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Income Inequalities among Earners Engaged in Selected Occupations and Professions in Pakistan

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Abstract *The current study investigates income inequalities among earners engaged in different occupations and professions in Pakistan using HIES data for 2010-11 and 2015-16, focusing on their yearly income. Income equation and differences of income between subgroups of the population are estimated by using the OLS method. The generalized Entropy (GE) Class method is employed to evaluate the contribution of different subgroups of household characteristics and different income sources in overall inequality. The regression-based decomposition method is used to assess decompose changes in income inequality by various socio-economic factors. OLS estimates conclude that all variables play a significant role in explaining the differences in income. All indices of GE method indicate that inequality within the group is a greater problem than inequality experiences between groups. The decomposition method shows a positive sign of inequality decomposition for most household characteristics and income sources which depicts that these determinants have greatly contributed to overall income inequality.*

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Introduction

The economic performance of a country and the living standards of people are very much dependent upon the channel through which income is distributed in the economy. This distribution process has divided the economies into different subgroups according to income generation levels. Some segments of the population benefited more than the other segments, as Organization for Economic Co-operation and Development (OECD) explains that income inequality has always existed. Still, the growing concern is due to the gap between the rich and the poor of the world growing even larger, which is one of the main reasons for the poor economic growth of the countries (OECD, 2011). The share of national income going to the richest one percent has increased rapidly in most parts of the world since 1980. It is worth wise to note that the one percent captured double

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income growth as much as the bottom half of the global population from 1980 to 2016 (IPS, 2019).

The economic performance of Pakistan has been badly affected by the disparity in households' income distribution since the 1990s. Households belonging to the highest income level in the country earn three times more average income as compared to the lowest income earner. This situation is further aggravated by an uneven and wider distribution of income in urban areas (PBS, 2016). Pakistan being a developing country, has to undergo different stages of economic growth. According to the World Bank (2017) average annual growth rate of Pakistan from 1961 to 2016 was 5.17 percent. However, it remained at 3.88 percent between 2010 to 2016 due to different national and international crises, especially unfavorable balance of payment pressure. As a result of this slow growth process, many socio-economic problems like slow economic performance, widespread poverty, hunger, ill-health, social and political instability have emerged. This difference in the distribution of income has affected the living pattern, daily social interaction, mental and physical capabilities of people.

Moreover, differences of regions, nature of job status, and choice of occupation, experience, and education have structurally divided the population into different segments. Overall income inequality also appears due to variations in mean wages between occupations, as incomes rise for some occupations and fall for some occupations. Education level, return to education, and gender is some factors that affect occupation inequality. Differences in income and wages are also observed between individuals of the same occupations and professions, as some professions such as management and sales are heterogeneous while some occupations such as medicine, law, teaching, engineering, and nursing are homogenous, so inequality grows within occupations.

Financial institutes also showed their concern that increasing the trend of inequalities at a global level would result in a high risk of economic & political crises and underutilization of human capital leading to hampering economic growth and stability (SDN, 2015). The importance of root cause of these problems has been recognized at United Nations, where goal 10 of Sustainable Development Goals (SDGs) is exclusively dedicated objective along with other related goals such as the first five goals and goal 8 (decent work and economic growth) and goal 9 (Industry, Innovation, and Infrastructure) for the nations to reduce income inequality by 2030 under Sustainable Development Goals program.

Different scholars have analyzed income inequality among occupations in Pakistan, compared disparities between them, and presented strategies to reduce income inequalities using HIES and PSLM data. These researchers used the Gini Coefficient Index, Theil-T index, and regression-based decomposition measure of inequality in various components. The present study focuses on the yearly income of the earning members of a household, concerns on the contribution of each source, and differences in the synthesis of household income which is missing in the literature. This current research has covered this gap.

Literature Review

To explain income distribution, disparities of the income distribution and analyze the effects of macroeconomic variables, studies used regression analysis on time series data mostly with the help of the Gini coefficient. While household survey data was employed to determine inequality at the micro-level using decomposition techniques which include

decomposition by population group and observed how various factors affected overall inequality within sub-group and between sub-groups. Decomposition by factor components was employed to analyze how various income sources affect total income inequality.

Scholars around the world have revealed a mixed trend of between-occupations and within-occupation income inequalities among earners engaged in different occupations. Between occupations, income inequalities were found by scholars like Goos & Manning (2007) in Great Britain and Mouw & Kalleberg, (2010) in the USA. Within-occupational income disparities in the USA were assessed by Sørensen (2000) and Kim & Sakamoto (2008), while Helpman *et al.* (2017) also found within occupation income inequality in Brazil. Some studies found a mixed trend of within and between occupational income inequalities like Williams (2012) in the United Kingdom, Xie, Killewald & Near (2016) in the USA, and Helland *et al.* (2017) in Norway. Bayar (2016) found regional income inequality according to household characteristics in Turkey.

