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# Analysing the Impact of Macroeconomics Variables on Poverty in Pakistan: A Fresh Insight using ARDL to Cointegration Analysis

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Poverty,
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GDS, GCF

*The aim for this examines is to describe the effect of macro-economic aspects affecting reduction in poverty. This analyses approximately the concept that how can get rid of poverty by working on macroeconomic variables. The Data is taken from WDI for the duration of 1998 to 2022 of Pakistan. An econometric model ARDL is used to analyse short- and long-term results. Research has proven that poverty may be reduced with the aid of the selected macroeconomic variables. Furthermore, in line with the study's findings, the Education has great impact on economic by reducing poverty. Economy stability growth plays a vital role in eliminating poverty. Inflation presents insignificant impact in short & long duration as it increases poverty so inflation must be in control. This research reveals that all the determinants of the model are statistically great. Gross capital formation is negatively related to poverty and helps in lowering it while the opposite three determinants are positively associated. This study has a novel contribution to literature in the domain Economy growth and poverty knowledge. It is unique in a way to integrate the knowledge in academics and awareness about poverty elimination in Pakistan among students & scholar. Moreover, the observation recommends that the government overview its guidelines & possibility by lessen poverty using education, to control inflation and enhance GDP to boost economic growth.*

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# 1 Introduction

Poverty is taken into consideration to be a simple requirement in a society associated with wellbeing (Lee & Yuan, 2024). It includes shortage of income and the shortage of capability to accumulate the essential objects and offerings vital for survival with dignity. According to Hartwig and Nguyen (2023) the line of poverty is a common tool used to quantify poverty. It is a common metric used to distinguish between affluent and poor individuals in which terrible are the ones whose income or consumption falls under the line. Poverty being the most unwanted socio-economic hassle of an financial system (Islam et al., 2001; Zafar, Waqas, & Butt, 2019). This worldwide hassle has its very own dynamics and converting the face with time and area and is located to be more severe in developing international locations (Chambers, 1995).

Poverty additionally encloses low degree of Fitness and education system as well as they acquiring a shortage of pure water and proper process of sanitation in mostly places ,they don’t have the possibility to better lifestyles of every individual and insufficient physical protection, lack of voice and insufficient capacity of basic necessities (Squire, 1993). The Poverty has multidimensional aspects and it is spread everywhere in the global (Poverty & Initiative, 2018). it's far a moreover a worldwide trouble but its intensity is considered one of a type in specific regions. according to international improvement record (Islam et al., 2001) . The arena’s six billion human beings, In the region of south-Asia eight billion human beings nearly 1/2 of the sector populace consumption of money is less than $2 a day and 1.2 billion nearly 1/5 stay on a below 1 Doller with the 44% residing. As Poverty effects starvation & malnourished. In the year 2009, its anticipated about the range of starving men and women is reached about 15 percentage of the predicted international populace.

Regardless of the variations in reason and outcomes of this hassle, financial growth has been a traditional and oldest approach of fighting it via trickledown effect (Kay, Pratt, & Warner, 2007). further, we realize that the scale of growth is largely decided by means of the provision of assets, gross domestic financial savings (GDS) began to be taken into consideration as a catalyst for the growth of the economic system (AbuAl-Foul, 2010) and as a result a distinguished determining issue for poverty discount. when many economies failed in reducing the incidence of poverty by means of realizing fast financial increase it become recommended that restricting boom because the best determinant of poverty won't serve the cause (Fukuda-Parr, 2006). Even as discussing the effectiveness of GDS in decreasing the poverty (Akobeng, 2017) . it's miles discovered that GDS can be an vital determinant of poverty reduction if it's miles translated into capital formation which is commonly represented as gross capital formation (GCF).

An entire lot of studies have taken into consideration the characteristics & dimensions of poverty globally but a bit work has been completed at the most important macroeconomic variables that have an effect on poverty with special reference to Pakistan (Akhtar, Hunjra, Safwan, & Ahmad, 2012). In addition poverty reduction is possible if economic growth Can increase (Afzal, Malik, Begum, Sarwar, & Fatima, 2012) and different studies suggest to make improvement in different variables to promote economic growth like Green economy boost dynamic growth (Younas, Shoukat, Awan, & Arslan, 2023), According to Kanwal, Hassan, and Butt (2023) the improvement of financial sector can enhance economic growth of the Pakistan and Technopreneurs-ship can boost economic growth of Pakistan (Awan, ul Hasnain, & Arshad, 2023) Although Foreign direct investment can enhance economic growth of Pakistan (Arslan, Kanwal, Kazmi, & Rahman, 2023) . Consequently, this research goals to take a look at the effect of the macroeconomic based variables which includes the inflation and the education on poverty for Pakistan in short and longer term. Due to this observation the statistical analyses of this research are done by ARDL model to co-integration.

