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The impact of inequality of opportunity on income disparity: A Case of Pakistan

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Abstract

This study is deliberated to explore the effect of Role of inequality of opportunity in the determination of income disparity in Pakistan. The data set from 1990 to 2020 has been taken for this study from World Bank. To check the short run and long run relationship among inequalities of opportunity in the determination of income disparity employed Autoregressive Distributed Lag (ARDL) bound testing used. The ARDL co-integration results indicate that there is a negative relationship of health and education inequality on income inequality in short run, while all other variables like gross domestic product (GDP) foreign direct investment (FDI) and domestic investment (DI) are also negatively linked with income inequality. In long run, only education inequality, health inequality and domestic investment (DI) are negatively related with income inequality. And all other variables gross domestic product (GDP) and foreign direct investment (FDI) are positively connected with income inequality. Government should implement a progressive tax system where higher-income individuals and corporations are taxed at a higher rate. Investing in education and skills training programs enables individuals from disadvantaged backgrounds to acquire the knowledge and skills necessary for higher-paying jobs. Governments can enhance access to quality education, vocational training, and scholarships to promote social mobility and reduce income inequality. Overall, the study highlights the importance of addressing inequality of opportunity in order to reduce income disparity in Pakistan. By implementing targeted policies and investing in education and skills development, governments can work towards creating a more equitable society with reduced income inequality.

Keywords: Inequality, Income disparity, ARDL, Pakistan

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Introduction

The concept of inequality of opportunity refers to the unequal distribution of opportunities for individuals to succeed and achieve their full potential due to factors beyond their control, such as their socio-economic background, race, gender, or location. Income disparity, on the other hand, refers to the unequal distribution of income among individuals or groups within a society.

Access to quality education is a crucial factor in determining an individual's earning potential. However, inequality of opportunity in education can arise from disparities in school funding, resources, teacher quality, and access to higher education. Those who have limited educational opportunities due to their socio-economic background or other factors may face reduced chances of acquiring the skills and knowledge needed to secure high-paying jobs, leading to income disparities.

Inequality of opportunity in the labor market can also contribute to income disparity. Discrimination based on factors like race, gender, or social class can limit certain individuals' access to high-paying jobs or career advancement opportunities. Additionally, individuals from disadvantaged backgrounds may face systemic barriers, such as limited networks or lack of access to information, that hinder their ability to secure well-paying employment.

Inequality of opportunity can impact social mobility, which refers to the ability of individuals to move up or down the socio-economic ladder in their lifetime. If opportunities for upward mobility are limited for certain groups, such as those born into poverty or marginalized communities, income disparities tend to persist across generations. Lack of access to resources, networks, and opportunities can create a cycle of intergenerational income inequality.

Inequality of opportunity can also affect the accumulation of wealth, which further exacerbates income disparities. Individuals with limited opportunities may struggle to build wealth through asset ownership, such as property or investments. The unequal distribution of wealth can lead to disparities in income-generating assets, passive income, and intergenerational transfers of wealth, reinforcing income inequality over time. Addressing inequality of opportunity is crucial for reducing income disparities. Policies and interventions that aim to level the playing field by providing equal access to quality education, employment opportunities, and social support can help mitigate the impact of factors beyond individual control on income distribution. By promoting equal opportunities, societies can work towards a more equitable distribution of income and create conditions for upward mobility and shared prosperity. Inequality of opportunity can play a significant role in the determination of income disparity. When people have unequal access to opportunities such as

education, healthcare, and employment, it can lead to unequal outcomes in terms of income and wealth.

For example, if certain groups of people have limited access to quality education, they may not have the same opportunities to acquire the skills and knowledge necessary to secure high-paying jobs. This can result in lower incomes and limited opportunities for upward mobility. Similarly, if certain groups of people have limited access to healthcare, they may experience health problems that limit their ability to work and earn income. This can also contribute to income disparities.

In addition, discrimination and bias can also play a role in inequality of opportunity. If certain groups of people are discriminated against based on their race, gender, or other factors, they may face additional barriers to accessing education, employment, and other opportunities that can lead to higher incomes. Therefore, addressing inequality of opportunity is important in reducing income disparities and promoting a more equitable society. Policies such as investing in education, expanding access to healthcare, and promoting diversity and inclusion can all help to reduce inequality of opportunity and promote greater economic equality.

Enhancing human capabilities and achieving socioeconomic development's desired goals both require education. People can expand their perspectives and opportunities through education, as well as participate in public decision-making. Education results in human capital and long-term economic growth because it produces skilled and productive workers. Underinvestment, failure to implement five-year plans, and a lack of purpose and policy direction are just a few of the problems that have plagued Pakistani education. Pakistan has added eighteen primary schools and increased enrollment sixteen times since it gained independence. However, the growing population and a lack of high-quality education have reversed these gains [HDR, 1998].

Accomplishing financial development is a significant objective of any economy. The country which has generally partaken in a decent Gross domestic product development rate but neglected to make an interpretation of this positive improvement into acceptable degree of human turn of events. Pakistan's development policies have primarily focused on achieving rapid economic growth since the country gained independence in 1947, with the provision of basic necessities being an afterthought. A structure of production and distribution resulting from such a process has only been indirectly responsive to social objectives.

The recognizable segregation among people is presently genuinely deeply grounded, as it is boundless in a few circles of life. When this imbalanced attitude toward women is taken into consideration, it is easy to see, for instance, that the wage scales of men and women are clearly different. The nature and extent of this disparity

and difference varies significantly between nations. As referenced over, one of the clearest example in this viewpoint is dissimilarity and lopsidedness in the wages are based on orientation. It is evident that, on average, women earn less than men for work of a comparable nature, and the disparity varies by nation.

