts to track and interview each individual in the sample, a certain amount of survey attrition was expected. As the survey response rates in Table 1 show, 1622 (or 80%) of the individuals in the study sample were successfully interviewed in both the baseline and midline surveys. Another 305 respondents were interviewed at baseline but not at midline and hence are not in the panel used for the analysis in this paper.[27] This survey attrition, while not much higher than other program evaluations in Africa, may cause concern that the results of this evaluation are biased, especially if the loss to follow up is correlated with individual characteristics that might affect the outcomes. To address this concern, Table 10 presents regressions on the likelihood of panel inclusion, that is, the likelihood of being interviewed at both baseline and midline. The first column indicates that treated individuals are significantly more likely than control to have been interviewed twice. This result persists even after controlling for individual characteristics and community dummies. Columns 2, 3, and 4 show that age, school attendance, and employment status at baseline are all correlated with survey attrition. To further investigate whether these characteristics lead to differential attrition between the treatment and control groups, we interact treatment with particular characteristics at baseline. Columns 5 and 6 show that, conditional on being in the control group, the most likely predictor of attrition is having a child. By itself, being a mother does not predict attrition, but when interacted with treatment, we see that control group mothers are more likely to have dropped out of the panel than their treated counterparts. Employment at baseline, while positively correlated with attrition, does not differentially affect treated and untreated individuals.

Because the differential attrition between treatment and control groups may bias our results, we use Inverse Probability Weighting (IPW) as outlined in Wooldridge (2002) to adjust the estimates of our key outcomes, using the inverse probability of inclusion in the panel as a probability weight. As a first step, we use the probit model in Column (6) of Table 10 to regress the likelihood of being observed twice on baseline individual characteristics, including those likely to affect attrition, such as employment and parental status. In the second step, we use the inverse of the predicted values from that probit model as probability weights to redo the difference-in-difference regressions for our key outcomes of interest. This method gives more weight to the individuals with the highest chance of attrition, giving them more influence on the estimate of the impact than those with a low probability of attrition. The results are reported in Table 11. The results show a high degree of similarity between the original (unadjusted) and the adjusted estimates. Across all outcomes, the point estimates and standard errors vary only slightly.

[27] Of these 305 cases, nine are dropped from the attrition analysis because the household head was not interviewed at baseline, hence the household level control variables are not available.

Because the adjusted estimates so closely mirror our original findings, we conclude that selective survey attrition is unlikely to be biasing our results.

7. Conclusion

Liberia's history of civil conflict compounds the challenges that face many African countries: large populations of low-skilled youth and limited labor market opportunities. A growing policy dialogue around youth employment in Africa has tended to focus on engaging young men in productive work to reduce the seeming threat of conflict, crime, and civil unrest. We argue that promoting young women's engagement in the labor market is just as pressing: getting women on the right track early in their working lives has the potential to affect not just their employment trajectories but, through the channel of empowerment, can also transform their roles in their families and communities. By focusing on both young men and women, African policy makers and development partners can ensure that countries like Liberia are able to reap the demographic dividend that comes only once in a country's development as fertility rates slow to a point where the ratio of working-age adults to dependents falls to a minimum.

As this paper demonstrates, skills training programs for young women can be wonderfully effective in increasing employment and incomes, at least in the short term. The EPAG program, which delivered six months of classroom-based skills training followed by six months of job placement support for either self or wage employment, led to a 47% increase in employment and 80% growth in earnings, relative to a randomly selected control group of non-participants. The program's Business Skills track had markedly higher impacts on employment and earnings than the Job Skills track, which focused on wage employment. These impacts vary somewhat but remain consistently positive and significant across almost all communities, educational backgrounds, and wealth levels. The highest impacts were obtained for those in the middle of the wealth distribution, and for girls with higher educational levels, which is consistent with the program's initial screening for young women with basic literacy who would be able to make use of a classroom-based skills course.

These strong impacts on employment and earnings translated into positive impacts in other realms of the participants' lives. Our results show striking improvements in various empowerment measures, including access to and control over monetary resources, including savings, where the program led to a sizeable difference of 35 USD in savings between treated and control individuals. The study also documents significant improvements in a wide range of subjective outcomes including measures of worry, life satisfaction, self-regulation, self-confidence, and self-perceptions of social abilities. In the area of fertility and sexual behaviors, the results paint a somewhat more nuanced picture. The EPAG program had no discernible effect on the desired number of children or on the actual number of children, conditional on having any children. There was a weak reduction in the likelihood of having any children, and a stronger increase in the likelihood of being pregnant, even after excluding those who were pregnant at baseline. On net, these impacts appear to cancel each other out, consistent with a hypothesis that treated individuals waited until the end of the EPAG program to become pregnant.

The third main area of outcomes looks at household-level measures. Consistent with the wide body of literature on the benefits to the household of women's increased resources, the results show a

significant improvement in household food security, judged by increased consumption of high-value animal proteins and lowered incidence of food shortages. Beyond food security, we find no generalizable impact on household asset holdings, plausibly due to the short term nature of this analysis, but we do find significant improvements in subjective measures of attitudes toward gender responsibilities among the heads of EPAG households. These outcomes provide some evidence that norms are shifting at the household level in ways that may benefit other female household members. Taken together with the results on food security, this suggests that the program had positive, though small, impacts on the households of treated individuals.

We end with a mention of the limitations of the study. First, as mentioned above, is the issue of selective attrition from the sample. Second, given the short time horizon of this study, in which follow up data was collected just one month after the conclusion of the first round of the program (which was seven months after the conclusion of the classroom-based training), questions remain about the persistence of the effects found and the potential for further impacts to emerge. The research design of this evaluation, in which the control group took part in the second round of the EPAG program, precludes a rigorous experimental comparison of treated and untreated individuals after the midline survey. However, an endline survey was conducted after the second round of the EPAG program as per the timeline depicted in Figure 1. Examination of this endline survey data will permit a descriptive analysis of the outcomes of the first group of trainees 12 months after they completed the EPAG program, as well as examination of the outcomes of the second batch of trainees. The second round included not only the control group from this impact evaluation but also newly recruited participants who were offered brief basic literacy and numeracy training program prior to program entry. Work is already underway to design and implement the third round of EPAG, with a substantial redesign of the Job Skills track, an emphasis on reaching younger girls with lower literacy, and expansion to communities outside of Monrovia. If the high success rates found in this study are replicated for these future cohorts, the EPAG program should serve as a model for policy makers in Africa and the world seeking to improve lives and livelihoods of all youth, male and female.

