

# Labour Market Outcomes and Child Marriage: Evidence from BRAC's Skills Training Programme

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Inadequate employment opportunities and child marriage are major challenges for female adolescents in many developing countries. Using panel data on a group of 14-18-year-old Bangladeshi adolescents receiving vocational skills training from BRAC and a group of non-participants, this paper analyses the impact of skills training on labour supply, earnings, and child marriage. The intervention is found to significantly increase adolescents' labour market participation and income, with the impacts being higher for girls. It also significantly reduces the possibility of female adolescents being married off before the minimum legal age, indicating that labour market participation is likely to reduce child marriage among them.

**Keywords:** Skills Training, Adolescent Development, Panel Data, Labour Market Participation, Child Marriage

**JEL Classification:** J12, J13, J24

## I. INTRODUCTION

Existing literature shows that education plays a significant role in ensuring better lives for adolescents (Angrist & Krueger, 1991; Oreopoulos & Salvanes, 2011). Unfortunately, economically vulnerable children are often forced to leave school early because of their financial conditions. The school drop-out rate is notably higher at the secondary level than at the primary level in South Asia (UNICEF, 2014). The primary and secondary school drop-out rates in Bangladesh are about 19 per cent and 37 per cent, respectively (BANBEIS, 2016). Most of these school drop-outs end up unemployed or in low-quality hazardous jobs. Moreover, many of them, particularly girls, fall into the trap of child marriage.<sup>1</sup> Skill development training can be a potential solution to address these problems.

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<sup>1</sup>In Bangladesh, as of 2007, about 66 per cent of 20–24-year-old girls were married before they turned 18. It decreased to 59 per cent in 2014 and remained unchanged in 2017-18 (BDHS, 2019).

There is substantial literature documenting the effect of vocational training on youth employment; however, few studies found any significant impact of training on labour market outcomes. McKenzie (2017) reviews 12 programme evaluation studies in eight developing countries—Turkey, Argentina, Colombia, Dominican Republic, India, Kenya, Malawi, and Peru. He finds that only three studies document statistically significant impacts on employment and two on earnings. A recent study (Alfonsi et al., 2020) shows the large effects of vocational training and apprenticeship (on-the-job training) on labour market outcomes. Estimating the individual impacts of vocational training and apprenticeship, Alfonsi et al. (2020) find a long-run impact (three years after the intervention) of apprenticeship and vocational training on employment with an increase of seven and eleven percentage points, respectively, in Uganda. Moreover, they find that vocational training has a steady and significant impact on earnings, whereas apprenticeship does not significantly impact earnings. Their findings highlight that the impacts of vocational training on employment and earnings are significantly higher and steady, and apprenticeship initially improves employment, but over time the impact decreases.

Child marriage—an adverse social norm—can be another potential area where vocational training can contribute by promoting employability. Many studies in developing countries have analysed the effect of economic factors, such as income and employment status, on young adults' age at first marriage (Jalovaara, 2012; Kim, 2017). These studies show that young adults' economic resources significantly impact the likelihood of marriage. Although efforts to prevent child marriage have focused on enforcing laws and policies in Bangladesh, little research exists on what approaches work best to delay marriage and why (Amin, Ahmed, Saha, Hossain, & Haque, 2016). A qualitative study initiated by the Population Council and partners on the effects of skills-building approaches to empower girls by delaying marriage presents some critical findings. The study shows that rural teenage girls in Bangladesh receiving educational support, skills, and livelihood training were less likely to be married two years after the intervention (Amin et al., 2016). Thus, there is a need for the contribution assessment of training programmes in this domain.

This paper examines the impact of BRAC's 'Skills Training for Advancing Resources (STAR)' programme, a comprehensive skill development programme consisting of classroom training on theory and soft skills and on-the-job training (apprenticeship). Using a Randomised Controlled Trial (RCT), Das (2018) finds

significant short-term impacts of this programme on employment and earnings. In particular, he shows that the STAR programme increases labour market participation and labour supply by 59 per cent and earnings by 49 per cent six months after the intervention. In this paper, we focus on the long-run (three years after the intervention) impacts of the STAR programme on employment, income, and child marriage. The analysis is based on three rounds of panel data collected during 2012-2015. We find that the long-run impact (32 percentage points) on employment is 1.7 times higher than that in the short run (19 percentage points). Gender disaggregated analysis shows that the impact size is larger for girls than for boys in both the short and long run. Programme participation also significantly increases adolescents' skilled labour supply and monthly income. Our findings show the distinguished impact of the intervention on child marriage for girls, with a 62 per cent reduction in the long run.

This paper makes several contributions to the knowledge base on the effectiveness of skills training. First, it estimates the long-run labour market impacts of a comprehensive training programme. Given the existing mixed results on training programmes' effects on labour market outcomes, this paper advances our knowledge by enhancing the existing literature on training programmes' impact. Second, the existing literature also shows mixed results on gender-disaggregated impacts of training (Das, 2018; Cho, Kalomba, Mobarak, Orozco, & Wolfson, 2016; Attanasio, Kugler, & Meghir, 2011). This paper strengthens the evidence on the larger effect of training for female participants. Third, as already mentioned, there is very little evidence about the impact of training programmes on child marriage reduction (Amin et al., 2016). This paper, thus, contributes to the literature on child marriage alleviation approaches.

However, there are a few limitations of this paper. Firstly, the attrition rate differed between participant and non-participant groups, which might have biased the estimates. Secondly, we could not test whether the parallel trend assumption holds for the period before the intervention due to data unavailability; hence, if this assumption is violated, the DiD estimates may be biased.

