



Distributional Effects of Public Educational Expenditures: Empirical Results from Cohort Analysis

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ABSTRACTS

This article scanned the empirical analysis of the distributional effects of public education expenditure using Gini coefficient of education based on cross-sectional data across cohorts in Bangladesh. The main purpose of this study was to investigate whether education expenditure plays a role as a catalyst to diminish education inequality across the country by increasing years of schooling across levels of education. The Data set proved that overall years of schooling increased while education expenditure increases for a long time having slight fluctuations. Consequently, the Gini coefficient of education gradually increased and the inequality of education getting narrowed down across levels of education. Distributional effects of public expenditure on education across cohorts produced an exceptionally good result indicating positive relationships between years of schooling and the Gini coefficient of education. Despite the achievements of the education sector, the government of Bangladesh has comprehended that in the public sector education, there are substantial numbers of challenges make it tough to get the best outcomes along with quality education and insufficient budget flow across levels of education. This paper tended to uncover education redistributive policy and the existence of inequality in the cohorts across levels of education by estimating the Gini coefficient of education in Bangladesh.

Key Words: public expenditure, education inequality, years of schooling, Gini coefficient

INTRODUCTION

This paper discussed the empirical results of the distributional effects of public education expenditures in Bangladesh in relation to education using Gini coefficients based on cohort in Bangladesh. The public sector education has reliably received substantial budgetary allocation from the government as the government tends to believe that the endowment of education to each citizen is not only important for the country's robust economic development but also facilitates equally individual to benefit as well from different channels of education. This is the reason to analyze whether the public education expenditure makes a bridge to reduce the education inequality across the country and whether years of schooling is increasing across

levels of education in cohorts and education inequality is steadily declining—that is really significant in Bangladesh. Despite the achievements of the education sector, the government of Bangladesh has comprehended that in the public sector education there are substantial numbers of challenges make it tough to get the best outcomes as well as quality education. This paper tended to uncover education redistributive policy and the existence of inequality across levels of education in the cohorts across the country by estimating Gini coefficient of education.

LITERATURE REVIEW

Beginning with income Gini, normally there are two methods to compute an income Gini; the direct method (Deaton Angus S., 1997) as well as the indirect method. Statistically, the direct method explains that income Gini is defined as "the ratio to the mean of half of the average overall pairs of the absolute deviations between [all possible pairs of] people" (Deaton Angus S., 1997). Conversely, the indirect method first builds the income Lorenz curve, with the aggregate ratio of the income on the vertical axis, and the aggregate ratio of the population on the horizontal axis (Deaton Angus S., 1997), and the produced 45-degree line is called the egalitarian line for it exemplifies an entirely equal society with respect to the distribution of income. And then the Gini is calculated as the percentage of two areas, with the area of the egalitarian triangle as the denominator and the area between Lorenz curve and the egalitarian line as the numerator (Deaton Angus S., 1997).

Correspondingly, both the direct method and the indirect method can similarly apply to the education Gini. As a referend to Deaton's definition, education Gini measures the ratio to the mean (average years of schooling) of half of the average schooling deviations between all possible pairs of people (Thomas, Wang, & Fan, 2001). Under the study, Gini coefficients of education method will apply for measuring the education inequality based on cohort analysis in Bangladesh using cross-sectional data.

So far, my knowledge, maximum of the previous literature that studied income inequality considering as a proxy of wealth inequality. Academically, income inequality boosts economic growth up by increasing aggregate savings, since the marginal propensity of rich/wealthier people to save is higher than that of poor people (Kaldor, 1955; Kuznet, 1955). On the contrary, income inequality inversely affects growth in expansionary fiscal policy (Perotti, 1993), in incompetent bureaucracy (Acemoglu, Ticchi, & Vindigni, 2011) or in political unsteadiness (Benabou, 1996). It could also hamper growth by lowering investment in human capital in poor families or by reducing human capital accumulation (Galor & Moav, 2004; Joseph & Oded, 2013). Another study acknowledged that positive or negative effects of inequality on economic growth may change over time, regardless of long- or short-term effects; for instance, channels like expansionary fiscal policy or human capital accumulation take longer time to affect growth (Halter, Oechslin, & Zweimüller, 2014).

But very few studies examined direct education inequality in a particular country like Bangladesh, which is also characterized as a developing country. And most of the research is based on either a case study or cross-country analysis in the case of education inequality. A case study in Sabah, Malaysia from 2009 to 2013 proved that education inequality in rural areas is always higher than that of urban areas and also shows the education inequality is more in rural areas where the number of schools tend to be high (Tan, Ho, & Pang, 2016). Measuring education

inequality by constructing a Gini index on educational attainments found that average years of education have a robust negative impact on measured income inequality where public expenditure on education is considered (Checchi, 2001). Education worldwide is perceived as a tonic for rising inequality which most of the time goes with development. It is assumed that many developing countries tend to spend more toward higher studies that benefits the upper class disproportionately. As many developing countries tilt expenditure to higher education, the study recommends that determination focuses only on mass education, for example, the UN's Millennium Campaign, may end up raising inequality in most of the developing countries (Gruber & Kosack, 2014). The pooled assessments using a probit model shows for all levels of education, except for the higher one, the distribution is getting nearer to the perfect equity line on the education Lorenz Curve, where reduction in inequality depended on some factors like household income, location that lead to reduce Gini coefficient of education (Banzragch, Mizunoya, & Bayarjargal, 2019). Analyzing the pattern of educational inequality using education Gini in NSSO 71st Round, Indian States, we show that there is more educational inequality exists and allure us to comprehend whether educational inequality is pro-poor or pro-rich in nature (Dutta, 2017). Education inequality measure by Gini is a new concept in terms of country context studies, especially primary, secondary, and higher levels of education showing public disbursement impacts on year of schooling and the Gini coefficients of education. A study in China showing disintegration results using Gini and Shapley value built on regression indicating the utmost contributing elements to educational inequality involve the urban-rural as well as social stratification divisions. In addition, the population from economically underprivileged areas still warrants social concern, especially about education inequality (Yang, Huang, & Liu, 2014).

