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Evaluating the impact of vocational education vouchers on out-of-school youth in Kenya

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Impact Evaluation**

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Summary

This report describes a vocational training program among Kenyan youth and provides results from the intervention. Implementation began in 2008 with the recruitment of 2,163 out-of-school youths (roughly between 17 to 28 years). Of these, a random half were awarded a voucher for vocational training, while the other half served as the control group. Of the voucher winners, a random half were awarded a voucher that could only be used in public (government) institutions, while the other half received a voucher that could be used in either private or public institutions. The program also included a crosscutting information intervention, which exposed a randomly-selected half of all treatment and control individuals to information about the actual returns to vocational education. We find that voucher winners were substantially more likely to enroll in vocational education institutions and were able to acquire an additional 0.55 years of education. The information treatment encouraged women to prefer and ultimately enroll in traditionally male-dominated trades but did not affect overall educational attainment for either gender. We find limited evidence that the program increased earnings, although the program led to a significant increase in hourly-wage earnings among wage earners. Furthermore, there is evidence that the program increased the likelihood of working in wage employment among those who have been out of school longer.

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Abbreviations and acronyms

GSP	Girls' Scholarship Program
ITT results	Intention-to-treat
KLPS	Kenyan Life Panel Survey
MOEST	Ministry of Education, Science and Technology
NGON	non-governmental organization
PSDP	Primary School De-worming Program
TOT results	Treatment-on-the-treated

1. Introduction

Youth unemployment is one of the most critical social and economic problems affecting less-developed countries in recent years (World Bank, 2007). Kenya, like many African countries, suffers from high youth unemployment. According to the 2005 Kenya Integrated Household Budget Survey, approximately 21 percent of youths aged 15–29 are unemployed, and a further 25 percent are neither in school nor working (Republic of Kenya, 2007). This is a critical problem given that individuals in this age group compose 30 percent of the country's population. Furthermore, high unemployment can have adverse social and economic consequences: it has been suggested that the majority of violent acts during the 2007 post-election crisis in Kenya were perpetrated by underemployed youth (World Bank, 2008).

Despite the importance of youth unemployment, little is known about how best to facilitate the transition of youth from school to the labor market in less-developed countries, or how to provide marketable skills for youth not on the academic schooling track. Vocational education provides a promising opportunity for addressing the problem. The 2007 *World Development Report* emphasizes that 'second-chance' schooling programs are crucial for countries like Kenya, given high dropout rates from primary school and limited primary to secondary school transition rates (World Bank, 2007). Proponents of vocational education argue that such training can deliver more readily marketable skills to these youth, and therefore offer an attractive alternative to traditional schooling that could smooth the school-to-work transition for those leaving the academic schooling track. However, there is limited rigorous empirical evidence on the effectiveness of vocational training in developing countries.

This report describes a vocational training intervention among Kenyan youth and details results of the intervention. This program aims to understand the mechanisms through which vocational education can address the widespread problem of youth underemployment in Kenya, using a multi-faceted randomized evaluation design together with an innovative panel dataset. In particular, through randomized provision of vocational training vouchers to program applicants, the program permits an evaluation of the effects of vocational education on formal sector employment and labor market earnings, participation in the informal and agricultural sectors, entrepreneurship decisions, and a range of other life outcomes in a sample of nearly 2200 Kenyan youth. The design of the program further allows for an estimation of how these effects vary by type (e.g. public versus private) of institution attended, as well as across individuals with different baseline characteristics. In addition, the use of a novel randomized-information intervention permits estimation of the role that information on labor market returns to vocational training plays in the demand for vocational education in Kenya.

While there is some existing evidence of the benefits of vocational education in Kenya (e.g. Nishimura and Orodho 1999), the majority of rigorous evaluation in less-developed countries has focused in Latin America. In a pair of papers, Angrist *et al.* (2002, 2006) examine Colombia's lottery program of providing vouchers to allow students to attend private secondary schools (including vocational training institutions and other schools with vocational training curricula), and find that it was very cost effective. Bettinger, Kremer, and Saavedra (2010) find that the greatest impact of this program was in the private vocational sector, and suggest that this may be due to private vocational schools being more successful than public schools at producing employable graduates, especially for jobs in Colombia's rapidly growing service sector. However, it is not possible to attribute the effect of the

program solely to private versus public vocational education since different sets of people apply to (or are accepted to) different types of institutions. The Kenyan program we study explicitly permits study of the impact of public and private vocational education courses using randomized evaluation methods.

Card *et al.* (2011) show that a randomized Dominican Republic job-training program had a significant positive impact on individuals' hourly wages and on the probability of health insurance coverage (conditional on employment), although overall effects were moderate. The authors uncover heterogeneous returns to vocational training for those with different levels of educational achievement, across urban and rural areas, and age. Attanasio, Kugler, and Meghir (2011) evaluate the benefits of a randomized vocational training intervention in Colombia, and find returns on the order of 8 to 18 percent in earnings, with especially high returns for girls.

More recent work has focused in and around Asia. Maitra and Mani (2012) report significant improvements in the labor market outcomes for women who participated in an NGO-implemented tailoring course in the slums of New Delhi, India. Bandiera *et al.* (2013) study a large-scale randomized control trial in Bangladesh that pairs the transfer of assets (in the form of livestock) with an NGO-run training program on livestock management for women. Results suggest that the combination of interventions increases total labor supply of women, while shifting their effort out of wage employment and into self-employment, with accompanying increases in earnings and per capita household consumption. In contrast, Hirshleifer *et al.* (2014) use randomized methods to study a national vocational training program in Turkey, and find near-zero, statistically-insignificant impacts on employment and earnings.

Few rigorous impact evaluation studies of vocational education have been conducted in Africa, the world's poorest region and one where the youth unemployment problem is particularly severe. In fact, we are aware of only two other vocational training RCTs conducted in Africa – one focusing on providing training for Ugandan women to run small businesses (Bandiera *et al.* 2014), and one to provide apprenticeships to youth in Malawi (Cho *et al.* 2013). A recent RCT by Blattman, Fiala, and Martinez (2013) in Uganda, finds that a program providing cash grants to youth groups to fund businesses and/or training had large economic returns. However, it is difficult to isolate the returns of training from the returns to capital in their program. A key difference with these related papers studying training in Africa and Asia is that the training is generally provided by specially-sourced trainers who are often specifically trained by the implementing organization to deliver a particular curriculum (except in the case of Hirshleifer *et al.* 2014). In contrast, the Kenyan program we study works with existing formalized vocational training institutions.

Additional evidence on what works in vocational-education delivery will be critical for good public policy in the education sector, and will inform the decisions of governments and NGOs throughout the region, including in our study country of Kenya, as they consider expanding programs to improve youth labor market skills. In addition to exploring the impact of vocational training, this study seeks to illuminate the factors that drive the demand for (public and private) vocational education in Kenya using an innovative randomized voucher delivery mechanism and information campaign. With several less-developed countries currently expanding and investing in their vocational education sectors, the results of this intervention will provide timely and comprehensive evidence to policymakers seeking to increase the demand for vocational education.

The present analysis focuses on program take-up, the demand for vocational education and the impact of the information intervention, voucher recipient institution and course selection, participant attendance, and medium-term labor market and other life impacts. Together, the results of this research will enable the Government of Kenya, the World Bank and other policymakers in the region to more effectively design youth skills training and employment programs in order to promote economic development via human capital formation.

2. Vocational education in Kenya

A formal youth polytechnic system was established in Kenya in the 1960s (King and Martin 2002). These public-training institutions range from relatively basic village polytechnics offering traditional trades such as skilled construction (e.g. masonry, carpentry, plumbing), automotive mechanics and tailoring, to larger polytechnics in towns offering a wider array of courses and complementary skills training in entrepreneurship education (e.g. accounting). Parallel to the youth polytechnic system, the Ministry of Education, Science and Technology (MOEST) also operates a system of technical training institutes, prestigious institutions offering both industrial education and commercial courses in business, computers and secretarial skills. These public institutions typically provide two-year training courses, with total course tuition ranging from US\$300–500 (with a mean of approximately US\$350 among institutions in our primary study area in rural western Kenya) at the time of program launch.

An alternative to the public model is present in the dynamic but understudied private vocational training sector, which could also play an important role in building youth skills in Kenya (as well as in other low-income countries). Kenya's private vocational education sector has grown markedly in recent years. MOEST statistics show that the number of private institutions grew by 16 percent between 2004 and 2007 (while public institutions grew by 6 percent). Under the umbrella of private institutions are a wide variety of institutional structures, including private technical colleges, small centers specializing in a single skill (e.g. hairdressing), and small businesses in which training resembles apprenticeships. Within the primary region of focus for the present study (western Kenya), private institutions offer courses ranging from a few months to two years. Course offerings at these institutions are usually narrower in scope than their public-sector counterparts, but allow students to specialize in specific skills – for example, a particular computer software package. The price of a course varies significantly, but typically ranged between US\$150–500 (with a mean of less than US\$300 among institutions in our study area) at the time of program launch. Thus, private institutions offer a substantially different training experience than public-training centers. Allowing individuals the opportunity to select the course that best fits their needs, whether public or private, may further boost the effectiveness of vocational training by leading to more efficient student-course matches – a possibility we will continue to study in future research.

3. Description of the intervention

3.1 Intervention design

The program we study is an NGO-administered randomized youth vocational education intervention in (primarily western) Kenya. In it, 2,163 out-of-school Kenyan youths between the ages of roughly 17 and 28 years applied for vocational education tuition vouchers, and a randomly-selected half were awarded a voucher. The vouchers were worth approximately

35,000 Kenyan Shillings (Ksh)¹ (about US\$460), an amount sufficient to fully (or almost fully) cover the tuition costs for most private vocational education programs and government-run rural village polytechnics or technical training institutes.

These youth were drawn from a pool of individuals participating in a unique and high quality longitudinal (panel) dataset that the authors have been collecting in this region since 1998, known as the Kenyan Life Panel Survey (KLPS). The KLPS sample was chosen as a representative subset of individuals who attended primary school in the former Busia District, a rural area in western Kenya, nearly ten years prior to the study. Primary schools in this district participated in one of two earlier NGO-run development programs – either a de-worming program launched in 1998 (the Primary School De-worming Program or PSDP; Miguel and Kremer 2004), or a merit scholarship program for girls that began in 2001 (the Girls' Scholarship Program or GSP; Kremer, Miguel, and Thornton 2009). The KLPS data contains detailed educational, health, nutritional, labor market, demographic and cognitive information for thousands of Kenyan adolescents from 1998 to 2009. The existence of detailed information on these and other life outcomes (such as cognitive ability and orphan status) in the KLPS data strengthens the evaluation of this vocational training program and enhances the external value of the evidence generated by permitting estimation of heterogeneous program impacts for different types of individuals.

The entire KLPS sample of 10,758 individuals was invited to an informational session on this vocational training program in late 2008.² Participants were recruited from the KLPS sample through local leaders. A total of 2,705 youth attended one of the 70 introductory meetings held in sub-locations where the original deworming and scholarship programs took place as well as in the cities of Nairobi, Mombasa, and Kisumu where many of them had since moved.³ During this introductory meeting, short surveys were administered to all participants to collect information on their beliefs about expected earnings with and without vocational education, for both the respondent individually and for 'other people in his/her community'. Participants were then given more details on the program, and those meetings selected for the information treatment received a special presentation (see below for more details). Finally, participants were given a list (compiled by program staff) of local vocational training centers and selected participating vocational training centers in urban areas outside of western Kenya, including in large cities such as Nairobi, Mombasa and Kisumu.⁴ Each training center description detailed the location, contact information of the manager or principal, courses offered, academic requirements (if any), and course duration. Meeting

¹ Ksh = 0.013 USD.

² We cannot confirm whether a particular individual received our invitation, but an attempt was made to invite the entire KLPS sample.

³ Sub-locations are local administrative units that vary in size, but generally contain a handful of primary schools and can usually be traversed on foot in a few hours (thus, meetings were within walking distance of most participants).

⁴ This list was compiled in two parts. First, names of public institutions were sought from local government offices. We included all public institutions (affiliated with either the Ministry of Youth and Sports – which at the time ran the polytechnics – or the MOEST – which at the time managed the technical training institutes) located in the heart of our study area (what is currently known as Busia County). In addition, we included many public institutions in the nearby districts of Bungoma East, Bungoma South, Kakamega North, Mumias, and Siaya, as well as a handful of institutions in the cities of Kisumu, Mombasa and Nairobi. Second, we utilized data from the (then) most recent round of the KLPS in addition to surveys at local market centers to identify a range of private vocational training institutions.

participants were also informed that they could apply to a training center not found on this list, as long as the center met program participation requirements.⁵

Individuals were instructed to return to a second program meeting at the same location two weeks later with a letter of support⁶ from a local authority (e.g. chief) or training center, and be prepared to state their preferred schools and courses should they be awarded an unrestricted (public or private institution) voucher or a public-only voucher (these interventions are described below). Students who attended the second meeting, brought a letter of support and had valid preferences for both unrestricted and public-only voucher types were included in the final sample of 2,163 individuals.⁷ This application procedure was designed to ensure a genuine interest in vocational education among applicants, making them a highly policy-relevant sample: those Kenyan youth likely to enroll in vocational education should further training subsidies become available.

