

A Benefit Incidence Analysis of Public Spending on Education in Pakistan Using PSLM Data

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Abstract

Education is one of the most important means of economic development, and there is consensus among policymakers that it is better to be educated than not. The debate on education is not, therefore, whether it is good or bad, rather it centers on whether the state should intervene in its provision. Public provision of education at the school level is generally considered one of the most important investments for creating social opportunities to help the wider population actively participate in various economic activities. This study investigates whether public spending on education in Pakistan is pro-poor at various levels of schooling. We find that public spending at the primary and secondary level is progressive, while higher education spending is regressive. These results hold at the national and provincial level. Based on these findings, we recommend that the government increase its spending on primary, secondary, and technical education. Higher education, however, should be provided on merit, and the private sector should be encouraged to provide high-quality education.

Keywords: Education, economic, development, Pakistan.

JEL Classification: I25.

1. Introduction

Education is one of the most important factors of human capital development, and plays a key role in helping individuals acquire useful skills, which in turn, help improve a country's socioeconomic wellbeing. Pakistan is a poor performer in implementing policies in the education sector: the average number of years of schooling in Pakistan was 3.9 in 2009, compared to 6.5 years for Sri Lanka, China, the Philippines, and Malaysia. Besides having one of the lowest literacy rates in the region, Pakistan's vocational and technical infrastructure is generally inadequate,

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irrelevant, and qualitatively poor. Consequently, a very small percentage of children at the secondary level enroll in technical education.

Besides achieving high literacy rates, most East Asian and Latin American countries have a higher percentage of youth acquiring technical education than South Asian countries. High literacy rates and skilled human resources play an important role in increasing total factor productivity (TFP) and, hence, economic growth. A rising TFP helps achieve sustainable and high economic growth. Moreover, there are social benefits to a better-educated population. An educated person is less likely to be influenced by prejudice, which would otherwise be harmful not only at an individual but also at a societal level. Education also creates social opportunities for the public to actively participate in a society's economic activities.

According to Sen (2000, p. 129), the state has played a major role in expanding basic education across the world. The rapid spread of literacy in high-income countries in the West and East Asia has been through public provision rather than through the market.

Banerjee and Duflo (2011) find that parents invest in schooling for those children whom they consider to be bright. This, however, implies that it is not fair to leave children's education to their parents. Moreover, poor children with higher IQ levels are more likely not to attend school than average-intelligence children from rich families. The quality of education for poor children will also be lower than that for rich ones. So, education, particularly in developing countries like Pakistan, cannot be pursued from a purely demand-side perspective. Elementary education should be compulsory for all, as is the case in the entire developed world. The state needs to invest more in education for the poor if public spending on education is to be pro-poor.

The large majority of policymakers agree that it is necessary to find a way to get children into classrooms and provide them with well-trained teachers. This is evident from the UN's Millennium Development Goals, the second and third of which, respectively, aim to "ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling" and to "eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education by no later than 2015."

Our focus in this paper is to analyze the impact of government spending on education in Pakistan and to carry out a benefit incidence analysis (BIA) to determine whether public spending on education is pro-poor or pro-rich. If public spending on education is pro-poor, it implies that the government should share the responsibility of providing elementary education to the poor.¹ To this end, we analyze:

- How much do the poor benefit from public spending in education?
- What is the incidence of education expenditure at each level of education at the national and provincial level?

We use the BIA tool to derive answers to these questions, by evaluating how government subsidies affect the distribution of benefits among the population. The tool uses information on the consumption of government services by the population and the cost of providing these services to appraise the rate of benefit from government spending across income groups. It shows how the initial “pre-intervention” position of individuals is distorted by public spending, or how well public spending serves to redistribute resources to the poor. Thus, it estimates how much the income of a household would have to be raised if it were to fully pay for the subsidized public service.

The rest of the paper is organized as follows. After defining targeting and progressivity in Section 2, a brief review of the literature on BIA is given in Section 3. The Pakistan Social and Living Standards Measurement Survey (PSLM) dataset for 2007/08 and the education levels used are described in Section 4. Section 5 presents the methodology used and the results derived. We conclude our study with a set of recommendations in Section 6.

2. Targeting and Progressivity

2.1. Lorenz and concentration curve

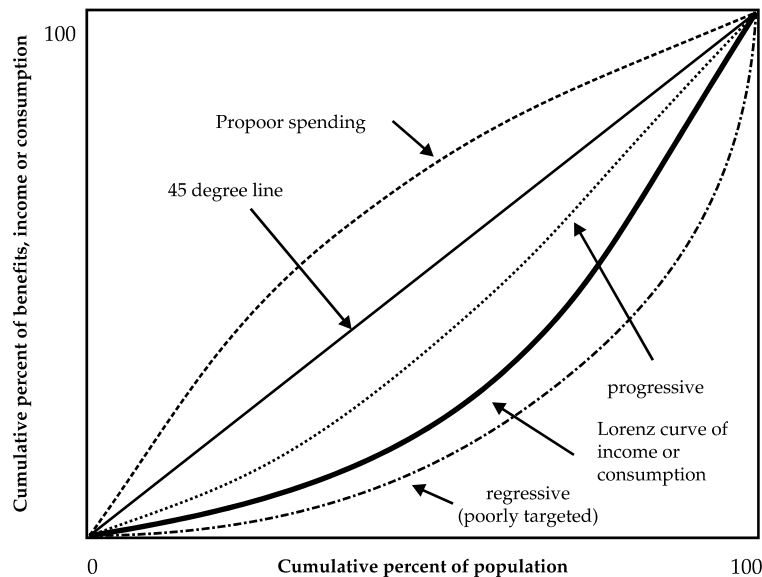
Targeting is a tool generally used with the objective of correctly identifying deserving households or individuals, to whom to provide the benefits from government spending on a service. All targeting methods share a general objective: to correctly identify which households or individuals are poor and which are not. A concentration curve or benefit

