



## **EDUCATE THE GIRLS: THE EFFECTS OF GENDER TARGETED CASH TRANSFERS ON FEMALE SCHOOLING AND EARLY MARRIAGE IN PUNJAB, PAKISTAN**

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ARTICLE INFO	ABSTRACT
<p><b>Keywords:</b> School Enrollment Ratio; Early Marriage Trend; Conditional Cash Transfer</p> <p><b>Corresponding Author:</b> <b>Najeeb Ullah,</b> Graduate School of International Relations, International University of Japan, Email: <a href="mailto:najeeb@iuj.ac.jp">najeeb@iuj.ac.jp</a></p>	<p>This study delves into the transformative impact of the "Zewar-e-Taleem Program", a targeted conditional cash transfer initiative aimed at enhancing female literacy in underprivileged districts of Punjab, Pakistan. Using data from the Pakistan Social and Living Standards Measurement survey (district level) for the years 2019-20, the study seeks to assess how this program influenced female enrollment rates in public schools, as well as the age at which adolescent girls enter into marriage in these districts. The findings of the study are both noteworthy and encouraging. Specifically, the research indicates that the "Zewar-e-Taleem Program" has resulted in an increase in female enrollment in schools. Additionally, the program has contributed to a substantial decrease in adolescent girls' age of marriage compared to a control group. These results underscore the effectiveness of targeted cash transfer programs as a tool for promoting social change and gender equality in developing countries.</p>

### **INTRODUCTION**

Conditional cash transfers can have a profound impact on social dynamics, but a poorly designed program may engender gender disparities and induce inefficiencies in society. Nonetheless, policy-makers across both advanced and developing nations agree that improving health and education, particularly among women and children, represents a fundamental objective of public policy. In developing countries, the disparities in both the scale and intensity of social issues can be significant. To tackle these challenges,

governments and foreign donor organizations have undertaken several initiatives, including the provision of free healthcare and the implementation of conditional cash transfer programs that incentivize school attendance. Such programs have emerged as a crucial strategy for policy-makers to address poverty and invest in human capital, with a focus on targeting impoverished households in developing countries. These ranged from Ehsaas Program<sup>1</sup> for Poverty Alleviation and Social Safety objective, flood relief cash program in Pakistan. Also, Food for Education Program in Bangladesh a monthly ration in shape of rice or wheat was provided to poor families if their children attend primary school.

It has also been observed that developing countries females are underinvested by the households regarding their education and health due to complex socio-economic factors/reasons which necessitates Government interventions. Same scenario is undergoing in Pakistan as a developing country with complex cultural differences.

Pakistani culture is rapidly evolving as more women compete in the public sphere. Conventionally, men's responsibilities include working outside the home to generate money, whereas women's responsibilities include domestic tasks like cooking, doing the laundry, cleaning, caring for dependents. Meanwhile, notable differences are there in viewpoints regarding the role of women among young respondents, particularly in females. Although education, jobs, and other infrastructure advances have altered, there still exists a contradiction of cultural values in rural villages. Some stereotyped gender concepts are still fairly obvious and needs to be tackled (Farooq, 2020).

Farooq and Kayani (2013) in a study found that, aside from marriage event, the customs on the birth of a son have been constant throughout the years, whereas traditions on the birth of a daughter have been trending higher. This transformation was mostly brought about by increased awareness via education. Also, economic reasons are there behind these changes in customs during of significant.

Khalid et al., 2020 in their study regarding empowerment of women in Punjab, comes to the conclusion that women's empowerment suffers in communities with limited access to education and basic provisions and vice versa. However, the study's calculations suggest that socio-economic and demographic factors play a substantial role in the current quandary and that changes in any of these factors (i.e., prenatal consultation, ownership of agricultural land, female head age, household's head education, household size, female age, educated women, residential status, occupancy status, wage difference) have a considerable influence on the empowerment of women.

Pakistan has effectively decentralized<sup>2</sup> control of public education to the provincial level, in contrast to many neighboring countries, where the system is heavily centralized. Our study is focused on with-in Punjab, which is Pakistan's biggest and richest province, where enrollment rates and gender disparities are lower than in other provinces and literacy rates are greater. Despite being the province in Pakistan with the best educational outcomes, the Government of Punjab (hereafter referred as GoP) was worried about a number of issues affecting the education sector, including inadequate resource allocation, systemic weakness in

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<sup>1</sup> Federal Government disbursed direct cash to females of low-income households for economic empowerment of women in Mar, 2019.

<sup>2</sup> Education autonomy was effectively decentralized through 18<sup>th</sup> amendment on April 19, 2010.

public sector delivery as a result of over-centralization and inadequate management, and poor performance of the schooling system in terms of quality, access, and discipline. To address these issues many programs<sup>3</sup> were initiated and more prominent reform program ever in Pakistan was the Punjab Education Sector Reforms Program.

The Government of Punjab in Pakistan has a specialized department for schools named “School Education Department” which is responsible from primary to higher secondary schools planning, legislation, and the improvement of educational standards in education. A number of interventions in the education sector has been implemented by this department, including the distribution of free textbooks, improved/new school infrastructure, the hiring of regular and contract teachers, raising entry requirements for teachers, a female stipend program, giving school councils more authority, and community and Non-Government Organization management of school councils. Some of these reform's components haven't been implemented completely yet; others have been phased in over time (for instance enhanced community involvement through school councils).

As per “Right of Children to Free and Compulsory Education Act of 2009”, free education for children aged six to fourteen, or up to eighth grade was implemented in Punjab. The GoP has undertaken a number of measures<sup>4</sup> to improve quality. The Federal Ministry of Education and the provincial governments are responsible for overseeing education in Pakistan. The federal government ministry of education is primarily assisting with curriculum formulation, accreditation, and research and development funding.

As per written statement of Article 25-A of Pakistan's Constitution, "The State shall offer free and compulsory education in the manner provided by law to all children from the age of five to sixteen years." Generally, Punjab's education system has pre-school (age 3~5), primary grades 1 to 5 (age 5~11), elementary grades 6 to 8 (age 11~14) and secondary grades 9 to 10 (age 14~17) before college for students.

Being a developing country and having per capita income of only USD 1188.9 (as of World Bank statistics of 2020), it is important for Pakistan to enable adolescent girls to provide education at lower cost and to reduce the cost of education especially in less developed areas. One vital policy to achieve this objective is transferring cash to parents which can help in increasing female school attendance ratio as used in “Zewar-e-Taleem Program” which is my area of analysis.