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Figure 1. Impact Evaluation Timeline

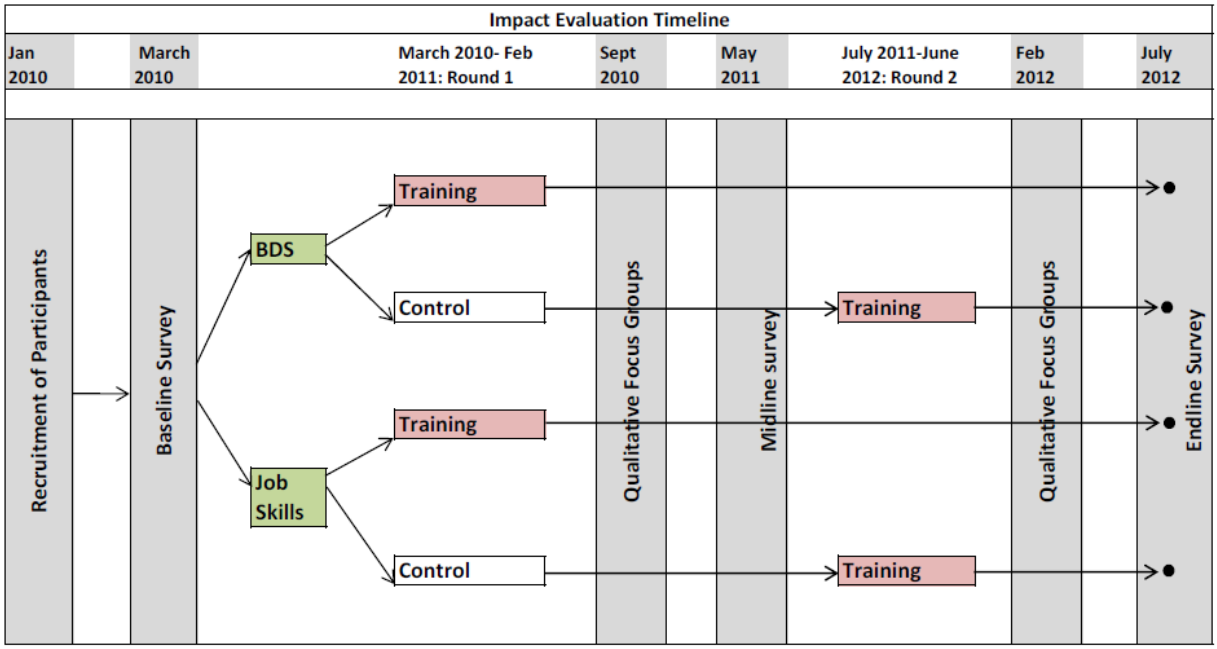

Figure 2. Summary of Assignment Process and Modifications

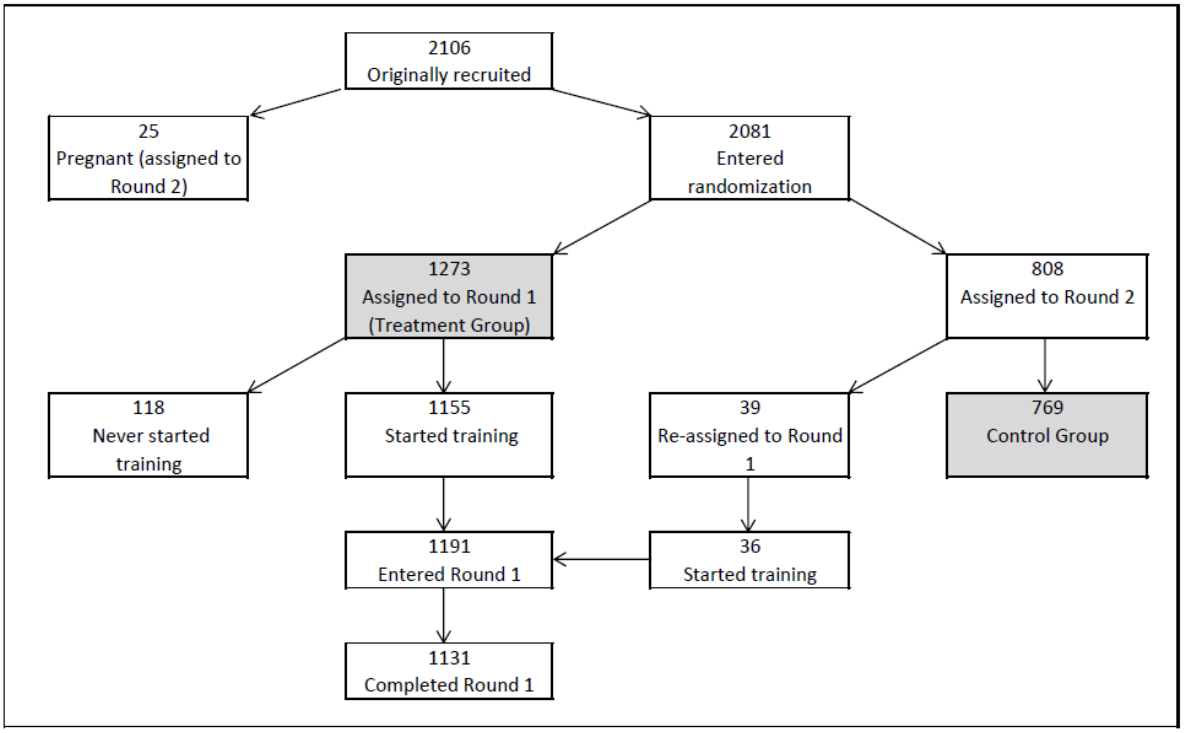

Table 1. Response Rates for Baseline and Midline Surveys

	Neither Baseline nor Midline	Baseline Only	Midline Only	Baseline and Midline	Total
Treatment	33	169	45	1026	1273
Control	26	136	11	596	769
Total	59	305	56	1622	2042

Note: A total of 2106 young women were originally recruited for this study and the EPAG program. This table excludes: 39 individuals from the control group who were issued as replacements and 25 exempt from randomization due to pregnancy. Please note that of the 1622 who were interviewed twice, 21 are dropped from the analysis because household information at baseline is missing. This leaves a sample of 1601 individuals for the main analysis in this paper. Of the 305 interviewed at baseline only, nine are missing baseline household information, so they are dropped from the attrition analysis in the "Robustness checks" section.

