

Explaining Poverty and Income Inequality in Pakistan: The Long-Run Role of Education, Employment and Macroeconomic Factors

Farzana Munir¹, Ifrah Tasleem², Khawaja Asif Mehmood³

¹Assistant Professor, School of Economics, Bahauddin Zakariya University, Multan, Pakistan.

Email: farzanamunir@bzu.edu.pk

²M. Phil Scholar, School of Economics, Bahauddin Zakariya University, Multan, Pakistan.

Email: ifratasleem2633@gmail.com

³Assistant Professor, School of Economics, Bahauddin Zakariya University, Multan, Pakistan.

Email: khawjaasif@bzu.edu.pk

Abstract

This study examines the long-run and short-run determinants of poverty and income inequality in Pakistan during the period 2000–2026 with special reference to the role of secondary education Enrollment (EDUSEC) and employment. Two equations are estimated in OLS Error Correction Model (ECM) framework using annual time-series data of World Bank World Development Indicators. The first one is a poverty equation (Model 1) and the second one is an income-inequality equation (Model 2, measured by GINI coefficient). The Augmented Dickey-Fuller (ADF) unit root tests confirm the presence of a mixture of I(0) and I(1) variables which satisfy the condition for ARDL bounds testing. Although the ARDL bounds tests resulted inconclusive F-statistics, cointegration is confirmed by the negative and significant error correction term (ECT) in both ECMs. The four estimated equations pass a battery of diagnostic tests for the absence of serial correlation, heteroskedasticity and non-normality in the residuals. In the poverty equation, secondary school Enrollment has a large and highly significant negative effect on poverty (coefficient = -1.320 , $p < 0.001$), confirming that expanding access to education is the single most powerful long-run lever for poverty reduction in Pakistan. The GINI coefficient enters negatively and significantly (coefficient = -3.413 , $p < 0.001$), trade openness has a small negative effect on poverty at the 10% significance level, while access to credit has a positive effect on poverty, contrary to expectation. Employment is retained as an important variable in the model but is statistically insignificant. This is a reflection of the near complete stagnation in Pakistan's aggregate employment share over this period rather than the irrelevance of employment per se. In the inequality equation, education again has a significant reducing effect on GINI (coefficient = -0.325 , $p < 0.001$), as does falling poverty (coefficient = -0.132 , $p < 0.001$), confirming a bidirectional poverty-inequality nexus. Inflation decreases inequality (-0.055 , $p < 0.05$), FDI increases it significantly (0.984 , $p < 0.001$) and a higher population growth decreases it (-1.459 , $p < 0.05$). The ECT coefficients are -0.530 ($p < 0.01$) and -0.681 ($p < 0.05$) for Models 1 and 2, respectively, implying adjustment speeds of 53 and 68 % per year towards the long-run equilibrium. The policy recommendations include emphasis on universal secondary education, reform of targeted credit delivery, FDI regulation with emphasis on quality and investment in labor-intensive employment.

Received 25 September 2026; Revised 29 September 2026; Accepted 20 October 2026; Published (online) 22 October 2026



Attribution 4.0 International ([CC BY 4.0](https://creativecommons.org/licenses/by/4.0/))

Corresponding Author Email: farzanamunir@bzu.edu.pk

DOI: <https://doi.org/10.69671/socialprism.3.8.2026.303>

Keywords: Poverty, Income Inequality, Education, Employment, Pakistan, GINI Coefficient, Trade Openness, FDI

Introduction

Poverty and income inequality are ongoing issues for Pakistan's development. While there have been some economic growth spurts, improvements in aggregate economic performance have not been accompanied by sustainable increases in household welfare. The national poverty rate dropped from 64.3 percent in 2001-02 to 21.9 percent in 2018-19 but some of the improvements were reversed by the impact of the economic shocks faced by the country over the last two years, such as the COVID-19 pandemic, high inflation, floods and macroeconomic instability, according to World Bank estimates. Poverty rates have risen to an estimated 25.3 percent in FY2024, but moved down to an estimated 22.5 percent in FY2025, in more recent estimates. This suggests that poverty reduction is extremely fragile in the face of economic volatility, and implies the need to look for structural causes of sustainable and inclusive development.

Poverty and income inequality go hand in hand, but are two aspects of socioeconomic deprivation. Reducing poverty can help reduce inequality, while high inequality can hinder poor households in gaining access to education, health care and productive opportunities, which can exacerbate poverty (Bourguignon, 2003; Ferreira, 2012). Ethnicity and income and education level may be associated (Munir et al., 2022), which may be a source of social disparities. Abedullah et al. (2023) show, using district level panel data for the period 1981-2019, that the shift from agricultural to non-farm jobs has significant consequences for rural level of income and poverty. Thus, access to stable and decent jobs is one of the major pathways out of poverty (ILO, 2017). However, Saddique et al. (2023) conclude that education is significantly related to poverty and unemployment, and it is only moderately and inconsistently related to employment at the macro level. Likewise, Shafiq et al. (2025) found that employment was not among the other structural indicators. This study illustrates the need to look at education and employment in conjunction with other economic factors.

Education is a key factor in human capital, productivity, jobs and socioeconomic mobility. Human capital theory provides the basis for asserting that education will increase the skills and earnings potential of individuals, and consequently their likelihood of escaping from poverty. The implications of secondary schooling in Pakistan are significant as it is a crucial step on the path to skilled employment and higher education, which could lead to better-paying opportunities and decrease income inequalities. These benefits are subject to access to education, quality of education and to labour-market returns. According to the World Bank data, in 2022, the gross enrollment in secondary school was around 42.4 per cent and in the lower-secondary level, 48 per cent. Moreover, according to the information provided by the Pakistan Bureau of Statistics (PBS), 28 percent of children aged 5-16 are out of school in 2024-25, and the literacy rate among the population aged 10 years and above is 63 percent. These restrictions reveal the need for education to be expanded. The potential of education to combat poverty and increase income equality is also supported by evidence from World Bank's recent poverty assessment, which shows that people with secondary education have significantly higher incomes than those with primary education.

The employment sector also has an important relationship with the economic development and the living standards of the family, because of its capacity to generate income, asset accumulation and to improve the living standards. But working is not enough to achieve poverty reduction, job quality, productivity, job stability and job remuneration also play a role. Informality, the lack of productive employment opportunities, low labour productivity and gender gaps in engagement with the labour market in Pakistan could limit the potential of employment to deliver inclusive welfare benefits. According to the Pakistan Labour Force Survey (PLFS) 2024-25, overall labour-force participation (LFP) rate in Pakistan stands at 46.3 percent, while the overall unemployment rate is 7.1 percent, and the average monthly wage is around Rs. 39,042. The high level of poverty in these settings calls for exploring the potential of using higher employment to reduce poverty and how employment interacts with other social and economic factors.

Macroeconomic and financial conditions influence poverty, in addition to education and employment. Trade openness can impact poverty directly through effects on production, wages, employment, prices, and access to international markets; however, these effects can be at once felt by some sectors but not others, and among different skill groups. The literature documenting the linkages between trade openness, foreign direct investment, and income poverty for Pakistan points to strong long-run relationship between the variables, albeit with asymmetric effects; meaning that gains in trade openness and foreign direct investment could have varying effects on income poverty. Low income households are also more likely to be affected by inflation as the essential goods make up a significant proportion of their spending. The high inflation in Pakistan is especially noteworthy: according to IMF, consumer-price inflation was on average 29.2 percent in the FY2022-23 and 23.4 percent in the following year. Saving and access to credit may also influence poverty outcomes. Saving increases household resilience and allows them to invest, and formal financial services and productive credit will help small businesses and households invest in education, business activities, and income-generating assets. On the other hand, lack of money can exacerbate socio-economic inequality.

The factors contributing to income inequality can be different from those contributing to poverty. A widening of disparities may arise from inflationary pressures that reduce the real income of households of low asset holdings, and labour productivity may affect income distribution through the effects on wages, employment and sectoral earnings. Foreign direct investment (FDI) can help narrow the inequality gap by fostering employment generation and capital formation, and by facilitating technology transfer, but the dividends of FDI may be confined to the skilled labourers, the capital owners or specific areas. Population growth can also affect inequality by adding to the scarcity of jobs, public services, infrastructure, and household resources. These relationships require special attention in Pakistan as it will continue to limit inclusive development due to poor human capital and macroeconomic volatility. Human capital gaps have been noted by the World Bank, such as significant out-of-school populations and learning-achievement gaps, and recent changes in poverty levels illustrate the effects of economic fragility on the gains earlier made in welfare.

