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## How Sustainable are the Impacts of Vocational Training? Evidence from BRAC's Intervention

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# ACRONYMS

ATT	Average Treatment Effect on the Treated
ADB	Asian Development Bank
BANBEIS	Bangladesh Bureau of Educational Information and Statistics
BBS	Bangladesh Bureau of Statistics
BEHTRUWC	Basic Education for Hard to Reach Urban Working Children
BNFE	Bureau of Non-Formal Education
CBTA	Competency Based Training and Assessment
DiD	Difference-in-Difference
EU	European Union
GoB	Government of Bangladesh
ILO	International Labour Organization
MCP	Master Craft Person
MDG	Millennium Development Goals
NGO	Non-Government Organisation
PO	Programme Organiser
PSM	Propensity Score Matching
SDP	Skills Development Programme
STAR	Skills Training for Advancing Resources
VET	Vocational Education and Training

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# ABSTRACT

In Bangladesh, school dropout rate at both the primary and secondary levels are quite high. Majority of these school dropout children end up being unemployed or in low quality jobs. Hence, training programmes can be a potential solution to address the rising unemployment among the school dropout youths. In this context, BRAC piloted a programme titled 'Skills Training for Advancing Resources (STAR)' in the five divisions of Dhaka, Chattogram, Sylhet, Rajshahi and Khulna in 2012, in partnership with the Bureau of Non-formal Education (BNFE). During this pilot phase, the programme provided livelihood skills training to a pool of 1000 urban adolescents aged 14-18 years, who completed five years of schooling under the Basic Education for Hard to Reach Urban Working Children (BEHTRUWC) project of the Bureau of Non-Formal Education (BNFE). This study uses three rounds of quantitative data (collected in 2012, 2013 and 2015) to estimate the short and long-run impacts of the pilot phase of the STAR programme by employing different techniques such as Difference-in-Difference (DiD) with fixed effect, Propensity Score Matching (PSM) and DiD using PSM and also includes qualitative methods to supplement the quantitative findings. Specifically, this study estimates the impacts on employment, income, savings, early marriage, etc. of adolescents, and on household welfare. Findings show that the positive impacts on the adolescents' labour market participation and monthly income are sustainable and higher in the long-run. In particular, the participants significantly shifted to the skilled labour market in the long-run. The impact on employment has been found to be higher for female participants. The programme also significantly reduces early marriage (for females). Additionally, positive impacts are found on empowerment, self-confidence and workplace environment. The study recommends- keeping the profile of trades consistent with market demands and the participants' age as well as their individual interests, and ensuring post training follow up by programme staff, among others, to make this programme even more effective.



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## SECTION ONE

# INTRODUCTION

Existing literature shows that education plays a significant role in ensuring better lives for adolescents (Angrist and Krueger 1991; Oreopoulos and Salvanes 2011). Unfortunately, economically vulnerable children are often forced to leave school at the early stage because of their financial conditions. School dropout rate is particularly higher at the secondary level compared to the primary level in South Asia (UNICEF 2014). To be specific, the secondary school dropout rate is estimated as about 37% in Bangladesh, while the rate is 19% at primary level (BANBEIS 2016). Unfortunately, school dropout adolescents usually get involved with the informal economy, e.g. household work, construction work, brick breaking, rickshaw/van pulling, etc. Notably, in Bangladesh, almost 93% of working children are engaged in the informal economy, which is characterised by hazardous and exploiting working conditions (Ahsan 2011). Lack of skill training is one of the main factors leading to their engagement with low-quality jobs. Although working is an integral aspect of most adolescents' lives, little scholarly attention has been given to the development consequences of adolescent employment (Zimmer-Gembeck and Mortimer 2006). Therefore, there is a need for focusing on the situation of the adolescents who are not only school dropout but also economically vulnerable.

A large amount of literature documents the effect of vocational training on youth employment. Biavaschi *et al.* (2013) examined the significant role of vocational training and education policies in determining labour market participation of young people in developed countries and the developing world. Dehmel (2005) also delved the contribution of vocational education and training (VET) to support lifelong learning based on evidence from EU's education and training policy, not only for the adolescents who completed upper secondary school but also for employees who wanted to enhance their skills. Evidence from Sweden shows that VET programmes' main outcomes include a higher rate of labour market participation, creating more opportunities to acquire a qualification for all categories of skills, which the participants did not previously have, and also building the chance for them to advance in a professional hierarchy (European Centre for the Development of Vocational Training 2011). Thus, providing skills training to school dropout

poverty-stricken youth group is acknowledged as a sustainable way to make their life better in terms of economic, social and psychological aspects.

Realising the importance of skills training for the youth of Bangladesh, BRAC initiated 'Skills Training for Advancing Resources (STAR)' programme as a pilot in 2012. It was initiated with an aim to develop the youth group as well-trained and empowered human capital. The programme provides a combination of in-class and on-the-job training. This combined (theoretical and practical) training is offered on various trades including mobile phone servicing, motorcycle repairing, refrigeration, electrical installation and maintenance, tailoring and dressmaking, block printing, embroidery, and beauty care. As a part of the on-the-job training, the adolescents are attached with local entrepreneurs, referred to as "Master Craft Person" (MCP), who have expertise in the relevant trades.

Evidence from a previous study on the pilot phase of the STAR programme in 2012-2013 shows that in the short-term this programme had a strong positive impact on the participants' employment and earnings along with their household income; positive changes were also observed in several other indicators of households' socioeconomic condition (Bhattacharjee and Kamruzzaman 2016). Their study also reveals that the programme had significant contribution in enabling the participants to dream for a better future and come up with realistic plans to make these dreams come true.

Findings from another impact assessment study conducted on the STAR programme using 2014-2015 panel data manifest that the programme support increased the participants' income about six times compared to the baseline mean and this increased income was translated into household welfare as proxied by food expenditure and durable asset holdings (Rahman *et al.* 2016). In addition, they document significant effects of the programme on enhancing empowerment, improving self-confidence, preventing substance abuse and improving workplace environment and job satisfaction. The cost-benefit ratio of the intervention was found to be about 1:3 (Rahman *et al.* 2016).

None of the studies on STAR programme mentioned above captures the long-run impact of the programme. To minimise this gap, we assess both the short- (6 months after intervention) and long-run (3 years after intervention) impacts of the programme using three rounds of panel data collected in 2012, 2013 and 2015. As follows, this paper presents research findings related to the long-run impacts of the STAR programme, in terms of employment, income, empowerment, early marriage, and household welfare. Comparison is also made between the short- and long-run impacts on indicators for which adequate information was available. Analysis of the panel data reveal that programme intervention increases employment rate in both the short- and long-run (3 years after intervention); and the increase in income is sustainable in the long-run. The magnitude of the impact in terms of employment and income is higher for girls than for boys. The programme also sustainably boosts adolescents' confidence and empowerment, and they gradually end up working at better workplaces in the long-run. Additionally, increased income of the adolescents positively influences household welfare reflected through significant increase in food expenditure.

This paper is organised as follows. Section 2 presents the overview of the STAR programme including the context and the components of the intervention. Section 3 describes the evaluation design and the data collection method. In Sections 4 and 5, descriptive statistics and the estimated equations used for identifying the causal effects of the intervention are presented, respectively. Section 6 explores the estimated impacts using the quantitative method, followed by qualitative findings discussed in Section 7. Finally, concluding remarks are provided in Section 8.

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## SECTION TWO

# OVERVIEW OF STAR PROGRAMME

## 2.1 BACKGROUND

Bangladesh, a lower middle-income country with a population of about 160 million, has 10% of her total population aged between 15 to 19 years and 61% of the total population within the working age group (15-64 years) (BBS 2011). Despite a modest decline in inequality at the national level, adolescent development is still at stake with many challenges, such as alarmingly high school dropout rate at both primary and secondary level, involvement in hazardous and low skilled informal jobs, child marriage and the rise of substance abuse.

Although the Government of Bangladesh (GoB) passed the Compulsory Primary Education Act 1993, which aims to ensure free five year primary education programme in all primary schools, the current dropout rate at the primary level is extremely disappointing (BANBEIS 2016). Furthermore, the secondary school dropout rate is drastically higher at 37% (BANBEIS 2016). Since there are many job opportunities available in informal sectors requiring low skill level, the school dropout adolescents often get engaged in these low quality jobs with poor payment. Many of these are categorised as hazardous work for children. According to the National Child Labour Elimination Policy-2010 adopted by the Ministry of Labour and Employment, 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 well-being and development; work without pay; work where the child becomes a victim of torture or exploitation or has no opportunity for leisure.

Unfortunately, there are limited government technical vocational skills training facilities (which only allow entry for Grade VIII graduates); and very few NGOs

are delivering free vocational skills training services, also in a very limited and unstructured manner (Hossain and Haider 2014). This results in poor quality training that creates problem with ensuring job placement. Considering all these, it is of utmost importance that school dropout adolescents or adolescents working in hazardous environment are provided with basic education along with skills training (consistent with market demand) to ensure their access to decent employment opportunities. Moreover, a strong linkage between the industry/private sector employers and providers of technical/vocational education or training results in enormous benefits for both parties (Gray 2006). In Bangladesh, this linkage is extremely limited and weak; and this is one of the main hindrances to the skills development system for adolescents (ADB and ILO 2016). Thus, the involvement of the demand side, i.e. the industry/private sector employers is essential to ensure that skills development courses are relevant and useful to potential new employees and the employers alike.