A study in Albania and Nepal applying large household survey data show that there exists significant education inequality in terms of education attainment which is determined by socio-economic, demographic as well as geographical factors (Devkota & Upadhyay, 2016). In Nigeria, using household data from the World Bank, show the household characteristics and educational achievement affect educational inequality (Umar, 2017). Educational attainment and per capita income affect increasing education inequality. Another study exposed (in)equity is higher among male, minority, and students from periphery; and (in)equity increases along the examined years (Dadon-Golan, BenDavid-Hadar, & Klein, 2019). The more or less some result shows in the study of U.S.A by age group and sex using education attainment data which indicate a declining trend of education inequality in the time frame of 1950-2009. The study also indicates that the education inequality is more among males compared to females (Bennett, 2012). The Gini of educational expenditure of an average student for compulsory education is becoming less over the year showing the huge gaps between categories of economic development in terms of Gini and in terms of per student expenditure for compulsory education (Wen, 2019). But the year of schooling is a very crucial factor along with the birth year that may reveal the real gaps in the educational attainment of a particular country and can show us the real scene of educational inequality in that region or country. Another study argues that average years of schooling as well as GDP per capita shows negative slopes where tertiary education tends to reduce education inequality (Ziesemer, 2016). In addition, a research measuring education inequality in coastal and inland provinces in the context of rural-urban inequality using Gini coefficients and, the major argument is, disparities in terms of access to education among rural-urban rather than between coastal and inland provinces are the main cause of education inequality in China (Qian

& Smyth, 2008). Furthermore, on the basis of years of schooling of individuals in Ghana, we found evidence of gender as well as spatial educational inequality (Senadza, 2012).

A book chapter calculating education Gini for every province, metropolis, city as well as ward from 1970-2000 in South Korea to quantify the level of inequality in terms of human capital distribution based on education attainment, indicating the aggregate, national level education inequality decreased significantly during the last 30 years (Burt & Namgi, 2008, p. 262). It is proved that with the increasing trend of education achievement, the level of education inequality is decreased. Tunisia's first study covering the time frame of 1975-2004 using census data calculating education Gini based on education attainment found that in the whole country and in all reasons increased tolerating the decrease of education inequality, and this inequality is higher for female than male despite the educational attainment increased (Trabelsi, 2013). A study in Thailand showing association between mean years of schooling as well as levels of inequality using socioeconomic survey data found that while increasing the levels of educational attainment, the level of education inequality is decreased at the national level but at the provincial level the result is heterogeneous in character in terms of educational inequality (Prasartpornsirichoke & Takahashi, 2013).

Though the BIA shows the effects of inequality of income on education and indicates whether the benefit incidence goes on to the poor or rich class of a country but cannot measure the holistic inequality in the educational sector in terms of the public expenditure distribution. Besides, distribution of income has the effect and, naturally, government benefit goes on upper class most of the countries across the world except in the case of primary or entry-level of education. To measure education inequality, the effects of income are not robustly representative because the country context is different, and the whole country is not homogenous. So, the Gini coefficient of education may be the best option for calculating education inequality in a specific country like Bangladesh. Education Gini could be the perfect method in Bangladesh to find out the actual scenario of education inequality. In that case, very few studies discussed education Gini based on the cohort.

DATA AND METHODOLOGY

Data

This research applied the data of Household Income and Expenditure Survey-2016 (HIES-2016), conducted by Bangladesh Bureau of Statistics (BBS), published in May 2019 and Bangladesh Demographic and Health Survey Report (BDHS), conducted by National Institute of Population Research and Training (NIPORT).

Methodology

We first calculated the years of schooling for each respondent of the survey, which has been used to calculate the Gini coefficient representing education inequality. To get the total distributional effects of public expenditure on education policy in Bangladesh, we calculated by incorporating average years of schooling, cumulative years of schooling and, populations share of years of schooling by using STATA-2016. Following (Uddin & Sarntisart, 2019) and (Castelló & Doménech, 2002), this paper calculated the Gini coefficient of years of schooling for each birth group as follows:

$$Gini^{edu} = \frac{1}{2H} \sum_{i=0}^{18} \sum_{j=0}^{18} |x_i - x_j| n_i n_j$$

where H be the average year of schooling, x_i and x_j be the cumulative average year of schooling of years of schooling i and cumulative average year of schooling of years of schooling j respectively. n_i and n_j are population share of i years of year of schooling and j years of year of schooling respectively. The estimated value of $Gini^{edu}$ measures education inequality, which is ranges from 0 to 1. More close to zero indicates more equality and more close to one indicates more inequality in education.

RESULTS AND DISCUSSION

This chapter discussed the empirical results of the distributional effects of public education expenditures in Bangladesh about education using Gini coefficients of education based on cross-sectional data across Bangladesh's cohorts. Although the government of Bangladesh's achievements has understood that there are many challenges in the public sector education, it is tough to get the best outcomes and quality education. This research, conducting Gini coefficients of education analysis, uncovered redistributive education policy and the existence of inequality in the cohorts across the country.