## **II. BRAC'S INITIATIVE FOR VULNERABLE URBAN YOUTH**

The primary school drop-out rate in Bangladesh is extremely disappointing despite having the Compulsory Primary Education Act 1993, which ensures a free primary (five-year) education programme. The drop-out rate is even higher at the secondary level (BANBEIS, 2016). Due to available job opportunities in informal

sectors with low payment, school drop-out adolescents with low education and skills often avail of these low-quality, hazardous jobs. According to the National Child Labour Elimination Policy- 2010, the criteria used for defining hazardous work for children include: working more than five hours a day; work that creates undue pressure on physical and psychological wellbeing and development; work without pay; work where the child becomes a victim of torture or exploitation or has no opportunity for leisure. While the number of working children aged 5-17 years went down from 2003 to 2013 (despite population growth), the proportion engaged in hazardous work went up from 17 per cent in 2003 to 37 per cent in 2013 (BBS, 2013).

Unfortunately, there are limited government vocational skills training facilities (which only allow entry for Grade VIII graduates). Also, very few NGOs deliver free vocational skills training services, often in a minimal, unstructured manner (Hossain & Haider, 2014). This situation results in poor quality training, leading to problems in terms of job placement. Therefore, it is of utmost importance that school drop-out adolescents involved in hazardous employment are provided with basic education and appropriate vocational skills training to ensure their access to decent employment opportunities. The absence of a strong linkage between the industry/private sector employers and technical/vocational training providers is another major obstacle to adolescents' skills development. Thus, the involvement of the demand side, i.e., the industry/private sector employers, is essential to ensure that skills development courses serve the purpose of both employee and employer.

As mentioned earlier, BRAC commenced the 'Skills Training for Advancing Resources (STAR)' programme as a pilot in 2012. The organisation's countrywide infrastructure and robust management system helped BRAC, in collaboration with the International Labour Organization (ILO) and the UNICEF, support the Bureau of Non-Formal Education's (BNFE) 2<sup>nd</sup> phase of the Basic Education for Hard to Reach Urban Working Children (BEHTRUWC) project. Through STAR, BRAC provides skills development training involving enterprise-based apprenticeships in the informal sector. During the pilot phase, BRAC implemented the programme in five divisions of Bangladesh- Dhaka, Chattogram, Sylhet, Rajshahi, and Khulna. Following the Bangladesh Labour Law, which permits adolescents aged above 14 years to work, the pilot phase of the programme covered a pool of 1,000 urban adolescents aged 14-18 years who completed class five under the BEHTRUWC of BNFE and were out of school for at least one year (Bhattacharjee & Kamruzzaman, 2016). Additional issues considered for participation selection included: i) distance

from the branch<sup>2</sup> office to the participants' residence, ii) distance from the participant's residence to the Master Craft Persons' (MCPs) workplace, iii) matching between local demand for trade and the participant's area of interest, and iv) the ratio of male and female participants (40:60).

BRAC provided the selected participants with both theoretical and practical training to develop their skills based on local market demand. The duration of the training was six months. The technical training was provided through attachment with relevant entrepreneurs in the local informal sector, referred to as the MCPs. The MCPs were selected using the following criteria: i) experienced as a skilled craftsman in the trade, ii) sufficient space in the workplace to accommodate apprentices, iii) high demand for the particular trade in the market, iii) short distance between the workplace and the participants' residence, and iv) previous successful experience in managing apprentices. The finally-selected MCPs received training to improve their understanding of work ethics and a decent work environment.

During the six-month-long training period, Competency-Based Training and Assessment (CBTA), as per the National Skill Development Policy 2011 (NSDP), was followed to conduct theoretical training. Each trade had its specific Competency-based Skill Logbook that documented the trainee's competencies achieved during the training period. Additionally, once a week, STAR staff provided lessons on various issues, such as financial literacy, market assessment, and basic communicative English. They also assisted the trainees in the post-training period to avail decent employment opportunities through proper information and guidance.

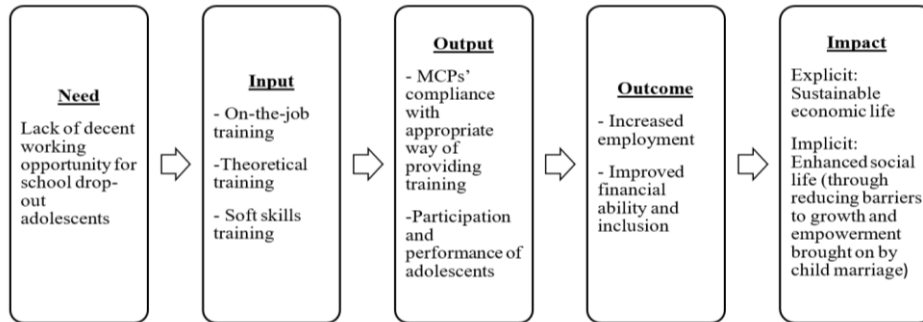
### **III. CONCEPTUAL FRAMEWORK: HOW THE STAR PROGRAMME CAN IMPACT ECONOMIC AND SOCIAL LIVES**

With the aim of promoting decent working opportunities for school drop-out adolescents, the intervention was designed as a combination of three types of training: (i) on-the-job, (ii) theoretical, and (iii) soft skills training. The combination of these components was expected to result in labour market participation, financial inclusion, and sustainability, explicitly leading to sustainable economic life. Subsequently, these impacts would also reduce the

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<sup>2</sup>Branch offices are the local offices of BRAC through which it conducts its operational activities across the country. Each branch office generally covers the catchment area of 5-8 km.

prevalence of child marriage—a social evil restricting women's empowerment and scope to grow as capable human beings.