## 2.2 PROGRAMME DESCRIPTION – PILOT PHASE

As mentioned earlier, BRAC commenced the 'Skills Training for Advancing Resources (STAR)' programme as a pilot in 2012. The organisation's countrywide infrastructure and a strong management system helped BRAC, in collaboration with ILO and UNICEF to explore this unique model in order to support the Bureau of Non-Formal Education's (BNFE)'s 2<sup>nd</sup> phase of the Basic Education for Hard to Reach Urban Working Children (BEHTRUWC) project through skills development involving enterprise-based apprenticeships in the informal sector. During the pilot phase, the STAR programme was implemented in five divisions- Dhaka, Chattogram, Sylhet, Rajshahi and Khulna. In accordance with the Bangladesh Labour Law which permits adolescents aged above 13 years to work, a pool of 1000 urban adolescents aged 14-18 years who completed class five under BEHTRUWC of BNFE and were out of school for at least one year were covered by the programme during this phase (Bhattacharjee and Kamruzzaman 2016). They were provided with both theoretical and practical trainings to develop trade-specific skills based on local market demand.

Along with the characteristics of the targeted adolescents mentioned above, some additional issues were also considered while selecting the participants, e.g. i) distance from branch office to the participants' residence; ii) distance from the participants' residence to the MCPs' workplace; iii) matching between local demand for particular trade and the participants' area of interest with regards to vocational training; and iv) the ratio of male and female participants (40:60).

As mentioned earlier, the participants were provided practical training through attachment with relevant entrepreneurs involved in the local informal sector, referred to as the MCPs. The duration of the training was six months. The MCPs were selected using the following criteria: i) experienced as a skilled craftsman in the particular trade; ii) sufficient space in his/her workplace to accommodate apprentice; iii) high demand for the particular trade in the market (to increase the participants' chances of finding decent employment upon completing the training); iii) short distance between his/her shop and the participants' residence; and iv) previous successful experience in managing apprentices. Upon selection, the finally participating MCPs went through a training to improve their understanding of work ethics and decent work environment.

During the six months long training period, Competency Based Training and Assessment (CBTA) as per the National Skills Development Policy 2011 (NSDP), with training modules ranging from Pre-vocational Level 1 to Level 2, was followed to conduct theoretical training. Each trade had its own Competency based Skills Logbook that acted as a documentation of the competencies achieved by the participants during the training period. Additionally, STAR staff provided lessons on various issues, such as financial literacy, market assessment, basic communicative Englishs, etc., once a week. After the training period, the programme staff assisted the participants to avail decent employment opportunities through proper information and guidance.



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## SECTION THREE

# SAMPLING DESIGN AND DATA COLLECTION

## 3.1 SAMPLE

With an aim to assess the impact of the STAR programme, the BRAC Research and Evaluation Division (RED) designed a study during the pilot phase of the programme in 2012. The initial study sample comprised of 1000 adolescents (including both the participants and non-participants). The sample size calculation for the participant group involved the following considerations: aiming for 95% confidence level and a precision level of  $\pm 4\%$  for a total population of 1000 (i.e. the total number of intervened children in the pilot phase of the programme), required sample size turned out to be about 375 which was rounded up to 400<sup>1</sup> participant adolescents. For assessing programme impact, 600 non-participant adolescents were also surveyed from the same communities to form a decent sized comparison group (Bhattacharjee and Kamruzzaman 2016). This total sample of 1000 adolescents were randomly selected from 13 BRAC branch offices scattered in seven (7) districts from five (5) divisions (ie Dhaka, Chattogram, Sylhet, Rajshahi and Khulna) of Bangladesh. The participant adolescents were selected proportionately from each branch. The non-participants were those adolescents that were selected based on criteria such as age, school enrolment status and socioeconomic background (of the family) in order to have a comparison group as close in characteristics to the participants as possible (Bhattacharjee and Kamruzzaman 2016).

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<sup>1</sup> During the survey, we could actually interview 394 participants out of the planned 400; so, we surveyed 606 non-participants to roundup the sample size to 1000.

## 3.2 DATA COLLECTION

A baseline survey was conducted during September-October, 2012, covering 1000 adolescents and their households, as already mentioned. Then, a follow-up survey was conducted in April-May, 2013 (referred to as the midline survey hereafter) where, 75% (i.e. 747) of the adolescents covered by the baseline survey was successfully revisited. Finally, during the end-line survey conducted in November-December, 2015, about 57% (i.e. 573) of the baseline study sample was successfully revisited. The attrition rate in the end line survey (42.7%) was found to be 1.68 times that in the midline survey (25.3%) (Annex Table A1). In addition, attrition rates were found to be significantly higher among the non-participants than that among the participants in both midline (34.32 vs. 11.42) and end line surveys (51.65 vs. 28.93)<sup>2</sup>. Internal and external migration, temporary absence of the adolescents in the households during the survey, and change of their residence due to marriage were identified as the main reasons for attrition.

Furthermore, few adolescents that could not be revisited during the midline survey could be successfully revisited during the end line survey. About 48% of the baseline sample could be revisited during both midline and end-line surveys.

For each round of the survey, a structured questionnaire was used to collect information by specially trained enumerators. The surveys collected information on adolescents' labour market participation, savings, work environment, knowledge of health related issues, among other issues. At the household level, information was collected on detailed demographic characteristics, housing condition and asset holding, among others. As programme intervention was actually underway during the baseline survey, the survey instrument was designed to recall some information for the pre-intervention period. In addition, the end line survey collected information on few other important indicators, including the adolescents' working hours, monthly income, confidence, job satisfaction, empowerment, and food and non-food expenditure at the household level. The end-line survey also had a separate qualitative part, which involved conducting in-depth interviews using a semi-structured interview guideline. A digital recorder was used to record all the interviews and the interviews were transcribed in full for further analysis.

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<sup>2</sup> For detailed characteristics of attrited and non-attrited sample, please see Table A2 in the Annex.

## SECTION FOUR

# DESCRIPTIVE STATISTICS

This section presents descriptive statistics of the socioeconomic characteristics of the study sample at both individual and household levels and the main outcomes to understand the changes occurring between baseline and end line surveys.

Table 4.1 shows the baseline statistics of age, sex, marital status, years of education and school dropout rate of the adolescents, who were successfully revisited during the end line survey, and also their household heads' age, sex and years of education. It appears that at baseline, there were dissimilarities between the participants and the non-participants in terms of most of the individual/household level socio-demographic indicators except adolescents' age and marital status, and household heads' sex and years of education. At baseline, 43% of the participants were male and in contrast, about 53% of the non-participants were male. This is expected as the programme purposively targeted a higher number of girls compared to boys (with a ratio of 60:40). About 98% of the participants were school dropouts, while this proportion was about 78% among the non-participants. This is perhaps due to the fact being school dropout was one of the selection criteria used by the programme, while not all of these criteria could be satisfied while selecting the non-participants from the adjacent areas for research purpose. In terms of years of education at baseline, on average, the participants completed five years of education while the non-participants completed 4.66 years. Since the STAR intervention is designed for underprivileged school dropout adolescents, results reported in Table 4.1 indicate that, overall, the proportion of mistargeted adolescents was quite insignificant.

**Table 4.1** Baseline characteristics of matched<sup>3</sup> sample during end line survey

Indicator	Participants	Non-participants	Difference
	(1)	(2)	(3=1-2)
Adolescents' average age (year)	14.87	15.05	-0.18
Male adolescents (Male=1, Female=0)	0.43	0.53	-0.10**
Married adolescents (Married=1, otherwise=0)	0.00	0.01	-0.01
Adolescents' average grade passed (year)	5.00	4.66	0.34***
Dropout adolescents (Dropout=1, otherwise=0)	0.98	0.78	0.20***
Household heads' average age (year)	45.58	47.09	-1.51**
Male household head (Male=1, Female=0)	0.90	0.93	-0.03
Household heads' education (year)	2.39	2.67	-0.27
Number of observations	280	293	

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

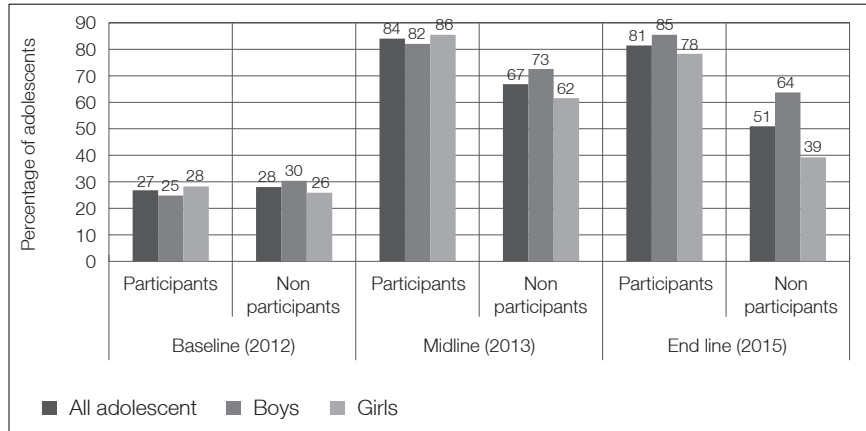
Figure 4.1 presents the over time change in labour market participation for both the participants and non-participants. It shows that there is a significant increase in labour market participation from baseline (27%) to midline (84%) among the participants. Overall, employment rates were quite similar for both groups at baseline; but during both midline (2013) and end-line (2015) surveys, the rate was found to be significantly higher among the participants than the non-participants. Specifically, the labour market participation rate among the participants increased from 27% to 81%, while it increased from 28% to 51% among the non-participants in between the baseline and end-line surveys. It should be noted here that recall data on employment was collected during the midline survey. The first round of data collected on employment has not been used since it could possibly be biased due to the fact that the participants were already involved in the training offered by programme during the baseline survey.