¹ We do not imply that the private sector has no role to play in education; this issue is not within the scope of our study.

concentration curve is one way of graphically representing the distribution of benefits to evaluate the targeting of government subsidies. The benefits from government spending on a service are said to be pro-poor if the concentration curve for these benefits is above the 45-degree line (Figure 1). The Lorenz curve is a graphical interpretation of the cumulative distribution of income on the y-axis against the cumulative distribution of population on the x-axis.

Whether public spending is progressive or regressive is evaluated by comparing the benefit concentration curve with the 45-degree diagonal and the Lorenz curve of income/consumption. Benefits are said to be progressive if the concentration curve for these benefits is above the Lorenz curve for income or consumption, but below the 45-degree line (Figure 1). For instance, if the concentration curve lies above the diagonal, then the poorest 10 percent of the population receives a share of benefits greater than their income/consumption share, and the distribution of benefits is said to be progressive in absolute terms (Figure 1).

Figure 1: Lorenz and concentration curves



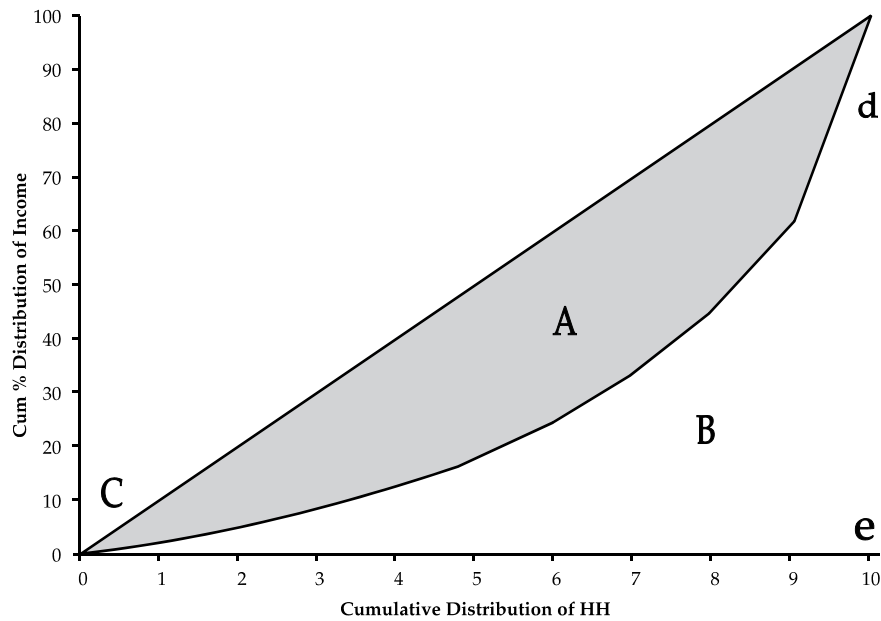
Source: Manasan et al (2008).

2.2. Concentration Index

The concentration coefficient is a summary measure of benefit incidence, and is based on the concentration curve. It is the ratio of the area

bounded by the diagonal and the concentration curve to the total area below the diagonal (Figure 2). If the distribution of benefits is progressive in absolute terms, the concentration index is negative. Conversely, if the distribution of benefits is regressive in absolute terms, then the concentration index is positive.

Figure 2: Gini measure of inequality



The formula used to calculate the concentration index is:

$$\text{Concentration index} = \frac{\text{Area of } A}{\text{Area of Triangle } cde}$$

However, the area of triangle cde = 0.5

Thus, the Concentration index = 2A, where the area of A is:

$$A = \frac{1}{2} - \left[\frac{1}{N} \sum_{i=1}^{N-1} C_i + \left(\frac{1}{N} \right) C_N \right], C_N = 1$$

N is the number of equal divisions.

If the concentration curve lies above the diagonal, then the poorest 10 percent of the population receives more than 10 percent of the benefits, and the distribution of benefits is said to be pro poor.

3. Literature Review

The BIA approach was pioneered by twin World Bank studies conducted by Selowsky (1979) for Colombia, and Meerman (1979) for Malaysia. Since then, various studies have investigated the progressive or regressive nature of public expenditure. The share of different income groups varies depending on the distribution of the benefits of public expenditure across region, caste, religion, gender, etc. Using data on 4,019 households in Colombia, Selowsky (1979) found that subsidies on primary education were strongly progressive, but that subsidies on higher education were regressive. The lowest-income families in Colombia preferred government schooling compared to higher-income families, since relatively rich households preferred private schooling to public schooling. Households in poorer quintiles had more children than those in higher-income quintiles, which made it difficult for the former to bear the cost of private schooling for their children. Meerman (1979) also found that public spending on primary education was progressive in the context of Malaysia.