Women are exploited in Pakistan in the name of custom and culture, and women's rights are frequently interpreted as religious cover (Waseem, 2006). Public discourse was increasingly ideological in the early stages of independence, but later efforts were made to incorporate Western political ideas into the Islamic state institution (Malik, 1996). Minister bunches were given authority support by the public authority of Zia-ULHaq. One more testing concern was the conflict that existed between ladies related social practices and Islamic norms.

Gap of Study

Inequality of opportunity in education can arise from disparities in school funding, resources, teacher quality, and access to higher education. Those who have limited educational opportunities due to their socio-economic background or other factors may face reduced chances of acquiring the skills and knowledge needed to secure high-paying jobs, leading to income disparities. Inequality of opportunity can also affect the accumulation of wealth, which further exacerbates income disparities. Individuals with limited opportunities may struggle to build wealth through asset ownership, such as property or investments. Some studies just like, Cheema and Sial (2012) check the Poverty and Income Inequality on Growth in Pakistan. Another study Rana et al. (2022) examined Gender Inequality in Pakistan. The gender analysis reveals Pakistan' s difficulty in addressing these issues as well as the widening gap between men and women in a number of fields. So, the aim of this study find out the impact of health and education inequality on income inequality. The improvement in such work, effect of education and health inequality on income inequality may be investigated in a different angle “Role of inequality of opportunity in the determination of income disparity: A Case of Pakistan”. So, this the main contribution of my study.

Objective

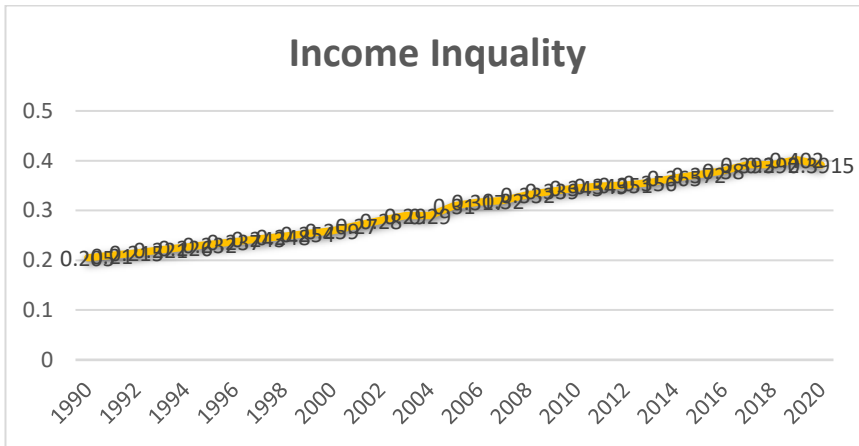
This study aims to address a gap perspective of the role of inequality of opportunity in the determination of income disparity in case of Pakistan from 1990 to 2020.

1. To check the effect of health inequality on income inequality for the case of Pakistan.
2. To check the urbanization on income inequality for the case of Pakistan

3. To check the effect of foreign direct investment on income inequality for the case of Pakistan.
4. To check the effect of domestic investment on income inequality.
5. To check the effect of economic growth on income inequality.
6. To check the effect of health inequality on income inequality for the case of Pakistan.

Graphs of the variables

Graph 1:

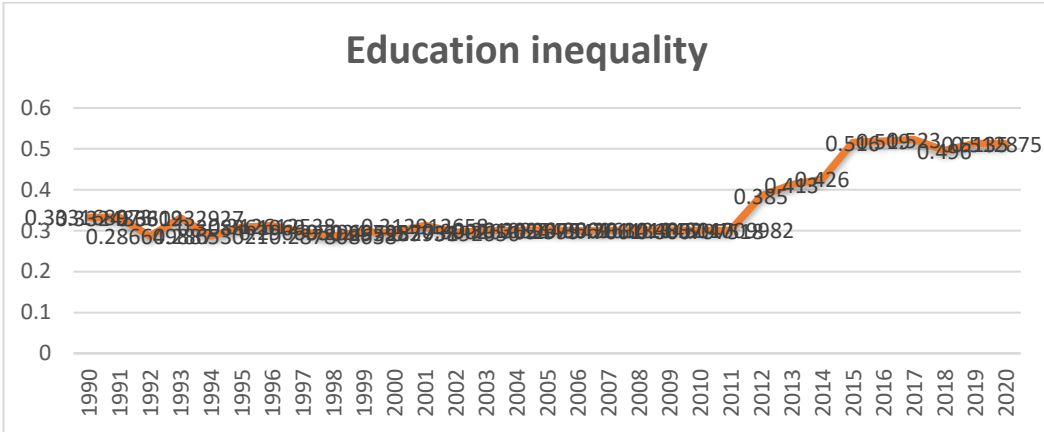


This graph shows the trend of income inequality. So, this graph shows that income inequality has almost increasing trend from 1990 to 2022.

