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Differences in the effects of vocational training on men and women: Constraints on women and drop-out behaviour

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Employment
and Labour
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Preface

The primary goal of the ILO is to work with member States towards achieving full and productive employment and decent work for all. This goal is elaborated in the ILO Declaration 2008 on *Social Justice for a Fair Globalization*,[1] which has been widely adopted by the international community. Comprehensive and integrated perspectives to achieve this goal are embedded in the Employment Policy Convention of 1964 (No. 122), the *Global Employment Agenda* (2003) and – in response to the 2008 global economic crisis – the *Global Jobs Pact* (2009) and the conclusions of the *Recurrent Discussion Reports on Employment* (2010 and 2014).

The Employment Policy Department (EMPLOYMENT) is engaged in global advocacy and in supporting member States in placing more and better jobs at the center of economic and social policies and growth and development strategies. Policy research and knowledge generation and dissemination are essential components of the Employment Policy Department's activities. The resulting publications include books, country policy reviews, policy and research briefs, and working papers.[2]

The *Employment Policy Working Paper* series is designed to disseminate the main findings of research on a broad range of topics undertaken by the branches of the Department. The working papers are intended to encourage the exchange of ideas and to stimulate debate. The views expressed within them are the responsibility of the authors and do not necessarily represent those of the ILO.

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[1] See http://www.ilo.org/public/english/bureau/dgo/download/dg_announce_en.pdf
[2] See http://www.ilo.org/employment.

Foreword

In response to the global youth jobs crisis, governments, employers and labour unions appointed youth employment the central topic of the 101st International Labour Conference in 2012. Entitled 'The Youth Employment Crisis: A call for action' the resolution reminds the international community that investing in young people is crucial for development.

The ILO has responded to this call by investing more into understanding "what works" in youth employment, including through a focus on the generation of evidence in the "Area of Critical Importance on Jobs and Skills for Youth" and through its technical cooperation portfolio.   Since 2010, the ILO has, with the support of the Danish Government, implemented the Youth Entrepreneurship Facility (YEF) programme, focusing on Kenya, Tanzania and Uganda. The ambition of YEF is to unleash entrepreneurial potential of young people and to turn their energies and ideas into productive businesses, while recognizing that encouraging productive wage employment is part of a holistic development strategy. An important objective of YEF is to support youth employment policy makers and promoters make evidence-based decisions for better resource allocation and programme design. To achieve this, YEF has supported the use of rigorous impact evaluation methods to build the evidence that will lead to informed investments in youth. The following paper is the result of such an impact evaluation, unveiling the main policy and programmatic questions on what works, why, and how, providing answers which help policy makers and practitioners in the region design and deliver better policies for young people.

The following paper *Differences in the effects of vocational training on men and women: Constraints on women and drop-out behaviour* authored by our partners at the World Bank, Yale University and the Malawi National AIDS Commission, evaluates the impacts of the "Technical and Vocational Skills Training pilot program (TVST)" for vulnerable youth, the first study of its kind to experimentally evaluate vocational training in Africa. The objective of the TVST program was to transfer marketable skills to youth through vocational training, mentorship, and start-up support. Youth were trained in common trades such as carpentry and joinery, tailoring, auto mechanics, and metal fabrication.

Of the 1,900 vulnerable youth, identified and verified by TEVETA, two thirds of them were randomly assigned to receive the program first while the remaining third received the intervention at a later point in time. The results show us the difficulties in providing quality vocational training to youth, especially young women. The programme provided limited labour market effects for men or women and resulted in negative effects for women in earnings and savings post training. Nevertheless, impacts were positive regarding skills and business knowledge including a large increase (24 additional hours) in human capital development. The study shows us the importance of considering the specific constraints faced by female participants and adapting program design to address such constraints.

These results are of significant importance to the ILO in its quest for promoting more and better jobs for inclusive growth and improved youth employment prospects. Vocational training can improve skills and business knowledge but the study has shown us the importance of providing services which sustain these impacts once training is complete. We thank the authors, Yoonyoung Cho, Davie Kalomba, Ahmed Mushfiq Mobarak and Victor Orozco, for their contribution to this important topic.

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Abstract

This paper provides experimental evidence on the effects of vocational and entrepreneurial training for Malawian youth, in an environment where access to schooling and formal sector employment is extremely low. It tracks a large fraction of programme drop-outs – a common phenomenon in the training evaluation literature – and examines the determinants and consequences of dropping out and how it mediates the effects of such programmes. The analysis finds that women make decisions in a more constrained environment, and their participation is affected by family obligations. Participation is more expensive for them, resulting in worse training experience. The training results in skills development, continued investment in human capital and improved well-being, with more positive effects for men, but no improvements in labour market outcomes in the short run.

Keywords: apprenticeship training; vulnerable youth; gender; drop-outs; Malawi JEL codes: O15, J24, I15

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1. Introduction

Providing young people with opportunities for skills acquisition is widely perceived to be a fair and effective use of public resources. Job training programmes have therefore emerged as an important – and widely studied – class of social policy experiments. Due to data availability, however, evaluations of such programmes have been limited mostly to developed countries (e.g. Lynch 1992; Bartel 1995; Heckman, Lochner and Taber 1998; Frazis and Loewenstein 2005; Kluve 2010). Most evaluations rely on non-experimental techniques, including conditioning on observables to limit selection bias (Friedlander, Greenberg and Robins 1997; Heckman et al. 2000), parametric selection correction methods (Heckman et al. 1998), and propensity score matching and duration analysis (Bring and Carling 2000; Gerfin and Lechner 2002; Sianesi 2004; Chong and Galdo 2006; Biewen et al. 2007; Jespersen, Munch and Skipper 2008).

This paper reports the results of a randomized controlled trial to evaluate an entrepreneurship and vocational training programme for youth in Malawi. Over 80 per cent of the workforce in sub-Saharan Africa is engaged in self-employment in small businesses and household enterprises (Gindling and Newhouse 2014), which makes entrepreneurship and vocational training more relevant in this context than formal job training programmes. In Banerjee and Duflo's (2007) 18-country-sample-based description of the lives of the poor, they report that a "large fraction of the poor act as entrepreneurs" and are self-employed, with many operating non-agricultural businesses. In contrast, formal employment opportunities are scarce in the developing world (The World Bank 2012b).

The programme we evaluate was designed to provide apprenticeship rather than classroom-based training. It targeted young people aged 15–24, because the youth often lack the formal education or skills required to access salaried employment. A growing number of development aid agencies around the world have attempted to reduce youth unemployment through on-the-job training and vocational programmes. Programmes in Tanzania, South Korea and Indonesia, for example, have attempted to shift secondary-school curricula away from general education and towards vocational training (Newhouse and Suryadarma 2011). In the Malawi programme we evaluate, 1,900 youths from 28 districts received on-the-job training through placement as apprentices to master craftspeople in their area of interest, and the programme timing was randomized. Apprenticeships of this type are common in sub-Saharan Africa, as a way for youth without access to formal education to gain employable skills (Biavaschi et al. 2012).[1] Despite their popularity, virtually no evidence exists on the effects of such programmes on participants.[1]

This paper makes three distinct contributions to the literature. First, experimental evaluations of training programmes are scarce, particularly for developing countries.[2] To our knowledge, only three recent studies conduct randomized evaluations in a developing-country context.[3] Card et al. (2011) and Attanasio, Kugler and Meghir (2011) explore the impacts of training programmes for youth in the Dominican Republic and Colombia (respectively), which had both classroom and on-the-job training components. Attanasio et al. find fairly large effects on probability of employment and wages, while Card et al. find

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[1] The ILO (2012) provides an extensive review of qualitative and quantitative studies of informal apprenticeship programmes. Monk, Sandefur and Teal (2008), working in Ghana with descriptive data, find that returns to informal apprenticeships are high for those who have low levels of education, but fall as formal education increases. We are unaware of any experimental evidence on apprentice-ships.

[2] Roughly 10 per cent of evaluations in the developed world have made use of randomized con-trolled trial methodology (Card, Kluve and Weber 2010).

[3] Related (although recent and largely unpublished) literature deals with the returns to business train-ing and financial literacy; however, these training schemes are designed to deliver generic business skills, rather than trade-specific skills. See Cole Sampson and Zia (2011), Bruhn and Zia (2011), de Mel, McKenzie and Woodruff (2011), Drexler, Fischer and Schoar (2014), Karlan and Valdivia (2011) and Calderon, Cunha and De Giorgi (2013).

no effect on employment, and modest effects on earnings. These studies were conducted in middle-income countries with larger formal sectors, and the programmes targeted wage employment. Our study concerns on-the-job development of technical skills in an environment where self-employment, rather than wage employment, is the norm. Blattman, Fiala and Martinez (2012) find that youth given a cash transfer in Uganda invest in vocational training and tools, which then translate into higher levels of employment and earnings.

A second important contribution of this paper lies in our treatment and analysis of programme drop-outs. Several published evaluations of job training programmes report that a large fraction of beneficiaries randomly assigned to receive training fail to show up, or discontinue training after a short period, and this complicates the evaluation method. Heckman et al. (2000), reviewing five different experimental evaluations of employment and training programmes in the United States, report rates of drop-out as high as 79 per cent. The Card et al. (2011) Dominican Republic study reports that 17 per cent of their treatment group failed to attend training, and that follow-up data was not collected on these people. This can introduce a significant selection bias, which complicates the estimation of the treatment effect even for studies which start out with experimental data.[4]

In our Malawi study, we experience similarly high rates of drop-out among youth randomly assigned to receive training, but we anticipated the problem and tracked down a significant fraction of the drop-outs in our follow-up surveys. This allows us to report intent-to-treat and treatment-on-treated results (accounting for the drop-out decision) that are closer to the pure experimental estimates. The main effects of training we report – which are large, significant increases in the self-reported skills and knowledge that the training was meant to impart, and improvements in trainees' subjective measures of well-being – are not sensitive to the way drop-outs are handled.

More importantly, we conduct a detailed analysis of why trainees chose to drop out. Since dropping out is a commonly observed phenomenon across such programmes in both developing and developed nations, it is useful to identify its causes and consequences, in order to better understand the direction of bias in existing evaluations of training programmes stemming from this specific source of attrition. Our data allow us to characterize whether drop-outs in training are positively or negatively selected. Why potential participants drop out and do not take advantage of a programme designed to build their human capital, and offered to them at deeply discounted rates (or even for free) is an important puzzle worth exploring.[5] We collect data on alternative opportunities and unanticipated shocks around the time of programme inception to understand better the conditions under which people choose to not partake in training.