Distributional effects of total Education expenditures on Education

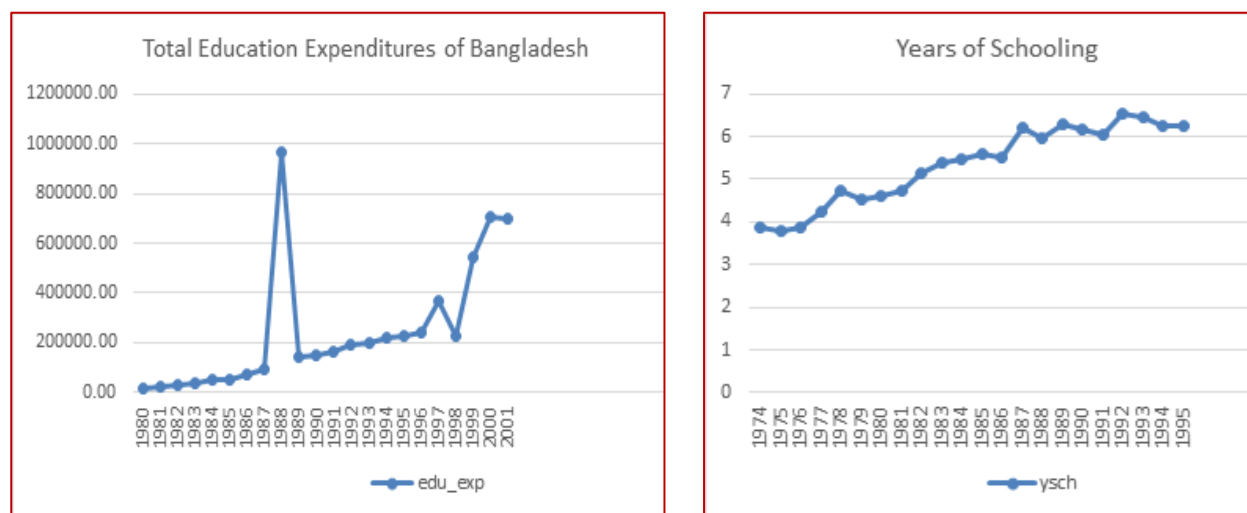
Distributional effects of public education expenditure on education based on cohort analysis in Bangladesh produced outstanding results that indicate an increasing trend of years of schooling, and Gini coefficients of education is increasing over the study period. As is proved from the literature section, that indicates the increasing trend of public education expenditures. Moreover, it is assumed that with the increasing trend of public education expenditure, inequality of education will go in opposite trend. At the same time, years of schooling followed the expenditure trend in the same direction. The data set comply the assumptions as the outcome posited on the right track (Table 4.1). Students having the birth year 1974 entered the primary education grade I in 1980 when the total public education expenditure of Bangladesh was BDT17600.95 million. The years of schooling of each respondent was 3.870, while the baseline of the Gini coefficients of education was 0.293. Total public education expenditures of Bangladesh gradually increasing over the years from 1980 to 1987, and years of schooling followed the same track while Gini coefficients of education go in opposite trend. The exception is 1988, as the total budgetary allocation of education expenditures amounted to BDT964768.83 million. The reason behind that was the 3rd Five-Year Plan (FYP), where the target was set to increase the enrollment of 70 percent primary-aged populations from 1990 for achieving the Universal Primary Education (UPE). With retention completion and reduce the gap between rural-urban and male-female in terms of educational facilities and given more emphasis on Science and Technical education. This exceptionally increased education expenditure did not affect schooling years (5.162) in 1982, and the Gini coefficient of education slightly decreased to 0.260 in 1988 from 0.273 to 1987.

Table 4.1 Education expenditure, birth year, year of schooling and Gini Co-efficient of education

Year	Education Expenditure (Million BDT)	Birth year of the students	Years of schooling	Gini coefficient of education
1980	17600.95	1974	3.870168	0.293121
1981	25420.28	1975	3.787002	0.296049
1982	27544.55	1976	3.866613	0.287827
1983	37503.48	1977	4.232559	0.28099
1984	49140.38	1978	4.744884	0.28365
1985	55138.60	1979	4.545052	0.283321
1986	70507.72	1980	4.59871	0.273239
1987	97549.02	1981	4.752669	0.273569
1988	964768.83	1982	5.161787	0.260236
1989	142256.06	1983	5.384865	0.268382
1990	150409.68	1984	5.481985	0.262467
1991	162574.15	1985	5.577628	0.261605
1992	194757.17	1986	5.529707	0.255471
1993	197479.98	1987	6.215687	0.261053
1994	219880.53	1988	5.956585	0.24851
1995	224821.21	1989	6.278411	0.246046
1996	239260.44	1990	6.160645	0.247224
1997	365227.90	1991	6.052699	0.24178
1998	226480.32	1992	6.556653	0.231768
1999	541703.62	1993	6.467173	0.223124
2000	704153.28	1994	6.261243	0.221018
2001	697263.78	1995	6.256369	0.21584

Source: Authors Own Calculation

The following figure 4.1 shows the gradual increasing trend of overall educational expenditure in Bangladesh just one- year exception that is 1988 and rest of the year also increasing trend with slight fluctuations.



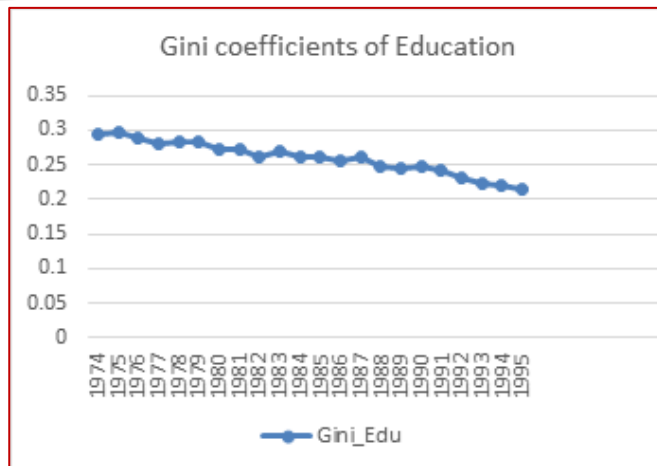


Figure 4.1 Total Education Expenditures of Bangladesh, **Figure 4.2** Years of Schooling and **Figure 4.3** Gini coefficients of Education in Bangladesh (Clockwise).