Hence it is imperative to dissect any new policy that aims to facilitate the education sector in Punjab (Pakistan) may create unwanted distortions in the market and can lead to undesirable results.

### **1.3 Research Question**

Therefore, this research aims to quantify the impact of Punjab's Conditional Cash Transfer Program on the adolescent girl's decision regarding their retention in schools after primary and later marriage and we will suggest future policies based on these results. The research question for this thesis is:

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<sup>3</sup> For better quality programs like Education Sector Reform (ESR) plan in Januray,2002, Pakistan Education Development and Improvement Program (EDIP) 2010-2013 were initiated.

<sup>4</sup> PMIU (Program Monitoring and Implementation Unit) staff regularly visit school and monitor the school's indicators electronically in Punjab.

1. How did the implementation of a specialized targeted cash transfer program, spearheaded by the Government of Punjab, influence the decisions pertaining to female schooling and age of marriage within the less-developed districts of Punjab? To answer the research question, this study utilizes Pakistan Social & Living Standards Measurement Survey 2019-20 district level data that was accumulated nationally by Pakistan Bureau of Statistics in Pakistan from each district on an approved questionnaire. We use the Difference in Differences (Variance if DID) Model that uses younger cohorts and comparison between less-developed districts and relatively developed-districts to estimate the impact of the policy on female enrolment and age of marriage. We use both school retention or enrollment after primary education and early marry as the outcome variables for measuring the trends in girls of Punjab. From the results of the study, we were able to conclude that the Policy of conditional cash transfer to girls of selected districts had a positive impact on the school enrollment and prolonged marriage, however, as the policy continued, it allowed the parents to consolidate their gains on education, thereby leading to greater social consequences with the passage of time.

#### **1.4 Importance of study**

Indeed, the findings of this research can be very helpful in identifying effective policy interventions that can improve female education and literacy rates in Punjab, Pakistan. The “Zewar-e-Taleem Program” is one such policy intervention that has been implemented to address the issue of low female education rates, and the research aims to evaluate the effectiveness of this program in achieving its objectives. If the research finds that the program has a positive impact on female education and literacy rates, it can provide valuable insights to policymakers and education departments on how to design and implement effective conditional cash transfer programs to improve education outcomes. Furthermore, the research can help to identify the factors that hinder female education and literacy rates in Punjab and suggest strategies to address these challenges. Overall, the research can play a crucial role in improving the education and literacy rates of women in Punjab, which can have significant long-term social and economic benefits for the region.

#### **1.5 Organization of the study**

The current study is organized into several distinct sections that aim to provide a comprehensive analysis of the targeted cash transfer program implemented in less-developed districts of Punjab by the Government of Pakistan. In Section 2, we offer a thorough background of the policy and program, providing readers with a nuanced understanding of its historical context and the underlying motivations that led to its creation. Additionally, we underscore the importance of our study in relation to Pakistan's literacy ratio, highlighting the program's potential impact on enhancing educational attainment among adolescent girls in disadvantaged areas. Section 3 of the study provides an overview of existing literature on gender-targeted cash transfers and identifies research gaps that our study seeks to address. By surveying the current state of scholarship in the field, we aim to contextualize our research and offer a more nuanced understanding of the policy interventions under investigation. In Section 4, we describe the data utilized and the methodology employed for the study. By outlining our research design and the data collection techniques employed, we provide readers with a comprehensive understanding of the methods used to investigate the policy's impact on female education and age of marriage decisions. Section 5 presents the regression

results and offers a detailed discussion based on those results. We employ sophisticated analytical techniques to examine the relationship between the targeted cash transfer program and key indicators of educational attainment and age of marriage among adolescent girls in less-developed districts of Punjab. Through this rigorous analysis, we seek to provide readers with a nuanced understanding of the program's impact. Finally, in Section 6, we offer a conclusion to our study, drawing on the results of our analysis to offer insights into the policy's effectiveness and its broader implications for gender-targeted interventions in developing countries. By contextualizing our findings within existing scholarship, we aim to provide a comprehensive and sophisticated analysis of this important policy intervention.

## 2. BACKGROUND

In March 2017, 16 districts of southern Punjab were sorted out for “Zewar-e-Taleem Program”. Under this program adolescent girls enrolled in public schools are offered monthly scholarship. The student must maintain attendance record of at least 80% in order to receive the stipend, which is given out on a quarterly basis. Punjab's minimum monthly salary is Rs. 15,000<sup>5</sup> (USD 98.53) per month, this transfer amount is 6.67 percent of minimum wage. The introduction of a stipend was offered in order to increase female student enrolment in public schools especially in less-developed districts of Punjab. To enhance quick delivery and transparency, the stipend was provided through ATM cards rather than the government postal service (previous practice of cash transfers in 2004). Households who have adolescent girls and these are enrolled in public elementary or secondary school can only utilize the conditional cash transfer as an income transfer.

### 2.1 What is Zewar-e-Taleem Program?

This program was introduced in March, 2017. Sixteen districts of Punjab out of 36 districts were selected for this CCT program on the basis of low literacy rate on an average. The average was estimated on population literacy rate of 10 years and older on the census of 1998. Both politically and ethically, randomizing stipend districts was not a good option. The least uncontroversial method to launch this new stipend program was instead thought to be the open distribution of this component to the districts with the lowest literacy rates.

Under this stipend program, the female students are entitled to receive a monthly stipend conditional on their enrollment in grade 6-10 in any government girls’ school in selected districts. Other main condition to receive this stipend is to maintain 80% class attendance on average. This stipend is dully verified from school on quarterly basis for payment from PMIU. Each eligible student is entitled to receive Rs.1,000 per month. Households who are going to

