

Aid Volatility and the Pattern of Education Spending in Bangladesh

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Bangladesh, with significant dependence on foreign aid after Independence especially for relief and reconstruction purposes, has diversified aid inflows over time to meet the country's increasing development needs. Foreign aid, particularly to the education sector, has, however, declined over the years. This paper examines the fluctuations in aid inflows to the education sector in Bangladesh vis-à-vis the country's domestic spending in education. Analysing aid volatility for the period 1980-2008, the paper reports that volatility in aid flows has not led to higher volatility in government's own spending on education. The results also validate that government's spending on education has led to improved performance in education indicators such as primary school enrolment.

I. INTRODUCTION

Since Bangladesh's independence in 1971 following the War of Liberation against Pakistan, the country's long-term economic viability has been a subject of concern. Observers predicted a state of perpetual aid dependence soon after independence. Bangladesh (the then East Pakistan) had a vulnerable agricultural system characterised by low yield crops, primitive farm practices and low quality lands, which were affected by salinity, soil erosion and floods. There was a dearth of industries and the few that existed were constrained by the availability of raw materials and a sustainable market for products. Bangladesh was heavily dependent on imports and the country's exports consisted of a few agricultural commodities with uncertain global demand. A large proportion of the population was either illiterate or lacked higher education while health and social welfare measures required urgent attention. Furthermore, the establishment of a stable state encompassing civil administration, a regimented defense system and an efficient financial institution, was essential.

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Without the help of the international community and the massive inflow of aid, it would have been very difficult for Bangladesh to be rehabilitated and start functioning as an independent country. Initially, the country received foreign assistance largely in the form of disaster relief and food aid. However, aid became more diversified as the volume of aid flow gradually increased to meet the country's development needs. A variety of donors and agencies, including international NGOs and both bilateral and multilateral agencies, have been involved over the years. Bangladesh has continued to be a major recipient of development assistance despite a significant drop in more recent years. The official development assistance (ODA) flows to Bangladesh have exhibited some fluctuations over the last few decades. The decline in total aid flows in the 1990s has been attributed to emerging global trends—aid flows have fallen as developed countries now commit fewer resources for ODA. A World Bank report (1999) revealed that, on average, commitments of all developed countries made in 1998 amounted to less than a quarter of one per cent of their combined GNP. Despite this decline in aid, Bangladesh has managed to achieve self-sufficiency in food production and garnered its own revenues for spending on key sectors such as education, transport and communication, agriculture, health and power. In particular, it has achieved a great degree of competency in spending in the pro-poor sectors of education, health and agriculture and as such, has made significant improvements in these areas. Therefore, despite the gloomy predictions, Bangladesh has made significant economic and social progress in the last three decades; it is no longer considered a basket case. In the face of low per capita income and widespread illiteracy, it has made some impressive strides in reining the rapid population growth rate from 2.5 per cent per year in the 1980s to less than 1.5 per cent per year in 2005 (BBS 2006). Furthermore, the poverty headcount rate declined from 57 per cent at the beginning of the 1990s to 40 per cent in 2005. A stable economic growth has been identified as one of the primary factors for this trend. With respect to the Millennium Development Goals (MDGs) indicators, Bangladesh even compares favourably with India despite India's higher per capita income, growth rates and social expenditures per capita (ADB 2006). As such, Bangladesh is on course to meet the year 2015 MDG for infant and child mortality and has already met the goal of gender parity in primary and secondary schooling (World Bank 2008).

The purpose of this study is to show how volatility in aid inflows into the pro-poor sector of education has not adversely impacted spending by Bangladesh itself on this sector. An attempt has been made to establish that the government expenditure on education is not fully dependent on aid. The hypothesis is that Bangladesh has the commitment and reasonable capacity to use its own resources to provide the basic needs of the poor without complete dependency

on foreign aid; aid is used to supplement government efforts on spending in education. Fluctuations in aid flows do not deter the government's own spending programme on education. This paper provides an overview of the trend in aid flows into Bangladesh; discusses the pattern of aid and spending in education from 1980 to 2008; and proposes a measure of aid volatility for Bangladesh for that period.

II. TREND IN AID FLOWS INTO BANGLADESH

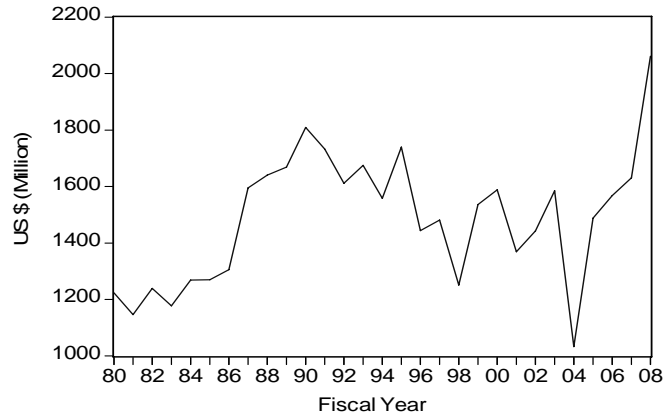
Most foreign aid is intended to meet either or more of the broad economic and development objectives laid out by Radelet (2006): (1) to spur economic growth through building infrastructure and supporting sectors like agriculture, (2) to strengthen the education, health, environmental or political systems, (3) to support subsistence consumption of food and other commodities, especially in times of humanitarian crises, or (4) to help stabilise an economy in the aftermath of an economic shock. Bangladesh is not an exception from these objectives and further rationales for foreign aid have been identified by other researchers. Chenery and Strout (1966) developed the "two-gap" model of development which states that to achieve a given growth rate, a developing country needs to have adequate savings and sufficient foreign exchange for investment. When a country is deficient in one of these areas, foreign aid can fill the gap by either providing foreign savings to complement insufficient domestic savings, or by providing foreign currencies to buy goods and services in the world market that the country cannot produce itself.