Graph 2:

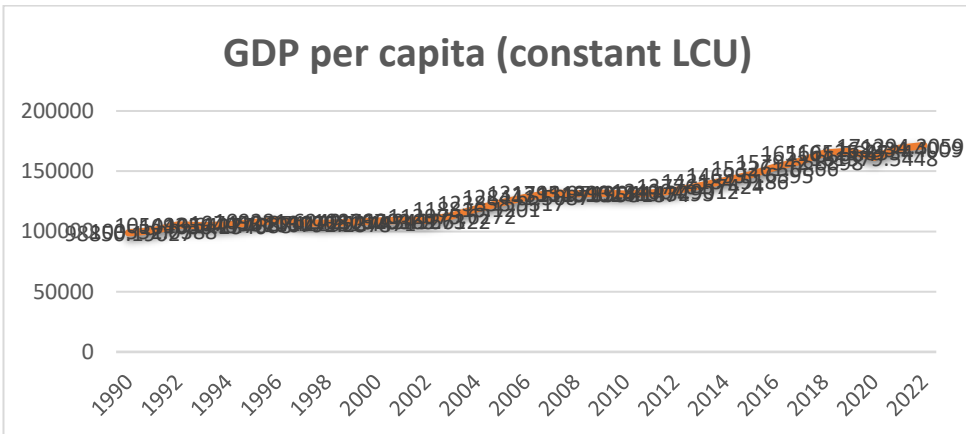
This graph shows the trend of Health Inequality. So, this graph shows that Health Inequality has almost increasing trend till 2017 then a sudden shock in 2018, but after it again an increasing trend till from 2020.

Graph 3:



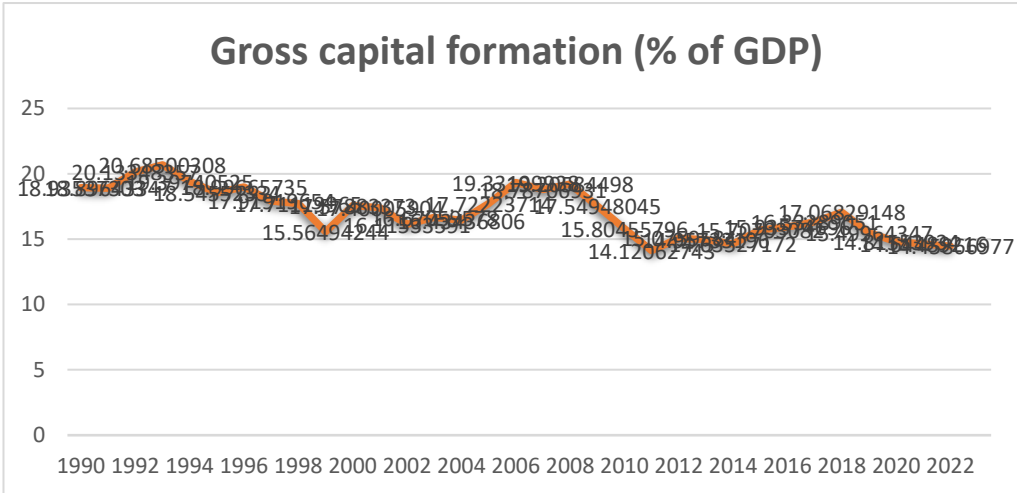
This graph shows the trend of education inequality. So, this graph shows that education inequality has almost increasing trend from 1990 to 2020.

Graph 4:



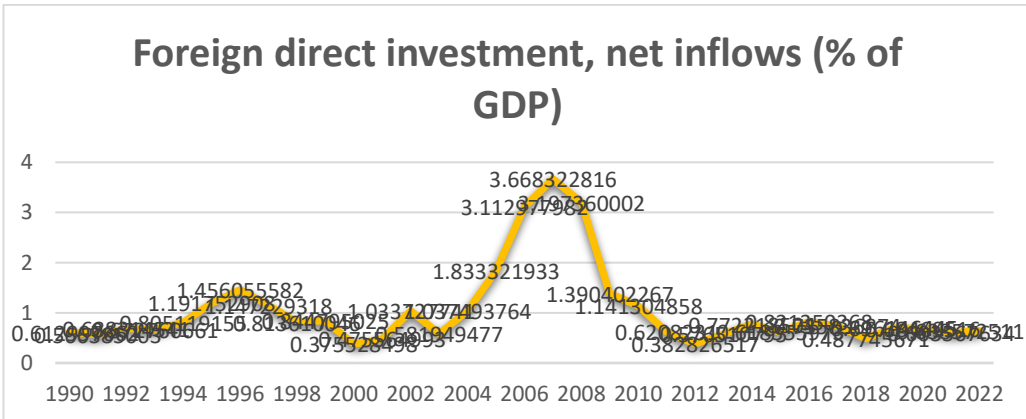
This graph shows the trend of population of GDP. So, this graph shows that GDP has almost increasing trend from 1990 to 2020.

Graph 5:



This graph shows the trend of population of Gross capital formation. So, this graph shows that gross capital formation (DI) has almost mixed trend from 1990 to 2020.

Graph 6:



This graph shows the trend of population of foreign direct investment. So, this graph shows that FDI has almost mixed trend from 1990 to 2020.

Literature Review

Akram et al. (2014) find out the impact of gender bias in education on human capital and its subsequent effect on economic growth. It suggests that when there is a disparity in educational opportunities between males and females, less capable males may receive education while potentially more capable females may be denied the same opportunities. This results in a situation where the overall average ability of educated individuals is lower compared to a scenario where both genders receive equal educational opportunities. The study being referred to aims to examine the effect of gender bias in education on economic growth in Pakistan. It uses data from the period of 1972 to 2010 and employs co-integration analysis to analyze the relationship between gender balance in education and economic growth. Ahang (2014) explored the Impact of Gender Inequality on Economic Growth in Developed Countries. As a result, societies would naturally prioritize gender equality in health and education. The estimation in the series of rich countries from 2006 to 2012 using panel data and pooled EGLS (cross-section weights) demonstrates that female experience, which is regarded as an index of social capital, has a negative impact on economic growth, while female human capital has a positive impact.

