Pakistan Economic Review
2:1 (Summer 2019), pp.20-34

DECOMPOSITION OF EARNINGS INEQUALITY IN SELECTED CITIES OF PAKISTAN

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Abstract

The study analyzes earnings inequality with respect to various factors that include, the levels of education completed, work experience, gender, nature of job, kind of employer organization and basic and higher educational expenditures. The data are divided into various subgroups for each of these factors. For measuring earnings inequalities, five inequality measures including Range, Coefficient of Variation, Theil indices and Gini coefficient. Earnings Inequalities are further decomposed for the various subgroups. The results of earnings inequality show that for every higher level of education the Gini coefficient keeps on increasing. The value of Gini Coefficient is highest for earners belonging to the highest experience category. It is also higher for the male earners and highest for the category of Professionals, for the private sector and for higher educational expenditure subgroups. The decomposition, by Theil indices compare the share of "between" and "within" group inequalities, in the total earnings inequalities. The factor with a greater share of between groups inequality has a greater impact on earnings inequality. The results show that "educational level" has the highest share of between group inequalities, followed by "higher educational expenditures", "work experience", "basic educational expenditure", the "nature of job", "sector of employment" and "gender" has the least share. The major policy implication of this study is, that the government should integrate educational planning into wider income inequality reduction strategies.

Keywords: Earnings Inequality, Education, Work Experience, Gender.

JEL Classification: D63, I24

1. INTRODUCTION

Earnings inequality is a major component of Income inequalities in a society. Their reduction should be a priority for any government. The long-run increase in income inequalities not only raises social and political concerns, but also economic ones, and tends to drag down GDP growth, as lower income people are prevented from realizing their human capital potential.

The study analyzes earnings inequality with respect to various factors, that is the level of education, years of work experience, gender, nature of job, employer/organization (public sector, private sector and autonomous), and basic and higher educational expenditures. These are further divided into subgroups. For this purpose, five inequality measures are used. The main objectives of this study are 1) To calculate earnings inequalities by using various measures such as Range, Coefficient of

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Variation, Theil indices and Gini coefficient. 2) To decompose earnings inequality into "between" and "within" group inequalities, for the above seven factors 3) To give some policy recommendations.

The study is based on a sample survey as the data was not otherwise available. The survey was conducted, with the help of questionnaires and interviews. The data was collected from individuals working for different government departments, private sector organizations and autonomous organizations, from various cities of Pakistan in all the four provinces. To analyze earnings inequality, five inequality measures are used. One of them is the Range which is the simplest measure of dispersion. Secondly, Coefficient of Variation is used which is good for the sake of comparisons. Further, Theil indices are used as these two are additively decomposable measures. Finally, Gini Coefficient is used as it is a widely accepted inequality measure with multiple qualities.

The various inequality measures are used and the decomposition of the overall earnings inequality is done for determining what factors cause the gap between the earnings of individuals to widen. This may help to suggest measures to reduce income inequalities or to promote equal opportunities to individuals. According to Shami and Hussain (2005), "Private sector in education has long been a major source of perpetual division and demarcation of privilege, status and esteem, power, opportunity and expectations that go with it". The study analyzes which of the above mentioned seven factors have an impact on earnings inequality and also the extent of that impact. For instance, does earnings inequality increase by spending a greater amount on basic and higher education? In developing countries markets are highly imperfect and opportunities are hugely unequal, so without an important role of public sector institutions at the basic and higher educational level, income inequalities may tend to pass on from one generation to the next.

2. REVIEW OF LITERATURE

Psacharopoulos (1987) compared public and private sector earnings for six countries. Some of the results of this comparison are: a) Average earnings in the public sector were found to be significantly higher. b) Comparing earnings by education levels, public/private sector differentials were positive at the lower levels of education but were negative in three of the six countries at higher education levels. c) Within both employment sectors differentials increased by education level but were widest for all educational level comparisons in the private sector.

Kruijk (1986) measured household income inequality in Pakistan, its provinces and rural-urban segments of each province. The study was based on the data of 1979 and Theil index was used for the purpose. The coefficients of Theil index showed that the income inequality was found to be the highest in NWFP followed respectively by Sindh, Punjab and Baluchistan. The incidence of urban income inequality was greater in all provinces as compared to that of the rural areas. The overall income inequality was also decomposed into within and between provinces.

