Education and Income Inequality in Pakistan

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Abstract

This paper investigates the impact of education and schooling on income inequality in Pakistan. The study applies Gini-Coefficient technique to calculate the income inequality in Pakistan using data from Pakistan Social and Living Standard Measurement (PSLM) Survey of 2004-05 of the Federal Bureau of Statistics (FBS) Islamabad. The results show that the distribution of income between male and female labor force was found to be unequal. The inequality was higher in males as compared to females. The value of the Gini-Coefficient for rural and urban areas shows that income inequality was more in urban areas (0.341) as compared to rural areas (0.261), while the value of the Gini-Coefficient for the whole of Pakistan remained 0.301. The results of the study indicate that education and schooling do affect the distribution of income in favor of the people with more education. Therefore, the study implies that equal opportunity of schooling and employment should be provided to male and female without any discrimination.

Keywords: Earnings, Education, Gini Coefficient, Income Inequality

Introduction

When the phenomenon of economic growth and development is viewed in a multidimensional and economic perspective, the distribution of income becomes of high importance on both the individual and collective (economy) level. Because it has been widely recognized that the concentration of wealth, income and resources in general lead to economic, social as well as political chaos, unrest and tension. While on the other hand, social and economic equity and justice promotes both social and economic welfare of human beings.

Education is one of the most important ingredients of human capital which enhances the ability, capability and broadens the mental horizons of the human intellect and reason. Therefore, in countries where

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there is greater equity in the distribution of educational and schooling opportunities, the poor sections of their societies have captured larger share of the benefits of their economic growth and development. As a result, income inequality in these countries is the lowest. So, based on the assumption that education and schooling tends to produce a considerable positive skewness in the distribution of income and wealth, the present study was intended to estimate the degree of inequality in the distribution of income between male and female labor force by the Gini-Coefficient formula using the data from Pakistan social and living standard measurement (PSLM) survey of 2004-05 of the federal bureau of statistics (FBS) Islamabad, Pakistan. The survey provides information about the households regarding their level of schooling, monthly income and employment.

Literature Review

Various researchers and economists have examined the relationship between the level of schooling and income inequality. Most of them are of the opinion that there is an inverse relationship between the level of schooling of a population of a country and income inequality. For example, the studies by Psacharopoulos,et al.[1], Park[2] and De Gregorio and Lee[3] have found an inverse relationship between a nation's average level of schooling attainment and income inequality. It means that when the average level of schooling of a population of a country increases the intensity of income inequality decreases. A study by Barro[4] has also confirmed this inverse relationship but only for primary schooling attainment. For tertiary education, he found a direct relationship between them.

Some of the researchers have also examined the impact of enrolments in education on income inequality. According to the studies by Barro[5], and Alderson and Nielson[6], higher level of enrolments especially at the secondary level of education was associated with decreased income inequality. However, the study by Barro[7] found an inverse relationship between primary education enrolments and income inequality only but a direct relationship between higher education enrolments and income inequality.

Some of the studies conducted on Pakistan are: Azfar[8], Bergan[9], Naseem[10], Khandkar[11], Kruijk and Leauwen[12], Kemal[13], and Guisinger and Hicks[14]. Bergan[15] and Azfar[16] have calculated Gini-coefficients for rural and urban areas of Pakistan. According to the calculation of Bergan[17], income inequalities in Pakistan were small as compared to other developing countries. Inequalities in urban areas were higher than in rural areas. The value of the Gini-coefficient for rural areas was 0.357,

for urban areas 0.430, while the value of the Gini-coefficient for Pakistan was 0.381. The Gini-coefficients computed by Azfar[18] slightly declined than the values estimated by Bergan[19]. For rural areas, it declined to 0.334, 0.424 for urban areas, while the Gini-coefficient for both the rural and urban areas together declined from 0.381 to 0.365. Similarly, the study by Khandkar[20] also confirmed that income inequalities in the urban areas compared to rural areas were high.