Voucher winners were then randomly selected from this final pool of applicants using a computer random number generator (in STATA). The allocation of vouchers was made among those preferring to apply to the same institution; in other words, if 20 sample individuals preferred to apply to a certain vocational training center, five were randomly chosen to receive the public voucher, five were randomly chosen to receive the unrestricted voucher, and the remaining 10 were allocated to the control group. This research design permits study of which precise institutional characteristics have the greatest impact on future labor market returns. Randomization for the voucher treatment assignment was also stratified by individual gender, assignment to the information intervention (described below), participation in one of the two original NGO primary school programs from which the sample is drawn (PSDP versus GDP), and preferred course (which was aggregated into broad occupation groups by course type), thereby ensuring balance across the treatment and control groups along those categories as well. The randomization process is summarized in Figure 1.

Among voucher winners, a random half received vouchers that can be used only in government-supported public vocational training institutes, while the other half received unrestricted vouchers that could be used in either public centers or in the growing private training sector. Of the final sample of 2,163, 526 individuals were assigned unrestricted vouchers and 529 were randomly assigned vouchers only for use at government institutions. The remaining 1,108 serve as the control group. Voucher winners were informed which type of voucher they had won by January 2009, and were subsequently provided the opportunity to apply to the vocational education institution of their choosing.

Table 1 summarizes how the vouchers were designed. Vouchers covered tuition, materials, uniforms, and trade test fees (if applicable). They did not support board, lunch or transport

⁵ See Section 3.2 for more information on eligibility requirements.

⁶ The letter of support was meant to introduce a small level of effort for the applicant during the application process, but was not meant to be prohibitive. Applicants could provide a letter of support from a training institution or local leader (such as a village elder).

⁷ Individuals who missed the first informational meeting but wanted to participate in the program were allowed to do so by attending the second meeting, or by visiting the implementing agency's offices in Busia Town. Project staff attempted to retain the information intervention (described below) treatment assignment of individuals by giving a short individual information presentation to those individuals who were originally assigned to a treatment sub-location.

costs. According to administrative data collected during the program, the mean (median)⁸ voucher amount paid for restricted voucher winners was Ksh21,507 (Ksh 21,300), and for unrestricted voucher winners was Ksh19,858 (Ksh18,000). Information collected from a small subset of voucher winners in mid-2010 (nearing the end of the program) suggests that the mean (median) fraction of total training costs covered by the voucher was 72 percent (96 percent) for restricted voucher winners, and 74 percent (95 percent) for unrestricted voucher winners.

The vocational training program additionally included an information intervention, implemented with a cross-cutting factorial design, such that a random subset of both the voucher treatment and control groups received the intervention. This intervention permits estimation of the role that information on labor-market returns play in demand for vocational schooling in Kenya. In particular, a randomly-selected half of all first program introductory meetings held at the sub-location level were exposed to information about the estimated Mincerian returns to vocational education, using (cross-sectional) information from existing KLPS data.⁹ The information was presented and explained in detail by project staff. Figure 2 presents the posters used in these information sessions. Posters displayed the higher average earnings of individuals who attended vocational training versus individuals who did not (for both men and women), and also broke down earnings by trade.¹⁰ One noteworthy component of the intervention highlighted the large discrepancy between expected earnings for graduates of traditionally male-dominated trades (e.g. mechanic) versus traditionally female-dominated trades (e.g. seamstress) and used this information, as well as more subjective methods – including screening a video of successful female car mechanics in Kenya – to encourage young women to enroll in more lucrative male-dominated trades.

The randomized design in both voucher allocation and the information intervention addresses leading concerns about selection bias in estimating the demand for, and the returns to, schooling. For instance, the classic concern in estimating returns to schooling is that higher-ability individuals are more likely to obtain additional schooling, leading researchers to overstate returns to schooling. Randomizing voucher offers across individuals, and randomizing information across project recruitment meetings, eliminates most relevant selection bias concerns. In the analysis that follows, we can thus more confidently attribute statistically-significant differences in demand for education and labor market gains to the project interventions.

⁸ While 'mean' is the average, calculated by adding up the given data by the number of data entries, 'median' is the middle number arrived at by arranging all the entries from the lowest to the highest.

⁹ For program enrollment meetings in the original KLPS sub-locations of Busia and surrounding districts, information treatment group assignment was performed at the sub-location level after first stratifying by division (an administrative unit containing 5–15 sub-locations). Out of 70 meetings, 35 were randomly selected to receive the information treatment. This information was most economically presented at a meeting-level (as opposed to thousands of one-on-one explanations of the information); so, the sub-location meeting was the relevant unit in the randomization. For the meetings held in Nairobi and Mombasa, randomization into information treatment and control groups was done at the individual level (and no information intervention was performed for the meetings held in Kisumu). The analysis presented below focusing on the information intervention clusters regression disturbance terms at the sub-location level.

¹⁰ Presenters attempted to describe the issue of possible selection bias in this cross-sectional analysis with the following phrase: *You should be aware that the information displayed is from people who were able to pay for their own vocational schooling. In that sense these people may be different from you and they may have benefitted more (or less) from their training program than you would.*

3.2 Training center eligibility

One remarkable facet of the program studied here is the variety of course and institution types available to program participants. The project targeted all major government village polytechnics and technical training institutes in the home study area of Busia County (formerly Busia, Bunyala, and Samia Districts), as well as a large cross-section of available private institutions in the area. While inclusion of government institutions was straightforward, private institutions were vetted before being included in the program.

In general, private institutions were eligible to be included in the program if they had one or more trainees at the time of program recruitment or had offered courses in the prior year, and if their fee structure fell within the program voucher limits. Due to the large number and wide range of institutional types in the private vocational schooling sector, the list of potential participating vocational training centers was necessarily far from exhaustive. The most comprehensive list of potential participating institutions was in the primary target area and original home of all of our participants, Busia County. In these areas, all formalized private vocational training centers were included. These include for-profit computer-training schools and church or NGO-run training centers. Further a variety of privately run for-profit businesses that regularly take students for six-month to two-year 'apprentice-style' training programs were included. These were vetted for legitimacy and formality – shops where space, tools, work and theoretical training were clearly available and where students had been taken many times before were included while those less-equipped to handle a semi-formal training program were excluded. In the rest of western Kenya as well as the cities of Kisumu, Nairobi, and Mombasa – where some of the KLPS sample resided – the program focused primarily on institutions of relatively greater sophistication that more closely resembled public institutions. Finally, all private institutions were vetted for fit with the project. Institutions with costs, program lengths and course types that were largely outside the program plans or far different from similar public options were excluded. In some cases students inquired about the possibility of enrolling in a particular institution. If the institution met the program's criteria then it was included. In a few cases, institutions were not willing to work with the program, and so were excluded.

As evidence of the diversity and versatility of the private vocational training sector in Kenya, the type, length and structure of the private institutions and courses included in the program vary widely. Some institutions run by private entrepreneurs, NGOs or church groups mirror the industrial training structure of the government-run polytechnic system. Others offer short training courses in a particular skill-set like computers or driving. Still others function as businesses-cum-training centers, teaching hairdressing, tailoring or some other trade through something akin to an apprenticeship. The private vocational training sector is arguably more adept at accommodating the needs of a larger variety of students, with courses as short as one month (well-suited to those already in the work force or supporting their families), to longer service-based courses desirable to recent secondary school leavers.

Like the institution and course types, fees vary widely across the courses available to program participants. For courses included in the original list distributed at recruitment meetings, the program covers all mandatory fees including uniform and registration fees. To accommodate the training needs of secondary school leavers and at the request of some voucher winners, the program also allowed students to enroll in more academic technical training diploma courses (e.g. in computer training) and to cover fees up to the level of the average two year industrial course, or 35,000 Ksh (about US\$460).

3.3 Characteristics of vocational institutions, by type

Surveys were administered to vocational training institution administrators and teachers during 2009 and 2010 to collect detailed information on potentially important institution-level characteristics. In particular, these surveys gathered information on school equipment and facilities, classrooms, and teacher characteristics, as well as course curricula.

We find important differences in infrastructure and instructional equipment across different types of institutions (results available upon request). Overall, we find that private institutions were more likely to have flush toilets than public schools. We also find that public and private schools were equally likely to have electricity.

We note a few key differences in the educational and labor market characteristics of teachers in public and private institutions. In particular, we find that 92 percent of teachers at public institutions had taken the secondary school exit examination compared to only 68 percent in private schools. In addition 64 percent of teachers at public schools had completed college compared to 42 percent in private schools. Both these differences in teacher education were statistically significant. Public school instructors had close to four more years of teaching experience than private school instructors (approximately a 50 percent increase and a statistically-significant difference). However, we do not observe any significant differences in the practical work experience of teachers in public versus private schools.¹¹ We also explore differences in pedagogy between different institutions, and find that teachers in public schools devoted a greater share of classroom time to practical work, while teachers in private schools focused relatively more on theory.

The data suggests that most, but not all, schools offer (mandatory) entrepreneurship programs, others offer mandatory remedial subjects such as Mathematics and English, and others encourage their trainees to sit in on some training in closely related fields (e.g. encouraging plumbers to learn basic welding skills). Practical experience is extremely important in enabling students to acquire relevant and employable skills. Overall we do not find any differences in the propensity of vocational training institutions to organize attachments (or internships) – both private and public schools were equally likely to organize attachments. However, we do see that public institution courses are more likely to require an internship or attachment as part of the coursework compared to private schools. This finding probably reflects the differences in course offerings across the different types of institutions, rather than a systematic difference in policy across them. However, we do find that private schools were significantly more likely to assist students with job placement compared to their public counterparts. This placement assistance could have significant implications for successful employment outcomes however the efficacy of such programs is currently unknown.

¹¹ It should be noted, though, that a potential weakness of this survey data is that it does not capture differences in the timing of the teacher experience in great detail. With rapid technological change, recent practical experience in industry may be a particularly salient dimension of teacher quality, and one which may enhance the labor market relevance of the training program.

4. Data and background

4.1 Data sources

Five sources of data were utilized in the analysis presented in this report. First, we use short baseline surveys administered during the 2008 recruitment meetings, prior to the voucher and information treatments. This baseline data is supplemented by data from Round 2 of the KLPS, collected between August 2007 and December 2009.¹² We also utilize monitoring data collected during 2009–2010 from training institutions where voucher winners enrolled. Additionally, we collected a short follow-up survey to capture information on take-up of vocational education within the treatment and comparison groups, and to update contact information of comparison group individuals in our sample.¹³ Finally, we obtain our medium-term outcome measures from Round 3 of the KLPS (KLPS-3) – this latest round of the survey was administered between August 2011 and August 2014, and contains follow-up information for 88 percent of the vocational training sample.¹⁴

4.2 Characteristics of participating individuals

Table 2 presents demographic and program participation data for the full KLPS sample, as well as for the 2,163 individuals who became participants of this vocational training program. The KLPS sample is generally representative of youth in western Kenya: both programs from which it was drawn (the PSDP and GSP) included youth enrolled in primary school in 1998/2001, and the 1998 Kenya Demographic and Health Survey suggests that 85 percent of 8 to 18-year-olds in western Kenya were enrolled in school at that time (Republic of Kenya, 1999).

The last column of Table 2 compares individuals who applied to the vocational training voucher program to individuals in the KLPS sample who did not apply. In general, program applicants are three percentage points more likely to be male than non-applicants, 0.15 years older, and slightly higher in baseline primary school grade. There are no statistically-significant differences in prior program participation (PSDP or GSP) across program applicants and non-applicants, and no difference in the likelihood that a participant was assigned to the PSDP treatment group. Results do suggest that program applicants were slightly more likely to be assigned to the GSP treatment group (2 p.p., p -value ≤ 0.05). In our primary analysis of medium-term program impacts, we control for all of these characteristics.

Table 3 summarizes the descriptive statistics of the vocational training program sample prior to any program intervention. The first thing to note from this table is that the voucher randomization procedure was successful at creating similar treatment and control groups.

¹² See Section 3.1 for a thorough description of the KLPS project.

¹³ For voucher winners who enrolled in training, these follow-ups were during monitoring visits to training institutions. For voucher winners who dropped out or did not enroll, and for comparison group individuals, these follow-ups were conducted by phone. By mid-2010, we were able to obtain this basic follow-up information for 91 percent of the control (non-voucher winner) sample.

¹⁴ The full KLPS sample was randomly divided into two halves, each designed to be representative of the whole, to be tracked in two separate 'waves' of data collection during the round. Data collection was designed in this way in order to allow for improvements to the survey and tracking methodologies between waves. Wave 1 data collection ended in December 2012, and Wave 2 data collection ended in August 2014. The tracking rate among program individuals was 88 percent, an extremely high rate for a longitudinal survey endeavor in rural sub-Saharan Africa. ¹³ The KLPS sample has a higher fraction of females than is representative of the youth population simply because only female participants from GSP schools were included in the KLPS tracking sample.

The treatment and control groups were well balanced along most observable dimensions (among all observables presented, only one shows a statistically significant difference, and only with a p value ≤ 0.10). This allows us to confidently interpret the differences between treatment and control outcomes as the causal effect of the vocational training voucher program.

Column (1) of Table 3 provides a description of the overall sample – a valuable depiction of individuals interested in receiving vocational training. Of the 2163 individuals included in the program, 63 per cent are female. The sample consists of more girls than boys mainly because one of the two school-based NGO programs from which the KLPS sample was originally drawn (the GSP) targeted only girls.¹⁵ Because of the relative size difference between these two different programs, 70 per cent of program applicants were previously involved in the PSDP, while only 30 per cent were previously involved in the GSP. The mean age at recruitment in 2008 was 22 years and sampled students ranged in age from roughly 17 to 28 years.