The Economic Relations Division (ERD) report of 2010 stated that since 1971 and up to 30th June 2009, a total of US\$50.3 billion have been disbursed to Bangladesh, of which 43.60 per cent were grants and 56.40 per cent were loans. ODA flows to Bangladesh are categorised into food, project and commodity aid. When foreign aid is classified by purpose, 12.9 per cent has been disbursed as food aid, 21.66 per cent as commodity aid and 65.45 per cent as project aid. Over the years, changes have taken place in the aid package to Bangladesh. Bilateral aid, which was 75.4 per cent of total aid in 1973-78, declined to 23.4 per cent in 2008-09. Multilateral aid has grown from 24.6 per cent to 76.6 per cent over the same period. The flow of food aid and commodity aid has diminished with food aid consistently declining from 47.9 per cent of total aid in 1971/72 to only 2.8 per cent in 2008/09. Commodity aid has similarly seen a sharp fall from 50.8 per cent to nil over the same period, while project aid has seen the greatest increase from 1.3 per cent to 97.2 per cent during that time.

Total aid into Bangladesh over the period of this author's interest, 1980-2008, has averaged around \$1.5 billion per year, with median aid flows

exceeding \$1.50 billion. Total aid flows have declined in the mid-1990s with some periodic spikes, but have not reached the levels of the late 1980s and early 1990s. However, after a drastic decline in the 2000s, aid receipts increased dramatically from 2004, reaching a new peak in the year 2008 (Figure 1).

Figure 1: Total Aid (1980-2008)

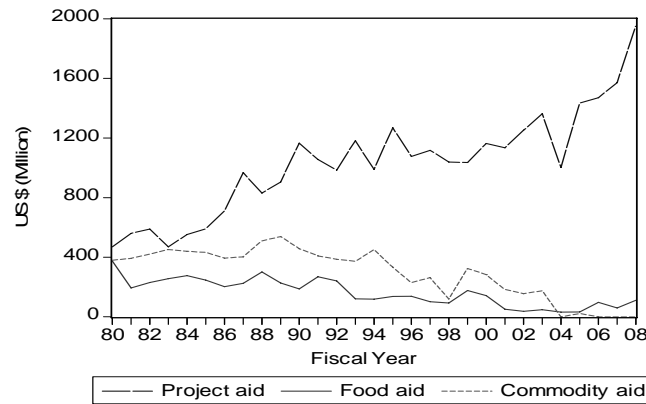


The food aid data demonstrates some fluctuations over the last two decades and there has been a decline in food aid in nominal terms. Bangladesh has been a food deficit country from the beginning and although food production has increased and self-sufficiency has almost been achieved, the need for food aid arises to meet emergency needs—there are occasional supply shortages caused by natural disasters like floods, cyclones and famines. Figure 2 shows that food aid increased during the cyclones of 1988 and 2007 and the flood of 1998.

Non-project aid, also known as commodity aid, has also experienced a secular decline over the years. Commodity aid was a very important element in the total aid package and the aid extended by the development partners has helped Bangladesh meet its balance of payments gap and also to generate local currency to finance development projects. Given the absence of commodity aid from the year 2006, it has been assumed by Murshid (2003) that the balance of payments gap has recently been alleviated by rising export revenues and other sources of finance.

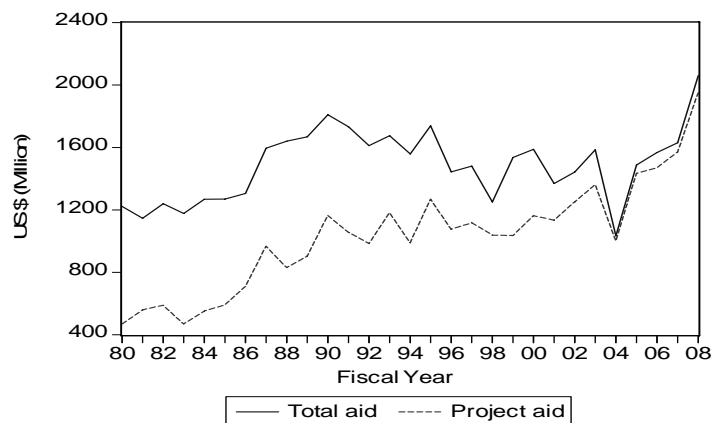
Project aid comprises the largest share of foreign assistance. It is granted out by the donors to finance the projects included in the annual development programme (ADP). The disbursement of project aid has seen a consistent upward trend since the early 1980s with some volatility in the 1990s. Despite a large decline in the years 2003 and 2004, project aid has steadily increased since then.

Figure 2: Aid by Type (1980-2008)



Project aid is disbursed to the various sectors of the economy such as agriculture, power, transport, communication, education and health among others. Consequently, project aid is used by Bangladesh to improve the country's economic capacity. In addition, it is used to further social development in the arenas of education and health. Figure 3 shows the plot of total aid against project aid. The disbursement of project aid is closely linked to the disbursement of total aid and thus project aid follows a similar trend to that of total aid, illustrating the donors' intentions in being involved in improving the functioning of the productive sectors of the economy. This characterises the shift in the donors' role to that of a more proactive one – aid has increasingly been targeted into specific sectors instead of just providing food relief and financing the balance of payments deficit.