Norman (1985) finds that higher-income quintiles receive more benefits than lower-income quintiles, and that government expenditure on education favors the former more than the latter. Demery and Verghis (1994) use a dataset on Kenya and conclude that public spending on secondary and university-level education is regressive while primary education spending is strongly progressive. Heltberg, Simler, and Tarp (2001) evaluate the incidence of public spending on education in Mozambique, and conclude that the poorest quintile of income groups receives 14 percent of total education spending, the poorest half receives 36 percent, and the richest quintile receives 33 percent.

Khan and Ali (2003) study the determinants of schooling in rural Pakistan, using a sample population in Pakpattan and Faisalabad districts. They identify a number of factors responsible for lower levels of schooling, key among which is that poor parents do not demand schooling because the associated expenditure is too high. Sending children to school could, therefore, be induced by subsidizing education for the poor and so the government should subsidize the cost of instructional materials, fees, uniforms, school meals, etc. Son (2006) uses a dataset on Thailand and finds

that government spending benefits the poor more than the rich and can reduce poverty.

Hakro and Akram (2007) use the PSLM dataset for 2004/05, and find that the distribution of education expenditure is progressive for Pakistan overall: 20 percent of the poorest population receives 17–20 percent of the subsidy while the share of the richest 20 percent of the population ranges between 19 and 23 percent of the education subsidy at the primary level. Almost the same distribution occurs at the secondary education level. Higher education is also progressive, that is, the lowest 20 percent of the population receives 16–18 percent of the subsidy, while the richest 20 percent of the population receives 19–22 percent of the subsidy. Our results are consistent with those of Hakro and Akram for primary and secondary education, but not for higher education. However, we evaluate results at the provincial level, which has not been done so far.

4. Data Description

We use the household level PSLM dataset for 2007/08. The Pakistan Bureau of Statistics (formerly the Federal Bureau of Statistics) developed its own urban area frame, which was updated in 2003 (Pakistan Bureau of Statistics, 2009). Each city/town is divided into enumeration blocks consisting of 200–250 households identifiable through a sketch map. Each enumeration block is classified into three categories of income groups, i.e., low-, middle-, and high-income, keeping in view the living standard of the majority. A list of villages published by the Population Census Organization as part of the 1998 census was used as the rural frame.

Information on the education section included age, sex, literacy, enrolment status, school attendance, type of school (government, private, or other, but for our purpose we have used only public sector educational institutions), distance from school, and expenditure on education. Total income and expenditure per individual was calculated using a balance sheet for income and expenditure from the survey questionnaire. Per capita income was calculated by dividing total income by household size. For all the surveys, literacy was taken as the ability to read a newspaper and to write a simple letter. The literacy rate for the population aged 10 years and above has slightly increased from 55 percent in 2006/07 to 56 percent in 2007/08.

Table 1 defines the levels of education in overall Pakistan, on the basis of which we have selected individuals currently attending school from Section 2 of the questionnaire for 2007/08. The age of every student enrolled in the current year was taken as greater than and/or equal to 4 years. Secondary education is represented by codes 6 to 10. On completing Grade 10, students are awarded a secondary school certificate (SSC), or Matriculation certificate.

Table 1: Education levels in Pakistan

Primary	Primary education/schools
Secondary	Middle and high schools
Tertiary	General universities/colleges/institutes and professional/technical universities/colleges/institutes
Others	Technical education, school for handicapped/disabled persons/libraries and museums/student hostels/education under ESPR programs

In 2007/08, according to the household survey, female primary enrolment was 43 percent and male primary enrolment was 57 percent in public schools. Total primary enrolment in public sector schools in urban and rural areas was 31 and 69 percent, respectively. The distribution of student enrolment at each level of education in the public sector is given in Table 2.

The share of female students is less than males at the national level, but, interestingly, this is *not* the case particularly in urban Punjab, Sindh and Khyber Pakhtunkhwa (KP) for at the primary and secondary levels, and is reversed in Punjab for tertiary education. At all levels, urban Punjab is an exception where female enrolment in secondary education is marginally higher than male enrolment (Table 2). The difference between the male and female enrolment ratio is more prominent in rural areas than in urban areas. There is a large gender disparity in KP and Balochistan.

Table 2: Enrolment by education level (public sector) in Pakistan (urban/rural) and provinces (%)

	Region	Primary			Secondary			Tertiary			Other		
		Male	Female	Both	Male	Female	Both	Male	Female	Both	Male	Female	Both
Pakistan	Urban	16	15	31	24	22	46	32	33	65	24	19	43
	Rural	41	28	69	37	16	54	23	12	35	42	15	57
	Total	57	43	100	61	39	100	55	45	100	66	34	100
Punjab	Urban	14	15	29	21	22	44	27	40	67	23	31	54
	Rural	38	33	71	35	21	56	15	17	33	30	16	46
	Total	52	48	100	57	43	100	42	58	100	53	48	100
Sindh	Urban	17	17	34	26	28	54	37	31	68	43	20	63
	Rural	42	25	66	35	11	46	28	5	32	31	6	37
	Total	59	41	100	62	39	100	64	36	100	74	27	100
KP	Urban	13	13	26	19	19	38	29	22	51	12	17	30
	Rural	43	31	74	43	19	62	35	14	49	47	23	70
	Total	56	44	100	62	38	100	63	37	100	59	41	100
Balochistan	Urban	22	17	38	34	21	55	53	25	78	25	7	32
	Rural	42	20	62	37	8	45	21	1	22	59	10	68
	Total	63	37	100	70	30	100	74	26	100	84	16	100

Source: Authors' calculations based on PSLM (2007/08) household survey data.

