NUST JOURNAL OF SOCIAL SCIENCES AND HUMANITIES
Vol.5 No.1 (January-June 2019) pp. 25-42

Earning Inequalities in Pakistan: Is Education the Main Driver?

Muhammad Idrees[*] and Farzana Naheed Khan[†]

Abstract:

The present study is an attempt to explore the role of education in earning inequalities. The analysis is based on two surveys of HIES for 2010-11 and 2015-16. Overall, the earning inequalities in Pakistan and its rural-urban segments are decomposed with respect to the education of the earner. For this purpose, the earners are classified into eight education groups. The results show that significant number of earners are either illiterate or belong to low education groups. Moreover, the level of inequality in general reduces with the increase in education level. Therefore, expansion of higher education can be a source of reducing earning inequality and hence, promoting more fair distribution of income and consumption. However, the study finds that around 20% of earnings inequalities are explained by differences in education in Pakistan. Therefore, the main conclusion of the present study is that contrary to the expectations, education of the earners does not account for much of the inequality among earnings and further studies are needed to analyze this phenomenon.

***Keywords*:** Inequality, Earnings, Education

1. INTRODUCTION

During the past few years, the earning disparities across individuals have been much pronounced and rising trends are found in large number of countries including USA, OECD countries, and India [see for example; Cingano (2014); Dabla-Norris, *et al.* (2015); Piketty and Qian (2009)]. Alongside, the gap between the rich and the poor has been widening. According to Todaro and Smith (2012) these growing income inequalities are at the core of all development problems and actually define the primary objective of development policy. Unfortunately, similar trends for earning inequalities are found in Pakistan. For instance, the average earnings of top 10 percent earners are 45 times

[*] Muhammad Idress <midrees@qau.edu.pk> is Professor, School of Economics, Quaid-i-Azam University, Islamabad.

[†] Farzana Naheed Khan <farzana@qau.edu.pk> is Assistant Professor, School of Economics, Quaid-i-Azam University, Islamabad, Pakistan.

greater than the average earnings of bottom 10 percent earners in 2015-16 and this ratio has increased from 33% to 45% from 2011 to 2016. Table 1 presents the time trends of the ratio of the average earnings of top and bottom earners in Pakistan.

Table 1. Ratio of the Average Earnings of Top and Bottom Earners

Ratio of the Average Earnings	2010-11	2015-16
Top 01% Earners to Bottom 01% Earners	537.7	728.6
Top 10% Earners to Bottom 10% Earners	33.1	44.8
Top 20% Earners to Bottom 20% Earners	13.0	15.1
Top 30% Earners to Bottom 30% Earners	7.6	8.5
Top 30% Earners to Bottom 40% Earners	5.3	5.8
Top 30% Earners to Bottom 50% Earners	4.0	4.3

Source: self-computation from HIES (2010-11 and 2015-16).

The statistics reported in Table 1 show that for all levels the ratio of average earnings is increasing over time indicating that the gap between top and bottom earners is widening. There could be numerous factors behind this phenomenon, among which education of earners could be one of the fundamental factors [see, Bardhan and Udry (1999)]. Improvement in information technology has changed the dynamics of labour market and the options for more educated workers have expanded [see Barro (2001)]. Consequently, the difference between earnings of educated and illiterate has increased with time. Table 2 reports the ratio of average earnings of literate earners relative to average earnings of illiterate earners.

The statistics reported in Table 2 show that on average more educated people earn more and the differential has increased over time. For instance, in 2010-11, the average earning of professional degree holders was 5.2 times greater than the average earnings of illiterates and in 2015-16 it got 6 times greater. It suggests a positive interaction between years of schooling and ability with respect to earnings. It also provides support for the hypothesis that earnings differentials due to educational differences have multiplied over time.

Table 2. Ratio of the Average Earnings of Literate Earners Relative to Average

Education Group	2010-11	2015-16
Illiterates	1.00	1.00
Primary	1.27	1.39
Secondary School Certificate	1.77	1.83
Higher Secondary School Certificate	2.23	2.26
Graduation	2.77	2.89
Post-Graduation or above	3.47	3.89
Professional Degree	5.21	6.00
Technical / Vocational	2.64	2.39

Source: self-computation from HIES (2010-11 and 2015-16).