Figure 4.1, figure 4.2 responded to the trend of educational expenditure, and overall years of schooling is increasing in Bangladesh with slight fluctuations. However, figure 4.3 shows the opposite trend, comparing Figure 4.1 and 4.2, which implies that overall schooling increases in Bangladesh when educational expenditure increases. Besides, while the two-proposition comes to true in a particular country, the education Gini coefficients of that particular country must narrow down. In the case of Bangladesh, the proposition is cent percent true. The overall Gini coefficients of education in Bangladesh are developing that implying Bangladesh's education expenditure policy more or less is on the right track in terms of overall educational expenditure since 1974. Following the policy outcome, the inequality of education is decreasing gradually.

Table 4.2 Primary Education Expenditure, Birth year of the students, Year of schooling and Gini Co-efficient of education

Year	Primary Education Expenditure (Million BDT)	Birth Year of the students	Years of schooling	Gini coefficient of education
1980	7088.26	1974	3.870168	0.293121
1981	11069.77	1975	3.787002	0.296049
1982	11937.69	1976	3.866613	0.287827
1983	18568.06	1977	4.232559	0.280996
1984	22106.58	1978	4.744884	0.28365
1985	26647.53	1979	4.545052	0.283321
1986	34664.94	1980	4.59871	0.273239
1987	39019.87	1981	4.752669	0.273569
1988	182577.10	1982	5.161787	0.260236
1989	182577.10	1983	5.384865	0.268382
1990	70184.05	1984	5.481985	0.262467
1991	80020.14	1985	5.577628	0.261605
1992	96028.66	1986	5.529707	0.255471
1993	106118.40	1987	6.215687	0.261053
1994	182577.10	1988	5.956585	0.24851
1995	182577.10	1989	6.278411	0.246046
1996	182577.10	1990	6.160645	0.247224
1997	187370.86	1991	6.052699	0.24178
1998	182577.10	1992	6.556653	0.231768
1999	240856.65	1993	6.467173	0.223124
2000	327363.75	1994	6.261243	0.221018
2001	182577.10	1995	6.256369	0.215840

Source: Authors Own Calculation

Distributional Effects of Primary Education in Bangladesh

The distributional effects of Public Primary education expenditures based on the cohort in Bangladesh also increased over the years of 1980 to 1987, indicating the increasing trend of years of schooling of Primary education that was 3.870 those born in 1974 and entered the grade I in 1980 and 4.752 in 1987. In that period, the Primary education expenditure was BDT7088.26 million in 1980 and BDT39019.87 million in 1987 that is a good sign of a country like Bangladesh. Following the year, the Primary education expenditure jumped overnight to BDT182577.10 million in 1988-1989. The reason behind that was under 3rd FYP 1985-1990, which made an emphasis on increasing enrollment of 70 percent primary-aged populations during 1990 to achieve the Universal Primary Education (UPE). With retention completion and reduce the gap between rural-urban and male-female in terms of educational facilities and given more emphasis on Science and Technical education. To achieve the 3rd FYP, the government took several strategies to enhance educational facilities from the very grass-roots level.

Consequently, the dropout rate at class V in 1990 was only 11 percent, and the enrollment rate was increased from 89.20 lakh in 1985 to 119.40 lakh in 1990. In that period, all educational parameters were enhanced due to taking some pragmatic policy and some programs by the

government ((Planning Commission, 1995). Furthermore, it may be the result of educational politics because the year of 1988-1989 was just the previous year when the dictator H.M Ershad overthrown from the state power under the pressure of mass revolution in 1990; and the year of 1990, the primary education expenditure declined to BDT70184.05 million. However, after 1990, the Primary education expenditure again prioritized the government that is the beginning of democratic government in 1991, and the year is also the election year. BNP government in 1991 started to emphasize over primary education budget in Bangladesh, and the expenditure graph also started to go up. That upward trend in Primary education expenditure was continued up to 1999-2000, before the election year, and ruled another democratic government, for example, Awami- League government led by Sheikh Hasina. After the election in 2001, the Primary education expenditure again declined means that education budget politics in Bangladesh is Omnipresent, which is proved by David Easton 1965 through his political systems theory.