Figure 3: Total Aid vs. Project Aid (1980-2008)



III. VOLUME AND PATTERN OF AID AND SPENDING

Morrissey (2001) identified the provision of and access to essential public services as pro-poor expenditures, while policies to help the poor in the rural areas are known as pro-poor policies. The services that were considered to be of utmost importance are education, especially at the primary level; health (including nutrition); and water, which includes sanitation and access to safe drinking water. In poor countries, government expenditures for the provision of such basic services can raise productivity and increase economic growth. Despite achieving significant progress in providing access to education for the poor, inequalities in opportunities and outcomes still persist across different wealth and income groups, gender and regions in Bangladesh. The provision of education improves non-farm employment opportunities, increases earnings of workers and enhances the mobility of the poor from depressed regions. Comparison with neighbouring countries and other countries at similar stages of development indicates that per capita public expenditure on education is low in Bangladesh. The quality of such services appears to be low as well.

The Bangladesh government's programme to alleviate poverty involves increasing the earning power of the poor by improving the services of primary education. The programmes designed to alleviate poverty were classified into two categories—reducing poverty by enhancing the earning capacity of the poor and through current income transfers. The programmes to improve the earning capacity of the poor include public education, health and family planning systems and special credit programmes.

The successive Five-Year Plan onwards highlights poverty alleviation as one of the major socio-economic objectives and the government has allocated the expenditures as such. The public expenditures involve two components: current (revenue) and development expenditures. Revenue expenditures consist of expenditures on general administration, subsidy, interest on domestic and foreign loans, etc. Development expenditure, on the other hand, finances the implementation of development projects. The development expenditure share of total public expenditure has declined from 60 per cent in the early 1980s to around 45 per cent by the early 1990s.

Figure 4 graphs the total education expenditure net of aid, as a proportion of the government expenditure for the period 1990-2008. The data for total expenditure prior to 1990 is not available. The share allocated to education increased dramatically from the 1990s, with some fluctuations in later periods. Over the last few years, spending on education has been around 10-12 per cent of the total budget.

Figure 4: Education Expenditure as % of Total Expenditure (1990-2008)

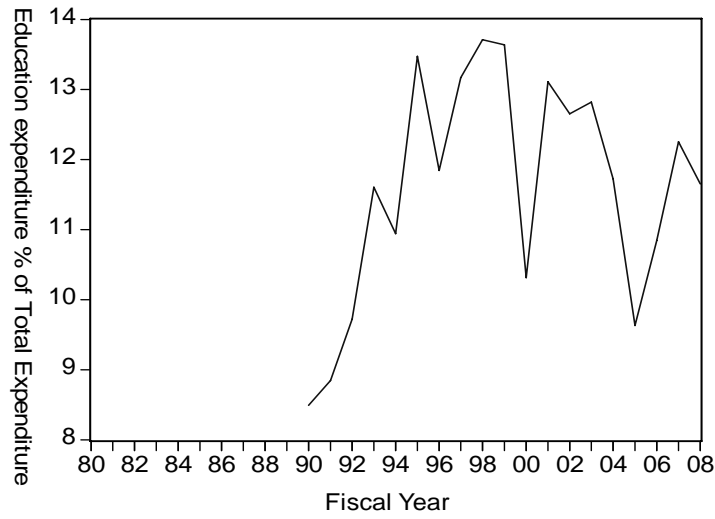
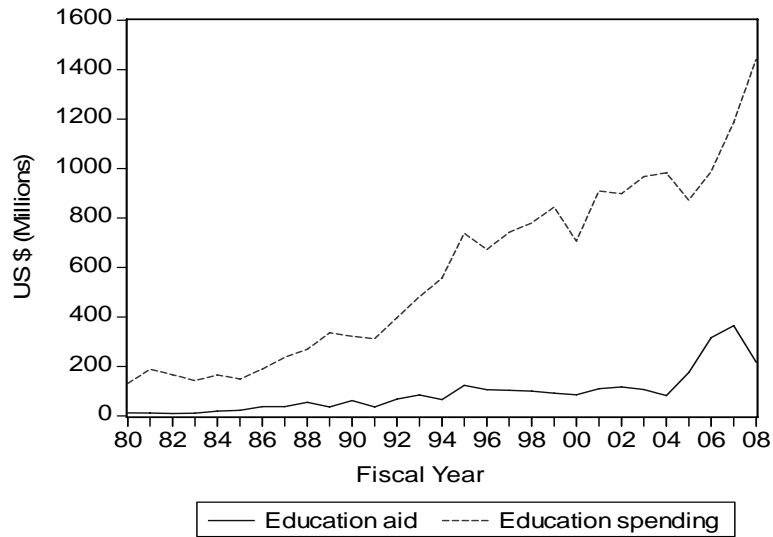


Figure 5 shows the increasing gap between education aid and government spending. The 1980s illustrate the small gap between aid and spending, which began to increase over time. From 2006 onwards, education aid began to decline and government spending increased. This reflects the relatively low and declining proportion of aid in total education spending.

Figure 5 : Education Aid vs. Education Spending



IV. VOLATILITY MEASURE

This section aims to find a measure of aid volatility and show how the volatility of aid for the education sector in Bangladesh has not led to much fluctuation in government spending in this sector. The methodology followed here is similar to Bulir and Hamann's (2003) measure of aid volatility.

