BRAC University Journal, vol. V, no. 2, 2008, pp. 23-29

VERTICAL EQUITY EFFECT OF SUBSIDY TO HIGHER EDUCATION IN BANGLADESH

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ABSTRACT

Government shares of the total recurring budget of public universities and public degree colleges are very high. The paper analyse equity effect of government subsidy among the students of poor and non-poor household in Bangladesh in 2005. Benefit incidence analysis is done and gini coefficient is estimated using data from Household Income and Expenditure Survey 2005. The resulted is compared with previous findings of the year 1996. Gini coefficient shows that higher education opportunity still favors the reach. Over the last five years with increasing enrollment in public universities and degree colleges, inequality has been increased slightly.

Key words: Vertical equity, poor and non-poor students, gross enrollment, public subsidy and gini-coefficient.

I. INTRODUCTION

Expansion of higher education opportunity is a policy of Bangladesh government to meet the challenge of 21st Century. Since 2001 till 2006 a total of 09 (nine) new general, agriculture, engineering and science & technology universities has been set up by the government. In addition to setting up new university, government share of funding is 95% of the total recurrent cost of a public university (UGC 2006:10) and 100% for public degree colleges. As for enrollment in 2005, student enrollment in public universities has been increased than the year 2001. About the inequality in the education sector out of two studies one study show that poor households receive only 15% of public spending on higher education[i] (UGC 2006: 6). Another study of World Bank shows that gini coefficient of education of Bangladesh is 0.42. In compare to the study period, has the equity situation been improved overtime in 2006, as government has set up new universities and enhances opportunity for participation in higher education? This is the main question the paper will answer.

In Bangladesh public subsidy[ii], is a strong driving force influencing higher education expansion in public sector. Theoretically public intervention in the education is justified to ensure equity and equality in the society that is presumably distorted due to its market imperfection. Concerning subsidy, there is a lot of criticism about public subsidy in higher education. Fundamental of those criticisms are higher education subsidy create social and income inequality (Nas 1980). It is argued that government subsidy to higher education financing with general taxation implies redistribution of resources from poor to rich through life long earning in the future (Psacharopoulos 1985, Cecilla *et al.* 2000,Yue *et al.* 2000). Inequality of participation benefits children's from upper class of the society, increasing the earning capacity and life time income of the educated. Therefore public subsidies of education involve a transfer of resources to the children of the rich or to those who become rich as a result of education (Psacharopoulos 1985: 273). This argument is supported by a research of Yue *et al.* (2000), a research has been done in China about impact of education on income groups of different social groups. The researchers found the evidence that

i The service-specific public fund received by an individual directly or indirectly.

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income equality is attributed to lower average educational level. Income gap is smaller, when average educational level of the group is higher. In the context of USA, Ehrenberg (2005: 11) in his seminar paper argue that forces working in both public and private higher education in USA works against improving access from the lower tail of the family income distribution. The paper will investigate the issue of equity from a distributional perspective using a approach of benefit incidence analysis (BIA).

Benefit incidence tells us who benefits from services. BIA generates distributions of benefits, i.e. benefit incidence, by combining information about the unit costs of providing those services (usually obtained from government data) with information on the use of these services (usually obtained from household surveys). In effect, the analysis computes the cost of providing the service to individual, i.e. the amount households or individuals would have to pay for the services they receive to cover the cost of these services. There are different types of BIA: average, marginal and behavioral. This paper is based on average benefit analysis which means that he incidence of all benefits on different household or individual groups (for instance, groups with different income levels or living in different regions). It measures the distribution of all, or average benefits, rather than marginal ones. It is applicable to any type of policy change or public finance reform, including reforms affecting prices that change household income or expenditure, reforms in public expenditure or in taxation. Also known as simple incidence analysis.

The study is important because inequality is always an interest of public policy. Asadulla (2006) did a research about private return to education in Bangladesh, where the researcher empirically estimated that private return to higher education is 12%. As such, it may be hypothesized that if at the higher education level, participation rate had been equalized, children's of poor family life long income would be increased substantially reducing income gap between the rich and the poor. But income gini has been increased from 0.37 in 81/82 to 0.39 in 2005[iii]. It may be attributed to inappropriate government higher education expansion policy.

Rest of the paper is organized in the following ways. In section II framework of analysis, in section III methodology and data, and in section IV discussion has been presented. Finally in section V policy implication and conclusion is presented.