At the time of project recruitment meetings, most participants lived in Busia County (the main study area of the PSDP and GSP projects in rural western Kenya), with roughly four per cent living just outside of the district and six per cent in large cities. This distribution makes sense, especially given that invitations to recruitment meetings were spread with the assistance of local area leaders throughout Busia County.

Average academic schooling attainment of individuals in the sample prior to the start of the program was 8.8 years, but there is a wide range in attainment: 26 per cent of the sample dropped out before attaining grade eight, 38 per cent terminated schooling upon graduating from primary school, 11 per cent of individuals attended some secondary school, and 24 per cent completed secondary school. Nearly two-thirds of individuals seeking vocational training had received only up to a primary school education. Fewer than three per cent of program applicants were still attending school at the time of program launch, and on average, program participants had been out of school for nearly four years by that time.

Approximately 14 per cent of the sample had previously been employed. Of these, fewer than a quarter were already working in a field in which the project affiliate training centers offer skills training, such as tailoring, hairdressing, skilled construction or computer services. Other common jobs include fishing and informal hawking/sales.

The vocational training voucher program was designed to be open to students who had already received some vocational training but wanted to further their skills. Nearly 22 per cent of the sample had already received some training, primarily through apprenticeships and other informal training at small private enterprises rather than at the larger public centers.¹⁶

¹⁵ As noted previously, the KLPS sample was drawn from the pupil samples for the PSDP, a school-based deworming program carried out from 1998–2002 and the GSP, a merit-based cash award program for the top performing female grade six students carried out in 2001–2002. The programs did not have overlapping samples, as the PSDP was carried out in Budalangi and Funyula divisions of the former Busia District and GSP was carried out in Township, Matayos, Butula and Nambale divisions.

¹⁶ Our data shows that the baseline proportion of individuals with some previous training was balanced across the voucher and control groups. Participation in the program enables these youth to gain official certificates from recognized examination bodies in Kenya (whereas they might not already have had these certificates, which are expensive to obtain), and thus could plausibly have labor market returns above and beyond the training itself.

4.3 The labor market in western Kenya

The region of rural western Kenya where this vocational training program was undertaken is primarily agrarian. Individuals farm for subsistence, and participation rates in wage and self employment are low. There are also important differences in the types of work performed by gender.

Table 4 uses the KLPS-2 data, collected in mid-2007 through 2009, to provide some information on the local labor market participation of youth in western Kenya, prior to the launch of the vocational training program. Nearly three quarters of youth work in agriculture, primarily for household subsistence. Just over 15 percent work in wage employment, primarily in business and retail (i.e. hawking food and clothing, 20 percent of wage earners), skilled construction (12 percent), professional work (i.e. teacher, salaried professional, 10 percent), and other low-skill work (i.e. domestic work, watchman, 10 per- cent). Approximately 11 percent work in self-employment, primarily in food/travel/tourism (i.e. butcheries, restaurants/cafes, distilling alcohol, 34 percent), business and retail (17 per- cent), and tailoring and textiles (12 percent). There are also important differences across gender. Men are much more likely to have wage employment than women. Within wage employment, men tend to work in business and retail, skilled and unskilled construction, while women focus in low-skill work, business and retail, professional work, tailoring, and food/travel/tourism. Among the self-employed, business/retail and food/travel/tourism are the largest employers for both genders. On the whole, most youth in western Kenya spend their time in low skill work – suggesting that a program enhancing their skills may allow them to move into potentially more lucrative endeavors. More than one-quarter of youth are unemployed (not employed in wage labor or self-employment, and currently seeking work).

5. Hypotheses and empirical strategy for medium-term impacts

5.1 Theory of change and hypotheses

There are a number of ways through which vocational education (and this voucher program in particular) can improve youth labor market outcomes. Lack of skills is a potential barrier that could hinder the employability of youth. However, since training programs are costly, youth facing credit constraints may be unable to invest in these programs. Thus, by providing vouchers (scholarships) for youth, the program would result in increases in educational attainment among those awarded the voucher (relative to those who were not chosen to receive the voucher). By alleviating the financial barriers to accessing training, the program could improve the skills of youth. If training improves worker skills and productivity, economic theory postulates that this would increase the demand for labor. Training could also serve as a signal to employers. If the skills that youth invest in are not in sufficient demand – either because the skills provided by training programs are not what is required by employers or due to insufficient labor demand – then training programs are likely to not improve the employability of youth. Potentially private-training providers are better able to respond to the needs of the market. If private providers offer skills that are better aligned with the labor market, then we may find that youth training in private schools may have better employment prospects.

While data collection was still underway, and before any analysis of medium-term program outcomes using the KLPS-3 had been completed, we registered a pre-analysis plan with the Abdul Latif Jameel Poverty Action Lab in December 2012. Pre-analysis plans are popular in

medical trials, but are just beginning to catch on in the evaluation of randomized trials in development economics (Casey *et al.* 2012). The goal of creating these plans is to reduce data mining and tendentious reporting by pre-specifying main research hypotheses, outcome variables and regression specifications. We note any departures from that plan in what follows.

We specified three main hypotheses (outcomes for which we would expect to see an effect of increased vocational education) and a set of exploratory hypotheses in our pre-analysis plan.

We present a range of these outcomes here, including:¹⁷

- (H1) Increased earnings, including both wage earnings and self-employed profits
- (H2) Improvements in other labor market outcomes, such as work hours and sectoral shifts out of agriculture
- (H3) Improvements to living standards, including asset ownership
- (H4) Impacts on attitudes, human capital, and marriage and fertility.

5.2 Empirical strategy

In our empirical analysis, we follow our pre-analysis plan by presenting both the treatment-effect-on-the-treated (TOT) results and the intention-to-treat (ITT) results. To estimate the TOT, we use an instrumental variable two-stage least squares (IV-2SLS) approach. Specifically, we use assignment to a voucher treatment, assignment to the information treatment, and an interaction of the two as instruments for years of vocational training attained. We deviate from our original pre-analysis plan (which was published prior to the launch of Wave 2 data collection) by incorporating interactions of all of these measures with an indicator for the individual being surveyed in the survey Wave 2, in order to explore the dynamics of labor market outcomes following training (each wave of data collection is representative of the whole, and individuals in Wave 2 were surveyed on average 21 months after those in Wave 1). We further deviate from our plan in this report for simplicity of presentation, by omitting the additional unrestricted voucher assignment term and its interactions.

We can specify the first stage of our instrumental variable approach in two equations, as follows:

$$\begin{aligned}
 VVVVVVVVdd_{ii} = & \alpha\alpha_0 + \alpha\alpha_1 * AAAAAAVVVVA AVVheerr_{ii} + \alpha\alpha_2 * \\
 & (AAAAAVVVVA AVVheerr_{ii} \times WWWWWWee2_{ii}) + \alpha\alpha_3 * IIAAIIVVIIrreeWWrr_{ii} + \alpha\alpha_4 * \\
 & (IIAAIIVVIIrreeWWrr_{ii} \times WWWWWWee2_{ii}) + \alpha\alpha_5 * (AAAAAVVVVA AVVheerr_{ii} \times \\
 & IIAAIIVVIIrreeWWrr_{ii}) + \alpha\alpha_6 * (AAAAAVVVVA AVVheerr_{ii} \times IIAAIIVVIIrreeWWrr_{ii} \times \\
 & WWWWWWee2_{ii}) + WW'_{ii}\gamma + \eta_{ii}
 \end{aligned} \tag{1}$$

$$\begin{aligned}
 VVVVVVVVdd_{ii} \times WWWWWWee2_{ii} = & \theta\theta_0 + \theta\theta_1 * AAAAAAVVVVA AVVheerr_{ii} + \theta\theta_2 * \\
 & (AAAAAVVVVA AVVheerr_{ii} \times WWWWWWee2_{ii}) + \theta\theta_3 * IIAAIIVVIIrreeWWrr_{ii} + \theta\theta_4 * \\
 & (IIAAIIVVIIrreeWWrr_{ii} \times WWWWWWee2_{ii}) + \theta\theta_5 * (AAAAAVVVVA AVVheerr_{ii} \\
 & \times IIAAIIVVIIrreeWWrr_{ii}) + \theta\theta_6 * (AAAAAVVVVA AVVheerr_{ii} \times IIAAIIVVIIrreeWWrr_{ii} \times \\
 & WWWWWWee2_{ii}) + WW'_{ii}\gamma + \eta_{ii}
 \end{aligned} \tag{2}$$

¹⁷ The full set of results on all pre-specified outcomes is available from the authors upon request.

where $VVVVVVVVdd_{ii}$ is the measure of individual vocational education (i.e. years of training completed), $InfoTreat$ is an indicator for receiving information about the potential labor market returns to vocational education, $Wave2$ is an indicator for the individual being surveyed in KLPS-3 Wave 2, and WW_{ii} is a vector of covariates. $AnyVoucher$ is an indicator for winning any type of voucher. Following Bruhn and McKenzie (2009), W contains the vector X of characteristics used for stratification during the randomization, namely: the individual's original project participation (in PSDP or GSP), their gender, and their preferred training course. Course preference consists of six indicator variables for the major occupational groups, namely, (i) construction and related trades, (ii) textiles and tailoring, (iii) mechanics and driving, (iv) beauty, (v) computers/secretarial/business, and (vi) other (As is standard, the '(vi) other' category indicator will be excluded from the regression to avoid collinearity issues). W also contains the following additional individual characteristics: age (in 2008), school attainment (by 2008, at program baseline), an indicator for any prior enrollment in vocational education (at baseline), stated preference for a public versus a private training institution (at baseline), indicators for treatment status in the earlier PSDP and GSP programs, a linear measure of the number of months since KLPS-3 data collection began, and an indicator for being in Wave 2 data collection.¹⁸ We can then specify our second stage as follows:

$$AA_{ii} = \beta\beta_0 + \beta\beta_1 * VVVVVVVVdd_{ii} + \beta\beta_2 * (VVVVVVVVdd_{ii} \times WWWWWWee2_{ii}) + WW_{ii}'\varphi\varphi + \varepsilon_{ii} \quad (3)$$

where we instrument for $VVVVVVVVdd_{ii}$ and $(VVVVVVVVdd_{ii} \times WWWWWWee2_{ii})$ using the first stage specified in equations (1) and (2).

Assignment to voucher treatment must satisfy several conditions to be a valid instrument for vocational training, including the *exogeneity* and the *relevance* of the instrument. Exogeneity is satisfied by the 'successful' randomization of subjects into the treatment and control groups, in terms of balance along observable characteristics, which we demonstrated in Table 3. Regarding 'relevance', there are a number of compelling reasons to believe that a vocational education tuition voucher should increase enrollment. Most obviously, eliminating or dramatically reducing the cost of vocational education will increase demand through price effects. Subsidies may ease credit constraints that prevent enrollment or lead to dropout prior to completion; enable youth to enroll in higher quality institutions, including those that offer preparation for official certification exams (note that the payment of certification exam fees was typically covered by the program); and allow students to spend more time studying, rather than working to cover their tuition payments.

The TOT might differ from the ITT effect because the experiment did not have perfect compliance: in preliminary analysis, we found that 26 percent of individuals offered a voucher did not take it up, and roughly 4 percent of individuals in the control group completed some vocational training. Thus, we also present reduced-form estimates (i.e. differences between those who were offered a voucher and those who were not), which is equivalent to the ITT estimate.

¹⁸ These last two controls were not included in our pre-analysis plan, which was written with the KLPS-3 Wave 1 data collection effort in mind, but we decided to add them in order to incorporate the Wave 2 data collection effort, which followed by several months.

6. Technical and vocational vouchers program results

6.1 Baseline school and course preferences

During program recruitment meetings (after the information intervention but prior to the voucher lottery), surveys were undertaken to elicit information on the preferences of each participant under the two voucher-treatment scenarios (i.e. if he/she were to receive an unrestricted voucher or a public-only voucher). We collected information on preferred training center and course, as well as the reasons for choosing this combination. Overall, applicants showed a moderate preference for public-training centers (57 percent preferred public, 43 percent preferred private, Table 3) as their first choice. Such preferences did not vary at statistically-significant levels across gender, level of education, or previous vocational training. However, individuals at or below median age (21 years) were more likely to prefer public institutions than their older peers (59 percent versus 53 percent), and those who had been out –of- school for three years or less were more likely to prefer public institutions than those who had been out- of- school longer (58 percent versus 54 percent). Previous participants of the GSP were much more likely than those of the PSDP to prefer public institutions (66 percent to 52 percent). Individuals living in or near Busia District (thus, primarily in rural areas) at the time of program meetings were substantially more likely to prefer a public training institution than those living outside of Busia (56 percent to 47 percent respectively). Furthermore, those living in a city were much more likely to prefer a private institution (56 percent to 43 percent respectively).

In terms of preferred industries for courses, the largest number of participants hoped to attend training for either tailoring or dressmaking (32 percent) followed by driving or mechanic (25 percent). Other popular industries included computer or secretarial or business work (15 percent), hairdressing (13 percent), and skilled construction (12 percent). Table 5 summarizes the breakdown of broad occupation of interest for various subgroups of program participants. The demand for tailoring or dressmaking, beauty and computer or secretarial or business courses is driven primarily by females, while the demand for vehicle-related and skilled construction courses is driven by males.¹⁹ The distribution of course preferences is fairly similar across individuals aged above and below the median, and across location of residence (although those living in cities seem to be more interested in vehicle-related trades while those living in rural areas appear to be relatively more interested in tailoring). In terms of education level, preferences are similar for those who attained less than a secondary degree, while those with a secondary degree are much more likely to apply for a program in computer or secretarial services. There do not appear to be substantial differences in terms of years since last in school, whether the individual has previously attended any vocational training, or whether or not they are currently working.

