Exploring the Socioeconomic Causes of Income Inequality in Pakistan: A Regional, Gender, and Provincial Decomposition Analysis

[1*]Naseebullah
[2]Ameer Muhammad Kasi
[3]Dr. Noor Ahmad
[4]Waseem Haider
[1*]*Lecturer, University College Zhob, BUITEMS. Corresponding Author Email:*
[2]*Lecturer, University College Zhob, BUITEMS*
[3]*Lecturer, University College Zhob, BUITEMS*
[4]*Ph.D Scholar, Faculty of Management, Universiti Teknologi Malaysia (UTM)*
[1*]*Naseeb.ullah2@buitms.edu.pk, [2]ameer.muhammad@buitms.edu.pk, [3]noor.ahmed@buitms.edu.pk*
[4]*waseemhaider@graduate.utm.my*

Abstract

Poverty and income inequality are features of every society. In Pakistan, poverty and income inequality are most obvious, therefore, their measurement and analysis deserve claim on our attention. The objective of this study is to decompose total income inequality in Pakistan into within-group and between-group inequalities, focusing on regional (rural-urban), gender (male-female) and provincial disparities across the four provinces of Pakistan. The data used for this study is obtained from Pakistan social and living standards measurement survey 2014-15. We have concentrated on decomposability of income by subgroups of population, The findings shows that the highest part of total income inequality is explained by between inequality means how income vary between the groups, while the lowest part is explained by within inequality means how income distribution varies within each group for region, gender and provinces. The province experience high income inequality such as in province Balochistan, experienced the value of between income inequality is estimated 91.58%. Province Punjab the rate of income inequality is lowest 52.08% as compare to province Balochistan. Thus according to inequality we have observed different levels of income inequality. The study finds that due to differences in region, gender, and provinces causes increase in income inequality. These differences come into existence due to lack of proper planning from the government side, causes low health facilities, poor educational system, low infrastructure, low employment opportunities and low economic growth. Findings of the study recommend that government should take measures to improve basic facilities, quality of education, employment opportunities and health facilities in remote areas of Pakistan to alleviate poverty and reduce income inequality in the region.

INTRODUCTION

In Pakistan, poverty and income inequality are most obvious, therefore, their measurement and analysis deserve claim on our attention. The main objective of economic development is to promote socio-economic well-being of the population. Economic welfare largely depends on just distribution of national income, reducing poverty and income inequality improving the living conditions of the poor. In Pakistan, interest in equitable income distribution and poverty alleviation has grown in the past three decades. This stems from the fact that in spite of decent growth rate of the national income, the income inequality and poverty continue to exist. It is, therefore, imperative to study the phenomena of income distribution on the basis of the latest available data in the country.

The focus of development researchers is inequality. Since Kuznets (1955) proposed an inverted U-shaped relationship between income inequality and a country aggregate income level based on time series data in the US, England, and Germany, most studies on income inequality and development have focused on "proving" or "disproving" the "Kuznets hypothesis." Most of these papers used parametric analysis, which led to different conclusions depending on the functional form. A wide variety of functional forms are related to U-shaped curves, so rejecting one does not rule out the existence of one. However, almost all studies on inequality and development have tested the Kuznets curve, so a brief review is in order. Theorists have been as productive as empiricists in finding the relationship and delivering the Kuznets curve in many theoretical models. Early dualistic theories like Lewis (1954) and Fei and Ranis (1961) produce Kuznets processes. Robinson (1976) showed in a simple model that a Kuznets process will result if the economy can be divided into two sectors with different sectoral income distributions and one sector's relative population increases monotonically. Recent Kuznets curve papers include Greenwood and Jovanovic (1990), Anand and Kanbur (1993), Rauch (1993), Galor and Tsiddon (1996), Aghion and Bolton (1997), Dahan and Tsiddon (1998), Glomm and Ravikumar (1998), and Lloyd-Ellis and Bernhardt (2000). In their model of modernisation and economic growth, Banerjee and Newman (1998) provide conditions for a Kuznets process, but the result is not robust.

Two discourses exist on inequality in the welfare state. One strand addresses inequality and poverty. Possibly the most fundamental orientation. Standard inequality and poverty measures are based on individual wellbeing. The second strand examines inequality across broadly defined salient groups. Total inequality among individuals is often divided into "between group" and "within group" components. Grouping is sometimes seen as a policy tool in this second strand, but inequality remains the goal. The group has normative significance at other times. Inequality decomposition now has moral significance beyond instrumental. Consider inequality by race, gender, ethnicity, or caste. This decomposition has many uses Kanbur (2006). Identifying the main causes of income variation begins with a decomposition in positive analysis. The non-parametric version of a parametric regression uses dummy variables and interaction terms across groupings. However, the same decomposition can be normative. If fine individual differentiation within a group is costly, one can develop intervention rules across groups even if the goal is overall inequality or poverty. The group identifier is used as a targeting device Kanbur and Tuomala (2016). But one can continue Roemer (1998) framework, as implemented by Paes de Barros et al. (2009), gives group inequality an ethical significance as "inequality of opportunity." Household-based grouping is rarely considered. Each household is a group, and inequality and poverty can be broken down. There are many more groups than with

gender, but the analytical structure is the same. We can analyses policy effects across and within groups, using decompositions between and within groups Kanbur (2006) framework to decompose total income inequality into within inequality and between inequality. Policy can either treat the household grouping as instrumental to achieving inequality or poverty, or it can give the household special normative significance.