Kruijk and Leauwen[21] measured the changes in income inequality in Pakistan as a whole and in rural and urban areas between 1969-70 and 1979 by the Gini-coefficient method. According to their analysis, inequality increased in both urban and rural areas of Pakistan during 1969-70 and 1979. Further, inequality was higher in urban areas than in rural areas like other studies. For Pakistan, the value of the Gini-coefficient was 0.329 in 1969-70 and 0.376 in 1979. While for urban areas of Pakistan in 1969-70 and 1979, the Gini-coefficients were 0.362 and 0.400 respectively. On the other hand, for rural areas, the Gini-coefficients were 0.295 in 1969-70, and 0.321 in 1979. To examine the trend in income distribution in Pakistan, it is observed that during 1980s income distribution improved from 0.428 in 1984-85 to 0.348 in 1987-88. During the same period, the Gini-coefficient for rural areas improved from 0.345 to 0.307 while there was a little improvement in the income distribution in the urban areas of Pakistan. The Gini-coefficient decreased from 0.379 in 1984-85 to only 0.366 in 1987-88 as shown in table 1.

Table. 1 Trend in the Gini-coefficient for rural and urban areas of Pakistan

Year	Rural Areas	Urban Areas	Pakistan
1963-64	0.348	0.368	0.355
1966-67	0.314	0.388	0.351
1968-69	0.293	0.37	0.328
1984-85	0.345	0.379	0.428
1985-86	0.33	0.354	0.355
1987-88	0.307	0.366	0.348
1990-91	0.41	0.39	0.407
1992-93	0.367	0.384	0.39
1993-94	0.40	0.35	0.40
1996-97	0.41	0.38	0.40
1998-99	0.40	0.33	0.41

Sources: Economic Survey (2001-02, p. 50) and UNDP (1999, p. 85)

In the decade of nineties, it rose to 0.407 in 1990-91 and remained almost stagnant till 1998-99. In rural areas too, the situation was not different while in urban areas during the 1990s, the income distribution improved from 0.366 in 1990-91 to 0.330 in 1998-99. If the values of the Gini-coefficients of the decades of 1980s and 1990s compared with the values estimated in the decade of 60s, the situation has worsened in Pakistan. The distribution of income was relatively more unequal in urban areas from 1963-64 to 1987-88 as compared to rural areas, while the income inequality for the entire country had remained almost the same during the same period except for the year 1984-85 in which the Gini-coefficient increased as high as 0.428. Since 1990-91 onward, the income distribution was relatively more unequal in rural areas as compared to urban areas of Pakistan, while the situation in Pakistan was also not satisfactory during the same period when compared with the previous years. However, using data from the Pakistan Household Integrated Survey (PIHS) of 2001, the value of the Gini-coefficient for the rural areas in 2001 decreased to 0.237 while for urban areas it was 0.323 and for the Pakistan the value decreased from 0.41 in 1998-99 to 0.275 in 2001.[22] Again the wage income was more unequally distributed in urban areas than in rural areas of Pakistan.

Data and Methodology

To estimate the Gini-coefficient the study used the data from the Pakistan Social and Living Measurement (PSLM) survey of 2004-05 of the federal bureau of statistics Islamabad. Table 2 shows the break up of the labor force by schooling level. Foe each level, the frequency or total number in the sample and the respective percentage is given.

Table 2 Education level of the labor force

Schooling Level	Frequency	Valid Percent	Percent
Less than class 1	1709	7	1.9
Class 1	3984	16.2	4.4
Class 2	2867	11.7	3.1
Class 3	2470	10.1	2.7
Class 4	2135	8.7	2.3
Class 5	2045	8.3	2.2
Class 6	1588	6.5	1.7
Class 7	1303	5.3	1.4
Class 8	1299	5.3	1.4

Class 9	1251	5.1	1.4
Class 10	1209	4.9	1.3
11: FA/FSc	1273	5.2	1.4
12: BA/BSc	748	3	0.8
13: Dgree in Engineering	66	0.3	0.1
14: MBBS	34	0.1	0
15: Degree in Computer Science	46	0.2	0.1
16: Degree in Agricultre	6	0.02	0
17: MA/MSc	153	0.6	0.2
18: MPhil/PH.D	5	0.02	0
19: Other	338	1.4	0.4
20: Total	24529	100	26.9
Missing	66790	-	73.1
Total	91319	-	100

