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Empowering Young Women through Business and Vocational Training

Evidence from a Field Intervention in Rural Egypt

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WHAT WORKS In Youth Employment

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Contents

List of figures and tables

Preface

In June 2012, the International Labour Conference of the International Labour Organization (ILO) resolved to take urgent action to tackle the unprecedented youth employment crisis through a multi-pronged approach geared towards pro-employment growth and the creation of decent jobs. The resolution "The youth employment crisis: A call for action" contains a set of conclusions that constitute a blueprint for shaping national strategies for youth employment. In 2016, the Global Initiative on Decent Jobs for Youth was launched to facilitate increased impact and expanded country-level action on creating decent jobs for young people through multi-stakeholder partnerships, the dissemination of evidence-based policies and the scaling up of effective and innovative interventions.

The ILO has responded to this challenge by making greater investments in understanding "what works" in youth employment and supporting governments and social partners to translate evidence into integrated employment policy responses. In 2013, the ILO set up the Fund for Evaluation in Employment and established the Area of Critical Importance: "What Works in Youth Employment" to foster knowledge sharing and provide financial and technical assistance for the rigorous assessment of youth employment interventions. Regional approaches have since been established, including the Taqeem (meaning "evaluation in Arabic) Initiative. Taqeem is a partnership with the International Fund for Agricultural Development (IFAD) as part of an IFAD-financed project titled "Strengthening gender monitoring and evaluation in rural employment in the Near East and North Africa". Through rigorous impact research, this capacity development and learning grant project aims to understand "what works" in the promotion of gender mainstreaming, with the ultimate goal of achieving gender equality in rural employment outcomes across the region.

The "Impact Report" series disseminates research reports from Taqeem-supported impact evaluations. Reports include baseline, endline and qualitative studies, which describe the research designs, methodologies, interventions under investigation, findings and policy and programmatic recommendations.

This paper presents results from an impact evaluation of a large-scale training intervention in rural Upper Egypt, where marginalized women in treated villages were offered intensive vocational, business and life skills training. In comparison to women in the control villages, the intervention increased the likelihood of treated women engaging in income-generating activities, driven by an increase in self-employment. They also became more likely to have business aspirations for the future. However, social aspects of empowerment (namely, intra-household decision-making capacity and attitudes toward gender equality) were not affected. The findings of the study suggest that, while the economic situation of women in conservative societies could be enhanced by training interventions, this does not necessarily translate into better social conditions for women.

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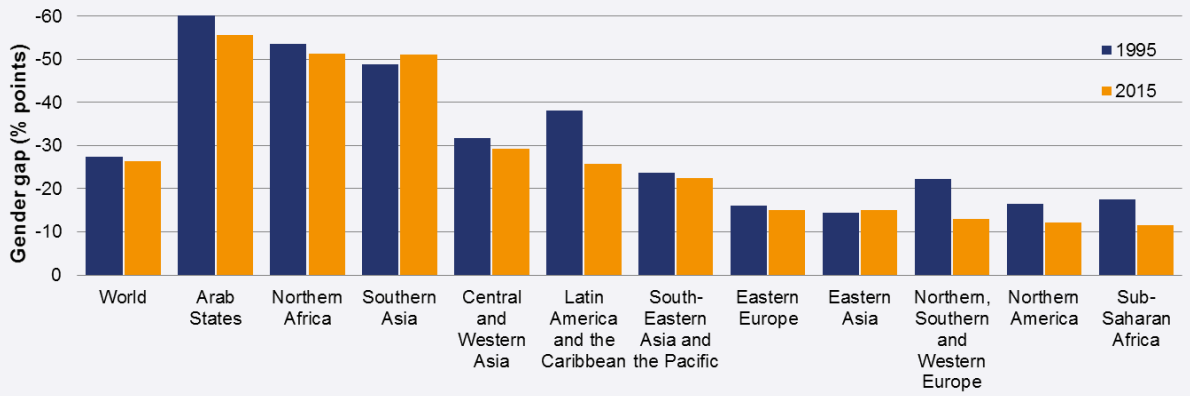
Section 1: Introduction

In many developing countries, women suffer from lower levels of economic and social empowerment, poorer investment in human capital and greater restrictions on access to labour markets in comparison to their peers in developed countries.2 The past few decades have witnessed a massive increase in the number of different microfinance and employment intervention programmes that have typically targeted women in developing countries to help them become more economically and socially independent (e.g. Bandiera et al., 2016; Field et al., 2010; Groh et al., 2016a, 2016b). These interventions have included a focus on skills development as a key to improving rural productivity, employability and income-earning opportunities, enhancing food security and promoting environmentally sustainable rural development and livelihoods. However, the literature shows mixed evidence for the success of these interventions. Some studies found that these interventions have had a strong positive impact on the labour market (as well as other social) outcomes of the target groups (e.g. Bandiera et al., 2016; Pitt et al., 2006; Jensen, 2012), while several other studies found hardly any (or very limited) evidence of improvement for women in comparison to men (e.g. Berge et al., 2014; De Mel et al., 2008, 2009, 2014; Fafchamps et al., 2014; Giné and Mansuri, 2014; Klinger and Schündeln, 2011).

Figure 1 Gender gaps in labour force participation rates by region, 1995 and 2015



Source: ILO, 2016, p. 7. The gender gap is measured as the difference between women's and men's labour force participation rates. The data cover 178 countries. More information on data and methodology can be found in ILO, 2016.

[2] Figure 1 shows gender differences in labour force participation across different regions. The figure clearly shows that Arab and North African countries, together with Southern Asia, account for most of the global gender gap in labour force participation, with little improvement over the period 1995–2015.

One reason for the inability of many interventions to achieve the planned goals for women is the fact that they focus exclusively on physical capital support without considering human capital. Gender differences in levels of educational attainment and access to business networks could limit women's ability to benefit from physical support (Field et al., 2010). Due to these gender differences, women often lack basic business knowledge and are less informed about investment opportunities in comparison to men (Karlan and Valdivia, 2011). Women who aspire to be self-employed are not regarded as entrepreneurs in many rural communities and thus have difficulty in accessing entrepreneurship development training and services. This is particularly the case with self-employment, as labour market imperfections draw women with lower levels of human capital into self-employment rather than wage work (Emran et al., 2011). Moreover, norms governing women's roles in society could be restricting their perceptions of what is achievable in the workplace and therefore limiting their motivation to invest in their human capital (Field et al., 2010). This consideration includes questions relating to the formalization of women's roles in rural employment, safety and security concerns in the workplace and a lack of female-friendly workplace policies, such as maternity protection and flexible working hours. A key question then is whether relaxing the constraints imposed on women in rural communities in terms of their human capital development could help them to achieve better economic and social outcomes, or whether gender norms are too ingrained to be relaxed by public policy interventions.

This paper aims to answer these questions by evaluating the impact of a large-scale women's empowerment intervention in the conservative setting of rural Upper Egypt.3 The *Neqdar Nesharek* (NN) (meaning "We can participate") programme provides an integrated approach to female economic and social empowerment which aims to enhance the transition into work for young marginalized women in rural Upper Egypt. The programme provides business skills training and actual support in starting a business or gaining employment. It emphasizes soft and life skills acquisition, knowledge of legal rights and the importance of involving the women's gatekeepers (husbands and fathers) and community leaders (Ramadan et al., 2014).4

Using a quasi-experimental design, which includes a midline survey and an endline survey, this paper evaluates the impact of the programme on young women's employment outcomes and aspirations, empowerment, intra-household decision-making capacity and attitudes towards gender roles. The impact of the programme is assessed using a strategy of difference in difference (DD) and propensity score matching (PSM) by comparing end-of-programme responses to midline survey responses for treated women and women in control villages. Spillover effects are also estimated by comparing the responses of women living in NN villages but not participating in the training to those of women living in control villages.

We find that, relative to women in the control villages, the programme increased the likelihood of treated women engaging in income-generating activities, a result which is driven by an increase in self-employment, and increased the share of women planning to set up their own businesses. However, social aspects of empowerment (namely, intra-household decision-making capacity and attitudes to gender equality) were not affected. Comparing the change in outcomes for untreated women in the intervention villages with those in control villages shows no significant difference, suggesting the absence of spillover effects within treated villages. Importantly, we find no evidence of different pre-treatment trends in employment across the treated and control groups prior to the intervention, which suggests that differences in the

[3] Upper Egypt refers to the south of the country while Lower Egypt is the north. The terminology "Upper" and "Lower" derives from the flow of the River Nile from the highlands of East Africa northwards to the Mediterranean Sea.