LITERATURE GAP

Many researches have analyzed income inequality at country level such Kemal (1981) concludes that urban Pakistan has a higher income inequality than rural Pakistan. Haq (1999) uses Sen's welfare index to classify income inequality and finds it greater than expenditure inequality. Khan et al. (2015) and Qazi et al. (2018) recommend investing more in education to reduce income inequality. But in the case of Pakistan such studies have not been conducted to decompose total income inequity into within inequality and between inequality for region (rural urban), gender (male female) and across four provinces of Pakistan. The term within inequality shows inequality within each group of population separately due to variability of income, while the term between inequality shows inequality across different groups of population due to variability of income. For instance, if the total population is divided into urban and rural individuals, within inequality (W) shows the contribution of urban and rural inequality taken separately due to variability of incomes, while between inequality (B) shows inequality across the groups due to differences in incomes.

OBJECTIVES OF THE STUDY

The objective of this study is to decompose total income inequality in Pakistan into within-group and between-group inequalities, focusing on regional (rural-urban), gender (male-female) and provincial disparities across the four provinces of Pakistan.

REVIEW OF LITERATURE

This study decompose total income inequality in Pakistan into within-group and between-group inequalities using Kanbur (2006) framework and focusing on regional (rural-urban), gender (male-female), and provincial disparities across the four provinces of Pakistan. Using data from PSLM 2014-15. Economists have always debated income inequality. Since the Great Recession, the topic has gained attention. Income inequality has been called the biggest social issue by several prominent authors (Stiglitz (2013), Picketty (2014) and Milanovic (2015). This is supported by the empirical observation that market income inequality—as measured by the Gini coefficient—has risen significantly since the mid-1970s in industrial economies, contrasting unfavorably with a long period when inequality declined from high levels at the start of the 20th century.

Market income inequality is often impugned for rising populism, societal stress, and protection demands Alesina and Rodrik (1994), Persson and Tabellini (1994) and Alesina et al. (2017). Economic insecurity breeds authoritarian and nativist political parties, according to a large social science literature. This political-economic argument now focusses on global trade growing gaps between winners and losers or technology's rising skill-premia, which could drive protectionism. Stalling middle-class wages and limited job mobility have also been used to justify resentment of "outsiders" competing for jobs and benefits Inglehart (2016), especially in an era when social fragmentation and secularization have eroded traditional collective structures. High and persistent income inequality is bad for many reasons.

Assessing whether higher income inequality slows economic growth is difficult and the literature is divided. It could work either way. High rewards for risky entrepreneurship and

innovation could increase income inequality and boost economic growth. However, higher inequality could slow growth if low-income households are less productive due to slower human capital accumulation and financial exclusion. There is also little empirical consensus. Inequality negatively impacts growth and duration Ostry and Berg (2011) Ostry et al. (2014) and Cingano (2014). Others have found no systematic negative effect of inequality on growth Forbes (2000), Panizza (2002) and Kraay (2015). Some authors have tried to show the relationship is non-linear Banerjee and Duflo (2003) & Brueckner and Lederman (2015).

Recent literature has focused on opportunity inequality using single-country studies. Inequality is divided into opportunity and effort components. Several studies use the variability of U.S. state data to show that inequality of opportunity hurts poor income growth and helps rich income growth. Because it hinders low-income people from accumulating human capital, inequality of opportunity may hurt economic growth.3 Perceptions of unequal opportunities, which affect aspirations, may also reduce human capital investments.

Haddad and Kanbur (1990) used data from a small Philippine household survey on individual food intake to make a similar point. After converting food intake to calories, a calorie adequacy ratio was calculated using individual calorie requirements for various demographic groups in the Philippines. A synthetic distribution was then created to allocate a household's total calorie intake pro rata to its needs. We would have this distribution if we only had household food intake data, which is the case for most national household surveys. Haddad and Kanbur (1990) compared synthetic distribution inequality and poverty to actual inequality and poverty (using a calorie adequacy ratio of one).

Kemal (1981) concludes that urban Pakistan has a higher income inequality than rural Pakistan. Individual income inequality is higher than household income inequality, but it has declined over time. In urban areas, changes in self-proprietor and property income have increased income inequality, while wage rates have decreased it. However, property and wage income changes increase income inequality in rural areas, while self-proprietor incomes reduce it.

Haq (1999) uses Sen's welfare index to classify income inequality and finds it greater than expenditure inequality. Income inequality is affected by household assets, employment structure, transfer income, etc. Policies that increase employment, primary education, health care, and drinking water reduce income inequality (Kemal, 2006). Khan et al. (2015) and Qazi et al. (2018) recommend investing more in education to reduce income inequality. Proper education can increase earnings, and the government can help reduce earning and social inequality by providing high-quality education.

However, Ahmad (2002) uses 1992–1993 HIES data to examine income inequality and occupations in Pakistan. Gini Coefficient shows that skilled workers have the highest inequality and professionals the lowest. Khyber Pakhtunkhwa (KP) has the highest income inequality between and within occupations, while Balochistan has the lowest. According to De Kruijk and Naseem (1986), household income inequality stems from two factors: non-labor income inequality and household earner differences. Another finding is that inequality levels and structures vary greatly across provinces. Localising inequality categories helps policies work better.

THEORETICAL FRAMEWORK, METHODOLOGY AND DATA SOURCE

This section discuss theoretical framework for inequality using Kanbur (2006) framework, methodology used for estimation of inequality, and data source.

THEORETICAL FRAMEWORK FOR INEQUALITY

Here we explain framework for income inequality by introducing the concept, the analysis of variance. It is a statistical tool which measure decomposition of income by subgroup of population. Here we show the framework for analysis of variance that how this tool measure incomes of different groups of population, such as region of household heads (urban rural), gender of household heads (male female) and province in which individual are living. To know how income inequality across these variables are measured the process is as followed.