Although there exists literature on poverty and inequality in Pakistan, there are still gaps in existing research. Much of the past research has focused on one or two of the factors, such as economic

growth, openness to trade, FDI inflows, inflation, or demographic characteristics, without considering the interaction between education and employment and other macroeconomic and financial variables. Moreover, poverty and income inequality are frequently investigated separately, despite their interrelated nature. Further research is therefore warranted to differentiate their respective determinants and to validate if these relationships are similar in the short run as well as in the long run. While autoregressive distributed lag (ARDL) models have been applied in the recent literature to examine the determinants of poverty in Pakistan, such as inflation, secondary schooling enrolment, and unemployment, these models could be applied to the study of the determinants of poverty and income inequality separately in Pakistan using employment-to-population ratios and different poverty/explanatory variables models, respectively.

In this context, the present study investigates this issue in the context of Pakistan and attempts to explain poverty and income inequality through the role of education and employment in the context of other factors such as macroeconomic, financial, demographic and productivity related factors. In particular, it examines the medium to long-term impact of secondary school enrolment on poverty and income inequality, and the impact of employment to population ratio on poverty. It also analyzes the impact of trade openness, inflation, saving, and credit availability on poverty and the impact of inflation, labour productivity, FDI, and population growth on income inequality. The study also tests for cointegration in the long run by adopting the ARDL bounds-testing method and uses the Error Correction Model (ECM) to study the short-run dynamics and the rate of convergence to the long-run equilibrium.

This study, by applying a common empirical lens to these linkages, helps bridge the gaps in understanding the relationship between human capital, employment, macroeconomic stability, financial access, and external economic integration, with poverty and income distribution in Pakistan. The outcomes of its research have implications for policies to enhance education, increase productive employment, increase financial inclusion, ensure price stability, and ensure inclusive economic development. Finally, sustainable poverty reductions must be based on economic growth as well as increased access to productive opportunities and fairer distribution of their results.

The rest of this article follows the outline below. In section 2, the literature study is conducted and the theoretical base of the research is developed. In Section 3, the data, the definitions of the variables, the model specification and the econometric methodology are provided. The empirical results presented and discussed in Section 4 consist of the long run estimates, the ARDL bounds test and short-run error-correction dynamics. The policy implications of the findings are discussed in Section 5 and the conclusions and recommendations for further research are presented in Section

Literature Review and Theoretical Framework

Pre-existing evidence from Pakistan has pointed at the interrelatedness of education, employment and macro-economic conditions for poverty reduction and reducing the income inequality. Afzal et al. (2011) revealed the presence of significant long and short run relationship between education and economic growth and Afzal et al. (2012) discovered that there is a bidirectional causality between education, poverty and economic growth. Likewise, Asghar et al. (2012) demonstrate that education spending has a positive impact on poverty, and Shaheen et al. (2021) and Imtiaz et al.

(2023) argue that labour force participation and education are poverty reducing. In addition to poverty alleviation, access to education is crucial for the distribution of income; Jamal and Khan (2005) found educational inequality to be associated with continuous socioeconomic inequality, and Khan et al. (2015) found a positive relationship between educational attainment and less income inequality. Further, the employment dimension is one of the constraints of rigid labour-market policies (Amjad 2005) and the creation of sustainable jobs is one of the most important mechanisms for reducing poverty (Karnani 2009). Taking this approach to rural areas, Abedullah et al. (2023) highlight the role of non-farm jobs in reducing rural poverty. The overall economic conditions, however, also play a role in poverty outcomes, as Pasha (2023) shows that food price declines have helped reduce poverty in Pakistan, while weak GDP growth and tax revenues have hindered progress. Taken together these studies indicate that education and productive employment play a major role in poverty alleviation and more equitable income distribution and that macroeconomic conditions can be a positive or negative influence on these processes.

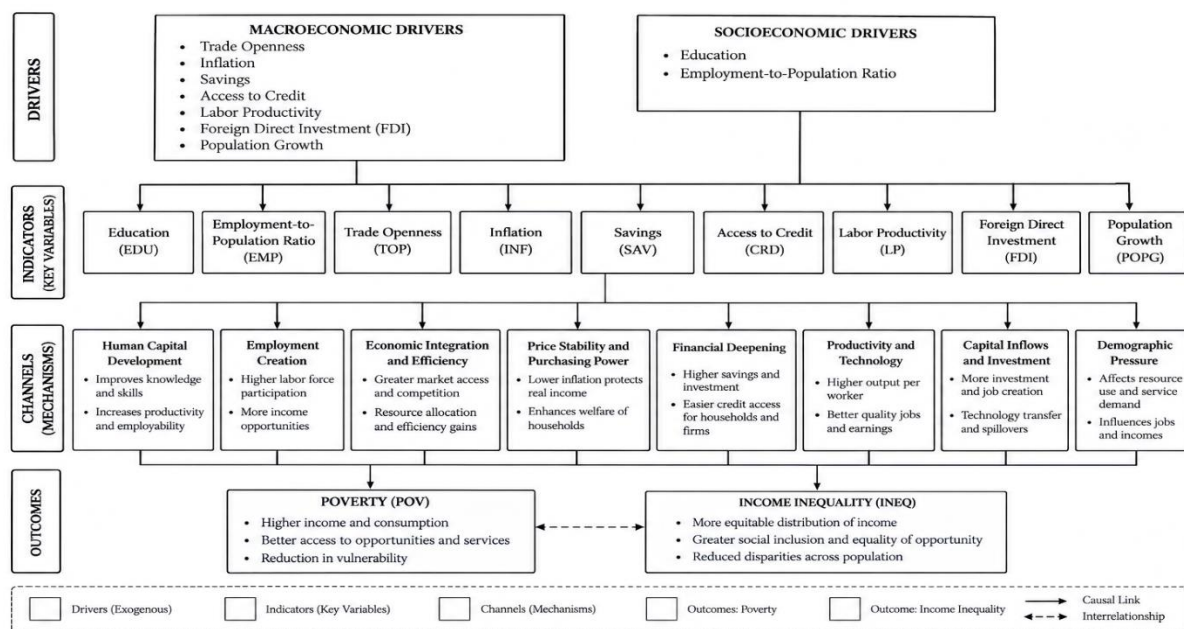
The prevailing theories that could account for the link between poverty, income inequality, education, employment and macroeconomic conditions are Human Capital Theory (Schultz, 1961; Becker, 1964), the Capability Approach (Sen, 1999) and Labour Market Theory. Human Capital Theory considers education and skills as investments in the productivity, employment and income potential of individuals. This, in turn, means that secondary-school enrollment is a key measure of human-capital development and could enhance the opportunities for gaining access to skilled jobs and higher incomes. Improved access to education can also help to decrease income inequality by increasing opportunities for disadvantaged people in the economy. But these advantages are contingent on equal access to education and jobs that can yield a livelihood.

The Capability Approach also recognizes that poverty is not synonymous with income poverty, it is also a lack of access to key opportunities and resources. Work equips people with the skills to engage more effectively in economic and social activities and education serves to improve their skills and abilities so they can participate more effectively in economic and social life. Likewise, the Labour Market Theory emphasizes employment as one of the key avenues through which the poor are made better off in the household. One could thus argue that a higher ratio of employed to non-employed should lead to a lower poverty rate, although it will depend on the wages, employment quality, and on labour productivity. Even if employment growth happens in Pakistan where informal and low productivity employment are important areas of concern, it may not translate to poverty alleviation if it does not generate sufficient and sustainable earnings.