[4] The video available at https://www.youtube.com/watch?v=-7VBRZdZnI8 offers a broader overview of the NN project.

follow-up survey are not simply a result of diverging trends. The findings of the paper suggest that, while the economic situation of women in conservative rural societies could be enhanced by training interventions, this does not necessarily translate into better social conditions for women in the short term.

The paper builds on a growing body of economic literature concerning the impact of training on the labour market outcomes of women (e.g. De Mel et al., 2014; Field et al., 2010; Karlan and Valdivia, 2011; McKenzie and Puerto, 2017). Most of these studies focus on existing entrepreneurs and evaluate the impact of training, alone or in combination with microfinance, on the performance of small firms as well as women's outcomes. Only a few studies focus on bringing women into the labour market in the first place, in either self- or wage employment (e.g. Bandiera et al., 2015; Groh et al., 2016a, 2016b; Maitra and Mani, 2017). The findings of these papers vary depending on the context and the type of training provided. Our study has the advantage of being one of the first to focus exclusively on rural women and uses a holistic approach to empowerment by providing women with a bundle of training measures covering business, vocational and life skills.5

The rest of the paper is organized as follows. Following this introduction, section 2 provides a brief background on the situation of women in Upper Egypt, section 3 details the institutional background of the NN programme and covers its goals, training components and key implementation activities. Section 4 explains the empirical strategy. Section 5 gives the results of the data analyses. Findings are then discussed in section 6 and key considerations for policy and practice are given in section 7.

[5] The study by Bandiera et al. (2015) adopts a similar approach, where adolescent women in Uganda were offered vocational training combined with soft skills training on health, reproduction and marriage. For an in-depth review of the studies on the training interventions, see McKenzie and Woodruff (2014) and for a detailed overview of the female empowerment interventions, see Buvinic and Furst-Nichols (2014).

Section 2: Context of women in rural Upper Egypt

In Egypt, as in many countries in the developing world, women face several forms of gender inequality. The *Global Gender Gap Report 2016* ranked Egypt 132nd out of 144 countries in terms of the relative disparities between women and men in four key areas: economic participation and opportunity, educational attainment, political empowerment and health and survival. The domain in which Egypt's performance is relatively poor is that of economic opportunity, in which it is ranked 132nd, as compared to 95th in the health and survival domain, 112th in educational attainment and 115th in political participation (World Economic Forum, 2016). Egypt's ranking has not changed significantly since its inclusion in the Gender Gap Index in 2006, when it was ranked 109th out of 115 countries.

Despite improvements in literacy and school enrolment rates over the recent decades, the gender disparity in terms of economic opportunity has not improved significantly among the younger cohort of the population. Young women face a persistently disadvantageous position on the Egyptian labour market. Based on the Population Council's 2014 *Survey of Young People in Egypt*, only 13.3 per cent of young women (aged 15–29) participate in the labour force compared to 57.8 per cent of their male peers. The unemployment rate among female youth (at 32.3 per cent) is more than triple that of young males (9.3 per cent). Young women's employment aspirations continue to be based on the flexible working conditions provided by the public sector, and the private sector has, to date, failed to offer conditions which are sufficiently attractive to encourage long-term labour force participation among female youth. The entrepreneurship rate among youth is still very low, particularly among females. Only 5.7 per cent of employed female youth reported establishing their own business in 2014, compared to 13.1 per cent of their employed male peers. Furthermore, young people throughout the country, and particularly females, face difficulties in starting and running their own business due to severely restricted access to credit, lack of business information and scarcity of marketing outlets and financial services (Assaad and El-Hamidi, 2009; Roushdy and Selwaness, 2015).

The situation is particularly challenging for young women in the rural setting of Upper Egypt, which is the country's most culturally conservative and traditional region. The agricultural sector provides livelihoods for 55 per cent of the population and directly employs about 30 per cent of the labour force. The majority of the rural poor live in Upper Egypt, where there are higher rates of illiteracy and infant mortality, limited access to safe water and sanitation and a greater number of children who are underweight. According to the Central Agency for Public Mobilization and Statistics (CAPMAS), around 51 per cent of the people living in rural areas in Upper Egypt are poor. It is one of those pockets of population in the Middle East and North Africa (MENA) region where the vicious cycle of low educational attainment, early marriage, high fertility rates and severe poverty persists (Assaad and Roudi-Fahimi, 2007).

Upper Egypt is culturally distinguished from other parts of Egypt in terms of its population's values and attitudes to gender roles. This region is characterized by distinct patriarchal values, which underscore the power of men over women, the influence of elders over youth and the prevalence of tribal feud (Hopkins and Saad, 2004). These cultural restrictions greatly limit

young women's mobility, educational attainment, economic opportunity and ability to participate in the public sphere, as the onset of puberty decreases girls' access to friends and restricts their ability to move around the community (Baldwin, 2011; Sieverding and Elbadawy, 2016). Only 13.5 per cent of young women (aged 15–29) participate in the labour force in these conservative communities. They face the most challenging transition to work, as job opportunities are not readily available in the villages. Young women in rural Upper Egypt also stand out as the largest group among those who are left behind in education. Almost 22.6 per cent of young women in rural Upper Egypt never attended school, compared to only 7 per cent of young men (Krafft, 2015).6 In these rural communities, where employment options in the non-agricultural private sector are extremely limited, both small enterprise development and the expansion of female-friendly employment within existing enterprises are essential aspects for boosting job creation and generating new employment opportunities.

[6] In other regions of the country, the rates of youth (aged 13–34) who have never been to school range from 3 to 8 per cent among young men and from 4 to 13 per cent among young women.

Section 3: The intervention

3.1 Background

The NN programme was launched by the Population Council's Egypt office in September 2011 with funds from the United States Agency for International Development (USAID) with the goal of enhancing young women's transitions to work in the rural communities of Upper Egypt. The training activities of the programme began in January 2013 and continued until mid-2014.7 The NN programme targeted women in 30 villages in the Upper Egyptian governorates of Fayoum, Suhag and Qena, and was implemented in partnership with three governorate-level non-governmental organizations (NGOs) and 30 village-level community development associations (CDAs). Each of the three NGOs oversaw ten CDAs. Unlike most existing women's empowerment programmes, which often focus on the provision of microfinance, the NN programme aimed to empower young rural Upper Egyptian women both economically, by providing them with business and vocational skills, and socially, through providing them with life skills and legal and civic rights education, while emphasizing the importance of involving all community members.

The NN project was designed to be implemented in 30 villages chosen a priori in Upper Egypt. Since the villages were not randomized, propensity score matching was used to select a group of 15 control villages that are comparable to the 30 intervention villages. The control and intervention villages were matched in terms of village size, poverty level, education prevalence and labour market-related variables. Using propensity score matching in the selection of control villages should allow the result to be as close to random as possible, thereby alleviating potential selection bias at the village level.8 Table A.1 in the Appendix shows a comparison between the characteristics of treated and control villages drawn from the 2006 census of Egypt. The table shows no significant differences in observable characteristics between treated and control villages.

Following the preparatory phase, registration opened in the intervention villages at the local CDA premises. The main eligibility criterion is to be a woman within the age range 16–29, with the ability to read and write. Outreach activities included advertisements and community events in the treated villages. Despite the large community outreach and advertising efforts conducted by the programme staff before the project registration period, the number of women who registered and were eligible for the programme only matched the target number of women for

[7] For a more detailed description of the programme, see Ramadan et al. (2014). The preparatory activities included getting governmental approvals to implement the programme, village selection, CDA selection, curriculum development, recruitment and training-of-trainers (TOT) instruction for promoters and other project staff.
[8] See Aiken (1998), Arceneaux et al. (2006), Bifulco (2012) and Dehejia and Wahba (2002) for discussion on how the experimental and matching methods may lead to similar results.

each village.9 Hence, the women were not randomly selected for participation in the programme.

3.2 Training provision

A total of 240 promoters (eight in each treated village), who are young, educated women (with at least secondary education), were recruited from the same local community to mentor, teach, coach, guide and provide moral support to the programme participants during the training period. Promoters also served as role models of women's achievements in areas where girls face many social and economic restrictions.