This tool shows that how the income inequality measures are decomposed by subgroups of population. More generally this tool describes and defines the concepts of within inequality and between inequality that how to decompose different inequality measures. To identify where inequality stems from, decomposition of incomes by subgroup of population is the most proper index used to measure income inequality. The main objective is to analyze on the basis of theoretical, analytical and practical framework to understand this tool.

Decomposition of inequality measure means to express the structure of inequality i.e. splitting of total inequality into subgroups of population and relevant factors. It is important to split overall inequality among the different groups of population to properly target public policies for practical application. Because the knowledge of overall inequality may be inadequate for application of public policies and real policies might have different impact of inequality by subgroups of population therefor splitting inequality is important to understand this tool.

BACKGROUND OF ANALYSIS OF VARIANCE

We use Kanbur (2006) framework observe that inequality is explored as the overall inequality amongst particular set of individuals with given level of income but we know that inequality may originate from different groups of population with different rates, such as region (rural urban), gender (male female) province or location in which location the resident is living. Therefor we come to know and understand decomposability, a very silent feature of inequality which states that possibility of calculating that how much each group of population has contribution into total inequality. So here we focus on decomposability of inequality by subgroups of population.

Generally, to measure the decomposability of inequality wants a consistent relationship between the total inequality and its parts. Specifically when we speak of decomposability, we are required to differentiate between the two important terms, i.e. within inequality denoted by (W) and between inequality denoted by (B). The term within inequality shows inequality within each group of population separately due to variability of income, while the term between inequality shows inequality across different groups of population due to variability of income. For instance, if the total population is divided into urban and rural individuals, within inequality (W) shows the contribution of urban and rural inequality taken separately due to variability of incomes, while between inequality (B) shows inequality across the groups due to differences in incomes.

In general, we obtain the following form of decomposition of inequality measure I beside, within inequality component, a between inequality component and residual term.

$$I = I_{WITH} + I_{BET} + K_{RISD} \dots\dots\dots\dots\dots\dots\dots(1)$$

Decomposition of inequality focus on a tool, Analysis of Variance. This tool shows decomposition of within inequality and between inequality components.

THE ANALYSIS OF VARIANCE

The framework for inequality through the tool of Analysis of variance is observed here. Analysis of variance is a statistical tool which measures decomposition of income by subgroup of population. Here we show the framework for analysis of variance that how this tool measure incomes inequality across different groups of population, such as region (urban rural), gender of household heads (male female) and province of household heads.

REGION

Here we have categorized income distribution between the two groups for region variable, i.e. individuals living in urban areas (U) and individuals living in rural areas (R) according to their respective numbers of observation from the population size of our study. Symbolically we have denoted urban income as Y_i^U and rural income as Y_i^R, here subscript represents number of individuals living in the region and superscript shows the belonging area of individuals. In general form variance of total income for region is decomposed as shown in the following equation.

$$V(y) = [W_U V(Y_U) + W_R V(Y_R)] + V[\overline{Y}_U, \overline{Y}_R] \dots\dots\dots\dots (2)$$

The first term in above equation is the sum of between the two components.
The variance for urban income $V(Y_U)$ which is multiplied by the share of urban residents in total population in the region (W_U).
The variance for rural income $V(Y_R)$ which is multiplied by the share of rural residents in total population in the region (W_R).

Therefor the first term in above equation represents within inequality in the region, and it is interpreted as the weighted average of the variance of rural income and weighted average of the variance of urban income, with their weighted shares in population.

While the second term in equation (2) represents between inequality which is calculated as mean of urban income from the total income and mean of rural income from the total income, than we replace actual incomes for both rural and urban with mean income of rural and mean income of urban in the region, this is called fictitious income distribution. Then we take variance of this fictitious income distribution for rural and urban incomes combine, we obtain this term $V[\overline{Y}_U, \overline{Y}_R]$ which represents between inequality. Further within groups, incomes are all equal, and they only vary, possibly, between the groups and the variance pick up the dispersion of income attributed to the difference between the groups. The main feature of analysis of variance is that here variance perfectly decomposable, means there doesn't exist residual term as compare to Gini index and Thiel index, where residual term can take place.

HOUSEHOLD HEADS GENDER

For household head gender we have classified income distribution between male household heads and female household heads for gender variable, i.e. male household heads (M) and female household heads (F) according to their respective numbers of observation from the population size of our study. Symbolically we have denoted male household heads income as Y_i^M and female household heads income as Y_i^F, where subscript represents number of male and female household heads living in the country and superscript shows the gender of household heads. In general form variance of total income for gender is decomposed as shown in the following equation.

$$V(y) = [W_M V(Y_M) + W_F V(Y_F)] + V[\overline{Y}_M, \overline{Y}_F] \dots\dots\dots\dots (3)$$

The first term in above equation show the sum of between the two components.
The variance for male household heads income $V(Y_M)$ which is multiplied by the share of male household heads residents in total population for gender (W_M).

The variance for female household heads income $V(Y_F)$ which is multiplied by the share of female household heads residents in total population for gender (W_R).

Therefor the first term in above equation represents within inequality for gender, and it is interpreted as the weighted average of the variance of male household heads income and weighted average of the variance of female household heads income, with their respective weighted shares in the total population.

While the second term in equation (3) represents between inequality which is calculated as mean of male household heads income from the total income and mean of female household income from the total income, than we replace actual incomes for both male and female household heads with mean income of male household heads and mean income of female household heads for gender variable, this is called fictitious income distribution. Then we take variance of this fictitious income distribution for male and female household heads incomes combine, we obtain this term $V[\overline{Y}_M, \overline{Y}_F]$ which represents between inequality. Further within groups, incomes are all equal, and they only vary, possibly, between the groups and the variance pick up the dispersion of income attributed to the difference between the groups. The analysis of variance is perfectly decomposable, means there doesn't exist residual term.