Sylwester (2002) empirically examined the effect of devoting more resources to education on the distribution of income (measured by the Gini coefficient), using a cross section of fifty countries. The study uses a twenty-year period. The study concludes that countries that devote more resources to public education as a percentage of GDP have lower income inequality.

Idrees (2006) conducted a detailed study on income inequalities in Pakistan. A section of this study discusses earnings inequalities. The study found that the proportion of earnings generally declines with successively higher levels of education but not as fast as the proportion of population. Its reason is that although the average earnings increase with the level of education but this increase is not enough to offset the declining share of the population.

Akram and Khan (2007), measure the incidence of government educational spending, on income distribution in Pakistan, at the provincial level for both rural and urban areas. The study concludes that overall expenditure in the primary education sector is progressive or pro-poor in Pakistan; both at the provincial and the regional levels. Government expenditure on secondary education is also progressive. The results imply, that expenditures are more equally distributed than the income for all levels of education. Public subsidy in professional and technical education is also progressive.

Hyder (2007) examines the magnitude of public/private wage differentials in Pakistan using data drawn from the 2001-02, Labor Force Survey. The labor market is divided into private sector, public sector and state-owned enterprises. The study shows that there are different reward systems in the different employment sectors in Pakistan. The public sector has a more compressed wage distribution and a smaller gender pay gap than that prevailing in the private sector.

Coady and Dizioli (2017) present an IMF working paper, which studies the relationship between educational expansion and income inequality. The study finds a large positive statistically significant and stable relationship between inequality of schooling and income inequality especially in developing economies and among older age cohorts. The study concludes that educational expansion will continue to be inequality reducing.

3. DATA AND METHODOLOGY

A comprehensive data set for this study was not available so primary data was collected by conducting a sample survey and using the Questionnaire method. The Questionnaire was designed to get all the information about the relevant variables by keeping it as simple as possible. The questions focus on the qualification of the individual, the work experience in years, the quality of education, income, kinds of educational institutions attended and the educational expenditures incurred. The universe of the study consists of, educated (Matriculation and above) individuals employed by different kinds of organizations (grouped under Public, Private and Autonomous sectors); working in the major cities of Pakistan (Islamabad/Rawalpindi, Karachi, Lahore, Peshawar and Quetta). The respondents did not include owners of

enterprises, self-employed individuals, unpaid family helpers, agricultural laborers, the armed forces and members of Parliament.

The data was for the most part randomly selected with a certain degree of purposive selection to make the data more representative. Thus, individuals from different professional categories and different educational, economic and regional backgrounds were selected. Out of a sample of 300 individuals, 210 are males and 90 are females. Out of the total sample, 126 work in the public sector, 129 in the private sector and 45 work for autonomous organizations/projects. According to the nature of job, the data is divided into four categories, that is, Professional, Managerial/Supervisory, Technical and Miscellaneous. Out of a total of 300 individuals, 111 are Professionals, 70 are Managers or Supervisors, 52 have a Technical nature of job and the rest 67 belong to the Miscellaneous category.

To study the effect of various factors on earnings inequality the data is divided into seven groups. Each of these groups are further divided into various subgroups. Earnings inequality is analyzed according to the level of education completed, experience, gender, nature of job, kind of employer organization and basic and higher educational expenditures. For this purpose, five inequality measures are used. One of them is the Range which is the simplest measure of dispersion or spread and it can also be used as a measure of inequality. A better measure is the Coefficient of Variation which is good for the sake of comparisons. Then Theil 1 and Theil 2 are used as these two are good additive decomposable measures. Finally, Gini Coefficient is used as it is a widely accepted inequality index with multiple qualities.

3.1. Explanation of Inequality Measures Used

The first measure used here is the Range. It is the simplest statistical measure of dispersion but it completely ignores the distribution in between the income levels. [2]

$$R = MaxY_i - MinY_i \qquad (1)$$

The second measure used for measuring earnings inequality is the Coefficient of Variation. It is the ratio of the standard deviation to the mean. It is a very important statistical measure of dispersion and is especially used for comparisons as it is scale free.

$$CV = \frac{\sqrt{V}}{\bar{Y}} \qquad (2)$$

$$Where,\ \bar{Y} = \frac{\sum_{i=1}^{n} Y_i}{n}\ and\quad V = \frac{\sum_{i=1}^{n}(Y_i - \bar{Y})^2}{n}$$

[2] For detailed discussion on inequality measures see Idrees M. and Ahmad E. (2018)