Table 2A. Baseline balance tests of individual characteristics

Panel 1: Demographics					
	Control	Treatment	Difference	P Value	Observations
Average age	22.849	22.780	-0.069	0.623	1601
Age 16-19	0.131	0.163	0.032	0.086*	1601
Age 20-24	0.582	0.529	-0.053	0.038**	1601
Age 25-27	0.287	0.309	0.022	0.365	1601
Married	0.048	0.063	0.015	0.225	1601
Cohabiting	0.284	0.302	0.018	0.445	1601
Separated/Widowed/Divorced	0.010	0.009	-0.001	0.792	1601
Never married	0.658	0.627	-0.031	0.209	1601
Panel 2: Education- Highest level completed					
	Control	Treatment	Difference	P Value	Observations
None/Informal only	0.020	0.031	0.011	0.187	1601
Primary (grades 1-6)	0.196	0.189	-0.007	0.730	1601
Junior High (grades 7-9)	0.224	0.243	0.019	0.380	1601
High School (grades 10-12)	0.269	0.257	-0.012	0.597	1601
Completed High School or above	0.291	0.280	-0.011	0.624	1601
Panel 3: Income-Generating Activities (IGA)					
	Control	Treatment	Difference	P Value	Observations
Any IGA	0.364	0.391	0.027	0.284	1601
Self-employment	0.316	0.333	0.017	0.476	1601
Wage-employment	0.048	0.058	0.010	0.410	1601
Monthly earnings in LD (unconditional on IGA)	2,377.181	3038.042	660.861	0.084*	1597
Monthly earnings in LD (conditional on IGA)	6,570.887	7875.539	1,304.652	0.145	602
Any savings	0.333	0.342	0.009	0.708	1601
Any loan outstanding	0.041	0.03	-0.011	0.232	1601
Panel 4: Ownership of Assets (either Jointly or Alone)					
	Control	Treatment	Difference	P Value	Observations
Owns cell phone	0.694	0.632	-0.062	0.012**	1601
Owns electronics	0.255	0.284	0.029	0.213	1599
Owns jewelry	0.403	0.394	-0.009	0.729	1600
Owns furniture	0.429	0.391	-0.038	0.139	1601
Owns poultry	0.186	0.19	0.004	0.850	1600
Owns vehicle	0.017	0.016	-0.001	0.853	1601
Owns dwelling	0.187	0.175	-0.012	0.541	1600
Owns land	0.152	0.147	-0.005	0.806	1600
Panel 5: Empowerment and Psychosocial Measures					
	Control	Treatment	Difference	P Value	Observations
Any money of your own?[28]	0.798	0.790	-0.008	0.708	1601
Entrepreneurial Ability score (0-1)	0.509	0.501	-0.008	0.698	1070
Self-regulation score (0-1)	0.655	0.650	-0.005	0.582	1598
Satisfaction w/ life overall (0-1)	0.429	0.421	-0.008	0.766	1600
Satisfaction w/ job/ business, if applicable (0-1)	0.276	0.326	0.050	0.075**	1161

[28] The wording of this yes/no question was "Do you most of the time have money of your own for basic uses that you alone can decide how to use, without having to ask for permission?"

Table 2A. Baseline balance tests of individual characteristics (cont.)

Panel 6: Family					
	Control	Treatment	Difference	P Value	Observations
Number of brothers and sisters	6.182	6.017	-0.165	0.330	1598
Is father alive	0.714	0.675	-0.039	0.104	1601
Is mother alive	0.872	0.863	-0.009	0.622	1601
Ever displaced during the war	0.781	0.773	-0.008	0.723	1601
Any living children	0.665	0.715	0.050	0.037**	1601
If yes, how many?	1.570	1.537	-0.033	0.510	1115
Are you pregnant?	0.097	0.063	-0.034	0.014**	1601
Desired number of children	3.501	3.470	-0.031	0.618	1588
Panel 7: Sexual Behaviors					
	Control	Treatment	Difference	P-Value	Observations
Have you ever had sex?	0.976	0.976	0.000	0.988	1601
If yes, age at sexual initiation (conditional on ever having sex)	17.198	16.981	-0.217	0.022**	1530
Have you ever had a regular partner?	0.939	0.947	0.008	0.485	1563
If yes, number of regular partners	0.993	1.009	0.016	0.418	1561
Have you ever had a casual partner?	0.331	0.336	0.005	0.850	1563
If yes, number of casual partners	0.539	0.542	0.003	0.961	1560
Have you ever used a condom?	0.701	0.716	0.015	0.524	1601
If yes, did you use a condom last time you had sex with your regular partner?	0.547	0.556	0.010	0.762	1087
Were you ever forced to have sex?	0.092	0.114	0.022	0.175	1563

Notes: The Self-Regulation Score is based on a set of eleven questions about self-reported behavioral patterns, adapted from the Adolescent Self-Regulatory Inventory (Mollanen 2006). Responses were coded as follows: 1=strongly disagree, 2=somewhat disagree, 3=somewhat agree, 4=strongly agree. The score is equal to the proportion of responses that reflect positive behaviors or attitudes, of the items that the respondent reported on, conditional on having responded to at least 6 items. The Entrepreneurial Ability Score is based on a set of questions that asked the respondent to rate how well she had been able to perform the following activities in the past year: (i) find information about job opportunities in your area, run her own business, (ii) save in order to invest in future business opportunities, (iii) manage business finances effectively, (iv) bargain with a supplier to obtain good prices when purchasing, (v) collect money from someone who owed her for purchases who are not repaying on time. The response categories were: very well, somewhat well, not very well, and not at all well. Numerical values were assigned to each response. The score is based on the proportion of items to which the respondent answered “very well” and “somewhat well” as opposed to “not very well” and “not at all well,” conditional on having responded to at least three of the activities.