Alam (2011) depicted the impact of gender discrimination on gender development and poverty alleviation. This study focuses on orientation separation and its impact on advancement and poverty alleviation. The researcher selected 50 respondents (25 male and 25 female) in Hazar Khuani Peshawar using purposive sampling. The purpose of the study is to identify the main causes and areas of orientation segregation and examine how it affects development and poverty alleviation. According to the findings of the data analysis, there is a disparity in the targeted area that has a number of effects on poverty alleviation and development.

Ali (2015) depicted the multiple linear regression was used to determine how gender inequality in employment and education affected economic growth. The estimates and results are looked at, and the results show that economic growth and gender equality in employment and education go hand in hand. Since GDP growth is positively impacted by all independent variables, reducing gender inequality will ultimately result in an increase in Pakistan's GDP growth.

Ali and Jiang (2000) find out that it is confirm the presence of a long-run relationship between economic growth and wage differential. Specifically, the findings indicate that wage inequality has a negative and significant impact on economic growth in the long run, as suggested by the results of the unrestricted error correction model. These findings diverge from the conclusions of a previous study conducted by Seguino (2000), which found a positive association between wage inequality and economic growth. The discrepancy between the two studies suggests

that the relationship between wage inequality and economic growth may vary depending on the specific context and variables considered.

Begam (2019) cited an Assessment of Gender Inequality. Secondary data from a variety of government, international, and local nongovernmental organizations' reports serve as the foundation for the analysis. The results of a gender assessment can be used to develop a variety of policies and strategies for dealing with gender issues.

Bukhari (2015) cited the practices of gender discrimination and its implications in Pakistan is a significant topic of concern. In this context, the study you mentioned focuses on the problems and potential solutions related to gender discrimination in the country. One key aspect addressed in the study is the role of women in Pakistani society. It likely explores the challenges and obstacles women face due to gender-based discrimination, as well as their contributions to various aspects of society. It is important to recognize that gender discrimination and unequal treatment of women are not unique to Pakistan but are prevalent in various Muslim countries and societies worldwide.

Bukhari and Ramzan (2013) explored the gender discrimination. Thematic analysis was used to look at the data. The principles suggested by Spiggle (1999) and others (Strauss and Corbin, 1990 ;) were utilized during the data analysis procedure. The outcome might be right however reason is social requirements, accepted practices, absence of mindfulness, absence of schooling and destitution, any place the conditions will be same the outcome will be practically same.

Chani et al. (2012) examined the relationship between a composite index of gender inequality, investment, trade openness, labor force growth, and the growth rate of real GDP per capita in Pakistan. According to the findings of the study, gender inequality has a significant and negative impact on Pakistan's economic growth. This suggests that higher levels of gender inequality are associated with lower economic growth rates. Gender inequality may manifest in various forms, such as disparities in educational opportunities, limited access to healthcare and resources, and unequal participation in the labor market.

Chaudhry (2009) examined the Impact of Gender Inequality in Education on Poverty in Pakistan. The paper you mentioned utilizes primary data sets and applies Logit regression analysis to examine the relationship between gender inequality in education and rural poverty in Pakistan. The primary objective is to investigate how gender inequality in education affects the likelihood of experiencing poverty in rural areas. This suggests that larger household sizes and a higher female-to-male ratio

within households are associated with an increased likelihood of poverty in rural areas of Pakistan.

Cheema and Sial (2012) find out Poverty, Income Inequality, and Growth in Pakistan. The study you mentioned analyzes the relationship between poverty, income inequality, and growth in Pakistan using pooled data from eight household income and expenditure surveys conducted between 1992/93 and 2007/08. It employs fixed effects/random effects models to estimate the long-term relationships between these variables. The gross growth elasticity of poverty represents the percentage change in poverty resulting from a 1% increase in per capita income, while the net growth elasticity of poverty accounts for changes in income inequality as well.

Gudaro (2010) examined multiple regression models are used to measure the connection between inflation, foreign direct investment, and GDP. The model is overall significant, with GDP and FDI having a positive and significant relationship, and GDP and inflation having a negative and significant relationship, according to the findings. Siddique (2017) depicted the impact of FDI on Economic Growth. To investigate this relationship, the study employs co-integration lag bounds with autoregressive distributed lag (ARDL) and the Granger causality test. The ARDL bounds test is used to determine whether economic growth, FDI, trade, physical capital, and human capital are co-integrated, indicating a long-term relationship between these variables. The findings point to a unidirectional relationship between FDI, physical capital, trade, and economic expansion.

Gul et al. (2012) described the factors influencing foreign direct investment. Using the straightforward least squares method, we estimated the impact that trade and FDI have on Pakistan's economic expansion in this study. The most significant result of the study is that there is a strong positive correlation between growth of the economy and foreign direct investment. Zeb et al. (2013) find out the role of foreign direct investment with economic growth for the case of Pakistan. Technique has been applied to really take a look at the impact of these factors on Gross domestic product of Pakistan. The findings demonstrate that FDI significantly contributes to Pakistan's economic expansion.

Hassan and Rafaz (2017) depicted the Role of Female Education in Economic Growth of Pakistan. This study used least Squares regression method to examining the impact of female education on Pakistan's economic growth from 1990 to 2016. The study utilizes OLS regression analysis to investigate the relationship between female education, female labor force participation, education expenditure, fertility rate, and Pakistan's GDP. Sajid (2014) cites the political economy of gender equality, indicating that gender equality and empowering women play a crucial role in driving economic growth and development. ARDL bond test approach was used to

determine the long-term relationship between the variables, but Wald test f statistics yielded inconclusive results. Lastly, the empirical analysis used the OLS estimation, which found that urbanization, economic growth, foreign direct investment, and improved law and order all have a positive impact on women's status in Pakistan while remittances have a negative impact.