II. ANALYTICAL FRAMWORK

Psacharopoulos G. *et al.* (1985:247) state that equity has normative and distributional aspects and determination of equity must therefore be based on the fact about how resources are distributed and on normative judgment how society should distribute resources.

BIA addresses distributional aspect only. In order to carry out BIA basically requires three steps. First identify the distribution of student enrollment rates in public schools across population quintiles sorted by income level ranging from poor to rich. Second, Estimate the unit subsidies for each level of schooling from the government finance data. Third combine this data in an estimate of the incidence of per capita subsidies accruing to each quintile/percentile.

Rest of the conceptual framework for analysis in this paper is presented below:-

(i) *What is the principle:* The vertical equity principle is the analytical tool that states that taxes levied on the household should be in accordance with its ability to pay. Under vertical equity, a policy that increases the income of a wealthy household is less desirable than a policy that increases the income of a poorer household. This paper undertakes the principle that poor benefit more than the rich from subsiding policy in public universities and degree colleges.

(ii) *Equity for whom:* Given that poverty may be measured from consumption or income point of view, the paper use per capita income as a unit of measurement of poverty.

Taking household income is taken into account, per capita household income below

iii As per UN specifications the income distribution is absolutely equal if the value of the Gini coefficient is lower than 0.2, if it varies between 0.3 to 0.4 it is reasonable if it vary from 0.4 to 0.5 unequal, if its value is higher than 0.6 absolutely unequal.

Tk. 700/- (Seven hundred taka) is classified as poor at the national level; per capita monthly income over Tk.700 is classified as non-poor households at the national level in Bangladesh Bureau of Statistics (HIES 2007, p.68).

Gender chapter of the Poverty Reduction Strategy Sourcebook (2001) identifies four main dimensions of poverty: opportunity, capability, Vulnerability, and empowerment. Opportunity is the dimension; the paper will take into consideration[iv].

(iii) Object(s) equity analysis comprises: Enrollment is the most basic equity concern because learning, regardless of the quality, cannot occur without access (Joel D. Sherman *et al.* 2007: 23). There are two types of concepts- gross enrollment and net enrollment. Gross enrollment is the concept defined in term of enrollment or students participation in public higher education institutions at the national level.

(iv) How to measure equity: In order to make quantative measurement of equity, the framework encompasses common technique i.e. gini coefficient[v] of measurement of horizontal equity. It is based on Lorenz curve that shows cumulative distribution of resources for students belong to different income groups. Distribution is usually analyzed by first showing the frequency of occurrence of different values of a variable among different groups in a population. A frequency distribution can also be described in terms of quartiles (which divide the distribution into four equal parts). The most commonly used measures of distribution are Lorenz cure and Gini-coefficient (Psacharopoulos 1985, p. 255).

There are two methods for calculating Gini coefficient (Vinod *et al.* 2000). One is direct method and the other one is indirect method through the Construction of Loren Curve. This paper adopts direct method to measure gini coefficient and Lorenz curve is presented to make visual understanding of the situation of inequality. Compute software STAT is used to estimate the Gini coefficient. That calculate the gini with the following formula:

If the Lorenz curve is represented by the function Y = L(X); then, gini

$$G = 1 - 2 \int_0^1 L(X)dX$$

For a population uniform on the values y_i, i = 1 to n, indexed in non-decreasing order ($y_i \leq y_{i+1}$):

$$G = \frac{1}{n}\left(n + 1 - 2\left(\frac{\sum_{i=1}^{n}(n+1-i)y_i}{\sum_{i=1}^{n} y_i}\right)\right)$$

III. DATA

This paper uses the data from two secondary sources the Household Income and Expenditures Survey (HIES) for 2005 and National Education (Post-primary) Survey 2005. The HIES is collected by the Bangladesh Bureau of Statistics (BBS), a state owned organization administered by the Ministry of Planning of the Government of Bangladesh. The survey is representative at national level, urban and rural areas. The survey was carried out resorting to two stage stratified random sampling followed in drawing a sample of HIES 2005 under the framework of Integrated Multipurpose Sample (IMPS) on the basis of sampling frame based on the population a Household Census 2001. Final sampling unit was household and total sample household was 10,080 of this total 6400 belongs to rural area and 3640 belongs 3680. On the with specially designed survey questionnaires survey was done by BABEIS through out country at the institution level with the assistance of District Education Officers/Upazilla Education Officers. There is enough credibility about the both sources of data for its good quality.