Table 2B. Baseline balance tests of household characteristics

Panel 1: Household Characteristics					
	Control	Treatment	Difference	P Value	Observations
Household head is male	0.597	0.582	-0.015	0.544	1601
Household size	4.736	4.738	0.002	0.988	1601
Father's education					
None or informal	0.247	0.218	-0.029	0.176	1601
Primary	0.051	0.034	-0.017	0.086*	1601
Junior School	0.061	0.062	0.001	0.938	1601
High School	0.235	0.243	0.008	0.713	1601
Beyond High School	0.391	0.389	-0.002	0.930	1601
Mother's education					
None or informal	0.583	0.563	-0.020	0.444	1601
Primary	0.085	0.097	0.012	0.436	1601
Junior School	0.082	0.078	-0.004	0.795	1601
High School	0.117	0.121	0.004	0.809	1601
Beyond High School	0.117	0.117	0.000	0.994	1601
Number of hh members aged 5-11	0.587	0.631	0.044	0.344	1587
Proportion of children per household aged 5-11 who are attending school, conditional on the household having any children aged 5-11	85.693	82.739	-2.954	0.296	646
Number of hh members aged 5-14	0.842	0.894	0.052	0.376	1587
Proportion of children per household aged 5-14 who are attending school, conditional on the household having any children aged 5-14	87.850	81.862	-5.988	0.016**	779
Number hh members aged 13-30	2.313	2.279	-0.034	0.652	1601
Proportion of individuals per household aged 13-30 with IGA conditional on the household having individuals aged 13-30	48.351	44.819	-3.532	0.128	1559

Table 2B. Baseline balance tests of household characteristics (cont.)

Panel 2: Housing Characteristics					
	Control	Treatment	Difference	P Value	Observations
Primary Source of Household Drinking Water					
Private connection to pipeline	0.131	0.119	-0.012	0.501	1601
Bottled / bagged water	0.010	0.014	0.004	0.530	1601
Borehole / rainwater catchments	0.015	0.020	0.005	0.441	1601
Vendor / tanker	0.104	0.163	0.059	0.001***	1601
Public tap	0.247	0.220	-0.027	0.208	1601
Protected spring	0.102	0.100	-0.002	0.881	1601
Unprotected well / spring or open source	0.012	0.021	0.009	0.194	1601
Hand pump	0.376	0.342	-0.034	0.167	1601
Sanitation					
Own flush toilet	0.308	0.276	-0.032	0.167	1601
Public flush toilet	0.214	0.185	-0.029	0.163	1601
Neighbour's flush toilet	0.019	0.017	-0.002	0.777	1601
Own improved pit latrine	0.184	0.180	-0.004	0.841	1601
Own unimproved pit latrine	0.043	0.047	0.004	0.718	1601
Neighbour's improved pit latrine	0.068	0.060	-0.008	0.536	1601
Neighbour's unimproved pit latrine	0.019	0.027	0.008	0.314	1601
Open source (bush, river, beach, stream)	0.145	0.210	0.065	0.001***	1601
Household owns their house	0.378	0.394	0.016	0.518	1601

Table 3. Impact of EPAG on Participation in Income Generating Activities

		ITT Estimates			ATT Estimates
	Baseline Mean	OLS	OLS	OLS	Using IV
Any IGA	0.381	0.181***	0.181***	0.181***	0.190***
	[0.486]	(0.026)	(0.026)	(0.037)	(0.026)
Observations	1601	3200	3200	3200	3200
Controls		No	Yes	No	Yes
Using individual fixed effects		No	No	Yes	No

For all tables: Standard deviation in brackets. Standard error in parentheses, clustered by classroom.
ITT: Intent to treat estimator. ATT: Average treatment effect on the treated. 46 individuals were offered a space but declined to join the first round of training. We use treatment as an instrumental variable for participation in the first round of training.
Notes: Two observations are missing for participation in income generating activities at midline. Controls used are type of training, household size, sex of household head, asset based quintiles, community, age of adolescent, educational status of adolescent, marital status of respondent, parental status of respondent (indicator variables for adolescent having a child and being pregnant), orphan status of respondent (one parent or both parents being deceased), and month of interview at midline; all controls are from baseline data except month of midline interview.

Table 3a. Impact of EPAG on Participation in income generating activities, by training track

	Job Skills Trainees (n= 608)+			BDS Trainees (n=993)+		
	Baseline-Mean	OLS (w controls)	Observations	Baseline-Mean	OLS (w controls)	Observations
Any IGA	0.309	0.101**	3200	0.425	0.226***	3200
	[0.463]	(0.041)		[0.495]	(0.031)	
Wage-employment	0.051	0.145***	3200	0.055	0.017	3200
	[0.220]	(0.039)		[0.229]	(0.018)	
Self-employment	0.258	-0.053	3200	0.370	0.204***	3200
	[0.438]	(0.042)		[0.483]	(0.033)	

+ Table reports the sum of coefficients and joint p-values of the interaction terms "post x treat" and "post x treat x type" where type is "job skills" or "BDS". Controls used are household size, sex of household head, asset based quintiles, community, age of adolescent, educational status of adolescent, marital status of respondent, parental status of respondent (indicator variables for adolescent having a child and being pregnant), orphan status of respondent (one parent or both parents being deceased), and month of interview at midline; all controls are from baseline data except for month of midline interview.