Hassan et al. (2016) find out the inequality with urbanization and crime. The Granger causality test and the autoregressive distributed lag model (ARDL) are used in this study to determine the direction of causality between crime and its determinates from 1978 to 2011.The results of the Granger causality test, there is a unidirectional Granger causality between economic growth and crime and a bidirectional Granger causality between urbanization and crime.

Iqbal et al. (2012) Cited a nation cannot be considered secure until its entire population feels safe, and the security of a state like Pakistan is linked to the security of its population as a whole. Promoting gender equality and eliminating biased attitudes towards women are indeed crucial for the advancement and success of a country. Gender equality is not only a matter of human rights but also an essential component of sustainable development. According to the findings of this study, there are a number of options for achieving gender parity in the country, which will increase non-traditional security, reduce gender discrimination against women, and give them equal opportunities in society and the workplace.

Muhammad et al. (2019) examined this concentrate fundamentally assesses the different orientation amount approaches embraced by Pakistan and what have been the entertainers and elements answerable for such techniques. Despite the fact that Pakistan's constitution guarantees women equal rights, these provisions have not significantly improved women's status. The distinct exploration folklore has been embraced for this paper. Investigation has discovered that orientation standard has forever been presented in detachment.

Mukherjee and Mukhopadhyay (2013) described impact of gender inequality on economic growth. This study looks at how gender inequality in education and labor force participation affect economic growth using cross-country regressions. The finding suggests that while gender inequality in labor force participation has a positive effect on economic growth, gender inequality in education has a negative impact.

Mushtaq and Soharwardi (2013) described the gender disparity in education. This review analyzed Orientation difference in net elementary school enrolment among the locale of Punjab (Pakistan). This study makes use of secondary data from 34 districts in Punjab. The study suggests that there is a negative relationship between the divergence in net primary enrollment among different regions in Punjab and the number of schools, number of teachers, male adult literacy rate, and female adult

literacy rate. On the other hand, there is a positive relationship between the divergence in net primary enrollment and per capita income and poverty status.

Rahman (2014) explored the numerous relapse method is utilized in which gross domestic product is reliant variable while unfamiliar direct speculation (FDI) and buyer cost record (CPI) are free factors. The outcome shows that there is a positive connection between the FDI and Gross domestic product and have a negative relationship with CPI.

Rana et al (2022) examined Gender Inequality in Pakistan. The gender analysis reveals Pakistan's difficulty in addressing these issues as well as the widening gap between men and women in a number of fields. A variety of strategies and policies for dealing with gender issues can be implemented on the basis of the results of a gender assessment.

Salik and Zhiyong (2014) described the analysis, interpretation, and findings of the data: Female residents of economically disadvantaged areas of the country need access to educational opportunities. It is possible to approach international nongovernmental organizations and international organizations that work to promote education, such as UNESCO, UNICEF, and the World Bank, and they may be involved in this endeavor. Masitoh and Pramesti (2020) find out gender inequality in Pakistan. This is shown by the results of a 2018 report from the World Economic Forum (WEF) called The Global Gender Gap Index. The data for this study will be gathered through secondary data and a literature review using qualitative research methods that place an emphasis on observing and comprehending a social phenomenon. The main finding of the study was that gender inequality is a problem in Pakistan in great detail.

Shahbaz (2011) explored Financial Development and Income Inequality in Pakistan. This study employed the ARDL bounds testing approach to investigate the existence of long-run relationships using data spanning from 1971 to 2005. The results of the study analyzing the behavior and dynamics of the variables over a relatively long period. Study find that income inequality worsens as a result of economic growth, and that trade openness further exacerbates this problem.

Methodology and Theoretical framework

This study has focused on investigating the impact of income inequality on economic growth in developing countries, with a particular focus on Pakistan. The data used in the study cover the period from 1990 to 2020, and the source of the data is the World Bank.

The following are estimated variable and their impact on model explained.

Model:

$$II = \gamma 0 + \gamma 1 edu.I + \gamma 2 HI + \gamma 3 URABAN + \gamma 4 FDI + \gamma 5 DI + EG$$

Where

II = education inequality

HI = Health inequality

URBAN = Urbanization

FDI = Foreign direct investment

DI = Domestic investment

EG = economic growth

Table 1: Variables Measurement

Dependent Variable	**Measurement**
Income inequality	Income disparity has been used for measuring inequality of opportunity. Income inequality is used to describe the situation of distribution of income amongst the peoples.
Independent Variable	**Measurement**
Health Inequality	Health expenditures are also an important variable to observe the impacts on income disparity. Also two forms of private and public expenditures are taken for health. Here, in this study, public expenditures taken on health.
Education inequality	Educational inequality can be defined as intergroup disparities regarding the opportunities for academic achievement. These disparities can concern a variety of educational factors, such as resources, treatment, access, and/or results.
Urbanization	Urbanization refers to the population shift from rural to urban areas, the corresponding decrease in the proportion of people living in rural areas, and the ways in which societies adapt to this change.
Foreign Direct Investment (FDI)	Foreign direct investment refers to direct investment equity flows in the reporting economy. It is the sum of equity capital, reinvestment of earnings, and other capital.