A large number of studies demonstrated that rate of return to education increases with level of schooling. In this regard, national level studies by Hamdani (1977), Haque (1977), Khan and Irfan (1985), Shabbir (1994), Ashraf and Ashraf (1993), Nasir and Mahmood (1998), Awan and Hussain (2007), Abbas and Peck (2008), Nasir and Iqbal (2009) and Hamid, *et al.* (2013) are important. Generally, the existing literature emphasized on regression analysis to explore the impact of education on earnings. The regression analysis merely focuses on the returns of education and do not explore earning differentials across various education groups. An appropriate approach in this regard can be to decompose earning inequalities with respect to education of earner.[1] These analyses will enable us to understand how earnings are distributed within and between different education groups. In this regard Theil's approach naturally leads to a decomposable structure while in other approaches, decomposability is imposed as an additional requirement [Cowell (2006)].

The basic motivation for this study is to compute Theil inequality index for the assessment of earning inequalities in Pakistan. Herrington (2015) chose Theil index for USA as it can be decomposed into "within" and "between" components while Piraino (2015) reported estimates of

[1] The origin of the modern inequality decomposition literature can be documented with Shorrocks (1980).

Theil inequality index for South Africa for the purpose of international comparison. Therefore, our study contributes to the existing inequality literature and computes Theil inequality index for Pakistan which is considered the most satisfactory measure among the class of generalized entropy indices [Idrees and Ahmad (2017)].

Although a few recent studies are available which computed Theil inequality index for Pakistan and dealt with the contribution of education in earning inequalities but these studies have some major drawbacks. For example, Naschold (2009) provided estimates of Theil inequality index for rural Pakistan. The study considered only rural areas of three provinces of Pakistan (Punjab, Sindh and KP) while it excluded Baluchistan, the most deprived province of Pakistan. Likewise, although Shaheen, *et al*. (2016) provided estimates of Theil inequality index but it restricted the sample to the age group 30-49 years. These data constraints inhibit the provision of better-quality estimates of inequality. Therefore, the next contribution of our study is provision of estimates of income inequality for rural, urban, and overall Pakistan. Moreover, it provides estimates of inequality for all age groups of employed persons.

Furthermore, our study divides education into eight groups while Naschold (2009) considered three levels of education (i.e., primary, middle, and secondary) for explaining determinants of income inequality in Pakistan. Conversely, Piraino (2015) measured education in six categories (i.e. no schooling, primary, lower secondary, upper secondary, matric, and post-secondary) for explaining earnings inequalities for South Africa. Besides, Shaheen, *et al*. (2016) considered only two levels of education (i.e. primary and secondary) for providing estimates of inequality for Pakistan. Unfortunately, all these studies ignored the role of technical (vocational) and professional education in explaining income inequality. Our study attempts to fill this gap in literature and explores the role of technical as well as professional education (along with traditional levels of education) in earning inequalities. In this sense, this study may be considered the most comprehensive study of the relationship between income inequality and education for Pakistan.

The next contribution of our study is that it makes use of recent data set for the provision of estimates of inequality. All other estimates

of inequality are meant for old data set and, therefore, do not depict the true picture of inequality. To the best of our knowledge, it is the only study that utilizes recent data set for the provision of Theil inequality index for Pakistan.

The study investigates the role of education in earning inequalities in Pakistan. Such knowledge is highly relevant to the policy makers as it enables them to assess whether the existing inequalities are due to unchangeable characteristics (i.e., rural/urban region) whose distribution cannot be changed or because of other variables that can be changed through policy intervention, for example, improving access to the education. Therefore, better awareness about the role of education in explaining income inequalities may help them to assess the effectiveness of different policies not only for income inequality but also for educational attainments that indirectly affect inequality.