IV.1 The Dataset

The database covers figures on education aid disbursements and government spending for them, from 1980 to 2008. The data on education aid has been taken from the Economics Relation Division (ERD) under the Finance Ministry of the People's Republic of Bangladesh. The total aid covers both development and revenue expenditures. The data on government spending has been extracted from the Bangladesh Bureau of Statistics' (BBS) Statistical Yearbook. Aid inflows for education have been deducted from the respective expenditures; as such, the government spending is net of aid. The original intention was to compute volatility from 1971, but given the lack of data on government spending in education from 1971 to 1979, the study has been based on figures from 1980 onwards.

While Bulir and Hamann (2003) computed their measure of volatility using aid and revenue figures, this paper instead uses aid and government spending for the two sectors to calculate volatility for the purpose of establishing the hypothesis that government spending fluctuates less than aid. Whether the fluctuations in aid have led to any changes in government spending in education can be captured most effectively if the volatility of aid relative to spending is calculated, instead of calculating it relative to revenue. There has been some concern in the literature to ensure that the aid series is stationary and consequently to make sure that the variance measure used to calculate volatility is constant over time. The Augmented Dickey-Fuller tests for education aid and government spending for these sectors were reported to be non-stationary at level. Therefore, the series has been de-trended using the HP filter to remove the stochastic trend in the series; a smoothing parameter of $\lambda=7$ has been applied, following Pesaran and Pesaran (1997). The HP filter is widely used in economics to estimate trends and cycles from time series data.

IV.2 Measuring Volatility and Relative Volatility

Aid and government spending are denominated in million U.S. dollars and are in real terms. Aid and spending for education have been de-trended and the coefficient of variation (θ) has been calculated for each series. The coefficient of

variation (c_v) in theory is defined as the ratio of standard deviation (σ) to the mean (μ):

$$c_v = \sigma / \mu$$

In probability theory and statistics, the coefficient of variation is a normalised measure of dispersion of data points around the mean. It is a helpful statistic for comparing the degree of variation of one data series from another. The coefficient of variation for a single variable describes the dispersion of the variable in a way that does not rely on the unit. The higher the c_v , the greater is the dispersion in the variable. For instance, in the financial world, the c_v allows one to determine how much volatility or risk a person is taking on. For the objectives of this paper, the measure of volatility or instability in aid and government spending is captured by this variable. The coefficient of variation was calculated for the following variables:

$$\theta_{EA} = \sigma_{EA} / \mu_{EA} \quad (1)$$

$$\theta_{ES} = \sigma_{ES} / \mu_{ES} \quad (2)$$

where

EA = education aid

ES = government spending in education

The measure of relative volatility of aid (Φ) for the specific sector, with respect to the government spending in that sector, is subsequently defined as the ratio of the respective coefficient of variation, where:

$$\Phi_{EA} = \theta_{EA} / \theta_{ES} \quad (3)$$

A value of $\phi > 1$ means that the numerator, i.e. coefficient of variation of aid, is greater than the denominator, i.e. coefficient of variation of spending. This would imply that the volatility of government spending in a sector is less than the volatility of aid for that particular sector. In effect, this means that aid is more volatile than spending (relative volatility of aid is high). A value of $\phi < 1$, on the other hand, means that the volatility of spending in a sector exceeds the volatility of aid in that sector. This shows that aid is less volatile than spending (relative volatility of aid is low).

The following section aims to find a measure of volatility for education for the entire period (1980-2008) and the sub-periods.

IV.3 Volatility Results

Table I presents the volatility results. For the period 1980-2008, the coefficient of variation (θ) of aid allocated to the education sector was 0.827. The coefficient of variation for education aid is more than the coefficient of

variation of education spending (0.621), indicating that government spending on education has a smaller dispersion and fluctuates less than aid. Volatilities in education aid were also calculated for the following periods: 1980-1989, 1990-1999 and 2000-2008. Volatility according to periods were calculated to provide a disaggregated measure—using a single indicator over the period 1980-2008 to draw a conclusion might be too general. For the first period of 1980-1989, the coefficient of variation of aid was at its highest—the dispersion in aid was high, while dispersion in government spending was not that much. The period 1990-1999 illustrates a different picture however. The θ for spending on education expenditures (0.294) has varied more with respect to the θ of aid (0.214). Therefore, it seems that government spending has experienced more fluctuations in response to the variability in aid, although the θ of 0.294 for education spending justifies the substantial amount of spending in education during that time. Murshid (2003) pointed out that it was during the 1990s that the Bangladesh government began to pay increasing attention to the social sectors. Therefore, it can be assumed that the spending patterns for these sectors were not stable to start out with. The third and the final period covers the next nine years and shows that the θ for aid in education has gone up, but still less than the decade of 1980. Meanwhile, the coefficient of variation for spending in education has gone down, reaching a value of 0.169. Government spending for the period 2000-2008 shows the smallest fluctuation (0.169), demonstrating that expenditures in education might have been stabilised in this decade. Therefore, measuring volatilities of education across the periods does not reveal differences from the single period measure.