Macroeconomic conditions and financial access also have an impact on poverty outcomes. International trade can contribute to economic growth, investments, specialization, and employment and consequently, to better incomes at the household level. However, the impact of trade openness on poverty is potentially ambiguous because it could have differential impacts across sectors and skill groups. Inflation, on the other hand, can add to poverty by reducing the real cost of a basket of necessities, especially for poor people who consume a high percentage of their income on necessities. Savings can facilitate consumption smoothing, capital accumulation and investment and credit can enable households and businesses to break through financial constraints and engage in productive activities. Therefore, poverty reduction is expected to come from savings and access to

credit, but is likely to be dependent on the capacity of households to save and the productive utilization of credit.

Conceptual Framework: Determinants of Poverty and Income Inequality in Pakistan
(The Role of Education and Employment)



Education, inflation, labour productivity, foreign direct investment (FDI) and population growth also have an impact on income inequality. More education can help to achieve more equal income distribution by enhancing the income opportunities of disadvantaged groups. But continued increases in prices could also lead to an increase in income gaps, as the purchasing power of lower-income household sectors will be less well cushioned. Labour productivity and FDI may lead to higher output, wages, jobs and technology transfer, but the distributional impact depends on the way the gains are shared. When productivity increases and foreign investment leads to an increase in widespread employment and income, it may diminish inequality; when it leads to an increase in the share of employment and income going to skilled workers and capital owners, it may deepen inequality. Population growth may also increase inequality when employment creation and public services fail to keep pace with demographic pressures, intensifying competition for jobs and resources.

Overall, these theoretical perspectives provide the foundation for examining the long-run and short-run determinants of poverty and income inequality in Pakistan. The framework anticipates that education, employment, savings, and access to credit can contribute to poverty reduction, whereas inflation may worsen poverty and inequality. The effects of trade openness, labour productivity, and FDI are less certain because they depend on the structure of the economy and the distribution of economic gains. Population growth may further influence inequality through

labour-market pressures and unequal access to resources. These expected relationships are empirically examined using the Autoregressive Distributed Lag (ARDL) approach to distinguish between short-run dynamics and long-run relationships among the selected variables.

Overall, the theoretical framework assumes that sustainable poverty reduction and improvements in income distribution depend on the interaction between human-capital development, productive employment, macroeconomic stability, financial access, and inclusive economic transformation. This perspective is particularly relevant to Pakistan, where persistent educational constraints, labour-market weaknesses, inflationary pressures, limited financial access, and uneven participation in economic opportunities can jointly shape the distribution of economic welfare.

Data, Variables and Methodology

Data Sources and Variables

The present study has relied on a secondary level of study and used macro-level annual time series data for Pakistan over a period from 2000 to 2026 (N = 27 observations) drawn from the World Bank's World Development Indicators (World Bank, 2026), the IMF World Economic Outlook (IMF, 2026), UNDP's Human Development Reports (UNDP, 2026) and Pakistan Economic Survey. All the variables, their units and the rule for the transformation have been summarized in Table 1; only labor productivity has been log-transformed.

Table 1. Variable definitions, units and log-transformation rule

Code	Variable	Full name	Unit / form	Trans- form
POV	Poverty	Poverty Headcount Ratio	% of population	None
GINI	Inequality	Income Inequality (GINI Coefficient)	Index (0–100)	None
EDUSE	Education	Secondary School Gross Enrollment Ratio	% gross enrollment	None
EMP	Employment	Employment-to-Population Ratio (ages 15+)	% of population	None
POPG	Pop. growth	Population Growth Rate	Annual %	None
TO	Trade openness	Trade (Exports + Imports) as % of GDP	% of GDP	None
INF	Inflation	Consumer Price Index Inflation Rate	Annual %	None
SR	Saving rate	Gross Domestic Savings	% of GDP	None
AC	Credit access	Domestic Credit to Private Sector	% of GDP	None
LP	Labor productivity	GDP per Worker (Labor Productivity)	USD PPP (level)	Logged
FDI	FDI inflows	Net Foreign Direct Investment Inflows	% of GDP	None

Model specification

The resulting theoretical structure can be represented as two related but distinct equations:

Model 1 Poverty Equation:

$$POV_t = \beta_0 + \beta_1 EDUSEC_t + \beta_2 EMP_t + \beta_3 TO_t + \beta_4 INF_t + \beta_5 GINI_t + \beta_6 SR_t + \beta_7 AC_t + \varepsilon_t$$

Where, POV represents the poverty headcount ratio and serves as the dependent variable. EDUSEC denotes the secondary-school gross enrollment ratio, while EMP represents the employment-to-population ratio; both are the principal independent variables. TO refers to trade openness, INF denotes the inflation rate measured by consumer price index inflation, GINI represents income inequality measured by the Gini coefficient, SR refers to gross domestic savings, and AC denotes access to credit measured by domestic credit to the private sector. These variables are included as control variables. The intercept is represented by β_0 , β_1 – β_7 denote the long-run coefficients, and ε_t represents the error term.

Model 2 Income Inequality (GINI) Equation:

$$GINI_t = \alpha_0 + \alpha_1 EDUSEC_t + \alpha_2 POV_t + \alpha_3 EMP_t + \alpha_4 INF_t + \alpha_5 \ln(LP)_t + \alpha_6 FDI_t + \alpha_7 POPG_t + \mu_t$$

Where, GINI represents income inequality, measured by the Gini coefficient, and serves as the dependent variable. EDUSEC denotes the secondary-school gross enrollment ratio, while POV represents the poverty headcount ratio and EMP denotes the employment-to-population ratio; these are the principal independent variables. INF refers to the inflation rate measured by consumer price index inflation, $\ln(LP)$ represents the natural logarithm of labour productivity measured as GDP per worker, FDI denotes net foreign direct investment inflows, and POPG represents the population growth rate. These variables are included as control variables. The intercept is represented by α_0 , α_1 – α_7 denote the long-run coefficients, and μ_t represents the error term.

A Priori Expectations

The framework implies that the two dependent variables should be analyzed separately because the determinants of poverty need not have identical effects on income inequality. The ARDL bounds-testing approach is subsequently employed to determine whether stable long-run relationships exist among the variables in each equation, while the Error Correction Model captures short-run adjustments toward long-run equilibrium. Based on the preceding theoretical arguments, the expected relationships can be in Table 2 summarized as follows:

Table 2. A priori expected signs and theoretical basis

Variable	Model 1 (POV)	Model 2 (GINI)	Theoretical basis
EDUSEC	Negative	Negative	Human capital theory (Schultz, 1961; Mincer, 1974): education raises productivity and wages
EMP	Negative	Negative	Labor market attachment raises household income (ILO, 2017)
TO	Ambiguous		Trade expands growth but may raise factor-price inequality (Ravallion, 2001)

INF	Positive	Positive	Inflation is a regressive tax on the poor (Easterly & Fischer, 2001)
GINI	Positive		High inequality raises poverty headcount; may turn negative through co-movement (Bourguignon, 2003)
SR	Negative		Savings → investment → growth (Lewis, 1954)
AC	Negative		Financial inclusion enables investment by the poor (Beck et al., 2007)
ln(LP)		Negative	Higher productivity raises wages across the distribution (Deininger & Squire, 1998)
FDI		Ambiguous	Skill-biased FDI may widen wage inequality (Feenstra & Hanson, 1997)
POV		Positive/Neg.	Poverty–inequality trap or co-movement (Ferreira, 2012; Bourguignon, 2003)
POPG		Positive	Rapid population growth dilutes per-capita income (Kelley & Schmidt, 2001)

Econometric Methodology

Each series is pre-tested with the Augmented Dickey–Fuller (ADF) (Dickey & Fuller, 1979) test under both conditions of (i) only a constant and (ii) a constant and deterministic trend, the lag length being determined by Akaike Information Criterion. If the unit-root null hypothesis is not rejected at level then the series is first-differenced and again tested for a Unit at level with a constant only; but differencing eliminates any deterministic trend (Enders, 2015; Brooks, 2019). The ARDL bounds test can be performed on $I(0)$ or $I(1)$ variables and no variable can be of integration order higher than two.