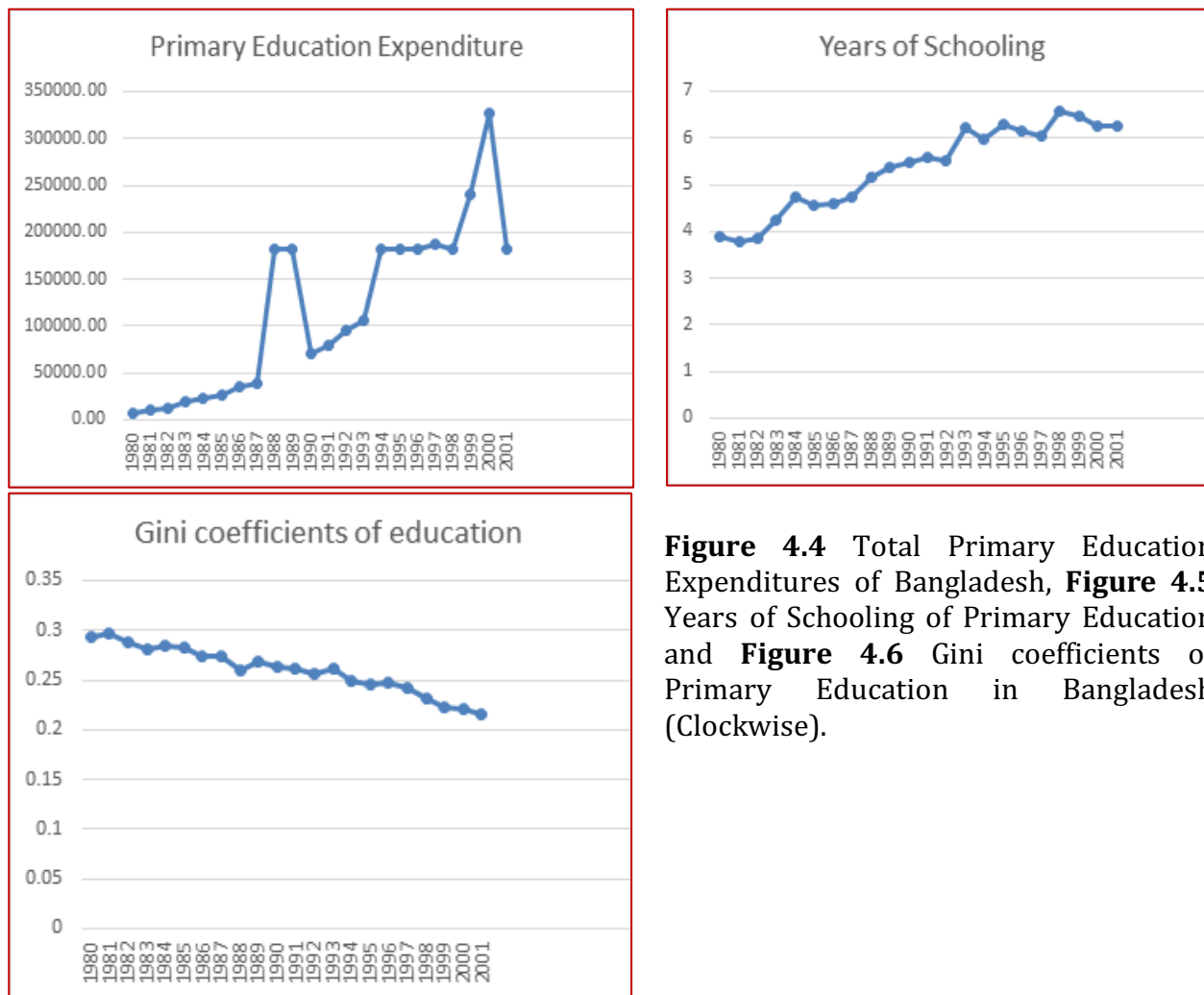


Figure 4.4 Total Primary Education Expenditures of Bangladesh, **Figure 4.5** Years of Schooling of Primary Education and **Figure 4.6** Gini coefficients of Primary Education in Bangladesh (Clockwise).

The above figure 4.4 indicates the gradually increasing trend of Public Primary education expenditures with some fluctuations. Following the education expenditure, the years of Primary schooling also increase with minor fluctuations (Figure 4.5). It is clear that with the sharp increase in public expenditure and fallen of public education expenditure, there is no such type of direct effect on the years of schooling. For example, Primary education expenditure in 1988-

1989 was jumped from the year of 1987 (Figure 4.4), but years of schooling in the year 1987 was 4.752, and in both years of 1988-1989, years of schooling were 5.161 and 5.384, respectively. Conversely, the Primary education expenditure declined from BDT182577.10 million in 1989 to BDT70184.05 million in 1990.

In contrast, the years of schooling was 5.384 in 1989 and 5.481 in 1990. However, there is jumped in the education expenditure budget in Primary education or a declining trend in Primary education expenditure in a short period that did not affected the years of schooling (Figure 4.5) in terms of Primary education in every cohort in Bangladesh. That means short-term fluctuations in education expenditure do not hamper the years of schooling in Bangladesh's case. The same picture prevails in the year 2000 when the Primary education expenditure was highest in Bangladesh at BDT327363.75 million and years of schooling were 6.261 in the same year. However, the following year 2001, Primary education expenditure declined to BDT182577.10 million and the years of schooling was 6.256 in the same year 2001.

Figure 4.6 shows the Gini coefficient of education for every respondent in the cohort gradually decreases from 1980 to 2001 in Primary education. The figure also shows the education inequality in Primary education decreases, which means all the respondents get more opportunity to retain in school long time and the years of schooling are increasing across the country. The Gini coefficient of education in the year 1980 was 0.293, and finally, it stood at 0.215 in the year 2001, having a very narrow margin over the research period. The development of education equality indicates the positive relationship between the education expenditure and education Gini, meaning that if the education expenditure increases gradually over time, then the education Gini coefficient will decrease over time. However, short-time budgetary expansion has no direct effect on education Gini in Bangladesh.

Table 4.3 Secondary Education Expenditure, Birth year of the students, Year of schooling and Gini Co-efficient of education