For Pakistan, an analysis of disparities of income distribution has been conducted by various scholars. Kruijk (1987) revealed within occupational group wage dispersion by the income of labor and income from other sources (remittances). A higher level of inequality among skilled workers and a lower level of inequality among professionals than overall inequality in Pakistan was found by Ahmad (2002). Kemal (2003) observed the highest level of Gini coefficient amongst the skilled workers, legislators, senior officials, managers, and unskilled workers while the lowest Gini coefficient amongst professional groups. Akhtar and Sadiq (2008) found short-term and long-term trends rising earnings disparities within each occupational category. Naseer and Athar (2016) examined those factors that determine the level of income inequality in Pakistan and concluded that share of age in income inequality was height among all occupations followed by a share of gender, education, and professional categories of occupation was found in inequality (Gini index).

Theoretical Framework

Analysis of this study is based on the theoretical framework of Becker (1994) in a human capital model, which states that investment in the human capital increases the productivity of an individual through education and skills. So, individuals invest in human capital to enhance productivity and hence increase their income and wages. The following equation presents the human capital model: $-lnY_i = \alpha + X_j\beta_j + \varepsilon_i$

Where lnY is a log of a yearly income of household members i, X_j represents row matrix of characteristics that determine and affect the income of individuals such as region / province, gender, age, education level, job status, and occupation, and ε_i is the error term.

Several techniques are used to measure disparities of income among the population of a society. Most widely adopted techniques include Gini coefficient and Lorenz Curve, Gini coefficient and Atkinson index, coefficient variation of earnings, Generalized Entropy Class of inequality including Theil Indices, and decomposition measures of inequality. To compare disparities in income across regions, Shorrocks (1982) decomposed total inequality into sub-components and determined the contribution of each of subcomponents with the help of the following equation: $-Y_i = \sum_j^n Y_i^k$ (1)

Where Y^k is the sum of component incomes obtained from K sources, n

denotes the total number of income recipients. This equation also gives an analysis of total income inequality, which is estimated by inequality measure (labour income, capital income, or transfer income). Later on, Fields (2003) extended Shorrocks (1982) model on income-generating function as:- $lnY_i = \alpha' Z_i$ (2)

lnY is a log of the gross income of household$_i$, α' represents regression coefficients, and Z_i is the matrix of independent variables which represents household characteristics.

Following Shorrocks (1980) Generalized Entropy class of indicators [GE(α)] consisting of Theil indices including two entropy formulae was presented by Theil (1967) to decompose and observe which of the different household characteristics or income sources is responsible for the overall level of inequality and uses Gini coefficient to examine the effect of these factors on change in inequality. The general formula for generalized entropy class of inequality differences is: $-GE(\alpha) = \frac{1}{\alpha(\alpha-1)}\left[\frac{1}{N}\sum_{i=1}^{N}\left(\frac{y}{\bar{y}}\right)^{\alpha} - 1\right]$ (3)

Where $\bar{y}$ is the mean income. The value of GE varies between 0 and ∞, in which 0 shows equal distribution whereas high values give higher inequality levels.

This study uses the OLS method to estimate the income equation, adopts regression-based decomposition proposed by Fields (2003) to investigate income differences between population subgroups. To assess the contribution of different subgroups of household characteristics and different sources of income in overall inequality, the study decomposes household characteristics and sources of income into "between-group" and "within-group" inequality. This study also employs GE(α) consisting of Theil indices including two entropy formulae presented by Theil (1967) to decompose and observe which of the different household characteristics or income sources is responsible for the overall level of inequality and uses Gini coefficient to examine the effect of these factors on the change in inequality.

Data, Methodology And Model Specifications

This study is based on disaggregate micro-level data and accounts for inequality at the household member level and not on the entire household to determine factors that are responsible for bringing income inequality and make changes in inequality. The study not only emphasizes average yearly income but also concerns the contribution of each source and differences in the synthesis of household income. The study presents results at the aggregate and sub-level of household characteristics and income sources to estimate the contribution of specific characteristics/sources to the increase in inequality.

Data and Sampling

The present study employs micro data sets of Household Integrated Economic Survey (HIES) separately for the years 2010-11 and 2015-16 conducted by the Pakistan Bureau of Statistics (PBS), Government of Pakistan. The study uses data set of 23,662 household members from HIES (2011) and 36,407 household members from HIES (2016) to estimate income inequality among earners actively engaged in different occupations and professions in Pakistan, focusing on their yearly income. The study includes only that income that has been earned by individuals engaged in different occupations (primary occupation only) and excludes other kinds/sources of income like earning from secondary occupations, remittance, pensions, financial assistance, and scholarships. Moreover, the role of

different levels of education, experience, nature of the job, gender, and provinces differences has also been studied at the subgroup population level with the help of decomposition analysis.