The training programme consisted of three main training components: (i) business skills training, (ii) vocational training and (iii) life skills, legal rights and civic education. The business skills curriculum was delivered in 12 weeks, with participants meeting three times a week for a two-hour session (i.e. a total of 72 hours). During the business training, beneficiaries started either directly searching for employment opportunities (while attending the programme classes) or began to prepare a market study, with guidance from promoters. The aim of the market study was to map existing local businesses and assess the potential for starting up the small businesses in which they were interested. Based on the market study, beneficiaries who were interested in starting their own business submitted their business plans and market assessments for their proposed projects, and accordingly identified their vocational training needs.

Vocational training started directly after the business skills training element. With the help of local training institutes and businesses, beneficiaries received a variety of training options, in activities such as accessory making, sewing, hairdressing, livestock raising, dairy-product making, perfume making, cleaning supplies production, mobile phone repair, computer hardware and software training, first aid/paramedic skills and dessert/food catering services. Simultaneously, beneficiaries who were seeking employment were helped to apply for employment opportunities in various factories, shops, schools and pharmacies, etc.

Concurrent with the vocational training and business start-up or employment phase, beneficiaries attended life skills training courses (comprising eight two-hour sessions), health awareness classes (consisting of four two-hour sessions) and legal rights and civic engagement (two two-hour sessions). In parallel with the training provision, NGO and CDA staff made sure that all beneficiaries had formal identification, since having the correct documentation is a prerequisite for applying for loans, formalizing businesses, finding employment, voting, etc.10 CDA staff also helped beneficiaries to open their own saving accounts at local post offices and banks.

3.3 Data collection and outcome variables

The NN programme implementation started before sufficient funds for a baseline impact evaluation survey were available. Accordingly, when funds became available, the Population Council contracted with an external independent entity (the Egyptian Demographic Association) to conduct a midline survey as well as an endline survey to access the impact of the programme (Ramadan et al., 2014). Data were collected for all treated women and a random sample of the untreated women in intervention villages. The midline survey was conducted in

[9] The take-up rate was, on average, 15 per cent of those women eligible for the intervention.
[10] A total of 402 beneficiaries received help to get their national identity cards.

December 2013/January 2014 and the endline survey in November/December 2014. Before the midline survey was carried out, the business skills classes were almost completed and the vocational training was just starting. The life skills, legal rights and civic engagement training and community awareness events were still to be implemented following the midline evaluation. Hence, following the midline data collection, it was anticipated that many changes to the programme participants' outcomes would be observed.11

The midline and endline surveys collected detailed information on women's household economic conditions, access to public services and ownership of durables and agricultural land, as well as individual information on age, marital status, education, employment history and fathers' educational levels. More importantly, the surveys included questions on work and financial independence, business and marketing knowledge, participation in decision-making and gender roles (including views on women's work, women's rights and gender equality).

We investigate the effect of the programme on labour market outcomes, women's economic aspirations and social empowerment.

Labour market outcomes are estimated by:

(i) *income-generating activity*: measured by a dummy variable on whether a woman was involved in any economic activity with the goal of generating income during the three months prior to the survey

(ii) *wage employment*: measured by a dummy variable that takes the value 1 if the woman currently works for a wage, and 0 otherwise

(iii) *self-employment*: a dummy variable that takes the value 1 if the woman is currently self-employed, and 0 otherwise

(iv) *business knowledge index*: a scale from 0 to 1 based on an unweighted index of six items that capture the level of women's business knowledge. Table A.2 in the Appendix details the individual components of the scale.

Economic aspirations are estimated by women's economic goals for the future. Women were asked about whether they have plans to:

(i) set up/continue a project or business, and/or

(ii) obtain wage employment.

Each of the two items is a dummy variable that takes the value 1 if the woman has that plan in mind, and 0 otherwise. The two items are not mutually exclusive (i.e. individuals can choose more than one item), so each item is considered a separate question in its own right.

Social empowerment is estimated using two indexes:

(i) *gender equality index (GEI)*: women were given different statements about the role of women and asked whether they agree with each statement. Table A.3 in the Appendix lists the statements. A scale ranging from 0 to 1 is calculated, based on the unweighted average of these statements, where 0 is the lowest value in terms of gender equality perception, and 1 is the highest

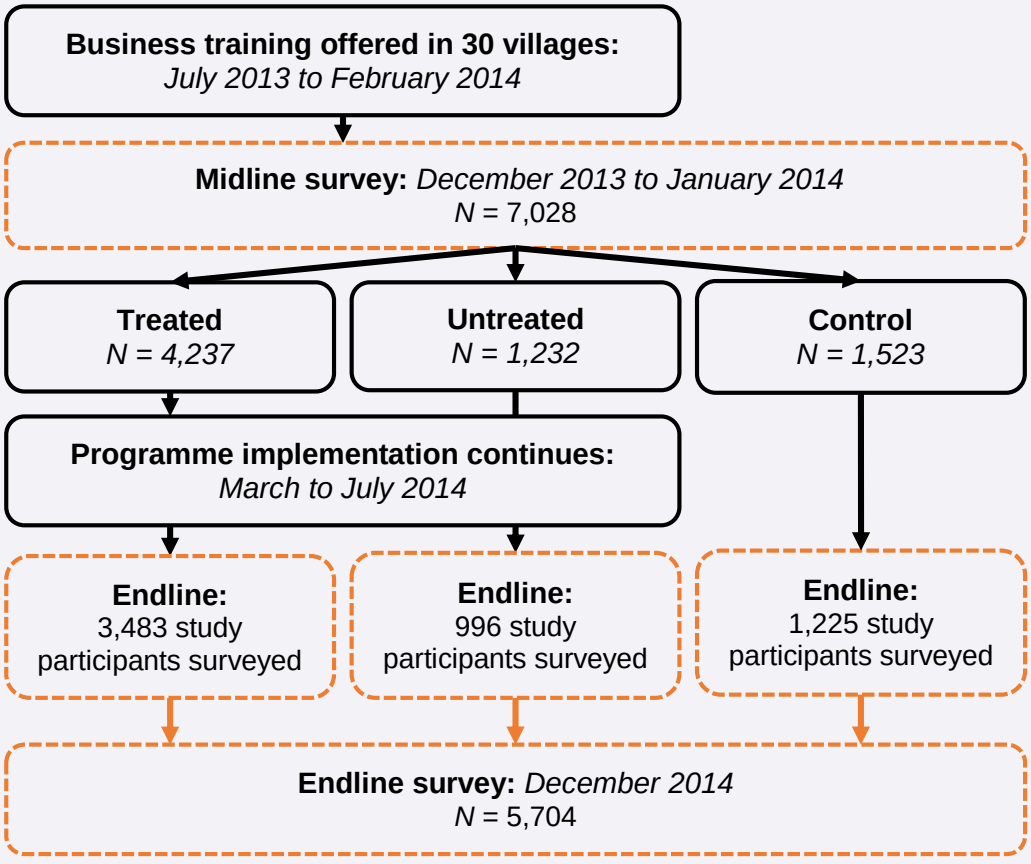
[11] Although the results of an interim survey, compared to those of a baseline survey, could underestimate the effects of the programme, we still believe that by comparing the results of the midline and the endline surveys, we should be able to capture a significant share of the programme's impact on women's economic and social outcomes.

(ii) *decision-making power index (DMI)*: women were asked whether they usually have the final say in making certain decisions within the family (see Table A.4 in the Appendix). The unweighted average of these items is determined and an index ranging from 0 to 1 is calculated, where 0 is the lowest value in terms of intra-household decision-making, and 1 is the highest.12

3.4 Sample size, attrition and descriptive statistics

A total of 7,028 women completed the midline survey; 4,273 of them received training (treated), 1,232 resided in treatment villages but did not receive training (untreated) and 1,523 lived in control villages (control), see also Figure 2. The endline survey tracked down 5,704 of these women (3,483 treated, 996 untreated and 1,225 control), corresponding to a tracking rate of 81 per cent. Table A.5 in the Appendix shows a comparison of observable characteristics between the group that remained across the two waves and the group that dropped out in the second wave. Although some differences in observable (and outcome) characteristics do exist between the two groups, attrition does not seem to be driven by the treatment status.