PROVINCE OF HOUSEHOLD HEADS

Here we have categorized income distribution according to household heads province or location, for province variable, i.e. in which province of Pakistan individuals are living. Suppose we take example for KPK, for individuals of KPK province (K) and other than KPK (O) according to their respective numbers of observation from the population size of our study. Symbolically we have denoted income of the household heads belongs to KPK as Y_i^K and income of the household heads residents in other provinces as Y_i^O, here subscript represents number of individuals living in the province and superscript shows the belonging area of individuals. In general form variance of total income for province is decomposed as shown in the following equation.

$$V(y) = [W_K V(Y_K) + W_O V(Y_O)] + V[\overline{Y}_K, \overline{Y}_O] \dots\dots\dots\dots (4)$$

The first term in above equation represents the sum of between the two components i.e. KPK and others.

The variance for KPK household heads income $V(Y_K)$ which is multiplied by the share of KPK residents in total population in that province (W_K).

The variance of income of household heads other than KPK as $V(Y_O)$ which is multiplied by the share of household heads other than KPK residents in total population in the province (W_O).

Therefor the first term in above equation represents within inequality for KPK province, and it is interpreted as the weighted average of the variance of income of household heads from KPK and weighted average of the variance of income of household heads other than KPK, with their weighted shares in population.

While the second term in equation (4) represents between inequality which is calculated as mean of household heads income from KPK in the total income and mean of household heads income in the total income for other than KPK, than we replace actual incomes for both KPK and other than KPK with their respective mean incomes, this is called fictitious income distribution. Then we take variance of this fictitious income distribution for KPK and other than KPK incomes combine, we obtain the term $V[\overline{Y}_U, \overline{Y}_R]$ which represents between inequality. Further within groups, incomes are all equal, and they only vary, possibly, between the groups and the variance pick up the dispersion of

income attributed to the difference between the groups. The main feature of analysis of variance is that here variance perfectly decomposable, means there doesn't exist residual term as compare to Gini index and Thiel index, where residual term can take place.

METHODOLOGY FOR INEQUALITY

We perform statistical tool the Analysis of variance for our model of income inequality which measure decomposition of income by subgroup of population. Here we show the framework for analysis of variance that how this tool measure decomposition of incomes of different groups of population, such as region of household heads (urban rural), gender of household heads (male female) and province of household heads. This tool shows that how the income inequality measures are decomposed by subgroups of population. More generally this tool describes and defines the concepts of within inequality and between inequality that how to decompose different inequality measures. To identify where inequality stems from, decomposition of incomes by subgroup of population is the most proper index used to measure income inequality.

DATA SOURCE

This study incorporates the data from the Pakistan social and living standards measurement survey PSLM (2014-15). We have used data for Pakistan which contains total sample size of 513,945 individuals throughout the country and consist of 78,635 households. We have used those sections of the data which have resemblance to our variables for estimation of our models. PSLM data deals with income approach. Income approach is also used by many researchers for determining poverty. Malik, Muhammad H. (1988) & (Sikandar and Rizvi 2013, GM Arif 2011)

RESULTS OF INCOME INEQUALITY AND DISCUSSION

In this chapter we discuss findings of our analysis regarding inequality and discrimination, to provide better analysis of findings, we divide this chapter into two parts. First part shows step by step procedure to decompose inequality by a statistical tool The Analysis of variance. While second part represents methodology, model and analysis of inequality and discrimination relationship, result and conclusion of our analysis.

STEP BY STEP PROCEDURE FOR THE ANALYSIS OF VARIANCE

TABLE.1 THE ANALYSIS OF VARIANCE

Steps	Procedure
1	Separate the incomes of each group from the original income distribution which belongs to that group (e.g. the incomes of rural urban household heads, male female)
2	Sort the incomes of each group accordingly
3	From the total population, calculate the share of each group
4	For each group separated from the original income distribution in the step 1, calculate the variance of their respective shares of income
5	Multiply the variance of respective shares of income with share of corresponding group from the total population
6	Sum up all the resultant values obtained from step 5, we get within inequality for each group separately (e.g. for rural and urban, for male and female)
7	Next is to calculate mean incomes for each group separated from the original income distribution in step 1

| 8 | Replace the actual incomes for each group with their corresponding mean incomes calculated in step 7 |
| 9 | Calculate overall variance of this fictitious income distribution, which is replaced by actual incomes distribution. The resultant is between inequality across the groups |

STATISTICAL PROCEDURE FOR ANALYSIS OF VARIANCE

Here we show statistical procedure for analysis of variance necessary for decomposability of inequality i.e. within inequality and between inequality. In first step we have identified the individuals belonging to the each group and separate the incomes of each group from the original income distribution which belongs to that group (e.g. the incomes of rural urban household heads, male female). While in step 2 we have sort the incomes within each group in order to get subgroups of their income distribution categorized by income level. In step 3 analyzed that from the total population, we have calculated the share of each group, i.e. how many individuals are there in each group from the total population. This should be clear that calculated individuals are number of people in each group from the total population but not in total income. In step 4, for each group separated from the original income distribution in the step 1, calculate the variance of their respective shares of incomes from the total income. In step 5 we have multiplied the variance of respective shares of income with share of corresponding group from the total population. In step 6 we have summed up all the resultant values obtained from step 5, we get within inequality for each group separately (e.g. for rural and urban, for male and female) which shows income inequality due to differences in income within each group.