Model Specification

The following regression equation is being used for the main analysis:

$$\ln Y_i = \beta_0 + \beta_1 gend_i + \beta_2\ age_i + \beta_3 age_i^2 + \beta_4 priedu_i + \beta_5\ secedu_i + \beta_6 interedu_i + \beta_7 profedu_i + \beta_8 occu_{i1} + \beta_9 occu_{i2} + \beta_{10} occu_{i4} + \beta_{11} occu_{i5} + \beta_{12} occu_{i6} + \beta_{13} occu_{i7} + \beta_{14}\ punj_i + \beta_{15} kp_i + \beta_{16} balochist_i + \beta_{17} paidemp_i + \beta_{18} culti_i + \varepsilon_i \quad (1)$$

$\ln Y_i$ represents the yearly earnings of an individual "i". The explanatory variables represent individual characteristics, β_0 represents intercept term, β_2 & β_3, are coefficients of the continuous variables, and β_1, β_4… β_{18} are the coefficients of the dummy variables.

Variables Description

This study takes the yearly income of the earners as the dependent variable, which consists of wages and salaries from employment and earnings from self-employment/being employed or engaged in any sort of economic activity. The study takes the log of yearly incomes to determine the effect of relative changes in explanatory variables. Table-4.3 below shows a brief description of dependent and explanatory variables.

Table 1. Variables Description

Variable Code	Variable Description	Definition
lnY	Yearly Income	Logarithm of a yearly income of an individual
$gend_i$	Gender of respondent *i*	Female is the base category $gend_i$ = 1 if respondent *i* is male, 0 otherwise.
	Proxy for the experience.	Interprets effects of two age coefficients together.
age_i	Age of the individual i	The continuous variable takes proxy for experience
age_i^2	Square of the age	Continuous variable
	Education of individual *i* (in the year of schooling).	No education as base category. $priedu_i$ = 1 if education level>0 and education level<=5, 0 otherwise.
$priedu_i$	Primary Education	$secedu_i$ = 1 if education level> 5 and education level<=10, 0 otherwise.
$secedu_i$	Secondary Education	$interedu_i$ = 1 if education level>10 & education level<=12, 0 otherwise.
$interedu_i$	Intermediate Education	$profedu_i$=1 if education level>12, 0 otherwise.
$profedu_i$	Professional Education	

Variable Code	Variable Description	Definition
	Occupation of individual *i* Occupation 3 (base)	Clerk / Service Workers / Shop and Market Sales Workers as base category.
$occu_{i1}$	Occupation 1	$occu_{i1}$=1 if occupation of individual is Legislators/ Senior Professionals, 0 otherwise.
$occu_{i2}$	Occupation 2	$occu_{i2}$=1 if the occupation of individual is Professionals, Managers / Technicians / Associate Professionals, 0 otherwise.
$occu_{i4}$	Occupation 4	$occu_{i4}$=1 if the occupation of the individual is Skilled Agricultural &Fishery Workers, 0 otherwise.
$occu_{i5}$	Occupation 5	$occu_{i5}$=1 if the occupation of individual is Craft and Related Trades Workers, 0 otherwise.
$occu_{i6}$	Occupation 6	$occu_{i6}$=1 if the occupation of individual is Plant/ Machine Operator &Assembler, 0 otherwise.
$occu_{i7}$	Occupation 7	$occu_{i7}$=1 if the individual is associated in Elementary Occupations, 0 otherwise.
	Province of individual i Punjab	Sindh as base category. $punj_i$=1 if lives in Punjab, 0 otherwise.
$punj_i$ *KPI* $Balochist_{an}$	Khyber Pakhtunkhwa Baluchistan	kp_i=1 if individual lives in KP, 0 otherwise. $balochist_i$=1 if lives in Baluchistan, 0 otherwise.
	Job Status of individual *I* Paid Employees	Employers, Self Employed as base category. $paidemp_i$=1 if paid employee, 0 otherwise.
$paidemp_i$ $culti_i$	Cultivators, Share Croppers, and Livestock	$culti_i$=1 if individual is Cultivators / Share Croppers / Livestock, 0 otherwise.

Results And Discussion

The study analyzes the overall level of income inequality in Pakistan, determinants of income among household members, and their contribution towards income inequality.

Estimation of Determinants of Income among Earners

Results of the estimated coefficients along with t values in parenthesis are given in Table-5.1 for both study periods.