The importance of studying earning inequalities in the context of Pakistan stems from the fact that Pakistan has HDI ranking as 147 and characterized by rising levels of education inequalities as inequality in education is 44.4% in the country.[2] Hence, the analysis is very much relevant for those policies specifically aimed at making the distribution of income more equitable.

The paper is split into five sections. Section 2 explains the data used in present study. A technical discussion on inequality measures is carried out in Section 3. Results and discussions are presented in Section 4. Finally, Section 5 summarizes the discussion.

2. DATA

The data source of present study is Household Integrated Economic Survey (HIES) conducted by Pakistan Bureau of Statistics, Government of Pakistan. Pakistan Bureau of Statistics initiated these surveys in 1963. Since then surveys are being regularly carried out with a gap of 2 to 3 years. The present study is based on surveys of 2010-11 and 2015-16. These are country representative surveys. The HIES of 2010-11 covered 15,403 households with 25,251 earners and HIES of 2015-16 covered 24,238 households comprising of 38,946 earners. It is

[2] Human Development Report (2015), United Nations Development Programme.

also to mention that unpaid family helpers are not treated as earners as their personal earnings are not recorded and their efforts are reflected in the earnings of that household member with whom they work.

The prime objective of the present study is to explore the role of earner's education in earning inequalities. In this regard, the earners will be divided into following eight education groups:

1. Illiterate (*Earners with less than 5 years of successful education*)
2. Primary (*Earners with 5 or more but less than 10 years of successful education*)
3. Secondary school (*Earners with 10 or more but less than 12 years of successful education*)
4. Higher secondary school (*Earners with 12 or more but less than 14 years of successful education*)
5. Graduation (*Earners with 14 or more but less than 16 years of successful education*)
6. Masters or above (*Earners with 16 years or above in non-professional education*)
7. Professional education (*Earners with degree in LLB, MBBS or Engineering*)
8. Technical/vocational education (*Earners with Diploma, technical certificate, etc.*). [2]

Education increases the productive capacity of an earner and hence his/her earning potential. In this respect education can play a key role in the determination of earning inequality. The decomposition of earning inequality with respect to education of earner will enable us to quantify the role of education in earning differentials.[3]

[2] Technical or vocational education is a specific type of education meant to import specific skills like electrician, motor mechanic, etc. The years of education vary from one type to another. The most popular type involves 10 years of conventional education plus two years of technical / vocational education in polytechnical colleges.

[3] Though education is not the only factor explaining earnings of an individual, factors like assets and ownership are also important. Therefore, this could be one of the limitations of the present study that we considered education only. It is, however, to be noted that for paid employees the most crucial factor is education and about two-third of earners in our data set are paid employees. The data further reveal that more than two-third earners do not hold earning assets.

3. SELECTION OF INEQUALITY MEASURE

There exists a huge literature on the measures of earning inequality [for details see Idrees and Ahmad (2017)]. An inequality measure satisfying certain desirable properties can be regarded as a good inequality measure. These are; i) The Pigou-Dalton transfer principle: It requires that the inequality measure should report decrease in inequality as a result of progressive transfer; ii) Income scale independence: It implies that the value of inequality measure should not change due to proportional changes in the income levels of all income receivers; iii) The population principle: It requires that if any two identical populations are merged then an inequality measure should show no change in inequality; and iv) Decomposability: It requires that measure should be able to relate within groups inequality with overall inequality.

Gini coefficient and Theil entropy measures satisfy these properties in the best possible way. A problem associated with Gini coefficient is that its neat decomposition of overall income inequality into within and between groups inequality is questionable, as it has trans-variation component which has no straight forward interpretation [Dangum (1997)].[4] Therefore, the present study will employ Thiel's two well-known measures that are neatly decomposable.