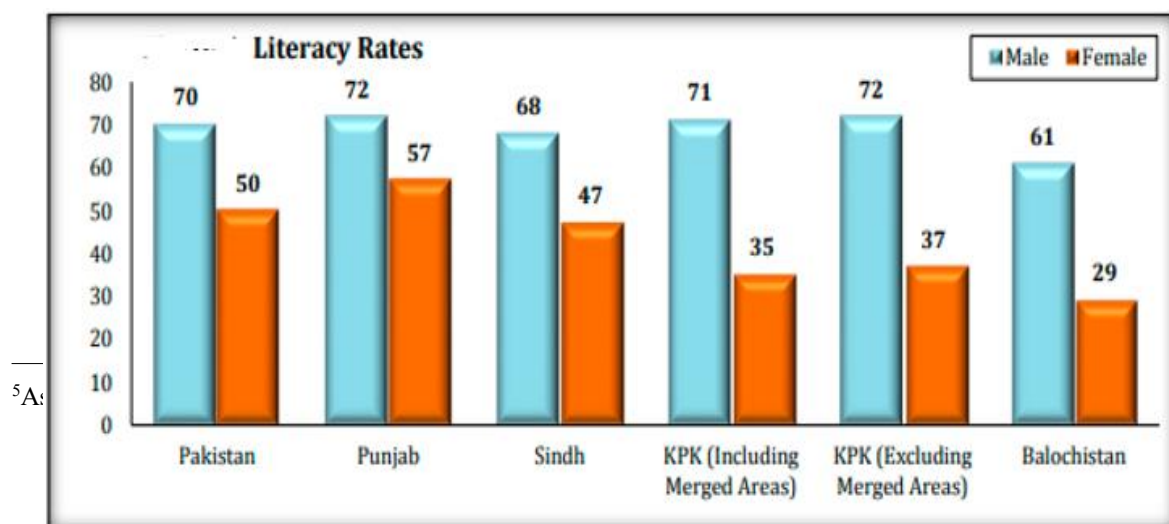


Figure 1: Literacy rate of all provinces of Pakistan with gender (PSLM 2019)

send their daughters in public middle or secondary schools, anyway they essentially receive an income transfer. The fascinating perspective, regarding this program is transferring of amount to each and every girl, enrolled in elementary and secondary class without any household income constraint. In contrast, it is an incentive for the households with out-of-school female students/daughters.

Out of school children are defined as those aged 5 to 16 years who have never attended school or who have dropped out. According to the data<sup>6</sup> provided, 32% of children at the national level fall into this category in 2019-20. Additionally, it is stated that out of school children are more prevalent in rural areas (37%) than in urban areas (22%). Lastly, the region of Punjab has the lowest percentage of out of school children at 24%. This statement is indicating that the district of Chakwal and Narowal in the Punjab province of Pakistan have the lowest number of out of school children, with 9% of children not attending school. On the other hand, Rajanpur district has the highest percentage of out of school children, with 48% of children not attending school. Overall, it seems that the majority of districts in Punjab have less than 25% of out of school children, with Chakwal and Narowal having the lowest numbers. Most of district have been included in this stipend program to intervene this situation in less developed districts of Punjab.

Figure-2 shows the percentage of out of school children in each district of Punjab, it clearly shows the less-developed districts (mostly in southern Punjab) have low literacy rate as well as more out of school children (up to 40%) compared to relatively developed districts in northern Punjab. The least literate district is Rajanpur which has most 47.05% out of school children nearly half.

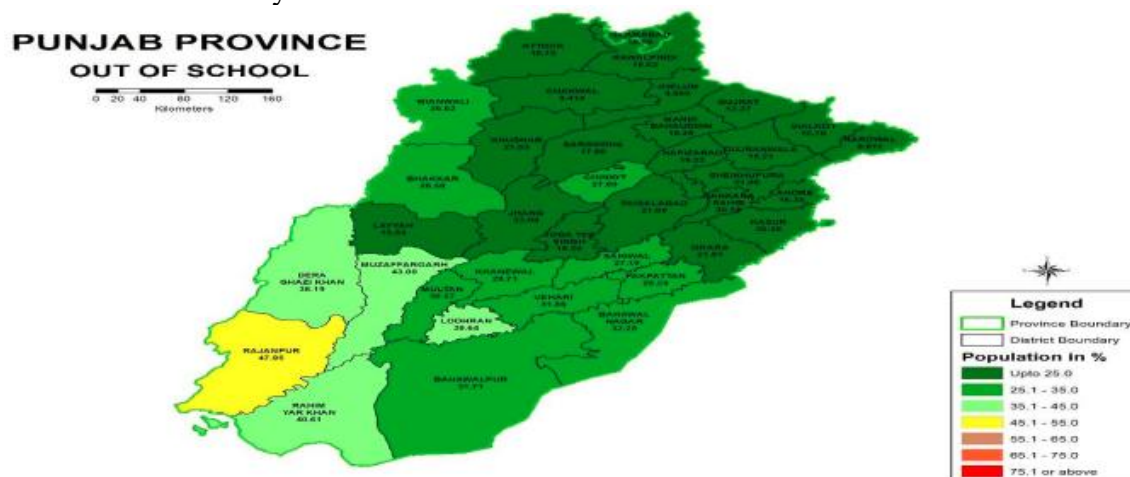


Figure 2: Out of School children in Punjab Pakistan (Source: PSLM key finding report 2019-20).

## 2.2 Review of PSLM Survey in Punjab

Data on Pakistan Social and Living Measurement (PSLM) Survey at national level is a regular activity by Pakistan Bureau of Statistics since 2004. The data is available for evaluating the development plans for all concerned policy makers and researchers. My data

<sup>6</sup> The source information is available at <https://www.pbs.gov.pk/publication/key-finding-report-pslm-district-level-survey-2019-20>. The key finding report figures at page 02,03,04 (Education) is referred.

was collected during October, 2019 to March, 2020 representing all districts of Pakistan. PSLM data contains our main variable of interest with demographic factors of each household. It also contains the information about family structure and health status of an individual.

It is a nationwide representative survey with 195,000 responding households with 870,171 observations. PSLM 2019-20 survey is the 12<sup>th</sup> round since 2004, however it was 6<sup>th</sup> level of round for district survey. To properly monitor SDG's the earlier questionnaire of 2004 was broadly discussed and reviewed by apex committee with inclusion of new modules like disability, immigration and food insecurity etc. Furthermore, to ensure reliability, first time survey results were accumulated and transmitted electronically through tablets based on a specialized android software coupled with GIS monitoring through central data processing unit. The PSLM 2019-20 district survey includes with variety of variables with representative of all provinces of Pakistan. This survey has large variety of questions regarding individual age, education, health of each household. It has two questionnaires of female and male that collect relevant information about maternal health as well. A total of 870,171 responses were collected through survey teams. Although the data includes all the provinces of Pakistan, Government of Punjab started this CCT for the females in Punjab therefore data for all districts of Punjab was analyzed in this paper. A total of 423,336 responses were collected from all 36 districts and one capital i.e., Islamabad. It is worth mentioning that federal capital, Islamabad, has no policy of Conditional Cash Transfer, therefore its responses not include in our analysis. 209,646 responses were gathered and accumulated in Punjab relate to female which is 50% of the total responses. As our main focus is on the girl's education status and their motivation to continue their education, so main analysis depends on their age of education and marriage.