Table 3b. Heterogeneous Impacts of EPAG on Participation in income generating activities—by community

	OLS		
Communities	Any IGA	Observations	Controls
All	0.181***		
	(0.026)	3200	Yes
West Point	-0.109**		
	(0.041)	252	Yes
Battery Factory	0.058		
	(0.065)	314	Yes
New Kru Town	0.141		
	(0.117)	338	Yes
Doe Community	0.245*		
	(0.112)	358	Yes
Bassa Community	0.347***		
	(0.075)	321	Yes
Red Light	0.121*		
	(0.063)	558	Yes
Old Road	0.239***		
	(0.032)	429	Yes
Bentol	0.354**		
	(0.087)	184	Yes
Kakata	0.184***		
	(0.056)	446	Yes

Controls used are household size, sex of household head, asset based quintiles, age of adolescent, educational status of adolescent, marital status of respondent, parental status of respondent (indicator variables for adolescent having a child and being pregnant), orphan status of respondent (one parent or both parents being deceased), and month of interview at midline; all controls are from baseline data except for month of midline interview.

Table 3c. Heterogeneous Impacts of EPAG on Participation in Income Generating Activities—by Wealth, Education and Age

Panel 1: By Wealth Quintile						
		OLS				
		Quintiles of asset-based welfare index				
	All	Q1	Q2	Q3	Q4	Q5
Any IGA	0.181***	0.006	0.178***	0.337***	0.256***	0.074
	(0.026)	(0.049)	(0.055)	(0.051)	(0.048)	(0.046)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3200	606	646	659	634	655
Panel 2: By Education						
		OLS				
		Education level of the Girl				
	All	None/ Informal only	Primary	Junior high school	High school	High school graduate and above
Any IGA	0.181***	0.219	0.192***	0.171***	0.140***	0.222***
	(0.026)	(0.149)	(0.047)	(0.050)	(0.044)	(0.036)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3200	88	612	758	835	907
Panel 3: By Age Group						
		OLS				
		Age group of the girl				
	All		16-19	20-24	25-27	
Any IGA	0.181***		0.227***	0.187***	0.151***	
	(0.026)		(0.049)	(0.032)	(0.038)	
Controls	Yes		Yes	Yes	Yes	
Observations	3200		484	1753	963	

Controls used are household size, sex of household head, asset based quintiles (excluded for "by wealth" regressions), community, age of adolescent (excluded for "by age group" regressions), educational status of adolescent (excluded for "by education" regressions), marital status of respondent, parental status of respondent (indicator variables for adolescent having a child and being pregnant), orphan status of respondent (one parent or both parents being deceased), and month of interview at midline; all controls are from baseline data except month of midline interview.

Table 4. Impact of EPAG on Hours and Earnings

Panel 1: Intensive Employment				
	Baseline Mean	OLS	Controls	Observations
Number of days worked past week (unconditional)	2.000 [2.758]	1.107*** (0.153)	Yes	3155
Number of days worked past week (conditional on IGA)	5.321 [1.604]	0.251*** (0.091)	Yes	1494
Number of hours worked on a typical day (unconditional)	2.712 [4.033]	1.282*** (0.216)	Yes	3134
Number of hours worked on a typical day (conditional on IGA)	7.247 [3.253]	-0.240 (0.193)	Yes	1473

Panel 2: Earnings					
	Baseline Mean	OLS	Tobit	Controls	Observations
Total earnings past week (LD), unconditional*	698.9 [1843.0]	563.216*** (124.839)	417.799*** (77.518)	Yes	3178
Probability that total earnings past week (LD) > 0			0.157*** (0.024)	Yes	3178
Total earnings past week (log), unconditional*	2.592 [3.443]	1.316*** (0.197)	0.982*** (0.151)	Yes	3178
Probability that total earnings past week (log) > 0			0.155*** (0.024)	Yes	3178
Total earnings past week (LD), conditional on IGA	1854.0 [2622.0]	437.573** (186.749)		Yes	1517
Total earnings past week (log), conditional on IGA	6.877 [1.403]	0.162 (0.128)		Yes	1517

Standard deviation in brackets. Robust standard errors in parentheses, clustered by classroom.

* For the unconditional earnings regression, a zero was imputed for respondents who report no income-generating activities. Controls used are household size, sex of household head, asset based quintiles, community, age of adolescent, educational status of adolescent, marital status of respondent, parental status of respondent (indicator variables for adolescent having a child and being pregnant), orphan status of respondent (one parent or both parents being deceased), and month of interview at midline; all controls are from baseline data except month of midline interview. Three outliers (LD 105,000, 133,625 and 218,750) were top-coded to 28,800 and a control indicator variable (1 for the ones top-coded and 0 otherwise) was added to the regressions. Days per week over 7 days were recoded to 7 days and a covariate indicating recoded observations was added. When hours per day exceeded the 99th percentile (which is 15 hours per day), they were recoded to the 99th percentile and a covariate indicating recoded observations was added.

Table 4a. Impact of EPAG on Participation on Earnings, by Training Track

	Job Skills Trainees (n= 607)+			BDS Trainees (n=990)+		
	Baseline-Mean	OLS (w controls)	Observations	Baseline-Mean	OLS (w controls)	Observations
Total earnings last week (LD) unconditional	729.5 [2322.7]	200.1 (185.6)	3178	680.1 [1474.8]	768.0*** (169.6)	3178

+ Table reports the sum of coefficients and joint p-values of the interaction terms "post x treat" and "post x treat x type" where type is "job skills" or "BDS". Controls used are household size, sex of household head, asset based quintiles, community, age of adolescent, educational status of adolescent, marital status of respondent, parental status of respondent (indicator variables for adolescent having a child and being pregnant), orphan status of respondent (one parent or both parents being deceased), and month of interview at midline; all controls are from baseline data except for month of midline interview.

Table 4b. Heterogeneous Impacts of EPAG on Participation on Earnings—by Wealth, Education and Age

Panel 1: By Wealth Quintile

		OLS Quintiles of asset-based welfare index				
	All	Q1	Q2	Q3	Q4	Q5
Total earnings	563.216***	444.259**	521.720**	436.218**	805.215***	477.683*
(LD) unconditional	(124.839)	(219.093)	(228.871)	(210.061)	(216.182)	(277.570)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3178	601	641	653	631	652

Panel 2: By Education

		OLS Education level of the Girl				
	All	None/ Informal only	Primary	Junior high school	High school	High school graduate and above
Total earnings	563.216*** (124.839)	809.749 (772.746)	724.562*** (217.737)	646.673*** (219.883)	341.710* (196.143)	559.497*** (200.076)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3178	87	604	753	833	901

Panel 3: By Age Group

		OLS Age group of the girl		
	All	16-19	20-24	25-27
Total earnings	563.216***	730.499***	578.846***	461.749***
	(124.839)	(162.166)	(178.138)	(158.549)
Controls	Yes	Yes	Yes	Yes
Observations	3178	478	1742	958

Controls used are household size, sex of household head, asset based quintiles (excluded for "by wealth" regressions), community, age of adolescent, educational status of adolescent (excluded for "by education" regressions), marital status of respondent, parental status of respondent (indicator variables for adolescent having a child and being pregnant), orphan status of respondent (one parent or both parents being deceased), and month of interview at midline; all controls are from baseline data except month of midline interview.