To see how sub group inequality measures can be effectively related to the population inequality, sub-group decomposition can be carried out. To analyze the relationship between overall inequality measure and the inequality measures from the components or sources of income, source decomposition is required. A measure is additive decomposable when total inequality of population can be broken into a weighted average of the inequality existing between and within sub-groups of populations. Non-additive decomposition is that when the basic focus of analysis is on the contribution of sub populations to total inequality instead of how total inequality is subdivided within and between sub populations. Sub-group decomposition is additive whereas source decomposition is non-additive. For sub-group decomposition, Theil 1 and Theil 2 measures are used and for source decomposition the Gini coefficient is used. Thiel (1967) presented two measures of inequality. These are part of the class of "entropy" measures. [3]

Theil's first measure:

$$T_1 = \frac{1}{n}\sum_{i=1}^{n}\left(\frac{Yi}{\bar{Y}}\right) ln\left(\frac{Yi}{\bar{Y}}\right) \quad (3)$$

Where, n = Sample size, Y_i: Individual's earnings and $\overline{Y}$: Mean earnings

Additive decomposition of Theil's first measure:
Let there be k subgroups of data then according to Shorrocks (1980) the decomposition form of Theil's first measure is given as:

$$T_1 = \sum s_k T_1^k + \sum s_k \, ln[\overline{Y}_k/\overline{Y}] \quad (4)$$

Where, s_k is the income share of sub-group, calculated as $[n_k\overline{Y}_k/n\overline{Y}]$, $\overline{Y}_k$ is the mean earnings of sub-groups, $T_1^k$is Theil's First measure for sub-groups and n_k is the size of sub-group. The first component measures share of within groups inequality and the second component measures share of between groups inequality.

Theil's second measure:

$$T_2 = \frac{1}{n}\sum_{i=1}^{n}\left[ln\left(\frac{\bar{Y}}{Y_i}\right)\right] \quad (5)$$

Where, n = Sample size, Y_i: Individual's earnings and $\overline{Y}$: Mean earnings

Additive decomposition of Theil's second measure:
Let there be k subgroups of data then Shorrocks (1980) gives decomposition of Theil`s second measure as:

[3]Entropy deals with the idea that occurrences that differ greatly from what was expected should receive more weight than events that are according to expectations.

$$T_2 = \sum P_k T_2^k + \sum P_k \, ln[\overline{Y} / \overline{Y_k}] \quad (6)$$

Where,P_k is the population share of sub-group, $\overline{Y}_k$ is the mean earnings of sub-groups, T_2^k is Theil's Second measure for sub-groups. The first component measures share of within groups inequality and the second component measures share of between groups inequality.

Gini Coefficient is one of the most widely used standard economic measures of income inequality. It was developed by, the Italian Statistician, Corrado Gini, in 1912. One of its important qualities is that it is easily comparable as it ranges between 0 and 1. Zero represents perfect equality and one indicates perfect inequality. It is called Gini coefficient or index of concentration.

$$G = 1 - \sum P_i (CYS_i + CYS_{i-1}) \quad (7)$$

Where, P_i is the population share, CYS_i is the cumulative income share of ith individual.

3.2. Decomposition of Earnings Inequality

In this section we will explain the sub-groups for which decomposition will be carried out. According to the level of education attained, the sample is divided into six subgroups, namely, Matric/O levels, FA/FSc/A levels, BA/BSc, MA/MSc, M.Phil/Professional degree and PhD/Specialist. The purpose is to observe the effect of the level of education attained on earnings inequality in the urban areas of Pakistan. To observe the effect of work experience on earnings inequality, the data is broken into six sub-groups.

To see the impact of gender on earnings inequality, the data is divided into 210 male and 90 female workers. According to the nature of job, the data is divided into four sub-groups namely Professionals, Managerial/Supervisory, Technical and Miscellaneous. Doctors, nurses, teachers, professors, researchers and lawyers etc. are grouped under the category of Professional. The category of Managers includes administrators or supervisors such as bank managers, bureaucrats and entrepreneurs etc. Under Technical, are grouped engineers, IT experts, operators (for instance of telephone or photocopy machines), stenographers and persons doing other jobs of technical nature. Those belonging to marketing, sales, insurance, hotels and media are grouped under Miscellaneous. Receptionists, librarians and coaches are also grouped under this category.