Source: PSLM (2004-05)

According to the survey, there were 1,709 workers having less than class 1 level of schooling. It constituted 7.0 percent of the labor force representing 1.9 percent of the total PSLM survey. Household members who have attained only class1 level of schooling constituted the bigger chunk (16.2%) of the workers, represented 4.4 percent of the total survey. Table 3 also reveals that the number of workers who have attained primary schooling was 2,045, constituting 8.3 percent of the literate labor force. Middle standard certificate holders were 1,299 while Secondary School Certificate (SSC) holders were 1,209 constituting 5.3 and 4.9 percent respectively. Higher Secondary School Certificate (HSSC) holders were greater than SSC holders, which was 5.2 percent of the workers. The number of educated workers decreased as the level of schooling increased. Degree holders were only 748, which was only 3.0 percent of the total workers. The number of professional degree holders was small. The workers who had degree in engineering were only 66 (0.3%). The number of medical doctors (MBBS) were 34 which was hardly 0.1 percent of the workers, while the workers holding degree in computer science were 46 and the number of people having degree in agriculture were only 6 which constituted only 0.02 percent of the total workers. Master degree holders both in arts and science, were 153. The higher qualification (M.Phil/Ph.D) possessors were only 5 in the PSLM

(2004-05) survey. The fourth column of the table shows the percentage with respect to the whole PSLM (2004-05) survey.

The survey reveals that most of the working population in Pakistan is illiterate and having no skill which may adversely impact the productivity, economic growth, development and the quality of production as well.

Average monthly earnings were derived from the PSLM survey 2004-05. Table 3 shows the monthly earnings of the workers according to their different levels of schooling. There were 7,318 male and 1,214 female who were without any level of schooling. There was a great difference in earnings of male and female workers. The monthly earnings of a male worker were Rs. 4,200 while that of female were Rs. 1,595 per month. Workers with schooling level less than class 1 were only 53, in which 50 were male, while three were female. Male workers were earning Rs. 3,069 per month while Rs. 1,800 by female workers.

Table 3 Monthly incomes of male and female workers by their schooling levels.

Level of Schooling	Sex	Mean	Median	N	Std. Deviation
No Schooling	Male	4200.384	3200	7318	776.85704
	Female	1595.765	1000	1214	286.66507
	Total	3829.779	3000	8532	733.48078
Less than 1 class	Male	3064.02	2858	50	177.62318
	Female	1800	1500	3	181.65335
	Total	2992.472	2716	53	178.9392
Primary	Male	4835.699	3333.3	3464	1534.2178
	Female	1589.129	1000	184	170.47184
	Total	4671.947	3100	3648	1497.98049
Middle	Male	4893.658	4000	2370	478.52459
	Female	1938.356	1500	73	166.30195
	Total	4805.349	3850	2443	474.97458
Matric	Male	6528.863	4500	3255	1613.34082
	Female	3013.174	2000	207	255.7467
	Total	6318.652	4500	3462	1563.81989
Higher Secondary FA/FSc	Male	8065.982	5500	895	1110.87767
	Female	4412.182	4000	110	430.23574
	Total	7666.063	5300	1005	1063.883
Under-graduation	Male	10103.77	6700	1219	1423.8636

BA/ BSc					
	Female	5918.384	4950	159	655.04393
	Total	9620.839	6418.5	1378	1363.04625
Degree in Engineering	Male	19236.64	15000	70	2490.31348
	Female	13175	9100	4	1335.24074
	Total	18908.99	15000	74	2440.29564
MBBS	Male	17248.41	14000	115	1930.14474
	Female	12036.59	10000	29	876.10055
	Total	16198.8	12000	144	1778.70053
Degree in Computer Science	Male	11188	5500	16	1345.88601
	Female	3500	3500	2	353.53391
	Total	10333.78	5000	18	1290.62103
Degree in agriculture	Male	10977.63	9600	19	408.63991
	Female	14000	14000	1	.-
	Total	11128.75	9800	20	402.84977
MA/MSc	Male	13596.61	10000	412	1288.5959
	Female	10715.22	8000	93	1179.21094
	Total	13065.98	9500	505	1272.13219
MPhil/ Ph.D	Male	27430.56	20000	12	3926.74828
	Total	27430.56	20000	12	3926.74828
Other	Male	10743.53	7500	68	1136.40307
	Female	4500	4000	5	200
	Total	10315.89	7000	73	1108.23797
Total	Male	5725.597	4000	19283	1207.90515
	Female	2815.942	1500	2084	485.85539
	Total	5441.808	3750	21367	1160.94497

Source: PSLM (2004-05).