Figure 2 Evaluation design



[12] The GEI is adopted from the composite index of discriminatory social norms relating to gender at the micro level created by Tuccio and Wahba (2015). The DMI is adopted from the large body of literature on intra-household decision-making. See, for example, Pitt et al. (2006) and Ashraf et al. (2010). Our results are robust to the use of a linear combination determined by a factor analysis of the individual responses to each question.

The analysis in this paper is limited to a balanced sample of 5,704 women who completed both the midline and endline surveys and have complete information on all relevant variables.13

Table 1 shows descriptive statistics of the three groups from the midline survey. Some 57 per cent of the treated women have less than secondary education, 38 per cent have secondary education and 5 per cent have higher than secondary education. The average age of treated women is 22 years. Around a third (35 per cent) of the treated sample are married. Approximately 13 per cent of the treated women were involved in income-generating activities over the three months prior to the survey, 8 per cent are currently in wage employment and 3 per cent are self-employed. The table shows clear, significant differences between the treated group and both untreated and control groups. Treated women are less likely to be married and have children, more likely to be working and have less conservative attitudes towards gender roles. However, normalized differences are below the rule of thumb of 0.25 (Imbens and Wooldridge 2009).14

[13] We repeated all the analyses after accounting for non-random attrition using inverse probability weights, see Wooldridge (2002). This gives similar results. Additionally, a different sample size with different subsets of variables was investigated for robustness checks, which also yielded similar results.

[14] Given that the midline survey took place six months after the start of the training, these differences could be driven by the intervention. In section 5.4 we estimate pre-trends in employment using data on employment history to test the possibility that these differences precede the intervention. We find no evidence for that, suggesting that these differences could indeed be driven by the intervention. Table A.6 in the Appendix shows the descriptive statistics for the whole sample of 7,028 women.

Table 1 **Descriptive statistics for midline sample (balanced, *N* = 5,704)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	NN villages		Control villages	p-value	Norm. diff.	p-value	Norm. diff.	p-value	Norm. diff.
	Treated	Untreated		(1) and (2)	(1) and (2)	(1) and (3)	(1) and (3)	(2) and (3)	(2) and (3)
Women's empowerment									
Income-generating activity	0.134	0.060	0.062	0.000	0.059	0.000	0.062	0.928	-0.001
Wage work	0.079	0.030	0.039	0.000	0.052	0.000	0.046	0.256	-0.008
Self-employment	0.034	0.012	0.007	0.001	0.030	0.000	0.040	0.079	0.005
Business knowledge index	0.476	0.256	0.338	0.000	0.165	0.000	0.120	0.000	-0.053
Wishes to set up/continue a project	0.270	0.078	0.078	0.000	0.109	0.000	0.118	0.978	-0.000
Wishes to be employed	0.295	0.214	0.261	0.000	0.046	0.016	0.021	0.004	-0.023
Gender equality index	0.601	0.573	0.576	0.005	0.040	0.000	0.038	0.508	-0.004
Decision-making power index	0.467	0.445	0.425	0.037	0.021	0.000	0.045	0.061	0.017
Background characteristics									
Less than secondary education	0.566	0.521	0.496	0.010	0.023	0.000	0.040	0.223	0.011
Secondary education	0.382	0.415	0.418	0.060	-0.017	0.033	-0.020	0.869	-0.001
Above secondary education	0.052	0.064	0.087	0.106	-0.013	0.000	-0.040	0.045	-0.020
Age	22.375	22.000	21.863	0.293	0.014	0.037	0.020	0.244	0.004
Married	0.348	0.602	0.544	0.000	-0.128	0.000	-0.109	0.039	0.025
Number of children	0.707	1.022	0.867	0.000	-0.064	0.000	-0.035	0.007	0.027
Household size	5.256	4.452	4.469	0.000	0.104	0.000	0.110	0.559	-0.002
Father can read and write	0.160	0.236	0.246	0.000	-0.050	0.000	-0.061	0.489	-0.005
1st wealth quantile	0.220	0.172	0.184	0.000	0.032	0.002	0.025	0.266	-0.007
2nd wealth quantile	0.216	0.173	0.200	0.001	0.029	0.153	0.012	0.096	-0.015
3rd wealth quantile	0.179	0.201	0.226	0.085	-0.014	0.000	-0.033	0.141	-0.014
4th wealth quantile	0.195	0.222	0.190	0.013	-0.018	0.977	0.003	0.039	0.017
5th wealth quantile	0.190	0.233	0.199	0.000	-0.027	0.280	-0.006	0.043	0.018
Sample size	**3,483**	**996**	**1,225**						

Section 4: Empirical strategy

To evaluate the impact of the intervention while accounting for unobserved heterogeneity of individuals, we use a difference-in-difference approach (DD). The design of the intervention enables the impact of the programme and the spillover effect to be estimated in one single equation:

$$Y_{it} = \alpha + \beta_1 T_{it} + \beta_2 U_{it} + \beta_3 W_t + \beta_4 [T_{it} * W_t] + \beta_5 [U_{it} * W_t] + \beta_6 \boldsymbol{X}_{it} + \varepsilon_{it} \quad (1)$$

where Y_{it} is the outcome of woman *i* at time *t*, T_{it} is a dummy variable that takes the value 1 if the respondent is treated and 0 otherwise, U_{it} is a dummy variable that takes the value 1 if the respondent is untreated (but lives in a village where NN training is offered) and 0 otherwise. W_t is a dummy variable that takes the value 1 if the observation is from the second wave of the study (endline) and 0 otherwise. The parameter β_4 for the interaction between T_{it} and W_t is our measure of change in treated women's outcomes compared to those of women in the control group and is the key parameter of interest. Moreover, β_5 captures the change in the outcome for untreated women compared to the control group and therefore provides an estimate of the spillover effect within NN villages. Finally, $\boldsymbol{X}_{it}$ is a set of control variables, which include age, a dummy for being married, a dummy for having children, education, father's education, household size, household wealth and region fixed effects, and $\varepsilon_{it}$is a time-varying error term.

The main problem of the above analysis in empirical terms is the self-selection of participants which arises from the voluntary nature of participation in the programme; especially since no randomization at the individual level took place.

To account for the selective nature of the intervention, we also combine DD with propensity score matching (PSM). PSM is based on two main assumptions: First, conditional independence (i.e. that no selection on unobservable characteristics exists), which is a strong assumption to make, and, second, common support, which means that for each value of pre-treat variables, there is a positive probability of being either treated or untreated. A combination of DD and PSM allows us to circumvent the self-selection problem by drawing on the assumption that, conditional on observable characteristics of women, unobservable characteristics that might affect self-selection into the programme and subsequent changes in outcomes are similar across both treated and control groups.

To illustrate the approach, which combines DD and PSM, let $T = 1$ if a woman is treated and $T = 0$ if she is in the control group. The outcome of being treated by the NN programme and the counterfactual outcome at time *t* can be denoted by (T_t^T, Y_t^C). The gain from treatment is $(T_t^T - Y_t^C)$ and we are interested in estimating the average effect of treatment on the treated (ATT), $(T_t^T - Y_t^C \mid T = 1)$. The inability to observe the counterfactual outcome for treated women prevents us from directly estimating the ATT. Using data from midline and endline, we control for the individual fixed effects. With *(t = 0)* denoting the midline and *(t = 1)* denoting the endline, we can rewrite the standard DD estimator as:

$$DD = E(Y_1^T - Y_0^T \,|T = 1) - E\left(Y_1^C - Y_0^C \middle| T = 0\right) = E(Y_1^T - Y_1^C | T = 1) + B_1 - B_0 \quad (2)$$

where B_t is the selection bias in period *t* and $B_t = E(Y_t^C \middle| T = 1) - E(Y_t^C | T = 0)$. If the initial individual characteristics that affect subsequent changes to the outcome variables are distributed differently between the treatment and the control groups, the condition $B_1 = B_0$ will not hold. To allow for this situation, we use PSM to balance these variables. The assumption underlying PSM is that, conditional on observable characteristics, changes in outcome variables for the control group are independent of actual treatment, $[\left(Y_1^C - Y_0^C\right) \perp T|\boldsymbol{X}]$. This assumption implies $[\left(Y_1^C - Y_0^C\right) \perp T|P(\boldsymbol{X})]$ where *P(**X**)* is the propensity score defined as $P(X) = Prob(T = 1\,|\boldsymbol{X})$. This justifies balancing on *P(**X**)* to remove selection bias based on $\boldsymbol{X}$. Note that this only addresses time-varying selection bias based on observables; a bias will remain if there are any time-varying factors correlated with the changes in counterfactual outcomes (see Rosenbaum and Rubin, 1983; Chen et al., 2009). In the empirical estimations we use a PS-weighted regression method proposed by Hirano et al. (2003), which produces an estimate of the ATT as the parameter in a weighted least square regression of the form: $Y_{it} - Y_{i,t-1} = \alpha + \beta T_i + u_i$ where $E(u_i|T_i) = 0$, and the weights equal 1 for treated observations and $\hat{P}(\boldsymbol{X})/[1 - \hat{P}(\boldsymbol{X})]$ for control observations. We use various methods for assuring balance on *P(**X**)*, one being to limit comparisons to a trimmed sub-sample with sufficient overlap in propensity scores (Crump et al., 2006). This trimming method minimizes the variance of the estimated ATT under homoscedasticity.