TABLE I
VOLATILITY OF AID, SPENDING AND REVENUES

	<i>Full Sample</i> 1980-2008	1980-1989	1990-1999	2000-2008
Coefficient of variation of education aid	0.827	0.545	0.214	0.44
Coefficient of variation of education spending	0.621	0.257	0.294	0.169

IV.4 Relative Volatility Results

Table II lists the results for the relative volatility of aid (ϕ). The measure is based on the coefficient of variation found for each variable previously. The first finding is that relative volatility of education aid (1.33) is high for the period

1980-2008. This means that for the entire period, when aid and spending are compared as ratios, education aid is more volatile with respect to government education expenditure. For the period of 1980-1989, ϕ is greater than 1 for education, showing that the high fluctuations in foreign assistance for the years 1980 to 1989 did not have much bearing on the government's own expenditure on education. This could indicate that the government was able to use domestic sources of finance and thus plan out its own spending on the education sector. The second period shows that the volatility measures are less than 1—foreign aid for education appears to have fluctuated less than government spending. Public expenditures in education were deemed to be very responsive to changes in aid. The period 2000-2008 illustrates that the θ for education aid was 2.60 times more respectively than the θ for public spending in these areas. The high relative volatility for aid for 2000-2008 can be attributed to the small fluctuations in government spending in education. Table II shows that the θ for expenditures in education at their minimum from 2000 to 2008; this implies that the relative volatility of aid was at its maximum for this period.

TABLE II
RELATIVE VOLATILITY OF AID AND SPENDING

	<i>Full Sample</i> 1980-2008	1980-1989	1990-1999	2000-2008
Relative volatility of education aid (ϕ)	1.33	2.12	0.728	2.60

V. GOVERNMENT SPENDING IMPACT ON EDUCATION INDICATOR

This section attempts to show that government spending in the pro-poor sector of education has led to an improvement in the respective indicator. The aim is to corroborate the earlier finding that government expenditure in education has been less volatile with respect to aid, with the hypothesis that government spending has been stable, self-sufficient and effective compared to aid in improving the welfare of the poor. This hypothesis has been tested by running regressions of an education indicator on government spending in the sector.

V.1 The Dataset

The database covers the same figures for expenditures on education and aid for the period 1980-2008. Furthermore, the figures on the number of primary students have been obtained from the 2008 Statistical Yearbook, Bangladesh Bureau of Statistics, for the period 1985-2005. (Refer to Table A.2 in Appendix).

The number of primary students enrolled has been chosen as an indicator for education. There was sporadic data for the literacy rate of Bangladesh and only the data on primary students was consistent enough. Using the primary school enrolment data also makes sense, as the government of Bangladesh since the 1990s has focused on increasing school enrolment nationwide, with a particular focus at the village level. Three sets of regressions were run for each indicator: one set includes government spending only, the second set includes aid in that particular sector and the final equation includes both government spending and aid to assess the joint impact. Both the data on spending and aid have been converted to logarithmic forms to evaluate the elasticity of each indicator.

V.2 Measuring the Impact of Pro-Poor Government Spending

The model used here is a time series OLS regression which will address the impact of government spending on education and also the impact of aid. The general form of the equation for the sector is as follows:

$$PStudents = \beta_0 + \beta_1 educexp + \beta_2 educaid + t + \varepsilon_t \quad (1)$$

where,

PStudents is the number of primary students enrolled, in millions, from grades 1 to 5.

educexp is the amount spent by the government on education, net of aid, in millions of dollars.

educaid is the amount of aid for education, in millions of dollars.

ε_t = classical error term.

t = time trend.

Since this is a time series regression, the Breusch–Godfrey serial correlation LM test was run to test for autocorrelation. The presence of autocorrelation or serial correlation would mean that the error terms in one time period are correlated with the error terms in subsequent periods. This would cause the t-values and standard errors to be affected. If there is a positive serial correlation, the standard errors will be underestimated and the t-values will be biased upwards. The null hypothesis and alternative hypothesis under serial correlation are given as follows:

H_0 : no serial correlation

H_a : serial correlation

The chi-squared (χ^2) test-statistic is compared with the test-statistic (TR^2) that is calculated, and we can accept the null of no autocorrelation if $TR^2 < \chi^2$ at any significance level.

V.2.1 Education

The regression to assess the impact of government spending in education was run and the results are discussed subsequently. The Breusch–Godfrey serial correlation LM test detected no presence of autocorrelation. When the statistic for the Obs*R-squared (3.17) is compared to the critical value of χ^2 at 5% level of significance with 1 lag (3.84), the null hypothesis cannot be rejected. (Refer to Table B.1 in the Appendix). The following specification was estimated:

$$\text{Log}(P\text{Students}) = 0.40 + 0.3768\text{log}(\text{educexp}) - 0.003t \quad (\text{i})$$

(6.318) (-0.65)

*Adjusted R*² = 0.9439 *F* = 169.3159 *Prob(F-statistic)* = 0.000 *Durbin-Watson* = 1.11.

‘log(educexp)’ and ‘log (PStudents)’ are the logarithm of educexp and primary students respectively. The t-statistics for each coefficient is denoted in the parenthesis. The equation shows an overall good fit, as illustrated by the adjusted R² value of 0.94. The t-statistics on education expenditure suggest that the variable is highly significant—there is statistical evidence that the coefficient on education expenditure differs from zero. The estimates show that public spending on education has had a strong positive impact on primary school enrolment in Bangladesh. Holding the other variables constant, a 1 per cent increase in public spending in education increases primary school enrolment by 0.38 per cent. As such, government education spending programmes in Bangladesh are acknowledged to have a beneficial pro-poor effect over the years 1985 to 2005.