Table 5. Impact of EPAG on Savings, Loans, and Transfers

	Baseline Mean	OLS	Controls	Observations
Any savings	0.339 [0.474]	0.471*** (0.033)	Yes	3202
Total amount of savings (LD), unconditional on any saving	1420.4 [4613.2]	2490.1*** (314.3)	Yes	3202
Any loans to be repaid	0.034 [0.181]	0.031*** (0.008)	Yes	3184
Any formal loans	0.016 [0.126]	0.029*** (0.008)	Yes	3184
Any loans to others	0.097 [0.296]	-0.002 (0.015)	Yes	3181

Note: "Formal" loans are those from banks, credit groups, susu, or money lenders. These are as opposed to "informal loans" from parents, friends, relatives, or business partners. Controls used are household size, sex of household head, asset based quintiles, community, age of adolescent, educational status of adolescent, marital status of respondent, parental status of respondent (indicator variables for adolescent having a child and being pregnant), orphan status of respondent (one parent or both parents being deceased), and month of interview at midline; all controls are from baseline data except month of midline interview. Savings over the 99th percentile (40,000 LD) were top-coded to the 99th percentile and a control indicator variable (1 for the ones top-coded and 0 otherwise) was added to the regressions.

Table 6a. Impact of EPAG on Empowerment and Well-being

VARIABLES	Baseline-Mean	OLS	Controls	Observations
Do you most of the time have money of your own for the basic uses that you alone can decide how to use, without having to ask for permission?	0.793 [0.406]	0.068*** (0.019)	Yes	3201
(Among those with IGA) Do you control the money you earn from this IGA? (Share reporting "Much" or "completely")	0.804 [0.397]	0.081*** (0.023)	Yes	1509
Worries: Proportion reporting "Most/all of the time in the past year" to the following statements:				
Worry about job/ income	0.381 [0.486]	-0.054** (0.023)	Yes	3178
Worry that household will not have enough money for basics	0.305 [0.460]	-0.150*** (0.025)	Yes	3142
(If married/cohabiting): Worry that you and your husband/partner might split	0.152 [0.359]	-0.056** (0.023)	Yes	1012
(If never married): Worry that you will not find a suitable husband	0.267 [0.443]	-0.041 (0.028)	Yes	1776
Satisfaction				
Satisfaction score (0-1)	0.558 [0.235]	0.026** (0.012)	Yes	3194
Satisfied with job/business, if applicable	0.307 [0.462]	0.140*** (0.024)	Yes	2474
Satisfied with income, if applicable	0.347 [0.476]	0.045* (0.023)	Yes	2945
Satisfied with life overall	0.424 [0.494]	0.028 (0.028)	Yes	3186
Satisfied with education level	0.221 [0.415]	-0.018 (0.019)	Yes	3190
Satisfied with relationship with family	0.904 [0.295]	-0.001 (0.012)	Yes	3189
Satisfied with relationship with husband, partner, or boyfriend, if applicable	0.793 [0.405]	0.034 (0.021)	Yes	3003
Satisfied with house	0.640 [0.480]	0.017 (0.019)	Yes	3186
Satisfied with the community	0.736 [0.441]	0.012 (0.017)	Yes	3189
Non-cognitive skills				
Self-regulation score (0-1)	0.652 [0.171]	-0.008 (0.009)	Yes	3195
Entrepreneurial ability score (0-1)	0.504 [0.324]	0.086*** (0.024)	Yes	2194

For all regressions, controls include household size, sex of household head, asset-based quintiles, community, age of respondent, educational status of respondent, marital status of respondent, parental status of respondent (indicator variables for having a child and being pregnant), orphan status of respondent (one parent or both parents being deceased), and month of interview at midline; all controls are from baseline data except month of midline interview.

Note: For the Worries regressions, the dependent variable is equal to 1 if the respondent is "Most/all of the time" and 0 for "at least monthly," "a few times" or "never." For the Satisfaction regressions, the dependent variable is equal to 1 if the respondent is "very satisfied" or "somewhat satisfied" as opposed to "not very satisfied" and "not at all satisfied". The Satisfaction score is equal to the proportion of items the respondents reported being "very satisfied" or "somewhat satisfied" on, conditional on having responded to at least 4 items.

Note: The Self-Regulation Score is based on an 11-item scale adapted from an adolescent self-regulation scale developed in the US. The responses were first converted to indicator variables; strongly agree and somewhat agree are grouped together as are strongly disagree and somewhat disagree. Negative statements are reversed-scored so that higher scores indicate higher levels

of self-regulation. The score is equal to the proportion of responses that reflect positive behaviors or attitudes, of the items that the respondent reported on, conditional on having responded to at least 6 items. Alternate methods of aggregating responses into a single score yielded similar results.

Note: The Entrepreneurial Ability score is based on a set of questions that asked the respondent to rate how well she had been able to perform the following activities in the past year: (i) find information about job opportunities in your area, run her own business, (ii) save in order to invest in future business opportunities, (iii) manage business finances effectively, (iv) bargain with a supplier to obtain good prices when purchasing, (v) collect money from someone who owed her for purchases who are not repaying on time. The response categories were: very well, somewhat well, not very well, and not at all well. Please note that "don't know" and "no response" were also allowable responses, but were dropped from the analysis, leading to a low sample size for this measure. The score is based on the proportion of items to which the respondent answered "very well" and "somewhat well" as opposed to "not very well" and "not at all well," conditional on having responded to at least three of the activities. Alternate methods of aggregating responses into a single score yielded similar results.