As a robustness check we also estimate the coefficients applying regular PSM techniques (Heckman et al., 1997, 1998) using the non-parametric kernel matching in which all the non-participants are used as controls and weights are assigned according to a kernel function of the predicted propensity score in order to ensure valid bootstrapped standard errors (Chen et al., 2009).

Section 5: Results

5.1 DD estimates

Table 2 shows the simple DD estimates from equation (1). The table shows a significant improvement in the labour market outcomes of the treated group relative to the control group. To benchmark the magnitude of the effects, we report the effects as a percentage of the treated group mean in the midline period. Table 2 shows that the probability of engaging in an income-generating activity increased by 4.5 percentage points for the treated group compared to the control group. This denotes an increase of 33 per cent for the treated group across the two waves. Most of the change is driven by the self-employment results which show an increase of 3 percentage points (an 88 per cent increase from the midline level) for the treated women relative to the control group, while wage employment was not affected by the treatment. Although the midline survey started after most women had finished the business skills component of the programme, business knowledge showed a significant increase of 6 percentage points (a 14 per cent increase from the midline level) for the treated women.

Economic aspirations show a similar pattern to the actual labour market outcomes: the share of women who plan to set up their own businesses increased significantly, by 9.4 percentage points (a 35 per cent increase from the midline level), while the share of women aiming to obtain wage employment was not affected. Social empowerment aspects of GEI and DMI showed no change. Comparing the change in outcomes between the untreated and control groups, the table reveals no evidence of spillover effects.

5.2 PSM estimates

Table 3 shows the coefficients of the propensity score estimates using a PS-weighted approach and kernel PSM for both untrimmed and trimmed samples (equation 2). The top half of the table shows the main effect of comparing the treated group with the control group and the bottom half shows the spillover effect of comparing the untreated group with the control group. The table confirms the pattern of results obtained using the DD approach detailed in Table 2. This suggests that results are not driven by selection on observables which are not captured in the standard DD approach. However, as mentioned above, this does not exclude the possibility that results are influenced by unobservable factors. Table A.7 in the Appendix shows the probit estimates used for calculating the propensity score.

5.3 Heterogeneity analysis

Table 4 examines the extent of heterogeneity of the programme impact with respect to the midline characteristics of education, marriage and wealth. The table also reports the

heterogeneity with respect to midline levels of social empowerment measures of GEI and DMI. Women with secondary education and above and married women are more likely to be involved in income-generating activities and to be self-employed. Women with lower levels of education, on the other hand, are more likely to gain business knowledge. Moreover, women from poorer families are more likely to benefit from the intervention. The table also shows that if a woman has a higher level of social empowerment in the midline survey, she is more likely to benefit from the programme.

5.4 Pre-treatment trends in employment

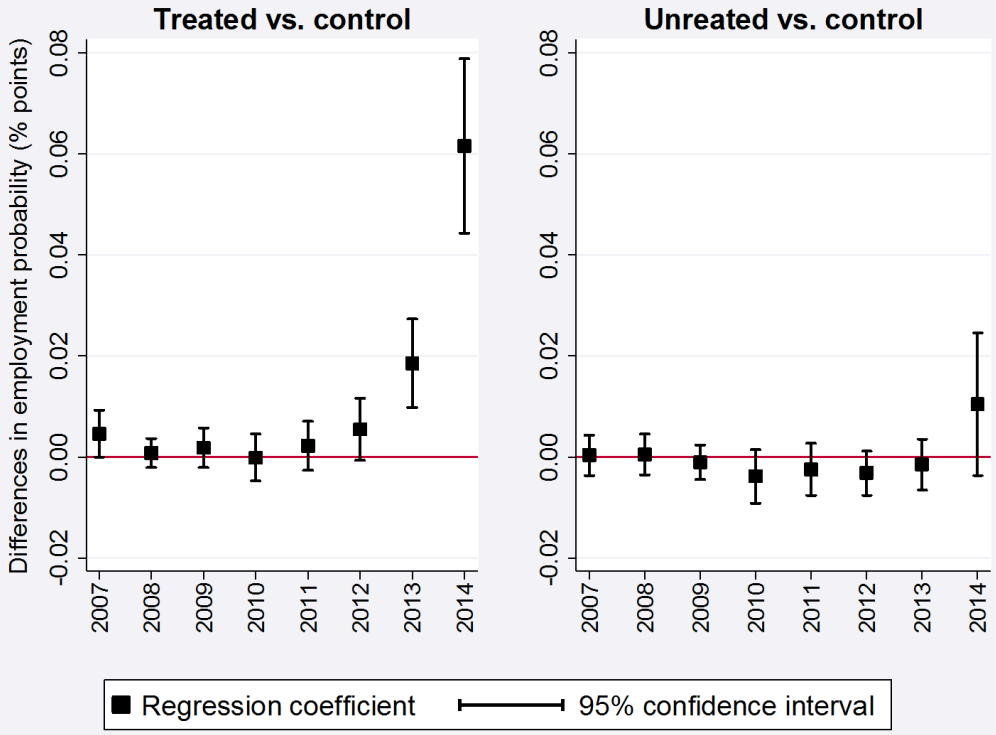
Given the lack of randomization in the intervention, there is a chance that the difference in empowerment outcomes between treated and control groups is not a result of the intervention but could, instead, be due to endogenous factors that affect empowerment outcomes differently for the treated and control groups. Table 2 shows that there are significant differences in levels between the treatment and the control group with respect to main outcomes (and the indicators for which we find impacts). However, differences between the treatment and control groups that remain constant over time do not lead to biased DD estimates. More specifically, our approach only requires common trends (conditional on covariates) in the outcome variables before the intervention. Therefore, we are investigating the extent to which differences in empowerment outcomes existed prior to the intervention. For this purpose, we use a detailed section of the midline survey to elicit information on employment history.15 Women were asked about all past (self-)employment spells of six months or longer and to provide start and finishing dates. For each year prior to the intervention (up to 2007) these data allow us to construct a proxy for whether a woman was working. We estimate the probability of employment in each year, controlling for the midline characteristics specified in equation (1).

Figure 3 shows the difference in employment probability in each year between treated and control groups (left-hand side) and between untreated and control groups (right-hand side). The table shows no evidence of difference between treated and control groups in each year prior to the start of the intervention (2007 to 2012). With the onset of the training in 2013, differences emerge and become substantial in 2014, after the intervention was completed. This suggests that the difference in employment outcomes between the two groups is not due to different pre-trends in employment and is a direct result of the intervention.16

[15] The endline survey contained a similar section on changes in employment history since the midline survey. Adding the two variables together produces a complete picture of the employment history of the individual up to the date of the endline survey (at the end of 2014).

[16] Note that the definition of employment as used when reconstructing employment history differs from the definition of outcome variables presented in the main analysis in Table 2. For example, they cover different time periods (i.e. the income-generating activity in the main analysis covers the last three months, while spells of six months or longer are asked about in the employment history section). A person was considered to have been employed in a given year if she reported being employed for at least six months. Moreover, given the difficulty of asking retrospective questions regarding attitudes, only pre-trends for employment are available.