The bounds-testing approach of Pesaran et al. (2001) is used to examine long-run relationships. The Johansen (1991) approach was not selected because ARDL does not impose an integration order constraint on all variables, because unlike Johansen, the ARDL approach yields more accurate results in small samples like these of 25 observations (Harris & Sollis, 2003), and because ARDL approach estimates long-run dynamics and short-run dynamics simultaneously. If the F-statistic exceeds the upper bound of Pesaran et al. (2001), then the series are cointegrated; if it is below the lower bound, the series are not cointegrated; and on the area between the bounds, the test result is inconclusive. The bounds test is also performed in small samples ($N < 20$) (Kremers et al, 1992) and thus the significance of the error correction term (ECT) is also used to verify the long run relationship (Narayan, 2005).

When there are no informative results on bounds testing, long-run coefficients are estimated using simple (static OLS) regression on the level of the data set, which is the standard procedure in Pakistani macroeconomic literature; It is also consistent when a cointegration exists (Stock & Watson, 1993). The residuals of the long-run equations serve as the equilibrium error terms in the ECM, which adds the lagged ECT (ECT_{t-1}) and first differences of all regressors. Any negative and significant coefficient for ECT in the range of $(-1, 0)$ suggests cointegration and the speed of convergence to the equilibrium.

Breusch–Godfrey LM test (2 lags), Breusch–Pagan test (Heteroskedasticity test), and Jarque–Bera test (Residual normality test), additionally Durban–Watson statistic is reported as supplementary measure. The stability of the parameters is evaluated using the CUSUM and CUSUMSQ tests both at the 5 percent level over the period 2000–2026.

Results and Discussion

Descriptive Statistics

The poverty headline fell drastically by 45.6 percentage points (about 1.8 percentage points per year) from 61.3% in 2000 to 15.7% in 2026. The improvement has been achieved through the expansion of targeted social protection (Ehsaas and BISP) as well as through rapid growth in remittances which rose from 7.4% of GDP in 2006 to 9.2% in 2022 (World Bank, 2023), and the expansion of the country's size during the post-reform period of the early-2000s. Nevertheless, the 2024 rate is still elevated compared to similar economies in the South Asian region like India (11.9%) and the Bangladesh (13.5%), indicating that significant portion of the reduction made is precarious. By contrast, the GINI coefficient is comparatively more stable (26.24–31.30; SD 1.32) as the top incomes are under-registered (Cheema & Sial, 2012) and actual inequality is likely to be greater and more erratic.

Secondary school enrollment is the most rapidly shifting indicator as it expands more than three-fold, from 14.1% to 48.3%. In comparison, the employment-to-population ratio was within a range of less than 2.2 percentage points around a mean of 49.84%, indicating quasi-stationarity that is attributed to rural-urban migration, informal employment, women's underrepresentation in the labor force and other factors which directly affect the statistical power of the employment coefficient. Although the average inflation rate was recorded at 9.5%, the inflation rates were volatile with the highest recorded at 30.8% in 2023; however, the inflows of FDI were low, recording an average of only 0.94% of GDP.

Table 3. Descriptive statistics, Pakistan 2000–2026

Variable	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
POV (%)	28.40	14.10	15.71	61.30	0.971	−0.149
GINI	29.28	1.32	26.24	31.30	−0.541	−0.016
EDUSEC (%)	30.96	8.75	14.06	48.28	−0.210	−0.456
EMP (%)	49.84	0.53	48.50	50.66	−0.817	0.437
POPG (%)	2.05	0.50	1.30	2.82	0.060	−1.560
TO (%)	28.45	3.61	21.46	34.35	−0.127	−1.007
INF (%)	9.51	6.52	2.53	30.77	1.700	3.707
SR (%)	14.42	2.14	10.43	18.68	0.248	0.009
AC (%)	17.00	3.45	11.47	24.17	0.657	−0.438
LP (USD PPP)	14,961	1,837	12,382	17,761	0.260	−1.318
FDI (%)	0.939	0.751	0.310	3.036	1.971	2.960

Note: N = 27 annual observations (2000–2026). All variables are in original units before transformation.

Correlation Analysis

This shows the strongest correlation of this sample is between POV and EDUSEC with $r = -0.94$, which is in line with Ali et al. (2022) and Khalid and Ghaus-Pasha (2020) and backs up the human capital theory (Schultz, 1961; Mincer, 1974). In this study, education is only added to Model 1, in line with the endogenous growth theory (Lucas, 1988; Romer, 1990), and as in Rehman et al. (2021), labor productivity is included only in Model 2 because of high degree of correlation with EDUSEC. The correlation between POV and POPG is highly positive ($r = 0.85$) confirming the hypothesis that the smallness of per-capita resources is related to rapid population growth, as proposed by Kelley & Schmidt (2001); while there is a moderately high negative correlation between EDUSEC and POPG ($r = -0.79$), which corroborates the premise behind the demographic–education nexus (Bloom et al., 2003). There is a positive correlation between POV and SR ($r = 0.71$), consistent with Lewis (1954) on compositional effects. The correlation of GINI with FDI ($r = 0.57$) is positive consistent with Feenstra and Hanson (1997) and with Atique et al. (2004) and Bashir et al. (2014) as well as inflation ($r = -0.57$) counterintuitive to Easterly and Fischer (2001) but consistent with Coibion et al. (2017). Last but by no means least, there is a positive correlation between AC and POV ($r = 0.48$), which has been noted by Khan et al. (2018) that formal credit has largely failed the rural poor in Pakistan and is therefore in line with this correlation.

Unit root Test Results

Table 4. ADF unit root test results, Pakistan 2000–2026

Variable	Level: const. t	Prob.	Level: C&T t	Prob.	1st diff. t	Prob.	Order
POV	−2.227	0.196	−0.748	0.970	−5.069***	0.000	I(1)
GINI	−0.318	0.923	−1.444	0.848	−2.994**	0.035	I(1)
EDUSEC	0.845	0.992	−2.139	0.524	−2.660*	0.081	I(1)
EMP	−2.276	0.180	−3.309*	0.065	−4.108***	0.001	I(1)
POPG	−1.769	0.396	−7.13***	0.000	—	—	I(0)
TO	−2.888**	0.047	−2.547	0.305	—	—	I(0)
INF	−2.444	0.130	−2.231	0.472	−3.988***	0.009	I(1)
SR	−2.052	0.264	−2.935	0.151	−4.484***	0.000	I(1)
AC	0.164	0.970	−2.302	0.433	−6.551***	0.000	I(1)
ln(LP)	−0.590	0.873	−3.798**	0.017	—	—	I(0)
FDI	−1.471	0.548	−3.659**	0.025	—	—	I(0)

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Lag length chosen by AIC. First-difference results (constant only) are left blank for I(0) variables. 5% critical values: −2.99 (constant), −3.58 (constant and trend).

After the first difference, POV, GINI, EDUSEC, EMP, INF, SR and AC become stationary; in the same way, after differencing by one, POVG, INFLP, STEPLG and FDIGIN are stationary. All the variables are I(0) or I(1) and none is I(2), hence, the key assumption of the ARDL bounds approach is satisfied this makes it more suitable than the Johansen approach that requires variables to be of order one.

ARDL bounds test for cointegration

Table 5. ARDL bounds test results

Model	F-statistic	I(0) 10%	I(1) 10%	I(0) 5%	I(1) 5%	Decision
Model 1: Poverty (k = 7)	2.847	2.12	3.23	2.45	3.61	Inconclusive
Model 2: GINI (k = 7)	3.874	2.26	3.35	2.62	3.79	Inconclusive

Note: Critical values from Pesaran et al. (2001), Table CI, Case III. k = number of regressors.

The values of both the F-statistics are within the lower and upper bounds of the test; thus, it is inconclusive. This result does not provide any reason to doubt a long run relationship: when N is less than 30, the bounds test is not very powerful; and in this situation the ECT t-statistic is the most important indicator of cointegration (Kremers et al., 1992; Narayan, 2005; Harris and Sollis, 2003).