These opportunities and constraints happen to affect men and women differently, which leads to the third main contribution of this paper: developing a better understanding of why training and other development programmes may have heterogeneous effects across gender. A growing literature documents differential treatment effects by gender (e.g. see Bergemann and van den Berg 2008; Attanasio, Kugler and Meghir 2011; Blattman, Fiala and Martinez 2012). We find generally better training outcomes for men compared with women. While improvements in self-reported skills were similar across genders, male trainees exhibit greater improvement in subjective measures of well-being and confidence compared with women. Any negative outcomes of treatment we observe tend to be

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[4] A large body of literature has devised non-experimental methods to correct for these biases (Manski 1989, 1990; Horowitz and Manski 1998; Heckman, Lalonde and Smith 1999; Heckman et al. 2000; Horowitz and Manski 2000; DiNardo, McCrary and Sanbonmatsu 2006; Lee 2009).

[5] This is related to a literature that identifies technologies designed to meet pressing needs are often not adopted at rates commensurate with their potential benefits (Mobarak et al. 2012; Meredith et al. 2013). The case of training appears related to a literature that suggests that the low take-up may signal that the product or service does not work as well as anticipated, given local conditions (e.g. Ashraf, Giné, and Karlan 2009; Hanna, Duflo and Greenstone 2012).

associated with women – reduced savings and decreased earnings-related activities following treatment.

These differences are explained by both the conditions under which women participate in training, as well as gender differences in the training experience. First, women drop out due to adverse shocks (severe illness or injury), and are more likely to participate when alternative opportunities disappear (e.g. they get fired). Men's participation decisions are not affected by adverse external conditions. Girls are on average less educated than boys at baseline, have more dependents, and spend more time on domestic chores as opposed to paid labour or business activities. Women (but not men) self-report constraints such as "family obligations" and "getting married" as the main reasons they drop out. Second, participating in training is expensive and trainees – especially girls – have to draw down their savings to do so. This is partly due to differences in the training experience: men are more likely to have received financial support from trainers or master-craftspersons (MCs) during the training. Distance to the training facility is more of a constraint for girls; boys are also more likely to attend regularly and are three times as likely to receive a paid job offer from the MC following the training period. Overall, the results suggest that women are significantly more constrained in their decision-making, which leads to a poorer training experience and less support, resulting in worse training outcomes. These results shed light on the more stringent constraints under which poor girls have to make decisions in developing countries, and how these inhibit skill acquisition. They can help to explain why other development programmes, such as capital infusion for micro-enterprises, have had much lower returns for women in Sri Lanka and Ghana (de Mel, McKenzie, and Woodruff 2008; Fafchamps et al. 2011). The results echo Field, Jayachandran and Pande (2010) who show that Muslim women in India do not benefit from business training, likely due to social restrictions.

2. Context and experimental design

2.1 Background

Malawi is one of the world's poorest countries. Over 50 per cent of the population fall below the national poverty line, while gross national income per capita is just $360 (The World Bank 2012a). Unemployment among youth is high (9.6 per cent for women, 8.5 per cent for men) (International Labour Organization 2011). Levels of formal education are low, as about 58 per cent of students drop out after primary school (Aggarwal, Hofmann and Phiri 2010). Most youth rely on low-productivity subsistence agriculture or self-employment to sustain themselves and their families. Youth are particularly vulnerable as they often possess fewer productive alternatives.

To address the employability issues, promote productive self-employment and reduce vulnerability to risky sexual behaviour, in 2009 the Government of Malawi decided to pilot a new apprenticeship programme aimed at vulnerable youth. The programme was implemented by the Technical Education and Vocational Education and Training Authority (TEVETA) across all 28 districts of Malawi. The programme was targeted to vulnerable youth, mainly defined as orphans or school drop-outs. The geographic scope of the programme made data collection more expensive, but it allowed us to evaluate the programme based on a nationally representative sample of vulnerable youth.

Baseline results (see table 1) show that the selection process was successful in choosing participants who were vulnerable and poor. More than a third are orphans of both parents, over 60 per cent live in a dwelling that has a grass roof (a proxy measure for poverty), and over 80 per cent report skipping a meal "often" or "sometimes" due to lack of money. Around two-thirds of the participants were male. They were 21 years old on average, and 10 per cent were still in school. When compared with a nationally representative sample of Malawian youth aged 15–24 from the Malawi Third Integrated Household Survey (National Statistical Office 2011), youth in our sample are more likely to live in a house with a grass roof, more than three times as likely to be an orphan, and less likely to still be in school.

Table 1.   Summary statistics at baseline – balance of treatment and control

	Control	Treatment	p-value of difference
N	363	759	
Household characteristics			
Household size	5.35	5.48	0.41
Number of adults	2.74	2.67	0.46
Number of children < 18	2.21	2.39	0.12
Number of respondent's dependents (in or out of hh)	0.88	0.81	0.40
Owns home = 1	0.89	0.87	0.52
Number of acres of land owned	1.91	1.84	0.65
Value of assets (in MWK)	29465.43	31260.54	0.68
Construction of walls			
Unburnt bricks	0.37	0.40	0.29
Burnt bricks	0.49	0.46	0.30
Construction of roof			
Grass	0.62	0.62	0.98
Iron sheets	0.37	0.36	0.69
Source of water			
Unprotected well	0.12	0.09	0.11
Communal tap	0.19	0.18	0.94
Borehole	0.51	0.53	0.48
Individual characteristics			
Gender: male = 1	0.69	0.66	0.39
Age	21.55	21.44	0.58
Head of household = 1	0.17	0.18	0.57
Married or living with partner = 1	0.18	0.16	0.22
Neither parents are alive (orphan) = 1	0.38	0.35	0.40
Educational attainment			
Completed primary	0.05	0.05	0.83
Some secondary	0.48	0.48	0.94
Completed Secondary	0.26	0.22	0.13
Currently a student = 1	0.11	0.10	0.61
Previously received vocational training = 1	0.13	0.13	0.69
Previously started a business = 1	0.39	0.32	0.04
Economic variables			
Annual personal income	19431.62	26155.18	0.48
Number of loans in past 12 months	0.38	0.37	0.73
Amount of loans in past 12 months (in MWK)	2636.84	2486.41	0.74
Number of cash and in-kind grants from social programmes in past 6 months	0.68	0.68	0.93
Amount of cash grants from social programmes in past 6 months (in MWK)	5613.88	6870.36	0.60
How often do you/other adults skip meals?			
Often	0.27	0.30	0.33
Sometimes	0.54	0.55	0.81
Not at all	0.19	0.15	0.13

TEVETA then identified a pool of potential trainers in each district. The MCs were selected from this pool based on their expertise and business performance in the neighbourhood. MCs were compensated for their work, and benefited from the free labour that the apprenticeship programme brought. In the 23 districts where our survey took place there were 164 MCs that offered 17 different trades. Each had an average of 14 years of practical experience in their specific field. TEVETA created a set of training modules customized for each of the principal trades, and provided one day of training to the MCs on how to use these modules.

During the apprenticeship, each MC trained between one and eight trainees at their workshops. MCs' workshops tend to be located in urban areas, while many of the many of the trainees lived in rural areas. The trainees were responsible for finding their own accommodation near the workshop, but received a small stipend (about MWK4,300 (Malawian kwacha), approximately US$28) to cover meals and accommodation.

2.2 Experimental design

The evaluation used an experimental phase-in design. Participants were randomly assigned to two cohorts, a treatment group that started the programme immediately, and a control group that started the programme around four months later on average, right around the time of the follow-up survey. We are therefore able to report short-run effects of training. Two-thirds of the 1,900 eligible youth were assigned to treatment and the remaining third to the control group.

The baseline survey was collected in March–April 2010 on a random subset of the youth selected. We surveyed 1,122 individuals of the original 1,900, of whom 363 were in the control group and 759 were in the treatment group (see figure 1). Summary statistics from the baseline survey indicate that randomization was successful in achieving balance across treatment and control groups (table 1).

Figure 1.   Study design
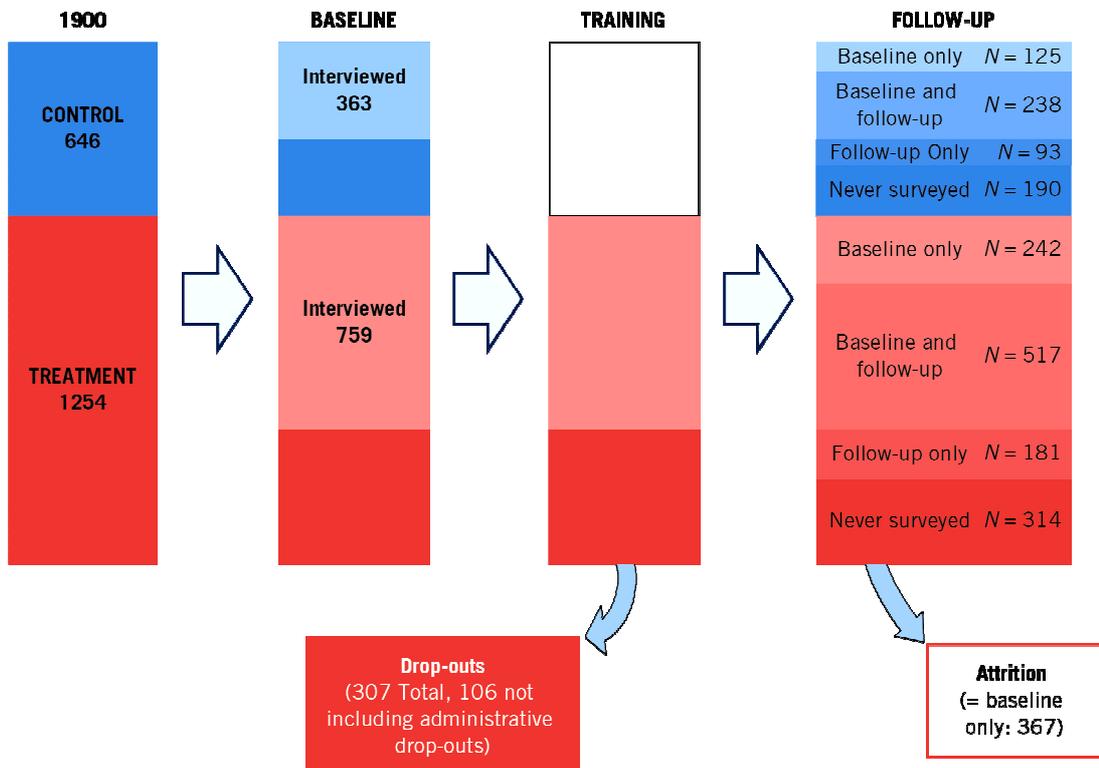
Trainees reported to training between August 2010 and May 2011; the specific start date varied by district and by MC. Training lasted for three months on average, but varied depending on the type of skill being taught. Table 2 provides the breakdown of occupations by gender of trainees.

