
EFFECT OF PRIMARY EDUCATION STIPEND ON CURRENT ENROLMENT

Abstract

Now-a-days, Conditional Cash transfer programs are used in various developing countries as they provide people with money but onto fulfilling certain conditions. For example, education being the path to improving poverty of a country, the Primary Education Stipend Program (PESP), in Bangladesh, provides household with a stipend amount as they sent their children to school. Although, to get the amount, they have some conditions which are to be fulfilled like full attendance, average grades etc. This paper examines the effect of PESP on current enrolment, since it has achieved progress by increasing primary school enrolment.

Ordinary Least Squares analysis has been used to find the estimates as we used linear regression to find the correlation between our variables. Since only the effect of PESP is to be measured, data of individuals aged from 5 to 11 has been examined.

Although many studies show that the effect of the program on current enrolment is not large enough, but our regression model showed that there is a positive relation between current enrolment and PESP, as the estimates are significant. However, since the number of total observations is small, our model had its limitations.

Introduction

The Government of Bangladesh (GoB) commenced the Primary Education Stipend Project (PESP) with a motive to increase literacy rate in July 2002 by reaching 5.5 million pupils. It mainly targeted poor households in rural Bangladesh as they provided them with cash assistance. Although to be applicable for the program the pupils had to maintain 85% of the attendance rate and achieve at least 50% marks in annual examination for each grade. Bangladesh had introduced several projects to improve the enrolment rate starting from the Food for Education (FFE) Programme in 1993 till the PESP. PESP increased the rate of enrolment by 13.7%, whereas FFE increased enrolment by 18.7%. The difference was mostly due to poor targeting of household as deduced by Baulch (2010), however since PESP replaced the FFE Programme, which had distributed food, we decided to find out the effects of the latter program.

The primary stipend had remained unchanged, since it was introduced in 2002-2003, and it provided household with Tk.100 per month for one child and Tk.125 for families with more than one child. The amount of stipend is the same for students who are in grade 1 and higher. Around 65,051 schools were eligible to participate for the programme, and the beneficiaries were selected by the School Management Committees following the eligibility of the programme.

There are many research studies on the targeting of PESP and effect on current enrolment, and most of them concluded that the targeting is weak since people who are not eligible for the

programme were being assisted, and those who needed it were not. Also, due to lack of information, they did not attain proper conclusion. Hence, we used the data of 2016 Household Income and Expenditure Survey (HIES) to obtain the effect of PESP on current enrolment in Bangladesh in order to check whether the program did have any impact on the education sector.

Literature review:

Primary education in a country needs to be accessed by every citizen, hence the Government of Bangladesh has established several programs to increase the level of literacy since Independence. Two of the programs that are currently available and financed by the Government of Bangladesh are: Primary Education Stipend Program (PESP) and Female Secondary Stipend Program (FSSP). Multiple studies have been conducted to test the efficiency of these programs. Bob Baulch (2011) in his journal "The medium-term impact of the primary education stipend in rural Bangladesh" deduced that net enrolment rates increased 84% to 92.2% in 2006 after the introduction of PESP in 2000. For his paper, Baulch surveyed 511 households in eight upazilas of the rural areas, and the households were evaluated in 2002, 2003 and 2006. Additionally, a journal by Ahmed Ullah and Muni Perumal (2012) published that, in the rural side, net enrolment rate was 53% in 2005 and a document by World Bank (2008) evaluated that amongst them 78.4% of females had finished primary school, in contrast with 70.2% males. Ullah and Perumal (2012) also included data from BANBEIS 2011 which showed that, in primary level, the gross enrolment level was 97.6% and net enrolment level was 90.8%. Although most of the surveys showed a positive increase, but some of the journals ended with the notion that the programs are not accurate since only 23% received stipend from the program, however the actual target was 40% as written by Ullah and Perumal (2012). Similarly, Ahmed Ullah (2013) also includes that, in both 2005 and 2010, 26% students receives stipend based on the HIES statistics. Hence, it creates a question on the system as to whether those who need the program are actually receiving it or not.