IV. ANALYSIS

(i) Gross enrollment: In Table 1 gross enrollment of students into two broad categories- (i) public institutions and (ii) private institutions, have been presented.

iv Opportunity refers to access, or lack thereof, to labor markets and employment opportunities, and to productive resources; constraints on mobility; and particularly for women, time burdens resulting from the need to combine domestic duties, productive activities and management of community resources. (Adopted from World Development Indicator Database)

v Other techniques of horizontal measurement are range ratio, co-efficient of variation, adjusted MacLoone index, and McLoon index.

Table 1: Students enrollment by types of universities and general colleges in 2006

Types of institutions	Total Number of Student Enrolled	% share of enrollled students in public institutions
Public universities[vi]	115929	8.44
Private universities	91648	----
Sub-Total (A)	***207577***	
Public general degree colleges	505810	36.82
Private General Degree Colleges	600206	--
Other public Professional Colleges	17933	1.31
Other private Professional Degree Colleges	42130	----
Grand total	**1373657**	**46.57**

Source: own calculation on the basis of data BANBEIS 2005

Table 1 shows total students enrolled in degree courses in both public and private universities, degree colleges, and professional colleges. It reveals that 46.57 % enrolled in institutions funded by the government with its revenue and development budget. It is further observed that of the percentage share of total student enrolled in general degree courses and post-graduates coursed at different types of institutions are 8.44% in 29 public universities, 36.82% in public degree colleges and 1.31% in public professional courses. The balance is enrolled in private institutions. Table 2 present distribution of enrollment in public institutions for non-professional degree courses.

From the table it is observed that of the total enrollment around 51% come from high income groups and approximately 2.75% students come from low income family and 34.40 % student come from middle moderate income family. Which imply that admission to higher education is highly inequitable. The poorer segments of society have dropped out much earlier in the education system, may be due opportunity of enrollment, high opportunity cost of attendance in higher education institution, gender, location etc.

Table 2: Distribution of enrollment rate in terms of per-capita income groups in 2005.

Income group /poverty status	All	Public (%)	Public degree colleges (%)	Public university (%)
< 399 (extreme poor)	0.50	0.23	0.18	0.04
400 – 799 (poor)	2.75	1.28	1.01	0.23
800 – 1999 (moderate)	34.49	16.06	12.70	2.91
2000 + (Non-poor)	62.26	29.00	22.93	5.29
Total	100	46.57	36.82*	8.44

Source: own calculation based on HIES 2005;
* Professional degree colleges is excluded

(ii) Distribution of subsidy:

Bangladesh spends about 14% of its public expenditure in the education sector (UGC 2006:9) Table3 presents government revenue budget for the year 2006-2007 by type of sub-sectors. As the distribution of budget is disaggregated it is observed that government education share is around 11%; on the other hand, around 19 % taken by the universities. As public subsidy for education is taken into account, it is found that in the year 2005/06 public recurrent expenditure per student in public universities is Tk. 42643 and in government colleges is Tk. 5556.

Table 3: Per Student (Capita) Govt. Recurring Cost by Type of Institution- 2005-06

Type of institution	Revenue budget (Tk. 000)	Total no. of students	Per student cost (Tk.)
Govt. Primary School	16912596	9483891	1783
Govt. Secondary School	1508334	221887	6798
Govt. College	2828856	509137	5556
University (Public)	4943565	115929	42643
Total	26216341	19817473	

Source: BANBEIS 2005.

[vi] It exclude national university and open university enrollment.

It is observed that per student government expenditure in government colleges is very low in compare per student expenditure in university, even though colleges are engaged in offering degree courses like university, under the guideline of National University. Per student cost in university is around 24 times high than those in primary education. According to a study of 1990s, the cost per student in higher education exceeds the regional mean by 90% (WB, 2000:69). That indicate internal cost efficiency of public institutions of Bangladesh.

(iii) Measuring gini-coefficient: To measure the incidence of public subsidy, both data is combined together and a comparison has been made between cumulative distribution of different income groups, categorized into extreme poor, poor, moderate non-poor and non-poor and the distribution of per capita annual total public educational subsidy. Beforehand in order to derive the cumulative distribution for various income groups, individual public school enrollment by income group is multiplied by the government's unit cost of subsidy , US$ 570, for each student enrolled for general stream of higher education (UGC 2006:9). Table4 and table 5present the result. Figures 1 shows the cumulative distribution *by total educational subsidy* for general education in whole Bangladesh.