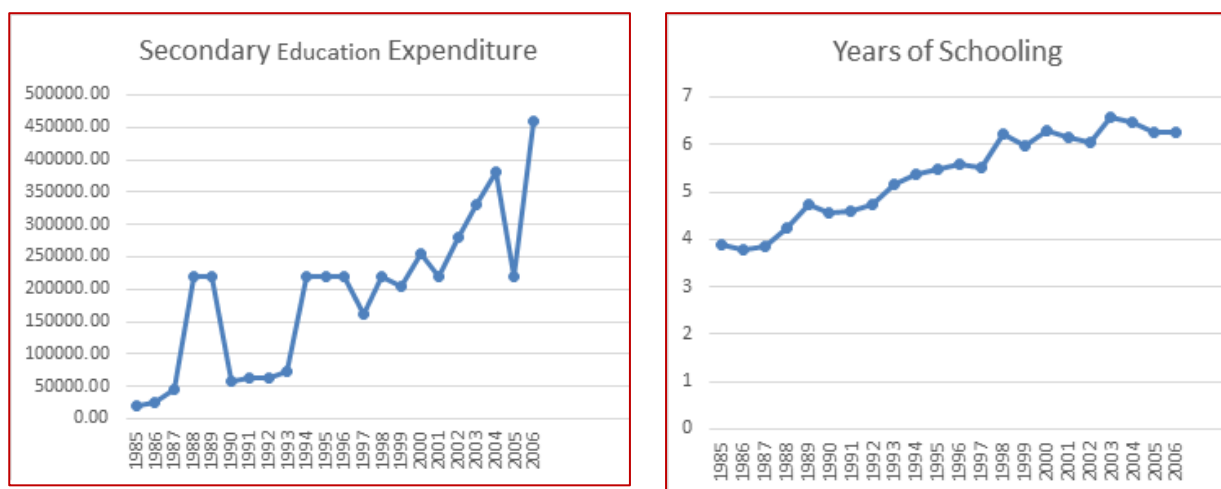
Year	Secondary Education Expenditure (Million BDT)	Birth Year of the Students	Year of Schooling	Gini coefficient of Education
1985	20210.62	1974	3.870168	0.2931212
1986	24281.77	1975	3.787002	0.2960486
1987	44909.69	1976	3.866613	0.2878273
1988	219654.36	1977	4.232559	0.2809896
1989	219654.36	1978	4.744884	0.28365
1990	58277.72	1979	4.545052	0.2833205
1991	63434.74	1980	4.59871	0.2732393
1992	62474.79	1981	4.752669	0.2735691
1993	73618.25	1982	5.161787	0.2602358
1994	219654.36	1983	5.384865	0.2683816
1995	219654.36	1984	5.481985	0.2624668
1996	219654.36	1985	5.577628	0.2616048
1997	160552.94	1986	5.529707	0.2554714
1998	219654.36	1987	6.215687	0.2610525
1999	205046.63	1988	5.956585	0.2485101
2000	254239.89	1989	6.278411	0.2460457
2001	219654.36	1990	6.160645	0.2472239
2002	279531.79	1991	6.052699	0.2417804
2003	330443.86	1992	6.556653	0.2317676
2004	381058.42	1993	6.467173	0.2231238
2005	219654.36	1994	6.261243	0.221018
2006	460050.39	1995	6.256369	0.2158403

Source: Authors Own Calculation

Distributional Effects of Secondary Education in Bangladesh

Distributional effects of Public Secondary education expenditure based on Bangladesh's cohort also increased over the years 1985 to 2006, which indicates the increasing trend of years of schooling of Secondary education that was 3.870 those born in 1974 and entered into the grade VI in 1985 and 6.256 in 2006. In that period, the Secondary education expenditure was BDT20210.62 million in 1985 and BDT460050.39 million in 2006 that is a good sign of a country like Bangladesh. The journey of Secondary education expenditures from 1985 to 2006 was not smooth in terms of budgetary expenditure as the time was mixed with the regime of dictatorship and a democratic government. The secondary education expenditure in 1985 started at BDT20210.62 million and jumped to BDT219654.36 million both the year of 1988-1989. The reason behind the sharp increase in expenditure may be the desire of the dictator government H.M Ershad as he was in trouble with his regime on that particular year and allocating more expenditure. He wanted to pacify the mass revolution against his dynasty.

Nevertheless, in 1990, H.M Ershad was overthrown, and Secondary education expenditure declined to BDT58277.72 million in 1990. Following the election in 1991 after Ershad's regime, the Secondary education expenditure is started to increase up to the year 2000 with minor fluctuations steadily. In 2001 which was also the election year, the Secondary education expenditure was BDT219654.36 million and picked it up at BDT460050.39 million in 2006, which was the last year of the BNP government regime. The trend of Secondary education expenditure proved the essence of budgetary education politics in Bangladesh.



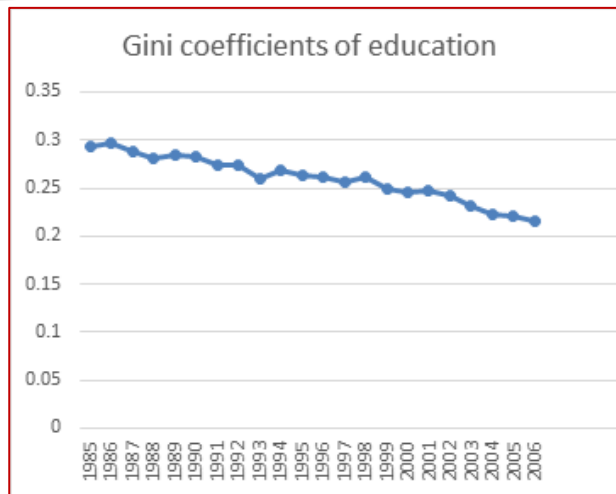


Figure 4.7 Total Secondary Education Expenditures of Bangladesh, **Figure 4.8** Years of Schooling of Secondary Education and **Figure 4.9** Gini coefficients of Secondary Education in Bangladesh (Clockwise).

Comparing figure 4.7 with the figure of 4.8 shows that the Secondary education expenditure starts at BDT20210.62 million in 1985 and years of schooling was 3.870. With the increasing education expenditure in 1989 BDT219654.36 million and the years of schooling also increased at 4.744 in the same year. Following the year, the total years of schooling of each respondent cohort-wise in Bangladesh are increasing over the research period with minor fluctuations compared to the trend of education expenditure. However, short-term increasing or decreasing budgetary allocation in education expenditure did not affect the increasing trend of cohort-wise years of schooling in Bangladesh, mainly secondary education.