The second regression only includes foreign aid in the education sector. The Breusch–Godfrey serial correlation LM test detected the presence of autocorrelation. To correct for serial correlation, an autoregressive (AR) term is included in the equation. For the purpose of this study, only the AR (1) term has been added to the specification (Table B.2).

$$\text{Log}(P\text{Students}) = 287.53 - 0.010\text{log}(\text{educaid}) - 1.09t + 0.9958\text{AR}(1) \quad (\text{ii})$$

(-0.31) (-0.02) (5.61)

*Adjusted R*² = 0.931 *F* = 87.18 *Prob(F-statistic)* = 0.000 *Durbin-Watson* = 2.19

‘log(educaid)’ is the logarithm on educaid. It appears that education aid results in falling primary school enrolments. A 1 per cent increase in foreign aid leads school enrolments to decline by 0.01 per cent. However, the figure is very small and, most importantly, the coefficient is not statistically significant.

Therefore, it appears that without any other sources of finance, education aid has had a trivial impact in determining primary school enrolments and generally has not led to any improvements in the education arena on the basis of this finding.

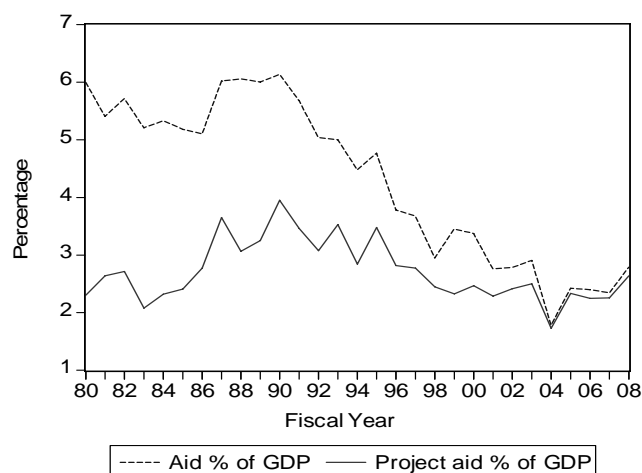
The third regression takes account of the joint effect of education aid and government spending:

$$\text{Log}(P\text{Students}) = 0.3569 + 0.417\text{log}(\text{educexp}) - 0.0478\text{log}(\text{educaid}) - 0.0039t \quad (\text{iii})$$

(5.70) (-0.96) (-0.69)

$$\text{Adjusted } R^2 = 0.9436 \quad F = 112.72 \quad \text{Prob}(F\text{-statistic}) = 0.000 \quad \text{Durbin-Watson} = 1.22$$

The final equation shows a very good fit as well. Education aid still appears to be statistically insignificant in determining enrolments, even though the coefficient states that a 1 per cent increase in aid causes enrolments to decline by 0.04 per cent (Table B.3). This estimate could indicate that aid flows for education do not supplement government efforts in the education sector of Bangladesh. Although the coefficient is negative, it should not be taken to mean that aid for education has actually led to a decline in school enrolments—the claim that foreign funded education projects aimed at encouraging primary school enrolment actually lead to a decrease in enrolment, would not have much basis. It could mean that aid for education might have a significant impact on other aspects of education, like setting up new schools or covering vital recurrent expenditures like teacher wages and school supplies. Unfortunately, the lack of data pertaining to the other facets of education does not permit one to perform such an analysis. The coefficient on government spending appears to be significant, implying that government spending could be independent of foreign sources of finance. A 1 per cent increase in government spending appears to increase school enrolment by 0.417 per cent. As far as the education sector is concerned, foreign aid has not contributed to an increase in school enrolments in Bangladesh. The estimates show that public spending in education, with or without foreign aid, seems to increase primary school enrolments. The Food for Education (FFE) scheme of the government could play a part here in increasing primary enrolments. This indicates, to some extent, that government spending in education could be independent of foreign aid fluctuations. The findings for the education sector seem to harmonise with the volatility measure, in ascertaining that government spending in education is stable and also less dependent on aid. Figure 6 illustrates that Bangladesh has become less dependent on total foreign aid over time.

Figure 6: Aid Dependency (1980-2008)

Murshid (2003) stated that development expenditures still rely heavily on aid, especially project aid. He reported that in the 1970s and 1980s, aid dependency was close to around 100 per cent and declined in the mid 1980s as a result of government efforts to mobilise domestic resources. Total aid represented almost 10 per cent of the GDP in the 1970s, but has declined substantially in recent years to around 3 per cent. More specifically, aid dependency seems to have been declining in a pronounced manner from the 1990s, dipping below the 5 per cent mark. Murshid (2003) attributed this partly to successful fiscal reforms of the government as well as to declines in aid volume. Project aid as a per centage of GDP has remained fairly static at around 2.5 per cent, although it did increase during the mid 1980s and early 1990s, reflecting the fact that the social sectors of education and health were starting to be prioritised. Aid dependency might have been further reduced through the growth of remittances from migrant workers. According to Sobhan (2004), remittances from migrant workers in the Middle East have contributed to around 72 per cent of the sum total of \$3.4 billion remitted in the year 2004, whereas total aid during the same year was a little over \$1 billion. Foreign aid per capita has declined from \$20 in 1990 to \$9 in 2008 and the domestic savings-investment gap has been met by worker's remittances in recent years (Ahmad and Quibria 2007). As such, the need for aid over the years might have been reduced.

VI. CONCLUSION

This paper assessed the impact of aid flows on government spending behaviour in Bangladesh. Specifically, an attempt was made to assess the overall

implications of volatile aid flows to the pro-poor sector of education, for government expenditures in this area. It also attempted to show that government spending programmes have been sufficient and successful in improving the performance indicator in education, when compared to aid in this sector.