Table 3 clearly shows us the pattern of earnings. The monthly earnings increased as the level of schooling of the labor force increased. The male workers whose educational level was less than class 1 earned Rs. 3,064 while female worker earned Rs. 1,800. Earnings increased to Rs. 27,430 per month of the worker with M.Phil/Ph.D qualification. The above table reveals that there was a gap between the earnings of male and female worker. The average monthly income of a male labor was Rs. 5,725 while female worker earned only Rs. 2,815 per month.

There are various methods to measure the inequalities in personal earnings distribution, like Gini-Coeffficient, Pearson's Skewness Coefficient, Pareto Distribution, the Kuznet Ratio, Thiel's Index, Atkinson's Measure and Coefficient of variation. Income inequality can be measured by all these different methods. But each of these techniques or methods has its own merits and weaknesses. There is no universally accepted single best technique or method which encompasses all aspects of income inequality.[23] However, in Pakistan majority of the studies have focused on estimating and calculating the inequality by the method of Gini-coefficient, because this method is the most widely used and the most popular method of measuring the income inequality. Corrado Gini was an Italian who developed an inequality measure called Gini-Coefficient or technique.

The present study used the Gini coefficient method for estimating the income inequality because this method has widely been used. It is a measure of income inequality based on the cumulative distribution function of total income and its recipients. The value of the Gini coefficient lies between zero and one. Zero means perfect distribution of income equality while one shows perfect distribution of income inequality. The Gini coefficient technique was used to determine the extent of inequality between the earnings of male and female labor force using data from the Pakistan social and living standard measurement (PSLM) survey of 2004-05. The Gini coefficient of inequality is also defined as the ratio of the area between the Lorenz curve and the diagonal of the total area under the diagonal.[24] The formula for the derivation of the Gini coefficient is as under:

$$G = 1 + \frac{1}{n} + \frac{2}{n^2 \overline{Y}}\left[y_1 + 2y_2 + 3y_3 + ... + ny_n\right] .....$$

.....(1)

where,

y = income of individuals

n = represents the number of earners

$\overline{Y}$ = mean of the incomes of individuals

$$\overline{Y} = \left(\frac{1}{n}\right)\sum y_i$$

Gini coefficient can have any value between zero and one. Zero means perfect income equality while one means perfect income ineqaulity (one individual has all the income).

Results

The value of the Gini-coefficient was computed using the PSLM (2004-05) data for male and female, rural and urban areas of Pakistan. Table 4 shows the Gini-coefficients by gender and region in Pakistan.

Table 4 Gini-coefficients by gender and region

Area/Gender	Gini-coefficient
Male	0.392
Female	0.371
Rural Areas	0.261
Urban Areas	0.341
Pakistan	0.301

The Gini-coefficient for male and female suggests that the earnings distribution for both the gender was unequally distributed. The inequality was higher in males as compared to female labor force. The analysis suggests that the incidence of male and female wage differential is a serious problem in the labor market of Pakistan. In other words, the values of the Gini-coefficients shows that a greater portion of earnings was received by very few earners (male and female workers) of the labor force, while a large number of labor force (male and female) enjoyed very small share in total earnings. The values of the Gini-coefficient for males and females were 0.392 and 0.371 respectively as shown in table 4.

The Gini-coefficients also indicate that there is more inequality in the urban (0.341) areas as compared to the rural (0.261) areas. For the whole of Pakistan, it was 0.301. The cause of low earnings inequality in rural areas is that the rural labor force is almost homogeneous, engaged in farming and agriculture related activities and self employment. Their levels of human capital development remain at low as compared with the urban areas. As a result, there is homogeneity in their earnings which causes low income inequality, while on the other hand, the labor force in urban areas is more heterogeneous as compared to rural areas of Pakistan. They are differentiated by skill, training and education. Moreover, various kinds of employment opportunities including business and other specialized services are available in urban areas which cause great variation in their income.[25] So, as a result, there is a relatively high income inequality in urban areas of Pakistan.