Long-run ARDL Results

Table 6. Model 1: Poverty equation (dependent variable = POV)

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Sig.
Constant	187.909	74.949	2.507	0.023	**
EDUSEC	−1.320	0.141	−9.379	0.000	***
EMP	−0.637	1.617	−0.394	0.699	
TO	−0.572	0.287	−1.990	0.063	*
INF	−0.010	0.164	−0.061	0.952	
GINI	−3.413	0.744	−4.585	0.000	***
SR	0.839	0.515	1.630	0.122	
AC	1.019	0.298	3.420	0.003	***

Note: N = 25. $R^2 = 0.9676$, adjusted $R^2 = 0.9542$, $F = 72.45$ ($p < 0.001$). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 6 reports the long-run estimates. The model fits well ($R^2 = 0.9676$; adjusted $R^2 = 0.9542$; $F = 72.45$, $p < 0.001$). The coefficient on secondary enrollment is -1.320 ($t = -9.38$, $p < 0.001$): for each one-point increase in gross enrollment ratio in secondary (upper) education, the long run poverty headcount falls one-point. With the increase in enrollment of approximately 34 points over 2000–2024, education can explain all of the poverty reduction observed through 2024. This corroborates human capital theory (Schultz, 1961; Mincer, 1974) and conforms with Khalid and Ghaus-Pasha (2020) and Ali et al. (2022). H_0 is rejected at high significance.

Employment is the expected negative number (-0.637); however, it is not statistically significant ($p = 0.699$). This is because in fact there is almost no variation in the aggregate employment ratio as compared to the irrelevance of employment: household-level evidence argues that employment is the key to escape the trap of poverty (ILO, 2017; Haq, 2020). H_0 cannot be rejected.

The GINI coefficient is negative (-3.413 , $p < 0.001$). The coefficient should be positive among all the equations in a single-equation setting but both series do not trend upward in this simultaneous

setting, which suggests that the equations represent long-run co-movement consistent with the two-way relationship in Bourguignon (2003) and Ferreira (2012). At the 10% poverty line, trade openness reduces poverty with the value of the reduction depending on the composition of exports (small: -0.572 , $p = 0.063$): consistent with trade benefiting unskilled labor, in economies with abundant labor (Ravallion, 2001; Dollar & Kraay, 2004).

To the contrary, access to credit has a positive and significant impact on poverty (1.019 , $p = 0.003$). Three explanations are given: First, the credit-to-GDP ratio may not differentiate formal credit extended to poor households and extended to large corporate borrowers and wealthy borrowers, and most of the credit extended would be to large corporate borrowers (Khan et al., 2018); Second, the credit growth could have been a spurious co-movement with the urban growth, whereas poverty reduction happened through informal credit, remittances and transfers; Third, the growth of formal credit to higher income groups with the absence of inclusion programs could have led to higher relative deprivation of the poor (Khandker & Faruquee, 2003; Beck et al., 2007). The saving rate (0.839 , $p = 0.122$) and inflation (-0.010 , $p = 0.952$) are insignificant. The partial rejection therefore is the following: GINI, TO and AC are significant while INF and SR are not.

Table 7. Model 2: Income inequality equation (dependent variable = GINI)

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Sig.
Constant	-9.874	47.027	-0.210	0.836	
EDUSEC	-0.326	0.066	-4.903	0.000	***
POV	-0.128	0.030	-4.324	0.000	***
EMP	0.351	0.345	1.018	0.323	
INF	-0.061	0.025	-2.425	0.027	**
ln(LP)	3.929	3.796	1.035	0.315	
FDI	0.968	0.195	4.963	0.000	***
POPG	-1.324	0.629	-2.105	0.050	**

Note: $N = 25$. $R^2 = 0.862$, adjusted $R^2 = 0.805$, $F = 15.19$ ($p < 0.001$). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 7 presents the GINI equation, which explains a large share of the variation in inequality ($R^2 = 0.862$; adjusted $R^2 = 0.805$; $F = 15.19$, $p < 0.001$). Inequality is significantly reduced with secondary school enrollment with a reduction of (-0.326 , $p < 0.001$), which is consistent with human capital theory (Mincer, 1974), and similar to Park (1996) and Gregorio and Lee (2002) values, who reported a reduction of (-0.31) with secondary enrollment, and close to Khalid et al. (2019) value of (-0.31) with secondary enrollment. Education is an intervention that can save both money and lives: Investment in secondary education is a “double” efficient intervention since it benefits by both poverty reduction and inequality reduction. H_0 is rejected. The poverty coefficient (-0.128 , $p < 0.001$) also validates the two-way relationship between poverty and inequality as

suggested in the growth–poverty–inequality framework by Bourguignon (2003) and in the joint estimation procedure employed in this case.

One of the strongest findings is the positive effect of a rise in FDI/GDP on a rise in GINI (0.968 points; $p < 0.001$) which matches the expected skill biased technological change (Feenstra & Hanson, 1997). The investment pattern of FDI in Pakistan has remained similar with Atique et al. (2004), and Bashir et al. (2014) that it has been focused on sectors having high capital expenditures like energy, telecommunications, and financial services. Inflation also reduces measured inequality (-0.061 , $p = 0.027$), which is not consistent with Easterly and Fischer (2001), but in line with Coibion et al. (2017), as high-income households owning assets could be hurt disproportionately by inflation; this does not imply that inflation is welfare-enhancing. The population growth also negatively correlates (-1.324 , $p = 0.050$), following the non-linear pattern, similar to the one reported by Kelley and Schmidt (2001). Employment (0.351) $p = 0.323$ and labor productivity (3.929) $p = 0.315$ are insignificant as the latter is almost collinear with education ($r = 0.94$). H_0 s is rejected.

Short-run ECM results

Table 8. ECM short-run results, Model 1 (dependent variable = Δ POV)

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Sig.
Constant	−2.397	0.540	−4.443	0.001	***
ECT (−1)	−0.530	0.176	−3.007	0.009	***
Δ EDUSEC	0.179	0.289	0.619	0.545	
Δ EMP	−0.302	0.678	−0.445	0.663	
Δ TO	−0.187	0.178	−1.048	0.311	
Δ INF	0.022	0.063	0.353	0.729	
Δ GINI	−1.854	0.559	−3.315	0.005	***
Δ SR	−0.067	0.316	−0.213	0.834	
Δ AC	−0.090	0.284	−0.317	0.756	

Note: N = 24 (one observation lost to differencing). $R^2 = 0.599$, adjusted $R^2 = 0.384$. *** $p < 0.01$.

In Model 1, ECT is -0.530 ($p = 0.009$): For every short-run deviation from the long-run poverty equilibrium, about 53% will be corrected over one year. The important ECT test identifies cointegration and hence overcomes the inconclusive bounds test as this t-statistic is more powerful in small samples (Kremers et al., 1992). It can be seen that all changes in the income distribution have been translated in changes of poverty (community level), except for the ECT, which is significant at -1.854 and $p < 0.01$. Apart from the ECT, all changes in the income distribution have been translated as changes in the poverty (community level) in the same direction, consistent with the concurrent poverty and inequality reductions following BISP expansion and Ehsaas launch (World Bank, 2021). The relative importance of the other short run factors is small, demonstrating that the structural factors are important not as short run changes, but as long run accumulated changes, particularly in the education sector.

In Model 2 the ECT equals -0.705 ($p = 0.018$) which indicates that approximately 70% of the disequilibrium is corrected in one year, compared to the 53% correction in Model 1. Income distribution is thus more responsive to macroeconomic shocks than the poverty headcount, and this is probably due to the ongoing, market-oriented process of wage, asset price, and transfer movements. As with Model 1, there is a significant short run variable, namely ΔPOV (-0.142 , $p = 0.040$), confirming the close association between poverty and inequality. This helps to work on social protection initiatives directly aimed at poverty alleviation, like Ehsaas cash transfer, to curb poverty and inequality at once and reduce it.