6.2 Program take-up

Program take-up rates illustrate strong participant interest in vocational training. Of the 1,055 individuals offered a voucher, 778 youth (74 percent) used it for at least one term of vocational training between 2009 and 2010. Perhaps surprisingly, there are no statistically-

¹⁹ There also appear to be some differences in the distribution of preferences between individuals previously participating in the PSDP and individuals previously participating in the GSP, though this is likely due to the gender component of the scholarship intervention (and indeed, preferences of former GSP participants closely mirror those of women in the sample as a whole; results not shown).

significant differences in take-up across gender, years since last in school (above or at/below median), or previous vocational training (although older voucher winners and those who reported being employed at the time of the pre-program informational meetings were less likely to use their voucher – by 7.9 percentage points for employed; results not shown).

There are, however, statistically significant differences in the take-up rate between individuals who were awarded the restricted (government only) vouchers and those who were awarded unrestricted vouchers (results not shown). Specifically, 79 percent of unrestricted voucher recipients attended vocational training at some point after January 2009 while only 69 percent of public-only recipients attended for at least one term. Furthermore, the finding that individuals employed at the start of the program were less likely to take-up is driven by those who received restricted vouchers (results not shown). This is sensible since any expansion in training options should be associated with higher take-up, by leading to the possibility of better trainee-institution matches.

Within their institutions of choice, individuals enrolled in a range of different courses. One-third of voucher winners chose courses that lasted two years or more (at least six school semesters), while roughly 50 percent of voucher winners chose courses that lasted at most one year. Table 6 describes course selection by voucher winners. The most popular courses among voucher winners were tailoring (38 percent), motor vehicle mechanic (18 percent), hairdressing and beauty (9 percent), driving (7 percent) and masonry (6 percent). The most popular courses for male voucher winners were motor vehicle mechanic (40 percent), driving (16 percent) and masonry (16 percent), while the most popular courses for females were tailoring (60 percent), hairdressing and beauty (14 percent) and secretarial and computing (11 percent). Course length varied widely across these choices, from 1.4 to 7.3 three-month semesters.

The project received an official decline of interest from 46 treatment students (4 percent of those awarded a voucher). Of those who gave a specific reason, 23 percent had enrolled in an academic college (including teachers' colleges, academic technical colleges, and private diploma courses), 17 percent enrolled in a four-year university, 15 percent enrolled in secondary or advanced-level secondary school in Kenya or Uganda, and 3 percent returned to primary school. Aside from academic schooling options, 12 percent cited family care needs, 9 percent distance to available training centers, and 9 percent work responsibilities. Only 6 percent expressed dissatisfaction with the courses on offer, as expected since this is a sample of individuals that had shown genuine initial interest in vocational education by attending program recruitment meetings in the first place.

Fewer than 4 percent of the control group sample, or 41 individuals, were reported to have enrolled in some type of vocational schooling during 2009–2010. Of these, just over one-third enrolled in institutions participating in the intervention, while the remaining individuals enrolled in apprenticeship-type training with smaller private enterprises. Approximately 2 percent of the control group was attending a secondary school or other academic institution, 19 percent were working and the remaining 67 percent for whom we have data were 'farming' (which typically means performing subsistence agriculture for one's own household) or 'just at home'.

6.3 Educational attainment

We use the KLPS-3 data (described in more detail in Section 3.1) to examine the impact of the program on years of vocational education completed. While previous analysis presented above examined initial program take-up, we can compare the differences in educational attainment across treatment and control groups. This analysis also serves as the first-stage in a standard econometric model that estimates the Mincerian returns to (vocational) education (Equation 1).

The results are shown in Table 7. Individuals awarded a voucher completed 0.55 years more of vocational education than their counterparts in the control group. As control group individuals attained 0.32 years of vocational education, these estimates suggest that the vouchers nearly doubled vocational educational attainment among program participants. This strong statistically-significant effect of the vouchers on vocational educational attainment suggests that the price of vocational training, possibly coupled with credit constraints, are a major impediment to vocational education access.

6.4 The information intervention and the demand for vocational training

Females and males participants of the vocational training program listed quite disparate course preferences, which conform with traditional gender patterns in Kenya. Specifically, men expressed their preference for male-dominated courses such as motor vehicle mechanics or driving, while women expressed their preference for traditionally female-dominated courses such as tailoring or hairdressing. Only 15 per cent of women preferred male-dominated courses (vehicle and construction-related, Table 5) while 15 per cent of men preferred female-dominated courses (mainly tailoring, but also beauty, Table 5).

Results suggest that large information gaps existed in the sample at the start of the program. On average both men and women appear to have had somewhat optimistic perceptions about the returns to vocational training: they believed that the average returns were 61 per cent compared to an estimated Mincerian return (using the KLPS data) of 37 per cent.²⁰ Sample individuals were also mistaken about the highest earning trades. Individuals believed tailoring and mechanics were the highest earning trades for women and men respectively. However, our data showed that the most lucrative trades were actually hairdressing for women and tailoring for men. Given these apparent baseline misperceptions about returns to vocational training, the provision of additional information could potentially have had meaningful consequences on individual educational choices.

We examine the impact of the information treatment on program enrollment, institution preferences, and take-up decisions in Tables 8 and 9. The information intervention did not significantly affect individual decisions to apply to the program (Table 8, Column 1), nor did it affect enrollment for voucher winners (Table 8, Column 3). However, the intervention did have a significant impact on females preferring and female voucher winners ultimately enrolling in male-dominated courses (Table 9, Columns 1 and 3). In fact, females exposed to the information intervention were more than 5 percentage points more likely to express a preference for a male-dominated course, and 5 percentage points more likely to actually enroll in one. More educated females were especially likely to prefer for male-dominated fields.

²⁰ One important caveat is that the Mincerian returns estimated from the KLPS data likely suffer from some selection bias, and thus are not always a reliable benchmark, as discussed in Section 3.1 above.

The information treatment also made respondents more likely to express a preference for a government (public) training institution (Table 8, Column 2), perhaps in part because these institutions' industrial trade and construction courses are traditionally male-dominated. Males also preferred government institutions, probably due to the increased availability of courses such as motor vehicle mechanics in government schools relative to private schools.

6.5 Course completion among voucher winners

School fees are often cited as the primary factor causing students to dropout of educational institutions in Kenya (Republic of Kenya, 2007). This factor is not relevant for the majority of voucher winners in our sample, for whom the voucher award paid for all fees, allowing us to understand other important determinants of dropout choices beyond fees.

Despite recruiting individuals who claimed to be highly interested in vocational training, and paying for all (or nearly all) of their fees, we still observe moderate dropout rates among the participants. Defining course completion as attending all terms of the course, 52 percent of voucher winners enrolled in vocational training completed the course in which they enrolled (48 percent of female enrolled voucher winners, Table 10). Defining course completion slightly more flexibly to allow participants to miss one term (as long as it wasn't the final term) of the course, 58 per cent of enrolled voucher winners completed their courses (54 per- cent of female enrolled voucher winners). This retention rate is lower than the rate found in Kenyan secondary schools, although it should be noted that the secondary rate is probably higher due to the positive selection caused by the low primary to secondary school transition rate (World Bank, 2004). For those individuals who did dropout, we observe a fairly sizeable degree of variation in the timing of dropout. The average dropout completes approximately three-quarters of their course before dropping out. This equates to approximately 3.6 terms, or 1.2 years of vocational education.

Table 10 explores the determinants of course-completion among vocational training program voucher winners enrolled in training. Completion data used in this table was collected during monitoring visits to training institutions during 2009–2010. Columns (1) and (4) define completion as attended all semesters of the course, for all participants and female participants, respectively. Women were substantially less likely to attend every semester than men (by 9.5 percentage points, s.e. 4.4). Furthermore, restricted (public-only) voucher winners were less likely than unrestricted voucher winners (by 6.7 p.p., s.e. 3.6). This makes sense, since the restricted choice set of institutions should lead to lower quality individual-institution 'matches' than in the unrestricted voucher case. Despite some evidence on the impact of information on training course selection, we do not find that the provision of information had any impact on retention. There were also no differences in completion according to prior program participation (PSDP versus GSP), years of schooling attained, whether the participant completed secondary school or received prior vocational training, or age. Similar results are obtained if we define completion somewhat more flexibly, allowing participants to miss one semester term of their course with the exception of the final semester (Column 2). Among female enrolled voucher winners, there is suggestive evidence that those who completed secondary school were somewhat more likely to complete their vocational training course (Column 5).

The simple retention analysis in Columns (1) and (2) (Columns 4–5 for females) can mask differences in the timing of dropout behavior. Columns (3) and (6) measure the percentage of course completed to provide a clear metric on human capital acquisition of program

participants, since there is some variance in course length, for the full sample of enrolled voucher winners and for females, respectively. This analysis shows that individuals with restricted (public institution only) vouchers completed 5 percentage points less of their course than unrestricted voucher winners. Females completed 8 percentage points less of their course than males, and individuals with higher schooling attainment at baseline completed more coursework than less educated individuals. Taken together, these results also suggest that students placed considerable valuation on the greater choice provided by the unrestricted voucher, and this led them to complete more training, perhaps because greater flexibility in the institution and course choice led to higher quality individual-institution matches.

6.6 Analysis of medium-term labor market impacts

6.6.1. Attrition and tracking in the KLPS-3 follow-up survey

The entire vocational training program sample of 2,163 individuals was tracked in a medium-term follow-up round, as part of KLPS-3. Tracking was randomly divided into two waves, where each wave was representative of the whole. This was done in part to allow for improvements to survey instruments over time. Tracking Wave 1 was launched in August 2011, and lasted approximately 16 months. Tracking Wave 2 was launched in July 2013, and lasted approximately 14 months. Hence, individuals interviewed during Tracking Wave 1 were surveyed in some cases as little as a few months following the end of their training program, while those interviewed during Tracking Wave 2 were surveyed two to three years following the end of their training program. This variation in the timing of interview can have important implications for our analysis, and we take advantage of the random splitting of the sample into survey tracking waves in our medium-term impacts analysis.

Table 11 describes attrition in the KLPS-3 survey round among the vocational training program sample.²¹ In particular, 88 percent of the sample was successfully surveyed, and information collected from them on years of vocational training attended. There is no evidence of differential attrition across the interventions we explore in what follows – assignment to receive a vocational training voucher, or assignment to receive the information intervention. There is suggestive evidence that restricted (public-only) voucher winners were slightly less likely to be surveyed in the medium-term follow-up round (3.9 percentage points, s.e. 2.0) – we do not explore that intervention in what follows. Furthermore, there was no differential attrition across any baseline characteristics, including gender, age, schooling attainment by 2008, attended vocational training prior to 2009, vocational training institution or course preference in 2008, baseline program participation (PSDP versus GSP), and whether the individual was assigned to the treatment group in their baseline program.

6.6.2. Earnings

We use the KLPS-3 follow-up data to examine the impact of vocational training on earnings in Table 12, taking advantage of the random division of the sample into two tracking waves as described above. Overall we find limited evidence on program impacts on earnings. The reduced form results in Panel A suggests a negative impact of vocational training vouchers

²¹ Note that one observation is missing from this table, as this individual is missing baseline information on whether he/she had previously attended vocational training.

on total earnings among those with positive (non-zero) earnings who were surveyed in Wave 1, but a positive, more-than-compensating increase in total earnings among those surveyed during Wave 2. This suggests, that there was some positive impact of the training vouchers on earnings among those with positive earnings but only after they had been out of training for a number of months (recall that Wave 2 individuals were surveyed more than a year after those in Tracking Wave 1).²² However, this evidence is only suggestive – the 2SLS results have the appropriate signs but are not statistically significant at traditional confidence levels. Furthermore, the results including individuals with zero earnings also have the same signs (negative for those interviewed in Tracking Wave 1, positive for those interviewed in Tracking Wave 2) but again are not statistically significant.

Panels B and D provide no evidence of impact on overall non-agricultural earnings or earnings from self-employment. Panel C examines the impact of the program on wage earnings. While we do not find a statistically-significant impact of the program on wage earnings for the full sample, we do find suggestive evidence that the program led to increases in hourly wage earnings for individuals that worked for a wage (i.e. individuals with positive wage earnings and positive hours in the wage work sector at the time of follow-up). In particular, our IV estimates for hourly-wage earnings show that the Mincerian rate of return was 39 percent for an additional year of vocational education, which is a very high rate of return. However, these findings are necessarily tentative, given that individuals select into the wage employment sector (a finding discussed in more detail below), and less than a quarter of the program participant sample are in the wage employment sample.

6.6.3. Sector shifts and hours worked

We examine the impact of the vouchers on the work sector and labor supply of program participants in Table 13. There is no evidence to suggest increases in work hours on the intensive margin (Panel A). Examining the extensive margin (Panel B), surprisingly, we do not find any evidence that the program led to a shift out of agriculture (although the main term coefficient is positive and the coefficient on the interaction with the Wave 2 indicator is negative). We do find suggestive evidence of initial shifts away from non-agricultural employment, with later shifts into this sector, and these results are driven by shifts in wage employment. We also do not see any significant change in the labor supply of individuals in our sample. However, we find that the program led to an initial decrease, and then later a more-than-compensating increase, in the probability of full-time non-agricultural employment, as well as some evidence that by Tracking Wave 2, voucher recipients were more likely to own a licensed non-agricultural business.