#### IV. EVALUATION DESIGN AND DATA COLLECTION

To assess the STAR programme's impact, BRAC's Research and Evaluation Division (RED)<sup>3</sup> designed a study during the intervention's pilot phase in 2012. The study sample was planned to comprise 400 participant adolescents and 600 non-participant adolescents from the same communities (to form a decent-sized comparison group). The baseline survey conducted in 2012 covered 394 participants out of the planned 400; another 606 non-participants (against the planned 600) were also surveyed, rounding up the total sample size to 1,000. This full sample of 1,000 adolescents was randomly selected from 13 BRAC branch offices across seven districts from five divisions (i.e., Dhaka, Chattogram, Rajshahi, Sylhet, and Khulna) of Bangladesh. The participant adolescents were selected proportionately from each of the branches. The non-participants were selected based on age, school enrollment status, and socio-economic background (of household) to have a comparison group as similar to the participant group as possible.

As already mentioned, the baseline survey was conducted in September-October 2012, covering 1,000 adolescents and their households. A follow-up survey was conducted in April-May 2013 (referred to as the mid-line survey hereafter), and finally, the end-line survey was conducted in November-December 2015.<sup>4</sup>

<sup>3</sup>Since January 2019, BRAC-RED has been integrated with the BRAC Institute of Governance and Development (BIGD), BRAC University.

<sup>4</sup>Attrition was mainly caused by- internal and external migration, temporary absence of the adolescents in the households during the survey, and change of their residence due to marriage.

## V. DESCRIPTIVE STATISTICS

This section describes the baseline characteristics of the study sample. Since we opt to estimate impacts using unbalanced data,<sup>5</sup> we present the baseline characteristics for the matched sample. Columns (1) and (2) of Table I show the baseline statistics, including age, sex, marital status, years of education, and school drop-out rate of the adolescents successfully revisited during the mid-line survey, and their household heads' age, sex, and years of education, disaggregated by treatment status. Columns (4) and (5) show these same indicators for the adolescents successfully revisited during the end-line survey. Differences are observed between the participants and non-participants at baseline regarding several indicators, except age, household heads' sex, and years of education. At baseline, compared to 43 per cent of the participants being male, about 53 per cent of the non-participants were male. This lower proportion of males among the participant group is expected as the programme purposively targeted more girls than boys (with a ratio of 60:40).

Moreover, about 98 per cent of the participants were school drop-outs, compared to about 78 per cent of non-participants. It is perhaps because school drop-out was one of the selection criteria used by the programme. In contrast, not all of these criteria could be satisfied when selecting non-participants from the same communities for research purposes. The participants' average years of education was five years, compared to 4.66 years for the non-participants.

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Furthermore, Table A1 in the Appendix delineates treatment status and year disaggregated analysis on attrition rate, and Table A2 shows the detailed characteristics of attrited and non-attrited samples.

<sup>5</sup>Due to this high attrition rate, we plan to estimate the impacts using unbalanced data. We estimate the short-run impacts using the sample that could be surveyed during mid-line survey, and for long-run impact estimation, we use the sample that could be surveyed during end-line survey.

TABLE I  
**BASELINE CHARACTERISTICS OF MATCHED<sup>6</sup>**  
**SAMPLE DURING FOLLOW-UP SURVEYS**

Indicator	Mid-line survey (6 months after the intervention)			End-line survey (3 years after the intervention)		
	Participants	Non- participants	Difference	Participants	Non- participants	Difference
	(1)	(2)	(3=1-2)	(4)	(5)	(6=4-5)
Adolescents' average age (year)	14.90	15.03	-0.12	14.87	15.05	-0.18
Male adolescents (male=1, female=0)	0.46	0.51	-0.05	0.43	0.53	-0.10**
Married adolescents (married=1, otherwise=0)	0.02	0.00	0.01**	0.00	0.01	-0.01
Adolescents' average grades passed	4.73	4.81	-0.08	5.00	4.66	0.34***
Dropout adolescents (dropout=1, otherwise=0)	0.93	0.88	0.05**	0.98	0.78	0.20***
Household heads' average age (year)	45.31	46.69	-1.38**	45.58	47.09	-1.51**
Male household head (male=1, female=0)	0.90	0.91	-0.01	0.90	0.93	-0.03
Household heads' education (year)	2.48	2.44	0.04	2.39	2.67	-0.27
Number of observations	349	398		280	293	

**Note:** \*\*\*, \*\*, and \* denote statistical significance at 1%, 5%, and 10% levels, respectively.

Moreover, Table A5 reports the overtime change in labour market participation and earnings of the adolescents disaggregated by treatment status. At baseline, 27 per cent of the participants were engaged in the labour market, which increased to 84 per cent and 81 per cent during mid-line and end-line surveys, respectively. In comparison, the labour market participation rate was 27 per cent among the non-participants, and it increased to 67 per cent and 51 per cent in the mid-line and end-line. Regarding the earnings, the baseline information is unavailable; however, the difference between participants and non-participants is significant in both mid-line and end-line, with higher earnings of the participants than that of non-participants.

<sup>6</sup> i.e. successfully revisited during follow-up survey.



This unbalanced attrition might happen because of the limitation in our study design. We could not implement an experimental design because of the challenges the programme experienced in the pilot phase, such as operational challenges, time constraints, etc.