Theil (1967) presented two measures of inequality, known as Theil First measure and Theil Second measure of income inequality. The formulas of the two measures are given below:

[4] Dagum (1997) has shown that Gini coefficient can be additively decomposed into three components; inequality within the sub groups of population, the net contribution of extended Gini inequality between sub-groups of population, and the contribution of the intensity of trans-variation (overlapping effect) between sub-groups of population. Here the term trans-variation (overlapping effect) refers to the fact that the differences in income across sub-groups considered are of opposite sign than the difference in the mean income of the corresponding sub-groups. Thus, if sub-populations are overlapping, Gini coefficient cannot be neatly decomposed into within and between groups inequality, but at the same time it allows measuring the effect of overlapping on inequality [for details see Idrees and Ahmad (2017)].

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

$$T_2 = \frac{1}{n}\sum_{i=1}^{n}\left[\ln\left(\frac{\overline{Y}}{Y_i}\right)\right] \quad \ldots (2)$$

where, Y_i stands for the earnings of i^{th} individual and $\overline{Y}$ is the mean earning. In case of perfect equality both T_1 and T_2 assumes the value equal to zero. On the other hand, in case of perfect inequality T_1 takes the value equal to $\ln(n)$ and T_2 has no upper limit.

Shorrocks (1980) has given the following decompositions of these measures:

$$T_1 = \underbrace{\sum_{k=1}^{K} s_k . T_1^k}_{T_W} + \underbrace{\sum_{k=1}^{K} s_k \ln\left(\frac{\overline{Y}_k}{\overline{Y}}\right)}_{T_B} \quad \ldots (3)$$

where, s_k is the earning share of k^{th} group? Equation (3) has two terms, the first term measures weighted inequality within each of the k sub-groups and the second term explains inequality between sub-groups, where s_k is taken as the weight.

$$T_2 = \underbrace{\sum_{k=1}^{K} p_k . T_2^k}_{T_W} + \underbrace{\sum_{k=1}^{K} p_k \ln\left(\frac{\overline{Y}}{\overline{Y}_K}\right)}_{T_B} \quad \ldots (4)$$

where, p_k is the population share of k^{th} group. Equation (4) has two terms, the first term describes weighted inequality within each of the k sub-groups and the second term measures inequality between sub-groups, where p_k is taken as the weight.

4. DECOMPOSITION OF EARNINGS INEQUALITY WITH RESPECT TO EDUCATION OF EARNERS

Despite the fact that education has long been recognized as an instrument for economic and social development of a nation [see Schulz (1988)] still, education being a human capital factor plays a significant role in determining the earnings of an individual. Education increases the productivity and efficiency of worker and thus education widens the earning gap. Bardhan and Udry (1999) emphasize that income inequality in poorer countries is essentially the result of lack of attainment of education. In order to analyze the role of education, the present study has decomposed earning inequality with respect to the education of the earner. The analyses are separately conducted for rural, urban, and overall Pakistan, and the results are reported in Table 3.

Table 3 shows that the largest group comprises of illiterate earners and the overwhelming majority of the earners have at most secondary school education; however, during the last five years their share has declined by more than 5%, as in 2010-11, 83.03% earners are either illiterate or at most have secondary school education and this percentage declines to 77.68% in 2015-16. In general, the proportion of earners falls with successively higher levels of education. Another noteworthy characteristic is that over time the proportion of earners with higher levels of education has increased. An important finding of the study is that percentage of illiterate earner has reduced for urban areas for latest data set. It may be because of improvement of education system in urban areas [see, Iftikhar (2016)].