Table 2.   **Occupations in which participants received training**

	Total trained	Men (%)	Women (%)	Average months of training
Auto	119	81	19	3.19
Beauty	44	19	81	2.91
Clothing	167	38	62	2.99
Construction	158	94	6	3.00
Electronics	56	69	31	3.00
Food	20	36	64	3.09
Metalwork	73	83	17	2.99
Other	36	67	33	3.33

The follow-up survey was conducted in June–August, 2011. The follow-up survey included questions on time use, employment, psychological well-being, risky sexual behaviour and trainee assessments of training quality. In order to increase the sample size, we returned to the original pool of 1,900 youth who had been selected to participate in the study. The sample at follow-up is composed of the 755 baseline respondents who we were able to find at the time of follow-up, plus 274 new participants (181 treatment, 93 control), for a total of 1,029 respondents.

In addition, we surveyed all MCs regarding their experience as trainers and their perception of each of the trainees' skills, diligence, effort, attendance, and so on. Finally, we also conducted a brief qualitative survey with the implementing agency's desk officers regarding their experience with the intervention to inform future programme design.

2.3 Attrition and drop out

Like many development programmes, the TEVETA programme suffered from several administrative setbacks which affected the implementation of the programme. For example, between the time that the original 1,900 youth were selected and the time that the baseline survey was conducted and the treatment participants were invited to begin training, over a year went by. Thus at the time that the training was offered, about 9 per cent of the people invited to training chose not to participate (we explore the possible reasons – including other potential opportunities or barriers facing these people – in greater depth below). In addition, owing to administrative errors, a large number (about 30 per cent) of those who were supposed to be invited to participate in the training reported in our follow-up that they never received the invitation. Lastly, even among those who were invited to the training and who chose to participate, not all completed the training. We treat all of these (not invited, did not participate, or did not complete) as drop-outs (as labelled in figure 1), as they were assigned to treatment but did not participate. For analysis purposes, however, we distinguish between those who dropped out because of the administrative error (not invited) and those who chose to drop out. More than half of all people who dropped out did so due to the administrative error.

In addition to people who dropped out of the training, there was also survey attrition between the baseline and follow-up surveys. Specifically, about one-third of the respondents in the baseline survey could not be found for the follow-up survey (242 from the treatment group, and 125 from the control group). This poses identification issues, since attrition from the survey is correlated with participation in training, and therefore with our outcome variables. People who participated in training were very easy for us to track, since we conducted our follow-up survey very soon after the completion of training. Thus it is likely that, of the attriters in the treatment group, most are drop-outs. This attrition is particularly problematic if we only successfully tracked a non-random sample of the drop-outs. In table 3a, we examine whether the attriters are statistically different from the drop-outs, who we were able to track in terms of their baseline characteristics. It is encouraging to note that the two groups are statistically similar across most dimensions, which indicates that our extra efforts in tracking drop-outs may have reduced some of the selection bias introduced by non-random attrition. This is especially true when we restrict our attention to drop-outs who chose to stop participating (and not the administrative errors). It appears that TEVETA ultimately chose not to invite a few participants who were originally selected but turned out to be relatively rich. They may have been correcting an earlier administrative oversight in selecting an ineligible participant (since the programme was designed to target the most vulnerable youth). However, even after these corrections, the attriters are older, have more dependents, and are less likely to be currently enrolled in school. In our analyses, we report evaluation results controlling for these baseline differences. We also conduct a bounding exercise, which confirms the direction of our results within a range of possible values for the missing observations.

Table 3a. Summary statistics at baseline - difference between drop-out and attrition

N	Dropped out (inc. administrative drop-outs)	Attrited	p-value of difference	Dropped out (inc. administrative drop-outs)	Attrited	p-value of difference
N	230	367		70	367	
Household characteristics						
Household size	5.70	5.15	0.01	5.53	5.15	0.21
Number of adults	2.83	2.58	0.04	2.70	2.58	0.48
Number of children < 18	2.43	2.14	0.05	2.47	2.14	0.15
Number of respondent's dependents (in or out of hh)	0.62	1.06	0.00	0.64	1.06	0.03
Owns home = 1	0.88	0.85	0.25	0.87	0.85	0.63
Number of acres of land owned	1.90	1.87	0.90	2.17	1.87	0.43
Value of assets (in MWK)	35298.70	22808.99	0.00	24975.00	22808.99	0.66
Construction of walls						
Unburnt bricks	0.38	0.40	0.59	0.34	0.40	0.37
Burnt bricks	0.48	0.49	0.85	0.53	0.49	0.56
Construction of roof						
Grass	0.63	0.57	0.16	0.54	0.57	0.65
Iron sheets	0.35	0.41	0.15	0.41	0.41	0.96

N	Dropped out (inc. administrative drop-outs)	Attrited	p-value of difference	Dropped out (inc. administrative drop-outs)	Attrited	p-value of difference
Source of water						
Unprotected well	0.08	0.10	0.30	0.06	0.10	0.23
Communal tap	0.16	0.21	0.12	0.19	0.21	0.61
Borehole	0.54	0.50	0.35	0.63	0.50	0.05
Individual characteristics						
Gender: male = 1	0.66	0.66	1.00	0.63	0.66	0.65
Age	20.36	23.26	0.00	20.29	23.26	0.00
Head of household = 1	0.15	0.24	0.01	0.20	0.24	0.47
Married or living with partner = 1	0.17	0.20	0.24	0.13	0.20	0.14
Neither parents are alive (orphan) = 1	0.35	0.35	0.88	0.35	0.35	0.94
Educational attainment						
Completed primary	0.04	0.05	0.75	0.01	0.05	0.19
Some secondary	0.46	0.52	0.16	0.46	0.52	0.33
Completed secondary	0.23	0.24	0.76	0.16	0.24	0.14
Currently a student = 1	0.16	0.05	0.00	0.14	0.05	0.00
Previously received vocational training = 1	0.15	0.12	0.38	0.11	0.12	0.85
Previously started a business = 1	0.30	0.39	0.03	0.27	0.39	0.06
Economic variables						
Annual personal income	15974.95	30202.99	0.09	8795.68	30202.99	0.14
Number of loans in past 12 months	0.37	0.38	0.87	0.36	0.38	0.78
Amount of loans in past 12 months (in MWK)	2223.99	2834.19	0.26	2413.91	2834.19	0.65
Number of cash and in-kind grants from social programmes in past 6 Months	0.66	0.73	0.28	0.61	0.73	0.27
Amount of cash grants from social programmes in past 6 months (in MWK)	16019.21	5133.32	0.02	13016.67	5133.32	0.11
How often do you/other adults skip meals?						
Often	0.31	0.29	0.48	0.37	0.29	0.15
Sometimes	0.55	0.54	0.81	0.53	0.54	0.83
Not at all	0.13	0.17	0.23	0.10	0.17	0.13

Table 3b.   Effect of treatment assignment on likelihood of attrition (surveyed at baseline but not at follow-up)

	All			Men			Women		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Treatment assignment	-0.026 [0.030]	-0.017 [0.025]	-0.009 [0.024]	0.000 [0.036]	0.015 [0.031]	0.010 [0.029]	-0.082 [0.055]	-0.089* [0.049]	-0.062 [0.045]
Household size			-0.009* [0.005]			-0.004 [0.007]			-0.019** [0.009]
Number of dependents (in or out of hh)			0.009 [0.009]			0.013 [0.011]			0.001 [0.015]
Owns home = 1			-0.083** [0.039]			-0.120** [0.051]			-0.016 [0.068]
Value of assets (in MWK)			-0.000** [0.000]			-0.000*** [0.000]			0.000 [0.000]
Age			0.052*** [0.004]			0.054*** [0.005]			0.051*** [0.007]
Head of household = 1			0.005 [0.036]			0.027 [0.046]			-0.029 [0.077]
Married or living with partner = 1			-0.061* [0.035]			-0.072* [0.044]			-0.074 [0.069]
Currently a student = 1			0.035 [0.037]			0.027 [0.045]			0.053 [0.070]
Previously started a business = 1			0.004 [0.025]			0.006 [0.030]			0.004 [0.049]
District dummies?	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Constant	0.344***	0.261**	-0.687***	0.320***	0.072	-0.928***	0.398***	0.189	-0.768**
	[0.025]	[0.106]	[0.129]	[0.030]	[0.060]	[0.147]	[0.046]	[0.223]	[0.313]
Observations	1,122	1,122	1,117	753	753	748	369	369	369
R-squared	0.001	0.291	0.419	0.000	0.287	0.425	0.006	0.320	0.437
F-test			23.70			18.17			6.565
F-test p-value			0			0			1.25e-08

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in brackets. The *F*-test is a test of joint significance of all the control variables.

It is crucial to investigate whether individuals assigned to treatment versus control group attrite at different rates, since such voluntary exit can threaten the validity of our randomized design. In table 3b, we estimate a linear probability model where attrition is a function of initial randomized assignment to receive training. The results indicate that there is no relationship between initial assignment to training and the likelihood of continuing in the sample. The coefficient on "Assigned to Treatment" is –0.017, with a standard error of 0.025. When we break up the sample by gender, treatment assignment is completely irrelevant for men in their likelihood of attrition (a coefficient of 0.000), but it is relevant for women (coefficient of –0.082, but not statistically significant at conventional levels). We will therefore present results separately by gender throughout the paper, and attrition bias will be a bigger concern in the female sample. This also provides the first indication that girls and boys appear to make training participation decisions under a different set of conditions.