Analyzing the above figure 4.7 and 6.8 shows the same trend in both the line chart of expenditure and total years of schooling in Secondary education. However, figure 4.9 Gini coefficient of Secondary education is declining steadily, which is a very significant trend in Bangladesh, meaning that education equality is improving in Bangladesh in Secondary education, also followed by Primary education. The Gini coefficient of education in 1985 was 0.293, and inequality gradually declined to 0.260 in 1993. Following the year, the Gini coefficient of education in the whole research period is improving. Finally, the Gini coefficient of education stood at 0.215 in 2006. That means the overall education inequality is declining in Bangladesh, particularly in Secondary education in Bangladesh, followed by comprehensive and primary education.

Table 4.4 Tertiary Education Expenditure, Birth year of the students, Year of schooling and Gini Co-efficient of education

Year	Tertiary Education Expenditure (Million BDT)	Birth Year of the Students	Year of Schooling	Gini coefficient of Education
1992	19827.78	1974	3.870168	0.2931212
1993	16796.64	1975	3.787002	0.2960486
1994	78315.72	1976	3.866613	0.2878273
1995	78315.72	1977	4.232559	0.2809896
1996	78315.72	1978	4.744884	0.28365
1997	17304.10	1979	4.545052	0.2833205
1998	78315.72	1980	4.59871	0.2732393
1999	59374.73	1981	4.752669	0.2735691
2000	71228.55	1982	5.161787	0.2602358
2001	70459.34	1983	5.384865	0.2683816
2002	71160.24	1984	5.481985	0.2624668
2003	66218.43	1985	5.577628	0.2616048
2004	90739.30	1986	5.529707	0.2554714
2005	78315.72	1987	6.215687	0.2610525
2006	136965.17	1988	5.956585	0.2485101
2007	138686.14	1989	6.278411	0.2460457
2008	221868.54	1990	6.160645	0.2472239
2009	166544.74	1991	6.052699	0.2417804
2010	78315.72	1992	6.556653	0.2317676
2011	279086.76	1993	6.467173	0.2231238
2012	435202.38	1994	6.261243	0.221018
2013	78315.72	1995	6.256369	0.2158403

Source: Authors Own Calculation

Distributional Effects of Tertiary/Higher Education in Bangladesh

Distributional effects of Higher education expenditures based on the cohort in Bangladesh are also increased over the years of 1992 to 1996, indicating the increasing trend of years of schooling of higher education that was 3.870 those born in 1974 and entered the tertiary levels of education in 1992 and 4.744 in 1978. Following the year 1996, which was also an election year, the tertiary education expenditure declined to BDT17304.10 million in 1997, and then the tertiary education expenditure steadily increasing over the years of 1997 to 2008. In 2008 (December 29, 2008), the year of election and the tertiary education expenditure sharply increased to BDT221868.54 million from BDT138686.14 million in 2007. Observation is that even higher education expenditure is not free from budgetary politics and is determined by education's politics as the primary and secondary education expenditure is determined. After the election year of 2008, the tertiary education expenditure declined to BDT78315.72 million in 2010 and picked it up BDT435202.38 million in 2012 before declined to BDT78315.72 million in 2013. The reason behind that, during the 6th FYP 2011-2015 plan, the political commitment of the government echoed in Vision 2021 and Education Policy 2010. Under this context, the aims,

priorities, and strategies for education subdivision in the 6th FYP are determined. The Plan explicitly highlighted the significance of educational quality across levels of education and took essential strategies to take care of the problem of poor education quality. Undoubtedly, it is not the mere knowledge gained through several courses taught at diverse levels of education; instead, it is the quality of that education that staples in building up a nation's human resource base. Under these circumstances, up-grading curricula, training teachers, promoting the incentive structure of instructors, supervising the syllabuses of higher educational institutions, and bridging the gap in educational institutions' quality in rural areas and urban areas are crucial issues to be considered.

Comparing the figure 4.10 tertiary education expenditure with the figure of 4.11 years of schooling of tertiary education shows the more or less same upward movement, meaning that while the tertiary education expenditure increases, the years of schooling is also increased with minor fluctuations. The total tertiary education expenditure in 1992 was BDT19827.78 million and the years of schooling in 1974 was 3.870, indicating that those who born in 1974 entered the tertiary levels of education in the year of 1992.