### **3. LITERATURE REVIEW**

Filmer and Schady (2011) in their paper tried to observe the impact of conditional cash transfer and its impacts on school enrolment in very poor countries specifically in Cambodia by using RD technique, they found up to 2% receipt of the median household expenditure has substantial increase of 25 percentage points in school enrolment. Above 2% transfer as mentioned above has less or did not raise enrollment rate. Chaudhury and Parajuli (2010) in their study talked about direct effect of stipend program on female schooling in Punjab, Pakistan by using provincial school census data of 2003-2005. By using triple differencing and regression discontinuity techniques they found 9% increase in female schooling enrolment in grade 6-8 in eligible schools. In this paper impact was noted in grade 6-8, we are focusing by using triple differencing model on enrolment trend from grade 6-10 by PSLM district level survey 2019-20.

In an estimate one hundred fifteen million school going children are out of schools in developing countries, so better access to school is important to achieve development objective. Secondary schooling investment by the governments helps for provision of local supply of teachers hence reduction in educational cost. Furthermore, construction of Government School in a village has a remarkable effect on educational outcomes (Andrabi, T., Das, J., & Khwaja, A. I. 2013).

Conditional cash transfers in Bangladesh were unable to take the poorest to schools which itself have more long-term adverse consequences as to take them in line with

governable citizens, however these CCT<sup>7</sup>'s have an impact on poor to alleviate chronic poverty and to expand educational access (Hossain, N. 2010).

Baired et al. (2010) claim that CCT programs are effective for enhancing school enrolment with other secondary outcomes as well likewise teen pregnancy, early marriage and sexual attitude. The study was done on young women of Malawi after Zomba Cash transfer program in the form of school fees and direct cash transfers to eligibles. The program was most significant by showing 30% to 40% reduction in probability of getting married earlier with sexual activity reduction by 38% in program beneficiaries compared to control group.

Sebastian et al. (2019) in their study tried to examine the influence of unconditional cash transfers in Lesotho. They use an experimental evaluation method and found non-identical results for girls and boys. The results shows that the conditional cash transfer program was really effective for sending girls to school as compared to that of boys. However, the results have different outcomes when a female-headed household is taken into account the results for boys also improved relative to girls. Also, if the cash is received by the mother has no significant impact in school attendance by this program.

Gitter and Barham (2008) tried to examine the Red de Protection Social (RPS) which is a conditional cash transfer to the household in exchange of their regular school attendance and health clinics in Nicaragua. In this program a unique feature was that the stipend will be transferred only in female account, the logic was there that many researches showed that it is more likely that these transfers have more tendency to be expensed on their children's health, nutrition and education.

Schultz (2002) in his study finds that inappropriate public expenditure towards female's education creating tax distortions and labor force issues especially in the territories where these are less educated. Basically, this study summarizes all the empirical work which clearly shows that years of schooling of women has more marginal returns to male as the year of schooling increases. In his paper he claims that a largest component of a public expenditure in sense of human capital comes with an outcome of tendency towards enrolment of the general public. From all empirical summaries he claims that children education is highly correlated to mother's education rather than fathers.

Hong and Sarr (2012) in their study tried to find the relation between women's stipend program and their education attainment with its subsequent long run effects in terms of their age of marriage and their labor market outcomes in Bangladesh. By using FSSP (Female Secondary Schooling Program) as an IV, they used the data of Demographic and Health Surveys (DHS,2007) and found the due to this conditional cash transfers have contributed a lot and arisen the women's education by 1.6 to 2 years. Also, it has increased the age of marriage by 1.4 to 2.3 years which they show as non-negligible outcome or effect.

Ahmed and Zeshan (2014) in their study tried to find the social effects of targeted cash transfers program for secondary school females in Khyber Pakhtunkhwa (Pakistan). By using both qualitative as well as quantitative approach they found the policy effective for women education attainment. They also used PSLM data for quantitative approach by probit modeling with variable of household education, income, distance of school and conditional

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<sup>7</sup> Conditional cash transferee



cash transfer. For parameter of interest, they found 7 percentage point increase in female school attendance due to this stipend program compared to districts where this program was not offered.

Chahyadi et al. (2020) in their empirical study tried to find the cumulative effects of targeted cash transfers in Indonesia. They used the World Bank's baseline survey data of 14,326 households in 2007. By using IV approach for an outcome of health seeking behavior they found that 23 percentage point increase that a baby will be born under the assistance of a trained midwife. Furthermore, regarding impacts on high school completion rate a significant result of 7 percentage point (with a  $p$ -value=0.139) was observed. As of age of marriage not a significant but a decrease in 1.2 percentage point was observed for age 16 to 17 (table-6).

Musadiq and Said (2023) in their analysis focused on the long-term effects of a conditional cash transfer program 2004 in Punjab (Pakistan) on women's marriage, fertility and health outcome. By using the panel data of MICS survey 2003-2017 they found on the basis of DID approach that due to this stipend program probability of completing secondary schooling increased by 1.9 percent and a significant decrease in age of marriage by 3.5 percent than the comparison sample. They suggested such interventions by Government which are beneficial for long run outcomes.

According to Benhassine et al. (2015), CCTs have been demonstrated to promote human capital investments; nevertheless, their typical characteristics make them costly. We estimate an alternative government-run program, a "labeled cash transfer" (LCT), using a large randomized experiment in Morocco: a small cash transfer made to fathers of school-aged children in poor rural communities that is not conditional on school attendance but is explicitly labeled as an education support program. We see significant increases in school participation. In our case, adding conditionality and targeting moms made no effect. The program enhanced parents' sense that education was a worthy investment, which is a possible explanation for the outcomes.

It is important to note that while the literature review provides valuable insights into the topic of conditional cash transfers and female schooling, age of marriage, fertility and their empowerment, it is still important to conduct a thorough analysis of the specific program (Zewar-e-Taleem) being implemented in Punjab, Pakistan. Additionally, while the results of our study may align with the expectations and previous researches, it is important to acknowledge any limitations and potential biases in the methodology and interpretation of the data.