Table 3: Decomposition of Pakistan's Earning Inequality by Education of Earner

	Earning Inequality and Decomposition	2010-11			2015-16		
		Overall	Rural	Urban	Overall	Rural	Urban
Earners' Percentage	Illiterate Earners	43.28%	52.82%	30.36%	37.70%	55.83%	28.79%
	Primary Pass Earners	25.18%	25.65%	24.55%	24.97%	23.89%	25.50%
	Earners with Secondary School Certificate	14.64%	12.16%	18.00%	15.01%	10.57%	17.19%
	Earners with Higher Secondary School Certificate	6.66%	4.20%	9.87%	7.88%	4.35%	9.16%
	Earners with Graduation Degree	5.38%	2.92%	8.73%	6.58%	2.41%	8.63%
	Earners with Post Graduation Degree or above	3.21%	1.47%	5.60%	5.57%	2.16%	7.26%
	Earners with Professional Degree	0.95%	0.17%	20.3%	1.47%	0.26%	2.06%
	Earners with Vocational or Technical education	0.70%	0.61%	0.85%	0.82%	0.52%	0.97%
Earning Shares	Illiterate Earners	29.09%	41.77%	17.41%	22.27%	40.86%	16.94%
	Primary Pass Earners	21.46%	25.35%	17.90%	20.56%	25.20%	19.23%
	Earners with Secondary School Certificate	17.37%	16.00%	18.64%	16.25%	14.54%	16.74%
	Earners with Higher Secondary School Certificate	9.90%	6.97%	12.62%	10.52%	6.85%	11.57%
	Earners with Graduation Degree	10.12%	5.24%	14.41%	11.23%	5.43%	12.89%
	Earners with Post Graduation Degree or above	7.49%	3.32%	11.34%	12.81%	5.45%	14.92%
	Earners with Professional Degree	3.36%	0.58%	5.95%	5.19%	0.94%	6.41%
	Earners with Vocational or Technical education	1.21%	0.77%	1.73%	1.16%	0.72%	1.29%
Mean Earning Relative to Grand Mean	Illiterate Earners	0.672	0.791	0.573	0.591	0.732	0.589
	Primary Pass Earners	0.853	0.988	0.729	0.824	1.055	0.754
	Earners with Secondary School Certificate	1.186	1.315	1.035	1.083	1.375	0.974
	Earners with Higher Secondary School Certificate	1.500	1.661	1.278	1.335	1.574	1.204
	Earners with Graduation Degree	1.859	1.795	1.650	1.706	2.249	1.494
	Earners with Post Graduation Degree or above	2.327	2.268	2.025	2.298	2.527	2.057
	Earners with Professional Degree	3.505	3.357	2.925	3.543	3.561	3.118
	Earners with Vocational or Technical education	1.784	1.257	2.042	1.413	1.377	1.329
	Theil's First Measure	0.408	0.353	0.422	0.440	0.394	0.418
Within group inequality	Inequality within Illiterate Earners	0.294	0.316	0.243	0.342	0.367	0.303
	Inequality within Primary Pass Earners	0.305	0.319	0.284	0.281	0.302	0.267
	Inequality within Earners with Secondary School Certificate	0.342	0.320	0.354	0.276	0.281	0.271
	Inequality within Earners with Higher Secondary School	0.392	0.344	0.415	0.444	0.278	0.467
	Inequality within Earners with Graduation Degree	0.335	0.208	0.366	0.296	0.334	0.290
	Inequality within Earners with Post Graduation Degree or	0.242	0.204	0.244	0.302	0.214	0.305
	Inequality within Earners with Professional Degree	0.187	0.147	0.188	0.321	0.337	0.317
	Inequality within Earners with Vocational or Technical	0.425	0.209	0.393	0.323	0.411	0.289

Continued on next page

(Continued) Table 3: Decomposition of Pakistan's Earning Inequality by Education of Earner