6.6.4. Other impacts

We examine the impact of the program on migration and living standards in Table 14. Panel A displays the results on migration. Surprisingly, it appears that individuals who did not receive a training voucher (the reduced form results), or individuals who had lower levels of vocational training (the 2SLS results) are more likely to be living in a city or outside of Kenya by the second Tracking Wave of data collection.

²² It may be that the voucher control group initially benefits from the extra potential (or actual) experience relative to the voucher treatment group, who are just entering the labor market. Standard models of human capital would predict that while the initial earnings differences between the treatment and control groups would be small (or even negative), these earnings differences between the groups would grow over time as the returns to education were realized.

Panel B of Table 14 explores selected consumption and well-being measures, such as number of meals eaten and asset ownership, which were collected during the KLPS-3 interview for the whole sample. Overall, we do not find significant improvements in consumption or well-being due to the program. Furthermore, we see some evidence of a fall in consumption for individuals surveyed later (fewer meals eaten for those interviewed in Wave 2, in both the reduced form and 2SLS results).

Table 15 explores a range of other outcomes, including attitudes (Panel A), human capital (Panel B), and marriage and fertility (Panel C). There is some evidence of decreased support for democracy and the Kenyan government, and decreased political participation as a result of the program, although this evidence is suggestive at best. There is no evidence of a program impact on human capital in the form of math and sentence reading test scores, and little to suggest impacts on marriage or fertility.

7. Discussion

The evidence discussed in this report suggests that vouchers are a potentially effective way of encouraging investment in vocational education in Kenya. The results show that individuals awarded a voucher were able to acquire more vocational education, consistent with the notion that financial constraints limit educational investments in this environment. We found suggestive (but not dispositive) evidence of shifts out of agriculture and into (wage) employment, however, we found little evidence of improvements in well-being or human capital due to the program. We found limited evidence on earnings, where we only see statistically-significant increases in wages among wage earners.

There are two major limitations of our study thus far. First, we are still working to explore the potential differences in the returns between private and public schooling and other heterogeneity analyses. Using the initial enrollment data, we did observe that individuals who were awarded an unrestricted voucher had higher take-up rates compared to those awarded a restricted (public institution only) voucher. These take-up differences may be caused by the greater ability of unrestricted voucher winners to find a program better suited to their needs. Our data suggest that private institutions may provide more flexible and relevant training, thus individuals who have access to them may be able to better customize their training programs. Second, the timing of the KLPS-3 follow up was potentially too close to the completion of training. Since the returns to education investments may not accrue in the short-run, our ability to document labor market outcomes from the program may be limited. We plan to conduct another (longer-run) follow-up survey (KLPS-4) in 2015–2016.

The scarcity of start-up capital may also potentially dampen the ability of program beneficiaries to reap the benefits of their training. Our data show that 75 percent of those not in self-employment report that the lack of capital is the main impediment to them starting a business. Discussions with training program enrollees highlighted the lack of start-up capital as a significant impediment to youth utilizing the skills obtained in vocational training. In particular, youth cited credit constraints impeding their ability to start their own enterprises and the diminishing the employability in trades such as auto-mechanics due to their inability to finance the purchase of tools. The complementarity between human and financial capital may be one reason for the dramatic program effects found in Blattman, Fiala and Martinez (2013). We will explore this possibility in more detail in future work by overlaying a start-up capital grant intervention on top of this current program.

Figure 1: Randomization process for vocational education program in Kenya

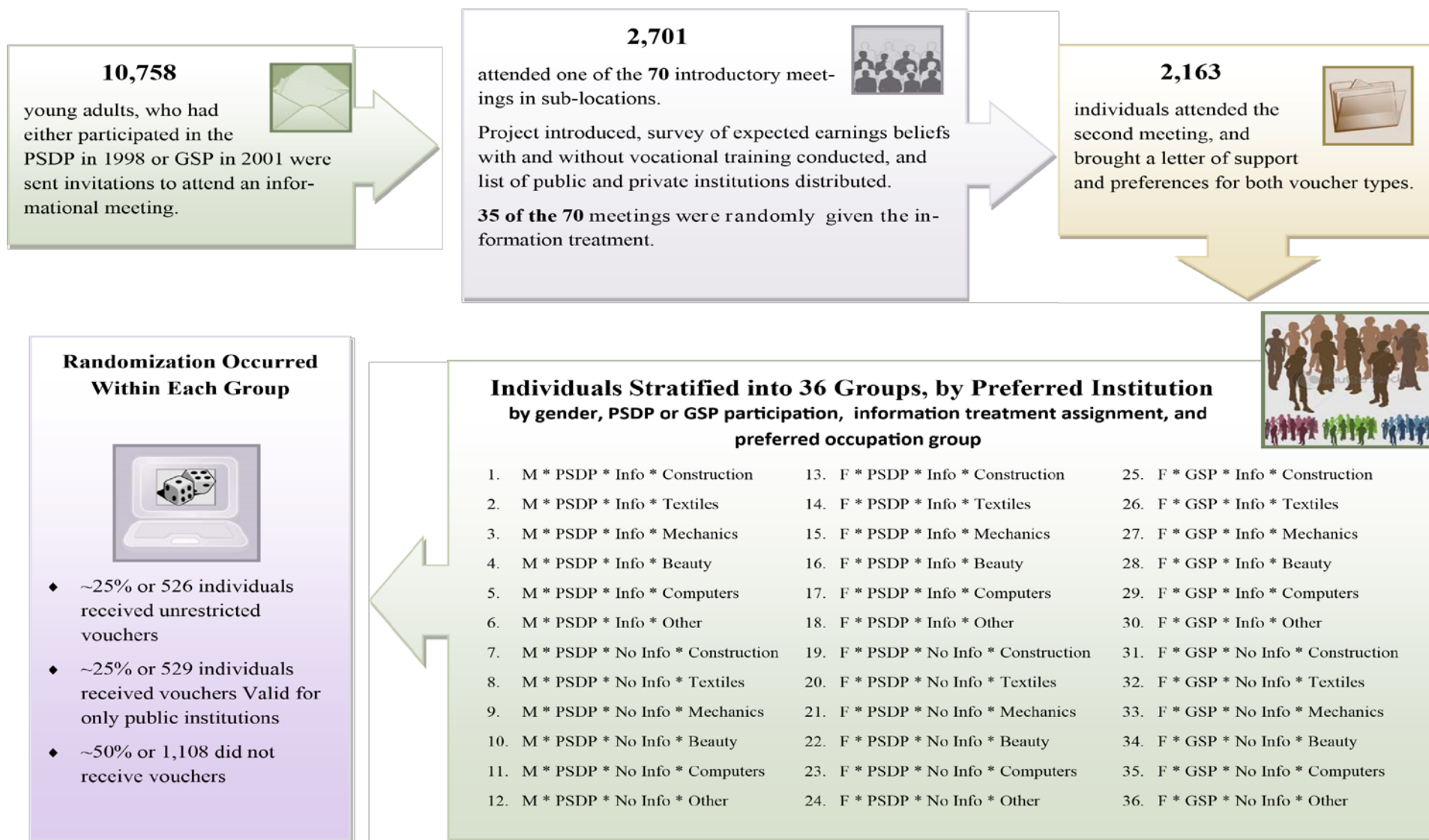
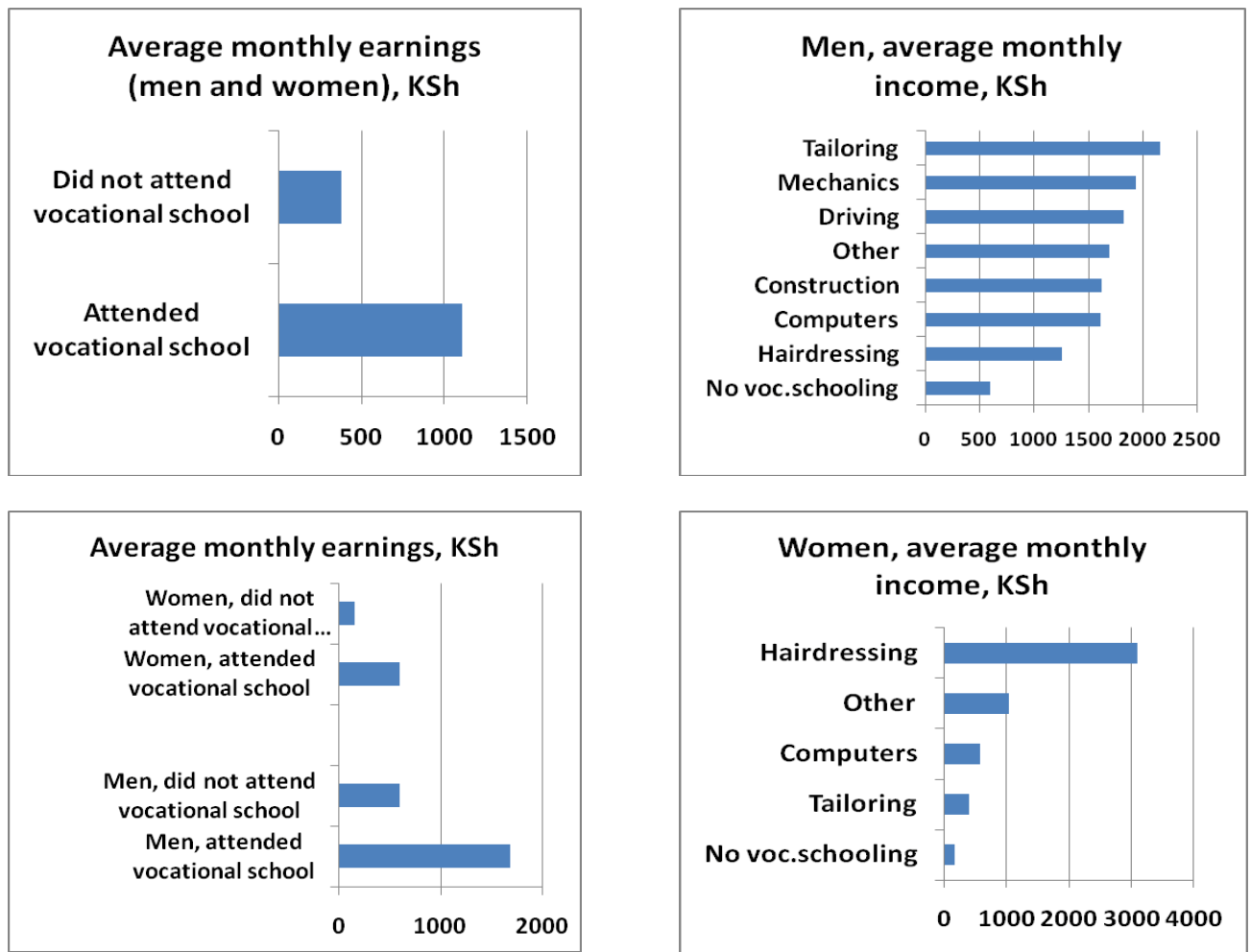


Figure 2: Information presented during information intervention in 2008



The above charts are based on information obtained from people of your age from Busia district that took part in the ICS/IPA de-worming program. The information in the charts suggests that the benefits of undertaking a vocational schooling program for some people of your age are quite high – and the impact on earnings are higher on average for certain training programs than others.

But you should be aware that the information displayed in the above charts are from people who were able to pay for their own vocational schooling. In that sense these people may be different from you and they may have benefitted more (or less) from their training program than you would.

Table 1: Summary statistics on voucher design

Expenses covered	Public-Only Voucher	Unrestricted Voucher
	Tuition, Materials, Uniform, Trade Test Fees	Tuition, Materials, Uniform, Trade Test Fees
Voucher amount (mean) in Kshs	21,507	19,858
Voucher amount (median) in Kshs	21,300	18,000
Out-of-pocket costs (mean) in Kshs	8,289	6,988
Out-of-pocket costs (median) in Kshs	1,000	1,000
Voucher percent of total costs (mean)	72.2%	74.0%
Voucher percent of total costs (median)	95.5%	94.7%
Course duration (3 month terms)	4.06	3.29

Notes: Data on voucher amounts and term length was collected during monitoring visits to training institutions of voucher winners during 2009–2010. Data on out-of-pocket costs was collected for a subsample of 112 voucher winners during a midline follow-up survey conducted in mid-2010. Data on course duration was collected from vocational training centers where voucher winners enrolled. Expenses not covered include board, lunch, transport

Table 2: Baseline summary statistics, vocational training vs. other KLPS participants

	Full KLPS Sample	VocEd Sample	Non-VocEd Sample	(VocEd - Non-VocEd)
Female	0.654	0.630	0.660	-0.030***
Age in 2008	21.9	22.0	21.9	0.147***
1998/2001 (KLPS baseline) grade	4.8	4.9	4.7	0.122***
Previous program participation				
Participated in PSDP	0.700	0.695	0.701	-0.006
Assigned to PSDP treatment group	0.461	0.463	0.461	0.002
Assigned to GSP treatment group	0.147	0.164	0.142	0.021**
Number of observations	10,758	2,163	8,595	10,758

Notes: Data presented in this table was drawn from baseline (1998/2001) information for the full KLPS sample. The first three columns present sample means, while the fourth column displays the average difference between those who participated in the vocational training program (i.e. VocEd Sample) and those who did not participate (i.e. Non-VocEd Sample). *** indicates $p \leq 0.01$, ** indicates $p \leq 0.05$, and * indicates $p \leq 0.1$. Note that 14.5 percent of observations are missing age data.