3. Determinants of dropping out

The rates of programme drop-out were clearly very high, both because of administrative errors by the implementers, and because some trainees chose not to attend or complete the programme. We tracked down many of the drop-outs, and collected data on adverse shocks and new opportunities that potential trainees faced in the period prior to programme inception for the entire follow-up sample, in order to identify the determinants of drop-out. Although drop-outs are a common phenomenon in training programmes and a challenge to evaluation studies, this study is one of the few to have extensive data on drop-outs and the conditions they faced. Examining whether people are forced to leave the programme due to external factors like unanticipated adverse shocks or choose to leave to take advantage of better opportunities will inform future programme design. It also serves to shed light on the direction of bias associated with ignoring drop-outs when follow-up data on them are missing. In our case, having follow-up data on a large fraction of drop-outs means that we can get closer to reporting pure experimental (intent-to-treat) estimates of training programme effects.

Drop-out rates varied a little across occupations in which training was offered. Almost a third of all participants invited to training for auto mechanic jobs chose not to complete. Drop-out rates were lowest (16–20 per cent) in beauty-care, electronics, metalwork and construction (table 4).

Table 4.   Drop-outs by training industry

	Dropped out (inc. admin. drop-outs) (%)	Dropped out (of those who were invited) (%)	Not invited (of those who dropped out) (%)
Auto	60.2	30.9	82.1
Beauty	38.6	18.2	75.0
Clothing	38.9	24.4	69.8
Construction	39.9	15.9	81.7
Electronics	56.9	19.4	88.1
Food	45.0	26.7	69.2
Metalwork	30.3	19.7	61.0
Other	67.6	29.4	91.4
Total	45.1	22.2	78.4

Table 5.   Effects of shocks on likelihood of dropping out (ordinary least squares)

	Dropped out (inc. administrative drop outs)		Dropped out (not inc. administrative drop outs)	
	Men	Women	Men	Women
Fired in past 12 months	0.019	-0.243*	0.127	-0.290***
	[0.106]	[0.136]	[0.127]	[0.088]
Incapacitated in past 12 months (severe illness or injury)	-0.109	0.104	-0.095	0.163
	[0.074]	[0.075]	[0.078]	[0.113]
Someone in household was incapacitated in past 12 months	-0.011	-0.034	0.023	-0.057
	[0.038]	[0.054]	[0.046]	[0.068]
Household member died in past 12 months	0.009	-0.016	0.016	-0.024
	[0.064]	[0.067]	[0.082]	[0.100]
Had child in past year	0.023	0.063	0.109	0.095
	[0.085]	[0.095]	[0.100]	[0.122]
Married within the last year	0.020	0.074	-0.029	0.049
	[0.061]	[0.071]	[0.071]	[0.107]
Migrated permanently or temporarily, for work, school or other	0.057	0.040	0.119**	0.032
	[0.042]	[0.054]	[0.053]	[0.073]
Lives more than 4 km from training center	-0.082	0.077	-0.006	0.096
	[0.070]	[0.103]	[0.077]	[0.124]
Has close friends or relatives at training site	-0.676***	-0.614***	-0.325***	-0.326***
	[0.036]	[0.053]	[0.067]	[0.084]
Hours worked in paid labour in month before training	-0.000	0.000	-0.000	0.000
	[0.000]	[0.000]	[0.000]	[0.001]
Hours worked in self-employment in month before training	-0.000	0.000	-0.000	0.001
	[0.000]	[0.000]	[0.000]	[0.001]
Hours spent in human capital development (school, job or trade training) in month before training	0.000	0.000	0.000	0.000
	[0.000]	[0.001]	[0.001]	[0.001]
_cons	0.832***	0.739***	0.431***	0.445***
	[0.041]	[0.066]	[0.079]	[0.096]
Number of observations	436	236	304	168
Adjusted R^2	0.438	0.380	0.101	0.085

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in brackets.

The location, accessibility and convenience of the training sessions, as well as family support, appear to be important determinants of attendance. Having friends or relatives close to the training centre is a very strong predictor of whether trainees – both males and females – can complete training. Compared with males, females are more likely to drop out due to severe illness or injury, or if they live far away from the training centre. In contrast, boys drop out in order to take advantage of migration work opportunities (ignoring drop-outs due to administrative error).

In general, female participation appears to be much more sensitive to external constraints imposed on them compared with their male counterparts. Not only do females drop out more due to distance, illness or injury, but on the flip side, females who are fired from a job are more likely to complete the programme. In other words, they stick with the programme in cases where alternative opportunities disappear. These same variables do not have a significant effect on the drop-out propensity of male trainees. The gender difference in drop-out patterns mirrors the findings from the analysis of attrition, in that selection concerns are more significant for women.

4. Estimation of programme effects

4.1 Outcome measures

Vocational training may improve labour market outcomes through multiple channels. First, training imparts practical, technical skills, which increase trainees' human capital, and potentially their productivity. Second, training sessions may increase awareness of higher-paying job opportunities, and improve knowledge of how to access these jobs and how to connect to potential employers. Working directly with the MCs, the workers will be able to connect not only to one potential employer but potentially to the network of employers through recommendations.[6] Third, practical training under MCs' mentorship allows trainees to reveal their "type" (effort, skills and talents) to a potential employer. Fourth, training may also impart more general skills on how to start and operate a business, which could spur entrepreneurship. Therefore, either salaried employment or self-employment may increase due to training.

An additional consequence of participation in training may be increased human capital investment, beyond the duration of the training programme. Trainees may learn about the importance of investing in skill development to further improve their labour market prospects. We will therefore estimate the effects of training on time use: hours worked in paid labour and self-employment (on family farm or self-employed), and also hours devoted to human capital investment beyond the training period. We will also measure downstream outcomes such as earnings, total expenditures (as a proxy for income), business start-up, and migration.

We also examine the effects of training on self-reported (subjective) outcomes related to the skills that the vocational training programme were meant to impart, to study whether (a) the training programme achieved its intended objectives focusing on skills and labour market outcomes, and (b) whether psycho-social well-being of participants improved as a result.

4.2 Estimating equations

Randomizing the offer to attend the training allows us to overcome the selection bias into training. We will report both the effect of offering the training based on random assignment (intent-to-treat (ITT) estimates), and the effect of receiving training among those who actually participated in the training, with participation instrumented by the random assignment. The discrepancy between random assignment and programme participation is almost entirely due to drop-outs (control group individuals did not have any opportunity to participate in training). Tracking down a large fraction of the drop-outs therefore allows us to report estimates closer to the pure experimental estimates.

The estimating equation for the ITT estimate is:

$$Outcome_{t+1,ij} = \beta_0 + \beta_1 \ Invited \ Training_{ij} + \beta_2 \ X_{ij} + d_j + \varepsilon_{ij}, \qquad (1)$$

where $Outcome_{t+1,ij}$ is a set of outcomes of interest for an individual i in district j at the follow-up ($t + 1$) and d_j captures time-invariant district-level characteristics; ε_{ij} is the error term. The estimated coefficient β_1 captures the effect of the random assignment, or being *offered to attend the training*. In some specifications we include a set of fixed individual and household characteristics X_{ij} to increase the precision of the estimates. These control variables include household size (squared), number of children under 18, acres of land

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[6] See Owolabi and Pal (2011)

owned, age, gender, and indicator variables for whether the respondent is married, if he/she is currently a student, if he/she has friends or family living close to the training site, and whether a household member who was contributing to household income died in the past 12 months.

The effect of training for those who attended the training is estimated using instrumental variable (IV) techniques, where the random assignment to treatment, *Invited Training$_{ij}$* is used as an instrument for the indicator variable *Attended Training$_{ij}$* (=1 if the individual *attended* the training)[7] in a first stage:

$$Outcome_{t+1,ij} = \alpha_0 + \alpha_1\ Attended\ Training_{ij} + \alpha_2\ X_{ij} + d_j + v_{ij} \qquad (2a)$$

$$Attended\ Training_{ij} = \gamma_0 + \gamma_1\ Invited\ Training_{ij} + \gamma_2\ X_{ij} + d_j + \omega\omega_{ij}, \qquad (2b)$$

The estimate of α_1 (2a) yields the local average treatment effect of the training – i.e., effect for those who was induced to attend the training as a result of random assignment to participate. Since the invitations were randomly assigned, the IV estimate can be interpreted as the causal effect of the treatment among compliers.

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[7] *Attended Training$_{ij}$* is defined by self-report of trainees. To be considered to have attended training, trainees must (i) have received the invitation to training, (ii) state that they participated, (iii) state that they participated for at least one month, and (iv) state that they rarely or never missed training days. We also ran an alternative specification in which the dependent variable is 1 if the person was (i) assigned to treatment and (ii) not listed as a drop-out in administrative records. However, there is considerable discrepancy in the administrative reports of who did or did not drop out, and this vari-able also does not catch non-compliers in the control group (of which there were four) who managed to attend training despite not being selected for it. The results from the two specifications are similar, and we prefer the former specification.

5. Results

5.1 Effects of training on skill development and human capital

We first investigate whether the training achieved its primary objective – boosting skills that the training was meant to impart, according to the trainees' own assessment. Specifically, we focus on the following proxies for skill development: (i) self-assessment of skills in a particular trade (estimated on the scale 1–10); (ii) knowledge of how to calculate profits; (iii) an indicator that the individual knows how to start a business (self-assessed). Both the ITT and the IV estimates of the training participation presented in table 6 indicate that the training was very successful in improving the self-assessed practical skills of the young people in our sample.

Table 6.   Effects of training on skills development[a]

	ITT – invited to training			IV – attended training			Mean of dependent variable in control group
	No controls	+ district dummies	+ controls and district dummies[b]	No controls	+ district control	+ control and district dummies	
Skill in area/trade today (1:poor/none; 10: master craftsperson)	2.636*** [0.181]	2.718*** [0.169]	1.108*** [0.198]	4.890*** [0.316]	5.086*** [0.284]	4.969*** [0.790]	2.578
Knows how to calculate profits of a business (today, 1-10)	1.632*** [0.207]	1.659*** [0.200]	0.578** [0.233]	2.970*** [0.377]	3.046*** [0.355]	2.450** [0.996]	4.272
Knows how to start a business (today) = 1	0.241*** [0.033]	0.235*** [0.033]	0.093** [0.040]	0.446*** [0.061]	0.439*** [0.061]	0.422** [0.173]	0.438

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in brackets. Sample size = 975.

Dependent variables in first column. Coefficient is on the dummy variable *Invited Training* for ITT estimates and on *Attended Training* for IV estimates.

Controls include: household size squared, number of children under 18 in household, acres of land owned, age, gender and dummy variables for married, currently a student, has friends/relatives near training site and whether a household member who was contributing to household income died in the past 12 months.