	Earning Inequality & Decomposition	2010-11			2015-16		
		Overall	Rural	Urban	Overall	Rural	Urban
Decomposition: Contribution to overall inequality	Inequality within Illiterate Earners	20.98%	37.41%	10.30%	17.28%	38.02%	12.28%
	Inequality within Primary Pass Earners	16.05%	22.93%	12.03%	13.13%	19.31%	12.31%
	Inequality within Earners with Secondary School Certificate	14.56%	14.49%	15.64%	10.19%	10.39%	10.85%
	Inequality within Earners with Higher Secondary School Certificate	9.53%	6.78%	12.38%	10.61%	4.84%	12.92%
	Inequality within Earners with Graduation Degree	8.24%	3.08%	12.49%	7.54%	4.60%	8.95%
	Inequality within Earners with Post Graduation Degree or above	4.44%	1.92%	6.54%	8.78%	2.96%	10.90%
	Inequality within Earners with Professional Degree	1.55%	0.24%	2.65%	3.79%	0.81%	4.86%
	Inequality within Earners with Vocational or Technical education	1.33%	0.46%	1.61%	0.85%	0.75%	0.89%
	Inequality within all Groups	76.68%	87.31%	73.37%	72.18%	81.67%	73.95%
	Inequality between all Groups	23.32%	12.69%	26.63%	27.28%	18.33%	26.05%
	Theil's Second Measure	0.422	0.393	0.417	0.467	0.476	0.418
Within group inequality	Inequality within Illiterate Earners	0.366	0.402	0.282	0.437	0.486	0.364
	Inequality within Primary Pass Earners	0.308	0.308	0.307	0.310	0.335	0.293
	Inequality within Earners with Secondary School Certificate	0.316	0.303	0.323	0.283	0.297	0.274
	Inequality within Earners with Higher Secondary School Certificate	0.357	0.308	0.383	0.369	0.304	0.377
	Inequality within Earners with Graduation Degree	0.341	0.237	0.375	0.304	0.321	0.301
	Inequality within Earners with Post Graduation Degree or above	0.276	0.256	0.273	0.306	0.261	0.306
	Inequality within Earners with Professional Degree	0.203	0.180	0.202	0.303	0.370	0.295
	Inequality within Earners with Vocational or Technical education	0.412	0.216	0.422	0.359	0.404	0.323

Decomposition: Contribution to overall inequality	Inequality within Illiterate Earners	37.60%	54.00%	20.49%	35.22%	57.05%	25.05%
	Inequality within Primary Pass Earners	18.41%	20.09%	18.08%	16.58%	16.79%	17.85%
	Inequality within Earners with Secondary School Certificate	10.97%	9.37%	13.94%	9.08%	6.60%	11.26%
	Inequality within Earners with Higher Secondary School Certificate	5.59%	3.29%	9.05%	6.22%	2.78%	8.67%
	Inequality within Earners with Graduation Degree	4.35%	1.76%	7.84%	4.28%	1.63%	6.21%
	Inequality within Earners with Post Graduation Degree or above	2.10%	0.95%	3.67%	3.65%	1.18%	5.31%
	Inequality within Earners with Professional Degree	0.46%	0.08%	0.99%	0.95%	0.21%	1.45%
	Inequality within Earners with Vocational or Technical education	0.70%	0.34%	0.86%	0.63%	0.44%	0.75%
	Inequality within all Groups	80.20%	89.87%	74.90%	76.62%	86.68	76.54%
	Inequality between all Groups	19.80%	10.13%	25.10%	23.38%	13.32%	23.46%

The proportion of earnings generally declines with the successively higher levels of education but not as fast as the proportion of the population. The reason is that, although the average earning increases with the level of education, but this increase is not enough to offset the declining share of the population. The categories of illiterate and primary are the only two in which the share of earnings is consistently less than its population share. Almost matching findings are also available for rural as well as urban areas for both data sets. On the other extreme, the categories of post-graduation & above and professional degree holders are the only two categories in which the earning shares are consistently more than twice the population shares. The table also provides similar evidence for rural and urban areas of Pakistan for higher education groups.

The results show that the level of inequality substantially varies across different groups. It seems to be on higher side for low income groups and technical/vocational education. The reason is that among the low education groups there are no specified jobs and they can work as unskilled and low paid workers or as independent businessmen. Earning rates of the persons with technical/vocational education also vary considerately depending on whether they become self-employed or work for others. Comparison made over time reveals that earning inequality had increased within illiterate earners and decreased for low education groups. Illiterate earners are mostly engaged in agriculture, livestock, construction, transportation, cleaning, and household services. Due to technological advancement and modernization of agriculture the average earnings of people involved in agriculture and livestock may have shown significant increase as compared to earnings of people involved in household and other low cadre services such as cleaning, masonry, and unskilled work. Consequently, the earning inequality has increased within illiterate earners and it is more prominent for rural areas.