The cause of this gender disparity requires careful analysis. Andrabi, Das, Khwaja, Vishwanath, and Zajonc (2007), in their study on education in Pakistan, initially find that parents send fewer girls to school than boys, which implies discriminatory behavior. However, they identify “distance to school” as a key underlying factor for this decision: The more distance there is from her home to her school, the less likely a girl is to have further schooling opportunities compared to a boy. Unfortunately, this gender disparity decreases school enrolments. One cause of the disparity between provinces may be that females are overprotected on cultural grounds. Closing the gender disparity gap will increase the school enrolment proportion.

Income deciles are defined over population, i.e., across individuals/population. Income deciles based on population/individuals are given in Table 3. The bottom income decile sends their children to government schools for primary education. With an increase in household income, the enrolment rate in public schools decreases, presumably because people who can afford the fees might now prefer to send their children to private schools rather than to state-run schools due to the quality of education or for other reasons. Lower-/middle-class families, however, show a mixed response at the secondary education level and above. Some opt for private schools as their first choice while others prefer government schools. The secondary, tertiary, and ‘other education’ categories show an increasing trend with respect to deciles. Since the lower-income deciles have more children than upper-income groups, it is not possible for them to afford private schools for their children.

Table 3: Total enrolments in Public Sector at four levels of education in Pakistan overall by income deciles based on population (%)

Decile	Income					
	('000)	Primary	Secondary	Tertiary	Other	Total
1	8.13	11.30	4.09	1.48	3.53	7.77
2	10.00	13.17	8.02	2.36	8.48	10.19
3	11.90	12.47	8.80	3.88	8.13	10.23
4	13.65	12.41	10.02	3.93	14.49	10.67
5	15.60	11.20	10.50	5.64	10.95	10.30
6	18.00	10.59	11.87	6.75	9.54	10.49
7	21.60	9.59	12.91	9.11	7.77	10.51
8	27.06	8.97	13.46	13.82	12.72	11.00
9	39.00	6.81	12.00	20.67	13.07	10.20
10	1,960.00	3.49	8.33	32.36	11.31	8.65

Source: Authors’ calculations based on PSLM (2007/08) household survey data.

5. Research Methodology and Results

In general, the following three steps are involved in conducting an incidence analysis:

- Obtain the estimates of the unit cost or subsidy embedded in the provision of a particular public service. For this step, data is usually extracted from public expenditure accounts. For example, the data on per student cost or subsidy by level of schooling can be obtained from the budget.
- Impute the subsidies to the individual or household identified as a user of the service by using the information available on its use by different income groups, e.g., enrolment rates in public schools across population deciles ordered by income level ranging from poor to rich as reported by households in consumer expenditure surveys.
- Aggregate individuals or households in groups ordered by income or expenditure or any other grouping of interest such as race or gender, distribute the benefits among different groups, and arrive at an estimate of the incidence of per capita subsidies accruing to each group.

These steps can be illustrated by simple algebra as applied to the case of education spending. The total benefit from government spending at all education levels (i.e., the combined primary, secondary, tertiary, and other spending) accruing to group j is estimated as

$$X_{ij} = \frac{E_{ij}}{E_i} S_i = \frac{S_i}{E_i} E_{ij}$$

$i = \text{level of education } j = \text{population decile groups}$ (1)

where E_{ij} represents the number of students enrolled in level i from group j , and S_i/E_i is the unit cost of providing education at level i ². Therefore, the total benefit from government expenditure at all levels of education accruing to group j ³ is

$$X_j = \sum_{i=1}^n X_{ij}$$

(2)

Substituting equation (1) into equation (2), we can arrange it as follows:

² Spending on education may occur at more than four levels, but we have focused on the four levels as in various other studies.

³ Population is ranked from poorest to richest using per capita income, and aggregated into deciles.

$$X_j = \sum_{i=1}^n \frac{E_{ij}}{E_i} S_i = \sum_{i=1}^n \frac{S_i}{E_i} E_{ij} \quad (3)$$

The data used was obtained from the following government sources:

- The information on subsidies provided by the government to public education was obtained from the national health accounts for 2007/08 (Pakistan Bureau of Statistics).
- The PSLM dataset for 2007/08 was used to find out total household income.
- Data on current enrollments in Pakistan overall and in the four provinces was also obtained from the PSLM 2007/08 dataset.

5.1. Results

We calculate the number of students enrolled in each decile and the government subsidy for each income group (decile) both at the national and provincial level. The results are given in Tables 4–8. At the primary level of education, the share of the poorest 10 percent of the population is 12.18 percent while the share of the richest 10 percent is 4.14 percent in Pakistan overall (Table 4). The lowest income group receives greater benefit from public spending on primary education than the upper-income group. We observe that public spending at the primary level is beneficial mainly for the bottom four deciles. This means that the major share of the PKR 28.57 million spent by the government on primary education was shared by the poorest since most upper-income families prefer to send their children to private schools. We find, therefore, that public spending on primary education for Pakistan overall is pro-poor.

As Table 4 shows, for secondary education, the income-wise comparison shows that the share of the lowest decile in education expenditure is 7.69 percent, while that of the highest decile is 10.10 percent in Pakistan overall. Tertiary education expenditure is marked by large inequalities. The top decile received 37 percent, 65 percent of the total tertiary expenditure was shared by the upper three income deciles, and only 11 percent was shared by the bottom 30 percent of the population. In the 'other education' category of expenditure, the share of the different income deciles has no special pattern and seems either neutral or pro-poor.