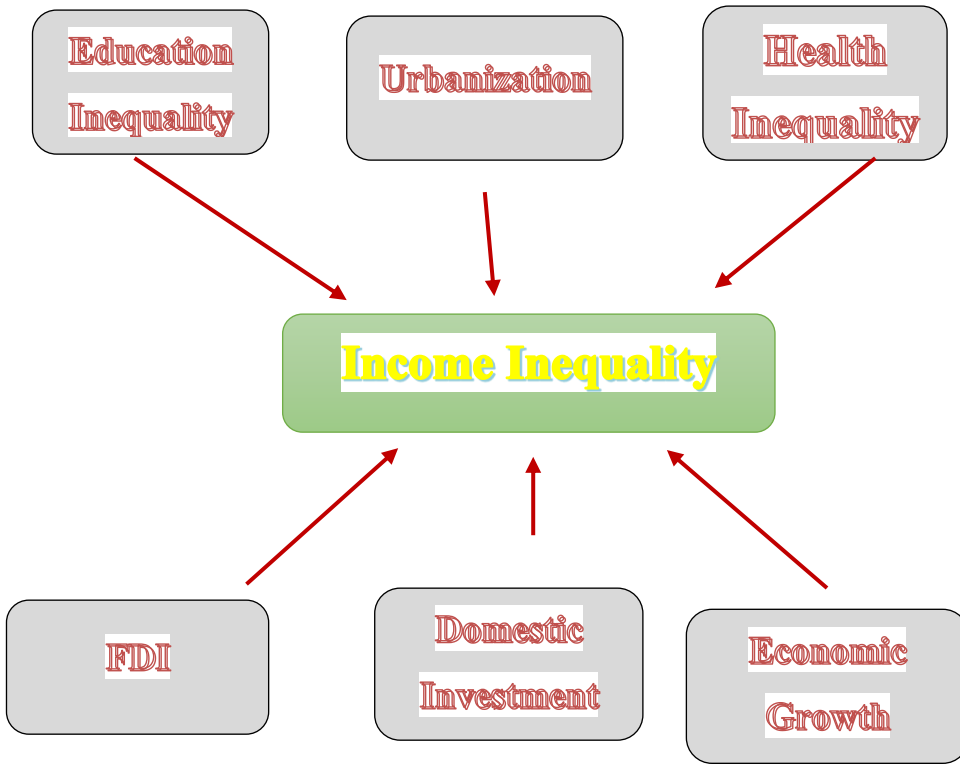
Domestic Investment	Gross domestic investment consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories.
Economic growth	An increase in the production of economic goods and services in one period of time compared with a previous period.

Theory

This study based on the theory of theoretical approaches to inequality in economics and sociology, focusing on the preliminary assessment of economic theories of inequality. It briefly mentions the perspective of Adam Smith and his work "Wealth of Nations" where he discusses the relationship between inequality and economic growth within the framework of a feudal society. According to Smith, a free market for goods and labor leads to an increasing division of labor, contributing to economic growth. However, Smith acknowledges that the distribution of the overall product is not equal but proportionate, meaning that different individuals or groups may benefit more from this growth. Smith's perspective reflects the tension between unfettered competition in the market and the existing social ranks in a feudal society, although he does not explicitly address this issue. Furthermore, the excerpt mentions that there are three traditions of research on inequality in both economics and sociology. These traditions are not explicitly described in the provided text. The second part of the paper is said to discuss contemporary issues of inequality that have been recognized by these three traditions, emphasizing the need to consider these issues when studying inequality.

Theoretical Framework

So, the theoretical framework of this study is based on economic theories of inequality which showed the effect of education, health inequality on income inequality.



Results and Discussion

The results of table 1 are showing the results of the statistical analysis, specifically describing the descriptive statistics and the results of the Jarque-Bera test for each variable included in the study. The variables examined are income inequality (II), education inequality (EI), health (HI), urbanization (URBAN), foreign direct investment (FDI), and domestic investment (DI).

Table 1

Descriptive Statistics

	II	EI	HI	URBAN	FDI	DI	logU
Mean	0.303016	0.354529	0.693786	4.197125	1.065919	21.40149	53910007
Median	0.310000	0.302541	0.695288	4.432626	0.772219	22.3156	53260672
Maximum	0.402000	0.523000	0.918894	7.705898	3.668323	28.73378	73223503
Minimum	0.205000	0.286530	0.547333	1.014396	0.375528	14.68225	32902112
Std. Dev.	0.063414	0.085921	0.096709	1.69098	0.823612	4.371632	1335096
Skewness	-0.015570	1.147443	0.544611	0.096029	2.087610	-0.186495	-0.011983
Kurtosis	1.626728	2.602385	2.368364	2.504475	6.403172	1.682836	1.594659
Jarque-Bera	2.437174	7.006769	2.047767	0.364808	37.47648	2.420636	2.551760
Probability	0.295648	0.030095	0.359197	0.833265	0.000000	0.298102	0.279185
Sum	9.393500	10.99039	21.50737	130.1109	33.04348	663.4462	1.67E+09
Sum Sq. Dev.	0.120638	0.221471	0.280581	85.77403	20.35009	573.3349	5.35E+15
Observations	31	31	31	31	31	31	31

For each variable, the mean, median, maximum, and minimum values are provided, indicating the central tendency and the range of values observed. The standard deviation is mentioned as a measure of data spread, with a higher value indicating greater variability.

Skewness and kurtosis values are provided to assess the symmetry and peakness of the distribution of each variable. A positive skewness suggests a right-tail skew, while a negative skewness suggests a left-tail skew. Kurtosis measures the degree of peakedness of the distribution.

The Jarque-Bera test is conducted to assess the goodness of fit of the data to a normal distribution. The test statistic and the p-value are reported for each variable. If the p-value is less than 0.05, it suggests that the variable's distribution significantly deviates from a normal distribution.

Additionally, the stationarity of the variables is tested using the Augmented Dickey-Fuller (ADF) test. The ADF test is a unit root test used to determine the presence of a unit root (non-stationarity) in a time series. The excerpt mentions that stationarity was checked at the level of the variables, but the results indicated non-stationarity. After taking the first difference, the variables achieved the required stationarity.