Figure 3 Differences in pre-treatment trends in employment



Note: Based on separate regressions for each year where the probability of working in a given year is regressed on treatment dummy and pre-treatment characteristics with clustering at the village level.

Table 2 Impact of the intervention on women's empowerment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	**Income-generating activity**	**Wage work**	**Self-employment**	**Business knowledge index**	**Plans to set up a project**	**Plans to work**	**Gender equality index**	**Decision-making power index**
Treated group x endline	0.045**	0.002	0.030**	0.061**	0.094***	0.023	0.005	-0.000
	(0.020)	(0.013)	(0.011)	(0.025)	(0.032)	(0.043)	(0.020)	(0.035)
Untreated group x endline	0.005	0.002	-0.004	0.024	0.044	0.031	0.002	0.017
	(0.017)	(0.010)	(0.008)	(0.026)	(0.030)	(0.046)	(0.024)	(0.037)
Treated group	0.074***	0.036***	0.032***	0.130***	0.190***	0.023	0.012	0.029
	(0.015)	(0.009)	(0.008)	(0.023)	(0.022)	(0.032)	(0.013)	(0.023)
Untreated group	-0.000	-0.011	0.006	-0.050**	-0.007	-0.029	-0.004	0.022
	(0.016)	(0.009)	(0.008)	(0.023)	(0.021)	(0.034)	(0.016)	(0.024)
Endline	-0.003	0.000	0.005	0.120***	0.040	0.021	0.002	-0.043
	(0.014)	(0.009)	(0.007)	(0.021)	(0.024)	(0.039)	(0.016)	(0.031)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
*R*2	0.076	0.067	0.049	0.272	0.102	0.051	0.076	0.086
Mean of outcome	0.134	0.079	0.034	0.432	0.27	0.295	0.601	0.467
Effect size (%)	33	3	88	14	35	8	1	0
Sample size	**11,408**	**11,408**	**11,408**	**11,408**	**11,408**	**11,408**	**11,408**	**11,408**

Note: *** denotes statistical significance at 1 per cent, ** at 5 per cent and * at 10 per cent level. Standard errors are clustered at the village level. Control variables include a dummy variable for having secondary education or higher, age, age squared, marital status, number of children, household size, a dummy variable that takes the value 1 if the girl's father is educated (and 0 otherwise), household wealth index and region (*markaz*) fixed effects.

Table 3 PSM impact estimates on women's empowerment

	PS-weighted DD		Kernel-matched DD	
	Untrimmed sample	Trimmed sample	Untrimmed sample	Trimmed sample
Main effect				
Income-generating activity	0.047***	0.047***	0.043***	0.043***
	(0.011)	(0.013)	(0.011)	(0.012)
Wage work	0.000	0.001	0.002	-0.001
	(0.007)	(0.009)	(0.008)	(0.008)
Self-employment	0.032***	0.031***	0.031***	0.029***
	(0.007)	(0.008)	(0.007)	(0.007)
Business knowledge index	0.105***	0.108***	0.088***	0.088***
	(0.022)	(0.023)	(0.012)	(0.012)
Wishes to set up a project	0.088***	0.080***	0.092***	0.096***
	(0.017)	(0.018)	(0.017)	(0.018)
Wishes to be employed	0.145	-0.156	0.007	0.003
	(0.164)	(0.166)	(0.021)	(0.023)
Gender equality index	-0.005	-0.006	0.003	0.001
	(0.01)	(0.01)	(0.01)	(0.01)
Decision-making power index	0.029	0.022	0.006	-0.001
	(0.025)	(0.028)	(0.014)	(0.014)
Spillover effect				
Income-generating activity	0.003	-0.001	0.000	0.000
	(0.011)	(0.012)	(0.010)	(0.010)
Wage work	0.000	-0.002	0.001	0.001
	(0.008)	(0.007)	(0.008)	(0.009)
Self-employment	0.006	-0.006	0.007	-0.005
	(0.007)	(0.007)	(0.005)	(0.006)
Business knowledge index	0.025	0.020	0.017	0.018
	(0.015)	(0.015)	(0.016)	(0.017)
Wishes to set up a project	0.031	0.028	0.026	0.025
	(0.019)	(0.018)	(0.016)	(0.016)
Wishes to be employed	0.045	0.038	0.040	0.048
	(0.034)	(0.026)	(0.029)	(0.037)
Gender equality index	0.001	0.006	-0.002	0.000
	(0.010)	(0.012)	(0.010)	(0.009)
Decision-making power index	0.024	0.028*	0.020	0.018
	(0.015)	(0.017)	(0.022)	(0.023)

Note: *** denotes statistical significance at 1 per cent, ** at 5 per cent and * at 10 per cent level. Standard errors are clustered at the village level. Control variables include a dummy variable for having secondary education or higher, age, age squared, marital status, number of children, household size, a dummy variable that takes the value 1 if the girl's father is educated (and 0 otherwise), household wealth index, and region (*markaz*) fixed effects. Similar to Crump et al. (2006) and Chen et al. (2009), the trimmed sample is calculated based on a common support interval between 0.1 and 0.9.

Table 4 Heterogeneity impact estimates on women's empowerment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	**Income-generating activity**	**Wage work**	**Self-employment**	**Business knowledge index**	**Wishes to set up/continue project**	**Wishes to be employed**	**Gender equality index**	**Decision-making power index**
Socio-economic factors								
1A: Below sec.education	0.028	-0.007	0.021**	0.082**	0.095***	0.016	0.003	0.008
	(0.019)	(0.011)	(0.010)	(0.041)	(0.026)	(0.048)	(0.022)	(0.042)
1B: Secondary education+	0.060**	0.011	0.039**	0.049	0.094**	0.024	0.006	-0.006
	(0.029)	(0.022)	(0.016)	(0.039)	(0.045)	(0.049)	(0.025)	(0.034)
2A: Unmarried	0.032	-0.005	0.028***	0.097***	0.101***	-0.001	0.009	0.004
	(0.026)	(0.017)	(0.010)	(0.035)	(0.035)	(0.037)	(0.022)	(0.036)
2B: Married	0.073**	0.007	0.045**	0.042	0.092**	0.024	-0.006	-0.019
	(0.030)	(0.015)	(0.020)	(0.049)	(0.043)	(0.054)	(0.023)	(0.040)
3A: Below median wealth	0.051*	-0.002	0.037***	0.065	0.101***	0.045	0.004	-0.020
	(0.026)	(0.016)	(0.014)	(0.042)	(0.037)	(0.053)	(0.025)	(0.040)
3B: Above median wealth	0.036*	0.004	0.021	0.072*	0.089**	-0.004	0.004	0.024
	(0.020)	(0.014)	(0.013)	(0.036)	(0.037)	(0.044)	(0.021)	(0.037)
Gender equality index								
4A: Below median	0.042**	0.003	0.027*	0.082*	0.109***	0.023		-0.003
	(0.019)	(0.015)	(0.013)	(0.041)	(0.033)	(0.046)		(0.039)
4B: Above median	0.055*	0.001	0.037***	0.051	0.080	0.035		0.009
	(0.030)	(0.014)	(0.013)	(0.040)	(0.049)	(0.057)		(0.042)
Decision-making power index								
5A: Below median	0.029	0.004	0.027**	0.107**	0.064	0.131*	-0.005	
	(0.024)	(0.015)	(0.011)	(0.040)	(0.050)	(0.075)	(0.020)	
5B: Above median	0.054**	0.001	0.030*	0.048	0.113***	-0.054	0.012	
	(0.022)	(0.015)	(0.015)	(0.044)	(0.031)	(0.032)	(0.028)	

Note: Simple DD estimates from equation (1). *** denotes statistical significance at 1 per cent, ** at 5 per cent and * at 10 per cent level. Standard errors are clustered at the village level. Control variables include a dummy variable for having secondary education or higher, age, age squared, marital status, number of children, household size, a dummy variable that takes the value 1 if the girl's father is educated, household wealth index, and region (*markaz*) FE.