Gender disaggregation of the results depicts that labour market participation rate was significantly higher among the participants than the non-participants for both genders during both midline (2013) and end line (2015) surveys. Interestingly, the comparative change in employment status among the participant and non-participant girls is higher than that among the participant and non-participant boys. In particular, the end line differences between the participants and non-participants were found to be 21 and 39 percentage

<sup>3</sup> i.e. successfully revisited during end line survey.

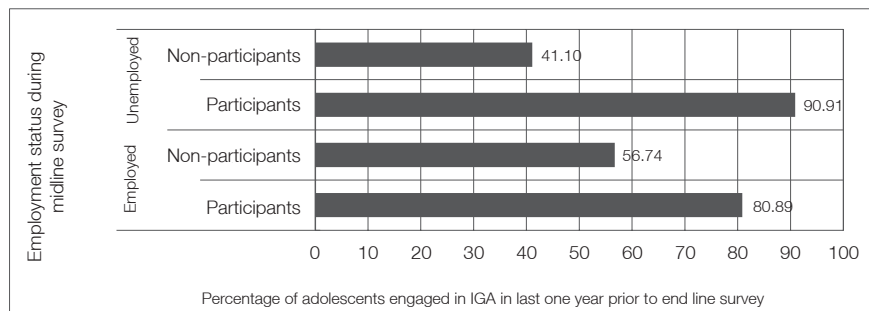
points for boys and girls, respectively. It indicates that both the participant girls and boys are more likely to be employed than their non-participant counterparts, with the contribution of the programme being higher for girls' involvement in the labour market.

**Figure 4.1 Over time change in labour market participation**



Additional analysis on continuity of labour market participation between the midline and end line survey period revealed that about 81% of the participants who were employed during the midline survey were also employed during the end line survey, while the corresponding ratio among the non-participants is quite low (only 57%) (Figure 4.2). In other words, programme intervention was likely to result in adolescents' continuing labour market participation for a longer period compared to their non-participant counterparts.

**Figure 4.2 Change in employment status from midline survey to end line survey**



Panels (A), (B) and (C) of Table 4.2 present findings on the change occurring over time in saving behaviour of all adolescents, girls and boys, respectively. In terms of saving tendency and amount of savings, results show that at the midline and end line, the participants are more likely to save compared to baseline, and changes in these indicators from baseline to end line are higher among the participants than the non-participants. The saving tendency was significantly higher during the midline survey (2013) among the participants as they were provided seed money (BDT11,000) by the BEHTRUWC project of BNFE after completing the training, so that they could initiate investment for a business using this lump-sum amount of money. Consistently, the amount of savings was found to be significantly higher among the participants during the midline survey compared to the non-participants. Panels (B) and (C) of Table 4.2 show that both female and male participants were more likely to save compared to their non-participant counterparts.

Table 4.3 summarises the descriptive statistics on adolescents' knowledge about health related issues, specifically HIV/AIDS. This information was collected to explore whether the programme has any effect on the adolescents' knowledge of health related issues. To be specific, adolescents were asked whether they ever heard the term HIV/AIDS, what the consequence of this disease is, and also about their knowledge on how HIV/AIDS spreads<sup>4</sup>. Their answers to the questions on how HIV/AIDS spreads were coded in binary (0/1) where 1 indicated that the adolescent knew the correct process; and then the averages were used as the knowledge point. A higher score in the knowledge point on HIV/AIDS indicates that the adolescent knows more about how the disease spreads. Statistics in Table 4.3 indicate that the over time increase in the knowledge point among the participants is higher compared to that among the non-participants. However, more than 90% of both the participants and non-participants were familiar with the term HIV/AIDS and more than 80% were aware of the ultimate consequence of AIDS during the end line survey. The differences between the two groups are minimal in this context.

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<sup>4</sup> Adolescents reported true/false on the following six (6) statements related to how HIV/AIDS spreads: 1) through having intercourse, 2) through using injection/needle used by AIDS patient, 3) through contracting germs from AIDS patients, 4) AIDS patient's cough, 5) infant gets HIV/AIDS if its mother has HIV/AIDS, 6) through mosquito bites.

Table 4.2 Over time change in saving behaviour

Indicators	Baseline (2012)		Midline (2013)		End line (2015)				
	Participants	Non-participants	Participants	Non-participants	Participants	Non-participants			
Panel A: All	(1)	(2)	(3=1-2)	(4)	(5)	(6=4-5)	(7)	(8)	(9=7-8)
Have savings (Yes=1, No=0)	0.26	0.12	0.15***	0.80	0.14	0.66***	0.40	0.20	0.20***
Amount of savings (BDT)	464.18	368.09	96.09	5566.05	518.52	5047.53***	2938.71	1626.28	1312.00
Panel B: Girls									
Have savings (Yes=1, No=0)	0.25	0.14	0.11**	0.80	0.13	0.68***	0.36	0.20	0.16***
Amount of savings (BDT)	480.63	202.17	278.5*	5634.66	460.82	5173.84***	3233.59	1828.99	1405.00
Panel C: Boys									
Have savings (Yes=1, No=0)	0.28	0.10	0.18***	0.80	0.15	0.65***	0.45	0.19	0.25***
Amount of savings (BDT)	442.56	515.81	-73.24	5485.00	574.51	4910.49***	2551.24	1445.81	1105.00

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



Table 4.3 Knowledge about HIV/AIDS

Indicators	Baseline (2012)		Midline (2013)		End line (2015)				
	Participants	Non-participants	Participants	Non-participants	Participants	Non-participants			
	(1)	(2)	(3=1-2)	(4)	(5)	(6=4-5)	(7)	(8)	(9=7-8)
Familiar with the term HIV/AIDS (Yes=1, No=0)	0.77	0.82	-0.05	0.89	0.82	0.07***	0.95	0.94	0.01
Average knowledge point (Conditional on being familiar with the term)	0.46	0.46	0.00	0.84	0.82	0.02	0.70	0.66	0.04
Know that death is the ultimate consequence of AIDS (Yes=1, No=0)	0.66	0.69	-0.03	0.83	0.73	0.10***	0.83	0.84	-0.01

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

## CHAPTER FIVE

# ESTIMATING EQUATION

Since descriptive statistics show that there is statistically significant difference in case of some baseline characteristics between the participants and non-participants, it is likely that the intervention is endogenous to various observable and unobservable characteristics. One possible avenue for possible correlation between error term and interaction term is through time-invariant individual characteristics those are correlated with the intervention. To identify the causal effect of the intervention, we had to control for these characteristics. Fixed effect estimator resolved such bias through controlling time-invariant individual/household characteristics. We used separate equations for estimating the short and long-run impacts of the programme.

To estimate the short-run impact, a panel comprising of baseline data (2012) and midline data (2013) has been used. The estimating equation is as follows:

$$y_{it1} = \tau_i + \theta_1 \text{YEAR}_{t1} + \theta_2 \text{INTV}_i * \text{YEAR}_{t1} + \epsilon_{it1}, \dots \dots \dots (1)$$

Where,

$y_{it1}$  is the outcome variable of interest for individual/household in year t1, where t1 refers to baseline (2012) and midline (2013)

$\text{YEAR}_{t1}$  is a dummy variable taking the value of 1 if t1 refers to midline survey year (2013) and 0 if otherwise

$\text{INTV}_i$  is a binary variable taking the value of 1 if the individual/household i is from the intervention group and 0 if not

$\tau_i$  are individual/household level fixed effects

- $\theta_1$  identifies the change in time
- $\theta_2$  identifies causal effect of the programme in the short run
- $\epsilon_{it1}$  is the error term

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

$$y_{it2} = \pi_i + \delta_1 \text{YEAR}_{t2} + \delta_2 \text{INTV}_i * \text{YEAR}_{t2} + \mathfrak{g}_{it2} \dots \dots \dots (2)$$

Where,

- $y_{it2}$  is the outcome variable of interest for individual/household i in year t2, where t2 refers to baseline (2012) and end line (2015)
- $\text{YEAR}_{t2}$  is a dummy variable taking the value of 1 if t2 refers to end line survey year (2015) and 0 if otherwise
- $\text{INTV}_i$  is a binary variable taking the value of 1 if the individual/household i is from the intervention group and 0 if not
- $\pi_i$  are individual/household level fixed effects
- $\delta_1$  identifies the change in time
- $\delta_2$  identifies the causal effect of the programme in the long-run
- $\mathfrak{g}_{it2}$  is the error term

Given the observed dissimilarities between the participants and the non-participants at the baseline, to estimate the long-run impacts, we also used Propensity Score Matching (PSM) method - one of the most popular and widely used methods, followed by DiD. This allows a robustness check of the impact estimates calculated using DiD with fixed effects. We referred to the estimates using this method as “DiD-PSM” estimates for the outcome variables for which both baseline and follow-up survey data are available (i.e., adolescent’s labour market participation, savings, working environment and knowledge on HIV/AIDS).