Table 6b. Alternate Measures of Self-Confidence

	Mean	Ordered Probit	Controls	Observations
Attitude score (1-4)	**3.368 [0.615]**	**0.419*** (0.047)**	**Yes**	**1595**
I feel more able to work well with people now than a year ago	3.566 [0.794]	0.344*** (0.056)	Yes	1589
I feel more comfortable with who I am now than a year ago	3.578 [0.761]	0.469*** (0.064)	Yes	1593
I feel more in control of my life now than a year ago	3.525 [0.820]	0.347*** (0.054)	Yes	1593
I feel more able to call upon my friends for support than I was a year ago	3.089 [1.062]	0.236*** (0.038)	Yes	1590
I am more able to help my friends now than I was a year ago	3.283 [0.950]	0.386*** (0.050)	Yes	1592
I am more comfortable in situations now with people I do not know than I was a year ago	3.446 [0.824]	0.356*** (0.044)	Yes	1588
I am more outgoing now than I was a year ago	3.098 [1.097]	0.270*** (0.039)	Yes	1573
Confidence score (1-6)	**5.610 [0.669]**	**0.308*** (0.048)**	**Yes**	**1599**
Confidence in business/job abilities	5.502 [1.187]	0.379*** (0.050)	Yes	1420
Confidence in respondent's ability to present yourselves positively in front of others	5.605 [0 .839]	0.256*** (0.053)	Yes	1578
[If single/unmarried] Ability to rely on self for money rather than rely on boyfriends	5.467 [1.125]	0.351*** (0.086)	Yes	870
[If not currently enrolled in school] Ability to return to school should respondent decide to do so	5.655 [0 .845]	0.013 (0.058)	Yes	1088
Anticipation that respondent will be in a rewarding job if not now in the near future	5.665 [0 .792]	0.130 (0.051)	Yes	1572
Anticipation that respondent will be in a position to be able to provide for own children	5.735 [0 .633]	0.300*** (0.056)	Yes	1441

Note: These alternate measures of self-confidence were introduced at midline. The first batch of questions on "attitude" measures changes in attitudes over the past year and responses are coded as follows: 1=strongly disagree, 2=somewhat disagree, 3=somewhat agree, 4=strongly agree The second batch of questions on "confidence" measures the confidence level of the respondent in comparison to a year before the survey and is coded as: 1=much lower, 2=somewhat lower, 3=not much lower, 4=not much higher, 5=somewhat higher, 6=much higher. The table reports the results of regressions using the midline cross-sectional data. The overall scores are the average response across all categories on which the respondent reported.

Controls include household size, sex of household head, asset-based quintiles, community, age of respondent, educational status of respondent, marital status of respondent, parental status of respondent (indicator variables for having a child and being pregnant), orphan status of respondent (one parent or both parents being deceased), and month of interview at midline; all controls are from baseline data except month of midline interview.

Table 7. Impact of EPAG on Fertility and Sexual Behaviors

Panel 1: Fertility				
	Baseline mean	OLS	Controls	Observations
Any living children	0.696 [0.460]	-0.045*** (0.012)	Yes	3196
Any living children x Not pregnant at baseline		-0.023** (0.011)	Yes	3196
Number of children (conditional)	1.549 [0.798]	-0.024 (0.026)	Yes	2353
Number of children (unconditional)	1.079 [0.975]	-0.071** (0.028)	Yes	3188
Are you pregnant right now?	0.076 [0.264]	0.057*** (0.012)	Yes	3169
Pregnant x Not pregnant at baseline		0.019* (0.010)	Yes	3169
Desired number of children	3.481 [1.203]	-0.038 (0.050)	Yes	3182
Panel 2: Sexual Behavior				
	Baseline mean	OLS	Controls	Observations
Number of regular partners	1.003 [0.378]	0.016 (0.023)	Yes	3106
Number of casual partners	0.541 [1.080]	0.065 (0.050)	Yes	3094
Ever used condom in your life?	0.710 [0.454]	-0.016 (0.019)	Yes	3150
If yes, did you use a condom last time you had sex with your regular partner?	0.553 [0.497]	0.024 (0.026)	Yes	2150

Notes: Controls used are household size, sex of household head, asset based quintiles, community, age of adolescent, educational status of adolescent, marital status of respondent, orphan status of respondent (one parent or both parents being deceased), and month of interview at midline; all controls are from baseline data except month of midline interview.

Table 8. Impact of EPAG on Household Characteristics

	Baseline mean	OLS	Controls	Observations
Panel A: Household Size				
Number of household members	4.738 [2.603]	-0.049 (0.088)	Yes	3182
Panel B: Household Food Security				
Egg included at least once in household meal each week	0.314 [0.464]	0.034 (0.020)	Yes	3154
Fish included at least once in household meal each week	0.900 [0.301]	0.038** (0.015)	Yes	3165
Meat/chicken included at least once in household meal each week	0.840 [0.367]	0.039*** (0.013)	Yes	3161
Dairy products included at least once in household meal each week	0.546 [0.498]	0.021 (0.026)	Yes	3141
Worry that household member would not have enough food	0.619 [0.486]	-0.126*** (0.021)	Yes	3171
A household member went to bed hungry in past 2 weeks	0.306 [0.461]	-0.103*** (0.021)	Yes	3170

Notes: Controls include household size, sex of household head, asset-based quintiles all at baseline, and month of interview at midline. Standard errors clustered by classroom.