The sector wise measures demonstrate that government spending in education has been less volatile in response to aid flows and are thus more stable. This is to be expected since government spending, both recurrent and non-recurrent, has to take care of a system that already exists and by its very nature has to grow incrementally over time, rather than fluctuate too much. The hypothesis is backed up by the regression results. Foreign aid was found to be insignificant in improving school enrolments in Bangladesh. The estimates show that public spending in education, with or without foreign aid, has increased primary school enrolments. This demonstrates, to some extent, that government spending in education could be independent of foreign aid fluctuations.

The study is not without its limitations. Firstly, the reason for a minor impact of aid on enrolment growth could be that aid was directed more towards taking quality improvement initiatives rather than expanding the system. There is an absence of data regarding aid for education used for setting up new schools or covering vital recurrent expenditure such as teachers' wages and school supplies. As such, the lack of reliable data at the disaggregated level did not permit such a study. Another reason could be that aid for education might not have been properly utilised. For instance, a recent ADP study showed that the utilisation of foreign aid last year was not adequate. The review found out that the various ministries could not utilise project aid due to certain weaknesses. This could mean that project aid for education and health over time has not been as effectively utilised to improve the performance indicators. As a result, the regression results for government spending could therefore be favourable relative to aid in education. If the foreign funds were adequately used and targeted, the impact of foreign aid on education might have been more significant.

As to meeting the basic needs of the poor, spending in primary education is not necessarily or automatically pro-poor. The Poverty Reduction and Economic Management Sector Unit (PREM) of the World Bank pointed out that starting from the last half of the preceding decade, primary education's share of the recurrent budget has declined to 39.5 per cent, while secondary education's share has increased from 36.8 per cent to 48.4 per cent. The report also highlighted that the quality of education has been abject and has not kept up with the expansion in enrollment. Most significantly, student attendance rates have been found to be low (62 per cent), teacher absenteeism was high (around 5-20 per cent and depending on the type of school), the curriculum has very little relevance to

practicality and the teacher-pupil contact time was very low. Even though the definition of pro-poor spending in the literature includes education spending as one of the facets, it would appear that Bangladesh does not quite have the relevant pro-poor impact. With respect to policy implications, it can be concluded that education investment is not dependent on the volatility of aid. However, expenditure on primary education is not necessarily pro-poor, unless there is a widespread and meaningful access of acceptable quality for the poor.

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APPENDIX

TABLE A.1
TOTAL EDUCATION AID AND EDUCATION SPENDING (1980 – 2008)
(Figures in \$ million)

Fiscal Year	Education aid	Education expenditure
1980	12.5	131.73
1981	12.1	188.73
1982	10	166.55
1983	10.9	142.65
1984	19.5	165.76
1985	23	149.32
1986	38.2	189.36
1987	37.7	236.93
1988	55.3	269.22
1989	36.6	336.29
1990	62.3	321.44
1991	36.7	311.97
1992	68.2	396.29
1993	84.9	481.84
1994	66.3	557.32
1995	123.8	737.93
1996	106.3	672.14
1997	103.7	742.61
1998	100.5	779.99
1999	91.9	844.87
2000	85.2	706.69
2001	110.2	908.7
2002	117.1	897.93
2003	107.5	967.74
2004	82.8	982.44
2005	176.1	872.93
2006	316.7	987.2
2007	364.6	1186.42
2008	217	1440.86
Total	2677.6	16773.85

TABLE A.2
TOTAL PRIMARY STUDENT ENROLMENT (1985-2005)

Fiscal Year	Primary student enrolment (millions)
1985	10.08
1986	10.78
1987	11.26
1988	11.76
1989	11.77
1990	12.34
1991	13.03
1992	13.72
1993	14.2
1994	15.19
1995	16.43
1996	17.07
1997	17.32
1998	17.63
1999	19.61
2000	17.67
2001	17.66
2002	17.56
2003	18.43
2004	17.95
2005	16.23

TABLE B.1
**IMPACT OF GOVERNMENT EDUCATION SPENDING ON PRIMARY
 SCHOOL ENROLMENT**

Dependent Variable: Log(PStudents)				
Method: Least Squares				
Date: 08/17/10 Time: 15:02				
Sample (adjusted): 1985 2005				
Included observations: 21 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
T	-0.003667	0.005633	-0.651066	0.5232
C	0.402105	0.292993	1.372403	0.1868
log(educexp)	0.376863	0.059644	6.318500	0.0000
R-squared	0.949528	Mean dependent var		2.697322
Adjusted R-squared	0.943920	S.D. dependent var		0.204550
S.E. of regression	0.048440	Akaike info criterion		-3.085417
Sum squared resid	0.042236	Schwarz criterion		-2.936200
Log likelihood	35.39688	F-statistic		169.3159
Durbin-Watson stat	1.115858	Prob(F-statistic)		0.000000
<hr/>				
Breusch-Godfrey Serial Correlation LM Test:				
F-statistic	3.024604	Probability		0.100084
Obs*R-squared	3.171932	Probability		0.074914
Test Equation:				
Dependent Variable: RESID				
Method: Least Squares				
Date: 08/17/10 Time: 15:04				
Presample missing value lagged residuals set to zero.				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
T	-0.000805	0.005360	-0.150158	0.8824
C	-0.013461	0.277895	-0.048439	0.9619
log(educexp)	0.003849	0.056592	0.068013	0.9466
RESID(-1)	0.425161	0.244466	1.739139	0.1001
R-squared	0.151044	Mean dependent var		-8.59E-17
Adjusted R-squared	0.001229	S.D. dependent var		0.045954
S.E. of regression	0.045926	Akaike info criterion		-3.153927
Sum squared resid	0.035856	Schwarz criterion		-2.954971
Log likelihood	37.11624	F-statistic		1.008201
Durbin-Watson stat	1.671601	Prob(F-statistic)		0.413309