## VI. ESTIMATING EQUATION

In this paper, we use Difference-in-difference (DiD) with individual/household<sup>7</sup> level fixed effect technique for impact assessment, which controls for the differences occurring between the participants and non-participants over time. For estimating the short-run impact, we have used a panel composed of baseline (2012) and mid-line (2013) data, the estimating equation being:

$$y_{it1} = \tau_i + \theta_1 YEAR_{t1} + \theta_2 INTV_i * YEAR_{t1} + \epsilon_{it1} \quad (1)$$

Here,  $y_{it1}$  is the outcome variable of interest for individual/household  $i$  in year  $t_1$ , where  $t_1$  refers to baseline (2012) and mid-line (2013).  $INTV_i$  is a binary variable taking the value of 1 if the individual/household  $i$  is from the intervention group and 0 if not.  $YEAR_{t1}$  is a dummy variable taking the value of 1 if  $t_1$  refers to the mid-line survey year (i.e., the year 2013) and 0 if otherwise.  $\epsilon_{it1}$  is an error term, and  $\tau_i$  are individual/household level-fixed effects.  $\theta_2$  identifies the causal effect of the programme in the short run.

For assessing long-run impact, a panel composed of baseline (2012) and end-line (2015) data has been used; and the estimating equation is as follows.

$$y_{it2} = \pi_i + \delta_1 YEAR_{t2} + \delta_2 INTV_i * YEAR_{t2} + \vartheta_{it2} \quad (2)$$

Here,  $y_{it2}$  is the outcome variable of interest for individual/household  $i$  in year  $t_2$ , where  $t_2$  refers to baseline (2012) and end-line (2015).  $YEAR_{t2}$  is a dummy variable taking the value of 1 if  $t_2$  refers to the end-line survey year (i.e., the year 2015) and 0 if otherwise.  $\vartheta_{it2}$  is an error term; and  $\pi_i$  are individual/household-level fixed effects.  $\delta_2$  identifies the causal effect of the programme in the long run. Other variables are as defined earlier.

Since baseline data was unavailable for certain variables (e.g., earnings, working hours), we cannot use equations (1) and (2) to estimate the effect on these outcome variables. For assessing the intervention's impact on these outcomes, we use Propensity Score Matching (PSM)—a rather popular and widely used method in situations where administering an RCT is difficult. In such cases, treatment and

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<sup>7</sup>We surveyed one adolescent from each household.

comparison groups are usually drawn from different populations to help construct an artificial counterfactual to compare the programme's impact (Dehejia & Wahba, 1999).

PSM constructs a statistical treatment and comparison group with a similar value of propensity scores, and this matching allows estimation of the Average Treatment Effect on Treated (ATT). It considers the observed characteristics unaffected by the programme while estimating the propensity score. We use these characteristics from the pre-intervention data on treatment and comparison groups to calculate propensity scores and match two groups, which is an ideal practice (Khandker, Koolwal, & Samad, 2009). Since we are interested in estimating the causal effects, mean differences in outcomes between participants and non-participants are not recommended. The characteristics of the two groups might be different without any intervention, known as the problem of 'selection bias,' and PSM offers a solution to this problem (Caliendo & Kopeinig, 2008).

The propensity score equation is as follows:

$$P(Z) \equiv \Pr\{D = 1|Z\} = E\{D|Z\} \quad (3)$$

where  $D$  takes a value of 0 or 1, indicating whether the observation falls within the treatment or comparison group, and  $Z$  represents variables displaying the pre-treatment characteristics.

The steps we have followed to use PSM are (i) estimating a Probit model using the available baseline data;<sup>8</sup> (ii) checking the balancing properties of the data by testing whether the two groups have the same distribution (mean) of propensity scores; and (iii) estimating the matching equations using the common support restriction to ensure that matches are formed only where the distribution of the density of the propensity scores overlap between the participant and non-participant groups. Finally, we have used STATA's `psmatch2` command to match propensity scores between treated and untreated groups through the nearest neighbourhood matching technique.

For this study, baseline characteristics, including age and school-going status of the adolescents and the socio-economic status of the households, have been used

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<sup>8</sup>For estimating the probability of participation versus nonparticipation in a binary treatment case, Logit and Probit models usually yield similar results (Caliendo & Kopeinig, 2008). We have chosen the Probit model.

for this matching based on the propensity score. The probit regression for propensity score matching is presented in Table A3. Moreover, the ps-test command has been employed to check the success of the matching for the exogenous variables, and the result is presented in Table A4.

Finally, we estimate the programme impacts by comparing the average outcomes of the matched treatment and comparison samples using the following equation.

$$ATT = E(Y1 | D=1) - E(Y0 | D=1) \quad (4)$$

Here, ATT is the average treatment effect on the treated. Y1 is the value of the outcome variable for participants. Y0 is the value of the outcome variable for non-participants. D indicating programme participation takes the value of 1 if participates and 0 if otherwise.

Further, since the participants and non-participants were selected from the same communities, these groups have equal chances to be exposed to other skill-development programmes (if any). Therefore, our impact estimates are less likely to be affected by unobserved participation in other programmes.

## VII. FINDINGS AND DISCUSSION

### 7.1 Impact on Employment

Table II presents the estimated short- and long-run impacts of the STAR programme on adolescents' employment rates. Columns (1) and (2) of Table II report the short- and long-run impacts for all adolescents, respectively; columns (3) and (4) report the impacts for girls, while the impacts for boys are presented in columns (5) and (6), respectively. Results showed that the intervention significantly increased labour market participation. Interestingly, the impact was both sustainable and higher in the long run compared to that in the short run. Specifically, labour market participation increased by 19 percentage points in the short run and 32 percentage points in the long run. Overall, the programme impact is about 28 per cent and 63 per cent of the non-participants' mean of the mid-line and end-line surveys, six months and three years after the intervention, respectively.