Table 4: Enrolment and distribution of expenditure on education in Pakistan by level of education and income group, 2007/08

Income deciles (poorest to richest)	Primary			Secondary			Tertiary			Other		
	No. of students	% of total	Exp. on education (PKR million)*	No. of students	% of total	Exp. on education (PKR million)*	No. of students	% of total	Exp. on education (PKR million)*	No. of students	% of total	Exp. on education (PKR million)*
1	1,103	12.18	28.57*	342	7.69	13.87*	95	5.11	104.81*	26	10.83	29.14*
2	1,137	12.56	29.46*	356	8.01	14.43*	80	4.31	88.26*	15	6.25	16.81*
3	1,066	11.78	27.62*	328	7.38	13.30*	48	2.58	52.96*	21	8.75	23.54*
4	1,157	12.78	29.97*	438	9.85	17.76*	93	5.01	102.60*	15	6.25	16.81*
5	987	10.90	25.57*	394	8.86	15.98*	83	4.47	91.57*	26	10.83	29.14*
6	1,008	11.13	26.11*	481	10.82	19.50*	105	5.65	115.84*	29	12.08	32.50*
7	867	9.58	22.46*	533	11.99	21.61*	147	7.91	162.18*	28	11.67	31.38*
8	737	8.14	19.09*	535	12.04	21.69*	187	10.06	206.31*	13	5.42	14.57*
9	616	6.80	15.96*	589	13.25	23.88*	327	17.60	360.77*	26	10.83	29.14*
10	375	4.14	9.71*	449	10.10	18.21*	693	37.30	764.57*	41	17.08	45.95*
Total	9,053	100.00	234.53*	4,445	100.00	180.23*	1,858	100.00	2,049.89*	240	100.00	269.00*

Source: Authors' calculations based on PSLM (2007/08) household survey data.

Note: * Total education expenditures at the national level have been allocated to each income decile according to their share in total enrolment.

We also analyze the distribution of public spending on education and enrolment status at the provincial level. Per capita public expenditure on education is calculated by dividing total government expenditure allocated to the number of students enrolled at a particular education level (primary, secondary, tertiary, or other) by the total population of *each province*. Deciles are defined over population, i.e., across individuals. A strong assumption is being made here, that government expenditure on each level of education has been equally divided among students in each level of education and in each province. In other words, we assume that government expenditure per student is equal across all students enrolled in government schools in all provinces.

For Punjab (Table 5), at the primary level, the share of the lowest decile is 12.89 percent and the highest decile is 3.18 percent. This means that public spending on primary education for Punjab is also pro poor. This result supports the supply-side perspective that primary-level spending by the government benefits the poorest, and that the government should share the main responsibility for providing education at this level to those who cannot otherwise afford it. The market in general does not take care of the poorest of the poor.

At the secondary level, the share of lower-income groups in public expenditure is 7.42 percent while that of higher-income groups is 10.18 percent (Table 5). At the tertiary level, the share of the lowest decile is 3.99 percent, and that of the top decile is 36.36 percent. About 68 percent of the total tertiary expenditure is shared by the upper three income deciles, while the remaining 32 percent is shared by the lowest 70 percent of the population. The share of the lowest 60 percent of the population in 'other education' is 45 percent while 55 percent is shared by the upper four deciles. The poorest decile received PKR 7.58 million of government spending on primary education, while the richest decile received only PKR 1.87 million out of the total PKR 58.28 million spent by the government on primary education in 2007/08. On the other hand, out of PKR 1,237.10 million of government spending on tertiary education, only PKR 49.30 million was allocated to the poorest decile while the richest decile received PKR 449.86 million.

Table 5: Enrolment and distribution of expenditure on education in Punjab by level of education and income group, 2007/08

Income deciles (poorest to richest)	Primary			Secondary			Tertiary			Other		
	No. of students	% of total	Exp. on education (PKR million)*	No. of students	% of total	Exp. on education (PKR million)*	No. of students	% of total	Exp. on education (PKR million)*	No. of students	% of total	Exp. on education (PKR million)*
1	417	12.89	7.58*	132	7.42	0.21*	32	3.99	49.30*	4	5.71	3.68*
2	407	12.58	7.40*	139	7.82	0.22*	32	3.99	49.30*	4	5.71	3.68*
3	451	13.94	8.20*	135	7.59	0.22*	19	2.37	29.27*	3	4.29	2.76*
4	442	13.66	8.03*	150	8.44	0.24*	21	2.62	32.35*	3	4.29	2.76*
5	364	11.25	6.62*	164	9.22	0.27*	37	4.61	57.00*	5	7.14	4.60*
6	339	10.48	6.16*	187	10.52	0.30*	42	5.23	64.71*	13	18.57	11.95*
7	292	9.02	5.31*	207	11.64	0.33*	71	8.84	109.38*	9	12.86	8.27*
8	239	7.39	4.34*	290	16.31	0.47*	123	15.32	189.49*	5	7.14	4.60*
9	182	5.62	3.31*	193	10.85	0.31*	134	16.69	206.44*	10	14.29	9.19*
10	103	3.18	1.87*	181	10.18	0.29*	292	36.36	449.86*	14	20.00	12.87*
Total	3,236	100.00	58.82*	1,778	100.00	2.87*	803	100.00	1,237.10*	70	100.00	64.35*

Source: Authors' calculations based on PSLM (2007/08) household survey data.

Note: * Total education expenditures at the national level have been allocated to each income decile according to their share in total enrolment.