Table 2. Earnings Equation Results, 2010 and 2015

Variables	2015		2010	
	Coef.	p>t	Coef.	p>t
Gender (female as a base) Male	1.321*** (118.69)	0.000	1.122*** (73.48)	0.000
Age	0.085*** (27.02)	0.000	0.082*** (21.07)	0.000
Age Square	-0.001*** (-24.42)	0.000	-0.0008*** (-19.30)	0.000
Education (No education as a base) Primary	0.238*** (24.72)	0.000	0.154*** (13.60)	0.000
Secondary	0.400*** (35.11)	0.000	0.373*** (25.60)	0.000
Intermediate	0.546*** (35.78)	0.000	0.519*** (25.74)	0.000
Professional	0.925*** (64.05)	0.000	0.837*** (42.72)	0.000
Occupations (Clerks, Service base) Legislators, Senior Professionals	0.747*** (28.15)	0.000	0.666*** (18.21)	0.000
Professionals, Managers	0.269*** (21.14)	0.000	0.301*** (15.97)	0.000
Skilled Agricultural& Fishery	-0.168*** (-4.35)	0.000	-0.263*** (-6.59)	0.000
Craft and Related Trades	-0.153*** (-13.08)	0.000	-0.042** (-2.34)	0.000
Plant Operators & Assemblers	0.081*** (3.11)	0.001	0.060*** (3.09)	0.001
Elementary Occupations	-0.148*** (-13.90)	0.000	-0.164*** (-11.6)	0.000
Job Status (Employers, Self Emp as base) Paid Employees	-0.328*** (-32.39)	0.000	-0.379*** (-27.34)	0.000
Cultivators, Share Croppers, Livestock	-0.245*** (-6.08)	0.000	-0.015*** (-0.37)	0.000
Province (Sindh as base) Punjab	0.079*** (7.37)	0.000	0.047*** (3.63)	0.000
KP	0.016* (1.81)	0.070	0.116*** (8.26)	0.000
Baluchistan	0.157*** (12.11)	0.000	0.341*** (21.11)	0.000
Constant	8.827*** (177.58)	0.000	8.568*** (136.90)	0.000
Mean Dependent Variable	11.822		11.292	
Number of Observations	36407		23662	
R-Squared	0.551		0.464	
F-test	1942.487		889.122	
*** p<0.01, ** p<0.05, * p<0.1	Prob> F		0.000	

Source: Author's own calculation from HIES (2011 & 2016).

The study estimates equation 1 above by using OLS method to establish determinants of income using human and non-human capital variables. Significant level (***) for analysis of the year 2010-11 shows that estimated coefficients (βs) of all the variables are significant at 1 percent level (***) except occupation craft and related trades which is significant at 5 percent level (**). Estimated coefficients of all the variables for the year 2015-16 are significant at 1 percent level except province KP which is significant at 10 percent significant level (*). All the variables are strongly significant, as shown by values of P>t, and estimated values of p are also in accordance with the asterisk signs (Table 5.1). Values of R^2 estimated coefficients to be 0.551 for the year 2015 and 0.464 for the year 2010, which indicates that the independent variables can explain 46 to 55 percent of variation in the dependent variable.

Regression Analysis

Estimation results revealed that the signs of coefficients of explanatory variables for the year 2015-16 are the same as signs of coefficients of independent variables in the year 2010-11, which depicts the same impact on the yearly income of workers with each unit increase. Negative signs of variables named skilled agricultural, crafts & associated professions, elementary profession, paid employees, and cultivators show their negative impact on the yearly income of the individual. Whereas positive signs of other explanatory variables depict positive association with the dependent variable. The estimated results for the regression equation for the year 2010-11 and 2015-16 are elaborated in succeeding paragraphs.

Gender

The study takes female as a base category for gender, and a sign of the coefficient is positive, which indicates that males earn more than female members. The difference in the coefficient of gender is highest as compared to other variables (Table-5.2). With each unit increase of labor force participation, yearly income of male workers increases by 1.122 units in 2010-11 and 1.321 units in 2015-16, which yields that difference of income earned by male increases in 2015-16 than 2010-11. However, number of female workers increases during study period of 2010-11 to 2015-16, the same increasing trend of female workers was also observed by Naseer and Athar (2016) during study period of 2005 ~ 2010.

Age

Study uses variable age as proxy of experience gained by the individuals. To see the effect of this variable, the study interprets the effects of two age coefficients together that is age (show non-linear relationship with yearly income) and square of age in regression model. With each year's growth of age, earners gain more and more experience, which in turns increases their income as estimated values depict that the yearly income of workers increases by 0.082 units in 2010-11 and 0.085 units in 2015-16. In both study periods, sign of age appears as positive and sign of age square as negative which imply as age of earners increases income also increases but at a decreasing rate. Signs of both the variables are following postulate of Human Capital Theory which requires that income increases with age but at decreasing rate. The same trend was also observed by Ahmed (2002), Naseer and Athar (2016).