Most interestingly, earning inequality has increased among professional degree holders and highly qualified earners as well. It indicates that over time opportunities became more uneven for highly qualified earners. These findings imply that education may have a positive impact upon within group wage inequality, as spread of returns widens for higher educational levels. These findings are consistent with

the findings of Sarwar, *et al*. (2013) that education promotes within group earning inequality. Some possible explanations are given by Martinsa and Pereira (2004) that factors such as over education, school quality, and different fields of study may be driving such a result.

According to the decomposition results the substantial part of overall earning inequality is explained by inequality within the various education categories. In this regard both measures reported that more than 70% of overall earning inequalities are explained by inequalities within groups. Theil Second Measure (T_2) marked this share around 75%. This difference is due to the weighing scheme of these measures. T_1 takes earning share as the weight and T_2 takes earners share as the weight. This indicates that share of inequality within groups is suppressed when earnings are taken as weight instead of earners.

The contribution of inequality within the categories of earners who are illiterate or have primary-level education is the highest; irrespective the weights are earners shares or earnings shares. The lowest share is that of the categories of earners having technical, professional, post graduate or higher degrees. This is obviously due to the low proportion of earners belong to these groups and their share in total earnings is also insignificant.

It is to be noted that over time the weighted share of inequality within groups declined in rural areas and slightly increased in urban areas. This indicates that between groups inequality is strengthening in rural areas and weakening in urban areas. The findings indicate that in Pakistan differences in education across earners explain only 25% earning inequalities in urban areas and below 20% in rural areas. Piraino (2015) also highlights that a limited set of inherited circumstances explain a significant fraction of South Africa's earnings inequality. While, Herrington (2015) finds public education and tax policies as a possible source of large differences in earnings inequality. Moreover, factors like gender, age, occupation, region, and industry may be more dominant in explaining earning differentials in Pakistan.

5. CONCLUSION

The present study decomposed earning inequality in Pakistan, its rural and urban segments with respect to the education of earner. In this regard earners were classified in eight education groups. We found that in general inequality decreases with the increase in education, for instance earning inequalities are lowest among highest education groups and highest among illiterates or vocational education group. This indicates that expansion of higher education can reduce earning inequalities. Therefore, spread of education can be an effective tool in reducing earning inequality and hence promoting more equal distribution of earnings. However, this policy implication needs to be considered with certain cautions as our study finds that only 20% of earning inequalities are explained by differences in education in Pakistan. It also suggests that difference in education of earners does not account for much of the inequality among earnings in Pakistan and therefore further studies are needed to analyze this phenomenon.

REFERENCES

Abbas, Q. and J. F. Peck (2008) The Mincer Human Capital Model in Pakistan: Implications for Education Policy. *South Asia Economic Journal*, 9:2, 435-462.

Ahmad, M. (2000) Estimation and Distribution of Income in Pakistan, Using Micro Data. *The Pakistan Development Review*, 39:4, 807-824.

Anwar, T. (2003) Trends in Inequality in Pakistan between 1998-99 and 2001-02. *The Pakistan Development Review*, 42:4, 809-821.

Ashraf, J. and B. Ashraf (1993) An Analysis of the Male-Female Earning Differential in Pakistan. *The Pakistan Development Review*, 32:4, 895-904.

Awan, M. S. and Z. Hussain (2007) Returns to Education and Gender Differentials in Wages in Pakistan. *The Lahore Journal of Economics*, 12:2, 49-68.

Bardhan, P. and C. Udry (1999) *Development Microeconomics*, Oxford University Press, New York.

Barro, R. J. (2001) Human Capital and Growth. *The American Economic Review*, 91:2, 12-17.

Cingano, F. (2014) Trends in Income Inequality and its Impact on Economic Growth, OECD Social, Employment and Migration Working Papers, No. 163. OECD Publishing, Paris. http://dx.doi.org/10.1787/5jxrjncwxv6j-en.

Cowell, F. (2006) Theil, Inequality Indices and Decomposition. *Research on Economic Inequality*, 13, 345-360.

Dabla-Norris, N., Kochhar, N., Ricka, F., Suphaphiphat, N., and E. Tsounta (2015) Causes and Consequences of Income Inequality: A Global Perspective, IMF Staff Discussion Note, SDN-15/13.