Assignment to treatment (ITT estimate) increases self-assessed skill score in a specific area of expertise by 2.6 points on a 10-point scale, or 1.1 points when district dummies and baseline control variables are added. The mean value for this variable is 2.6 in the control group, so the effect of training represents a substantial increase. We also observe positive and strongly significant effects of training on the other two self-assessed categories of skill development. Being invited to the training increases the subjective business-profit-calculation ability by 37 per cent of control group mean (or 14 per cent with district dummies and baseline controls). Training also increases the likelihood that a respondent knows how to start a business by 24 percentage points (or 9 percentage points with controls, representing a 20 per cent increase from the mean in the control group).

There are two important further points to note from table 6. First, IV estimates where training participation is instrumented by the random assignment to training are always larger than the ITT estimates, which is expected, since almost all non-compliers are drop-outs from the treatment group. Second, controlling for district dummies only does not affect the magnitude or statistical significance very much, but adding controls for individual/household characteristics that were related to the drop-out decision and imbalance at baseline does compress the magnitude of treatment effects. We will therefore report this conservative specification alongside the pure experimental estimates in all subsequent tables.

5.2 Time use during and after training, and economic outcomes

Table 7 examines another first-order effect: how training changed the participants' time use relative to the control group during and immediately after training. We examine outcomes at four distinct points in time: (a) month before the training (as a placebo outcome); (b) the period during training; (c) month after the training; and (d) a week before the follow-up survey (which was, on average, four months after completion of training). Constructing time periods this way in our follow-up survey allows us to measure time use consistently among respondents engaged in a variety of activities (training in different sectors, and then either working, studying, or self-employed). An important drawback is that the survey timing does not allow us to capture the longer-run effects of training. Card, Kluve and Weber (2010) and Cho and Honorati (2013) argue that it probably takes longer for labour market effects to materialize.

Table 7 presents ITT and IV results on: (i) hours worked in paid labour (which includes any paid employment, including paid labour in agriculture); (ii) hours worked in self-employment, which includes both work on family-owned land and in own business; and (iii) hours spent in human capital development such as school, job or trade training for each of the time periods (before, during, after training) described above. Reassuringly, there are no statistically significant effects of treatment assignment on time use in the month prior to training (the placebo outcome). Treatment assignment and training participation leads to very large increases in time spent on human capital development (i.e., training) during the training period. Being assigned to the treatment group leads to 170–343 extra hours of training, and those who actually attended invested an extra 636–773 hours in training according to IV estimates. Since training in most professions lasted over three months (the average training duration was 13–14 weeks), this is a reasonable estimate, and suggests that the training kept all trainees quite busy over the entire training period.

Table 7.   Effects on time use - before, during and after training[a]

	ITT – invited to training		IV – attended training		Mean of dependent variable in control group
	No controls	**+ controls and district dummies[b]**	**No controls**	**+ controls and district dummies**	
Hours worked in paid labour in month before training	-4.867	-0.237	-7.833	1.471	30.491
	[3.966]	[4.173]	[7.347]	[18.653]	
Hours worked in self-employment in month Before training	-3.670	0.760	-6.249	5.379	53.256
	[4.012]	[4.556]	[7.476]	[20.427]	
Hours spent in human capital developm. (school, job or trade training) in month before training	1.116	3.161	2.084	14.171	14.384
	[2.897]	[2.954]	[5.442]	[13.320]	
Hours worked in paid labour during training	-32.320***	-10.995	-56.857***	-43.441	57.959
	[8.555]	[11.152]	[15.696]	[49.431]	
Hours worked in self-employment during training	-75.983***	-22.500**	-140.998***	-101.437**	131.803
	[10.384]	[10.786]	[19.035]	[46.261]	
Hours spent in human capital development (school, job or trade training) during training	342.679***	170.471***	636.212***	772.875***	41.097
	[16.110]	[19.562]	[26.046]	[69.638]	
Hours worked in paid labour in month after training	-3.271	1.041	-6.350	4.194	19.606
	[3.504]	[4.532]	[6.570]	[20.322]	
Hours worked in self-employment in month after training	-0.366	7.477*	-0.028	36.092**	41.747
	[3.551]	[3.878]	[6.630]	[17.948]	
Hours spent in human capital development (school, job or trade training) in month after training	6.513**	5.391	12.232**	24.369	10.456
	[2.967]	[3.536]	[5.579]	[15.744]	
Hours worked in paid labour in past week	0.493	1.551	1.158	7.516	6.150
	[1.015]	[1.228]	[1.888]	[5.564]	
Hours worked in self-employment in past week	-0.464	-0.553	-0.530	-1.596	9.325
	[0.927]	[1.071]	[1.728]	[4.777]	
Hours spent in human capital development(school, job or trade training) in past week	1.562**	1.488**	2.838**	6.177*	1.978
	[0.635]	[0.724]	[1.196]	[3.212]	

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in brackets. Sample size = 975.

Dependent variables in first column. Coefficient is on the dummy variable *Invited Training* for ITT estimates and on *Attended Training* for IV estimates.

Controls include: household size squared, number of children under 18 in household, acres of land owned, age, gender, and dummy variables for married, currently a student, has friends/relatives near training site, and whether a household member who was contributing to household income died in the past 12 months.

Investing all this time in training displaced many hours of work in both paid labour and in self-employment (e.g. decreases of 32 hours and 76 hours respectively in the ITT estimate). Both the IV and ITT estimates suggest that about 30 per cent of the hours in training came from displacing paid labour and self-employment hours. This is an important result because it shows that the opportunity cost of attending the training in terms of both time and forgone earnings may be substantial. This may explain some of the drop-out decisions, which we will explore more in our gender-disaggregated analysis. On the other hand, 70 per cent of the training hours are for youth who would otherwise be unemployed, under-employed, in school, or enjoying leisure during the training period.

Turning our attention to the effects of treatment assignment on time use after the training is completed, we see that the most important consequence of the training programme is continued investment in human capital. This is promising, because this may

have significant and lasting implications for labour market opportunities in the long run. In some cases, this is because the trainee forms a longer-term relationship with the MC, something we will explore below.

Training participation increases total hours spent on skill development (through school, or other job training) by 6 hours (ITT) or 14–24 hours (IV) one month after the training. This is large relative to how the control group spends their time, and relative to how all individuals spent time prior to the start of training. In the week preceding the survey, those who completed the training programme continued to spend 3–6 hours per week in additional human capital development activities. We do not observe strong significant effects in hours worked in the period after training, except for some effect on self-employment that is sensitive to the inclusion of control variables, and therefore not robust.

In table 8 we see that all this extra time spent on training and on further human capital development post-training comes at a financial cost to the trainees. Trainees have to draw down their savings by MWK1,600–3,000 (US$10–20),8 which is a substantial amount in this sample. Importantly, we will see below that this effect is largely driven by female trainees, who face even more drastic decreases in savings (of about $38) in the corresponding specification. Data we will present below on the training experience indicates that the stipend provided for the participants (MWK4,300, or $28 on average) was not sufficient to cover transportation and lodging costs.

Given that we do not find any significant changes in hours worked in the short run, it is not surprising that we also do not find a discernible impact of training on the total earnings (last week) and on total monthly expenditure. The estimated effects are negative, but generally not statistically significant. Consistent with the human capital investment results both during and post training, we also see that training participants were significantly less likely to start a business in the previous 12 months. Trainees are also significantly less likely to migrate away in search of employment, which is again consistent with trainees making some longer-run investments, often in collaboration with the MC trainers at their location of origin.

5.3 Effects of training on well-being and health behaviours

In table 9 we investigate the impacts of training on non-market outcomes including psychosocial well-being, self-esteem and sexual behaviour. Subjective measures of well-being are a useful complement to the time use and labour market data we collect to paint a more comprehensive picture of the overall effects of the training intervention. Such measures are increasingly used in the economics and evaluation literatures (Ashraf, Field and Lee 2010; Devoto et al. 2012).

Table 8. Effects of training on economic outcomes[a]

	ITT – invited to training		IV – attended training		Mean of dependent variable in control group
	No controls	+ controls and district dummies[b]	No controls	+ controls and district dummies	
Personal savings	-1,571.551*	-1,332.252*	-2,956.059*	-6,168.389*	2,272.813
	[852.771]	[757.558]	[1,605.566]	[3,477.858]	
Total earnings from work (last week)	-305.274	-195.244	-579.030	-898.751	995.469
	[266.610]	[224.848]	[504.245]	[1 023.489]	
Started business during last 12 months	-0.047*	-0.071**	-0.082*	-0.307**	0.188
	[0.026]	[0.029]	[0.048]	[0.133]	
Total monthly expenditure	-251.925	-616.123	-497.868	-2 852.917	3 936.331
	[366.602]	[382.149]	[688.935]	[1 750.311]	
Migrated permanently or temporarily,	-0.061*	-0.069*	-0.120**	-0.340**	0.319
for work, school or other	[0.031]	[0.036]	[0.058]	[0.167]	

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in brackets. Sample size = 975.

Dependent variables in first column. Coefficient is on the dummy variable *Invited Training* for ITT estimates and on *Attended Training* for IV estimates.

Controls include: household size squared, number of children under 18 in household, acres of land owned, age, gender, and dummy variables for married, currently a student, has friends/relatives near training site, and whether a household member who was contributing to household income died in the past 12 months.

Table 9. Effects of training on well-being[a]

	ITT – invited to training		IV – attended training		Mean of dependent variable in control group	N
	No controls	+ controls and district dummies[b]	No controls	+ controls and district dummies		
Household rarely or never skips meals	-0.029	-0.007	-0.048	-0.026	0.815	848
	[0.029]	[0.032]	[0.054]	[0.138]		
Happy and satisfied with life	0.075***	0.053*	0.132***	0.225	0.775	975
(Str. Agree/Agree) = 1	[0.027]	[0.031]	[0.050]	[0.138]		
Life has improved during last year	0.119***	0.067*	0.218***	0.292*	0.613	975
(Str. Agree/Agree) = 1	[0.032]	[0.038]	[0.060]	[0.168]		
Sees self as entrepreneur	0.019	-0.015	0.036	-0.067	0.856	975
	[0.023]	[0.029]	[0.044]	[0.131]		
Able to earn money outside farming	0.095***	0.057	0.172***	0.239	0.625	975
(Str. Agree/Agree) = 1	[0.032]	[0.038]	[0.060]	[0.168]		
Used condom almost every time or every	-0.016	-0.062	-0.041	-0.278	0.267	525
time with most recent sexual partner	[0.040]	[0.041]	[0.076]	[0.178]		
Married within the last year	-0.014	-0.003	-0.029	-0.027	0.125	975
	[0.022]	[0.021]	[0.041]	[0.096]		
Had child in past year	-0.030	-0.027	-0.050	-0.108	0.116	975
	[0.021]	[0.023]	[0.039]	[0.104]		

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in brackets. Sample size = 975, except for "Household rarely skips meals", for which there was a high number of missing responses, and "Used condom", for which many responses were "Not applicable" due to the fact that not all respondents were sexually active.