Education

Five categories of educational level are taken with variable no education as base category. The coefficient of education is

positive and highly significant for both study periods, which implies that income of individuals increases with the rise in education level (table-2). Moreover, a difference of coefficient of professional education to base category for both study periods is more than other categories, the reason is that individuals having higher level of education have more knowledge and skills and have more opportunities of income generation, so this category has a higher value of differential. The difference in coefficient value between primary education and base category is less because persons with a low level of education have limited opportunities for income generation as compared to other categories. However, the percentage difference in incomes declines in 2015-16 as compared to 2010-11 which states that return to education declines over time (follow Psacharopoulos, 1994 conclusion), and the same pattern was also observed by Ahmed (2002), Ali & Akhtar (2014) and Naseer & Athar (2016).

Occupation / Profession

To see income differential due to occupation, this study divides occupations into seven categories, and clerical / market sales category is taken as the base category. Household members belong to three categories (legislators/senior professionals, professional/manager technicians, and plant/machine operators) earn more than clerk/market sales earners as shown by positive and highly significant sign in both study periods at a 99 percent confidence level (Table-5.2). The reason is that highly educated and more skilled persons are engaged in these occupations as compared to base category persons. On the other hand, the negative sign of the coefficients (agriculture/fishery, craft/related trades, and elementary occupations) implies that individuals engaged in these occupations earn less than base category. The reason is that low-income household members having less education and skills are employed in these occupations, there is an absence of minimum wage laws in the country, and these persons have to face losses during harvesting. The same trend was also observed by Ahmed (2002), Ali (2013), Ali & Akhtar (2014), and Naseer & Athar (2016).

Job Status

The study introduces three categories for job status variable, namely paid employees and cultivators/sharecroppers/livestock with employers/self-employed as base category. It appears that employers/self-employed persons earn more than individuals of the other two categories as depicted from negative signs of both the variables in both study periods. The reason is that employers/self-employed and cultivators/sharecroppers/livestock individuals run their businesses and earn more profits as compared to fixed income of paid employees; however, cultivators/sharecroppers/livestock face seasonal losses, so their income is less than the employees/self-employed persons. The results are consistent with previous research conducted by Ahmed (2002) and Naseer & Athar (2016).

Region

There are four provinces of Pakistan, and this study takes Sindh as a base category. Signs of coefficients for Punjab, KP & Baluchistan are positive and significant for both study periods which show that the income of earners belonging to these provinces is more than the income of individuals belonging to Sindh. Although it is thought that people from Baluchistan are low-paid and there might be a high

level of poverty, results of estimations show that the income of household members belonging to Baluchistan is higher than people living in other provinces of Pakistan. The prime reasons are social rigidity due to which only relevant employment resources are available, and income within occupations remain almost alike as well as observes lesser differences between rural and urban living standards / style in most parts of Baluchistan. Moreover, the collection of data from most parts of Baluchistan is difficult as compared to other parts of the country, as also evident from lesser number of households enumerated in HIES and PSLM official data. The results are inconsistent with the previous study conducted by Naseer and Athar (2016), which estimated signs of Punjab & KP as negative and Baluchistan as positive. The reason for the difference in results may also be that literate persons are paid more to attract them for work in these provinces.

Inequality Decomposition by Sub Groups of household members

To calculate overall inequality in Pakistan, inequality decomposition is conducted by subgroups of household characteristics and sources of income for both the years 2010-11 and 2015-16, and results are provided in Table 5.31 and Table 5.32 respectively.