Section 6: Discussion

Women in many developing countries face enormous challenges due to a lack of economic and social empowerment. This paper investigates the extent to which relaxing the human capital constraint on women – by increasing and enlarging their skill sets – could enhance their empowerment perspectives. Using a difference-in-differences approach, together with propensity score matching techniques, we evaluate the impact of a large-scale female empowerment intervention in rural Upper Egypt. Women in 30 treated villages were offered extensive training in vocational, business and life skills. Changes in women's employment outcomes and aspirations, intra-household decision-making capacity and attitudes to gender roles are assessed by comparing end-of-programme responses to midline survey responses for treated women and those in control villages. Spillover effects are also estimated by comparing the responses of the untreated women in the intervention villages to those of women in control villages. To investigate whether differences in empowerment outcomes between treated and control groups are driven by divergent trends rather than by the intervention, data on employment history is also gathered.

The paper shows that, while labour market outcomes, economic aspirations and business knowledge of treated women improved in comparison to women in control villages, social empowerment measures (e.g. decision-making capacity and attitudes to gender equality) were not affected. The paper shows no evidence for spillover effects within treated villages. Employment history data reveal no difference between treated and control groups prior to the intervention, suggesting that the effects found are entirely due to the intervention. The findings of the paper show that, while training interventions have the potential to help women achieve economic empowerment, binding constraints arising from social norms could still hinder social empowerment. The lack of effect on social empowerment is in line with the literature, which shows that in conservative societies intra-household decision-making practices and attitudes towards the role of women in society generally are usually much more deep-seated and are not easily influenced by empowerment interventions (Beath et al., 2013).

One possible reason why the intervention had no significant impact on the social empowerment of women could be the scope of the training programme, which emphasized business, vocational and life skills training, and touched only slightly on gender issues. However, the effect on social empowerment is expected to be indirect, in the sense that economically empowered women are more likely to become socially independent, based on the literature that finds a link between women's earnings and intra-household decision-making (e.g. Majlesi, 2016). The short time period over which the impact of the programme was evaluated could be another reason for the lack of impact on intra-household decision-making capacity. Treated women, although they became more likely to set up their own businesses, could have not have amassed sufficient earnings to feel economically empowered by the time of the survey. Long-term impact evaluations are needed to develop a better understanding of the effects of training interventions on the social empowerment of women.

Section 7: Key considerations for policy and practice

This paper evaluates the impact of a large-scale empowerment intervention in rural Upper Egypt targeting marginalized women. Overall, results point to a strong and highly significant impact on labour market outcomes but no effect in terms of social empowerment measures. Based on these findings and the evaluation at large (see also Ramadan et al., 2014), the following recommendations for policy-makers and development practitioners emerge:

Improving women's human capital in a conservative setting like rural Upper Egypt is a vital step towards women economic empowerment. Some entrepreneurship promotion interventions focus exclusively on providing financial services. Only a small number of recent programmes combine both financial and non-financial services. However, research shows that gender differences in human capital play an important role, in particular in conservative settings where women are often less well-educated, less experienced in basic cost–benefit analysis, have more restricted access to business networks and are less informed about investment opportunities than men (Karlan and Valdivia, 2011; McKenzie and Woodruff, 2012). The findings of this evaluation provide evidence that increasing women's human capital provides a significant jump-start to their economic empowerment. The provision of hard and soft skills, in the form of vocational, business and life skills training, combined with close guidance for business start-ups, improved women's business knowledge and engagement in entrepreneurial activities.

Ensuring the accessibility of classes and vocational training for women is crucial for the success of women's economic empowerment programmes in conservative rural settings. Most of the youth employment programmes implemented in Egypt have broad and/or multiple target groups. Furthermore, the few programmes that specifically target young women rarely employ a gender-sensitive design, which would include gender-sensitive outreach, creating female-friendly spaces during training, minimizing the distance to training facilities, flexible timing of classes and close mentoring by local women, who serve as role models. Even with these mechanisms in place, the study finds that programme participation was highly dependent on socio-economic factors. For example, married women were less likely to participate in the training. An important lesson to be learned is that making the timing and location of classes and training convenient for all women can help to ensure high rates of take-up and positive overall training experiences.

Promoting safe, flexible, female-friendly employment and workplaces for women. Job opportunities are limited in the villages, but women generally have been reluctant to seek employment outside their own village. Finding ways to make work and married life with children more compatible should be an important policy priority. Maternity protection, paternity leave and other protection measures help to encourage women to return to work and facilitate shorter career breaks, as well as allowing for a more harmonized work–family balance. National laws and policies in Egypt need to be designed to minimize the financial cost to employers, particularly small and medium-sized enterprises, as well as expanding coverage to

those categories of workers who are frequently excluded, such as non-standard workers, domestic workers and homeworkers. At the same time, there is a need for more statutory provision of leave entitlement for fathers and measures to encourage uptake of leave.

Engaging local communities is an indispensable factor in creating enabling environments for women's empowerment. Involving community members in the rural villages in women's livelihood programmes and gaining the community's support is critical for the effective implementation and sustainability of the programme. Throughout the NN programme, community mobilization events took place; for example, promoters made home visits to parents and husbands when beneficiaries failed to attend or when they faced familial constraints. Encouraging women to start businesses with other family members creates an environment that enables women to be active economically. The fact that this study does not find short-term impacts on women's decision-making power indicates that established gender roles change slowly, at best, and need to be taken into consideration when designing an empowerment intervention.

There is an urgent need for intensive training on gender dynamics and social norms, combined with innovative programme design, to be able to enhance both social and economic empowerment of young women in rural settings. As shown by previous research, and confirmed in this study, gender norms and intra-household decision-making power may not be easily altered by classroom-based empowerment training interventions (Beath et al., 2013; Field et al., 2010). The NN project attempts to enhance young women's economic and social empowerment through a combination of life and livelihood skills training, delivered within a safe space setting. However, the intervention appeared to have no impact on embedded attitudes towards gender roles and intra-household decision-making dynamics. This might be due to the scope of the training programme, which emphasized business, vocational and life skills training rather than social norms and gender dynamics. It might also be the case that classroom-based training is not the most effective method of promoting social empowerment and changing gender roles. There is an urgent need to continuously design, test and provide evidence on the effectiveness of new programme approaches and gender dynamics curricula on different target groups and community settings, both in Egypt and worldwide. One alternative programme approach is to provide livelihood skills training through a youth-friendly and voluntary delivery mechanism, such as through young women's clubs. This approach proved successful in the Empowerment and Livelihood for Adolescents (ELA) programme implemented in Uganda and Tanzania.

Long-term impact estimates are needed to properly access the effect of livelihood intervention programmes on the social empowerment of young women in conservative rural settings. The endline survey evaluating the effects of the NN project was conducted approximately six months after the programme ended, thus allowing a very short period over which the impact of the programme could be gauged. Some NN participants may have had enough time to set up their own businesses. However, social empowerment might also in part be driven by economic empowerment, such as establishing a profitable business and accumulating savings. Thus, effects on gender roles and intra-household decision-making power might take longer to materialize. In fact, evidence shows that short-term project gains may help to change gender norms, causing additional positive project outcomes to arise after a delay (e.g. Jensen, 2012; Buvinic and Furst-Nichols, 2014; Valdivia, 2015). Hence, long-term impact evaluation is needed to better understand the full potential of training interventions to boost the social and economic empowerment of young women in rural settings.

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Appendix

Table A.1 Treated and control village characteristics

	Treated villages		Control villages		
	Mean	SD	Mean	SD	p-value
Population size of the village	16,817	7,800	16,065	6,213	0.747
Number of women in the age group 15–29	2,504	1,139	2,855	1,282	0.356
Household size	4.71	0.443	4.775	0.693	0.702
Female labour force participation	6.924	3.386	7.34	5.819	0.763
Unemployment rate among men	6.997	5.56	7.015	4.12	0.991
Share of households with head working in agricultural sector	0.445	0.092	0.429	0.084	0.577
Share of illiterate women	27.916	5.625	24.127	7.752	0.068
Compulsory school enrolment rate among women	0.714	0.176	0.719	0.164	0.92
Share of illiterate household heads	0.656	0.112	0.656	0.132	0.989
Share of households with access to electricity	98.451	1.338	98.917	0.503	0.202
Share of households connected to public water network	69.609	22.634	68.016	21.998	0.823
Share of households with private kitchen	0.355	0.222	0.316	0.205	0.57
Share of households with private toilet	0.258	0.117	0.294	0.096	0.302
Number of villages	**30**		**15**		

Note: The table provides descriptive statistics for the treated and control villages from the 2006 census.