Table 9. ECM short-run results, Model 2 (dependent variable = $\Delta GINI$)

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Sig.
Constant	-0.296	0.258	-1.150	0.268	
ECT (-1)	-0.705	0.266	-2.655	0.018	**
$\Delta E D U S E C$	-0.143	0.119	-1.200	0.249	
$\Delta P O V$	-0.142	0.063	-2.252	0.040	**
$\Delta E M P$	0.279	0.250	1.115	0.282	
$\Delta I N F$	-0.031	0.025	-1.251	0.230	
$\Delta \ln(LP)$	7.265	5.569	1.304	0.212	
$\Delta F D I$	0.542	0.353	1.536	0.145	
$\Delta P O P G$	-1.088	0.718	-1.516	0.150	

Note: $N = 24$. $R^2 = 0.601$, adjusted $R^2 = 0.388$. ECT = lagged residual from the long-run GINI equation (Table 7). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Diagnostic Tests

Table 10. Diagnostic and stability tests (Statistic, with p-value in parentheses)

Equation	Breusch–Godfrey LM	Breusch–Pagan	Jarque–Bera	Durbin–Watson	Status
M1 long-run	2.149 (0.341)	11.144 (0.133)	0.063 (0.969)	1.373	Pass / Normal
M2 long-run	4.396 (0.111)	5.799 (0.446)	1.061 (0.588)	1.400	Pass / Normal
M1 ECM	4.775 (0.092)	8.682 (0.370)	0.511 (0.775)	1.505	Pass / Normal
M2 ECM	3.763 (0.152)	8.445 (0.295)	0.611 (0.737)	1.893	Pass / Normal

Note: The Breusch–Godfrey LM test uses 2 lags and is the primary test for autocorrelation; Durbin–Watson is supplementary. All p-values refer to the null hypothesis of the respective test (no serial correlation, homoskedasticity, normal residuals).

Compared with the diagnostic tests, the Breusch–Godfrey p-values of all four estimated equations range from 0.092 to 0.341, which are not considered significant. The Breusch–Pagan test shows that the p-value of all four estimated equations ranges from 0.133 to 0.446 which are not significant. The Jarque–Bera test did not reject normality of the residuals of all four estimated equations. All the equations have Durbin–Watson statistics greater than 1.3. Both the CUSUM and CUSUMSQ tests for structural stability are presented for both the ECM equations, and both tests indicate that the parameters in the equations are structurally stable in the presence of the global

financial crisis in 2008, the flood shocks of 2010, the balance-of-payments crisis of 2018-2019, the COVID-19 shock of 2020, and the extreme inflation of 2022-2023.

Conclusion, Limitations and Policy Recommendations

In this study, we have explored the determinants of poverty and income inequality in Pakistan in long term and short-term perspective for the period 2000-2026 through two equations of ECM. One of the most effective long-term levers is education expansion: For every point increase in secondary gross enrollment, there is a corresponding decrease of 1.32 points in poverty and 0.33 points in the GINI coefficient. The employment ratio is statistically insignificant but it's not the irrelevance of employment, it's the fact that aggregate employment has almost completely stagnated at roughly 50 percent (Haq, 2020; ILO, 2017). Poverty and inequality have a strong, bi-directional relationship to each other, both in the short and long run. FDI also leads to high inequality and most of the credit has gone towards non-poor borrowers, suggesting the effectiveness of credit expansion in improving the financial situation of the poor. The extent of inequality is high in the context of FDI and there is not much credit extended to poor borrowers in private sector. Trade Openness shows a small poverty reducing impact. All of the diagnostic and stability tests are passed in both models and the estimated accuracy of education results for both models is high ($t = -9.4$ in Model 1 and $t = -4.9$ in Model 2).

The first limitation is that the sample size (27 annual observations) causes low statistical power that leads to inconclusive bounds tests, which could be overcome by the ECT approach (Kremers et al., 1992). Second, national aggregates mask provincial variations in the level of poverty. Third, the employment/population ratio fails to distinguish between formal and informal jobs, or between low- and high-quality jobs, and Pakistan has a significant informal sector (around 72% of jobs; ILO, 2023). The fourth is that static OLS is robust to cointegration (Stock & Watson, 1993) but not fully able to tackle endogeneity and other future studies may incorporate the DOLS, FMOLS, instrumental variables or the SVAR approach. Fifth, the GINI series based on household surveys underestimates top incomes (Cheema & Sial, 2012) that could lead to an underestimate of the value of inequality. Lastly, the education impact is the estimated impact of a speedy growth in school entry that is occurring from a low entry point, and the marginal impact may diminish as school entry levels reach saturation and the need for quality rather than quantity becomes greater.

The findings offer several policy implications for Pakistan's federal and provincial governments, the State Bank of Pakistan, and development partners. Expanding access to quality secondary education through fee waivers, targeted scholarships, and financial assistance for girls in rural areas can strengthen human capital and improve future employment prospects. Improving financial inclusion through Islamic micro-finance, digital banking, and targeted credit facilities for low-income households, women entrepreneurs, and small enterprises can support productive investment and income generation. Similarly, foreign direct investment policies should prioritize labour-intensive industries, technology transfer, skills development, and local employment, particularly within special economic zones and CPEC projects. Employment policies should also promote women's labour-force participation through safe transport, childcare support, and market-oriented vocational training. Furthermore, export diversification, assistance for workers affected by trade adjustments, and improved access to family planning, girls' education, and maternal healthcare

can help address structural constraints on inclusive development. Collectively, these measures can strengthen the links between education, productive employment, and financial access, thereby supporting sustainable poverty reduction and a more equitable distribution of income in Pakistan.

References

1. Abedullah, Farooq, S., & Naz, F. (2023). Developing strategy for rural transformation to alleviate poverty in Pakistan: Stylized facts from panel analysis. *Journal of Integrative Agriculture*, 22(12), 3610–3623. <https://doi.org/10.1016/j.jia.2023.11.028>
2. Afzal, M., Rehman, H. U., Farooq, M. S., & Sarwar, K. (2011). Education and economic growth in Pakistan: A cointegration and causality analysis. *International Journal of Educational Research*, 50(5–6), 321–335. <https://doi.org/10.1016/j.ijer.2011.10.004>
3. Afzal, M., Malik, M. E., Begum, I., Sarwar, K., & Fatima, H. (2012). Relationship among education, poverty and economic growth in Pakistan: An econometric analysis. *Journal of Elementary Education*, 22(1), 23–45.
4. Ajakaiye, O., Jerome, A. T., Nabena, D., & Alaba, O. A. (2015). *Understanding the relationship between growth and employment in Nigeria* (WIDER Working Paper No. 2015/124).
5. Ali, A., Aloudat, A., & Ayyoub, M. (2022). Education, employment and poverty in Pakistan: Evidence from time-series data. *Pakistan Journal of Applied Economics*, 32(1), 45–78.
6. Amjad, R. (2005). Pakistan's poverty reduction strategy: Why employment matters. *Lahore Journal of Economics*, 10(Special Edition), 145–178.
7. Anwar, T. (2002). *Impact of globalization and liberalization on growth, employment and poverty: A case study of Pakistan* (WIDER Discussion Paper No. 2002/17).
8. Appelbaum, E. (2012). *Reducing inequality and insecurity: Rethinking labor and employment policy for the 21st century*.
9. Aref, A. (2011). Perceived impact of education on poverty reduction in rural areas of Iran. *Life Science Journal*, 8(2), 498–501.
10. Arias, R., Giménez, G., & Sanchez, L. (2016). Impact of education on poverty reduction in Costa Rica: A regional and urban-rural analysis. *Contemporary Rural Social Work Journal*, 8(1), 3.
11. Arsani, A. M., Ario, B., & Ramadhan, A. F. (2020). Impact of education on poverty and health: Evidence from Indonesia. *Economics Development Analysis Journal*, 9(1), 87–96.
12. Asghar, N., Hussain, Z., & Rehman, H. U. (2012). The impact of government spending on poverty reduction: Evidence from Pakistan 1972 to 2008. *African Journal of Business Management*, 6(3), 845.
13. Atique, Z., Khan, M. H., & Azhar, U. (2004). The impact of FDI on economic growth under foreign trade regimes: A case study of Pakistan. *Pakistan Development Review*, 43(4), 707–718. <https://doi.org/10.30541/v43i4Ipp.707-718>
14. Awan, M. S., Malik, N., Sarwar, H., & Waqas, M. (2011). *Impact of education on poverty reduction*.
15. Bashir, M. F., Nawaz, S., Yasin, K., Khursheed, U., Khan, J., & Tahir, M. J. (2014). Determinants of inequality in Pakistan: An empirical investigation. *Pakistan Journal of Commerce and Social Sciences*, 8(1), 12–27.