Table 3. Inequality Decomposition by Sub Groups (for k = 1,2,3…K) – 2010-11

Variable	Population Share	Mean Income	Income Share	GE (0)	GE (1)	GE (2)	Gini
By Gender							
Male	0.90	125646	0.95	0.33	0.37	0.72	0.43
Female	0.10	58852	0.05	0.73	0.69	1.18	0.61
Within groups				0.37	0.38	0.7	
Between groups				0.02	0.018	0.015	
By Age Group							
1 - 20 years	0.13	51637	0.05	0.28	0.23	0.29	0.36
21 - 30 years	0.28	91902	0.21	0.27	0.26	0.38	0.37
31 - 40 years	0.24	131091	0.26	0.32	0.31	0.49	0.40
40 - 50 years	0.19	153860	0.25	0.35	0.34	0.57	0.43
51 - 55 years	0.07	173462	0.09	0.46	0.47	0.94	0.49
> 55 years	0.09	143239	0.11	0.51	0.54	1.32	0.52
Within groups				0.34	0.35	0.72	
Between groups				0.06	0.05	0.05	
By Highest Level of Education							
No Education	0.38	80543	0.26	0.31	0.27	0.34	0.39
Primary	0.30	98277	0.25	0.30	0.31	0.70	0.39
Secondary	0.15	139645	0.17	0.32	0.34	0.68	0.41
Intermediate	0.07	174919	0.09	0.35	0.39	0.84	0.43
Professional	0.10	253608	0.22	0.34	0.31	0.43	0.42
Within groups				0.32	0.31	0.66	
Between groups				0.08	0.09	0.10	
By Occupation							
Legislators, Seniors, etc.	0.02	401467	0.06	0.28	0.25	0.29	0.39

Variable	Population Share	Mean Income	Income Share	GE (0)	GE (1)	GE (2)	Gini
Professionals, Managers etc.	0.11	200372	0.19	0.36	0.31	0.44	0.41
Clerks, Service workers etc.	0.20	142251	0.24	0.34	0.34	0.60	0.42
Skilled Agricultural etc.	0.15	130030	0.16	0.48	0.49	1.25	0.49
Craft and Related… etc.	0.09	93685	0.08	0.39	0.33	0.47	0.42
Plant Operators etc.	0.07	108278	0.07	0.14	0.14	0.18	0.28
Elementary Occupations	0.35	71385	0.21	0.22	0.19	0.23	0.32
Within groups				0.31	0.31	0.66	
Between groups				0.08	0.09	0.11	
By Province							
Punjab	0.42	124716	0.44	0.51	0.50	1.04	0.50
Khyber Pakhtunkhwa	0.16	112257	0.15	0.37	0.35	0.57	0.44
Sind	0.27	108983	0.25	0.34	0.38	0.72	0.44
Baluchistan	0.15	127001	0.16	0.17	0.17	0.21	0.32
Within groups				0.39	0.39	0.76	
Between groups				0.002	0.002	0.002	
By Job Status							
Employer, Self Employed	0.15	186032	0.24	0.37	0.39	0.72	0.45
Paid Employee	0.71	101364	0.61	0.34	0.32	0.48	0.42
Cultivators, livestock	0.14	133619	0.16	0.47	0.49	1.25	0.49
Within groups				0.36	0.37	0.73	
Between groups				0.03	0.03	0.03	

Source: Author's own calculation from HIES (2011).

Table 4. Inequality Decomposition by Sub Groups (for k = 1,2,3…K) – 2015-16

Variable	Population Share	Mean Income	Income Share	GE (0)	GE (1)	GE (2)	Gini
By Gender							
Male	0.87	227876	0.93	0.33	0.36	0.76	0.43
Female	0.13	105430	0.07	0.95	0.93	3.23	0.67
Within groups				0.41	0.40	0.87	
Between groups				0.03	0.02	0.02	
By Age Group							
1 - 20 years	0.13	85604	0.05	0.32	0.25	0.31	0.37
21 - 30 years	0.28	163011	0.21	0.32	0.31	0.64	0.39
31 - 40 years	0.24	229357	0.26	0.34	0.29	0.44	0.40
40 - 50 years	0.19	277377	0.26	0.39	0.37	0.79	0.44

Variable	Population Share	Mean Income	Income Share	GE (0)	GE (1)	GE (2)	Gini
51 - 55 years	0.07	318351	0.10	0.45	0.43	0.72	0.49
> 55 years	0.09	267837	0.12	0.56	0.59	1.57	0.54
Within groups				0.37	0.37	0.84	
Between groups				0.07	0.06	0.05	
By Highest Level of Education							
No schooling	0.32	124787	0.19	0.40	0.33	0.55	0.42
Primary	0.29	169327	0.23	0.30	0.28	0.45	0.39
Secondary	0.17	222819	0.18	0.28	0.28	0.52	0.38
Intermediate	0.08	277210	0.10	0.36	0.40	1.27	0.43
Professional	0.14	441020	0.30	0.34	0.33	0.57	0.42
Within groups				0.34	0.32	0.77	
Between groups				0.10	0.11	0.12	
By Occupation							
Legislators, Senior, etc.	0.02	809252	0.08	0.33	0.41	0.92	0.43
Professionals, Managers etc.	0.16	352989	0.27	0.36	0.32	0.46	0.42
Clerks, Service workers etc.	0.24	221292	0.25	0.28	0.27	0.39	0.39
Skilled Agricultural etc.	0.09	187164	0.08	0.43	0.46	1.03	0.47
Craft and Related… etc.	0.17	149238	0.12	0.49	0.34	0.42	0.44
Plant Operators etc.	0.02	181915	0.02	0.19	0.20	0.29	0.32
Elementary Occupations	0.29	126086	0.17	0.26	0.21	0.25	0.34
Within groups				0.34	0.31	0.74	
Between groups				0.10	0.12	0.15	
By Province							
Punjab	0.42	213226	0.42	0.48	0.45	0.85	0.48
Khyber Pakhtunkhwa	0.19	238047	0.22	0.38	0.43	1.29	0.45
Sind	0.28	185628	0.25	0.45	0.43	0.76	0.47
Baluchistan	0.11	224773	0.11	0.30	0.28	0.40	0.40
Within groups				0.44	0.42	0.89	
Between groups				0.04	0.004	0.004	
By Job Status							
Employer, Self Employed	0.18	336768	0.28	0.37	0.42	1.03	0.45
Paid Employee	0.73	183215	0.64	0.41	0.37	0.57	0.45
Cultivators, livestock	0.09	192152	0.08	0.44	0.47	1.04	0.48
Within groups				0.41	0.39	0.86	
Between groups				0.03	0.03	0.04	