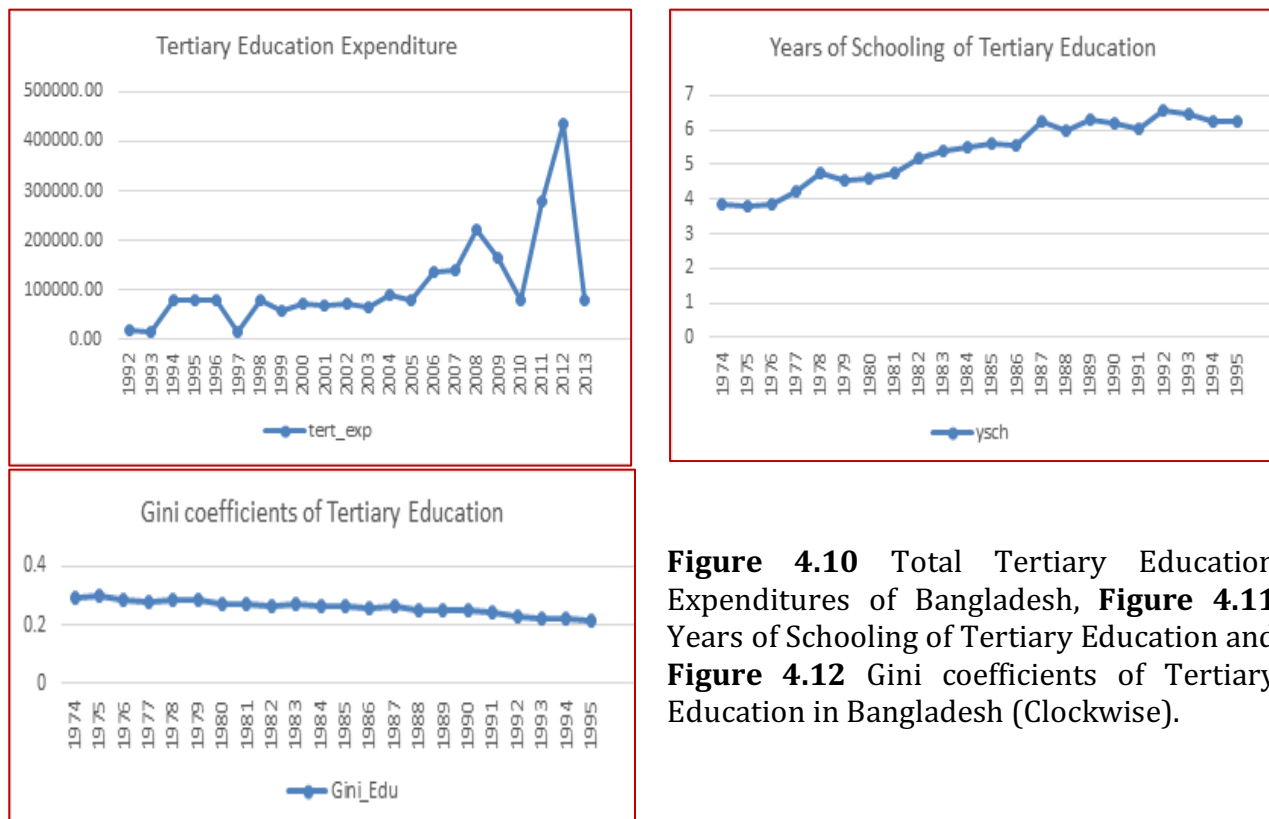


Figure 4.10 Total Tertiary Education Expenditures of Bangladesh, **Figure 4.11** Years of Schooling of Tertiary Education and **Figure 4.12** Gini coefficients of Tertiary Education in Bangladesh (Clockwise).

In 1978, years of tertiary education schooling was 4.744, and the total tertiary education expenditure in 1996 was BDT78315.72 million as the students who born in 1978 are entered into the higher levels of education, and there is a straight link between education expenditure as well as years of schooling in Bangladesh. Following the increasing trend of tertiary education expenditure, figure 4.11 showing years of tertiary education schooling is also increased over the research period from 1974 to 1995 with few fluctuations. The margin of schooling years was low in tertiary education compared to Primary and Secondary education in Bangladesh. For example,

during 1974, total years of schooling were 3.870, at the end of 1995, the estimated years of schooling stood at 6.256, which is just about to double from the starting point of 1974. The reason may be that the number of students at the tertiary level is very insignificant compared to Secondary and primary students. Furthermore, the tertiary level of education is costly, and most of the educational institutions are urban based in Bangladesh.

On the other, the Gini coefficient of tertiary education goes an opposite trend than figures 4.10 and 4.11 as the Primary and Secondary education trend. Comparing to the total tertiary education expenditure and years of a schooling line chart. It is observed that though there are fluctuations in the line chart of the above figure, the Gini coefficient of education figure 4.12 is looking smooth in terms of declining the education inequality in the tertiary levels of education. The fluctuations of education expenditure did not affect the line chart of the Gini coefficient of education, implying that short-term fluctuations in expenditure do not affect the Gini coefficient line in Bangladesh that is an important message for Gini coefficient literature. Another observation from the Gini coefficient of education is that though the Gini coefficient line is smoothly declining, the Gini coefficient in tertiary education levels is insignificant. For example, the Gini coefficient of education at the tertiary level of 1974 was 0.293, and, to the end of the research period, the Gini stood at 0.215 in 1995. Gini's margin declined from 1974 to 1995, just 0.077 during the 22 years that is not significant compared to other countries worldwide. The reason may be the number of students at the tertiary level. Higher education is a privilege, not treated as a right, and most of the higher education institutions are in urban areas of Bangladesh. Furthermore, the tertiary level education expenditure is also not sufficient compared to the people-student ratio in Bangladesh.

CONCLUSION AND RECOMMENDATIONS

This study explored the distributional effects of public expenditures on education and found a significant and positive relationship among the concept of public expenditure, years of schooling, and education inequality across levels of education where primary and secondary education achievement is comparatively better than higher education. Initially, years of schooling and Gini coefficient of education were 3.8701 and 0.2931 in 1980 respectively and in 2001 that stood at 6.2563 and 0.2158 respectively (Table 4.1). Within the 20 years, years of schooling increased at 2.3862, and education inequality decreased to 0.0773. In that case, different education programs aided in this progress, e.g. stipend program, public-private initiative, cash incentive and other social safety net programs. Education expenditure is holistically guided by party philosophy observed in Bangladeshi political culture, though there were variations in budgetary allocation in the education sector. Finally, the Bangladesh government needs to identify a better education program and increase education expenditure uninterruptedly across education levels to get desired and internationally expected outcomes.

Based on the conclusion, the paper proposed the following recommendations.

1. The government needs to introduce a need-based educational curriculum across levels of education. A taskforce may form that may suggest the government implement their strategy for more significant betterment of the education sector.

2. The government needs budgetary allocation as per the requirement of educational institutions. To do that, the government can collect financial demand from the head of educational institutions before preparing the following years' budget.
3. The government may introduce Student's Friendly Environment (SFE) in education institutions, and to do that government can provide more Teaching-Learning Opportunity (TLO) to the teaching staff, and
4. The government needs to facilitate the communication system in rural and off-grid regions. For doing that, Public-Private Partnership (PPP) could be the option for the government in Bangladesh.

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