Table 3: Pre-intervention summary statistics, by voucher treatment group

	All	Treatment			Control	T-C
		Overall	Unrestricted/ Restricted			
Female	0.630	0.625	0.622	0.628	0.635	-0.011
Age	21.7	21.6	21.6	21.7	21.8	-0.120*
Location of residence						
Busia District ¹	0.893	0.895	0.889	0.901	0.891	0.003
District neighboring Busia ²	0.042	0.042	0.040	0.044	0.042	0.000
City ³	0.055	0.050	0.055	0.046	0.059	-0.008
Previous program participation						
Participated in PSDP	0.695	0.695	0.694	0.696	0.695	0.000
Assigned to PSDP treatment group	0.463	0.479	0.485	0.473	0.449	0.030
Assigned to GSP treatment group	0.164	0.153	0.150	0.155	0.174	-0.022
Highest level of schooling completed ⁴						
Some primary	0.264	0.263	0.255	0.270	0.265	-0.003
Primary	0.376	0.383	0.405	0.361	0.370	0.013
Some secondary	0.108	0.110	0.114	0.106	0.106	0.003
Secondary	0.241	0.234	0.209	0.250	0.247	-0.013
Other education characteristics						
Total years of schooling completed ⁴	8.8	8.8	8.7	8.9	8.8	-0.025
Number of years since last in school ⁴	3.8	3.8	3.9	3.8	3.9	-0.038
In school	0.025	0.028	0.034	0.023	0.023	0.006
Ever attended vocational training	0.218	0.218	0.231	0.203	0.217	0.000
Employed ⁵	0.136	0.137	0.137	0.138	0.134	0.003
In agriculture/fishing	0.204	0.214	0.181	0.247	0.195	0.019
In retail	0.211	0.186	0.181	0.192	0.235	-0.049
In an unskilled trade	0.068	0.062	0.056	0.068	0.074	-0.012
In a skilled trade	0.211	0.221	0.306	0.137	0.201	0.019
As a professional						
Preferred training course group ⁶	0.058	0.069	0.069	0.068	0.047	0.022
Construction and related	0.118	0.118	0.105	0.130	0.119	-0.002
Textiles and tailoring	0.324	0.328	0.333	0.323	0.320	0.008
Mechanics and driving	0.247	0.238	0.240	0.236	0.255	-0.018
Beauty	0.129	0.135	0.129	0.140	0.124	0.011
Computers, secretarial, business	0.149	0.152	0.156	0.147	0.146	0.005
Other	0.033	0.030	0.038	0.023	0.035	-0.005
Prefers to attend private institution ⁷	0.433	0.450	0.464	0.437	0.416	0.034
Number of observations	2,163	1,055	526	529	1,108	2,163

Notes: Data presented in this table was collected during program recruitment meetings in 2008, before vouchers were awarded. The first five columns present sample means, while the final column displays the average difference treatment groups and control groups.

¹Busia District treatment (overall) and control groups. * indicates $p \leq 0.1$ is defined here to also include Samia and Bunyala Districts.

²Districts neighboring Busia include Siaya District, Busia (Uganda), Bugiri (Uganda), and other districts in Kenya's Western Province.

³Kenya's five largest cities are Nairobi, Mombasa, Kisumu, Nakuru and Eldoret. Major cities (population over 150,000) outside of Kenya are also included in this definition.

⁴These schooling measures do not include vocational training.

⁵Farming includes agricultural laborer, or fishing; retail includes selling your own agricultural products, hawking items, owning a shop, working in another's shop, or owning/working in another's financial or commercial business; unskilled work includes domestic, hotel and restaurant watchmen, bicycle taxi, or unskilled construction labor; skilled work includes hairdressing, tailoring/seam stressing, butchering, welding, mechanical repair, factory work, skilled construction, or computer repair; and professionals include teaching, clerical and secretarial work, or police force.

⁶Ninety one observations were missing information on first course preference. Eighty six of these were replaced with their second course preference, and five were replaced with their first public institution course preference.

⁷Ninety nine observations were missing information on first institution preference. Ninety three of these were replaced with information on second institution preference, and the remaining six are missing.

Table 4: Pre-intervention local labor market characteristics

<i>Fraction of individuals in:</i>	All	Male	Female
Agriculture	0.745	0.739	0.753
Wage Employment, <i>of which:</i>	0.152	0.209	0.088
Food, Travel, and Tourism	0.073	0.056	0.118
Skilled Construction	0.116	0.159	0.000
Unskilled Construction	0.077	0.103	0.008
Tailoring and Textiles	0.037	0.003	0.129
Professional	0.102	0.087	0.141
Government	0.065	0.085	0.012
Business and Retail	0.199	0.220	0.141
Transportation	0.014	0.019	0.000
Other Low-Skill Work	0.096	0.043	0.236
Other	0.231	0.237	0.214
Self Employment, <i>of which:</i>	0.112	0.115	0.108
Food, Travel, and Tourism	0.336	0.215	0.481
Skilled Construction	0.008	0.015	0.000
Unskilled Construction	0.039	0.067	0.006
Tailoring and Textiles	0.124	0.070	0.190
Professional	0.005	0.009	0.000
Business and Retail	0.174	0.141	0.214
Transportation	0.061	0.111	0.000
Other Low-Skill Work	0.029	0.039	0.018
Other	0.242	0.359	0.099
Unemployed ¹	0.272	0.269	0.277
Observations	5,083	2,596	2,487

Notes: The data used in this table comes from the KLPS-2 survey, which was collected during 2007–2009. All sub-category breakdowns display fractions of the total in that category. Means are weighted to preserve initial population weights.

¹Unemployed individuals are defined as those who are not employed in wage or self-employment, and are currently looking for a job. The number of observations for the 'Unemployed' category is 5,049 for 'All', 2,580 for 'Male', and 2,469 for 'Female'.

Table 5: Pre-intervention participant course preferences

	Vehicle- Tailoring	Related	Computers/ Secretarial	Beauty	Construction	Other	No. Obs
Overall	0.324	0.247	0.149	0.129	0.118	0.033	2163
Gender							
Male	0.123	0.485	0.091	0.026	0.241	0.034	800
Female	0.442	0.107	0.183	0.189	0.046	0.032	1363
Age							
At or below median	0.343	0.190	0.183	0.144	0.103	0.038	1100
Above median	0.305	0.306	0.114	0.114	0.135	0.027	1063
Location of Residence							
Busia District ¹	0.326	0.243	0.146	0.128	0.124	0.032	1927
District surrounding Busia ²	0.411	0.211	0.167	0.144	0.033	0.033	90
City ³	0.178	0.339	0.186	0.136	0.110	0.051	118
Education Level ⁴							
Some primary	0.408	0.235	0.065	0.142	0.142	0.009	571
Primary degree	0.365	0.247	0.093	0.143	0.124	0.028	814
Some secondary	0.321	0.295	0.115	0.154	0.090	0.026	234
Secondary degree	0.177	0.242	0.332	0.083	0.096	0.071	521
Years since school at or below median	0.304	0.232	0.191	0.122	0.108	0.043	1366
Above median	0.359	0.272	0.077	0.142	0.136	0.015	797
Attended vocational training							
No	0.316	0.249	0.152	0.128	0.117	0.038	1672
Yes	0.357	0.234	0.140	0.129	0.125	0.015	465
Working							
No	0.336	0.225	0.154	0.138	0.113	0.034	1869
Yes	0.248	0.384	0.116	0.071	0.153	0.027	294

Notes: Data presented in this table was collected during the program recruitment meetings, before vouchers were awarded. Ninety- one observations were missing information on first course preference, 86 of these were replaced with their second course preference, and five were replaced with their first public institution course preference.

¹Busia District is defined here to also include Samia and Bunyala Districts, which were just recently defined as distinct administrative districts by the Kenyan government.

²Districts neighboring Busia include Siaya District, Busia (Uganda), Bugiri (Uganda), and other districts in Kenya's Western Province.

³Kenya's five largest cities are Nairobi, Mombasa, Kisumu, Nakuru and Eldoret.

⁴Primary school runs through grade 8; secondary school runs through grade 12.

Table 6: Courses chosen by enrolled voucher winners

	Number of Students	% of All Students	% of Male Students	% of Female Students	Average Course Length (Terms)
Construction					
Carpentry	14	1.8	4.7	0.0	6.0
Masonry	48	6.2	15.9	0.2	6.0
Metal Work	4	0.5	0.7	0.4	6.0
Mechanical/Mechanical Engineering	4	0.5	1.4	0.0	7.3
Welding and Plumbing	9	1.2	2.0	0.6	6.0
Electrical Engineering/Installation	26	3.3	5.4	2.1	6.6
Textile					
Tailoring/Dressmaking/Textile ²³	297	38.2	2.4	60.0	5.5
Embroidery	3	0.4	0.0	0.6	3.0
Vehicle Related					
Driving	51	6.6	16.3	0.6	4.7
Motor Vehicle Mechanics	140	18.0	40.7	4.1	4.7
Hairdressing and Beauty	68	8.7	0.3	13.9	2.7
Computers/Secretarial					
Computer Packages	23	3.0	3.1	3.1	1.4
Secretarial	12	1.5	0.3	2.3	4.8
Copy Typist/Clerk	2	0.3	0.0	0.4	2.0
IT (Secretarial and Computer)	26	3.3	0.0	5.4	5.0
Computer Systems and Applications	4	0.5	0.0	0.6	1.5
Computer Engineering	2	0.3	0.7	0.0	3.0
Business Skills					
Business Administration	21	2.7	1.7	3.3	5.5
Business Management	1	0.1	0.3	0.0	6.0
Sales and Marketing	4	0.5	0.0	0.8	–
Human Resources	3	0.4	0.3	0.4	2.0
Food/Tourism					
Hotel and Catering/Hospitality	2	0.3	0.3	0.2	3.0
Travel and Tourism	5	0.6	0.3	0.8	2.0
Other					
Electronics	3	0.4	1.0	0.0	5.8
Others	6	0.8	2.0	0.0	–
Number of Observations	778	778	295	483	–

Notes: Data on course of enrollment for voucher winners, and on average course length, was collected during monitoring visits to training institutions of voucher winners during 2009–2010. Individuals who enrolled in more than one course have been assigned to their 'primary' or 'longest' course. All categories include their relevant certificates and diplomas; for example, 'Motor Vehicle Mechanics' includes the Automotive KNEC Certificate. The average course length column uses separate school-course level data on time needed to complete a course. 'Driving' and 'Motor Vehicles' were combined in the analysis of course term length, since some courses were 'Driving and Motor Vehicle Mechanics' courses. 'Other' does not adequately capture the types of courses students enrolled in. There was no data for 'Sales and Marketing'.

²³ 'Tailoring/Dressmaking/Textile' includes 'Suiting' and 'Dressmaking only'.

Table 7: Relationship between voucher assignment and vocational training

	Dependent Variable: Years vocational education Completed by KLPS- 3 Interview		Indic for Attended vocational education by KLPS-3	
	(1)	(2)	(3)	(4)
Assigned to vocational training voucher	0.544*** (0.056)	0.548***	0.378*** (0.029)	0.378*** (0.028)
Assigned to information intervention	0.016 (0.047)	0.010 (0.044)	0.017 (0.029)	0.016 (0.026)
Vocational training voucher* Information intervention	0.086 (0.083)	0.062 (0.077)	-0.007 (0.043)	-0.016 (0.040)
Demographic and stratification controls	No	Yes	No	Yes
Number of observations	1896	1896	1896	1896
R2	0.099	0.217	0.141	0.257
Mean (std dev) in voucher control group	0.320 (0.738)	0.320 (0.738)	0.286 (0.452)	0.286 (0.452)

Notes: Data used in this table was drawn from the KLPS-3 survey, as well as information collected during program recruitment meetings in 2008, before vouchers were awarded. Demographic and stratification controls include an indicator for female, age in 2008, years of schooling attained by 2008, an indicator for vocational training prior to 2009, an indicator for preference to attend a private vocational training center (2008), indicators for preference to enroll in one of five different course groups (2008), an indicator for participation in the PSDP, an indicator for assignment to the PSDP treatment group, an indicator for assignment to the GSP treatment group, an indicator for interviewed in KLPS-3 Wave 2, and a measure of months since launch of KLPS-3 surveying. Robust standard errors in parentheses. *** indicates $p < 0.01$, ** indicates $p < 0.05$, and * indicates $p < 0.1$.