## **4. DATA AND METHODOLOGY**

### **4.1 Data**

The present inquiry employs a dataset obtained from a nationwide survey conducted by the Pakistan Bureau of Statistics (PBS), an official government agency that gathers and disseminates statistical information for the purposes of policy formulation, planning, and research. The cross-sectional dataset used in this study encompasses a representative sample of Punjab, comprising 423,336 responses, which is supplemented with an education file to procure educational background information for each respondent. Given that the variable of interest pertains to adolescent girls, cohorts were formed for birth years within the relevant age group. Sixteen districts of Punjab, which were offered a conditional cash transfer program for adolescent girls by the Government of Punjab, are designated as the treated

group, while the remaining twenty districts that did not receive this subsidy are assigned to the comparison group. A dummy variable is employed to signify the treatment districts, with a value of "1" assigned to districts that received the conditional cash transfer, and a value of "0" assigned to those that did not. This enables a comparative analysis of outcomes between the two groups of districts. Overall, the dataset utilized in this study comprises 71,624 observations at the district level, and is employed to scrutinize the impact of the conditional cash transfer program on female enrollment in schools and the age of marriage in the targeted districts of Punjab.

This conditional stipend is offered to female students in grade 6-10. Typically, students aged between 11 to 15 are enrolled in schools. It is a fact that in secondary education has paucity of private schools (Unlike primary education) in Punjab, therefore this program has initial focus on public schools' reforms as well. One of the more obvious objectives of this program is to enhance the supply of female teachers as well as other health care related services, particularly the areas with poor economic situation and low literacy rate (mostly in south Punjab)

Figure-3 shows the literacy trend between the less developed and relatively developed districts of Punjab can be shown as below on the basis of literacy rates as per previous 4 national census reported by Pakistan Bureau of Statistics (PBS).

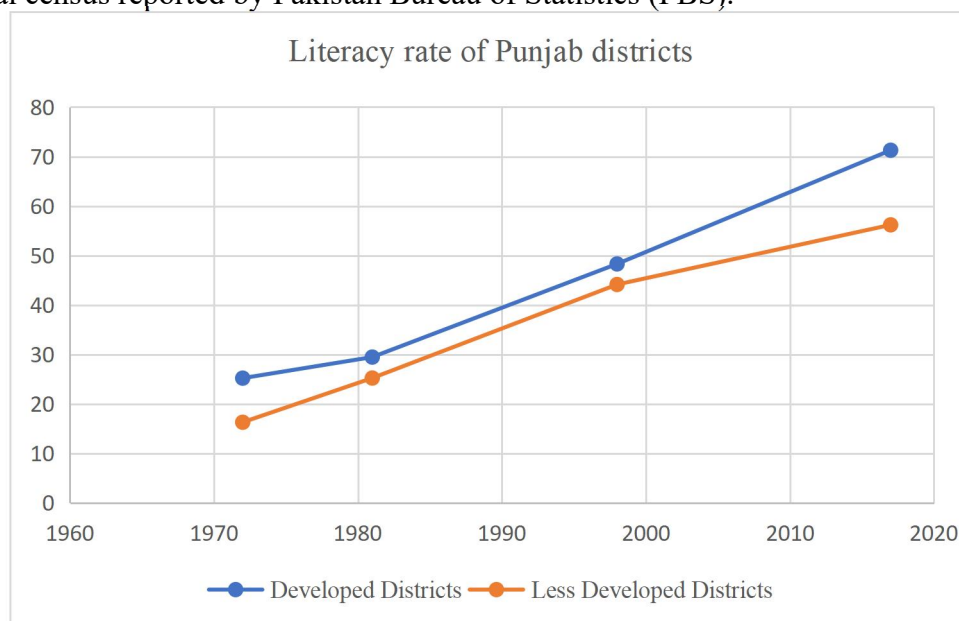


Figure 3: Author's work: Census data 1961, 1981, 1998 & 2017.

The variables used in our model are defined below.

**Table 1: Definitions of the Variables.**

Dependent Variables	Description
enrollment	Refers to a binary variable about respondent, who is attending the public school currently equals 1 or zero

	otherwise.
marry	It refers to a respondent marital status of a respondent equals 1 if married or zero otherwise.
<b>Independent Variables</b>	
younger	Younger cohort is the respondent who born after 2002 equals 1 or zero otherwise but not elder than 19 years in 2019.
district	Refers to the name of the marked area with specific population.
treatment	Treatment refers to a respondent who is residing in the district where CCT is offered.
female	It belongs to a gender of a respondent with code 1 if the respondent is a girl or zero otherwise.
urban	It refers to place of residence of a respondent. If reside in urban area variable code is 1.

We have created age cohorts in our analysis based on the date of birth of the girls in our sample. We have also assigned exposure to the conditional cash transfer program based on two criteria: (i) the treatment status of the district where the girls were enrolled in school and (ii) the number of years during the girls' school-going age when the program was effective. Girls in comparison districts were not eligible for this program during this period. Girls aged 18 and older in 2019 are too old which were not eligible for this stipend in the treated districts. These two groups with specific age groups form our comparison sample. Girls aged 15 in 2017 with birthyear 2002 have one-year exposure, respectively birth year 2003, 2004, 2005 and 2006 have 2 years of program exposure in 2019 as explained below in Table 2.

**Table 2: details of the treated group and years of exposure to each birth year cohort.**

Treatment Group, 16 districts (Grade in 2017)	Age at 2017	Age at 2019	Status	Birth year (as per PSLM Survey 2019)
Grade 6	11	13 (2 years exposure)	Treated	2006~2007
Grade 7	12	14 (2 years exposure)	Treated	2005~2006
Grade 8	13	15 (2 years exposure)	Treated	2004~2005

Grade 9	14	16 (2 years exposure)	Treated	2003~2004
Grade 10	15	17 (1-year exposure)	Treated	2002~2003
Not known	16	18 (No exposure)	Not Treated	2001~2002
Not known	17	19 (No exposure)	Not Treated	2000~2001

#### 4.2 Summary statistics.

This conditional stipend is offered to female students in grade 6-10. Typically, students aged between 11 to 15 are enrolled in schools. It is a fact that in secondary education has paucity of private schools (Unlike primary education) in Punjab, therefore this program has initial focus on public schools' reforms as well. One of the more obvious objectives of this program is to enhance the supply of female teachers as well as other health care related services, particularly the areas with poor economic situation and low literacy rate (mostly in south Punjab). Table.3 provides the summary statistics for the variable "district" used in our estimation. The number of respondents used in our estimation were 32788 and 38836 in less developed and developed districts respectively with a total of 71,624 responses.