PSM matches treated and untreated observations on the estimated probability of being treated. Rosenbaum and Rubin (1983) also acknowledged that the

probability of receiving treatment depends on pre-treatment characteristics. For this study, baseline characteristics including age and school going status of the adolescents and socioeconomic status of the households have been used for this matching on the basis of the propensity score.

$$P(Z) \equiv \Pr\{T = 1 | Z\} = E\{T | Z\} \dots \dots \dots (3)$$

Where,

T indicating participation in programme takes the value of 1 if participates and 0 if otherwise

Z represents variables displaying the pre-treatment characteristics

The steps followed to use PSM method included- i) employing a probit model using baseline data (2012) on adolescents' age, school-going status and their households' socioeconomic status; ii) then checking the balancing properties of the data by testing whether the two groups have the same distribution (mean) of propensity scores and of variables within groups of the propensity score; iii) and finally, estimating the matching equations using the common support restriction to ensure that matches were formed only where the distribution of the density of the propensity scores overlap between the participant and non-participant groups. The STATA command used to match the propensity score between these two groups through the nearest neighbourhood matching technique was `psmatch2`.

The estimated propensity scores to match untreated units (i.e., non-participants) to treated units (i.e., participants) were employed to estimate the impact of the programme and calculate standard errors with the matched sample. The estimated impact of the programme is nothing but the average difference in the outcomes for each participant adolescent from a weighted average of outcomes in each similar non-participant group of adolescents from the matched sample, referred to as Average Treatment Effect on the Treated (ATT). ATT is considered as an appropriate estimator to estimate the treatment effect for the subset of the population who would actually be assigned to intervention (Heckman *et al.* 1999 and Jones and Rice 2009). The applied model is as follows;

$$ATT \equiv E(Y_1 | D = 1) - E(Y_0 | D = 1) \dots \dots \dots (4)$$

Where,

ATT is the average treatment effect on the treated

$Y_1$  is the value of outcome variable for participant adolescents

$Y_0$  is the value of outcome variable for non-participant adolescents

$D$  indicating participation in programme takes the value of 1 if participates and 0 if otherwise

Since baseline data was not available for some of the outcome variables of interest i.e. working hour, confidence, empowerment, we could not use equations (1) and (2) for estimating the effect on these outcome variables. Thus, we estimated the long-run impact on the outcomes using PSM method. Hereafter, the Average Treatment Effect on the Treated (ATT) estimates from equation (4) are referred to as the long run impacts of the programme on these variables.

## SECTION SIX

# FINDINGS AND DISCUSSION

## 6.1 IMPACT ON EMPLOYMENT

The estimated short – and long-run impacts of the STAR programme on adolescents' employment are presented in Table 6.1. Columns (1) and (2) of Table 6.1 report the short-run impacts in absolute value and percentage, respectively, and columns (3) and (4) report the long-run impacts in absolute value and percentage, respectively. Furthermore, column (5) reports the long-run impacts estimated using DiD-PSM. Results presented in panels (A), (B) and (C) are for all adolescents, girls and boys, respectively. Results show that the programme significantly increases labour market participation. Interestingly, the impact (using both DiD with fixed effect and DiD-PSM) is not only sustainable in the long-run but also higher in the long-run compared to that in the short-run. Labour market participation increases by 19 percentage points in the short-run, while it increases by 32 percentage points in the long-run. Overall, programme impact is about 70% and 119% of baseline mean of the participants six months (short-run) and three years (long-run) after programme intervention, respectively.

Table 6.1 Impact on employment

Indicators	Short-run impact using DiD with fixed effect (1)	Percentage change over baseline mean of participants (2)	Long-run impact using DiD with fixed effect (3)	Percentage change over baseline mean of participants (4)	Long-run impact using DiD-PSM (5)	Percentage change over baseline mean of participants (6)
Panel A: All						
Participated in labour market in last year (Yes=1, No=0)	0.19*** (0.05)	70.37	0.32*** (0.06)	118.52	0.42*** (0.08)	156.47
Number of observations	966		966		466	
Panel B: Girls						
Participated in labour market in last year (Yes=1, No=0)	0.22*** (0.06)	77.77	0.37*** (0.08)	130.79	0.40*** (0.12)	139.79
Number of observations	528		528		237	
Panel C: Boys						
Participated in labour market in last year (Yes=1, No=0)	0.15** (0.07)	60.52	0.27*** (0.08)	108.93	0.30*** (0.10)	122.45
Number of observations	438		438		192	

Note: Here, the balanced panel has been used since baseline data on employment had been recalled during the midline survey. Figures in the parentheses are standard errors. \*\*\*, \*\* and \* denote statistical significance at 1%, 5% and 10% level, respectively. Columns (1) and (3) report the short – and long-run impacts estimated using equation (1) and (2), respectively. Column (5) reports the long-run impacts estimated using equation (4). Columns (2), (4) and (6) report the impacts in percentage; these are obtained by dividing impact estimate reported in columns (1), (3) and (5) by mean for the participants and then multiplying by 100.

Gender disaggregation of the impact estimates shows that programme impacts on employment are positive and significant for both genders (Panel B & C of Table 6.1). Interestingly, the impact is higher for girls compared to the boys. Similarly, DiD with PSM estimate for the long-run is higher for girls than that for boys. These results indicate that it is more challenging for the non-participant girls to get involved in labour market compared to the non-participant boys. This is not surprising given that, in the prevailing socio-cultural setting of Bangladesh, boys are expected to go out and earn for the family; contrary to that, girls face challenges and discouragement from society, and hence from family, to join the labour market (Hossain *et al.* 2010). Therefore, what is happening due to programme intervention is possibly that it is not only enhancing the participating adolescents' skills, but also their confidence to enter the labour market. Looking into the difference in impact between the short- and long-run, it is found that in the short-run employment rate increases by 22 percentage points for girls while it increases by 37 percentage points in the long-run. Similarly, for boys, the long-run impact on employment rate (27 percentage points) is also higher than the short-run impact (15 percentage points).

## 6.2 IMPACT ON LABOUR SUPPLY

As seen earlier in Figure 4.1, over time employment rate increases among both the participants and non-participants. However, another crucial issue to examine is whether the programme affected total labour supply. For this purpose, average number of hours spent per day, by both the participants and non-participants, for different employment categories as well as total working hours spent per day have been analysed (Table 6.2). It is to be noted that while analysing working hour, the full sample has been used. Due to unavailability of data, only the long-run impact of the intervention on labour supply has been analysed, using PSM method. The average working hour of the non-participants is found to be about 4.57 hours/day. Programme impact on the total working hour is found to be positive and about 17% of the end line mean of the non-participants. It is also found that about half of their average working hour (around 2.4 hours/day) is spent in “other” employment category, which includes driving, assisting drivers, hotel boy, etc. On the other hand, most of the participants are occupied in skilled-labour<sup>5</sup>, due to programme intervention. The results show that the programme significantly increases working hours spent in this specific category. The significant impact on labour supply in skilled labour is about 1.15 times (115%) the average labour supply by the non-participants in this category.

<sup>5</sup> Additional analysis of employment by trades for which the programme offers training shows that in the long-run, the participants with training in trades like motorcycle repairing and electric work have higher likelihood of being employed, followed by tailoring, beauty care and refrigerator repairing (see Table A4 in annex).



**Table 6.2 Impact on labour supply (time devoted to earning activities/day)**

Indicators	Long-run impact using PSM	End line mean of outcome variable of non-participants	Percentage change over end-line mean of non-participants
	(1)	(2)	(3)
Agriculture, day labour	0.02 (0.02)	0.00	-
Agriculture, self-employed	0.01* (0.01)	0.00	-
Non-agriculture, day labour	-0.25 (0.24)	0.59	-42.16
Skilled-labour (tailoring, beautician, mechanic, other skilled)	1.58*** (0.41)	1.37	115.81
Shopkeeper	0.02 (0.02)	0.00	20614.37
Business	-0.05 (0.18)	0.22	-22.37
Other (service, driver, helper, hotel boy, etc.)	-0.56 (0.42)	2.39	-23.39
Total working hours	0.77 (0.52)	4.57	16.93
Number of observations	557	278	

Note: Figures in the parentheses are standard errors. \*\*\*, \*\* and \* denote statistical significance at 1%, 5% and 10% level, respectively. Column (1) reports the long-run impacts estimated using equation (4). Column (2) reports the mean of outcome variable for the non-participants. Column (3) reports the impacts in percentage; these are obtained by dividing impact estimate reported in column (1) by mean for the non-participants reported in column (2) and then multiplying by 100.