TABLE B.2
**IMPACT OF FOREIGN AID IN EDUCATION ON PRIMARY SCHOOL
 ENROLMENT**

Dependent Variable: Log(PStudents)				
Method: Least Squares				
Date: 08/17/10 Time: 18:18				
Sample (adjusted): 1985 2005				
Included observations: 21 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
T	0.021897	0.005604	3.907547	0.0010
C	1.870723	0.221772	8.435337	0.0000
log(educaid)	0.116175	0.067322	1.725668	0.1015
R-squared	0.860638	Mean dependent var		2.697322
Adjusted R-squared	0.845153	S.D. dependent var		0.204550
S.E. of regression	0.080492	Akaike info criterion		-2.069766
Sum squared resid	0.116620	Schwarz criterion		-1.920548
Log likelihood	24.73254	F-statistic		55.58003
Durbin-Watson stat	0.802696	Prob(F-statistic)		0.000000
Breusch-Godfrey Serial Correlation LM Test:				
F-statistic	7.879681	Probability		0.012123
Obs*R-squared	6.650941	Probability		0.009910
Test Equation:				
Dependent Variable: RESID				
Method: Least Squares				
Date: 08/17/10 Time: 18:19				
Presample missing value lagged residuals set to zero.				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
T	7.83E-05	0.004766	0.016433	0.9871
C	0.168067	0.197908	0.849215	0.4076
log(educaid)	-0.041718	0.059159	-0.705183	0.4902
RESID(-1)	0.872720	0.310900	2.807077	0.0121
R-squared	0.316711	Mean dependent var		2.51E-16
Adjusted R-squared	0.196131	S.D. dependent var		0.076361
S.E. of regression	0.068464	Akaike info criterion		-2.355366
Sum squared resid	0.079685	Schwarz criterion		-2.156409
Log likelihood	28.73134	F-statistic		2.626560
Durbin-Watson stat	1.589433	Prob(F-statistic)		0.083779

(Cont. Table B.2)

Dependent Variable: Log(PStudents)
Method: Least Squares
Date: 08/17/10 Time: 18:20
Sample (adjusted): 1986 2005
Included observations: 20 after adjustments
Convergence achieved after 500 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
T	-1.098757	48.09305	-0.022846	0.9821
C	287.5365	23619.10	0.012174	0.9904
log(educaid)	-0.010277	0.032559	-0.315642	0.7564
AR(1)	0.995821	0.177424	5.612674	0.0000
R-squared	0.942352	Mean dependent var		2.716660
Adjusted R-squared	0.931543	S.D. dependent var		0.189145
S.E. of regression	0.049489	Akaike info criterion		-2.997290
Sum squared resid	0.039186	Schwarz criterion		-2.798143
Log likelihood	33.97290	F-statistic		87.18178
Durbin-Watson stat	2.194403	Prob(F-statistic)		0.000000
Inverted AR Roots	1.00			

TABLE B.3
**JOINT IMPACT OF FOREIGN AID IN EDUCATION AND GOVERNMENT
SPENDING ON PRIMARY SCHOOL ENROLMENT**

Dependent Variable: Log(PStudents)
Method: Least Squares
Date: 08/17/10 Time: 17:12
Sample (adjusted): 1985 2005
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
T	-0.003917	0.005650	-0.693313	0.4975
C	0.356947	0.297327	1.200518	0.2464
log(educexp)	0.417627	0.073261	5.700512	0.0000
log(educaid)	-0.047880	0.049764	-0.962152	0.3495
R-squared	0.952134	Mean dependent var		2.697322
Adjusted R-squared	0.943687	S.D. dependent var		0.204550
S.E. of regression	0.048540	Akaike info criterion		-3.043203
Sum squared resid	0.040055	Schwarz criterion		-2.844246

(Cont. Table B.3)

Log likelihood	35.95363	F-statistic	112.7201	
Durbin-Watson stat	1.219196	Prob(F-statistic)	0.000000	
F-statistic	2.555513	Probability	0.129468	
Obs*R-squared	2.892174	Probability	0.089011	
Test Equation:				
Dependent Variable: RESID				
Method: Least Squares				
Date: 08/17/10 Time: 17:13				
Presample missing value lagged residuals set to zero.				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
T	0.000152	0.005409	0.028047	0.9780
C	0.041953	0.285799	0.146793	0.8851
log(educexp)	-0.021542	0.071406	-0.301679	0.7668
log(educaid)	0.020780	0.049374	0.420870	0.6794
RESID(-1)	0.402139	0.251557	1.598597	0.1295
R-squared	0.137723	Mean dependent var	4.82E-17	
Adjusted R-squared	-0.077847	S.D. dependent var	0.044752	
S.E. of regression	0.046461	Akaike info criterion	-3.096143	
Sum squared resid	0.034538	Schwarz criterion	-2.847447	
Log likelihood	37.50950	F-statistic	0.638878	
Durbin-Watson stat	1.743027	Prob(F-statistic)	0.642338	