16. Beck, T., Demirgüç-Kunt, A., & Levine, R. (2007). Finance, inequality and the poor. *Journal of Economic Growth*, 12(1), 27–49. <https://doi.org/10.1007/s10887-007-9010-6>
17. Becker, G. S. (1964). *Human capital: A theoretical and empirical analysis, with special reference to education*. National Bureau of Economic Research; Columbia University Press.
18. Bloom, D., Canning, D., & Sevilla, J. (2003). *The demographic dividend: A new perspective on the economic consequences of population change*. Rand Corporation.
19. Bokhari, S. H. Z., Malik, S., & Faridi, M. Z. (2022). Role of education in poverty mitigation in Pakistan: Evidence from Southern Punjab. *Pakistan Journal of Humanities and Social Sciences*, 10(2), 669–677.
20. Bourguignon, F. (2003). The growth elasticity of poverty reduction: Explaining heterogeneity across countries and time periods. In T. Eicher & S. Turnovsky (Eds.), *Inequality and growth: Theory and policy implications* (pp. 3–26). MIT Press.
21. Brooks, C. (2019). *Introductory econometrics for finance* (4th ed.). Cambridge University Press.
22. 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.
23. Cheema, I., & Sial, M. H. (2012). Poverty, inequality and growth nexus in Pakistan: An empirical analysis. *Pakistan Economic and Social Review*, 50(1), 1–20.
24. Coibion, O., Gorodnichenko, Y., Kueng, L., & Silvia, J. (2017). Innocent bystanders? Monetary policy and inequality. *Journal of Monetary Economics*, 88, 70–89. <https://doi.org/10.1016/j.jmoneco.2017.05.005>
25. Deininger, K., & Squire, L. (1998). New ways of looking at old issues: Inequality and growth. *Journal of Development Economics*, 57(2), 259–287. [https://doi.org/10.1016/S0304-3878\(98\)00099-6](https://doi.org/10.1016/S0304-3878(98)00099-6)
26. Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 74(366), 427–431. <https://doi.org/10.2307/2286348>
27. Dollar, D., & Kraay, A. (2004). Trade, growth and poverty. *Economic Journal*, 114(493), F22–F49. <https://doi.org/10.1111/j.0013-0133.2004.00186.x>
28. Easterly, W., & Fischer, S. (2001). Inflation and the poor. *Journal of Money, Credit and Banking*, 33(2), 160–178. <https://doi.org/10.2307/2673879>
29. Enders, W. (2015). *Applied econometric time series* (4th ed.). Wiley.
30. Engle, R. F., & Granger, C. W. J. (1987). Co-integration and error correction: Representation, estimation, and testing. *Econometrica*, 55(2), 251–276. <https://doi.org/10.2307/1913236>
31. Farquharson, C., McNally, S., & Tahir, I. (2024). Education inequalities. *Oxford Open Economics*, 3(Supplement_1), i760–i820.
32. Feenstra, R. C., & Hanson, G. H. (1997). Foreign direct investment and relative wages: Evidence from Mexico's maquiladoras. *Journal of International Economics*, 42(3–4), 371–393. [https://doi.org/10.1016/S0022-1996\(96\)01449-9](https://doi.org/10.1016/S0022-1996(96)01449-9)
33. Ferreira, F. H. G. (2012). Distributions in motion: Economic growth, inequality and poverty dynamics. In P. N. Jefferson (Ed.), *The Oxford handbook of the economics of poverty* (pp. 427–462). Oxford University Press.

34. Ghaffar, A., & Atta, N. (n.d.). [Title and year not specified in original document]. *Journal of Research in Social Sciences (JRSS)*.
35. Gregorio, J. D., & Lee, J. W. (2002). Education and income inequality: New evidence from cross-country data. *Review of Income and Wealth*, 48(3), 395–416. <https://doi.org/10.1111/1475-4991.00060>
36. Hanum, F. (2025). Study of Women's Roles in Poverty Reduction. *Efficient: Indonesian Journal of Development Economics*, 8(2), 194–205. <https://doi.org/10.15294/efficient.v8i2.20434>
37. Haq, N. ul. (2025). Poverty and inequality in Pakistan: Trends, causes, and policy implications. *ACADEMIA International Journal for Social Sciences*, 4(6), 31–42. <https://doi.org/10.63056/ACAD.004.06.1160>
38. Haq, R. (2020). Labour market outcomes and poverty in Pakistan: A distributional analysis. *Pakistan Development Review*, 59(2), 117–140. <https://doi.org/10.30541/v59i2pp.117-140>
39. Harris, R., & Sollis, R. (2003). *Applied time series modelling and forecasting*. Wiley.
40. Hoffmann, R., Hu, Y., de Gelder, R., Menvielle, G., Bopp, M., & Mackenbach, J. P. (2016). The impact of increasing income inequalities on educational inequalities in mortality: An analysis of six European countries. *International Journal for Equity in Health*, 15(1), 103.
41. Ilyas, S., Mehmood, K. A., & Saeed, S. (2025). Education, poverty, and economic growth nexus in Pakistan. *The Regional Tribune*, 4(1), 184–193. <https://doi.org/10.63062/trt/WR25.071>
42. Imtiaz, M., Abid, M. Y., & Sheikh, D. S. M. (2023). Impact of education and income inequality on the poverty rate of Pakistan: An econometric analysis. *Pakistan Islamicus (An International Journal of Islamic & Social Sciences)*, 3(2), 129–141.
43. International Labour Organization. (2017). *World employment and social outlook: Trends 2017*. ILO Publishing. https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_541211.pdf
44. International Labour Organization. (2023). *Pakistan labour market country brief 2023*. ILO Regional Office for Asia and the Pacific. <https://www.ilo.org/asia/countries/pakistan/lang--en/index.htm>
45. International Monetary Fund. (2024). *World Economic Outlook database, April 2024*. <https://www.imf.org/en/Publications/WE0>
46. Jamal, H., & Khan, A. J. (2005). The knowledge divide: Education inequality in Pakistan. *Lahore Journal of Economics*, 10(1), 83–104.
47. Jamil, B., Yaping, S., Ud Din, N., & Nazneen, S. (2022). Do effective public governance and gender (in)equality matter for poverty? *Economic Research-Ekonomska Istraživanja*, 35(1), 158–174.
48. Janjua, P. Z., & Kamal, U. A. (2011). The role of education and income in poverty alleviation: A cross-country analysis. *Lahore Journal of Economics*, 16(1), 143–172.
49. Johansen, S. (1991). Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models. *Econometrica*, 59(6), 1551–1580. <https://doi.org/10.2307/2938278>
50. Karnani, A. G. (2009). *Reducing poverty through employment* (Ross School of Business Paper No. 1132).
51. Kelley, A. C., & Schmidt, R. M. (2001). Economic and demographic change: A synthesis of models, findings, and perspectives. In N. Birdsall, A. C. Kelley, & S. Sinding (Eds.),