Panels (A) and (B) of Table 6.3 depict the impact on labour supply for girls and boys, respectively, for the various employment categories. Although the employment rate is found to significantly increase by about 27 percentage points (Table 6.1) among boys due to programme participation, no significant impact is found on their hours devoted to earning activities. On the other hand, participation in skilled labour is found to be significantly higher among the participant girls than the non-participant girls.

**Table 6.3 Gender disaggregation of the impact on labour supply (time devoted to earning activities/day)**

Indicators	Long-run impact using PSM	End line mean of outcome variable of non-participants	Percentage change over end line mean of non-participants
	(1)	(2)	(3)
Panel A: Girls			
Agriculture self-employed	0.02 (0.02)	0.00	1408.33
Non-agriculture day labour	-0.31* (0.17)	0.32	-96.81
Skilled-labour (tailoring, beautician, mechanic, other skilled)	2.58*** (0.34)	0.32	802.26
Business	-0.03 (0.11)	0.04	-94.34
Other (service, driver, etc.)	-0.83* (0.50)	2.27	-36.71
Total	1.42** (0.56)	2.95	48.15
Number of observations	274	127	
Panel B: Boys			
Agriculture day labour	0.04 (0.04)	0.00	-
Agriculture self-employed	-0.01 (0.03)	0.02	-79.80
Non-agriculture day labour	0.04 (0.38)	0.74	5.61
Skilled-labour (tailoring, beautician, mechanic, other skilled)	0.45 (0.62)	2.76	16.43
Shopkeeper	0.05 (0.04)	0.00	-
Business	-0.05 (0.28)	0.44	-10.74
Other (service, driver, etc.)	-0.61 (0.62)	2.83	-21.42
Total	-0.09 (0.66)	6.78	-1.29
Number of observations	241	121	

Note: Figures in the parentheses are standard errors. \*\*\*, \*\* and \* denote statistical significance at 1%, 5% and 10% level, respectively. Column (1) reports the long-run impacts estimated using equation (4). Column (2) reports the mean of outcome variable for the non-participants. Column (3) reports the impacts in percentage; these are obtained by dividing impact estimate reported in column (1) by mean for the non-participants reported in column (2) and then multiplying by 100.

### 6.3 IMPACT ON EARNINGS

Table 6.4 shows that the programme significantly increases monthly earnings of the adolescents (considering full sample). It should be mentioned here that the end line earnings have been deflated to 2012 prices using consumer price index. Panels (A), (B) and (C) demonstrate the impact for all adolescents, girls and boys, respectively. The magnitude of the programme's impact is higher in the long-run than in the short-run. Also, the magnitude of the estimated long-run impact on monthly earnings is substantially higher for girls compared to boys. To be specific, the programme significantly increases monthly earnings by BDT 650 for the full sample, while the estimated impact on girls' and boys' monthly earnings are BDT 789 and BDT 541 (with both impact estimates being statistically significant) three years after programme intervention.

**Table 6.4 Impact on monthly earnings (Full sample)**

Indicator	Short-run impact using PSM	Percentage change over end line mean of non-participants	Long-run impact using PSM	Percentage change over end line mean of non-participants
	(1)	(2)	(3)	(4)
Panel A: All				
Monthly earnings (BDT, at 2012 constant price)	562.42*** (197.32)	39.06	650.00*** (235.42)	38.19
Number of observations	730		557	
Panel B: Girls				
Monthly earnings (BDT, at 2012 constant price)	928.04*** (240.89)	83.74	789.22*** (267.10)	69.70
Number of observations	370		274	
Panel C: Boys				
Monthly earnings (BDT, at 2012 constant price)	433.68** (213.60)	28.65	541.45* (314.28)	23.13
Number of observations	345		241	

Note: Figures in the parentheses are standard errors. \*\*\*, \*\* and \* denote statistical significance at 1%, 5% and 10% level, respectively. Columns (1) and (3) report the short – and long-run impacts estimated using equation (1) and (2), respectively. Columns (2) and (4) report the impacts in percentage; this are obtained by dividing impact estimate reported in columns (1) and (3) by mean for the non- participants and then multiplying by 100.

Since labour market participation, labour supply and monthly income are interconnected, estimates on these indicators synopsis that the non-participants, and in particular, the non-participant boys work for longer hours with lower wage. Moreover, by and large, programme participation not only significantly increases labour market participation, but also contributes to engagement in decent jobs with balanced working hours and better wage.

## 6.4 IMPACT ON SAVINGS

Programme impacts on savings behaviour and amount of savings are reported in Table 6.5. Results presented in Panels (A), (B) and (C) of Table 6.5 report the saving behaviour of all adolescents, girls and boys, respectively. Impact on the saving behaviour is about 62 percentage points in the short-run, perhaps because the programme staff (POs) helped the participants to open a savings account in the bank during the intervention period with an aim to encourage them to save for their future. However, the impact is found to be insignificant in the long-run. Similarly, the programme significantly increases the amount of savings of the adolescents in the short-run; but the long-run impact is found to be insignificant. In addition, not much variation is found between boys and girls with regard to saving behaviour or amount of savings. Insignificant impact on savings in the long-run indicates that there is scope of introducing savings products among adolescents to encourage them to invest their earnings for higher returns in future.

Table 6.5 Impact on savings

Indicators	(1)	(2)	(3)	(4)	(5)	(6)
	Short-run impact using DiD with fixed effect	Percentage change over baseline mean of participants	Long-run impact using DiD with fixed effect	Percentage change over baseline mean of participants	Long-run impact using DiD-PSM	Percentage change over baseline mean of participants
Panel A: All						
Have savings (Yes=1, No=0)	0.62*** (0.04)	326.32	0.06 (0.05)	21.64	0.02 (0.06)	7.62
Amount of savings (BDT)	5229.05*** (325.50)	1860.85	1216.34 (819.50)	261.97	1542.99 (1129.89)	332.41
Number of observations	1494		1146		546	
Panel B: Girls						
Have savings (Yes=1, No=0)	0.62*** (0.05)	263.72	0.05 (0.07)	19.08	0.13 (0.09)	50.59
Amount of savings (BDT)	5196.69*** (448.3)	1490.49	1126.14 (1318.00)	234.28	1689.09 (1218.40)	351.43
Number of observations	770		594		280	
Panel C: Boys						
Have savings (Yes=1, No=0)	0.64*** (0.05)	409.60	0.08 (0.07)	26.69	0.09 (0.08)	31.10
Amount of savings (BDT)	5260.24*** (475.70)	2613.66	1178.68 (957.30)	266.40	1277.06 (1195.96)	288.56
Number of observations	724		552		240	

Note: Figures in the parentheses are standard errors. \*\*\*, \*\* and \* denote statistical significance at 1%, 5% and 10% level, respectively. Columns (1) and (3) report the short – and long-run impacts estimated using equation (1) and (2), respectively. Column (5) reports the long-run impacts estimated using equation (4). Columns (2), (4) and (6) report the impacts in percentage; this are obtained by dividing impact estimate reported in columns (1), (3) and (5) by mean for the participants and then multiplying by 100

## 6.5 IMPACT ON WORKPLACE ENVIRONMENT

To estimate the programme impact on workplace environment, we selected some relevant indicators including access to electricity, fan, sufficient air, drinking water, sanitary latrine and use of heavy machinery, chemical, etc. Estimates for these indicators indicate that the employed adolescents (during the midline and end line surveys) have access to improved workplace environment due to programme intervention. These impacts are also found to be sustainable and even larger in the long-run. As can be seen from Table 6.6, the long-run impacts using DiD with fixed effect (Column 3) are almost double than that of the short-run in case of indicators such as access to electricity, fan, drinking water at the workplace. DiD-PSM estimates (Column 5) for the long-run are also significant for a number of indicators, i.e. access to electricity, fan, sufficient air, etc., indicating the robustness of the results.