*Table 3: Summary Statistics (by development status of a district)*

Treatment: 16 Less Developed Districts						Control: 20 Developed Districts				
Variable	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
Enrollment	32788	.475	.499	0	1	38836	.511	.5	0	1
Marry	32788	.074	.261	0	1	38836	.054	.226	0	1
District	32788	16.8	9.896	2	36	38836	21.112	11.023	1	37
Younger	32788	.62	.485	0	1	38836	.621	.485	0	1
Female	32788	.488	.5	0	1	38836	.49	.5	0	1
Age	32788	16.474	2.308	12	21	38836	16.487	2.295	12	21
Urban	32788	.338	.473	0	1	38836	.282	.45	0	1

Table.4 provides the summary statistics for the variable "younger" used in our estimation. Our sample consisted of 71,624 individuals in total. Furthermore, the number of respondents for treatment and control cohorts were 44,430 and 27,194 respectively for our estimation.

*Table 4: Summary Statistics (by birth cohort)*

Treatment: Younger Cohorts (age 13 to 17)						Control: Older Cohorts (age 18 to 19)				
Variable	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
Enrollment	44430	.63	.483	0	1	27194	.273	.446	0	1
Marry	44430	.007	.082	0	1	27194	.155	.362	0	1
District	44430	19.136	10.727	1	37	27194	19.141	10.76	1	37
Treatment	44430	.457	.498	0	1	27194	.458	.498	0	1
Female	44430	.483	.5	0	1	27194	.499	.5	0	1
Age	44430	14.959	1.403	12	18	27194	18.968	.872	17	21
Urban	44430	.305	.461	0	1	27194	.311	.463	0	1

In general, the literacy rate in less developed districts is significantly low compared to the developed districts. Also, in less developed districts the girls are married early and have more chances to leave school compared to the developed districts.

### 4.3 Methodology

The question of whether conditional cash transfers can impact the enrollment of adolescent girls is a complex one. In a traditional experiment, we could easily divide similar age groups into treatment and control groups and observe changes in enrollment over a period of 2-3 years. However, our scenario is not so straightforward. If we were to gather data on all education-related districts before and after the policy by birth year cohort, we could compare enrollment and marriage trends before and after the policy. However, other factors could influence these changes, such as the construction of new schools, government efficiency, budget policies, and infrastructure improvements. By using cross-sectional data from both periods, with and without the policy, we can control for these factors by comparing trends in education and marriage among respondents. Additionally, by comparing respondents with and without the stipend, we can estimate how the policy affected education trends in females and compare it to what would have happened without the policy.

Overall, the use of cross-sectional data allows us to more accurately assess the impact of conditional cash transfers on female enrollment in schools and age of marriage in the targeted districts of Punjab. However, there may still be unobservable effects that are correlated about a girl as she continues her education in the public school which may impact the school enrollment in treatment districts. For instance easy availability of school conveyance, peer pressure, traditionally increase in private school fees, more government teacher's recruitment because historically they have been a big source of persuasion for general public in Pakistan. These are some of the unobservables that may push our outcome variables and thus impact the enrollment trend and later marriage decisions in the poor districts compared to other non-poor districts. The same can be true in the other direction where unobservables may actually bias our simple OLS estimates down.

Therefore, this research aims to utilize the difference in differences (DDD) method to eliminate the unobservable to estimate the change in enrollment trend as well as later marriage decisions by the adolescent girls by younger and older cohorts in less-developed districts as a treatment group compared to the relatively developed districts of Punjab as a control group due to the introduction of this conditional cash transfer policy. The general unobserved models are given below.

$$y_i = \alpha + \beta_1 young_i + \beta_2 treatment_i + \beta_3 female_i + \beta_4 young_i * treatment_i + \beta_5 treatment_i * female_i + \beta_6 young_i * female_i + \varepsilon_i \quad [1]$$

As we have binary outcome variable “ $y_i$ ” in the model mentioned in eq (1) corresponds to our dependent variables i.e school enrollment status and marital status of a respondent. Our main parameter of interest (triple difference estimate) is  $\beta_7 = young_i * treatment_i * female_i$  and our explanatory variable is  $young_i$  which is a dummy variable=1 if a respondent is younger or born after 2002 “0” otherwise, the respondent was so old that unable to enjoy this stipend program. Also  $treatment_i$  is a dummy variable=1 of a district where this CCT program was offered and “0” the other districts without program.  $female_i$  is a dummy variable=1 if the gender of a respondent is female and “0” otherwise.  $Z_i$  refers to residential status=1 if a respondent resides in urban area and “0” otherwise.

otherwise. If the unobserved effect  $\varepsilon_i$  is correlated with the explanatory variables, then we cannot use pooled OLS for estimation of the coefficients as it is going to give us a biased result.

We have key assumption of parallel trend assumption which is school-enrollment status of the respondents in developed and less-developed districts that both cohorts have the same trends before the policy as shown in figure-4.

From the above figure it can be observed that since ending of year of birth 2001 the trend is changing with an increasing pattern in less-developed districts.

Also, in case of observing the parallel trend assumption for marital status of

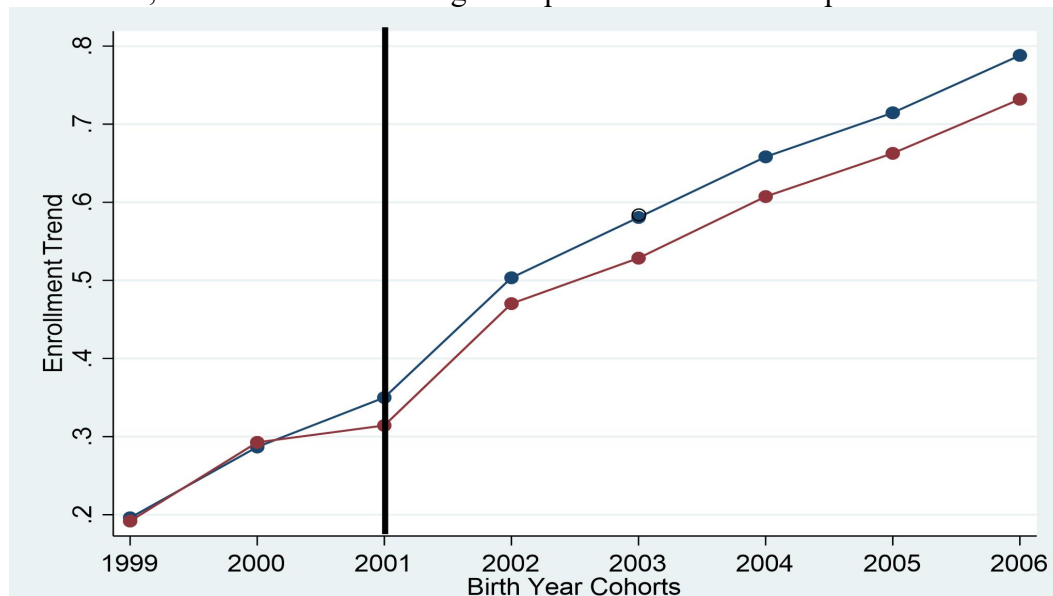


Figure 4: Parallel trend view of variable "enrollment" for treatment and control group

respondents between treatment and control groups, it can be observed that change with decreasing rate of marital status can be observed in the year 2002 in figure-5.