Dangum, C. (1997) A New Approach to the Decomposition of Gini Income Inequality Ratio. *Empirical Economics*, 22, 515-531.

Hamdani, K. A. (1977) Education and the Income Differential: An Estimation for Rawalpindi City. *The Pakistan Development Review*, 144-164.

Hamid, A., Akram, N., and M. Shafiq (2013) Inter and Intra Provincial Educational Disparities in Pakistan. *Pakistan Journal of Social Sciences*, 33:2, 447-462.

Haque, N. (1977) An Economic Analysis of Personal Earnings in Rawalpindi City. *The Pakistan Development Review*, 4, 353-382.

Herrington, C. (2015) Public Education Financing, Earning Inequality and Intergenerational Mobility. *Review of Economic Dynamics*, 18:4, 822-842.

Human Development Report (2015) United Nations Development Programme, New York, USA.

Idrees M. and A. Eatzaz (2017) Measurement of Income Inequality-A Survey. *Forman Journal of Economic Studies*, 13, 1-32.

Iftikhar, A. (2016) Assessing the Effects of Fiscal Decentralization on the Education Sector: A Cross-Country Analysis. *The Lahore Journal of Economics*, 21:2, 53-96.

Khan, S. R. and M. Irfan (1985) Rates of Returns to Education and the Determinants of Earnings in Pakistan. *The Pakistan Development Review*, 26:3, 4, 671-683.

Malik, S. (1992) Rural Poverty in Pakistan: Some Recent Evidence. *The Pakistan Development Review*, 31:4, 975-995.

Martinsa, P.S. and P. T. Pereira (2004) Does Education Reduce Wage Inequality? Quintile Regression Evidence from 16 Countries. *Labor Economics*, 11, 355- 371.

Naschold, F. (2009) Microeconomic Determinants of Income Inequality in Rural Pakistan. *The Journal of Development Studies*, 45:5, 746-768.

Nasir, Z. M. and N. Iqbal (2009) Employers Size Wage Differential: Does Investment in Human Capital Matter? *The Pakistan Development Review*, 48:4, 509-521.

Nasir, Z. M. and R. Mahmood (1998) Personal Earnings Inequality in Pakistan: Findings from the HIES 1993-94. *The Pakistan Development Review*, 37:4, 781-792.

Patrizio P. (2015) Intergenerational Earnings Mobility and Equality of Opportunity in South Africa. *World Development*, 67: C, 396-405.

Piketty, T. and N. Qian (2009) Income Inequality and Progressive Income Taxation in China and India, 1986-2015. *American Economic Journal*: *Applied Economics*, 1:2, 53-63.

Sarwar, G., Sial, M., and T. Abbas (2013) Returns to Education and Earning Inequality Nexus: A Micro econometric Analysis for Pakistan. *World Applied Sciences Journal*, 24:7, 885-888.

Schultz, T.W. (1988) On Investing in Specialized Human Capital to Attain Increasing Returns. *The State of Development Economics: Progress and Perspectives*, edited by G. Ranis and T. Paul Schultz. Oxford: Basil Blackwell, 339-52.

Shabbir, T. (1994) Mincerian Earning Function for Pakistan. *The Pakistan Development Review*, 33:1, 1-18.

Shaheen, S., Awan, M., and A. Cheema (2016) Measuring Inequality of Opportunity in Pakistan: Parametric and Non-Parametric Analysis. *Pakistan Economic and Social Review*, 54:2, 165-190.

Shorrocks, A. F. (1980) The Class of Additively Decomposable Inequality. *Econometrica*, 48:3, 613-625.

Theil, H. (1967) *Economics and Information Theory*. Amsterdam: North Holland.

Todaro, M.P. and S.C. Smith (2012) *Economic Development*, Eleventh edition, Addison- Wesley, United Kingdom.

World Bank (2003) *Poverty in Pakistan: Vulnerabilities, Social Gaps, and Rural Dynamics*. World Bank, Washington, D.C.