To provide a sound base for the economic growth system, nationalization of banks became finished with a view to sell resource mobilization (gross home savings) and funding (gross capital formation) so that India may additionally recognize speedy financial increase and might have a fall in the incidence of poverty (Acharya & Sadath, 2023). So, amidst all of those, the Pakistan society perceived a massive increase in population and can have any of the implication on poverty as mentioned above. To recognise the truth and discover the policy implications the present studies make an attempt and investigates the effect of economic growth, financial savings mobilization, capital formation and growth of the population on occurrence of poverty in Pakistan. So objectives of this research are to examine the macro-economic factors affecting poverty for Pakistan, to examine role of government on policies for poverty in Pakistan and to examine Pakistan in terms of can achieving poverty reduction with the help of macro-economic factors.

In this study researcher used Theories of economic development. Theories of economic development are made in a try and provide an explanation for how a international locations forms and prospers, and these theories are frequently used to make legal hints and regulations.

## 2 Literature Review

There's a large volume of literature both theoretical and empirical, to be had on the problem of economic increase and poverty reduction. The to be had literature means that development in economic growth led to poverty remedy (Alam, Israr, & Abusaad, 2021; Amann, Aslanidis, Nixson, & Walters, 2006). According to Norton (2002) this research determined that economic progress results in economic increase with none vast impact on the lives of the negative. Greenwald and Stiglitz (1993) determined that negative economic marketplace is a measure cause of poverty inside the developing nations

Brady (2003) analysed essential determinants regarding poverty at macro level for the duration from 1963 to 1994. Poverty come to be similarly decomposed in two types that was both the urban and rural populations poverty. In this study the simple regression approach is used and taken consideration of daily aspects of poverty and geographics entities of poverty as set up concern variables. Poverty has given a Very hard situation on independent variables which includes in keeping with capita Gross national product, the inflation percentage exchange within the passage of previous year, Gini Index one after the other for Pakistan, rural areas, urban regions, actual remittances consistent with capita and actual remittances taken as the percent of Gross national product, term of trade and so on. variables located significant were actual in align with capita GNP, the remittances actual salary, job stress as a percentage of overall populace and Job strain engaged in agriculture sector (Johnson, 2017). The subsidies in step with per capita was the most effective massive for usual Poverty, regular with per capita the availability of meals grain turned into most effective massive and agriculture productivity changed into first-class big for poverty of rural area. This research was being based mostly on a limited variety of study that can’t be relied on for coverage capabilities.

Forgha, Mbella, and Ngangnchi (2014) provided technique based on a simultaneous series of equation for analysing the poverty from 1970 to 2005. After applying the co-integration errors correction mechanism, He used a 3 level least squares (3SLS). After all He concluded that all the variables besides GDP, had direct link with the variable named inflation. So, these findings were steady with the theory of economic besides the relation of Phillips’s economy curve hypothesis. anticipated inflation price and money deliver have been more advantageous through boom and improvement through poverty alleviation. The observe additionally advised that authorities should make target rules a good way to create employment chances thru growth in new business industry & jobs sector, development in occupational & vocational based education. The study advocated the concerned authorities for developing a polices to alleviate poverty in the longer period of time.

Chaudhry, Malik, Hassan, and Faridi (2010) explored whether distinct extent of literacy prompted Poverty relief from 1972-2007. education influences poverty immediately via improvement in knowledge and capability due to better salary and indirectly via external benefits which includes fulfilment of primary desires, a better accommodation , good fitness centres, water supply, and sewage disposal (Chaudhry et al., 2010). To discover the analytical bound among all economy-based variables, ARDL model had been used: first of all for variable like poverty ARDL version discovered, increase, literacy rate, customer fee index. The study considered all variables inside the log duration have a look at discovered for the first technique that Consumer price index (CPI) and Trade opening had been insignificant during statistical testing & presented anticipated sign. Along with this the education fee, HCI & CPI have been statistically substantial with anticipated sign. For the second version, GDP, education had been insignificant during statistical testing with the expected sign, consumer price index (CPI) and trade opening a whole year have been statistically large with anticipated signal. The study come to an end that to get university degree or better schooling had a significant impact on the poverty relive despite this Reality that development in human capital and inflation grow to be the main reason of poverty even as opening of trade decreased. The study was further recommended about monetary regulations should recognition for the removal of poverty although to learn, although to manage the inflation in country and the opening of trade across the borders.

According to Z. U. Rahman and Ahmad (2019) the influence of Gross Capital Formation (GCF) on the growth of economy & poverty via way of the usage of ARDL approach. The observe moreover taken into consideration the effect of the remittances, actual Gros domestic product, inequality of income among people due to poverty. The study was also analysed that Gross Capital Formation have outstanding and the during statistical analyses it’s a widespread impact on monetary increase and Gross Capital Formation es additionally have strong statistically great impact on poverty discount.

Several studies has located that composition of increase and prevailing socioeconomic conditions within the society particularly wealth and earnings distribution, degree of saving and funding, capital formation, instructional status, urbanization and modern-day socioeconomic indicators impacts the effectiveness of financial increase on poverty reduction (Loayza & Raddatz, 2010) similarly to the already published literature on the interconnection among the variable named poverty and financial form of growth, economic development, and populace increase, this observe specializes in the function of financial growth savings, capital formation, and population boom in poverty reduction (Sackey, 2023).