Regardless of that, a research by Tania Barham, Karen Macours and John A. Maluccio (2012) in Nicaragua shows that there was an increase in enrolment rate after the introduction of Conditional Cash Transfer (CCT) Program. The research showed the long term and short-term effect of CCT program. Similarly, a paper by Yeasmin Sayeed (2016) showed that school completion is affected by the FSSP as it increases between 0.4 to 1.1 years. Sayeed (2016) had used regression discontinuity and Difference in Difference method to test her hypothesis. In his thesis, "An Analysis of the Impact of Educational Conditional Cash Transfer (CCT) Programs in Bangladesh", Ahmed Ullah (2013) criticised the findings of Baulch (2011) that his sample size was fairly small, hence his evaluation was not pertinent. Moreover, the 460 upazillas studied did not have similar social or economic status. On the contrary, Ullah (2013) himself ended his analysis by concluding that the PESP is not "well-targeted".

Akhter U. Ahmed (2004) in his elaborate publication found that Gross enrolment rate in primary and secondary school varies from 89%-140% and 21%-77%, respectively, which shows that enrolment will rise up if both PESP and FSSP are used effectively. Although, the survey shows a noticeable variation in enrolment level across the 20 randomly selected districts. Additionally, Shahidur Khandker, Mark Pitt and Nobuhiko Fuwa (2003) in their paper included that since the introduction of the FSSP, there has been an increasing rate in female enrolment which is more than that of male.

Similar to these studies, we are going to look for the effects of PESP on current enrolment rate, although there are other variables which we will consider like educational costs and family size etc, and find the overall effect. Unlike other studies, we will only see the effects of PESP since it is available to both girls and boys and in this paper, we will account for total enrolment. Some of the studies used gross enrolment as their dependant variable, but we are going to use net enrolment as our dependant variable.

The above table provides a summary of all the independent variables that can affect our dependent variable, current enrolment. It shows the mean, standard deviation, maximum and minimum values, p-values of t-test and chi-square tests. It is said that that if the mean and standard deviation values are approximately close to one another, there is one evidence of data being distributed normally. However, in this case, most values show great difference in mean and standard deviation values which indicates chances of a non-normal distribution. The minimum and maximum values here, aids in calculating the maximum direct and indirect costs contributed in the Stipend program. Moreover, it proves that we have calculated our regression for primary students aged 5-11.

According to Ahmed and Sharmeen (2014), gross enrolment rate increased substantially due to conditional cash transfers and Primary education stipend program. This is also evident from the data as the chi square p-value is zero (less than 5% significance level), we cannot accept null hypothesis and thus conclude that PESP has a strong relation with student enrolment. In addition to this, age, sex and earner also shows relationship with student enrolment (chi square p-value less than 0.05), which, according to Ullah and Perumal (2012) proved to be a well-targeted PES. The t-test p-values of direct and indirect of education shows there is significant connection with enrolment of students.

Regression Diagnostics

As we all know that the purpose of a linear regression analysis is that there needs to be a linear relationship between the dependent variable (current enrollment) and a set of independent variables. For our model, we used scatter plot to visually inspect our linearity. This process can also assist in cancelling out unusual large observations known as outliers.

Outliers

As shown in the above diagram, scatter plot was conducted with enrollment as the dependent variable and stipend for primary students as the independent variable. From here, we were unable to identify the outliers. So, we generated standardized residuals against the predicted values that enabled us to evaluate the extent to which the linear regression model is adequate and also spot the outliers. Thus, we used the stem and leaf plot method to detect individual effect on the observations and regression residuals and dropped the outliers from the dataset.

Checking Normality of residuals

To check the normality of the residuals, we used few graphical methods. The rvf plot on the top left shows that the pattern of data points gets narrower as they move towards the right and a few outliers, indicating possibility of heteroskedasticity. The Kernel density model of density against studentized residuals shows it is highly skewed to the right with kurtosis higher than 6.