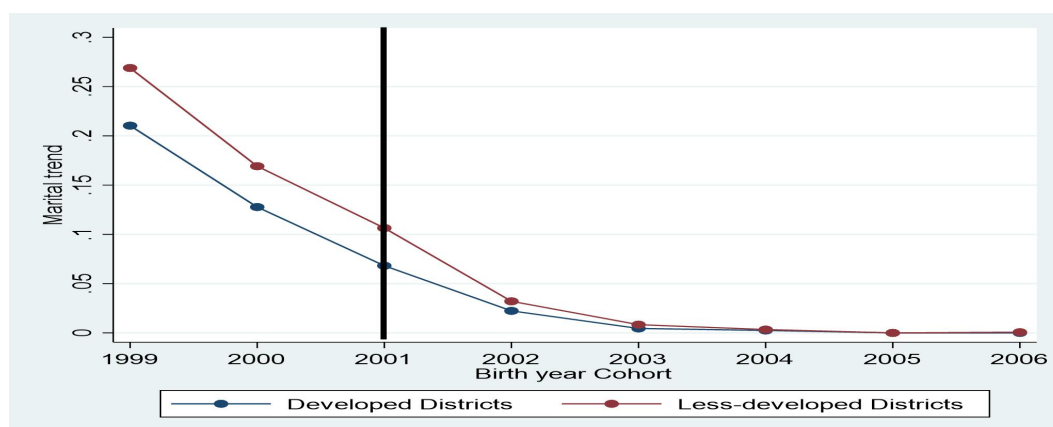


Figure 5: Parallel trend view of variable “marry”

Since in our case, the stipend status was granted by the government for one time in 2017, it is highly unlikely that families could decide to shift to the districts where stipend facility was offered from their current status. Therefore, it can be said that the identifying assumption of parallel trend is plausible in this case.

In order to remove the unobservable, we use the Difference in Differences method. The unobserved factors effects may bias the estimate of change in enrollment trend as a result of Punjab government conditional cash transfer to females in public schools, therefore it can be removed through finding the difference in trends by using eq (1).

we assume that the above model satisfies the classic linear model assumptions and hence pooled OLS will give us biased estimators. The basic underlying assumption is that  $\Delta z_i$  is uncorrelated to  $\Delta treatment_i$ . We can then also use the t and F statistics for hypothesis testing. The coefficients  $\beta_7$  can be estimated to analyze the impact of conditional cash transfer on school continuation/enrollment trend as well as marriage decision of adolescent girls. If  $\beta_7$  is positive and statistically significant, we can conclude that CCT policy increased the adolescent girls' trend to study more which were granted the special status compared to the other districts girls which were not granted this status. However, if these coefficients are negative, we can conclude that this CCT status decreased the number of enrollments of girl's students in public schools. For the marriage case, if  $\beta_7$  is positive it means that due to this stipend program there is increased trend in marriages of the girls in treated districts compared to the control districts as well as vice versa for negative parameter.

## 5. RESULTS

We estimate the impact of conditional cash transfer policy on girls' education trend and later marriage decision in Punjab, Pakistan using the enrollment status and the marry variable through observational experiment of targeted individuals in a linear equation for each district.

### 5.1 Results for enrollment status

As a starting point, the analysis utilized a simple Ordinary Least Squares (OLS) regression to estimate the impact of government interventions through conditional cash transfers (CCT) on the continuation of studies by adolescent girls in less-developed districts, using the outcome variable of interest, denoted as  $y_i$ . However, relying solely on OLS estimation may not provide a complete picture, as there can be other factors, known as confounders, that may bias the estimates of the coefficients of the treated variable. Additionally, unobservable factors that vary across areas or districts can also contribute noise to our model. To control for these unobservable factors and address the issue of confounding, the difference-in-differences (DiD) method was employed in the analysis. This method allows for the estimation of the change in female education trend/ratio over time, while controlling for other confounding variables that may affect the outcomes. However, even with the DiD method, there may still be unobservable factors that could potentially bias our results. To address this issue, the triple difference (DDD) approach was used, which enables the comparison of the change in education trend within the same district by gender before and after the policy change. Therefore, to estimate the unbiased coefficients, Model (1) was estimated, as described in equation (1) above. By using these advanced methods, the analysis

aims to provide a more comprehensive and accurate assessment of the impact of the conditional cash transfer program on the education outcomes of adolescent girls in the less-developed districts of Punjab.

### 5.1.1 DDD Result

As per Difference in Differences (DDD) specification we are concerned with the interaction term “ $\beta_7 \text{young}_i * \text{treated}_i * \text{female}_i$ ”.  $\beta_7$  is our parameter of interest here. As per table-5, the estimate indicate that conditional cash transfer program was instrumental to increase female education ratio among the masses and thereby increased the literacy ratio in girls.

Table 5: Regression results for enrollment

Enrollment	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
younger	.352	.007	53.02	0.000	.339	.365	***
treatment	-.12	.02	-5.90	0.000	-.16	-.08	***
female	.027	.007	3.66	0.000	.012	.041	***
younger x treatment	.046	.01	4.64	0.000	.026	.065	***
female x younger	.047	.009	4.97	0.000	.028	.065	***
female x treatment	.06	.011	5.67	0.000	.039	.081	***
female x treatment x younger	.019	.014	1.38	.167	-.008	.046	
urban	.131	.004	30.93	0.000	.123	.139	***
district	-.143	.017	-8.31	0.000	-.177	-.109	***
Constant	.304	.013	23.29	0.000	.278	.329	***
Mean dependent var	0.494		SD dependent var		0.500		
R-squared	0.171		Number of obs		71624		
F-test	428.506		Prob > F		0.000		
Akaike crit. (AIC)	90635.052		Bayesian crit. (BIC)		91029.757		
*** $p<.01$ , ** $p<.05$ , * $p<.1$							

The table above indicates that the parameter  $\beta_7$  represents the treatment effect. The coefficient of 0.019 is not statistically significant, However, it means that on average, there was a net increase of 1.9 percentage points in the education trend of girls compared to boys in the 16 districts where the CCT program was implemented, compared to the 20 districts where it was not. This suggests that the CCT program had a positive impact on the education trend of adolescent girls in those districts.