Dependent variables in first column. Coefficient is on the dummy variable *Invited Training* for ITT estimates and on *Attended Training* for IV estimates.

Controls include: household size squared, number of children under 18 in household, acres of land owned, age, gender, and dummy variables for married, currently a student, has friends/relatives near training site, and whether a household member who was contributing to household income died in the past 12 months.

Participating in training had strong positive effects on subjective measures of well-being. Specifically, random assignment to training increases the share of respondents happy and satisfied with life and agreeing that life has improved during the last year by 5 and 7 percentage points respectively (22 and 29 percentage point effect in the IV– TOT specification). These are sizeable increases relative to the control group means. Additionally, related to the prior discussion on skills acquisition, trainees report being more confident in their ability to switch away from agriculture and earn money in other sectors. We don't observe any statistically significant effects on health behaviours. However, there is important heterogeneity by gender across all these outcome variables, which we will explore below.

5.4 Gender differences in outcomes

Both the drop-out and the attrition analysis indicated that women are significantly more constrained in their decision-making than men (unlike men, women participate in training when other opportunities disappear, drop out due to illness or injury, and attrite when they are not assigned to treatment). Table 10 reports results disaggregated by gender to explore whether these apparent constraints lead to differential gender incidence of benefits and costs of training. The sub-sample analysis also helps to establish the robustness of our results in the male sample, where attrition bias is less of a concern.

Trained men and women report very similar gains in self-reported skills, but that is where their similarity ends. Men spend more time in training (probably due to the occupations they select into), and this extra time comes from men's hours in self-employment. In the full sample, the only significant treatment effect on time use post-training was that trainees continue to invest in human capital development. The gender-disaggregated results show that this comes entirely from the sample of men. Men spend 11 extra hours (21 hours in TOT) in further skills development in the month after training, continue to do so in the week prior to the survey, and these hours reflect over 100 per cent increases relative to the control group. Among women, there is no treatment effect on any category of time use in the period after training ends.

Attending training was evidently much more costly for women. They experience a much larger decline in personal savings (of MWK5,600, or US$36) by participating in training. This extra depletion of personal savings among female participants may indicate that women are more credit constrained and do not have other sources of financing. We will explore this further by examining data on the trainees' experience during the training programme. Only women (and not men) experience other statistically significant negative effects of training on employment and business activities. Trained women's earnings are lower and they are less likely to have started a business.

Next, we see that the positive gains to subjective measures of well-being and confidence (that we reported on earlier) accrue to men to a larger extent. This is consistent with the heterogeneity in all the real effects of training across gender, and the extra constraints under which women appear to make participation decisions. Treatment is associated with smaller positive effects in the female sample also, but men are twice as likely to report that "life has improved in the past year". However, the gender difference is not statistically significant.

Table 10. Effects of training, by gender[a]

	Men			Women			*p*-value of diff.btwn. men and women	
	ITT	TOT	Mean of dep. var. in control	ITT	TOT	Mean of dep. var. in control	ITT	TOT
Skill in area/trade today (1: poor/ none; 10:master craftsperson)	2.768***	5.061***	2.580	2.386***	4.553***	2.575	0.313	0.446
	[0.225]	[0.390]		[0.304]	[0.540]			
Knows how to calculate profits of A business (today, 1-10)	1.654***	2.963***	4.430	1.582***	2.970***	3.982	0.867	0.993
	[0.259]	[0.466]		[0.346]	[0.634]			
Knows how to start a business (today) = 1	0.244***	0.448***	0.444	0.233***	0.443***	0.425	0.876	0.972
	[0.041]	[0.075]		[0.056]	[0.105]			
Hours worked in paid labour during training	-35.811***	-60.698***	68.652	-26.273***	-50.207***	38.372	0.531	0.709
	[12.161]	[21.870]		[9.131]	[17.648]			
Hours worked in self-employm. during training	-96.271***	-174.867***	153.633	-38.891***	-76.347***	91.814	0.003	0.006
	[14.004]	[25.378]		[13.632]	[25.562]			
Hours spent in human capital development (school, job or trade training) during training	364.503***	666.042***	33.952	301.989***	578.051***	54.186	0.059	0.098
	[20.360]	[33.035]		[26.127]	[41.610]			
Hours worked in paid labour in month after training	-2.768	-5.426	23.502	-4.405	-8.536	12.469	0.800	0.799
	[4.843]	[8.936]		[4.294]	[8.292]			
Hours worked in self-employment in month after training	-4.032	-7.262	46.536	6.296	13.730	32.973	0.128	0.099
	[4.798]	[8.827]		[4.789]	[9.176]			
Hours spent in human capital development (school, job or trade training) in month after training	11.446***	21.175***	7.266	-2.609	-5.060	16.301	0.037	0.042
	[3.245]	[6.031]		[5.906]	[11.403]			
Hours worked in paid labour in past week	1.480	3.107	6.903	-1.368	-2.652	4.770	0.152	0.125
	[1.340]	[2.454]		[1.467]	[2.836]			
Hours worked in self-employment in past week	0.157	0.447	9.879	-1.639	-2.458	8.310	0.342	0.413
	[1.179]	[2.177]		[1.478]	[2.801]			
Hours spent in human capital development (school, job or trade training) in past week	2.342***	4.401***	1.865	0.113	-0.179	2.186	0.091	0.066
	[0.793]	[1.490]		[1.055]	[2.002]			
Personal savings	-851.092	-1,576.879	1,643.478	-2,895.749*	-5,608.688*	3,425.664	0.290	0.278
	[940.754]	[1,740.238]		[1,690.151]	[3,286.013]			
Total earnings from work last week)	-192.645	-375.498	1,043.116	-515.942*	-973.780*	908.186	0.496	0.506
	[382.170]	[713.202]		[282.734]	[549.506]			
Started business during last 12 months	-0.007	-0.013	0.155	-0.120***	-0.215**	0.248	0.041	0.058
	[0.030]	[0.056]		[0.046]	[0.091]			
Total monthly Expenditure	-21.396	-58.433	3,957.976	-686.446	-1 364.300	3,896.681	0.416	0.405
	[417.465]	[770.657]		[703.468]	[1 366.970]			
Migrated permanently or temporarily, for work, school or other	-0.078**	-0.144**	0.314	-0.028	-0.072	0.327	0.452	0.561
	[0.038]	[0.071]		[0.053]	[0.103]			
Household rarely or never skips meals	-0.043	-0.067	0.823	-0.002	-0.004	0.800	0.514	0.598
	[0.035]	[0.063]		[0.051]	[0.103]			

	Men			Women			p-value of diff.btwn. men and women	
	ITT	TOT	Mean of dep. var. in control	ITT	TOT	Mean of dep. var. in control	ITT	TOT
Happy and satisfied with life	0.082**	0.142**	0.773	0.063	0.113	0.779	0.745	0.787
(Str. Agree/Agree) = 1	[0.034]	[0.062]		[0.046]	[0.087]			
Life has improved during last year	0.146***	0.262***	0.604	0.068	0.132	0.628	0.249	0.310
(Str. Agree/Agree) = 1	[0.040]	[0.073]		[0.055]	[0.105]			
Sees self as entrepreneur	0.021	0.039	0.874	0.015	0.028	0.823	0.900	0.912
	[0.027]	[0.050]		[0.043]	[0.083]			
Able to earn money outside farming	0.103***	0.191***	0.638	0.078	0.134	0.602	0.707	0.654
(Str. Agree/Agree) = 1	[0.039]	[0.072]		[0.055]	[0.106]			
Used condom almost every time or every time with most recent sexual partner	-0.035	-0.081	0.316	0.018	0.032	0.182	0.506	0.451
	[0.053]	[0.100]		[0.059]	[0.112]			
Had child in past year	-0.007	-0.004	0.077	-0.070*	-0.137*	0.186	0.183	0.145
	[0.022]	[0.040]		[0.042]	[0.082]			

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in brackets. $N = 647$ for men, and $N = 347$ for women, except for "condom use" (338 men and 201 women) and "skips meals" (582 men and 283 women).

[a] Dependent variables in first column. Coefficient is on the dummy variable *Invited Training* for ITT estimates and on *Attended Training* for IV estimates

One positive effect of the vocational training programme on women is that they are significantly less likely (7 percentage points in ITT, 14 percentage points in TOT) to have given birth in the past year: 19 per cent of young women in the control group had a child in the past year, so this signifies a very significant decline. Baird, McIntosh and Özler (2011) also found that a schooling intervention resulted in delays in childbirth and marriage. Early sexual experience, marriage and childbirth are often associated with lower investment in education and lower future earnings potential (Baird et al. 2010; Baird, McIntosh and Özler 2011), so the reduced incidence of childbirth is an encouraging result. The rate of condom use also increases with treatment in the female sample, but this effect is not statistically significant.