- Population matters: Demographic change, economic growth and poverty in the developing world* (pp. 67–105). Oxford University Press.
52. Khalid, U., & Ghaus-Pasha, M. (2020). Education, poverty and inequality in Pakistan: Long-run analysis. *Social Indicators Research*, 149(2), 681–702. <https://doi.org/10.1007/s11205-019-02240-x>
 53. Khalid, U., Sultana, S., & Malik, A. (2019). Determinants of income inequality in Pakistan: A time series analysis. *Journal of Applied Economics and Business Research*, 9(2), 80–97.
 54. Khan, M. Z., Rehman, S., & Rehman, C. A. (2015). Education and income inequality in Pakistan. *Management and Administrative Sciences Review*, 4(1), 134–145.
 55. Khan, N., Zaman, K., & Waseem, M. (2018). Financial inclusion, poverty and inequality in Pakistan: Evidence from household-level data. *Pakistan Economic and Social Review*, 56(2), 151–178.
 56. Khandker, S. R., & Faruquee, R. R. (2003). The impact of farm credit in Pakistan. *Agricultural Economics*, 28(3), 197–213. <https://doi.org/10.1111/j.1574-0862.2003.tb00138.x>
 57. Kihwele, E. A., & Gwahula, R. (2015). Impact of saving and credit cooperative societies in poverty reduction: Empirical evidence from Tanzania. *European Journal of Business and Management*, 7(23), 104–111.
 58. Klasen, S., & Lamanna, F. (2008). *The impact of gender inequality in education and employment on economic growth in developing countries: Updates and extensions* (IAI Discussion Paper No. 175).
 59. Kremers, J. J. M., Ericsson, N. R., & Dolado, J. J. (1992). The power of cointegration tests. *Oxford Bulletin of Economics and Statistics*, 54(3), 325–348. <https://doi.org/10.1111/j.1468-0084.1992.tb00005.x>
 60. Kuznets, S. (1955). Economic growth and income inequality. *American Economic Review*, 45(1), 1–28.
 61. Ladin, K. (2025). Absolute Deprivation. In *The Wiley Blackwell Encyclopedia of Health, Illness, Behavior, and Society* (pp. 1–3). John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781118410868.wbehibs505.pub2>
 62. Lewis, W. A. (1954). Economic development with unlimited supplies of labour. *The Manchester School*, 22(2), 139–191. <https://doi.org/10.1111/j.1467-9957.1954.tb00021.x>
 63. Ljungdahl, S., & Bremberg, S. G. (2015). Might extended education decrease inequalities in health? A meta-analysis. *The European Journal of Public Health*, 25(4), 587–592.
 64. Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22(1), 3–42.
 65. Majumder, S., & Biswas, S. C. (2017). The role of education in poverty alleviation: Evidence from Bangladesh. *Journal of Economics and Sustainable Development*, 8(20), 151–160.
 66. Mincer, J. (1974). *Schooling, experience, and earnings*. National Bureau of Economic Research; Columbia University Press.
 67. Munir, F., Khan, I. H., Javed, M., Sibte-Ali, M., & Zaib, L. (2022). Understanding social inequalities in Pakistan: An intersectionality perspective on ethnicity, income, and education. *International Journal of Special Education*, 37(3), 3985–4000.
 68. Narayan, P. K. (2005). The saving and investment nexus for China: Evidence from cointegration tests. *Applied Economics*, 37(17), 1799–1990. <https://doi.org/10.1080/00036840500278103>

69. Okpara, G. C. (2010). Microfinance banks and poverty alleviation in Nigeria. *Journal of Sustainable Development in Africa*, 12(6), 177–191.
70. Park, K. H. (1996). Educational expansion and educational inequality on income distribution. *Economics of Education Review*, 15(1), 51–58. [https://doi.org/10.1016/0272-7757\(95\)00045-3](https://doi.org/10.1016/0272-7757(95)00045-3)
71. Pasha, H. A. (2023). The growth–inequality–poverty nexus in Pakistan. *Pakistan Journal of Applied Economics*, 33(2), 231–239.
72. Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289–326. <https://doi.org/10.1002/jae.616>
73. Ravallion, M. (2001). Growth, inequality and poverty: Looking beyond averages. *World Development*, 29(11), 1803–1815. [https://doi.org/10.1016/S0305-750X\(01\)00072-9](https://doi.org/10.1016/S0305-750X(01)00072-9)
74. Rehman, F. U., Nasir, M., & Shahbaz, M. (2021). What have we learned? Assessing the effectiveness of financial development on poverty and income inequality in Pakistan. *Economic Change and Restructuring*, 54(1), 241–272. <https://doi.org/10.1007/s10644-020-09281-y>
75. Romer, P. M. (1990). Endogenous technological change. *Journal of Political Economy*, 98(5, Pt. 2), S71–S102.
76. Rosen, S. (1989). Human capital. In J. Eatwell, M. Milgate, & P. Newman (Eds.), *Social economics* (pp. 136–155). Palgrave Macmillan.
77. Saddique, R., Zeng, W., Zhao, P., & Awan, A. (2023). Understanding multidimensional poverty in Pakistan: Implications for regional and demographic-specific policies. *Environmental Science and Pollution Research*. <https://doi.org/10.1007/s11356-023-28026-6>
78. Samariya, A. K., & Sharma, D. P. (2025). Two to tango: Multiple affirmative action policy in education and employment. *Journal of Policy Modeling*.
79. Schultz, T. W. (1961). Investment in human capital. *American Economic Review*, 51(1), 1–17.
80. Sen, A. (1999). Development as freedom. Alfred A. Knopf.
81. Shafiq, S., Sami, F., & Taqqadus, H. (2025). THE ROLE OF REMITTANCES IN PAKISTAN ECONOMIC GROWTH: TRENDS, IMPACT, AND POLICY RECOMMENDATIONS. *Gomal University Journal of Research*, 41(1), 63–72.
82. Shaheen, R., Yasmin, N., Safdar, N., Yasmin, F., & Khatoon, S. (2021). Education, poverty, and unemployment: A way forward to promote sustainable economic growth in Pakistan. *The Journal of Contemporary Issues in Business and Government*, 27(6), 74–85.
83. Siddique, H. M. A., Ali, H., Ullah, K., & Mahmood, M. T. (2018). Human capital and economic growth nexus in Pakistan: The role of foreign aid. *Bulletin of Business and Economics*, 7(1), 13–21.
84. Stock, J. H., & Watson, M. W. (1993). A simple estimator of cointegrating vectors in higher order integrated systems. *Econometrica*, 61(4), 783–820. <https://doi.org/10.2307/2951763>
85. Taruno, H. T. (2019). Public spending and poverty reduction in Indonesia: The effects of economic growth and public spending on poverty reduction in Indonesia 2009–2018. *The Indonesian Journal of Planning and Development*, 4(2), 49–56.
86. Tasleem, Z., Muhammad, S. A., & Saif, A. (2025). A Conceptual Framework on the Determinants of Poverty and Its Impact on Households in Pakistan. *Sociological Research And Innovation*, 3(1), 24–45. <https://doi.org/10.32350/sri.31.02>

87. Tilak, J. B. G. (2002). Education and poverty. *Journal of Human Development*, 3(2), 191–207.
88. Umair, M., Ahmad, W., Hussain, B., Fortea, C., Zlati, M. L., & Antohi, V. M. (2024). Empowering Pakistan's economy: The role of health and education in shaping labor force participation and economic growth. *Economies*, 12(5), 113. <https://doi.org/10.3390/economies12050113>
89. United Nations Development Programme. (2023). *Human development report 2023/24: Breaking the gridlock*. <https://hdr.undp.org/content/human-development-report-2023-24>
90. World Bank. (2021). *Pakistan: Poverty and equity assessment 2021*. World Bank Group. <https://openknowledge.worldbank.org/handle/10986/35517>
91. World Bank. (2023). *Pakistan development update: Restoring fiscal sustainability*. World Bank Group. <https://openknowledge.worldbank.org/handle/10986/39534>
92. World Bank. (2024). *World Development Indicators database*. World Bank Group. <https://databank.worldbank.org/source/world-development-indicators>
93. Zafar, M., Waqas, M., & Butt, M. N. (2018). *THE ROLE OF SMALL AND MEDIUM ENTERPRISES ON POVERTY REDUCTION IN DEVELOPING COUNTRY: A CASE OF PAKISTAN*. 20(3).
94. Zafar, M., Waqas, M., & Butt, M. N. (2019). The role of small and medium enterprises on poverty reduction in developing country: A case of Pakistan. *Business & Economic Review*, 20(3), 703–713.
95. Zaman, K., Ahmad, M., & Shamsuddin, Z. (2021). Financial development, trade openness and poverty reduction in Pakistan: Evidence from ARDL bounds testing approach. *Journal of Asian Finance, Economics and Business*, 8(4), 685–695. <https://doi.org/10.13106/jafeb.2021.vol8.no4.0685>
96. Zaman, K., Khan, M. M., Ahmad, M., & Rustam, R. (2012). Determinants of electricity consumption function in Pakistan: Old wine in a new bottle. *Energy Policy, Special Section: Past and Prospective Energy Transitions - Insights from History*, 50, 623–634. <https://doi.org/10.1016/j.enpol.2012.08.003>
97. Zaman, K., Shah, I. A., & Ahmad, M. (2012). Understanding the relationship between economic growth, employment, income inequality and poverty in Pakistan. *Journal of Social and Economic Development*, 14(1), 1–25.
98. Zhang, C. (2021, April). Role of education on poverty reduction: The case study of Pakistan. In *2021 6th International Conference on Social Sciences and Economic Development (ICSSSED 2021)* (pp. 24–29). Atlantis Press.