TABLE II  
IMPACT ON EMPLOYMENT

Indicators	All adolescents		Girls		Boys	
	Programme impact in the short run (after 6 months)	Programme impact in the long run (after 3 years)	Programme impact in the short run (after 6 months)	Programme impact in the long run (after 3 years)	Programme impact in the short run (after 6 months)	Programme impact in the long run (after 3 years)
	(1)	(2)	(3)	(4)	(5)	(6)
Participated in labour market in last year (yes=1, no=0)	0.19*** (0.05)	0.32*** (0.06)	<b>0.22***</b> <b>(0.06)</b>	<b>0.37***</b> <b>(0.08)</b>	<b>0.15**</b> <b>(0.07)</b>	<b>0.27***</b> <b>(0.08)</b>
Number of observations (N)	966	966	528	528	438	438
Follow-up survey <sup>#</sup> mean of non-participants	<u>0.67</u>	<u>0.51</u>	<u>0.62</u>	<u>0.39</u>	<u>0.73</u>	<u>0.64</u>
% change over follow-up survey <sup>#</sup> mean	<u>28.43</u>	<u>62.83</u>	<u>35.71</u>	<u>94.18</u>	<u>20.68</u>	<u>42.37</u>

**Note:** Here, impacts have been estimated using DiD with fixed effects. Figures in parentheses are standard errors (SEs). \*\*\*, \*\* and \* denote statistical significance at 1%, 5% and 10% levels, respectively. Columns (1), (3), and (5) report short-run impacts estimated using equation (1) for all adolescents, girls, and boys, respectively. Columns (2), (4), and (6) report long-run impacts estimated using equation (2) for all adolescents, girls, and boys, respectively. <sup>#</sup>The mid-line and end-line statistics are reported in odd and even number columns, respectively. The values in bold indicate that the difference between girls and boys in terms of the outcome is statistically significant at the 1 per cent level. To test whether the difference is significant, we do the t-test between the impact estimates for girls and boys.

Gender disaggregation of the impact estimates (Columns 3-6 of Table II) showed that programme impacts on employment rates were positive and significant for both boys and girls. Interestingly, the impact was significantly higher for girls than for boys. These results indicated that it was more challenging for the non-participant girls to get involved in the labour market than the non-participant boys. This finding is not surprising given that boys are expected to earn for the family in Bangladesh's socio-cultural setting. At the same time, girls face challenges and discouragement from society and family in joining the labour market (Hossain, Ahmed, & Akter, 2010). Therefore, the intervention possibly enhances the participants' skills and confidence to enter the labour market. The

impacts were also higher in the long run than in the short run for both boys (27 vs. 15 percentage points) and girls (37 vs. 22 percentage points).

The assumption of the parallel trend of outcomes must hold to estimate unbiased impacts using DiD approach. Unfortunately, we could not test this assumption because of the unavailability of data for the previous years. Thus, we also estimate the treatment effect on employment using PSM. The impact estimates using PSM (Table A6) are quite similar to those using DiD (Table II). Both PSM and DiD estimates show that the programme increases labour market participation in the short and long run with a larger impact in the long run.

## **7.2 Impact on Labour Supply**

To examine the skills training's impact on the adolescents' labour supply, we analysed the average and the total number of hours spent per day for different employment categories (Table III). Gender-disaggregated impacts on this indicator were estimated as well. It is worth noting that while analysing working hours, we used the full sample. Due to data unavailability, only the long-run impact of the intervention on labour supply was analysed using the PSM method. We found the average working hour of the non-participants to be about 4.57 hours/day. Programme impact on the total working hour was found to be positive; however, not significant. We also found that about half of their average working hour (around 2.4 hours/day) was spent in the "other" employment category, which includes driving and working as helpers, hotel boy, etc. On the other hand, most of the participants were occupied with skilled labour. The results showed that the programme significantly increased the working hours spent in this specific category. The significant impact on labour supply in skilled labour was about 1.15 times (115%) the average labour supply by the non-participants in this category.

Columns (2) to (3) of Table III depict the impact on the labour supply of girls and boys for the different employment categories. Although the employment rate significantly increased by about 27 percentage points among boys in the long run (Table II), no significant impact was found on their hours devoted to earning activities. On the other hand, participation in skilled labour was significantly higher among the participant girls than the non-participant girls.

TABLE III  
**IMPACT ON LABOUR SUPPLY (TIME DEVOTED  
 TO EARNING ACTIVITIES/DAY)**

Indicators	All adolescents	Girls	Boys
	Programme impact in the long run (after 3 years)	Programme impact in the long run (after 3 years)	Programme impact in the long run (after 3 years)
	(1)	(2)	(3)
Agriculture, day labour	0.02 (0.02)	<b>0.00</b>	<b>0.04</b> <b>(0.04)</b>
Number of observations	557	274	241
End-line mean of non-participants	0.00	0.00	0.00
% change over the end-line mean	U/D	U/D	U/D
Agriculture, self-employed	0.01* (0.01)	<b>0.02</b> <b>(0.02)</b>	<b>-0.01</b> <b>(0.03)</b>
Number of observations	557	274	241
End-line mean of non-participants	0.00	0.00	0.02
% change over the end-line mean	U/D	U/D	-79.80
Non-agriculture, day labour	-0.25 (0.24)	<b>-0.31*</b> <b>(0.17)</b>	<b>0.04</b> <b>(0.38)</b>
Number of observations	557	274	241
End-line mean of non-participants	0.59	0.32	0.74
% change over the end-line mean	-42.16	-96.81	5.61
Skilled labour (tailoring, beautician, mechanic, other skilled)	1.58*** (0.41)	<b>2.58***</b> <b>(0.34)</b>	<b>0.45</b> <b>(0.62)</b>
Number of observations	557	274	241
End-line mean of non-participants	1.37	0.32	2.76
% change over the end-line mean	115.81	802.26	16.43
Shopkeeper	0.02 (0.02)	<b>0.00</b>	<b>0.05</b> <b>(0.04)</b>
Number of observations	557	274	241
End-line mean of non-participants	0.00	0.00	0.00
% change over the end-line mean	20614.37	U/D	U/D
Business	-0.05 (0.18)	<b>-0.03</b> <b>(0.11)</b>	<b>-0.05</b> <b>(0.28)</b>