To observe the impact of the kind of the employer organization on the earnings inequality the data is divided into three sub groups. The three sub groups are public sector employees (126), private sector employees (129), and those employed by the autonomous organization (45). This decomposition will show the extent of inequality of earnings within and between the sectors.

In Pakistan, there are various kinds of schools providing education of varied quality and expense. Parents have to make choices with respect to their children's education

and future. It is important for them to know whether paying high fees will secure a better and a high paying job for their child or not. The decomposition of earnings inequality with respect to basic education expenditures will show the extent of earnings inequality between and within the various sub groups and their impact on overall inequality. For this purpose, the data is divided into six sub groups. In Pakistan until the mid 1980`s, higher education was provided either by public sector universities or by colleges affiliated with these public sector universities. The tuition fees were highly subsidized. Since then, the private sector has been playing an increasing role in providing higher education but at very high tuition fees. Some students go abroad for higher education bearing enormous expenditures in the hope of securing better paying jobs. The purpose, of decomposition of earnings inequality with respect to higher educational expenditures, is to see the extent of inequality between and within the various sub groups. This may help the policy makers in making better decisions with respect to higher education. For this purpose, as well six groups are made.

4. ANALYSIS OF RESULTS

This section presents the results of the study. The effects of earnings inequalities were explored from different dimensions, such as education, experience, gender, nature of job, kind of employer organization and basic and higher educational expenditures. For this purpose, Range, Coefficient of Variation, Theil 1, Theil 2 and The Gini coefficient are used. The maximum earnings in the sample is Rs.210,000 per month and the minimum earnings recorded is Rs.3800. Thus, the range of the entire data is Rs.206,200. The mean income is Rs.26,340. Coefficient of variation for the entire data is 1.100. Theil's first index is calculated as 0.36608 whereas Theil's second index is 0.31747. The Gini coefficient for the sample is 0.4340. The results for the entire sample show that there are substantial earnings inequalities. To see the impact of various factors on earnings inequalities, the data is divided into seven groups.

4.1. Decomposition of Earnings Inequality by Levels of Education

To see the impact of completed levels of education on earnings inequality the sample is divided into six sub-groups.

Table 1. Levels of Education: Descriptive Statistics

Education levels	Sample size	Min Y	Max Y	Range	Mean	CV
Matric/O levels	20	3,800	13,500	9,700	6,420	0.3483
F.A/FSc/A levels	21	5,500	16,000	10,500	9,500	0.3379
B.A/BSc	85	4,000	58,000	54,000	15,674	0.6045
M.A/ MSc	96	10,000	100,000	90,000	23,559	0.5271
M.Phil/ Prof. Degree	59	13,000	200,000	187,000	35,135	0.7424
PhD/ Specialist	19	30,000	210,000	180,000	100,368	0.5572
Total	300	3800	210000	206200	26339.706	1.1005

Table 2. Decomposition by Levels of Education

a) Within Group Inequality	Theil First Measure	Theil Second Measure	Gini Coefficient
Within 1st level	0.0507	0.0469	0.1684
Within 2nd level	0.0532	0.0537	0.1858
Within 3rd level	0.1406	0.1269	0.2773
Within 4th level	0.1114	0.1034	0.2539
Within 5th level	0.1641	0.1249	0.26521
within 6th level	0.1449	0.1594	0.3012
b) Decomposition			
Inequality within levels	37.09%	34.84%	
Inequality between levels	62.91%	65.16%	
Overall Earnings inequality	0.3661	0.3175	

Table 1 shows, the mean as well as the maximum income of the six groups. Both are increasing continuously as we move from the lowest level to the highest. This clearly shows that with an improvement in qualification, the earnings increase. The Range also increases continuously except for level six for which it falls slightly. Coefficient of Variation, shows that earnings inequality is lower within the first two sub-groups and increases in higher groups.

In Table 2, Theil 1, Theil 2 and Gini, show that earnings inequality is quite low within the first two educational levels. Within group inequalities are higher for the remaining four (higher) educational levels. Gini is highest for the sixth level. For the purpose of decomposition of earnings inequality Theil 1 and Theil 2 are used. The results for both show that the share of within subgroups inequality (out of the total sample inequality) is much lower as compared to the between subgroups inequality. This shows that earnings inequality is quite high between earners who have completed different levels of education making it quite evident that educational attainment is an important determinant of earnings differential.

4.2. Decomposition of Earnings Inequality by Years of Work Experience

To see the effect of work experience on earnings inequality, the data is divided into six subgroups (with an interval of five years).