**Table 6.6** Impact on workplace environment

Indicators	Short-run impact using DiD with fixed effect	Percentage change over baseline mean of participants	Long-run impact using DiD with fixed effect	Percentage change over baseline mean of participants	Long-run impact using DiD-PSM	Percentage change over baseline mean of participants
	(1)	(2)	(3)	(4)	(5)	(6)
Adolescents have...(Yes=1, No=0)						
Access to electricity	0.21*** (0.03)	196.38	0.47*** (0.05)	10668.97	0.23** (0.10)	5292.96
Access to fan	0.28*** (0.04)	261.84	0.47*** (0.05)	10668.97	0.24** (0.10)	5470.13
Access to sufficient air	0.30*** (0.04)	273.16	0.48*** (0.05)	10895.97	0.38*** (0.10)	8646.61
To use heavy machinery	-0.09** (0.04)	307.56	-0.01 (0.04)	10000.00	0.02 (0.09)	163.64
To use chemical	0.16*** (0.04)	1384.00	0.05 (0.04)	1073.71	-0.01 (0.07)	-144.45
Clean work place	0.39*** (0.05)	396.88	0.43*** (0.05)	9760.97	0.22** (0.11)	5076.53
Access to drinking water	0.22*** (0.04)	217.49	0.42*** (0.05)	9533.97	0.22** (0.09)	5014.62

[ Table 6.6 contd... ]

[ ...Table 6.6 contd ]

Indicators	Short-run impact using DiD with fixed effect	Percentage change over baseline mean of participants	Long-run impact using DiD with fixed effect	Percentage change over baseline mean of participants	Long-run impact using DiD-PSM	Percentage change over baseline mean of participants
	(1)	(2)	(3)	(4)	(5)	(6)
Access to sanitary latrine	0.21*** (0.04)	234.39	0.28*** (0.05)	6355.98	0.06 (0.09)	1444.54
Contaminated work place <sup>#</sup>	0.01 (0.03)	69.51	-0.03 (0.03)	10000.00	-0.10 (0.07)	9909.09
Number of observations <sup>##</sup>	1174		796		337	

<sup>#</sup>Containing polluted air, poisonous chemical, smoke flames, etc.

<sup>##</sup>for those who were employed during re-survey.

Note: Figures in the parentheses are standard errors. \*\*\*, \*\* and \* denote statistical significance at 1%, 5% and 10% level, respectively. Columns (1) and (3) report the short- and long-run impacts estimated using equation (1) and (2), respectively. Column (5) reports the long-run impacts estimated using equation (4). Columns (2), (4) and (6) report the impacts in percentage; these are obtained by dividing impact estimate reported in columns (1), (3) and (5) by mean for the participants and then multiplying by 100.

## 6.6 IMPACT ON JOB SATISFACTION

For analysing programme impact on job satisfaction of the adolescents, an index has been constructed using their responses to a set of questions<sup>6</sup> on various facilities/incentives offered by their employers. The answers have been coded in a binary (0/1) scale, with 1 indicating that the adolescent had that facility and 0 if otherwise. Then each outcome has been standardised into a z-score, by subtracting the control group mean and dividing by the control group standard deviation (SD). After that, an average of the z-scores has been calculated and finally standardized to the control group. Thus, the effect sizes can be interpreted relative to the control group. The findings presented in Table 6.7 show that while the overall impact, as well as the impact on boys, are statistically insignificant, the impact is statistically highly significant for girls, with the impact size also being larger for girls.

<sup>6</sup>For constructing the job satisfaction index, adolescents' responses to six (6) questions on satisfaction with: 1) current salary, and availability of the following facilities/incentives from their job have been considered: 2) paid leave during festivals, 3) festival bonus 4) sick leave with pay, 5) scope to share personal issues (sickness, financial issues, etc.) with his/her employer, and 6) relationship with colleagues.

**Table 6.7** Impact on job satisfaction

Indicator	Long-run impact using PSM	Percentage change over end line mean of non-participants
	(1)	(2)
Job satisfaction index	0.15 (0.13)	423.46
Number of observations	487	
Panel A: Girls		
Job satisfaction index	0.64*** (0.21)	107.62
Number of observations	211	
Panel B: Boys		
Job satisfaction index	-0.06 (0.17)	27.92
Number of observations	224	

Note: Figures in the parentheses are standard errors. \*\*\*, \*\* and \* denote statistical significance at 1%, 5% and 10% level, respectively. Column (1) reports the long-run impacts estimated using equation (4). Column (2) reports the impacts in percentage; these are obtained by dividing impact estimate reported in column (1) by mean for the non-participants and then multiplying by 100.

## 6.7 IMPACT ON CONFIDENCE AND EMPOWERMENT

Similar to the index on job satisfaction, two other indices on adolescents' level of confidence<sup>7</sup> and empowerment have been constructed<sup>8</sup>. Findings presented in Table 6.8 show that the programme significantly boosts confidence level among both boys and girls in the long-run, with the magnitude of impact being higher for girls. No significant impact of the programme is found on empowerment (measured here from the aspect of decision-making power) of the adolescents.

<sup>7</sup> For constructing the confidence index, adolescents' responses to questions on being confident enough to perform the following activities have been considered: 1) running own business, 2) starting new business with loan or expanding business, 3) guiding and monitoring his/her employees, 4) purchasing business products at efficient rate, and 5) taking up jobs abroad.

<sup>8</sup> For constructing the empowerment index, adolescents' responses to questions on being allowed/able to make decisions regarding the following issues: 1) household issues 2) their own lives, 3) their siblings' lives, 4) travelling outside of the country and 5) city – for work.



**Table 6.8** Impact on confidence and empowerment

Indicator	Long-run impact using PSM	Percentage change over end-line mean of non-participants
	(1)	(2)
Confidence index	0.19* (0.11)	249.94
Empowerment index	0.06 (0.11)	115.02
Number of observations	487	
Panel A: Girls		
Confidence index	0.33** (0.16)	146.69
Empowerment index	0.19 (0.19)	40.32
Number of observations	211	
Panel B: Boys		
Confidence index	0.27** (0.12)	117.53
Empowerment index	-0.11 (0.13)	20.89
Number of observations	224	

Note: Figures in the parentheses are standard errors. \*\*\*, \*\* and \* denote statistical significance at 1%, 5% and 10% level, respectively. Column (1) reports the long-run impacts estimated using equation (4). Column (2) reports the impacts in percentage; these are obtained by dividing impact estimate reported in column (1) by mean for the non-participants and then multiplying by 100.

## 6.8 IMPACT ON KNOWLEDGE REGARDING HIV/AIDS

Programme impacts on the adolescents' health related knowledge, particularly HIV/AIDS, are reported in Table 6.9. It appears that in the short-run, the programme participants are more likely to know about HIV/AIDS and the ultimate consequence of this disease. However, in the long-run, programme impact using DiD with fixed effect is smaller and also insignificant; perhaps because urban context offers the possibility of gathering knowledge on this concept for the non-participants as well. On the other hand, DiD-PSM estimates (Column 5) show significant and positive long-run impacts in terms of being familiar with this term and having better knowledge about how AIDS spreads.

Table 6.9 Knowledge about HIV/AIDS

Indicators	Short-run impact using DiD with fixed effect	Percentage change over baseline mean of participants	Long-run impact using DiD with fixed effect	Percentage change over baseline mean of participants	Long-run impact using DiD-PSM	Percentage change over baseline mean of participants
	(1)	(2)	(3)	(4)	(5)	(6)
Familiar with the term HIV/AIDS (Yes=1, No=0)	0.06* (0.04)	8.39	0.04 (0.04)	5.50	0.16** (0.06)	20.33
Average knowledge point (Conditional on being familiar with the term)	0.03 (0.02)	6.69	0.04 (0.03)	9.47	0.07** (0.03)	16.05
Adolescents know that death is ultimate consequence of AIDS (Yes=1, No=0)	0.12*** (0.04)	18.80	0.00 (0.05)	-0.60	0.12 (0.07)	18.08
Number of observations	1494		1146		546	

Note: Figures in the parentheses are standard errors. \*\*\*, \*\* and \* denote statistical significance at 1%, 5% and 10% level, respectively. Columns (1) and (3) report the short- and long-run impacts estimated using equation (1) and (2) respectively. Column (5) reports the long-run impacts estimated using equation (4). Columns (2), (4) and (6) report the impacts in percentage; this are obtained by dividing impact estimate reported in columns (1), (3) and (5) by mean for the participants and then multiplying by 100.

## 6.9 IMPACT ON EARLY MARRIAGE

Early marriage of girls is a burning issue in the context of Bangladesh. According to a UNICEF report, about 52% of girls aged 20-24 years old get married before the age of 18 (UNICEF 2016). Findings from a national survey conducted by Plan Bangladesh and ICDDR,B show that poverty, lack of education and unavailability of suitable employment opportunities for girls are among the major factors leading to parents considering marrying off their daughters as the only viable option (Bhattacharyya 2015). The STAR programme does not have any direct activity/component to prevent the social evil of early marriage. However, the programme can still be expected to have an indirect effect through enhancing girls' skill levels, thereby better preparing them for the job market, and ultimately supporting them to available suitable employment opportunities. If this chain of actions works, then young girls, as well as, their parents can be expected to consider that it is better for them to refrain from arranging early marriage and to continue with their employment to get financially secured as well as empowered. With this anticipation, the impact of the STAR programme on adolescent girls' early marriage has been analysed, and the findings are presented in Table 6.10.

For estimating the programme's impact on early marriage, analysis has been conducted on a sample comprising only of girls who were unmarried during the baseline survey. The indicator considered here shows whether the girls who were unmarried during baseline survey got married before the age of 18 during the follow-up surveys. It is found that the programme decreases early marriage by 3 percentage points in the short-run and by 8 percentage points in the long-run. Further exploration reveals that 17 out of the 135 non-participant girls who were unmarried at the baseline got married (before the age of 18) in between the baseline and end line surveys. This number is eight (8) out of 158 for the participant girls, which is about half of the number for the non-participants. This shows that the programme significantly decreased early marriage for girls by more than half (62% to be exact) in the long-run. Possibly, the programme participant girls are able to delay their marriage because of their employment opportunities. This is supported by available literature, which indicates that working status of women has significant effect on age at marriage (Bhattacharyya 2015).