Source: Author's own calculation from HIES (2016).

Gender

In Pakistan, women normally work in professions like teaching, medical, finance & management, clerical support, cleaning & domestic, and so on. The population share of male-headed households is higher than females. However, it had fallen from 90 percent in 2010-11 to 87 percent in 2015-16. This implies that females have gained greater access to income-generating opportunities in recent years. The number of female earners increased; their income shares also increased. However, income inequality for females increases as the Gini coefficient enhances. Results of GE (α) indices also indicate greater inequality problem within-group than inequality experiences between the group (table-5.3.1 & 5.3.2).

Age

The population share of household members belonging to the age group of 21-30 years is more than age groups of 31-40 years and 41-50 years, but income share is less than these age groups because the income of persons increases with experience gain with age. There is wider income inequality in the age group of greater than 55 years because of multiple reasons, for example, job status, savings, wealth etc., and this income disparity becomes wider in 2015-16 (table-5.3.1 & 5.3.2). All indices experience more inequality within-group inequality than between-group inequality.

Education Level

Within the highest level of education group, population share and income share of household members having no education are higher as compared to other categories. The major change is observed in the decline of the income share of household members having no education in 2015-16, as the population share of individuals having no education decreases (table-5.3.1 & 5.3.2). Among the individuals with a certain level of education, the income share of professional degree holders increased in 2015-16 because trained persons possessing higher certificates, diplomas, and degrees belong to this category. However, these training and degrees within this group create greater income disparities among members. Education level improved in 2015-16 as compared to 2010-11 as well as inequality is common in the groups having above secondary school education as evident from GE (α) values (table-5.3.2 & 5.3.2). So, within-group inequality exhibits an increased problem than between the groups.

Occupation / Profession

Income shares of household members engage in professionals, managers, and technicians' group is more than those individuals who are engaged in other categories in the year 2015-16, which also confirms the results of improvement in education level as well as population share of these individuals in 2015-16 (table-5.3.1 & 5.3.2). Moreover, the number of persons engaged in clerical and services occupations also increases, while there is a decline in people working in elementary occupations, as well as drift, is also observed in other occupations in the year 2015-16 as compared to 2010-11. However, the study experiences more inequality within-group than inequality between groups for all indices.

Region

No change in population share in the provinces Punjab and Sindh is observed; however, a small change is seen in the other two provinces but not significantly between the two survey periods. Results of population share also reflect a change of income share in the same manner. All inequality indices register an increase for

all provinces between 2010-11 and 2015-16 (table-5.3.1 & 5.3.2). This could be a result of increased development in these regions and the decline in the dependence on the traditional sector. There is more inequality within a group than between-group inequality for provinces.

Job Status

Population and income share of household members engaged as cultivators and livestock occupations decreased in 2015-16, however, more income disparity is witnessed than other categories. Gini coefficient for employed / self-employed remains the same in both study periods, rises for paid employees indicating a rise in inequality and decreases for cultivators, livestock, etc., indicating a decrease in inequality (table-5.3.1 & 5.3.2). The results of GE (α) depict that inequality within the group is greater than inequality experiences between the groups.

Overall study finds that education level and occupation exhibit greater inequality for both within-group and between-group than other variables for both study periods; however, between-group inequality rises in 2015-16. Moreover, all indices show that within the group, disparities of income are a greater problem than inequality experiences between the groups.