Table: 3. Years of Work Experience: Descriptive Statistics

Experience levels	Sample Size	Min Y	Max Y	Range	Mean	CV
1 to 5 years	103	3,800	100,000	96,200	14,882	0.7948
6 to 10 years	57	5,500	75,000	69,500	20,140	0.6714
11 to 15 years	42	6,000	110,000	104,000	24,467	0.7143
16 to 20 years	42	11,000	200,000	189,000	34,052	1.0589
21 to 25 years	29	10,000	200,000	190,000	39,920	0.9703
Above 25 years	27	13,500	210,000	196,500	59,462	0.8445
Total	300	3800	210000	206200	26339.706	1.1005

Table: 4. Decomposition by Years of Work Experience

a) Within Group inequality	Theil First Measure	Theil Second Measure	Gini Coefficient
Within 1st level	0.2104	0.188	0.3347
Within 2nd level	0.1836	0.1789	0.3303
Within 3rd level	0.1902	0.182	0.3238
Within 4th level	0.3228	0.2455	0.3802
Within 5th level	0.3028	0.262	0.3818
within 6th level	0.2833	0.2871	0.411
b) Decomposition			
Inequality within levels	68.99%	66.02%	
Inequality between levels	31.01%	33.98%	
Overall Earning inequality	0.3661	0.3175	

As can be seen from Tables 3 and 4, the mean and minimum income is lowest for the first subgroup and it continuously increases as we move to higher experience level sub-groups. The Range also increases continuously from the lowest to the highest group except for the second subgroup. The Coefficient of Variation fluctuates and is highest for the fourth level. The Gini coefficient shows that the earnings inequality is highest among the earners having the highest experience and it is lowest for the third level. Theil 1 and Theil 2 show that the share of within group inequalities in the total is much higher as compared to the share of between group inequalities and there is substantial earnings inequality between each of the six subgroups. Thus, it can be concluded that experience is also an important determinant of earnings differential but it is less important as compared to the levels of education completed.

4.3. Decomposition of Earning Inequality by Gender

To see the impact of gender on earnings inequality the data is divided into two groups of Males and Females.

Table: 5. Gender: Descriptive Statistics

Gender	Sample size	Min Y	Max Y	Range	Mean	CV
Male	210	3800	210000	206200	27536	1.1288
Females	90	5000	190000	185000	23549	0.9897
Total	300	3800	210000	206200	26339.706	1.1005

Table: 6. Decomposition by Gender

a) Within Group inequality	Theil First Measure	Theil Second Measure	Gini Coefficient
Within Male	0.3919	0.3472	0.4521
Within Female	0.2866	0.2399	0.379
b) Decomposition			
Inequality within levels	99.30%	99.21%	
Inequality between levels	0.70%	0.79%	
Overall Earning inequality	0.3661	0.3175	

Tables 5 and 6 show the mean earnings of the male sub-group is higher than that of the female sub-group. The maximum income and range are also greater and so is the Coefficient of Variation. According to Table 6, the Gini coefficient, Theil 1 and Theil 2 measures show that there is greater earnings inequality within the group of male earners. The decomposition of the earnings inequality shows that the share of within group inequality in the total inequality is very high as compared to the share of between groups inequality as both, Theil 1 and Theil 2 are around 99 percent. The share of between groups inequality is less than one percent. To conclude, we can say that gender is not an important determinant of earnings inequality in this sample of earners, as the decomposition shows that most of the inequality is due to the within group inequality.

4.4. Decomposition of Earning Inequality by the Nature of Job

To observe the impact of nature of jobs on earnings inequality, the data is divided into four sub-groups, namely, Professional, Managerial/supervisory, Technical and Miscellaneous.

Table: 7. Nature of Job: Descriptive Statistics

Job Description	Sample size	Min Y	Max Y	Range	Mean	CV
Professional	112	8000	210000	202000	35814	1.0883
Managerial	70	10000	200000	190000	31697	0.7549
Technical	52	4000	31000	27000	12988	0.575
Miscellaneous	66	3800	100000	96200	15099	0.8457
Total	300	3800	210000	206200	26339.706	1.1005