Table A3 in annex presents an additional analysis of the role of marriage in labour market participation for girls. Existing literature indicates that marriage often acts as an obstacle for girls to get involved in labour market (Verick 2014). But our findings show that 92% of married female participants were employed during the end line survey while the corresponding ratio among married female non-participants is only 55%. It points to the fact that despite being married, female participants are skilled and highly motivated to be engaged in the labour market due to programme intervention, while married

Table 6.10 Impact on early marriage (only for girls)

Indicators	After 6 months (Short-run)			After 3 years (Long-run)			
	Participants	Non-participants	Impact	Participants	Non-participants	Impact	% change over baseline mean
Early marriage for girls (early marriage=1)	(1) 0.005	(2) 0.031	(3=1-2) -0.025* (0.01)	(5) 0.05	(6) 0.13	(7=5-6) -0.08** (0.03)	(8= (7/6)*100) 61.53
Number of observations	183	196		158	135		

Note: Figures in the parentheses are standard errors. \*\*\*, \*\* and \* denote statistical significance at 1%, 5% and 10% level, respectively. Columns (3) and (7) report the short- and long-run impacts, respectively. Columns (4) and (8) report the impacts in percentage; these are obtained by dividing impact estimate reported in columns (3) and (7) by mean for the non-participants reported in columns (2) and (6) and then multiplying by 100.

girls, in general, find it difficult to get involved in the labour market. Therefore, it is safe to state that programme intervention can efficiently prevent possible hindrances to girls' employment caused by marriage.

## 6.10 IMPACT ON HOUSEHOLD WELFARE

Given the increased income of the adolescents due to programme participation (Table 6.4), improvement in their household welfare can be expected as existing literature shows that adolescents' incomes have highly positive consequences for their families (Shanahan *et al.* 1996). Food and non-food expenditures have been used here as proxy variables for household welfare. As seen from Table 6.11, per capita daily food expenditure increases significantly due to programme intervention in the long-run. The magnitude of the impact on food expenditure is quite large – about 12% of the mean for the non-participants at end line.

**Table 6.11 Household food and non-food expenditure**

Indicators	Long-run impact using PSM	End line mean of outcome variable of non-participants	Percentage change over end line mean of non-participants
	(1)	(2)	(3)
Per day per capita food expenditure (BDT)	4.92** (2.27)	42.78	11.49
Per day per capita non-food expenditure (BDT)	-1.75 (5.41)	51.69	-3.38
Number of observations	546	268	

Note: Figures in the parentheses are standard errors. \*\*\*, \*\* and \* denote statistical significance at 1%, 5% and 10% level, respectively. Column (1) reports the long-run impacts estimated using equation (4). Column (2) reports the mean of outcome variable for the non-participants. Column (3) reports the impacts in percentage; this are obtained by dividing impact estimate reported in column (1) by mean for the non-participants reported in column (2) and then multiplying by 100.

## SECTION SEVEN

# QUALITATIVE FINDINGS

For better understanding the reasons behind the success and failure of the STAR programme participants, we have also applied qualitative method, which involved in-depth interviews and case studies. For conducting semi-structured interviews, initially, we shortlisted the candidates for further interview by analysing the quantitative data. The success and failure cases have been identified based on post-training employment status and monthly income of the participants. Particularly, adolescents who are successfully involved in their trained field and earning more than BDT 60,000<sup>9</sup> yearly have been considered as success cases. On the contrary, failure cases have been defined as the ones who are still unemployed or employed in an occupation unrelated to the trade in which s/he was trained. Considering these criteria, we have drawn a sample from the end line survey data collected in 2015 on STAR programme participants; and then constructed a sub-sample based on their gender, training background, income, and job location. Dhaka and Chattogram have been purposively selected as the study area in order to shed light on the areas where the programme worked intensively during its pilot phase in 2012. The number and distribution of cases by location are reported in Table 7.1.

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<sup>9</sup>Based on the quantitative data collected during end line survey (2015), highest quintile out of four earning quintiles has been considered here. In other words, since it is found that about 25% of the participants earn more than BDT 60,000 per year, it has been considered as the threshold point for measuring success/failure.

**Table 7.1** Distribution of case studies

Location	Success cases		Failure cases	Total number
	Male	Female		
Dhaka	3	1	2	6
Chattogram	1	3	2	6
Total	4	4	4	12

Most of our respondents belong to households with low per capita income that are unable to prioritise their children's education. Even though few respondents reported being insincere in studies as the main reason behind dropping out, for the majority of them, poor financial condition of their households is the main factor responsible, specifically for most of the female respondents. However, male respondents who are the eldest children of their families asserted that they dropped out with the intention of getting a job for contributing to the household income.

In the context of Bangladesh, higher or tertiary education is often considered as a prerequisite for having a successful career. It is also commonly believed that only professionals like doctors and engineers are able to earn a higher salary. While talking with the STAR programme participants, two dimensions of the school dropout adolescents' frustration were revealed. First, they think that it is no longer possible for them to become a highly paid professional like doctor or engineer or even a teacher due to dropping out from school. And second, their despair grows even higher when they can hardly find any answers to the questions like "what to do next?" or "what would I do for living or supporting my family financially?"

Aside from the psychological pressure after dropping out, the majority of them either remain unemployed or find jobs in the hazardous informal sector through their social networks. Opportunities for getting a decent employment are even more limited for school dropout girls. They are either forced to get married at an early age or bound to stay away from their home to get better opportunity since most of the garments factories are located in the big cities. In this regard, STAR programme helps many of the participants to find their first job often in their neighbourhood. The focus of this programme is to guide these underprivileged and school dropout youths of Bangladesh to have a decent and secure career by equipping them with necessary practical skills. We found that many of the programme participants successfully availed employment opportunities with a higher salary in their training field within one year of completing the training. In this section on findings from the qualitative exploration, we discuss the elements that played a key role in the participants' success (or failure).

## Choosing the right trade

BRAC's STAR programme works for combating the issue of rising youth unemployment through introducing poverty-stricken school dropout adolescents to different trade based vocational trainings. A match between the participants' interests and the trade in which they received training appear to be one of the main factors behind their success. All the successful participants reported that they did not even have the slightest doubt about the trade they had chosen. Several respondents reported that they could complete the training smoothly and their confidence level also increased because of being trained in their area of interest.

### BOX 1.

#### TUMPA'S SUCCESS STORY

Like many girls in Bangladesh, Tumpa had to drop out of school before completing her primary education due to financial crisis. Tumpa's father was unable to work because of illness; and her mother worked as a housemaid in their neighbourhood to bear household expenses. Despite wanting to complete her education, Tumpa was forced to look for a job to support her family. The most likely opportunity for her was to work as a housemaid like her mother. At that time, she learned about BRAC's STAR programme from her former class teacher. She communicated with the local STAR staff and expressed her interest to participate in the programme. When they asked about her preferred trade, she chose tailoring. From a very early age, she had keen interest in dress making as she watched her friends wearing new dresses tailored by their mothers or elder sisters. She always thought that someday she would make dresses for herself and her siblings. Although initially she was a little nervous, she got used to the environment and confidently carried on her journey to be a skilled tailor. She was also fond of the classroom training sessions. She said, "Before this training, I had no idea that tailoring involved so much calculations. Now I have a firm idea about proper measurements." She joyously informed that this knowledge and skill have given her advantage in her current workplace. Now, Tumpa is the key earning member of her family and she inspires and supports her younger sister and brother to continue their education. She is very grateful to BRAC STAR programme for changing her life. She aspires to become a successful entrepreneur, and wishes that in future BRAC's STAR programme will come up with more advanced level vocational training courses.



BOX 2.

## LIZA'S DISAPPOINTMENT

The case of Liza is a perfect example of the importance of matching trade with the participants' interest. Liza was interested to get enrolled in tailoring. However, STAR programme organiser (PO) persuaded her to take a course in mobile phone servicing due to scarcity of seat in tailoring. They assured her that she will be able to transfer to the trade of her choice within two months. She struggled to learn the trade as she did not find it interesting. When she wanted to move to tailoring after two months of training, the programme staff could not accommodate her there. They tried to motivate her by saying, "If boys can do this, why can't you?! As a girl, you have to try to keep pace with the boys as well." As her family members also told her to finish the course, despite her unwillingness, she continued the training. Although she attended most of the training sessions, she felt insecure while working in an environment which is severely male dominated. She said, "How can I work alone with unknown men all around me!" As a result, she obtained only some basic ideas on mobile phone hardware. Currently, she has no plans to do any other mobile phone servicing course or pursue a career in that particular trade. However, she is still interested in having training on tailoring, and stated that if she gets another chance from the STAR programme to pursue a training course on tailoring she would definitely take that opportunity.