Table 8: Information intervention impacts on applications, preferences, and enrollment

	Dependent Variable			
	Completed Valid Preference Sheet and Entered vocational education Sample	Chose a Public Institution as Top Preference	Of Voucher Winners, Confirmed Enrollment	Of Unrestricted Voucher Winners, Enrolled in a Public Institution
	(1)	(2)	(3)	(4)
Assigned to information intervention	-0.016 (0.024)	0.071** (0.035)	-0.033 (0.037)	0.033 (0.055)
Assigned to a public only voucher	- -	- -	-0.101*** (0.026)	- -
Female	0.013 (0.020)	-0.096*** (0.032)	-0.051 (0.033)	-0.130*** (0.042)
PSDP participant	-0.063** (0.024)	-0.178*** (0.043)	-0.027 (0.041)	-0.157** (0.066)
Years of schooling attained (2008)	0.017** (0.008)	-0.002 (0.010)	-0.002 (0.012)	-0.002 (0.018)
Completed secondary school (2008)	-0.093*** (0.033)	-0.066 (0.051)	-0.037 (0.048)	-0.101 (0.108)
Ever attended vocational training (2008)	0.004 (0.019)	-0.018 (0.026)	0.001 (0.034)	0.040 (0.058)
Age in 2008	-0.005 (0.004)	-0.003 (0.005)	-0.017** (0.007)	-0.012 (0.010)
Observations	2645	2132	1041	517
R-Squared	0.014	0.029	0.025	0.030
Mean of Dependent Variable	0.801	0.567	0.737	0.420

Notes: Columns (1) and (2) employ data collected during program recruitment meetings in 2008, before vouchers were awarded. Columns (3) and (4) combine this data with information collected during monitoring visits to institutions of voucher winners during 2009–2010. Column (1) includes all individuals who attended an introductory meeting in 2008 and who provided data on the controls included, even if they did not ultimately apply for vocational training voucher. The samples used for the remaining columns are indicated in the column headings. In Column (1), missing-age data is replaced with mean age, and the regression additionally includes an indicator for missing-age data. Results presented are from OLS regressions, but are substantively the same when a Probit specification is used. Standard errors are clustered by 2008 assigned sub-location, and all columns additionally include a constant term. *** indicates $p \leq 0.01$, ** indicates $p \leq 0.05$, and * indicates $p \leq 0.1$.

Table 9: Information intervention impacts on female preferences and enrollment

	Dependent Variable (Among Females)		
	Of Program Applicants, Chose a Male-Dominated Course as Top Preference	Of Voucher Winners, Confirmed Enrollment	Of Voucher Winners, Enrolled in a Male Dominated Course¹
	(1)	(2)	(3)
Assigned to information intervention	0.051* (0.027)	-0.048 (0.041)	0.048* (0.028)
Assigned to a public only voucher	- -	-0.132*** (0.032)	0.005 (0.024)
PSDP participant	0.129*** (0.024)	-0.021 (0.042)	0.003 (0.031)
Years of schooling attained (2008)	-0.010 (0.008)	0.003 (0.016)	0.012 (0.013)
Completed secondary school (2008)	0.126*** (0.045)	-0.046 (0.067)	0.131** (0.070)
Attended vocational training prior to 2009	0.017 (0.026)	-0.000 (0.038)	0.005 (0.022)
Age in 2008	-0.001 (0.004)	-0.019** (0.009)	-0.004 (0.005)
Observations	1,342	649	649
R-Squared	0.039	0.038	0.081
Mean of Dependent Variable	0.169	0.733	0.094

Notes: All columns use data collected at program recruitment meetings in 2008, before vouchers were awarded. Columns (2) and (3) additionally use data collected during monitoring visits to training institutions of voucher winners during 2009–2010. The sample used in Column (1) includes all females who attended an introductory meeting, even if they did not ultimately apply for a vocational training voucher. Columns (2) and (3) are restricted to female voucher winners. Results presented are from OLS regressions, but are substantively the same when a Probit specification is used; however, in Column (3), the indicator for having completed secondary education is not significant at the 10 percent level using the Probit specification. Standard errors are clustered by 2008 assigned sub-location, and all columns additionally include a constant one. Courses were assigned as ‘male-dominated’ if, in semester. *** indicates $p \leq 0.01$, ** indicates $p \leq 0.05$, and * indicates $p \leq 0.1$. The KLPS Round 2 survey data, at least 70 percent of individuals who report working in that industry/occupation were male. The male-dominated occupations thus defined include skilled construction, driving and automotive, IT and computers, sales and marketing, and farming.

Table 10: Course completion among enrolled voucher winners

	Among All Enrolled Voucher Winners			Among All Enrolled Female Voucher Winners		
	Course Completion (defn 1)	Course Completion (defn 2)	Course Completion Rate	Course Completion (defn 1)	Course Completion (defn 2)	Course Completion Rate
	(1)	(2)	(3)	(4)	(5)	(6)
Assigned to information intervention	0.019 (0.036)	0.037 (0.035)	1.160 (2.212)	0.038 (0.046)	0.054 (0.046)	2.567 (2.963)
Assigned to a public only voucher	-0.067* (0.036)	-0.059* (0.035)	-5.186** (2.204)	-0.039 (0.046)	-0.025 (0.046)	-3.757 (-2.936)
Female	-0.095** (0.044)	-0.010** (0.044)	-8.184*** (2.811)	- -	- -	- -
PSDP participant	0.006 (0.048)	0.001 (0.048)	-0.978 (3.098)	0.017 (0.050)	-0.000 (0.050)	-0.970 (3.305)
Years of schooling attained (2008)	0.021 (0.015)	0.022 (0.015)	2.553** (1.040)	0.008 (0.020)	0.002 (0.020)	1.052 (1.324)
Completed secondary school (2008)	0.075 (0.078)	0.004 (0.044)	-0.204 (4.892)	0.146 (0.101)	0.207** (0.100)	5.542 (6.581)
Ever attended vocational training (2008)	-0.010 (0.044)	0.003 (0.008)	0.777 (2.681)	0.053 (0.056)	0.054 (0.055)	2.508 (3.502)
Age in 2008	0.002 (0.008)	-0.003 (0.008)	-0.150 (0.511)	-0.006 (0.012)	-0.005 (0.012)	-0.474 (0.789)
Observations	769	769	769	477	477	477
R-Squared	0.037	0.048	0.055	0.026	0.036	0.026
Mean of Dependent Variable	0.515	0.575	74.546	0.476	0.536	71.663

Notes: The data used in this table comes from information collected during monitoring visits to vocational training institutions where voucher winners were enrolled, as well as from a survey conducted in the 2008 program recruitment meetings, prior to the voucher randomization. Completion in Columns (1) and (4) is defined such that the participant attended all terms of their program. Completion in Columns (2) and (5) allows individuals to miss one semester of their course as long as it was not the final semester. The Completion Rate in Columns (3) and (6) is defined as number of semester attended divided by number of semester to complete course, multiplied by 100. Results are from OLS regression with robust standard errors, though results for Columns (1), (2), (4) and (5) are substantively similar using a Probit specification. All columns additionally include a constant term. Note that nine observations are missing due to lack of data on years of schooling attainment and/or vocational training prior to 2009. *** indicates $p \leq 0.01$, ** indicates $p \leq 0.05$, and * indicates $p \leq 0.1$.

Table 11: KLPS-3 follow-up survey attrition

	Dependent Variable	
	Indicator for Provided Info on Vocational Training History in KLPS-3 Survey	
	(1)	(2)
Assigned to vocational training voucher	-0.000 (0.014)	0.019 (0.017)
Assigned to a public only voucher	-- --	-0.039* (0.020)
Assigned to information intervention	0.003 (0.014)	0.003 (0.014)
Female	-0.019 (0.020)	-0.018 (0.020)
Age in 2008	0.000 (0.003)	0.001 (0.003)
Years of schooling by 2008	0.001 (0.004)	0.002 (0.003)
Attended vocational training prior to 2009	-0.022 (0.018)	-0.023 (0.018)
Preferred to enroll in a private training center (2008)	0.016 (0.015)	0.015 (0.015)
Preferred course in: Construction and related trades (2008)	0.027 (0.047)	0.030 (0.047)
Preferred course in: Textiles and tailoring (2008)	0.019 (0.045)	0.021 (0.045)
Preferred course in: Mechanics and driving (2008)	0.040 (0.044)	0.042 (0.044)
Preferred course in: Beauty (2008)	0.037 (0.047)	0.039 (0.047)
Preferred course in: Computers, secretarial, business (2008)	0.028 (0.046)	0.03 (0.046)
Participant in PSDP	0.021 (0.027)	0.022 (0.027)
Assigned to PSDP treatment group	-0.022 (0.017)	-0.023 (0.017)
Assigned to GSP treatment group	-0.009 (0.028)	-0.008 (0.028)
Number of observations	2,162	2,162
R ²	0.006	0.007
Mean (std dev) of dependent variable	0.877 (0.329)	0.877 (0.329)

Notes: The data used in this table was drawn from the KLPS-3 follow-up survey as well as from information collected during program recruitment meetings in 2008, before vouchers were awarded. One observation is missing from this table, as this individual is missing baseline information on whether he/she had previously attended vocational training. Results shown are from OLS regressions, but results are substantively similar using a Probit specification. Robust standard errors in parentheses, and all columns additionally include a constant term. *** indicates $p \leq 0.01$, ** indicates $p \leq 0.05$, and * indicates $p \leq 0.1$.

Table 12: Vocational education impacts on earnings

	Reduced form coefficient estimate (s.e.)		IV-2SLS coefficient estimate (s.e.)		Control group mean (s.d.)	Number of Observations
	Vocational education	Vocational Education *W2	Vocational Education	Vocational Education*W2		
Panel A: Total Earnings¹						
Ln(Total earnings, past month)	-0.260** (0.123)	0.405** (0.167)	-0.103 (0.142)	0.128 (0.202)	7.644 (1.272)	1,549
Ln(Total earnings, past month), including zeros	-0.146 (0.282)	0.096 (0.387)	-0.094 (0.340)	0.040` (0.465)	6.264 (3.159)	1,892
Panel B: Non-agricultural Earnings²						
Ln(Non-agricultural earnings, past month)	-0.021 (0.171)	0.117 (0.216)	0.099 (0.188)	-0.008 (0.248)	7.927 (1.316)	925
Ln(Non-agricultural earnings, past month), including zeros	-0.379 (0.345)	0.537 (0.498)	-0.599 (0.418)	0.476 (0.594)	3.946 (4.073)	1,892
Ln(Hourly non-agricultural earnings, past month)	-0.079 (0.174)	0.100 (0.219)	0.239 (0.208)	-0.201 (0.264)	2.863 (1.182)	773
Ln(Hourly non-agricultural earnings, past month), including zeros	0.104 (0.339)	-0.178 (0.424)	0.468 (0.393)	-0.421 (0.499)	2.244 (2.312)	840
Panel C: Wage Employment Earnings						
Ln(Wage employment earnings, past month)	-0.008 (0.184)	-0.104 (0.235)	0.373* (0.196)	-0.475* (0.252)	8.252 (1.081)	579
Ln(Wage employment earnings, past month), including zeros	-0.079 (0.324)	0.479 (0.479)	-0.446 (0.397)	0.771 (0.572)	2.536 (3.856)	1,880
Ln(Hourly wage employment earnings, past month)	-0.079	0.114	0.393*	-0.444	3.062	493

	(0.189)	(0.235)	(0.221)	(0.277)	(0.991)	
Ln(Hourly wage employment earnings, past month), including zeros	0.003	0.167	0.504	-0.480	2.691	530
	(0.290)	(0.362)	(0.317)	(0.401)	(1.575)	
Panel D: Self Employment Earnings						
Ln(Self-employment earnings, past month)	-0.18	0.407	-0.29	0.317	7.406	373
	(0.327)	(0.407)	(0.330)	(0.477)	(1.441)	
Ln(Self-employment earnings, past month), including zeros	-0.355	0.187	-0.218	-0.198	1.546	1,883
	(0.246)	(0.382)	(0.308)	(0.450)	(3.082)	
Ln(Hourly self employment earnings, past month)	-0.115	0.044	-0.031	-0.095	2.528	285
	(0.356)	(0.455)	(0.358)	(0.508)	(1.368)	
Ln(Hourly self employment earnings, past month), including zeros	0.282	-0.901	0.519	-1.174	2.148	305
	(0.431)	(0.658)	(0.483)	(0.792)	(2.059)	
	(1)	(2)	(3)	(4)	(5)	(6)

Regression Notes: Data used in this table was drawn from the KLPS-3 survey, and information collected during program recruitment meetings in 2008, before vouchers were awarded. The first two columns (the 'reduced form') present results from a regression of the dependent variable on an indicator for assignment to a vocational training voucher, and that indicator interacted with an indicator for surveyed in KLPS-3 Survey Wave 2. The reduced form regression also includes an indicator for assignment to the information intervention, that indicator interacted with an indicator for surveyed in KLPS-3 Survey Wave 2, an interaction between indicators for assignment to vocational training voucher and assignment to information intervention, and a triple interaction between these and the indicator for surveyed in KLPS-3 Survey Wave 2. The second two columns (the 'IV-2SLS') present results from a two-stage least squares regression in which years of vocational training and years of training interacted with the indicator for surveyed in KLPS-3 Survey Wave 2 are instrumented using an indicator for assignment to receive a vocational training voucher, an indicator for assignment to receive the information intervention, these indicators interacted with each other, these indicators each interacted with an indicator for surveyed in KLPS-3 Survey Wave 2, and the triple interaction of all three indicators. Additional controls in both the reduced form and 2SLS regressions include an indicator for female, 2008 age, years of schooling attained by 2008, an indicator for vocational training prior to 2009, an indicator for preference to attend a private vocational training center (2008), indicators for preference to enroll in one of five different course groups (2008), an indicator for participation in the PSDP, an indicator for assignment to the PSDP treatment group, an indicator for assignment to the GSP treatment group, an indicator for interviewed in KLPS-3 Wave 2, and a measure of months since launch of KLPS-3 surveying. Robust standard errors in parentheses. *** indicates $p \leq 0.01$, ** indicates $p \leq 0.05$, and * indicates $p \leq 0.1$.