### 5.2 Results for marry

As a starting point the simple OLS results of the impact of interventions by the government through CCT on the marriage decision of the respondents of less-developed districts using the  $y_i$  as outcome variable. Which shows that impact was significant but the



impact shown as positive. However, the analysis seems biased using simply an OLS estimate as there can be other factors that may confound our estimates of the coefficients of *treated* due to this CCT program. To control for such unobservable that, we can use the difference in difference in our model and estimate the model accordingly. By using Difference in Difference, we are able to estimate the change in female marital decision/trend. However, there can be unobservables (demographic factors and culture etc. of a specific district) which can biased our results. For more confinement and fair comparison, we can use difference in differences (DDD) in this model, by using triple difference, we are able to compare the age of marriage decision effectively within the same district by gender pre and post the policy change. Therefore, to estimate the unbiased coefficients we estimate Model (2) as given in eq (2) above.

### 5.2.1 DDD Result

As per Difference in Differences (DDD) specification we are concerned with the interaction term “ $\beta_7 \text{young}_i * \text{treated}_i * \text{female}_i$ ”.  $\beta_7$  is our parameter of interest here. As per table-6, our parameter of interest indicate that conditional cash transfer program worked to decrease female early marriage ratio among the masses.

Table 6: Regression results for marry

Table of Reg. Estimation Results for Marry							
Marry	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
younger	-.203	.005	-42.70	0.000	-.213	-.194	***
treatment	.031	.011	2.75	.006	.009	.053	***
female	.157	.005	29.24	0.000	.146	.167	***
younger x treatment	.024	.004	5.55	0.000	.016	.033	***
female x younger	.15	.005	27.43	0.000	.139	.16	***
female x treatment	-.042	.008	-5.01	0.000	-.059	-.026	***
female x treatment x younger	-.039	.009	-4.56	0.000	-.056	-.023	***
urban	-.028	.002	-15.08	0.000	-.032	-.025	***
district	.032	.008	3.79	0.000	.015	.048	***
Constant	.051	.006	8.89	0.000	.04	.063	***
Mean dependent var	0.063		SD dependent var		0.243		
R-squared	0.160		Number of obs		71624		
F-test	129.289		Prob > F		0.000		
Akaike crit. (AIC)	-11860.525		Bayesian crit. (BIC)		-11465.820		
*** $p<.01$ , ** $p<.05$ , * $p<.1$							

As we can observe in the table above that  $\beta_7$  reflects the treatment effect. The coefficient 0.039 is statistically significant at 1% level. It means that on average, a net decrease of 3.9

percentage points was observed in female early marriage in those 16 less-developed districts where the stipend/CCT program was offered compared to those 20 relatively developed districts of Punjab where this program was not implemented.

### **5.3 Discussion**

The results discussed above clearly demonstrate that the conditional cash transfer policy introduced by the Punjab government led to an increase in enrollment status in the girls of less-developed districts which is better for the society and incoming generation, it will also help in supply side of the female labor force in the market. However, as the duration of the policy increases, there are more expectation regarding upward trend of outcome variable i.e. female enrollment. For our second outcome variable i.e. early marriage of adolescent girls, it will also reduce with time in less-developed districts of Punjab. This makes sense because the parents having weak financial position mostly discontinue education of their adolescent girls after primary in less-developed districts especially. Furthermore, early marriage of the girls is also a strong factor for this discontinuation of education. However, this financial support to poor families compels them to continue girl's education due to sharing of expenditure through CCT. In a broader sense, this stipend program has social and motivational impact for the boys to continue their education at a household level.

### **5.4 Limitations**

Due to lack of the data in current years in this research study may limit the generalizability and scope of the results that it fully reflects the effect of this Program on adolescent girls' enrolment. In the research it is a data limitation which can be abolished by using more recent data. Therefore, to enhance the reliability of the findings, it is necessary to collect more data over time and across different contexts to determine if the impact of the policy remains consistent. Moreover, since the data used in this study only pertains to the education sector overall, it would be useful to gather additional data from more relevant sources, such as public-school enrollment data, to obtain a more detailed understanding of the effectiveness of the policy. Finally, it is important to acknowledge that other government policies implemented during the same period may have influenced the enrollment of girls in schools in Punjab, Pakistan. Therefore, future research should aim to isolate the specific impact of the conditional cash transfer program from other potential factors that may have affected the education outcomes of adolescent girls in the region.

It is further added that more variable of interest can be included in reduced form regression equation which may include family characteristics like parent's level of education, family size and so on. It may further improve the accurate estimation regarding program effects.

## **6. CONCLUSION**

Based on the aforementioned discussion and the results obtained, we can draw a conclusive inference that the conditional cash transfer policy, namely the "Zewar-e-Taleem Program", has effectively contributed to reducing the prevalence of early marriage among adolescent girls in the province of Punjab, Pakistan. Furthermore, this policy has facilitated an increase in the literacy rate among disadvantaged gender, specifically girls, which is an encouraging development. Notably, the policy has addressed the historical gender inequality that has perpetuated the domination of males over females with regard to investment in education and health in a given household. This, in turn, has led to a significant improvement in women empowerment, even though this may not have been the intended outcome of the policy. In

such a scenario, it is warranted that a study may be conducted to assess the impact of the policy on the overall female literacy in these districts. As the primary purpose of the policy was to female literacy through CCT, the policy may have achieved its objective which needs investigation. After the assessment, it is up to the government's policy choice whether it wants to continue human capital investment especially women and children as a core objective without political gains. In case the government prefers more literacy rate, it is not desirable to offer this stipend only specified districts in Punjab.

However, if the government wants to boost women literacy rate in these sixteen districts while at the same time allow the young generation to compete and enter the labor market, it can further support these under invested members of household by providing such CCT program to college level as well.

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