Table: 4 Aggregate public subsidy received by households (%)

Income groups	Share in %
Q1 (25th percentile)	0.49
Q2(50th percentile)	2.75
Q3(75th percentile)	34.49
Q4(100th percentile)	62.27
	100

Source: own calculation.

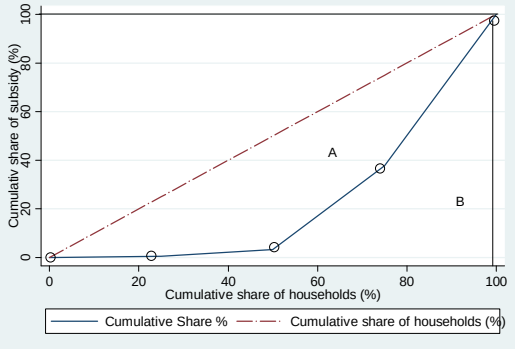
Table 5: Cumulative distribution of public subsidy by income groups (in percentage)

Income groups	households	Cumulative share of households	Share of subsidy	Cumulative share of subsidy
Q1 (25th percentile)	8.61	8.61	0.49	0.49
Q2 (50th percentile)	29.33	37.94	2.75	3.24
Q3 (75th percentile)	43.39	81.33	34.49	37.73
Q4 (100th percentile)	18.67	100	62.27	100
All	100	-	100	-

Source: own calculation.

From the tables it is found that students of poor households, per capita income per month less than Tk. 799, is very meager in compare to students from non-poor households, per capita income over Tk. 2000. Students from poor households consists of around 38%, receive only around 3.25% share of total public subsidy, whereas students from non-poor households consists of around 19%, receive around 62% of the total public subsidy. Mean that the tertiary level education is strongly regressive in that it mainly benefits the richest percentile. One of the main messages is that the students from poorest income groups receive progressively smaller subsidies. Estimated education Gini coefficient for them is 0.59. That shows strong existence of inequality in higher education opportunity in terms of economic status. The result is consistent with the findings about gini coefficient for the distribution of public spending between different levels of the education systems, which was 0.42 (WB 2000: 72). The present finding 0.59 is higher than the gini coefficient 0.42. Implied that inequality in higher education is wide than that of primary and secondary education opportunity.

Figure 1: Lorenz curve shows distribution of subsidy



As the finding is compared to income gini of Bangladesh, which is 0.392 (WB 2005:38), higher education gini higher substantially. Inequality situation in higher education become worse than the year 1996. So the situation has not been improved at all. Thus the distribution of public subsidy in higher education is more unequal than the distribution of overall education subsidy and income.

VI. CONCLUSION AND POLCIY RECOMMMENDATIONS

While government policy in higher education is interested in expanding higher education opportunity, this paper shows that it does not necessarily ensure more students from economically disadvantage groups of the society. It shows that public expenditure at the tertiary level is more regressive than the pattern of household expenditure. A large share of public resources given to this level of education tends to favor non-poor students, who presumably live in urban areas, has been creating an imbalance society. In term of private rate of return, the prevailing situation may fuel further inequality in terms of future lifelong income in the society. That is not desirable.

A strategy to reallocate the educational public expenditures from a higher to a lower level of instruction in order to favor the poor groups, would have to involve the government to undertake the policy to reduce public subsidy from 95% to 70% might make higher income students pay a higher proportion of the costs of their education, thus freeing resources for subsidies for the fortunate, which could take the form of selective scholarships or quantitative expansion and qualitative improvements that would benefit those suffering the greater inequalities. Moreover, government may resort to tax policy in order to realize increasing cost for higher education applying suitable principle of tax.

Alternatively government may opt for the development of higher educational credit markets. Meaning that, the government's appropriate role could be to help overcome market failures in the financial sector, which limit the availability of long-term finance for investments in higher education. These failures can be corrected through student loan programs, or means-tested financial aid and scholarship programs. These programs are rarely devoid of subsidy components, but they are preferable to a direct, cost-free provision of services because the subsidy is more closely targeted to the source of market failure.

Limitation of this finding is that definition of poor is not unique to all study. As such the above findings drawn on earlier study deserve to be taken into account with causation. However it gives an idea how the things is going on.

ACKNOWLEDGEMENT

The author is acknowledged to Professor Zhang Li, Director General, Ministry of Education of P.R. China and tutor of the course titled "Analysis of Education Policy" at Beijing Normal University for his evaluation, comment and suggestions about the paper.

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