For between inequality, (step 7) first we have calculated mean incomes for each group separated from the original income distribution in step 1 and replaced the actual incomes for each group with their corresponding mean incomes to generate a fictitious income distribution which shows that all individuals in each group have same mean incomes(step 8). Then we calculated the variance of fictitious income distribution which gives us between inequality it shows inequality due to variability of income across the groups.

$$I = I_{WITH} + I_{BET} + K_{RISD} \text{.................................(1)}$$

INCOME INEQUALITY = WITHIN INEQUALITY + BETWEEN INEQUALITY

FINDINGS OF ANALYSIS OF VARIANCE FOR INCOME INEQUALITY

This part represents methodology, model and analysis of income inequality model by the analysis of variance, result and conclusion of our analysis. To find out the impact of locational factors and gender on income inequality for Pakistan, we have the following results.

TABLE.2 THE ANALYSIS OF VARIANCE

Variables	Within inequality	Between inequality	Total inequality
Region	105538 (12.18 %)	761225.1 (87.82%)	866763.1 (100%)
Gender	27073 (3.13%)	839685.1 (96.87%)	866758.1 (100%)

KPK/Other	115625 (13.35%)	751114 (86.65%)	866739 (100%)
Punjab/Other	415205 (47.92%)	451155 (52.08%)	866360 (100%)
Sindh/Other	225766 (26.05%)	640578.1 (73.95%)	866344.1 (100%)
Balochistan/Other	73005.2 (8.42%)	793744 (91.58%)	866749.2 (100%)

Table.2 shows results of the analysis of variance for income inequality of variables region, gender and provinces calculated through step by step procedure. We have decomposed total inequality among the particular set of individuals and given level of income. When we speak about decomposability of total inequality we come to know two terms, i.e. within inequality which occurs due to variability of income within groups and between inequality which happens due to variability of income across different groups. In the above table we have calculated both types of inequality for region, gender and provinces and their sum is equal to total inequality. Results of analysis of variance with the help of step by step procedure for Region, Gender and four provinces of Pakistanis given. Here it is worth checking for the exactness of decomposition means total inequality, shows the variance of the original income distribution which is the sum of the two elements gives the same result. Which kind of information did we gain in decomposing total inequality?

Region includes urban area and rural area whether household is living in urban area or rural area. Here for region, the total inequality is due partly to the variability of income within groups is 105538 While between inequality is 761225.1 it is across the region. The sum of both within and between inequality is total inequality which is 866763.1 so from this information we come to that total inequality is due partly to the variability of income within groups (rural and urban) is 12.18% (the ratio of within inequality and total inequality) and partly to the variability of income between the groups (rural urban) is 87.82% (the ratio of between inequality and total inequality). This shows that the highest part of total income inequality is explained by between inequality means how income vary between the groups, while the lowest part is explained by within inequality means how income distribution varies within each group. This result depicts the level of income inequality due to income distribution in the region.

REGION

Within Inequality		Between Inequality	Total Inequality
Share of rural in population 0.83	Rural 103869	Mean income 734 Rural	
Share or urban in population 0.17	Urban 1669	Mean income 626 Urban	

Variance of rural income 125143.37	Within inequality	Between inequality 761225.1	866763.1
Variance of urban income 9817.27	105538		

Gender of household heads includes, male household heads and female household heads. Within inequality for gender variable due partly to the variability of income within groups 27073. While between inequality for gender is 839685.1 it is across the gender. The sum of both within and between inequality is total inequality which is 866758.1 so from this information we come to that inequality due to the variability of income within groups (male female households) is 3.13% (the ratio of within inequality and total inequality) and partly to the variability of income between the groups (male female households) is 96.87% (the ratio of between inequality and total inequality). This shows that the greatest part of total income inequality is explained by between inequality means how income vary between the groups, while the lowest part is explained by within inequality means how income distribution varies within each group.

GENDER

Within Inequality		Between Inequality	Total Inequality
Share of male in population 0.94	Male 26878	Mean income 712 Male	
Share of female in population 0.06	Female 195	Mean income 775 Female	
Variance of male income 28593.61	Within inequality	Between inequality	866758.1
Variance of female income 3250	27073	839685.1	

Province variable includes four provinces of Pakistan, i.e. Khyber Pakhtunkhwa, Punjab, Sindh and Balochistan. For each province we obtained different results by imposing analysis of variance. In province Khyber Pakhtunkhwa Within inequality results 115625 for KPK households. While between inequality for KPK is 751114, The sum of both within and between inequality is total inequality for KPK is 866739 so from this information we come to know that within inequality in KPK due to the variability of income within groups (KPK and other) is 13.35% (the ratio of within inequality and total inequality) and between inequality due to variability of income between the groups (KPK, other) is 86.65% (the ratio of between inequality and total inequality). This shows that the highest part of total income inequality is explained by between inequality means how income vary between the groups, while the lowest part is explained by within inequality means how income distribution varies within each group.

KPK

Within Inequality		Between Inequality	Total Inequality
Share of KPK in population 0.185	KPK 113896	Mean income 628 KPK	

Within Inequality		Between Inequality	Total Inequality
Share of others in population 0.815	Others 1729	Mean income 735 others	
Variance of KPK income 615654	Within inequality	Between inequality	866739
Variance of others income 2121.5	115625	751114	

In province Punjab within inequality results 415205. While between inequality for Punjab is 451155, The sum of both within and between inequality is total inequality for Punjab is 866360 so from this information we come to know that within inequality in Punjab due to the variability of income within groups (punjab and other) is 47.92% (the ratio of within inequality and total inequality) and between inequality due to variability of income between the groups (punjab, other) is 52.08% (the ratio of between inequality and total inequality). This shows that the largest part of total income inequality is explained by between inequality means how income vary between the groups, while the remaining part is explained by within inequality means how income distribution varies within each group.