Table 11.   Differential constraints, by gender

	Women	Men	p-value of difference
Trainees' experiences			
N	460	791	
Months of training	2.864	2.956	0.094
Missed no days of training	0.452	0.533	0.042
Amount of stipend received for training per month (MWK)	4,049.402	4,028.777	0.880
Stipend was sometimes insufficient to cover needs	0.508	0.469	0.338
Received food or money from MC	0.464	0.555	0.023
MC always attended training	0.812	0.818	0.842
Tools were always available for practice	0.680	0.737	0.115
Felt encouraged by MC	0.916	0.933	0.420
Received paid work from MC following training	0.012	0.039	0.048
Baseline characteristics by gender			
N	369	753	
Household characteristics			
Household size	5.46	5.42	0.80
Number of adults	2.50	2.79	0.00
Number of respondent's dependents (in or out of hh)	1.01	0.75	0.00
Owns home = 1	0.85	0.89	0.02
Number of acres of land owned	1.76	1.91	0.33
Individual characteristics			
Age	21.10	21.66	0.01
Head of household = 1	0.12	0.20	0.00
Married or living with partner = 1	0.13	0.18	0.02
Neither parents are alive (orphan) = 1	0.31	0.38	0.03
Lives with at least one parent	0.45	0.38	0.02
Educational attainment			
Completed primary	0.06	0.05	0.58
Some secondary	0.51	0.47	0.22
Completed secondary	0.19	0.25	0.03
Currently a student = 1	0.09	0.11	0.38
Received vocational training = 1	0.11	0.14	0.15
Previously started a business = 1	0.36	0.34	0.56
Economic variables			
Annual personal income	17 227.47	26 820.08	0.33
Number of loans in past 12 months	0.37	0.37	0.97
Amount of loans in past 12 months (in MWK)	2,869.76	2,370.47	0.26
Number of cash and in-kind grants from social	0.64	0.70	0.21
Amount of cash grants from social programmes in past programmes in past 6 months	3,340.90	7,717.29	0.08
Time use			
Hours per year spent on agriculture or domestic chores	764.58	425.26	0.00
Hours per year spent on paid labour	105.74	203.79	0.00
Hours per year spent in own business	48.22	51.59	0.80
Hours per year spent on other activities	26.15	15.71	0.05

Why are the effects of vocational training much more positive for men than they are for women? Is it that the nature of the training, and the way men and women experienced the programme was very different? To investigate this further, we analyse:

(a) the details of the training programme and the experience as reported by male and female trainees in the treatment group;
(b) summary statistics on the baseline conditions faced, to identify whether females were differentially constrained based on their domestic situation.

Overall, males and females report similar experiences during training. Male and female trainees are of similar age, the training programmes were of similar length on average, they received similar-sized stipends from the implementing organization, and the MC attendance and mentorship/encouragement were all comparable. However, boys are significantly less likely to have missed any days of training, and they are slightly (10 per cent) less likely to drop out, although the latter difference is not statistically significant. These suggest – as the drop-out and attrition analysis did before – that women are participating in training in a more constrained environment. These slight gender differences then translate into better "real" experiences for boys: (a) MCs are significantly more likely (by 9 percentage points, or 20 per cent) to give help with food and money to boys during the training period; (b) boys are accordingly 4 percentage points (8 per cent) less likely to report that the (same-sized) stipend is insufficient to meet their needs; and (c) boys are significantly more likely to receive paid work from the MCs after the completion of training. Paid employment is a rare outcome, and the 2.8 percentage points greater likelihood of boys receiving that offer from an MC represents a large (233 per cent) increase over girls.

In terms of the differential conditions faced by women at baseline before the training is implemented, comparison of summary statistics indicates that women live in households with fewer adults and more dependent children. Women report spending almost twice as much time as men on household and agricultural chores. Men, on the other hand, are older, more likely to be the head of household, and less likely to still be living with at least one parent. They are more likely to have completed secondary school, and they spend more time in paid labour. While both male and female youth of Malawi are burdened with a great deal of family responsibility at a young age, the fact that men's responsibilities appear to be more financial in nature, and more likely to carry market returns, may imply that they have the chance to develop skills outside the home that allow them to make better use of the training.

In contrast, when we ask drop-outs why they had chosen to not participate, it becomes clear that women's responsibilities may prevent them from taking advantage of the training: 21 per cent of women cited family obligations as the reason, while no men did. This matches reports we received at baseline, where women were twice as likely (*p*-value of gender difference = 0.03) to report "family obligations" as the reason they had never before taken advantage of any training. Women are also seven times as likely to mention getting married as the reason for drop-out (*p*-value = 0.02), and four times as likely to mention transportation problems (*p*-value = 0.17). Men, on the other hand, are more likely to report administrative errors – that they did not receive the message from TEVETA to show up, possibly because migration rates are greater for men.[8]

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[8] An important caveat to this discussion is that there is segregation in the types of industries/occupa-tions that men and women select into (see table 2). Around 85 per cent of training in auto mechan-ics, metalwork and construction goes to men, while women are more likely to be trained in cloth-ing fabrication or beauty. Some of these gender differences may reflect underlying differences in employment conditions within these professions. Even so, that would imply that women are selecting into professions that are more constrained or lead to worse outcomes.

In summary, baseline characteristics and the attrition and drop-out analyses indicate that women participate in training in a more constrained environment. They get less financial support which puts greater pressure on their personal funds. Their attendance is slightly worse, drop-out risk is higher, and in turn MCs treat male trainees a little better during and after training (which, admittedly, may be due to gender segregation in the occupational mix rather than any particular MC's behaviour). All of this accumulates to worse treatment effects for girls compared with boys, and lower levels of (subjective) satisfaction with life after training.

6. Examining drop-out and attrition bias using follow-up data on drop-outs

The follow-up data we collected on drop-outs yield another strategy to examine whether drop-outs are selected in either a positive or negative direction. If those assigned to training dropped out because better alternative opportunities cropped up (i.e. positive selection), then we would expect the drop-out decision to be associated with better post-training outcomes. We estimate a simple ordinary least squares model, separately by gender, in which we compare outcomes for those who chose to drop out with outcomes for those who chose to continue participating in training. The right-hand variable is an endogenous choice (to drop out) that is not randomly assigned, and therefore these results cannot strictly be interpreted as causal effects. Nevertheless, the conditional correlations reported in table 12 are still helpful in identifying the likely direction of bias, if any, associated with drop-outs. This is a potentially useful exercise given the high drop-out rates experienced in many training evaluations around the world.

Table 12. Effects of dropping out on outcome variables[a]

	Dropped out (inc. administrative drop-outs)		Dropped out (not inc. administrative drop-outs)	
	Men	Women	Men	Women
Skill in area/trade today (1: poor/none; 10: master craftsperson)	-3.481*** [0.248]	-3.775*** [0.310]	-2.432*** [0.394]	-3.006*** [0.478]
Knows how to calculate profits of a business (today, 1-10)	-2.541*** [0.266]	-2.800*** [0.351]	-1.832*** [0.390]	-2.597*** [0.476]
Knows how to start a business (today) = 1	-0.269*** [0.044]	-0.437*** [0.057]	-0.155** [0.066]	-0.357*** [0.085]
Hours worked in paid labour in past week	4.211** [1.734]	-0.489 [1.411]	4.396 [3.027]	0.416 [1.988]
Hours worked in self-employment in past week	-1.985 [1.273]	-1.310 [1.502]	-1.588 [2.002]	-0.438 [1.918]
Hours spent in human capital development (school, job or trade training) in past week	-0.189 [1.175]	-0.862 [1.073]	1.892 [2.162]	-1.712* [1.014]
Personal savings	75.041 [308.938]	-46.098 [250.366]	183.850 [392.220]	-246.312 [252.337]
Total earnings from work (last week)	113.933 [175.531]	-104.544 [152.583]	19.920 [247.188]	74.925 [293.423]
Started business during last 12 months	0.010 [0.035]	-0.066 [0.043]	0.054 [0.056]	-0.037 [0.061]
Total monthly expenditure	-493.182 [458.018]	-1,091.667* [659.644]	-841.640 [596.657]	-929.478 [840.741]
Migrated permanently or temporarily, for work, school or other	0.011 [0.041]	0.045 [0.060]	0.135** [0.067]	0.023 [0.082]
Household rarely or never skips meals	0.018 [0.042]	0.056 [0.058]	-0.002 [0.063]	0.018 [0.083]
Happy and satisfied with life (Str. Agree/ Agree) = 1	-0.085** [0.035]	-0.067 [0.048]	-0.109* [0.056]	-0.019 [0.063]

	Dropped out (inc. administrative drop-outs)		Dropped out (not inc. administrative drop-outs)	
	Men	Women	Men	Women
Life has improved during last year (Str. Agree/Agree) = 1	-0.204***	-0.151**	-0.218***	-0.103
	[0.042]	[0.061]	[0.067]	[0.084]
Sees self as entrepreneur	-0.099***	-0.179***	-0.122**	-0.213***
	[0.031]	[0.049]	[0.052]	[0.076]
Able to earn money outside farming (Str.	-0.121***	-0.153**	-0.139**	-0.209**
Agree/Agree) = 1	[0.043]	[0.061]	[0.066]	[0.088]
Used condom almost every time or every	-0.005	-0.021	0.035	-0.051
time with most recent sexual partner	[0.061]	[0.070]	[0.089]	[0.089]
Married within the last year	0.008	0.056	0.006	0.035
	[0.029]	[0.046]	[0.043]	[0.062]
Had child in past year	0.016	0.053	0.052	0.075
	[0.025]	[0.043]	[0.044]	[0.065]

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in brackets. When including administrative drop-outs, $N = 421$ for men, 230 for women, except for "skips meals" (381/189) and "condom" (214/132). Not including administrative drop-outs, $N = 298$ for men, 164 for women, except for "skips meals" (276/131) and "condom" (152/94).

[a] Dependent variables in first column. Coefficient is on the dummy variable *Dropped Out*

In general, we find that drop-outs – when compared with training participants – seem to have simply missed out on the benefits of training that we estimated by comparing trainees with the control group. In other words, the drop-outs look very much like the control group in terms of their follow-up outcomes. Individuals who dropped out have a statistically significantly lower level of skills development, and are significantly less likely to think that their life has improved during last year, perceive themselves as entrepreneurs, or have confidence that they can secure a job outside of farming. These are mirror images of the training effects we have observed in all the main regressions, and even the magnitudes are similar to the main treatment effects. This implies that the outcomes for drop-outs are similar to those for the (randomly assigned) control group.[9] This suggests that drop-outs do not appear to be systematically selected in either a positive or negative direction. To reiterate, the drop-out decision is not randomly assigned, and these results are therefore only suggestive.

Even though we track down many of our drop-outs, our sample is still plagued by some survey attrition, and the attriters are almost all either drop-outs or were originally assigned to the control group. Although the results above suggest that the attriters' profiles are unlikely to introduce systematic bias in either direction, we employ a matching and imputation method here to estimate lower bounds for our treatment effects, in order to verify this formally. Specifically, following Calderon, Cunha and De Giorgi (2013), we use one-to-many matching to match both treatment and control attriters (who were surveyed at baseline, but not at follow-up) to five members of the control group for whom we have follow-up data.[10] We then replace the missing values of our outcome variables with the average of the matched control respondents. This constitutes a lower bound for our results

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[9] Indeed, when we compare summary statistics for the control group with those of the group of drop-outs, controls are slightly older and also marginally more likely to be numerate than drop-outs, but otherwise there are no statistically significant differences between the two groups (see Appendix, table A1).