(Contd. Table III)

Indicators	All adolescents	Girls	Boys
	Programme impact in the long run (after 3 years)	Programme impact in the long run (after 3 years)	Programme impact in the long run (after 3 years)
	(1)	(2)	(3)
Number of observations	557	274	241
End-line mean of non-participants	0.22	0.04	0.44
% change over the end-line mean	-22.37	-94.34	-10.74
Other (service, driver, helper, hotel boy, etc.)	-0.56 (0.42)	<b>-0.83*</b> <b>(0.50)</b>	<b>-0.61</b> <b>(0.62)</b>
Number of observations	557	274	241
End-line mean of non-participants	2.39	2.27	2.83
% change over the end-line mean	-23.39	-36.71	-21.42
Total working hours	0.77 (0.52)	<b>1.42**</b> <b>(0.56)</b>	<b>-0.09</b> <b>(0.66)</b>
Number of observations	557	274	241
End-line mean of non-participants	4.57	2.95	6.78
% change over the end-line mean	16.93	48.15	-1.29

**Note:** Here, impacts have been estimated using PSM. Figures in parentheses are standard errors. \*\*\*, \*\*, and \* denote statistical significance at 1%, 5% and 10%, levels, respectively. U/D refers to undefined value because of the non-participants' end-line mean of zero. The values in bold indicate that the difference between girls and boys in terms of the outcome is statistically significant at the 1 per cent level. To test whether the difference is significant, we do the t-test between the impact estimates for girls and boys.

### 7.3 Impact on Earnings

Table IV shows that the intervention significantly increased the adolescents' monthly earnings (considering the full sample). It is worth noting that the end-line earnings value was deflated using 2012 constant prices. Columns (1) and (2) demonstrate the impact on all adolescents. The effects for girls and boys are presented separately in columns (3) to (4) and (5) to (6), respectively. The magnitude of the programme's impact was higher in the long run than in short run. Also, the magnitude of the estimated long-run impact was substantially higher for girls than for boys. Specifically, the programme significantly increased monthly earnings by BDT 650 for the full sample in the long run. The estimated impact on girls' and boys' monthly earnings was BDT 789 and BDT 541 (both impact estimates being statistically significant). Moreover, the difference between the impacts on girls and boys is statistically significant.

TABLE IV  
IMPACT ON MONTHLY EARNINGS (FULL SAMPLE)

Indicator	All adolescents		Girls		Boys	
	Programme impact in the short run (after 6 months)	Programme impact in the long run (after 3 years)	Programme impact in the short run (after 6 months)	Programme impact in the long run (after 3 years)	Programme impact in the short run (after 6 months)	Programme impact in the long run (after 3 years)
	(1)	(2)	(3)	(4)	(5)	(6)
Monthly earnings (BDT, at 2012 constant price)	562.42*** (197.32)	650*** (235.42)	<b>928.04***</b> <b>(240.89)</b>	<b>789.22***</b> <b>(267.10)</b>	<b>433.68**</b> <b>(213.60)</b>	<b>541.45*</b> <b>(314.28)</b>
Number of observations	730	557	370	274	345	241
Follow-up survey <sup>#</sup> mean of non-participants	1439.93	1703.04	1108.219	1132.52	1513.61	2340.86
% change over follow-up survey <sup>#</sup> mean	39.06	38.19	83.74	69.69	28.65	23.13

**Note:** Here, impacts have been estimated using PSM. Figures in parentheses are standard errors. \*\*\*, \*\*, and \* denote statistical significance at 1%, 5%, and 10% levels, respectively. Columns (1), (3), and (5) report short-run impacts estimated using equation (4) for all adolescents, girls, and boys, respectively. Columns (2), (4), and (6) report long-run impacts estimated using equation (4) for all adolescents, girls, and boys, respectively. <sup>#</sup>The mid-line and end-line statistics are reported in odd and even number columns, respectively. The values in bold indicate that the difference between girls and boys in terms of the outcome is statistically significant at the 1 per cent level. To test whether the difference is significant, we do the t-test between the impact estimates for girls and boys.

#### 7.4 Impact on Child Marriage

In 1994, the GoB launched the Female Stipend Programme (FSP)<sup>9</sup> in Bangladesh issuing stipends to girls aged 11-14 years in secondary education. This stipend is conditional on their having 75 per cent attendance and a 45 per cent score

<sup>9</sup>The female secondary school stipend programme began as an experiment in 1982 by a local NGO in a single upazila with USAID's financial assistance under the supervision of the Asia Foundation. A second upazila was included in 1984 and several more subsequently, totaling seven by 1992, when NORAD took over support for the programme. The stipend programme continued in the name of FESP from July 1992 to December 1996 as a sub-project under the umbrella of the General Education Project of NORAD. The experience of this pilot project has been described as highly successful since the actual number of stipends provided far exceeded the projected number at the time of inception and the number of awardee schools increased by 12 per cent in four years of project life.



on end-of-year tests. They are also required to remain unmarried until they sit the Secondary School Certificate examination or reach the age of 18 (Mahmud, 2004). Yet, about 52 per cent of girls aged 20-24 years (at the time of data collection) get married before 18 (UNICEF, 2016). Poverty, lack of education, and suitable employment opportunities for girls are among the major factors leading to parents considering marrying off their daughters early as the only viable option to reduce the burden on family earnings (Bhattacharyya, 2015). Although the STAR programme does not have any direct activity/component to prevent child marriage, it can still be expected to have an indirect effect. This effect can occur by enhancing girls' skill levels, thus, better preparing them for the job market and supporting them to avail suitable employment opportunities. If this chain of actions works, young girls and their parents can be expected to consider refraining from arranging child marriage and continuing their employment to achieve financial security and empowerment. Based on this assumption, the STAR programme's impact on adolescent girls' child marriage was analysed, considering a sample comprising only the girls who were unmarried during the baseline survey. We present the findings in Table V.