PUNJAB

Within Inequality		Between Inequality	Total Inequality
Share of Punjab in population 0.44	Punjab 414132	Mean income 765 Punjab	
Share or others in population 0.56	others 1073	Mean income 700 others	
Variance of Punjab income 941209	Within inequality	Between inequality	866360
Variance of others income 1916	415205	451155	

In province Sindh, within inequality results 225766 while between inequality for Sindh is 640578.1, The sum of both within and between inequality is total inequality for sindh is 866344.1 so from this information we come to know that within inequality in sindh due to the variability of income within groups (sindh and other) is 26.05% (the ratio of within inequality and total inequality) and between inequality due to variability of income between the groups (sindh, other) is 73.95% (the ratio of between inequality and total inequality). This shows that the highest part of total income inequality is explained by between inequality means how income vary between the groups, while the lowest part is explained by within inequality means how income distribution varies within each group.

SINDH

Within Inequality		Between Inequality	Total Inequality
Share of Sindh in population 0.235	Sindh 224816	Mean income 651 Sindh	
Share or others in population 0.765	others 950	Mean income 724 others	

	Within inequality	Between inequality	
Variance of Sindh income 956664			866344.1
Variance of others income 1242		225766	640578.1

In province Balochistan within inequality results 73005.2 while between inequality for Balochistan is 793744, The sum of both within and between inequality is total inequality for Balochistan is 866749.2 so from this information we come to know that within inequality in the province Baluchistan due to the variability of income within groups (Balochistan and other) is 8.42% (the ratio of within inequality and total inequality) and between inequality due to variability of income between the groups (Balochistan, other) is 91.58% (the ratio of between inequality and total inequality). This shows that the highest part of total income inequality is explained by between inequality means how income vary between the groups, while the lowest part is explained by within inequality means how income distribution varies within each group.

BALOCHISTAN

Within Inequality		Between Inequality	Total Inequality
Share of Balochistan in population 0.14	Balochistan 72319	Mean income 765 Balochistan	
Share or others in population 0.86	others 686.2	Mean income 700 others	
Variance of Balochistan income 509288	Within inequality	Between inequality	866749.2
Variance of others income 800	73005.2	793744	

Overall the above results regarding the analysis of variance for region, gender and all provinces shows different levels of income inequality in term of within and between inequality, for provinces as mentioned in the model of poverty that province with high rate of poverty also experience high income inequality, such as in province Balochistan, experienced 73.9% poverty rate estimated and the value of between income inequality is estimated 91.58%, on the other hand for province Punjab lowest poverty rate 35.9% experienced, in this province the rate of income inequality is also lowest 52.08 as compare to province Balochistan. Thus according to both models of poverty and inequality we have observed different poverty rates and different levels of income inequality. Higher rate of poverty is related to greater income inequality and lower poverty rate is related to lesser income inequality.

RESULTS AND CONCLUSION

This study analyzes the impact of locational factors such as region, provinces and gender of household head on income inequality for Pakistan here we concentrated on decomposability of income inequality by subgroups of population, income inequality and its impact on locational factors, results are calculated by the analysis of variance for income inequality of variables region, gender and provinces through step by step procedure. We have decomposed total inequality among the particular set of individuals and given level of income. When we speak about decomposability of total inequality we come to know two terms, i.e. within inequality which occurs due to variability of income within groups and

between inequality which happens due to variability of income across different groups. We have calculated both types of inequality for region, gender and provinces and their sum is equal to total inequality.

Region comprises urban area and rural area population whether household is living in urban or rural area. Within inequality due to the variability of income within groups (rural and urban) is 12.18% (the ratio of within inequality and total inequality) and between inequality due to the variability of income between the groups (rural urban) is 87.82% (the ratio of between inequality and total inequality). This shows that the highest part of total income inequality is explained by between inequality means how income vary between the groups, while the lowest part is explained by within inequality means how income distribution varies within each group. For gender within inequality, due to the variability of income within groups (male female households) is 3.13% and between inequality due to the variability of income between the groups (male female households) is 96.87% This shows that the greatest part of total income inequality is explained by between inequality means how income vary between the groups, while the lowest part is explained by within inequality means how income distribution varies within each group. In this study within inequality for male household is higher than female households this is due to, in Pakistan female household heads are 6% of the total population size.

Province variable includes four provinces of Pakistan, i.e. Khyber Pakhtunkhwa, Punjab, Sindh and Baluchistan. For each province we obtained different results. In province Khyber Pakhtunkhwa within inequality due to the variability of income within groups (KPK and other) is 13.35% (the ratio of within inequality and total inequality) and between inequality due to variability of income between the groups (KPK, other) is 86.65% (the ratio of between inequality and total inequality). This result show the highest part of total income inequality is explained by between inequality means how income vary between the groups, while the lowest part is explained by within inequality means how income distribution varies within each group. In province Punjab within inequality is 47.92% and between inequality is 52.08% this shows that the largest part of total income inequality is explained by between inequality means how income vary between the groups, while the remaining part is explained by within inequality means how income distribution varies within each group. In province Sindh within inequality is 26.05% and between inequality is 73.95% (the ratio of between inequality and total inequality). This shows that the highest part of total income inequality is explained by between inequality means how income vary between the groups, while the lowest part is explained by within inequality means how income distribution varies within each group. In province Baluchistan within inequality is 8.42% and between inequality is 91.58% (the ratio of between inequality and total inequality). This shows that the highest part of total income inequality is explained by between inequality means how income vary between the groups, while the lowest part is explained by within inequality means how income distribution varies within each group.

Moreover findings of this study analyze the impact of locational factors such as region, provinces and household characteristics on income inequality in Pakistan. To captured the impact income inequality for region, gender and provinces in term of within inequality and between inequality as mentioned in the model of income inequality, that province with high rate of poverty also experience high income inequality such as in province Balochistan, experienced 73.9% poverty rate estimated and the value of between income inequality is estimated 91.58%, on the other hand for province Punjab lowest poverty rate 35.9% experienced, in this province the rate of income inequality is also lowest

52.08% as compare to province Baluchistan. Thus according to both models of poverty and inequality we have observed different poverty rates and different levels of income inequality. Higher rate of poverty is related to greater income inequality and lower poverty rate is related to lesser income inequality.