For Sindh, (Table 6), the share of the lowest and highest deciles is 13.07 and 4.07 percent, respectively, in primary education. About 71 percent of the total expenditure on primary education is shared by 60 percent of the (low-income) population while 29 percent is shared by the highest 40 percent of the population. At the secondary level, the topmost decile receives 8.22 percent and the lowest decile receives 5.93 percent. The tertiary level is marked by the largest inequality in public spending, such that the lowest decile receives 4.65 percent and a 38.48 percent share is received by the highest decile. In the 'other education' category, the share of the lowest and highest deciles is 11.36 and 11.36 percent, respectively.

Table 6: Enrolment and distribution of expenditure on education in Sindh by level of education and income group, 2007/08

Income deciles (poorest to richest)	Primary			Secondary			Tertiary			Other		
	No. of students	% of total	Exp. on education (PKR million)*	No. of students	% of total	Exp. on education (PKR million)*	No. of students	% of total	Exp. on education (PKR million)*	No. of students	% of total	Exp. on education (PKR million)*
1	279	13.07	11.39*	57	5.93	3.00*	22	4.65	25.77*	5	11.36	21.27*
2	294	13.77	12.01*	78	8.12	4.10*	12	2.54	14.06*	1	0.00	0.00*
3	256	11.99	10.45*	83	8.64	4.36*	14	2.96	16.40*	6	13.64	25.53*
4	303	14.19	12.37*	97	10.09	5.10*	22	4.65	25.77*	9	20.45	38.29*
5	162	7.59	6.62*	95	9.89	4.99*	28	5.92	32.80*	7	15.91	29.78*
6	215	10.07	8.78*	100	10.41	5.26*	25	5.29	29.29*	2	4.55	8.51*
7	192	8.99	7.84*	127	13.22	6.68*	35	7.40	41.00*	3	6.82	12.76*
8	192	8.99	7.84*	124	12.90	6.52*	49	10.36	57.41*	2	4.55	8.51*
9	155	7.26	6.33*	121	12.59	6.36*	84	17.76	98.41*	5	11.36	21.27*
10	87	4.07	3.55*	79	8.22	4.15*	182	38.48	213.22*	5	11.36	21.27*
Total	2,135	100.00	87.18*	961	100.00	50.52*	473	100.00	554.15*	44	100.00	187.20*

Source: Authors' calculations based on PSLM (2007/08) household survey data.

Note: * Total education expenditures at the national level have been allocated to each income decile according to their share in total enrolment.

In KP (Table 7), 70 percent of the total primary education expenditure is shared by the lower six income deciles, while 30 percent is shared by the upper 40 percent of the population. KP's tertiary education spending is also highly unequal: Only 4 percent of students enrolled in tertiary education come from the bottom decile while 31 percent come from the top decile. The distribution of public spending on 'other education' has no fixed pattern: 51 percent of total public expenditure is shared by 50 percent of the upper-income population while 49 percent is shared by the lower 50 percent of the population.

In Balochistan (Table 8), 11.01 percent of primary education spending is shared by the bottom decile and 5.34 percent by the top decile. Secondary education expenditure is shared between the bottom and top deciles in the proportions 9.87 percent (upper-income) and 7.19 (lower-income), respectively. At the tertiary level, this share is 6.95 and 36.36 percent for the top and bottom deciles, respectively. The share in 'other education' is 14.06 percent for the lowest decile and 9.36 percent for the highest decile.

Table 7: Enrolment and distribution of expenditure on education in KP by level of education and income group, 2007/08

Income deciles (poorest to richest)	Primary			Secondary			Tertiary			Other		
	No. of students	% of total	Exp. on education (PKR million)*	No. of students	% of total	Exp. on education (PKR million)*	No. of students	% of total	Exp. on education (PKR million)*	No. of students	% of total	Exp. on education (PKR million)*
1	220	11.90	7.93*	78	8.81	9.15*	18	4.56	6.71*	9	14.52	0.93*
2	212	11.47	7.64*	70	7.91	8.21*	27	6.84	10.07*	1	1.61	0.10*
3	218	11.80	7.86*	80	9.04	9.38*	17	4.30	6.34*	7	11.29	0.72*
4	215	11.63	7.75*	84	9.49	9.85*	14	3.54	5.22*	6	9.68	0.62*
5	197	10.66	7.10*	91	10.28	10.67*	37	9.37	13.80*	7	11.29	0.72*
6	223	12.07	8.04*	100	11.30	11.72*	28	7.09	10.44*	1	1.61	0.10*
7	159	8.60	5.73*	84	9.49	9.85*	24	6.08	8.95*	9	14.52	0.93*
8	187	10.12	6.74*	108	12.20	12.66*	48	12.15	17.90*	2	3.23	0.21*
9	143	7.74	5.16*	97	10.96	11.37*	59	14.94	22.00*	5	8.06	0.52*
10	74	4.00	2.67*	93	10.51	10.90*	123	31.14	45.87*	15	24.19	1.55*
Total	1,848	100.00	66.63*	885	100.00	103.76*	395	100.00	147.32*	62	100.00	6.39*

Source: Authors' calculations based on PSLM (2007/08) household survey data.

Note: * Total education expenditures at the national level have been allocated to each income decile according to their share in total enrolment.