[10] Attriters were matched to control-group non-attriters based on the following baseline characteristics: household size; number of dependents; owns home; acres of land owned; age; gender; currently a student; lives with at least one parent; completed primary school; married; previously received vocational training; previously started a business; and hours per year spent on agriculture, paid labour and own business.

because it assumes that attriters from the treatment group would have experienced the same outcomes as our controls, thereby minimizing the difference between treatment and control.

Results are presented in table 13. Overall, the results confirm our original estimates in terms of magnitude and direction. A few differences are worth noting, however. When using the imputed values, ITT estimates show a statistically significant drop in personal savings for men as well as women, and the values remain larger for women. Women assigned to treatment also are less likely to migrate, a change that could result from assuming that attriters did not migrate, when in fact it is likely that a main cause of attrition is migration. In terms of social outcomes, women trainees are now significantly more likely to report that they are happy and satisfied with life, and that they are able to earn money outside of farming (this variable loses significance for men).

7. Conclusions

This study makes three important contributions. First, we are among the first to provide experimental evidence on the effects of vocational and entrepreneurship training in a country where the majority lack access to formal education and skills development. Apprenticeship training is particularly relevant in the sub-Saharan Africa setting, as programmes that foster entrepreneurship provide alternatives to highly rationed wage employment. Second, we shed light on gender differentials in the effects of such programmes, by documenting the additional constraints under which women have to make human capital investment decisions, and the resulting differences in the nature of their experiences during the training programme. Third, by tracking a large fraction of programme drop-outs at follow-up, we are able to both examine the determinants and consequences of drop-outs, and partially address a challenge faced by most published evaluations of training programmes: many potential participants drop out, and the lack of follow-up data on drop-outs introduces selection biases.

We find that the vocational training programme led to enhanced (self-reported) skills of the type that the training was intended to impart. Male trainees reacted by continuing to invest in their human capital development during the post-training period, but there were no significant effects on labour market outcomes in the short run. Participating in training was expensive, particularly for girls who had to draw down their savings and did not receive as much help from the trainers as the boys did. External constraints (such as illness and getting fired) more strongly affected girls' participation decisions. Girls could not attend as regularly as boys and were less likely to end up with job offers from their trainers. Overall, the experience led to more positive effects on self-reported well-being among male participants. These results support the conclusions of Duflo (2012)'s review of gender and development that women's empowerment will require active and continuous policy commitment to equality in order to level the playing field.

Table 13. Effects of training: Lower bounds assuming treatment group attriters would be like (matched) controls[a]

	Men			Women			p-value of diff.btwn. men and women		
	ITT	TOT	Mean of dep. var. in control	ITT	TOT	Mean of dep. var. in control	ITT	TOT
Skill in area/trade today(1: poor/ none; 10:master craftsperson)	1.849***	5.564***	2.400	1.625***	4.721***	2.282	0.475	0.258
	0.184	0.420		0.254	0.616			
Knows how to calculate profits of a business (today, 1-10)	1.101***	3.490***	4.258	1.063***	3.631***	3.981	0.913	0.880
	0.212	0.542		0.282	0.757			
Knows how to start a business (today) = 1	0.165***	0.572***	0.456	0.095**	0.416***	0.480	0.219	0.308
	0.033	0.087		0.046	0.127			
Hours worked in paid labour during training	-18.605**	-65.969***	66.415	-12.539	-41.093*	48.788	0.625	0.444
	8.852	23.171		8.693	22.763			
Hours worked in self-employment during training	-61.396***	-184.644***	142.471	-18.963*	-52.561*	93.854	0.009	0.002
	11.594	30.925		11.245	29.555			
Hours spent in human capital development (school, job or trade training) during training	222.473***	675.637***	54.490	202.170***	585.265***	57.642	0.509	0.150
	18.623	36.331		24.516	51.195			
Hours worked in paid labour in month after training	-1.500	-6.355	23.756	-0.965	0.384	15.144	0.911	0.592
	3.599	9.799		3.123	7.903			
Hours worked in self-employment in month after training	-0.774	-6.081	43.482	0.231	7.821	36.263	0.858	0.355
	3.865	10.435		4.097	10.838			

	Men			Women			p-value of diff.btwn. men and women	
	ITT	TOT	Mean of dep. var. in control	ITT	TOT	Mean of dep. var. in control	ITT	TOT
Hours spent in human capital development (school, job or trade training)in month after training	7.246***	22.281***	6.331	-0.935	-7.831	11.288	0.097	0.038
	2.415	6.605		4.300	12.898			
Hours worked in paid labour in past week	0.845	3.358	7.526	-2.003	-3.673	6.861	0.089	0.127
	1.083	2.818		1.277	3.647			
Hours worked in self-employment in past week	-0.597	-1.352	9.502	-1.349	-2.595	8.519	0.621	0.774
	0.930	2.501		1.206	3.542			
Hours spent in human capital development (school, job or trade training) in past week	1.279**	4.967***	1.924	-0.108	-0.391	2.031	0.198	0.091
	0.570	1.564		0.914	2.754			
Personal savings	1,222.038***	-269.996	1,986.008	-3,601.396**	-8,926.101*	6,591.695	0.008	0.093
	463.474	440.375		1,759.411	5,137.113			
Total earnings from work (last week)	84.803	153.350	807.142	-216.937	-310.460	832.331	0.082	0.324
	104.204	272.517		138.817	383.253			
Started business during last 12 months	0.001	-0.055	0.198	-0.133***	-0.269**	0.318	0.007	0.104
	0.026	0.064		0.042	0.115			
Total monthly expenditure	170.844	368.791	3,940.671	-84.954	400.696	4,069.229	0.666	0.984
	291.677	750.093		515.752	1 448.556			
Migrated permanently or temporarily, for work, school or other	-0.066**	-0.142*	0.354	-0.090**	-0.156	0.395	0.664	0.926
	0.031	0.081		0.045	0.127			
Happy and satisfied with life (Str. Agree/Agree) = 1	0.022	0.068	0.801	0.051	0.184*	0.786	0.520	0.363
	0.026	0.069		0.037	0.107			
Life has improved during last year (Str. Agree/Agree) = 1	0.048	0.208**	0.626	0.037	0.158	0.610	0.841	0.750
	0.031	0.084		0.045	0.130			
Sees self as entrepreneur	0.003	0.076	0.852	0.015	0.082	0.785	0.773	0.958
	0.023	0.060		0.038	0.109			
Able to earn money outside farming (Str. Agree/Agree) = 1	0.035	0.202**	0.635	0.132***	0.296**	0.536	0.088	0.543
	0.032	0.084		0.047	0.131			
Had child in past year	-0.010	-0.022	0.077	0.010	-0.011	0.107	0.591	0.916
	0.018	0.048		0.032	0.094			

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in brackets. $N = 746$ for men, and $N = 368$ for women.

[a] Dependent variables in first column. Coefficient is on the dummy variable *Invited Training* for ITT estimates and on *Attended Training* for IV estimates.

Given the continued investments in skills development that we observe among trainees, it would be valuable to follow this sample up over a longer period to identify whether the additional human capital leads to improved labour market outcomes in the long run. In this context, an important shortcoming of our analysis is that the follow-up survey was conducted only four months after the completion of the training programme (on average). However, conducting the follow-up quickly allowed us to track down many of the drop-outs, which was valuable.

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Appendix

Table A1. Summary statistics at follow-up - differences between control group and drop-outs

	Control	Dropped out (inc. administrative drop-outs)	*p*-value of difference	Control	Dropped out (not inc. administrative drop-outs)	*p*-value of difference
N	328	307		328	106	
Household characteristics						
Household size	4.93	4.84	0.62	4.93	4.84	0.71
Number of adults	2.84	2.72	0.25	2.84	2.73	0.44
Number of respondent's dependents (in or out of hh)	1.35	1.65	0.06	1.35	1.66	0.15
Owns home = 1	0.84	0.83	0.70	0.84	0.81	0.45
Individual characteristics						
Gender: male = 1	0.64	0.64	0.83	0.64	0.59	0.36
Age	22.00	21.29	0.01	22.00	21.35	0.08
Head of household = 1	0.23	0.24	0.84	0.23	0.26	0.50
Married or living with partner = 1	0.29	0.27	0.65	0.29	0.27	0.75
Neither parents are alive (orphan) = 1	0.45	0.42	0.50	0.45	0.38	0.21
Educational attainment						
All primary	0.05	0.04	0.35	0.05	0.02	0.12
Some secondary	0.55	0.53	0.74	0.55	0.55	0.98
All secondary	0.15	0.16	0.63	0.15	0.11	0.39

Table A1.   Summary statistics at follow-up - differences between control group and drop-outs (Continued)

	Control	Dropped out (inc. administrative drop-outs)	*p*-value of difference	Control	Dropped out (not inc. administrative drop-outs)	*p*-value of difference
Currently a student = 1	0.11	0.15	0.13	0.11	0.14	0.43
Received vocational training = 1	0.11	0.07	0.13	0.11	0.08	0.47
Economic variables						
Previously started a business = 1	0.37	0.31	0.14	0.37	0.31	0.31
Worked for wage in past 12 months = 1	0.22	0.18	0.28	0.22	0.21	0.85
Personal savings	2,266.16	731.11	0.08	2,266.16	720.75	0.29
Number of loans in past 12 months	0.35	0.36	0.79	0.35	0.41	0.39
Amount of loans in past 12 months (in MWK)	3,548.50	2,710.38	0.35	3,548.50	2,978.21	0.66
Expenditure on food as percent of total	0.47	0.47	0.82	0.47	0.47	0.97
In the past 12 months, has anyone in your household had to skip meals?						
No	0.47	0.50	0.53	0.47	0.50	0.68
Yes, but infrequently	0.34	0.31	0.44	0.34	0.28	0.33
Yes, about once a month	0.10	0.08	0.45	0.10	0.10	0.98
Yes, more than once month	0.09	0.11	0.39	0.09	0.12	0.41
Migration						
Migration episodes in past 12 months	0.28	0.20	0.04	0.28	0.26	0.78
Average duration of migration episode	8.61	12.93	0.17	8.61	12.67	0.31
Number of migration episodes for work in past 12 months	0.08	0.05	0.12	0.08	0.07	0.63

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