Table Notes: 'Including zeros' indicates that values of zero were replaced with either one or the variable's positive, minimum value - whichever is smaller - before taking the natural log. Hourly measures are calculated among those who work at least 10 hours per week.¹Total earnings includes earnings from agriculture, wage, and self-employment.
²Non-agricultural earnings include earnings from wage and self-employment.

Table 13: Vocational education impacts on work hours, sector, and other employment outcomes

	Reduced form		IV-2SLS		Control group	Number
	Coefficient estimate (s.e.)		coefficient estimate (s.e.)			
Panel A: Work Hours						
Total hours worked across all activities	0.760	2.974	1.354	0.752	51.792	1882
	(2.721)	(3.712)	(3.282)	(4.442)	(28.637)	
Total hours worked in agriculture for the household	2.974	2.192	1.278	1.019	10.47	1876
	(3.712)	(1.795)	(1.645)	(2.205)	(14.424)	
Total hours worked in wage- or self-employment	-0.634	2.939	1.354	0.752	21.405	1894
	(2.309)	(3.406)	(3.282)	(4.442)	(26.652)	
Total hours worked in wage employment	0.511	0.416	-2.071	3.349	14.365	1894
	(2.168)	(3.198)	(2.572)	(3.709)	(24.726)	
Total hours worked in self-employment	-1.144	2.523	-2.062	1.873	7.039	1894
	(1.346)	(2.108)	(1.725)	(2.523)	(16.963)	
Panel B: Sector of Work						
Indic for positive hours worked	-0.010	0.013	-0.014	0.018	0.986	1882
	(0.012)	(0.016)	(0.013)	(0.018)	(.116)	
Indicator for positive hours worked in agriculture for the household	0.009	-0.018	0.073	-0.015	0.547	1879
	(0.042)	(0.061)	(0.051)	(0.073)	(.498)	

Indicator for positive hours worked in wage or self-employment	-0.067 (0.043)	0.107* (0.062)	-0.116** (0.054)	0.147* (0.075)	0.504 (.5)	1882
Indicator for positive hours worked in wage employment	-0.016 (0.039)	0.050 (0.057)	-0.079 (0.048)	0.120* (0.069)	0.311 (.463)	1880
Indicator for positive hours worked in self-employment	-0.048 (0.033)	0.059 (0.051)	-0.035 (0.043)	0.014 (0.061)	0.208 (.406)	1880
Panel C: Other Employment Outcomes						
Indicator for unemployed	0.069 (0.042)	-0.044 (0.059)	0.105** (0.052)	-0.016 (0.073)	0.301 (.459)	1880
Indicator for has a full time job in wage or self-employment ¹	-0.020 (0.039)	0.059 (0.059)	-0.110** (0.050)	0.145** (0.072)	0.352 (.478)	1881
Indicator for owns a non-agricultural business that is licensed	-0.014 (0.017)	0.049* (0.027)	-0.016 (0.022)	0.033 (0.033)	0.051 (.219)	1892
Number of employed workers in place of (self-)employment	0.687 (0.823)	7.833 (7.545)	-0.135 (0.515)	4.850 (4.652)	0.636 (1.497)	1892
	VocEd	VocEd*W2	VocEd	VocEd*W2	mean (s.d.)	Observations

Notes: For notes on what is included in the regressions, see 'Regression Notes' under Table 12. ¹Full time job refers to working at least 30 hours in a given sector.

Table 14: Vocational education impacts on migration and living standards

	Reduced form		IV-2SLS		Control group	Number
	coefficient estimate (s.e.)		coefficient estimate (s.e.)			
Panel A: Migration outcomes						
Indicator for residence in city at time of survey	0.031 (0.038)	-0.081 (0.054)	0.039 (0.044)	-0.128** (0.063)	0.238 (.426)	1890
Indicator for residence in a city since program launch	0.058 (0.040)	-0.129** (0.057)	0.073 (0.049)	-0.163** (0.070)	0.327 (.469)	1891
Indicator for residence outside of Kenya at time of survey	0.011 (0.012)	-0.033* (0.019)	-0.007 (0.015)	-0.026 (0.023)	0.028 (.165)	1896
Indicator for residence outside of Kenya since program launch	0.014 (0.017)	-0.020 (0.026)	-0.008 (0.019)	-0.010 (0.029)	0.042 (.201)	1896
Panel B: Living standards						
Number of meals eaten yesterday	0.083 (0.061)	-0.193** (0.087)	0.074 (0.072)	-0.251** (0.101)	2.24 (.657)	1891
Number of meals with protein eaten yesterday	-0.064 (0.059)	0.036 (0.085)	-0.020 (0.071)	0.032 (0.099)	0.722 (.657)	1883
Indicator for home has improved floor or roof	0.068* (0.041)	-0.046 (0.058)	-0.002 (0.049)	-0.053 (0.070)	0.694 (.461)	1835
Indicator for home has electricity	-0.017	-0.007	-0.011	-0.014	0.285	1838

	(0.037)	(0.055)	(0.045)	(0.066)	(.452)	
Indicator for home has a toilet	-0.002	-0.005	-0.013	0.046	0.116	1839
	(0.030)	(0.041)	(0.034)	(0.049)	(.32)	
Number of rooms in home	0.037	0.119	0.114	0.055	2.734	1837
	(0.135)	(0.185)	(0.167)	(0.217)	(1.402)	
Indicator for home has piped water	-0.042	0.014	0.041	-0.111	0.388	1838
	(0.043)	(0.062)	(0.052)	(0.074)	(.488)	
Indicator for home is owned	0.006	0.013	0.012	0.025	0.654	1838
	(0.040)	(0.058)	(0.048)	(0.069)	(.476)	
Summary index of improved living standards ¹	-0.008	0.026	-0.010	0.012	-0.005	1896
	(0.033)	(0.046)	(0.039)	(0.053)	(.345)	
	VocEd	VocEd*W2	VocEd	VocEd*W2	mean (s.d.)	Observations

Notes: For notes on what is included in the regressions, see 'Regression Notes' under Table 12. ¹Summary measure includes all measures listed under Panel B, as well as a count of each of 26 different household assets and an indicator for responding 'better' to the question 'Compared to two years ago, would you say that your own personal economic situation today is much the same, better, or worse?'

Table 15: Vocational education impacts on attitudes and other outcomes

	Reduced form IV-2SLS				Control group	Number
	coefficient estimate (s.e.)	coefficient estimate (s.e.)	coefficient estimate (s.e.)	coefficient estimate (s.e.)		
Panel A: Opinions and Social Attitudes						
Summary measure of gender equality views	0.038 (0.042)	-0.052 (0.061)	0.013 (0.051)	-0.020 (0.071)	0.003 (.482)	1891
Summary measure of increased support for democracy	0.055 (0.052)	-0.111 (0.072)	0.111 (0.071)	-0.220** (0.092)	0.003 (.622)	1891
Indic for satisfaction with democracy in Kenya	0.016 (0.042)	-0.032 (0.060)	0.051 (0.052)	-0.085 (0.073)	0.661 (.473)	1890
Indic for thinks Kenyan governance is better than 2 years ago	-0.074* (0.039)	0.088 (0.054)	-0.098** (0.046)	0.088 (0.063)	0.235 (.424)	1891
Summary measure of political participation	-0.069* (0.037)	0.083 (0.065)	-0.102** (0.047)	0.234*** (0.079)	-0.004 (.537)	1892
Summary index for justified political violence	-0.069* (0.037)	0.083 (0.065)	-0.102** (0.047)	0.234*** (0.079)	-0.004 (.537)	1892
Indic for agrees that most people cannot be trusted	-0.038	0.035	-0.055*	0.031	0.07	1892

Panel B: Human Capital	(0.023)	(0.030)	(0.029)	(0.035)	(.256)	
Summary index of math and reading test scores	0.001	-0.025	0.077	-0.085	-0.011	1821
Panel C: Marriage and fertility	(0.067)	(0.089)	(0.077)	(0.106)	(.887)	
Indic for married, conditional on not married by 2008	0.075	-0.100	0.061	-0.151	.464	1077
	(0.054)	(0.080)	(0.063)	(0.093)	(.499)	
Age at first marriage, conditional on not married by 2008	-0.156	0.318	0.600*	-0.695	23.161	497
	(0.243)	(0.363)	(0.354)	(0.523)	(2.525)	
Number of pregnancies, conditional on not pregnant by 2008	0.121	-0.202	0.021	-0.212	1.051	1074
	(0.106)	(0.155)	(0.119)	(0.175)	(1.027)	
Age of first pregnancy, conditional on not pregnant by 2008	-0.415	0.102	-0.519	0.777	22.188	651
	(0.376)	(0.542)	(0.454)	(0.650)	(3.109)	
Spouse's education level, conditional on not married by 2008	-0.235	0.452	0.393	-0.195	9.607	485
	(0.488)	(0.661)	(0.667)	(0.899)	(2.744)	
	VocEd	VocEd*W2	VocEd	VocEd*W2	mean (s.d.)	Observations

Notes: For notes on what is included in the regressions, see 'Regression Notes' under Table 12.

References

- Angrist, Joshua, Bettinger, Eric, and Kremer, Michael (2006). "Long-Term Consequences of Secondary School Vouchers: Evidence from Administrative Records in Colombia." *American Economic Review*, 96(3), 847–862.
- Angrist, Joshua, Bettinger, Eric, Bloom, Erik, King Elizabeth, and Kremer, Michael (2002). "Vouchers for Private Schooling in Colombia: Evidence from a Randomized Natural Experiment." *American Economic Review*, 92(5), 1535–1558.
- Attanasio, Orazio Kugler, Adriana, and Meghir, Costas (2011). "Subsidizing Vocational Training for Disadvantaged Youth in Colombia: Evidence from a Randomized Trial." *American Economic Journal: Applied Economics*, 3(3), 188–220.
- Bandiera, Oriana, Buehren, Niklas, Burgess, Robin, Goldstein, Markus, Gulesci, Selim, Rasul, Imran, and Sulaiman, Munshi (2014). "Women's Empowerment in Action: Evidence from a Randomized Control Trial in Africa."
- Bandiera, Oriana, Burgess, Robi, Das, Naryan, Gulesci, Selim, Rasul, Imran, and Sulaiman, Munshi (2013). "Can Basic Entrepreneurship Transform the Lives of the Poor?" IZA Discussion Paper No. 7386. Available at SSRN: <http://ssrn.com/abstract=2266813>
- Bettinger, Eric, Kremer, Michael, and Saavedra, Juan (2010). "Are Education Vouchers Only Redistributive?" *Economic Journal*, 120(546), 204–228.
- Blattman, Christopher, Fiala, Nathan, and Martinez, Sebastian (2013). "Generating Skilled Self Employment in Developing Countries: Experimental Evidence from Uganda." *Quarterly Journal of Economics*, forthcoming.
- Bruhn, M., and McKenzie, D. (2009). "In Pursuit of Balance: Randomization in Practice in development Field Experiments", *American Economic Journal: Applied Economics*, 1(4).
- Card, David, Ibarra, Pablo, Regalia, Ferdinando, Rosas-Shady, David, and Soares, Yuri (2011). "The Labor Market Impacts of Youth Training in the Dominican Republic." *Journal of Labor Economics*, 29(2), 267–300.
- Casey, Katherine, Glennerster, Rachel, and Miguel, Edward (2012). "Reshaping Institutions: Evidence on Aid Impacts Using a Pre-Analysis Plan" *Quarterly Journal of Economics*, 127(4), 1755–1812.
- Cho, Yoonyoung, Kalomba, Davie, MushfiqMobarak, A, and Orozco Victor (May 2013). "Gender Differences in the Effects of Vocational Training: Constraints on Women and Dropout Behavior." IZA Discussion Paper 7408.
- Hirshleifer, Saroini, McKenzie, David, Almeida, Rita, and Ridao-Cano, Cristobal (2014). "The Impact of Vocational Training for the Unemployed: Experimental Evidence from Turkey." *Economic Journal*, forthcoming.
- King, Kenneth and Martin, Chris (2002). "The Vocational School Fallacy Revisited: Education, Aspiration and Work in Ghana 1959-2000." *International Journal of Education Development*, 22(1), 5–26.
- Kremer, Michael, Miguel, Edward, and Thornton, Rebecca (2009). "Incentives to Learn." *Review of Economics and Statistics*, 91(3), 437–456.

Maitra, Pushkar and Mani, Subha (2012). "Learning and Earning: Evidence from a Randomized Evaluation in India." Monash University Department of Economics Discussion Paper 44/12.

Miguel, Edward and Kremer, Michael (2004). "Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities." *Econometrica*, 72(1), 159–217.

Nishimura, M. and Orodho, J. (1999). *Education, Vocational Training and Employment: Designing Projects that Link Education and Vocational Training and Employment in Kenya*. JICA: Nairobi.

Republic of Kenya (2007). "Kenya Integrated Household Budget Survey 2005/06 (KIHBS)." Central Bureau of Statistics, Ministry of Finance and Planning. Government Printer: Nairobi.

Republic of Kenya (1999). "Demographic and Health Survey 1998 (KDHS)." Central Bureau of Statistics, National Council for Population and Development. Government Printer: Nairobi.

World Bank (2004). "Strengthening the Foundation of Education and Training in Kenya: Opportunities and Challenges in Primary and General Secondary Education" Report No. 28064-KE. Washington, DC.

World Bank (2007). *World Development Report 2007*. Washington, DC.

World Bank (2008). *Kenya Poverty and Inequality Assessment*. Washington, DC.

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