Table: 8. Decomposition by Nature of Job

a) Within Group inequality	Theil First Measure	Theil Second Measure	Gini Coefficient
Within Professional	0.391	0.3399	0.4559
Within Managerial	0.1752	0.1463	0.2923
Within Technical	0.1513	0.1547	0.3099
Within Miscellaneous	0.2231	0.1935	0.3383
b) Decomposition			
Inequality within levels	78.87%	72.58%	
Inequality between levels	21.13%	27.42%	
Overall Earning inequality	0.3661	0.3175	

The mean income of the Professional category was found to be the highest, followed by that of the Managerial/Supervisory sub-group. The maximum income, Range and Coefficient of Variation is also highest for the Professional category. By analyzing the Gini coefficient, Theil 1 and Theil 2 measures for within group inequality, it is observed that the earnings' inequality is highest within the Professional category followed by the Miscellaneous category. The reason being that different types of professionals are grouped in the first subgroup, for instance from school teacher to specialist doctors. Same is the case for the miscellaneous groups. The decomposition of earnings inequality shows that the share of between groups inequality is almost

one fourth of the total inequality, the remaining three fourths belonging to the within groups inequality. This shows that the nature of jobs does have an impact on earnings inequality but that this effect is not very large.

4.5. Decomposition of Earning Inequality by Sector of Employment

To see the effect of employer organization on earnings inequality, the data is divided into three sub groups. The subgroups are public sector, private sector and autonomous organizations.

Descriptive Statistics including mean, range and coefficient of variation are given in Table 9 and estimates of earnings decomposition with respect to sector of employment are reported in Table 10.

Table: 9. Sector of Employment: Descriptive Statistics

Employer	Sample size	Min Y	Max Y	Range	Mean	CV
Private	129	3300	210000	206200	31127	1.2851
Government	126	4000	77000	73000	21644	0.622
Autonomous	45	7000	115000	108000	25760	0.7857
Total	300	3800	210000	206200	26339.706	1.1005

Table: 10. Decomposition by Sector of Employment

a) Within Group inequality	Theil First Measure	Theil Second Measure	Gini Coefficient
Within Private	0.509	0.445	0.5143
Within Government	0.1804	0.1998	0.3336
Within Autonomous	0.2131	0.18797	0.3333
b) Decomposition			
Inequality within levels	96.22%	95.60%	
Inequality between levels	3.78%	4.40%	
Overall Earning inequality	0.3661	0.3175	

The maximum and mean income and Range for the earners in the private sector is found to be the highest followed by those in the autonomous organizations. The minimum income of the earners in the public sector is slightly higher than that of those in the private sector. Coefficient of variation is highest for the private sector and lowest for the public sector. The Gini coefficient Theil 1 and Theil 2 are highest for the private sector. Theil 1 and Theil 2 for the private sector are more than double than those of the public and autonomous sector. This shows that the earnings inequalities are much higher in the private sector. The decomposition of earnings inequalities shows that the share of between group inequalities in the total inequalities is very small as compared to the share of within group inequalities. It can be concluded that the sector of employment explains a small portion of earnings inequality between earners, whereas the inequalities within the private sector are quite high.

4.6. Decomposition of Earnings Inequality by Basic Educational Expenditure.

Here the data is divided into six sub-groups. The first group consists of those individuals who have attended public schools in rural as well as urban areas. This group has the highest number of earners.

Table: 11. Basic Educational Expenditure: Descriptive Statistics

Edu. Exp.	Sample size	Min Y	Max Y	Range	Mean	CV
less than 500	148	3800	100000	96200	19210	0.7017
500 to 1,500	43	5000	45000	40000	17377	0.5333
1,500 to 3,000	39	7000	200000	193000	35195	0.9746
3,000 to 15,000	29	6000	58000	52000	21275	0.5912
15,000 to 25,000	25	14000	210000	196000	51844	1.0278
Above 25,000	16	8000	200000	192000	64125	0.8983
Total	300	3800	210000	206200	26339.706	1.1005

Table: 12. Decomposition by Basic Educational Expenditure

a) Within Group inequality	Theil First Measure	Theil Second Measure	Gini Coefficient
Within 1st level	0.1921	0.1983	0.3504
Within 2nd level	0.1235	0.1222	0.2735
Within 3rd level	0.3127	0.2791	0.4129
Within 4th level	0.148	0.1477	0.2962
Within 5th level	0.3824	0.3579	0.4627
within 6th level	0.3439	0.3885	0.4572
b) Decomposition			
Inequality within levels	70.67%	70.26%	
Inequality between levels	29.33%	29.74%	
Overall Earning inequality	0.3661	0.3175	

The mean income of the first subgroup is higher than that of the second sub group but it is less than the mean incomes of the other four sub groups. The mean incomes of the last two subgroups are the highest. The Gini coefficient, Theil 1and Theil 2 for the last two subgroups are the highest followed by those of the third subgroup. The decomposition of the earnings inequality shows that the share of between group inequalities in the total inequalities is almost 30% whereas the share of within group inequalities is much higher (more than double). Thus, basic educational expenditures are one of the important determinants of earnings inequality.