The indicator considered here shows whether the unmarried girls during the baseline survey later got married before the age of 18 (during the period between the baseline survey and the follow-up surveys). We found that the programme decreased child marriage by four percentage points in the short run and nine percentage points in the long run. The results show that the programme significantly reduced child marriage for girls by 64 per cent in the long run. It is quite likely that the programme participant girls could delay their marriage because of their employment opportunities. This finding is supported by existing literature, which indicates that women's working status significantly affects age at marriage (Bhattacharyya, 2015).

Table A7 in the appendix presents some additional analysis of marriage's role in labour market participation for girls. Existing literature indicates that marriage often obstacles girls from getting involved in the labour market (Verick, 2014). Our findings showed that 92 per cent of the married female participants were employed during the end-line survey, compared to 55 per cent of their non-participant counterparts. It indicates that despite being married, female participants were skilled and highly motivated to engage in the labour market due to programme intervention. Therefore, it is safe to state that the intervention could efficiently minimise the challenges girls face due to marriage in case of employment.

TABLE V  
**IMPACT ON CHILD MARRIAGE (ONLY FOR GIRLS)**

Indicators	Programme impact in the short run (after 6 months)	Programme impact in the long run (after 3 years)
	(1)	(2)
Child marriage for girls (child marriage=1, otherwise=0)	-0.04* (0.03)	-0.09* (0.05)
Number of observations	270	252
Follow-up survey <sup>#</sup> mean of participants	0.01	0.06
Follow-up survey <sup>#</sup> mean of non-participants	0.05	0.14
% change over follow-up survey <sup>#</sup> mean	80.00	64.29

**Note:** Figures in parentheses are standard errors. \*\*\*, \*\*, and \* denote statistical significance at 1%, 5%, and 10% levels, respectively. Columns (1) and (2) report short and long-run impacts estimated using PSM, respectively. The last row reports the impacts in percentage; these are obtained by dividing the impact estimates reported in columns (1) and (2) by the mean for non-participants and then multiplying by 100. <sup>#</sup>The mid-line and end-line statistics are reported in columns (1) and (2), respectively.

### VIII. CONCLUSIONS

Notwithstanding remarkable progress in terms of the Millennium Development Goals (MDGs), not much progress has been made in adolescent development in Bangladesh. Among the multitude of challenges, incidences of school drop-out, involvement in unskilled labour, and child marriage require significant attention since these are among the ones with severe long-term and even intergenerational negative consequences. Financial hardship compels parents to get their children to drop out of school. Without proper skills training, male adolescents are compelled to engage in the informal economic sector, characterised by poor and hazardous working conditions. In contrast, female adolescents are often married off. Creating decent employment opportunities for adolescents, therefore, remains a major concern. In this context, this paper examines how training can promote youth employment in the skilled labour market. For this purpose, we assessed the impact of BRAC's 'Skills Training for Advancing Resources (STAR)' programme. BRAC initiated it as a pilot in 2012 to support economically vulnerable and school drop-out adolescents aged 14-18 by enhancing their skill levels to help them avail decent and skilled employment opportunities.

This paper also analyses the sustainability of the programme's gender-disaggregated impacts on employment, labour supply, income, and child marriage. Findings revealed that the long-run impact (32 percentage points) on employment was higher than that in the short run (19 percentage points). The magnitudes of the impact were higher for girls than for boys in both the short and long run, indicating that the absence of intervention led to a more significant loss for girls in terms of employment opportunities. Programme participation also significantly increased the adolescents' skilled labour supply and monthly income. We found a highly encouraging and sustainable impact of the intervention on child marriage for girls. Specifically, the intervention reduced child marriage of girls by about 62 per cent in the long run, indicating that the role of the STAR programme in delaying marriage among urban female adolescents through skill-building is recommendable. The impact of technical learning and financial security on delaying marriage among adolescent girls is persuasive. Because of these factors, their confidence level goes up, and their status is elevated in society. As they become self-confident, income-generating members, their families, and the community also respect their potential and refrain from forcing them to get married before reaching at least the legal age of marriage. Therefore, skills training components should be planned by assessing adolescents' needs during both adolescence and post-adolescence periods. Moreover, their preference needs to be emphasised when choosing technical training for them. Although the roles of public and private stakeholders and the community are challenging, they must come forward with appropriate interventions with the necessary components to overcome the obstacles to adolescent development.

The paper has two major limitations, as mentioned in the introduction. The first limitation is the different attrition rates between participant and non-participant groups, leading to the risk of having biased estimates. Second, we could not test whether the parallel trend assumption holds because of data unavailability, and violation of this assumption might bias the DiD estimates presented. Nevertheless, the results are still promising for a programme that just started operation.

A comprehensive training programme evidently can serve two-fold interconnected purposes—economic and social development of the young generation. Moreover, the effectiveness of the training programme through a gender lens intensifies the importance of scaling up such initiatives in developing countries where girls are still deprived of basic human rights.