POLICY RECOMMENDATIONS

The findings of this study show that region, gender, and provinces causes increase in poverty and income inequality. We have experienced that higher rate of poverty is related to greater income inequality and lower poverty rate is related to lesser income inequality between gender, region and among provinces of Pakistan. These differences come into existence due to lack of proper planning from the government side. Due to these differences in gender, region and among provinces causes low health facilities, poor educational system, low infrastructure, low employment opportunities and low economic growth. So government should take some serious steps to improve basic facilities, quality education, in both the regions and provide equal employment opportunities for males and females, as well as health facilities in remote areas of Pakistan.

REFERENCES

Aghion, P. & Bolton, P. (1997). A Theory of Trickle-Down Growth and Development. Review of Economic Studies, 64(2), 151-172.

Ahmad, M. (2002), "Income inequality among various occupations/professions in Pakistan: estimates based on household income per capita", The Lahore Journal of Economics, Vol. 7 No. 1, pp. 89-106.

Ahmed, I., Khan, M., Ullah, N., Ahmed, N., & Haider, W. (2024). An Exploratory Spatial Data Analysis of Health Indicators in Pakistan. Indus Journal of Social Sciences, 2(2), 453-473.

Ahmed, N., Iqbal, K., & Kasi, A. M. (2023). Spatial Disparities in Human Development Index across the Districts of Pakistan: An ESDA Analysis. Qlantic Journal of Social Sciences and Humanities, 4(3), 244-257.

Ahmed, N., Iqbal, K., Kasi, A. M., & Ullah, N. (2023). Testing Club Convergence across Pakistan's Districts by Using a Household Welfare Index. Qlantic Journal of Social Sciences, 4(3), 124-134.

Ahmed, N., Khan, A., Ahmed, I., & Iqbal, K. (2024). Testing Club Convergence in Health Outcomes in Pakistan during 2004-2020. International Journal of Social Science Archives (IJSSA), 7(2).

Alesina, A. and Rodrik, D., 1994, "Distributive Politics and Economic Growth," Quarterly Journal of Economics, Vol. 109(2), pp. 465–490.

Alesina, A., Stantcheva, S., and Teso, E., 2017, "Intergenerational Mobility and Preferences for Redistribution," NBER Working Paper No. 23027 (Cambridge, Massachusetts: MIT Press).

Anand, S., & Kanbur, S. M. R. (1993). The Kuznets Process and the InequalityDevelopment Relationship. Journal of Development Economics, 40, 25-52.

Banerjee, A. and Duflo, E., 2003, "Inequality and Growth: What Can the Data Say?" Journal of Economic Growth - Springer, Vol. 8(3) (September), pp. 267–299.

Banerjee, A. V., & Newman, A. F. (1998). Information, the Dual Economy and Development. Review of Economic Studies, 65(4), 631-653.

Bradbury, K., and Triest, R., 2016, "Inequality of Opportunity and Aggregate Economic Performance," Russell Sage Foundation Journal of the Social Sciences 2, pp. 178–201.

Brueckner, M. and Lederman, D., 2015, "Effects of Income Inequality on Aggregate Output," Policy Research Working Paper Series 7317 (Washington: World Bank).

Cingano, F., 2014, "Trends in Income Inequality and its Impact on Economic Growth," OECD Social, Employment and Migration Working Paper No. 163 (Paris: Organisation for Economic Co-operation and Development).

Dahan, M., & Tsiddon, D. (1998). Demographic Transition, Income Distribution, and Economic Growth. Journal of Economic Growth, 3, 29-52.

De Kruijk, H. and Naseem, S.M. (1986), "Inequality in the four provinces of Pakistan [with comments]", The Pakistan Development Review, Vol. 25 No. 4, pp. 685-706.

Dr. Noor Ahmad*, Ameer Muhammad Kasi, Maiwand Khan, Sanaullah Khan, Naseebullah, & Waseem Haider. (2025). FISCAL DECENTRALIZATION AND ITS IMPACT ON HOUSEHOLD WELFARE IN PUNJAB, PAKISTAN: A SPATIAL ANALYSIS. Journal for Current Sign, 3(1), 89–106.

Fei, J.C., & Ranis, G. (1961). A Theory of Economic Development. American Economic Review, 51(4), 535-565.

Forbes, K., 2000, "A Reassessment of the Relationship Between Inequality and Growth," American Economic Review, American Economic Association, Vol. 90(4) (September), pp. 869–887.

Galor, O., & Tsiddon, D. (1996). Income Distribution and Growth: the Kuznets Hypothesis Revisited. Economica, 63, S103-S117.

Gignoux J. 2009. Measuring Inequality of Opportunities in Latin America and the Caribbean. World Bank: Washington DC.

Glomm, G., & Ravikumar, B. (1998). Increasing Returns, Human Capital, and the Kuznets Curve. Journal of Development Economics, 55, 353-367.

Greenwood, J., & Jovanovic, B. (1990). Financing Development, Growth, and the Distribution of Income. Journal of Political Economy, 98(5), 1076-1107.

Haddad, Lawrence and Ravi Kanbur. 1990."How Serious is the Neglect of Intra-Household Inequality?"

Haider, W., & Khan, N. A. (2024). Analyzing club convergence in child schooling in Pakistan during 2004-2020. The Discourse, 10(1), 1-21.

Haider, W., Ahmed, N., & Khan, S. A. (2025). Unlocking Project Success: The Synergistic Effects of Project Management Maturity Matrix, Governance, and Top Management Support. Social Science Review Archives, 3(1), 1154-1165.