Table 2

Correlation Matrix

	II	EI	HI	URBAN	FDI	DI	logU
II	1.000	-0.538615	-0.304185	0.262339	0.129474	0.109267	-0.131182
EI		1.000000	0.097837	-0.240754	-0.148327	-0.141718	0.041132
HI			1.000000	0.182756	0.669039	0.549791	-0.128492
URB				1.000000	0.029403	0.298369	0.061715
FDI					1.000000	0.773659	-0.140062
DI						1.000000	
logU							1.000000

Above correlation matrix show positive relationship with all the employed variables, like II, education inequality, health, urbanization , foreign direct investment and domestic investment .Income inequality is strongly and positively correlated with education inequality (EI),health (HI) ,urbanization (URBAN) ,foreign direct investment (FDI) , and domestic investment (DI) respectively. Education inequality is also strongly and positively correlated with health (HI), foreign direct investment (FDI) and domestic investment (DI) respectively.

Table 3

Unit root Test

	ADF test		PP test	
Variables	**t-stat.**	**Stationarity**	**t-stat.**	**Stationarity**
II	-3.679322 (0.0000)	I(1)	-3.679322 (0.0000)	I(1)
EI	-3.679322 (0.0000)	I(1)	-3.679322 (0.0000)	I(1)
HI	-3.679322 (0.0000)	I(1)	-3.679322 (0.0000)	I(1)
URBAN	-3.679322 (0.0016)	I(1)	-3.679322 (0.0020)	I(1)
FDI	-3.679322 (0.0136)	I(1)	-3.679322 (0.0187)	I(1)
DI	-3.679322 (0.0016)	I(1)	-3.679322 (0.0016)	I(1)
logU	-3.679322 (0.0313)	I(0)	-3.679322 (0.0277)	I(0)

Table 3 is showing the findings of the unit root test. According to the results, Income inequality (II), Education inequality (EI), Health (HI), urbanization (URBAN) and are stationary at the first difference, while the FDI and Domestic investment (DI) are stationary at a level at ADF Test. The variables included in the analysis have different integration orders. Integration refers to the stationarity properties of a time series variable. In this case, some variables (II, EI, HI, and DI) are stationary after taking the first difference, while others (FDI and DI) are stationary at the level (without differencing).

To investigate the long-run and short-run relationships among the variables, the study employs ARDL (Autoregressive Distributed Lag) bound testing. ARDL bound testing is a methodology used to examine the existence of cointegration, which indicates a long-run relationship, among variables with different levels of integration.

Table 5									
ARDL bound testing to cointegration									
ARDL Bound Testing					**Diagnostic Tests**				
Estimated model	**Optimal lag length**	**F. stats**	**1 percent**		χ^2 **LM Serial**	χ^2 **BPG Hetro**	χ^2 **Ramsey RESET**	**Normality Test**	
			LB	**UB**					
F_{CO2}(II/EIH,urban, FDI,DI,logU)	2,1,0,0,2,2,2	3.11812*	2.88	3.99	0.7088 (0.4334)	0.8716 (0.7477)	0.134616 (0.7196)	**Jarque. Bera**	1.036829 (0.595464)
*, significant at 1 percent level									

The results of table 5 indicate that the bound test statistic value is 3.11812, which is higher than the critical value of 5 for the upper bound. This result indicates that there is a long-run relationship among the variables included in the analysis. Now we can estimate a short run and long run coefficient.

Table 6				
Short Run and Long Run Estimations				
Short run Analysis				
Dependent Variable II				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	2.120059	0.147515	14.37184	0.0000*
II	0.426512	0.282483	1.509867	0.0707**
EI	-0.073791	0.035471	-2.083496	0.0000*
HI	-0.095557	0.031833	-3.001812	0.0170*
URBAN	-0.001454	0.000573	-2.107928	0.0681**
FDI	-0.001969	0.002255	-0.873332	0.4079
DI	-1.0243	0.01410	-0.59465	0.0400*
logU	-0.000000	0.000000	-3.678745	0.0062*
ECT_{t-1}	-1.866650	0.456899	-4.085474	0.0035*
The findings of the table revealed the results of short run coefficients. Values of the probability of the variables Income inequality (II), Education inequality (EI), Health (HI), Urbanization (URBAN), and Foreign direct investment (FDI) and Domestic investment (DI)				

show the significance level at 5%. The impact of the Income inequality (II), Education inequality (EI), Health (HI), Urbanization (URBAN), and Foreign direct investment (FDI) are positive on the II of Pakistan but the FDI has an inverse impact on II. The coefficient of ECM term is -0.91354 and the p-value is 0.0000 which indicates it is significant and about 91% adjustment speed will be required for one year towards equilibrium.

Long Run Analysis

Dependent Variable II

EI	0.013685	0.017672	-0.774407	0.4610
HI	0.131177	0.020283	-6.467270	0.0002*
URBAN	-0.001825	0.00598	3.053211	0.0157*
FDI	-0.007613	0.001422	5.353160	0.0007*
DI	-1.1043	0.001410	-0.509465	0.0121*
logU	-0.000000	0.000000	53.703487	0.0000*
C	0.091858	0.007916	11.604723	0.0000*
R-squared		0.914661		
Adjusted R-squared		0.851412		
Durbin-Watson stat		2.837900		

*, **. Significant at 1 and 5 percent level

The results in table 6 show that income inequality (II), education inequality (EI), health (HI), and urbanization (URBAN) have positive and significant effects on income inequality (II) in the long run. This means that an increase in these factors is associated with higher levels of income inequality in Pakistan.