Inequality Decomposition by Factor Components

The regression-based decomposition methodology proposed by Fields (2003) enables the current study to measure how much inequality in yearly income is explained by various human and non-human capital characteristics of each earner. Table 5.4.1 and Table 5.4.2 provide results of decomposition disparities by factor components (Gini decomposition by income source) in Pakistan.

Table 5. Inequality Decomposition by Factor Component – 2010-11

Source	SK (Inequality Contribution)	GK (Source Gini)	RK (Gini Correlation from Source)	Share in total inequality	Percent Change
Gender	0.08	0.10	0.58	0.11	0.03
Age	3.23	0.21	0.29	4.57	1.34
Education	0.11	0.57	0.44	0.60	0.50
Occupation	0.43	0.22	-0.39	-0.84	-1.27
Job-status	0.18	0.13	-0.17	-0.08	-0.26
Province	0.18	0.29	0.12	0.14	-0.05
Total income		0.04			

Source: Author's own calculation from HIES (2011).

Table 6. Inequality Decomposition by Factor Component – 2015-16

Source	SK (Inequality Contribution)	GK (Source Gini)	RK (Gini Correlation from source)	Share in total Inequality	Percent Change
Gender	0.07	0.13	0.61	0.13	0.06
Age	3.06	0.21	0.31	4.33	1.27
Education	0.12	0.52	0.49	0.68	0.56

Source	SK (Inequality Contribution)	GK (Source Gini)	RK (Gini Correlation from source)	Share in total Inequality	Percent Change
Occupation	0.38	0.24	-0.40	-0.80	-1.18
Job-status	0.08	0.25	-0.29	-0.12	-0.20
Province	0.19	0.21	-0.05	-0.04	-0.24
Total income		0.05			

Source: Author's own calculation from HIES (2016).

In both survey periods, age (a proxy for experience) provides the highest contribution in income inequality as its involvement to overall inequality, although it decreases during the study period much more than other sources. Moreover, its share in total inequality is also significant in both study periods, as illustrated in column 5 (table-5.4.1 & 5.4.2).

Education, on the other hand, has a high percentage in overall inequality, although its contribution to income inequality is comparatively less for both study periods. The reason for this high percentage is a result of the Rk value and the source's high percentage contribution to total income (table-5.4.1 & 5.4.2).

There has been a significant drop in inequality contribution made by job status in 2015-16 with negative Rk value, which reflects that job status reduces the inequality.

The effect of other sources like gender, occupation, and province has not changed significantly to overall contribution to inequality in both study periods. Province-wise contribution to income inequality indicates a rise in income inequality; however, share in overall inequality decreases during the study period (table-5.4.1 & 5.4.2).

1 percent change in age (experience) has the greatest impact on the Gini coefficient as compared to other variables (last column of Table-5.4.1 & 5.4.2), followed by education and gender with a positive impact of 1 percent change; however, remaining variables show a negative impact on Gini coefficient. Contribution in overall inequality of occupation is second highest after age. However, its share in overall inequality is negative and also shows a negative impact of 1 percent change on the Gini coefficient.

Conclusion

The present study investigates income inequality among the household members engaged in different occupations and professions in Pakistan using micro data set HIES conducted by the government of Pakistan for the years 2010-11 and 2015-16 and focuses on a yearly income of individuals. The study presents results at the aggregate and detailed sub-level of household characteristics and income sources to estimate the contribution of specific characteristics to the increase in inequality.

All the variables play a significant role in explaining the differences in income, and variable gender is the most important determinant of income among the earners (as a contribution of male is the highest to income during the study period), followed by province education, occupation, and job status. Legislators/senior professionals, professional/manager technicians, and plant/machine operators earn more than base category during the study period. Employers/self-employed household members earn more profits as compared to the fixed income of paid employees.

Overall study finds that education level and occupation exhibit greater inequality for both within-group and between-group than other variables for both study periods. However, between-group inequality rose in 2015-16 for both variables. Moreover, all indices indicate that inequality within the group is a greater problem than inequality experiences between the groups. The study also finds a rising trend in between-group differences of occupation and education in yearly average income and concludes that income inequality increases due to change in the relative economic status of household members belonging to professionals, managers, and technicians' groups as a result of improvement in education level in the year 2015-16. An increase in income inequality observes because of development in all provinces of Pakistan and a decline in the dependence on traditional sector. The study also observes increased income disparities among cultivators and livestock occupation during the study period.

Moreover, variable age provides the highest contribution in income inequality to overall inequality, and variable education has the highest share in overall inequality. Effect of sources has not changed significantly to overall contribution in inequality during study period except job status, which reduces inequality. Although, variable occupation positively contributes to overall inequality, however, exhibits a negative share in overall inequality and also shows a negative impact of a 1 percent change on the Gini coefficient.

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