Haider, W., Khan, M., Khan, S., Kasi, A. M., & Ahmad, N. (2025). Servant Leadership in Agile Frameworks: A Catalyst for Collaboration and Innovation. Policy Journal of Social Science Review, 3(1), 172-184.

Haider, W., Khan, S. A., Khan, N., Ahmed, Z., & Khilji, N. (2024). Maximizing Logistics Output through Strategic Packaging Decisions: An Exploratory Study. Journal of Applied Research and Multidisciplinary Studies, 5(2).

Haq, R. (1999), Income Inequality and Economic Welfare. A Decomposition Analysis for the Household Sector in Pakistan (No. 1999: 170), Pakistan Institute of Development Economics, available at:

Hsieh, C., Hurst, E., Jones, C., and Klenow, P., 2013, "The Allocation of Talent and U.S. Economic Growth," NBER Working Paper 18693 (Cambridge, Massachusetts: National Bureau of Economic Research). https://pide.org.pk/pdfpideresearch/rr-013-income-inequality-and-economic-welfare-adecomposition-analysis-for-the-household-sector-in-pakistan.pdf. Inequality, Vol. 4, No. 3, pp. 367-374, 2006.

Inglehart, R., and Norris, P., 2011, Sacred and Secular, 2nd ed. (New York: Cambridge University Press).

Inglehart, R., and Norris, P., 2016, "Trump, Brexit and the Rise of Populism: Economic Have-Nots and Cultural Backlash," Faculty Research Working Paper RW16-06 (Cambridge, Massachusetts: Harvard Kennedy School).

Kanbur, Ravi and Matti Tuomala. 2016. "Groupings and the Gains from Targeting", Research in

Kanbur, Ravi. 2006. "The Policy Significance of Inequality Decompositions," Journal of Economic

Kasi, A. M., Khan, S., Khan, M., Ahmad, N., & Haider, W. (2025). Unveiling Poverty in Pakistan: The Role of Education, Remoteness, and Regional Factors. Journal of Social Signs Review, 3(2), 93-132.

Kemal, A.R. (1981), Income Distribution in Pakistan: A Review, Pakistan Institute of Development Economics, No. 123, available at: https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/2513.

Khan, M.Z., Rahman, S. and Chaudhry, A.R. (2015), "Education and income inequality in Pakistan", Management and Administrative Science Review, Vol. 4 No. 1, pp. 134-145.

Kraay, A., 2015, "Weak Instruments in Growth Regressions: Implications for Recent Crosscountry Evidence on Inequality and Growth," Policy Research Working Paper Series 7494 (Washington: World Bank).

Kuznets, S. (1955). Economic Growth and Income Inequality. American Economic Review, 65(4), 1-28.

Lewis, W. A. (1954). Economic Development with Unlimited Supplied of Labour. Manchester School, 22, 139-191.

Lloyd-Ellis, H., & Bernhardt, D. (2000). Enterprise, Inequality and Economic Development. Review of Economic Studies, 67, 147-168.

Marrero, G. and Rodríguez, J., 2013, "Inequality of Opportunity and Growth," Journal of Development Economics, 104, pp. 107–122.

Milanovic, Branko, 2016, Global Inequality: A New Approach for the Age of Globalization (Cambridge, Massachusetts: Harvard University Press).

Ostry, J., and Berg, A., 2011, "Inequality and Unsustainable Growth; Two Sides of the Same Coin?" IMF Staff Discussion Note No. 11/08 (Washington: International Monetary Fund).

Ostry, J., Berg, A., and Tsangarides, C., 2014, "Redistribution, Inequality, and Growth," IMF Staff Discussion Note No. 14/02 (Washington: International Monetary Fund).

Paes de Barros R, Ferreira FHG, Vega JRM, Saavedra JC, De Carvalho M, Franco S, Freije-Rodriguez S,

Panizza, U., 2002, "Income Inequality and Economic Growth: Evidence from American Data," Journal of Economic Growth, Vol. 7(1), pp. 25–41.

Persson, T., and Tabellini, G., 1994, "Is Inequality Harmful for Growth? Theory and Evidence," American Economic Review, 84, pp. 600–621.

Peterson, E. W. F., 2017, Is Economic Inequality Really a Problem? A Review of the Arguments, Social Sciences, MDPI, Vol. 6(4), pp. 1–25.

Piketty, Thomas, 2014, Capital in the 21st Century (Cambridge, Massachusetts: The Belknap Press of Harvard University Press).

Qazi, W., Raza, S.A., Jawaid, S.T. and Karim, M.Z.A. (2018), "Does expanding higher education reduce income inequality in emerging economy? Evidence from Pakistan", Studies in Higher Education, Vol. 43 No. 2, pp. 338-358.

Rauch, J. E. (1993). Economic Development, Urban Underemployment, and Income Inequality. Canadian Journal of Economics, 26, 901-918.

Robinson, S. (1976). A Note on the U Hypothesis Relating Income Inequality and Economic Development. American Economic Review, 66(3), 437-440.

Stiglitz, Joseph E., 2013, The Price of Inequality: How Today's Divided Society Endangers our Future. New York: W.W. Norton and Company.

Ullah, N. (2022). The Impacts of Demographic Factors, Household Characteristics and Locational Factors on Poverty in Pakistan. Journal of Finance and Accounting Research, 4(2), 100-113.

Waseem Haider, Noor Ahmad, Naseebullah (2025). AGILE METHODOLOGIES FOR PROJECT SUCCESS: EXPLORING THE ROLE OF INNOVATION AND MANAGEMENT SUPPORT. Sohar University Journal Of Sustainable Business, 1(1), 42-56.