Specifically, the coefficient for income inequality (II) is estimated to be 0.4610, and the probability associated with this coefficient is 0.013685. This indicates that income inequality has a positive and statistically significant impact on itself, suggesting that higher levels of income inequality tend to perpetuate and exacerbate income inequality over time.

Similarly, education inequality (EI), health (HI), and urbanization (URBAN) also have positive and significant effects on income inequality. This implies that disparities in education, health, and urbanization contribute to higher levels of income inequality in Pakistan.

On the other hand, foreign direct investment (FDI) is found to have a negative and significant impact on income inequality. The coefficient for FDI is estimated to be -0.007613, and the associated probability is 0.0007. This suggests that an increase in foreign direct investment is associated with lower levels of income inequality in Pakistan.

Conclusion

The main objective of this study is to investigate the impact of education and health inequality on income inequality in Pakistan for the period 1990 to 2020. The study finds that the higher level of education inequality can lead to greater income inequality in the short term. Inequality of opportunity can also affect the accumulation of wealth, which further exacerbates income disparities. Individuals with limited opportunities may struggle to build wealth through asset ownership, such as property or investments. The unequal distribution of wealth can lead to disparities in income-generating assets, passive income, and intergenerational transfers of wealth, reinforcing income inequality over time. In addition, discrimination and bias can also play a role in inequality of opportunity. If certain groups of people are discriminated against based on their race, gender, or other factors, they may face additional barriers to accessing education, employment, and other opportunities that can lead to higher incomes. The findings of the study show that education and health inequality have positively and significant linked with income inequality. The result of the current study is related to the theory "A theory of theoretical approaches to inequality in economics and sociology. A preliminary assessment. The proper distribution of resources can leads to low level of inequalities and instabilities in Pakistan. The results of the study imply that reducing education and health disparities and ensuring equal access to opportunities can play a crucial role in mitigating income inequality in Pakistan. Policies and interventions aimed at improving educational and healthcare systems, addressing discrimination and bias, and promoting inclusive growth can help create a more equitable society with reduced income disparities and greater stability.

References

Akram, N., Hamid, A., & Bashir, S. (2011). Gender differentials in education and their impact on economic growth of Pakistan. *Journal of Business & Economics*, *3*(1), 102.

Alam, A. (2011). Impact of gender discrimination on gender development and poverty alleviation. *Sarhad J. Agric*, *27*(2), 330-331.

Ali, A., & Jiang, L. J. (2016). Examining the Relationship between Inequalities in Gender Wage and Economic Growth in Pakistan. *Pakistan Journal of Gender Studies*, *12*(1), 39-52.

Ali, M. (2015). Effect of gender inequality on economic growth. Case of Pakistan. *Journal of Economics and Sustainable Development*, *6*(9), 10-10.

Begam, A., & Mujahid, N. (2019). An Assessment of Gender Inequality: A Case Study of Pakistan. *IJWE*, *5*(1), 43-62.

Bukhari, F. Y., & Ramzan, M. (2013). Gender discrimination: A myth or truth women status in Pakistan. *Journal of Business and Management*, *8*(2), 88-97.

Bukhari, M. A. H. S., Gaho, M. G. M., & Soomro, M. K. H. (2019). Gender inequality: problems & its solutions in Pakistan. *The Government-Annual Research Journal of Political Science.*, *7*(7).

Chaudhry, I. S., & Rahman, S. (2009). The impact of gender inequality in education on rural poverty in Pakistan: an empirical analysis. *European Journal of Economics, Finance and Administrative Sciences*, *15*(1), 174-188.

Cheema, A. R., & Sial, M. H. (2012). Poverty, income inequality, and growth in Pakistan: A pooled regression analysis. *The Lahore Journal of Economics*, *17*(2), 137.

Gudaro, A. M., Chhapra, I. U., & Sheikh, S. A. (2010). Impact of foreign direct investment on economic growth: A case study of Pakistan. *IBT Journal of Business Studies (JBS)*, *2*(2).

Gul, S., Sajid, M., Afzal, F., Khan, M. B., & Mughal, S. (2012). Factors influencing foreign direct investment. *Economics & Finance Review*, *2*(2).

Hassan, M. S., Akbar, M. S., Wajid, A., & Arshed, N. (2016). Poverty, urbanization and crime: Are they related in Pakistan. *International Journal of Economics and Empirical Research*, *4*(9), 483-492..

Hassan, S. A., & Rafaz, N. (2017). The role of female education in economic growth of Pakistan: A time series analysis from 1990-2016. *International journal of innovation and economic development*, *3*(5), 893.

Iqbal, H., Afzal, S., & Inayat, M. (2012). Gender discrimination: implications for Pakistan security. *IOSR Journal of Humanities and Social Science*, *1*(4), 16-25.

Muhammad, S., Rahim, N., & Hanif, S. (2019). Gender quota in Pakistan: An analytical study. *Pakistani Social Sciences Review*, *3*(2), 30-46.

Mukherjee, P., & Mukhopadhyay, I. (2013). Impact of gender inequality on economic growth: A study of developing countries. *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, *13*(2), 61-69.

Rahman, Z. U. (2014). Impact of foreign direct investment on economic growth in Pakistan. *Journal of Economics and Sustainable Development*, *5*(27).

Salik, M., & Zhiyong, Z. (2014). Gender discrimination and inequalities in higher education: A case study of rural areas of Pakistan. *Academic Research International*, *5*(2), 269.

Shahbaz, M., & Islam, F. (2011). Financial development and income inequality in Pakistan: an application of ARDL approach.

ul ain Rana, Q., Tarar, M. A., & Sultan, R. S. (2022). Gender Inequality in Pakistan: An Assessment. *Pakistan Social Sciences Review*, *6*(2), 221-231.