Comparing the results of this study with table 1 presented in section 2 above of this paper, the situation of income distribution has improved, especially in rural areas, while in urban areas the Gini-coefficient has increased, indicating high income inequality in 2004-05. However, as a whole the distribution of income inequality improved from 0.410 in 1998-99 to 0.301 in 2004-05, shows a healthy sign.

Moreover, it is to be kept in mind that the distribution of income according to source of income was once considered important, however, today's focus is on the distribution of income and wealth based on race, ethnic background, geographical regions, gender and other socio-economic factors such as type of jobs etc. Table 5 gives an idea of the distribution of income according to socio-economic characteristics among the labor force by gender.

Table 5. Various socio-economic Income Distribution Descriptions (Mean and Median Income, 2004-05)

Occupational Category	Sex	Mean	Median	N	Std. Deviation
1 Senior officials / Managers	Male	15940.56	11750	438	1908.3
	Female	10847.42	5000	31	1436.59
	Total	15603.91	10500	469	1884.327
2 Professionals	Male	9788.669	7000	785	1083.359
	Female	6416.224	5000	250	668.7218
	Total	8974.069	6300	1035	1008.245
3 Tech. and associate professionals	Male	8864.761	5600	607	3042.13
	Female	4989.889	4000	81	697.5718
	Total	8408.562	5500	688	2870.59
4 Clerks	Male	6342.201	5500	561	496.0286
	Female	4540.759	4500	29	199.4899
	Total	6253.655	5425	590	487.3067
5 Service, shop , sales workers	Male	5966.843	4000	6592	1116.364
	Female	2875	1900	471	371.9311
	Total	5760.661	4000	7063	1085.449
6 Skilled agriculture & fishery	Male	4767.003	3500	4690	774.0154
	Female	1570.386	1091.6	416	163.6002
	Total	4506.566	3333.3	5106	749.3683

7 Craft & trade workers	Male	5145.118	4000	672	539.531
	Female	1177.57	700	142	122.6978
	Total	4452.99	3000	814	515.802
8 Plant machinery operators	Male	4922.954	4000	1028	384.9389
	Female	2161.111	1750	18	159.6333
	Total	4875.427	4000	1046	383.9725
9 Elementary occupation	Male	4310.19	3000	3716	1432.988
	Female	1957.396	1200	514	362.9905
	Total	4024.295	3000	4230	1350.583
Total	Male	5753.607	4000	19089	1212.264
	Female	2917.936	1500	1952	469.3218
	Total	5490.538	3800	21041	1166.644
Source: PSLM (2004-05).					

Table 5 shows that income differs substantially by type of job leading to argue that a new professional and non-professional class distribution is arising in the Pakistani society. The table also predicts substantial differences in income which exists between the income of male and female labor force. According to table 5, senior officials and managers got more than all other workers in other occupations. Average monthly income of both male and female worker was Rs. 15,603 in which male worker earned Rs. 15,940 while female earned Rs. 10,847. This occupation was followed by professionals who got more than the rest of the occupations. The number of male workers in the senior officials and managers category was 438 while the number of female workers was only 31. Service, shop and sales workers was the occupation which accommodated most of the male and female labor force. There were 6,592 male workers while the number of female workers engaged in this category was 471. Technical and associate professional was the third category of occupation earnings-wise. The earnings of male were Rs. 8,864 while the earnings of a female worker were Rs. 4,989. There were 607 male and 81 female workers employed in this category of occupation.

Conclusion

The distribution of income and earnings between male and female was found to be unequal. The inequality was higher in males when compared

to the females. Comparison of rural-urban income inequality showed that it is higher in urban areas of Pakistan. To improve the situation further, equal opportunity for education and employment should be given to male and female, and also to the people living in rural areas as well as urban areas of Pakistan.

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