Table 9. Gender Norms and Attitudes of Household Head

	Baseline mean	OLS	Controls	Observations
Suitable minimum age of marriage for men	28.243	-0.076		
	(4.886)	(0.218)	Yes	3143
Suitable minimum age of marriage for women	23.475	-0.161		
	(4.508)	(0.184)	Yes	3168
Gender equality score (scale of 0-5, 5 meaning highest degree of gender equality)	1.661	0.207***		
	(1.247)	(0.070)	Yes	3202
Thinks both should earn money for family	0.645	0.027		
	(0.479)	(0.022)	Yes	3176
Thinks both should be responsible for washing, cooking, cleaning	0.121	0.062***		
	(0.326)	(0.021)	Yes	3171
Thinks both should be responsible for fetching water	0.216	0.031		
	(0.412)	(0.027)	Yes	3168
Thinks both should be responsible for feeding and bathing children	0.164	0.043**		
	(0.370)	(0.018)	Yes	3172
Thinks both should help children with studies	0.523	0.030		
	(0.500)	(0.019)	Yes	3141
Parent or caregiver approves of an unmarried woman engaging in the following:				
Spending time with friends at a friend's house	0.313	-0.034		
	(0.464)	(0.025)	Yes	2531
Spending time with friends at a video club, community center, night club or bar	0.229	-0.040*		
	(0.420)	(0.020)	Yes	2517
Continuing or re-entering formal schooling	0.825	0.011		
	(0.380)	(0.027)	Yes	2515
Vocational training course	0.847	0.024		
	(0.360)	(0.022)	Yes	2524
Unpaid internship (job practice to get experience, but without pay)	0.783	0.042		
	(0.412)	(0.028)	Yes	2521
Self-employment	0.823	0.004		
	(0.382)	(0.017)	Yes	2520
Dating a man of roughly the same age, that is, no more than five years older	0.604	-0.022		
	(0.489)	(0.033)	Yes	2430
Dating a man at least 10 years older	0.306	-0.042*		
	(0.461)	(0.024)	Yes	2409
Wage employment	0.763	0.013		
	(0.426)	(0.026)	Yes	2455

Notes: Lower panel on parent or caregiver approval is conditional on having at least one unmarried woman over age 15 in the household. Controls include household size, sex of household head, asset-based quintiles all at baseline, and month of interview at midline. Standard errors clustered by classroom.

Table 10. Correlates of Survey Attrition

Dependent Variable: In Panel (1=yes, 0= no)

	(1) OLS	(2) OLS	(3) OLS	(4) Probit	(5) OLS	(6) Probit
Treated	0.047*	0.084**	0.081**	0.087**	-0.039	-0.035
	(0.025)	(0.011)	(0.013)	(0.014)	(0.067)	(0.066)
Aged 16 to 19		-0.082***	-0.069***	-0.074***	-0.082***	-0.082***
		(0.023)	(0.023)	(0.026)	(0.011)	(0.015)
Aged 20 to 24		-0.018	-0.017	-0.018	-0.017	-0.018
		(0.012)	(0.013)	(0.015)	(0.014)	(0.016)
In School		0.058***	0.054***	0.054***	0.070***	0.062***
		(0.017)	(0.018)	(0.015)	(0.002)	(0.004)
Completed at least some primary school		-0.019	-0.011	-0.013	-0.057***	-0.049***
		(0.048)	(0.050)	(0.048)	(0.007)	(0.007)
Married or cohabitating		0.006	0.010	0.008	-0.007***	-0.007***
		(0.012)	(0.011)	(0.012)	(0.002)	(0.002)
Has Child		-0.017	-0.018	-0.015	-0.051***	-0.045***
		(0.028)	(0.027)	(0.025)	(0.002)	(0.002)
Is Pregnant		0.033	0.028	0.024	0.016**	0.013**
		(0.023)	(0.022)	(0.021)	(0.006)	(0.005)
Any IGA		-0.046***	-0.041**	-0.039**	-0.052***	-0.046***
		(0.017)	(0.018)	(0.017)	(0.003)	(0.004)
Program Dropout		-0.203***	-0.198***	-0.219***	-0.197***	-0.215***
		(0.070)	(0.068)	(0.074)	(0.069)	(0.076)
Treated x Age 16-19					0.021	0.012
					(0.031)	(0.027)
Treated x In School					-0.028	-0.019
					(0.023)	(0.029)
Treated x Completed at least some primary school					0.068	0.068
					(0.060)	(0.065)
Treated x Married or Cohabitating					0.028	0.026
					(0.019)	(0.020)
Treated x Has Child					0.055*	0.054*
					(0.030)	(0.029)
Treated x Pregnant					0.018	0.018
					(0.050)	(0.050)
Treated x Any IGA					0.018	0.012
					(0.023)	(0.024)
Observations	1895	1895	1895	1895	1895	1895
Community Dummies	No	No	Yes	Yes	Yes	Yes

Note: Probit models in columns (4) and (6) report marginal effects.

Table 11. Estimates of key outcome variables, adjusted for survey attrition

	Weighted ITT Estimates Adjusted for Attrition	ITT Estimates Unadjusted for Attrition	Observations
Any IGA	0.183***	0.181***	3200
	(0.026)	(0.026)	
Weekly income (LD, unconditional)	551.401***	563.216***	3178
	(126.302)	(124.839)	
Any savings	0.460***	0.471***	3202
	(0.036)	(0.033)	
Total amount of savings (LD)	2,411.490***	2,490.057***	3202
	(317.827)	(314.278)	
Any loans	0.033***	0.031***	3184
	(0.008)	(0.008)	
Any money of your own	0.070***	0.068***	3201
	(0.020)	(0.019)	
Entrepreneurial Ability score	0.089***	0.086***	2194
	(0.024)	(0.024)	
Satisfaction score	0.023*	0.026**	3194
	(0.012)	(0.012)	
Satisfaction with job / business	0.131***	0.140***	2474
	(0.024)	(0.024)	
Any living children	-0.033**	-0.045***	3196
	(0.013)	(0.012)	
Are you pregnant right now?	0.056***	0.057***	3169
	(0.012)	(0.012)	
Eggs included at least once	0.032	0.034	3154
in household meal each week	(0.020)	(0.020)	
Fish included at least once	0.037**	0.038**	3165
in household meal each week	(0.015)	(0.015)	
Meat / chicken included at least once	0.038***	0.039***	3161
in household meal each week	(0.013)	(0.013)	
Dairy products included at least once	0.024	0.021	3141
in household meal each week	(0.026)	(0.026)	
Worry household will not have	-0.128***	-0.126***	3171
enough food	(0.021)	(0.021)	
A household member went to bed hungry	-0.107***	-0.103***	3170
in past two weeks	(0.022)	(0.021)	