The pnorm graph shows deviation in the center of the diagonal line and qnorm also shows considerable deviations along the line in the tail, showing non-normality of the residuals.

The above three numerical tests for normality depicts not having a normal distribution of residuals. The p-values are all less than the pre-defined significance level, thus we can reject the null hypothesis and conclude the non-normality of the residuals.

Heteroscedasticity test

Since there should be constant variance in the residuals, hence we first used the white test to detect any heteroskedasticity. The p-value shows that we reject the null hypothesis of no heteroskedasticity at 5% significance level (p-value=0.0000).

The Breush-Pagan test also yields the same result that there is heteroskedasticity in the model, as p-value is again very small. To deal with no homogeneity, we will use robust measures to generate standard errors which are not affected by the changing variance, hence making the regression more reliable.

Similarly, the link test shows that the model is not specified correctly as the $_hatsq$ is not insignificant as the p-value is less than 5% significant level.

Regression results:

Ordinary least square method has been used to find the unknown parameter of our regression model, and the table above shows the coefficients of the independent variables. The model is used to find the effect of primary education stipend program (PESP) on current enrolment (primary level), along with that many other independent variables are also added to get a more reliable result since they will affect the model.

From the regression, we can see that primary education stipend program, keeping all other factors constant, increases the chances of school enrolment by .189918, and the value is significant with a p-value=0.00. PESP provides students incentives that influence families to allow their children to be admitted to school. Also, the coefficient of stipend duration is positive (.0066893), so it is economically significant, but statistically insignificant even at 10% significance level since the p-value is very high. If a student is continuously given stipend, then the family is more likely to allow the child to be enrolled in school so increase in stipend duration increases the probability of enrolment. However, indirect cost of education (transport cost, tiffin cost, private tutor etc.) also has a positive coefficient although it is very small (2.79e-06), but insignificant even at 10% significance level. Additionally, direct cost has a positive coefficient with current enrolment (but it is significant at 5% significant level). In our knowledge, higher educational cost reduced current enrolment, but the model shows the opposite which is increase in educational cost increases the chances of enrolment, keeping all other factors constant, this could be due to various stipend program like PESP and involvement of NGOs that give parents the incentive to allow their children to go to school.

Moreover, the model shows that probability of current enrolment reduces by around .000384 unit with 1% increase in consumption (insignificant at 5%, but significant at 10%), since more consumption indicates a big family size, so the family cannot afford the expenses of primary

education regardless of the presence of stipend program. However, number of children has a positive significant coefficient (.0330764), keeping other factors constant, that increases the probability of current enrolment. This might be because household of different income levels are used in the model, and not only low-income household were chosen.

Additionally, if a child becomes an earner before 11 years old then the probability of enrolment in school, keeping other factors constant, reduces by 0.3824 (significant coefficient), this can be due to poor financial status of families that causes them to choose work over education.

Our model tried to interpret the appropriate effect of stipend on current enrolment, however there were lacking in the data since we used data from both rural and urban household, and the PSEP program is allowed only in rural areas. Moreover, some of the coefficients are still statistically insignificant even after using robust in regression and this might be due to low observations. Also, we did not include involvement of other social safety net program which might have caused our estimates to be biased.

Conclusion:

We have seen in our data how primary education stipend program and other different characteristics effect net enrolment in Bangladesh. From our study, we tried to find out and identify the impact on primary student's participation in school and what factors caused hindrances in it when stipend program was established. Even though we had limitations, our regression results showed positive student enrolment patterns.

Baulch (2011) discovered that between 2000-2006, the stipend program has shown signs of improving participation rate. However, few problems still persist. As Ullah (2014) in his thesis, specified a common issue that various cohorts of children (like boys and girls or rural and urban) are facing different types of obstacles to enrolment and to continuing their education. Furthermore, he believes that government intervention can be done as they have different types of program like PSP and FSP for different groups. This can also stop administrative loopholes which might hamper the stipend program.

In retrospect, further research based on this topic needs to be conducted to attain proper results on the real effects and provide stipends while taking into consideration the inflation rates and other economic factors.