Table 8: Enrolment and distribution of expenditure on education in Balochistan by level of education and income group, 2007/08

Income deciles (poorest to richest)	Primary			Secondary			Tertiary			Other		
	No. of students	% of total	Exp. on education (PKR million)*	No. of students	% of total	Exp. on education (PKR million)*	No. of students	% of total	Exp. on education (PKR million)*	No. of students	% of total	Exp. on education (PKR million)*
1	202	11.01	2.41*	59	7.19	1.66*	13	6.95	7.74*	9	14.06	1.56*
2	260	14.18	3.10*	78	9.50	2.19*	8	4.28	4.76*	5	7.81	0.86*
3	161	8.78	1.92*	66	8.04	1.85*	11	5.88	6.55*	5	7.81	0.86*
4	203	11.07	2.42*	71	8.65	2.00*	7	3.74	4.17*	4	6.25	0.69*
5	203	11.07	2.42*	92	11.21	2.59*	9	4.81	5.36*	7	10.94	1.21*
6	182	9.92	2.17*	74	9.01	2.08*	10	5.35	5.95*	8	12.50	1.38*
7	179	9.76	2.14*	89	10.84	2.50*	19	10.16	11.31*	7	10.94	1.21*
8	181	9.87	2.16*	91	11.08	2.56*	12	6.42	7.14*	6	9.38	1.04*
9	165	9.00	1.97*	120	14.62	3.37	30	16.04	17.86*	7	10.94	1.21*
10	98	5.34	1.17*	81	9.87	2.28*	68	36.36	40.48*	6	9.38	1.04*
Total	1,834	100.00	21.90*	821	100.00	23.07*	187	100.00	111.32*	64	100.00	11.07*

Source: Authors' calculations based on PSLM (2007/08) household survey data.

Note: * Total education expenditures at the national level have been allocated to each income decile according to their share in total enrolment.

Figures 3–6 show the benefit incidence of public spending on education using deciles for the four provinces of Pakistan. The figures also verify that government spending on primary education is pro poor in absolute terms since the concentration curve for primary education in each case lies above the diagonal or perfect equality (PE) line).

Figure 3: Distribution of government expenditure in Punjab on education and distribution of income

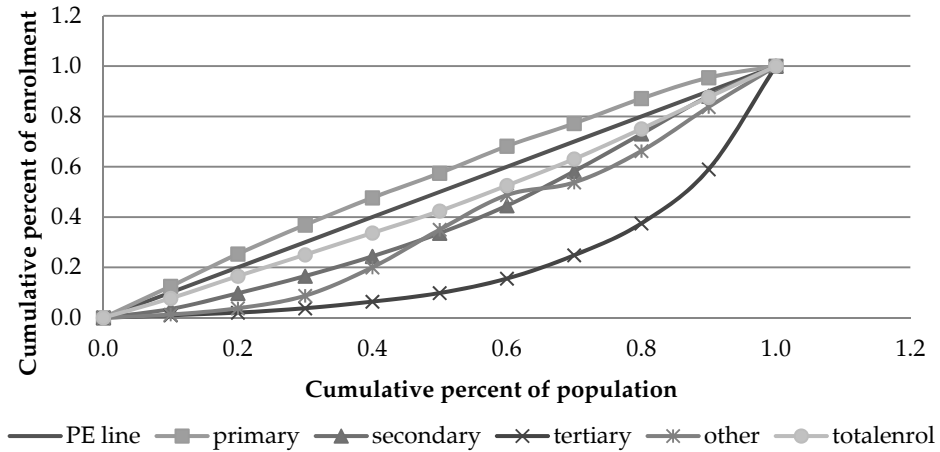


Figure 4: Distribution of government expenditure in Sindh on education and distribution of income

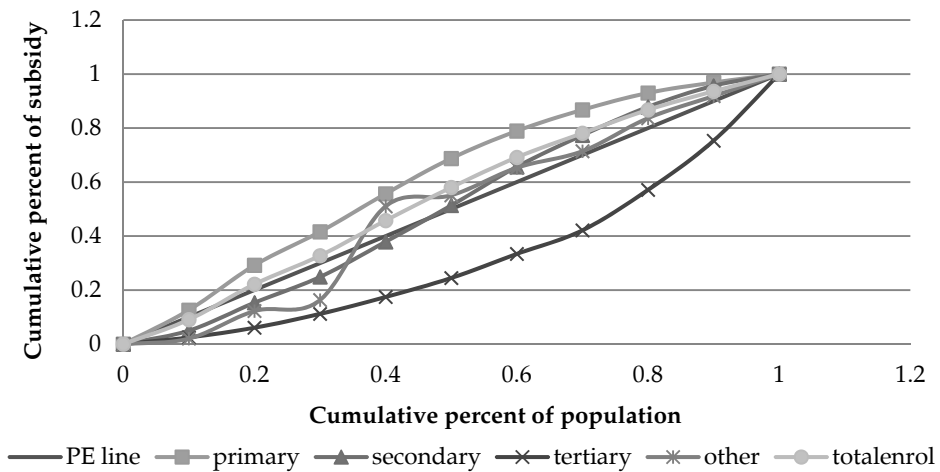


Figure 5: Distribution of government expenditure in KP on education and distribution of income