4.7. Decomposition of Earnings Inequality by Higher Educational Expenditures

Here again the sample data is divided into six subgroups according to the amount (in rupees) a respondent paid, for tuition (per annum) at the last higher educational institution he/she attended or for the last certificate or degree he/she obtained.

Table: 13. Higher Educational Expenditures: Descriptive Statistics

Edu. Exp.	Sample size	Min Y	Max Y	Range	Mean	CV
less than 2,500	43	3800	22700	18900	8740	0.4793
2,500 to 10,000	90	4000	58000	54000	15904	0.523
10,000 to 20,000	78	8000	52000	44000	25041	0.4154
20,000 to 40,000	33	7100	100000	92900	35936	0.6672
40,000 to 100,000	31	12000	200000	188000	31923	1.1035
Above 100,000	25	18000	210000	192000	78640	0.7558
Total	300	3800	210000	206200	26339.706	1.1005

Table: 14. Decomposition by Higher Educational Expenditures

a) Within Group inequality	Theil First Measure	Theil Second Measure	Gini Coefficient
Within 1st level	0.0973	0.0942	0.2457
Within 2nd level	0.1115	0.1053	0.2522
Within 3rd level	0.0872	0.0964	0.2338
Within 4th level	0.1908	0.1952	0.3428
Within 5th level	0.3304	0.2473	0.3765
within 6th level	0.254	0.2741	0.3981
b) Decomposition			
Inequality within levels	49.06%	44.11%	
Inequality between levels	50.04%	55.89%	
Overall Earning inequality	0.3661	0.3175	

The first subgroup of the data consists of mostly those individuals who have attended public sector colleges or have appeared in public examinations as *private candidates*.[4] Table 13 shows the mean income continuously increases as we move from one level to a higher level except for the fifth level for which it falls slightly. The maximum income also keeps on increasing except for the third level where it falls a little. Coefficient of Variation is highest for the fifth level followed by the sixth and fourth levels, thus indicating that higher expenditure subgroups have higher variability in earnings. Gini, Theil 1 and Theil 2 are also highest for the highest two subgroups (fifth and sixth) followed by the fourth subgroup, again showing that earnings inequalities are higher in the higher expenditure subgroups. Decomposition of earnings inequality shows that the share of between group inequalities in the total inequalities is very high (more than fifty percent). Thus, it can be concluded that higher educational expenditures are also an important determinant of earnings inequality.

5. CONCLUSIONS

To sum up our discussion, we can rank all these seven factors according to the share of between group inequalities in the total earnings inequalities. The factor with a

[4]Those candidates of Board and University examinations who have not attended a higher educational institution.

greater share of between groups inequality has a greater impact on earnings inequality. From a comparison of the second tables in each section, it can be observed that "educational level" has the highest share of between group inequalities leading to the conclusion that a salaried individual who has attained a higher level of education will be able to earn more. It is followed by "higher educational expenditures". Then comes "work experience" which is again an important determinant of earnings inequalities. "Basic educational expenditure" is ranked fourth and the "nature of job" is ranked fifth. The "sector of employment" is ranked sixth and "gender" seems to have the least impact on earnings inequalities as the share of between group inequalities in the total inequality is very nominal in its case.

The main policy implications, which can be derived from this paper is that the government should integrate educational planning into wider income inequality reduction strategies. The decomposition of earnings inequality by levels of education shows that inequality "between" levels is more than 60 percent (highest of all the seven categories) followed by higher educational expenditure. This shows that earnings' inequality is quite high between earners who have completed different levels of education and higher educational expenditures are also an important determinant of earning inequality. Thus, if more and more individuals from the disadvantaged sections of the economy are able to obtain good quality basic and higher education then income/earnings inequalities can be reduced significantly. Secondly, "Need" based scholarships and interest free student loans be provided at higher educational levels so as to provide an opportunity to individuals from lower income groups to improve their earnings potentials.

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