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**Appendix****Table A1: Attrition Rate**

Sample type	In 2012	In 2013	In 2015	Attrition at 2013	Attrition at 2015	Revisited in both 2013 and 2015	Attrition in balanced data <sup>#</sup>
Participants	394	349	280	11.42	28.93	269	31.73
Non-participants	606	398	293	34.32	51.65	214	64.69
Total	1,000	747	573	25.30	42.70	483	51.70

**Note:** <sup>#</sup> refers to the adolescents that could be revisited in two waves (mid-line and end-line) of the survey.

**Table A2: Baseline Characteristics of Attrited and Non-attrited Sample at the End-line**

Indicators	Attrited	Non-attrited	Difference
Household heads' average age (year)	45.72	46.35	-0.64
Male household head (male=1, female=0)	0.91	0.92	-0.01
Household heads' education (year)	2.19	2.53	-0.34*
Adolescents' average age (year)	15.14	14.94	-0.31***
Male adolescents (male=1, female=0)	0.62	0.48	-0.16***
Married adolescents (married=1, otherwise=0)	1.02	1.01	-0.01
Adolescents' average years of schooling	4.40	4.82	0.54***
Dropout adolescents (dropout=1, otherwise=0)	0.92	0.88	0.13***
Number of observations	427	573	

**Note:** \*\*\*, \*\*, and \* denote statistical significance at 1%, 5%, and 10% levels, respectively.

**Table A3: Probit Regression for Propensity Score Matching**

Indicator	Coefficient	Standard Error	P value
Adolescent's age (year)	-0.12	0.04	0.00
Drop-out adolescent (yes=1, no=0)	1.74	0.24	0.00
Number of room	0.01	0.07	0.87
Wall made of cement (yes=1, no=0)	0.26	0.12	0.03
Roof made of cement (yes=1, no=0)	-0.04	0.20	0.83
Have a sanitary latrine (yes=1, no=0)	0.09	0.18	0.62
Have an electricity connection (yes=1, no=0)	-0.25	0.24	0.31
Number of cow/buffalo owned by household	-0.05	0.11	0.65
Number of chicken/duck owned by household	0.03	0.02	0.19
Constant	0.19	0.69	0.78

**Table A4: Checking the Success of Matching Variables**

Indicator	Participants	Non-participants	% Bias
Adolescent's age (year)	14.88	14.90	-1.50
Drop-out adolescent (yes=1, no=0)	0.98	0.98	0.00
Number of rooms	1.64	1.59	6.40
Wall made of cement (yes=1, no=0)	0.49	0.52	-5.70
Roof made of cement (yes=1, no=0)	0.09	0.08	4.70
Have a sanitary latrine (yes=1, no=0)	0.88	0.89	-2.00
Have an electricity connection (yes=1, no=0)	0.93	0.94	-2.80
Number of cow/buffalos owned by household	0.10	0.10	-0.70
Number of chickens/ducks owned by household	0.80	0.57	6.60

**Note:** Bias<10% indicates the success of matching variables.

**Table A5: Overtime Change in Labour Market Participation and Earnings**

Indicators	Baseline		Mid-line		End-line	
	Participants	Non-participants	Participants	Non-participants	Participants	Non-participants
	(1)	(2)	(3)	(4)	(5)	(6)
Participated in the labour market last year (Yes=1, No=0)	0.27	0.28	0.84	0.67	0.81	0.51
Monthly income (BDT, prices constant in 2014)	N/A	N/A	2002.35	1439.93	2353.39	1703.04
Number of observations	269	214	269	214	269	214

**Note:** N/A refers to data unavailability.

**Table A6: Impact on Employment Using PSM**

Indicators	All adolescents		Girls		Boys	
	Programme impact in the short run (after 6 months)	Programme impact in the long run (after 3 years)	Programme impact in the short run (after 6 months)	Programme impact in the long run (after 3 years)	Programme impact in the short run (after 6 months)	Programme impact in the long run (after 3 years)
	(1)	(2)	(3)	(4)	(5)	(6)
Participated in the labour market last year (yes=1, no=0)	0.17*** (0.04)	0.30*** (0.04)	0.24*** (0.05)	0.38*** (0.06)	0.12*** (0.06)	0.24*** (0.06)
Number of observations	470.00	470.00	234.00	234.00	188.00	188.00
Follow-up survey <sup>#</sup> mean of non-participants	0.67	0.51	0.62	0.39	0.73	0.64
% change over follow-up survey <sup>#</sup> mean	25.66	59.76	38.58	97.44	16.44	37.50

**Note:** Here, impacts have been estimated using PSM. Figures in parentheses are standard errors. \*\*\*, \*\* and \* denote statistical significance at 1%, 5%, and 10% levels, respectively. Columns (1), (3), and (5) report short-run impacts estimated using equation (4) for all adolescents, girls, and boys, respectively. Columns (2), (4), and (6) report long-run impacts estimated using equation (4) for all adolescents, girls, and boys, respectively. <sup>#</sup>The mid-line and end-line statistics are reported in odd and even number columns, respectively.

**Table A7: Employment Status of Married and Unmarried Girls at End-line**

Indicators	Marital status during end-line survey					
	Married			Unmarried		
	Participants	Non-participants	Difference	Participants	Non-participants	Difference
Engaged in earning activity during end-line survey (yes=1, no=0)	0.92	0.55	0.37*** (0.12)	0.73	0.41	0.32*** (0.06)

**Note:** Figures in parentheses are standard errors. \*\*\*, \*\* and \* denote statistical significance at 1%, 5% and 10% levels, respectively.