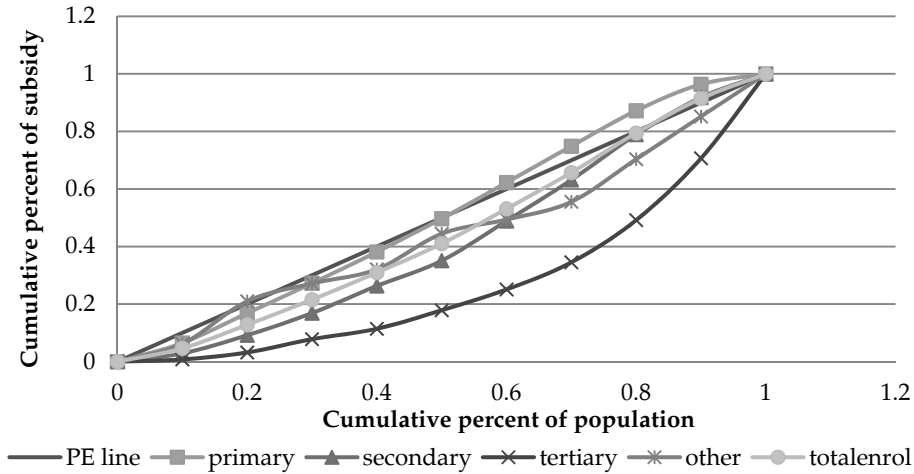
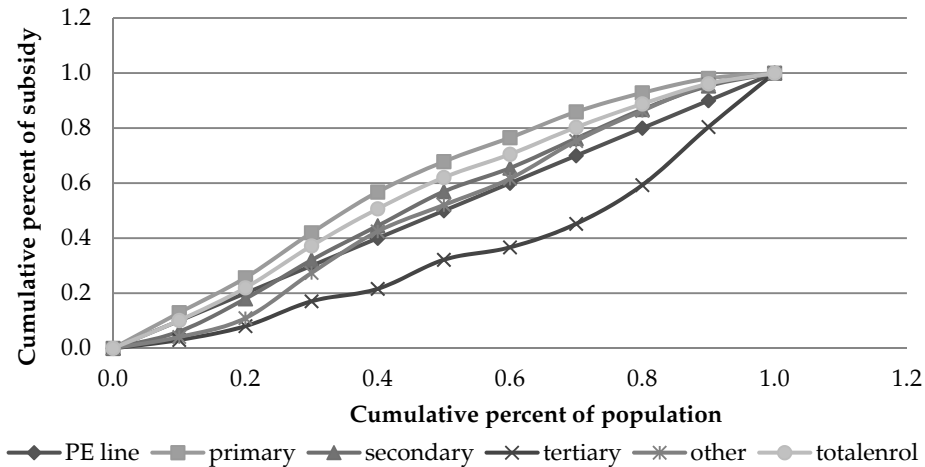


Figure 6: Distribution of government expenditure in Balochistan on education and distribution of income



Government spending at the tertiary level is, nonetheless, highly unequal, while expenditure in the secondary and 'other education' categories is generally neutral. The differences between the provinces may be because some have pursued their own policies to improve their public sector education programs more rigorously than others. In collaboration with international donor agencies, some provinces have tried to improve education for schoolchildren through a range of initiatives, from cash

stipends and low-cost private schools to more effective school councils over the last 10 years.

We have also calculated the concentration index and analyzed the data with a Lorenz curve (Table 9). As mentioned earlier, a negative concentration index value indicates that public spending is progressive, while a positive value indicates that it is regressive; a value close to 0 indicates neutrality. The table shows that primary education expenditure is pro-poor in all four provinces. Secondary education is progressive in Sindh and Balochistan, and neutral in Punjab and KP. Tertiary-level public spending is highly regressive in all four provinces. The 'other education' category shows a mixed response.

Table 9: Concentration index for all provinces for different education levels

Concentration index	Primary	Secondary	Tertiary	Other
Punjab	-0.2156	0.0969	0.4805	0.1575
Sindh	-0.3266	-0.1218	0.2607	-0.0980
KP	-0.1182	0.0536	0.3586	0.0173
Balochistan	-0.3170	-0.1629	0.1930	-0.1123

Source: Authors' calculations.

6. Conclusion and Recommendations

We have carried out a BIA for government expenditure on education (public sector) at the national and provincial level, using ungrouped or individual household survey data for 2007/08. Our results indicate that lower-income deciles have a large share of enrolment in basic education, whereas at higher levels of education, this predominance shifts to higher-income deciles. Government spending is progressive at the primary level of education, meaning that lower-income groups are its main beneficiaries—these results hold at the national and provincial level. Lower-income groups benefit least, however, from public spending on higher education, implying that government spending is regressive at the higher education level. Similar results hold at the provincial level.

Our results support the late Dr. Mahbubul Haq's point that the pattern of education spending in South Asia is inequitable because education subsidies are skewed toward upper-income groups, where a significant percentage of money is spent on university-level education (M.

Haq and Haq, 1998, p. 135). Their study implies that governments spend too little on the education of many (primary education) and too much on the education of few (university education).

We recommend that primary (preferably elementary) education be made compulsory and that education at the primary and secondary level be provided free of cost to all those who could not otherwise afford it. Technical education should be made generally available, and higher education should be accessible on the basis of merit. Society as a whole is at risk when people are poorly educated. Supply-side rather than demand-side policies should be adopted to provide education to the poorest of the poor. Such policies should aim to provide subsidies to the poor in the form of tuition fees, instructional materials, uniforms, and school meals, etc. Private markets generally fail to supply such goods and services to this income group, which is probably why Adam Smith focused on the public provision of education. Moreover, education is a merit-based good and a fundamental right. Governments, therefore, play a crucial role in providing education to all.

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