Table A.2 Items comprising the business knowledge index

No.	Question
Q1	What are the procedures required for registering a small business?
Q2	What are the procedures required for getting a loan for a small enterprise?
Q3	Are buildings, equipment and machinery considered among the fixed or variable assets of the project?
Q4	What is the primary goal of the market analysis?
Q5	What are the main three components of a feasibility study?
Q6	What is the goal of a financial study?

Note: Women were asked to give a correct answer to each of these statements. A complete correct answer on each question takes the value 1. If the answer is wrong, incomplete or the respondent does not know, the statement takes the value 0. The unweighted average is calculated and rescaled from 0 to 1.

Table A.3 Items comprising the gender equality index

No.	Question
Q1	A woman's place is not only at home, she should be allowed to work.
Q2	When job opportunities are scare, priority must go to men over women, regardless of capabilities.
Q3	If the wife is working outside her home, the husband should help her with domestic work.
Q4	A woman can have her own business project.
Q5	Education is important for a girl to help her find a good job.
Q6	Girls in the family should have same level of education as boys.
Q7	If the family is financially constrained, boys should have priority over girls in accessing education.
Q8	Women can be effective members of parliament.

Note: Women were asked if they agree or disagree with each of the statements. Women's responses are given a value of 1 if they agree, 0 otherwise. The unweighted average of the eight questions is calculated and rescaled from 0 to 1.

Table A.4 Items comprising the decision-making power index

No.	"I will tell you some life decisions you may experience and you tell me who makes them"
1	You becoming employed or starting a business project
2	Choosing your household chores
3	How to spend your leisure time
4	Spending your income from work
5	You going to a doctor/health unit
6	Buying clothes for yourself
7	Spending your saved money

Note: Choices of response given are: me alone, me with my partner (or family if unmarried), my partner alone (or family alone if unmarried) or other. Women's responses are given a value of 1 if they make the decision on their own, and 0 otherwise. The unweighted average of the seven statements is calculated and rescaled from 0 to 1.

Table A.5 Descriptive statistics for dropouts vs. remaining participants in endline survey

	Remaining		Dropouts		
	Mean	SD	Mean	SD	p-value
Treatment groups					
Treated	0.611	0.488	0.597	0.491	0.370
Untreated	0.175	0.380	0.178	0.383	0.772
Control	0.215	0.411	0.225	0.418	0.427
Women's empowerment					
Income-generating activity	0.106	0.308	0.135	0.342	0.002
Wage work	0.062	0.241	0.085	0.279	0.002
Self-employment	0.024	0.154	0.020	0.141	0.387
Business knowledge index	0.408	0.319	0.427	0.318	0.046
Wishes to set up/continue a project	0.195	0.396	0.176	0.381	0.103
Wishes to be employed	0.273	0.446	0.284	0.451	0.452
Gender equality index	0.591	0.186	0.601	0.185	0.078
Decision-making power index	0.454	0.276	0.452	0.276	0.804
Background characteristics					
Less than secondary education	0.543	0.498	0.558	0.497	0.319
Secondary education	0.396	0.489	0.370	0.483	0.088
Above secondary education	0.061	0.240	0.072	0.258	0.166
Age	22.200	7.139	22.727	10.643	0.029
Married	0.434	0.496	0.373	0.484	0.000
Number of children	0.797	1.236	0.661	1.173	0.000
Household size	4.947	1.945	5.011	2.003	0.280
Father can read and write	0.192	0.394	0.161	0.368	0.011
1st wealth quantile	0.204	0.403	0.219	0.414	0.230
2nd wealth quantile	0.205	0.404	0.222	0.416	0.185
3rd wealth quantile	0.193	0.394	0.181	0.385	0.329
4th wealth quantile	0.198	0.399	0.193	0.395	0.657
5th wealth quantile	0.200	0.400	0.186	0.389	0.243
Sample size	**5,704**		**1,324**		

Table A.6 Descriptive statistics for complete midline sample (*N* = 7,028)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	NN villages		Control villages	p-value	Norm. diff.	p-value	Norm. diff.	p-value	Norm. diff.
	Treated	Untreated		(1)=(2)	(1) and (2)	(1)=(3)	(1) and (3)	(2)=(3)	(2) and (3)
Women's empowerment									
Income-generating activity	0.145	0.064	0.056	0.000	0.067	0.000	0.080	0.205	0.006
Wage work	0.086	0.034	0.037	0.000	0.057	0.000	0.059	0.676	-0.002
Self-employment	0.033	0.011	0.007	0.000	0.034	0.000	0.043	0.053	0.005
Business knowledge index	0.434	0.245	0.306	0.000	0.149	0.000	0.118	0.000	-0.041
Wishes to set up/continue a project	0.266	0.081	0.074	0.000	0.112	0.000	0.126	0.380	0.004
Wishes to be employed	0.292	0.217	0.275	0.000	0.045	0.150	0.011	0.000	-0.029
Gender equality index	0.605	0.572	0.577	0.000	0.048	0.000	0.043	0.728	-0.007
Decision-making power index	0.466	0.444	0.426	0.019	0.023	0.000	0.044	0.071	0.015
Background characteristics									
Less than secondary education	0.566	0.521	0.496	0.010	0.022	0.000	0.038	0.223	0.011
Secondary education	0.382	0.415	0.418	0.060	-0.016	0.033	-0.019	0.869	-0.001
Above secondary education	0.052	0.064	0.087	0.106	-0.013	0.000	-0.038	0.045	-0.019
Age	22.375	22.000	21.863	0.293	0.012	0.037	0.018	0.244	0.004
Married	0.348	0.602	0.544	0.000	-0.121	0.000	-0.104	0.039	0.023
Number of children	0.707	1.022	0.867	0.000	-0.061	0.000	-0.034	0.007	0.025
Household size	5.256	4.452	4.469	0.000	0.098	0.000	0.104	0.559	-0.002
Father can read and write	0.160	0.236	0.246	0.000	-0.047	0.000	-0.058	0.489	-0.005
1st wealth quantile	0.220	0.172	0.184	0.000	0.030	0.002	0.024	0.266	-0.007
2nd wealth quantile	0.216	0.173	0.200	0.001	0.027	0.153	0.011	0.096	-0.014
3rd wealth quantile	0.179	0.201	0.226	0.085	-0.014	0.000	-0.032	0.141	-0.013
4th wealth quantile	0.195	0.222	0.190	0.013	-0.017	0.977	0.003	0.039	0.016
5th wealth quantile	0.190	0.233	0.199	0.000	-0.026	0.280	-0.006	0.043	0.017
Sample size	**4,273**	**1,232**	**1,523**						

Table A.7 Probit regression of participation in the NN programme using baseline covariates

	(1)	(2)
Variables	**Treated**	**Untreated**
Age	0.029***	-0.000
	(0.003)	(0.004)
Married	-0.576***	0.102
	(0.053)	(0.072)
Number of children	0.031	0.032
	(0.020)	(0.025)
Household size	0.067***	0.010
	(0.009)	(0.014)
Father can read and write	-0.173***	-0.061
	(0.035)	(0.044)
Education		
Less than secondary education	Reference	Reference
Secondary education	-0.073**	-0.056
	(0.031)	(0.040)
Above secondary education	0.336***	-0.208***
	(0.058)	(0.075)
Region		
Region 1: Qena	Reference	Reference
Region 2: Fayoum	0.183***	-0.055
	(0.035)	(0.043)
Region 3: Suhag	0.016	-0.252***
	(0.034)	(0.046)
Wealth quantiles		
1st wealth quantile	Reference	Reference
2nd wealth quantile	-0.006	0.016
	(0.043)	(0.060)
3rd wealth quantile	-0.178***	0.005
	(0.043)	(0.058)
4th wealth quantile	0.008	0.177***
	(0.044)	(0.058)
5th wealth quantile	-0.024	0.206***
	(0.044)	(0.059)

Note: *** denotes statistical significance at 1 per cent, ** at 5 per cent and * at 10 per cent level. Standard errors are clustered at the village level.

The ILO Taqeem "Impact Report" series disseminates research reports from Taqeem-supported impact evaluations. The studies use experimental and quasi-experimental approaches to estimate employment outcomes of active labour market policies and programmes. The goal is to improve the evidence base for "what works" in the effective design and implementation of integrated employment policy responses for youth and women's employment.

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