From both of these cases, it is evident that matching trade with the participants' interest is one of the vital indicators for success of any vocational training course. In case of unavailability of adequate accommodation in trades of interest, priority might be given to older adolescents who are more likely to learn better and also to make better use of the training. Younger adolescents can be covered in the following years.

## Dedication

Successful people always give efforts to sharpening their skills and working on their professional development despite facing many obstacles at the workplace. Runa's story is the perfect example of the dedication that one requires embracing to become successful in his/her career.

## BOX 3.

## RUNA'S DEVOTION

From a very young age, Runa aspired to become a beautician. She came to know about BRAC's STAR programme from her class teacher. She acknowledged that the theoretical part of the training programme was really good. She also spoke highly of the constant supervision of the POs of the STAR programme. But the people working in the beauty salon where she went to receive on-the-job training were not sincere and supportive to her. Nevertheless, she continued attending the training because of her dedication towards achieving her personal goal. She even made arrangements to meet another beautician every week to learn the things she missed out during her regular training session. According to her, "The more you learn, the more you increase your capacity to learn more. It's just like a sports where the more you play the better results you get." Now, she is working as a freelance beautician in her neighbourhood, and hopes to set up her own beauty salon within 1-2 years.

## Aspiration and proper career planning

Aspiration and proper career planning is also a major driver of success. Proper skills with effective career planning technique and the ability to cope with ambiguity in a changing environment enable individuals to reach their desired career goal.

## BOX 4.

## RASEL'S AMBITION

Since his childhood, Rasel wanted to become a renowned tailor. Despite his parents' doubt about his career choice, Rasel opted for a training course in tailoring under the STAR programme after dropping out of school due to poor financial condition. After successful completion of his training, he convinced the STAR staff to recommend him to one of the famous tailoring shops of the area. With his constant persuasion and dedication, he was able to find a job in the tailor shop of his choice. Moreover, he was able to prove his ability to his supervisor through constant dedication and hard work and was able to double his salary within a year. Although he had offers from few neighbouring tailor shops with a higher salary, he preferred to maintain the good terms with his current employer and planned to keep learning and saving money until he is able to open his own tailoring shop. He is confident that he will be able to do so within the next couple of years.

Thus, proper planning for a career along with acquiring the necessary skills is an important indicator of success. It requires planning to gain proper experience and to figure out how to land the right job. The extent of effort given in career planning, as well as the execution of the plan, also determine the success of an individual.

## Participants age

Selection of the trade of a participant should be done carefully and prudently. Family background, education, gender status, ambition, age, physical and mental condition, and previous work experience should be considered before offering a course to a particular participant. Qualitative findings show that the intervention is less effective for relatively younger participants. Moreover, younger adolescents face difficulties to learn technical trades (i.e. mobile phone servicing, fridge repairing, etc.).

### BOX 5

#### AHAD'S HARDSHIP

Ahad's family migrated to Chattogram from Barishal 20 years ago because of riverbank erosion. Since then his elder brother took up the household responsibilities. At the age of 13, Ahad chose to get trained in the motor mechanic trade under BRAC's STAR programme. However, he did not have the basic competencies required to learn the trade. None of his family members or BRAC staff guided him in this regard. During training sessions, he understood that he was too young to learn many complex issues of this trade. He failed to catch up with the others who were much older than him. Moreover, the duration of the course was not favourable for him to understand anything thoroughly. He believed that if the duration of the course were longer (like a year or so), he could have understood it better. Currently, Asad is working as a day labourer like his elder brother and can hardly earn BDT 1,500 per month.

Thus, the age range of targeting should be set up according to trades, particularly for more technical trades (i.e. mobile phone servicing, fridge repairing, etc.). Respondents reported that younger participants failed to learn technical knowledge and orderliness within the given training period.

## Social Network

Success also depends on various other individual issues such as networking. Having a strong social network can be of great advantage for individuals to avail better jobs. Several successful participants reported that they got their jobs through their social networks. Respondents, specifically female participants, reported that they had very limited knowledge about job market because of the absence of having any supportive relatives or neighbours who could help them find a proper job.

## Importance of post-training support by the programme staff

Lastly, most of the programme participants found unemployed during the end line survey were expecting BRAC to do something for them. Several of them reported that the STAR POs did not help them to get any job after completion of the training. During the training period, the POs frequently visited them and spoke with them; but the frequency of visits came to zero once the training was over. Thus, the STAR programme needs to think of properly designed and feasible post training supports to help potential entrepreneurs.

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## SECTION EIGHT

# CONCLUSION

Notwithstanding remarkable progress in terms of the Millennium Development Goals (MDGs), not much noticeable progress has been made in case of adolescent development in Bangladesh. The school dropout adolescents, in particular, are among the most vulnerable ones. Poverty and absence of proper skills training force them to engage in the informal economic sector characterised by poor and hazardous working conditions. Creating decent employment opportunities for adolescents, therefore, remains a major concern. In this context, BRAC has initiated the programme titled 'Skills Training for Advancing Resources (STAR)' in 2012, to work for achieving sustainable development of the adolescents that are deprived of education because of financial hardship. The programme aims to do so by enhancing their skill levels which would help them to avail decent and appropriate employment opportunities. In particular, the programme works with 14-18 years old, secondary school dropouts, with financially vulnerable family background.

This paper analyses the sustainability of the programme impacts on employment, income, savings, and empowerment of the adolescents and also on the welfare of their household as a whole. Findings reveal that the long-run impact on employment (32 percentage points) is higher than that in the short-run (19 percentage points). The magnitudes of the impact are found to be higher for girls than for boys in both the short- and long-run, indicating that absence of programme intervention leads to a great loss for girls in terms of employment opportunities. Programme participation also significantly increases skilled labour supply and monthly income of the adolescents. This increased income of the adolescents is found to be transformed into household welfare in the long-run. In the long-run, the programme also has positive impacts on adolescents' confidence,

empowerment and work environment. Highly encouraging and sustainable impact of programme intervention is also found on early marriage for girls. To be specific, programme intervention is found to have reduced early marriage of girls by about 62% in the long-run.

Trade wise analysis of employment indicates that in the long-run adolescents with training on trades like motorcycle repairing and electric work have higher employment rate, followed by tailoring, beauty care and refrigerator repairing. This is something that needs to be monitored continuously so that the programme can provide training for trades which actually have good career prospects for the participating adolescents.

Furthermore, qualitative findings demonstrate that STAR programme participants can successfully avail employment opportunity with the decent monetary return, and that the temperament of success varies from adolescent to adolescent and depends on individual's ambition, perseverance, prudence, future plan and determination. Additionally, the findings indicate the need for setting age range of targeting by trades and providing post training supports from the programme.

The integral role played by the STAR programme to achieve adolescent development is commendable. Despite some struggles faced by the participants during the training and the post training phase (ie unavailability of preferred trades, absence of proper post training follow-up, etc.), the prominent improvements occurring in the livelihood and social aspects are quite promising. Therefore, offering training on trades with high demand in the job market, considering suitability of participants age for specific trades and giving adequate emphasis on post training follow-up are recommended to make this programme even more effective.

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## ANNEXES

**Table A1. Attrition rate**

Sample type	2012	2013	2015	Attrition at 2013	Attrition at 2015	Revisited at both 2013 and 2015	Attrition in balanced data
Participants	394	349	280	11.42	28.93	269	31.73
Non-participants	606	398	293	34.32	51.65	214	64.69
Total	1000	747	573	25.30	42.70	483	51.70

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

**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	-0.344*
Adolescents' average age (year)	15.14	14.94	-0.312***
Male adolescents (Male=1, female=0)	0.62	0.48	-0.160***
Married adolescents (Married=1, otherwise=0)	1.02	1.01	-0.01
Adolescents' average years of schooling	4.40	4.82	0.539***
Drop out adolescents (Dropout=1, otherwise=0)	0.92	0.88	0.133***
Number of observations	427	573	

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

**Table A3. Employment status at end line of married and unmarried girl**

Indicators	Marital status during the end-line survey					
	Married			Unmarried		
	Participants	Non-participants	Difference	Participants	Non-participants	Difference
Engaged in IGA 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 the parentheses are standard errors. \*\*\*, \*\* and \* denote statistical significance at 1%, 5% and 10% level, respectively

**Table A4. Employment status at end line across different trades offered by the programme**

Participation in trade on	Number of participants	Engaged in IGA (Yes=1, No=0)
Mobile Phone servicing	35	0.74
Tailoring and dress making	98	0.79
Motorcycle repairing	48	0.92
Block printing	1	1.00
Embroidery	10	0.70
Beauty care	54	0.78
Refrigeration	22	0.77
Electrical installation and maintenance	12	0.83

# SKILLS DEVELOPMENT

Working paper | Series No. 03

The Skills Development Working Paper Series is a part of RED's on-going research agenda. This series has been initiated with the aim of documenting the learnings from BRAC's experiences with its Skills Development initiatives. The findings contained in this series are expected to help policymakers and development practitioners to be better equipped to enhance skills of disadvantaged youths, and thus facilitate their job placement. These would also help to promote decent work and social inclusion.

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