## 3 Methodology of the Study

In an econometric model first of all the unit root test is used to check the significance of the variables in this research. So, for this purpose two main test of unit root is applied when the data is time series .one test is Augmented Dickey-Fuller test (ADF) (Lopez, 1997) and other one is Philip Peron. So, After make analyses of ADF and Philip Peron (p.p) the f-statics bound test is applied and then ARDL in long and short run is done to check the result in short and long run. Moreover, in terms of Theoretically framework, poverty have correlation with particular macroeconomic based variables. There may be a strong interconnection between poverty and macroeconomic variables.so one aspect must be stated that each person might not be underneath poverty line badly .so poverty is decreased via alleviating of unemployment of peoples. Poverty in a positive way is associated alongside inflation. excessive inflation outcomes in the distinctive phrase a person isn't capable of finding the money for primary dreams of lifestyles. Since the facts for poverty isn't always available in non-stop series, interpolation has been completed on the idea of clean commonplace growth charge the various periods. inside the poverty is considered as dependent variable. While other variables are income, gross capital formation, gross domestic saving and population are taken as independent variables. In this research the co-integration linkages some of the variables poverty, economic growth gross, capital formation, gross domestic financial savings and populace boom are taken into consideration. education impacts poverty at once through development in information and skills as a result of better revenue and no longer immediately through outside benefits along with fulfilment of easy needs, safe haven, better fitness centres, water and sanitation (Loayza & Raddatz, 2010). so we formulate the subsequent version of the poverty. in addition, the long-term relationship is expected the use of the poverty as the established. The empirical structure for present research is specific as below:

$$\mathrm{POV} = \mathrm{f}(\mathrm{EDU}, \mathrm{GDP}, \mathrm{INF}, \mathrm{GCF}, \mathrm{GDS})$$

In above equation the variable poverty is presented as 'POV', Education is presented by 'EDU', Inflation is presented by 'INF' Gross capital formation is presented by 'GCF' and Gross domestic saving is presented by 'GDS'. So, the econometric model is described below as:

$$\mathrm{POV_t} = \alpha + \beta_1 \mathrm{EDU} + \beta_2 \mathrm{GDP_t} + \beta_3 \mathrm{INF_t} + \beta_4 \mathrm{GCF_t} + \beta_5 \mathrm{GDS_t} + \mu_t$$

The measurement, Data Source and symbols of the variables is given below;

**Table 1: Variables, Data Sources and Mesearement**

| Variables | Symbol | Data Source | Measurement |
|---|---|---|---|
| Poverty | Pov | WDI | Multidimensional poverty index |
| Educatioon | Edu | WDI | Education expenditure (current US$) |
| Gross Domestic Saving | GDS | WDI | Gross domestic savings (% of GDP) |
| Gross Capital Formation | GCF | WDI | Gross capital formation(annual growth) |
| Economic Growth | GDP | WDI | GDP growth (annual %) |
| Inflation | Inf | WDI | Inflation, GDP deflator (annual %) |

So, its impotent to investigate the interconnection between the variables for both long and short run. Their order of integration must be checked due to the truth regression of non-desk bound variables can probably deliver spurious effects. Time series data are usually found to be non-stationary, even if they could be continuous. Consequently, the conventional least squares approach might not be the most effective for assessing the model. The basic or multiple linear regression methods must be used before the Dickey and Fuller (1981) and Phillips and Perron (1988) procedures are used. As a result, the association among the variable that is dependent and its independent variables was examined using the ARDL model. Because the ARDL model could handle short-term as well as long-term events within a single, coherent framework, it was selected for time series analysis over other econometric approaches. Compared to more conventional models like vector autoregressive and an autoregressive incorporated moving average, ARDL models provide a more accurate depiction of the underpinning economic relationships since they permit the co-integration across parameters. This is quite useful for handling non-stationarity issues with time series data. Because of their adaptability to mixed-order integration levels and their versatility in capturing dynamic interactions, ARDL models are valuable instruments for empirical study. This is particularly crucial when the data creation process itself has long-term and short-term effects. Additionally, time series research often use statistical methods to evaluate long- and short-term associations, respectively, such as bounds testing, the Autoregressive Distributed Lag (ARDL), and the Error Correction Model (ECM). The ECM is a highly helpful tool for simulating short-term dynamics. It is necessary to compute the ARDL model in order to determine cointegration. The next step is to do F-statistics bound test; if cointegration is discovered, the ECM has to be looked. So the ARDL technique of above version may be written as:

$$\begin{aligned}\Delta\ln Pov = {} & \alpha_0 + \sum_{i=1}^{p} \alpha_1\ \Delta\ln GEDU_{t-i} + \sum_{i=1}^{p} \alpha_2\, \Delta\ln GDP_{t-i} + \sum_{i=1}^{p} \alpha_3\, \Delta INF_{t-i} \\ & + \sum_{i=1}^{p} \alpha_4\, \Delta\ln GCF_{t-i} + \sum_{i=1}^{p} \alpha_5\, \Delta\ln GDS_{t-i} + \lambda_1 GEDU_{t-1} + \lambda_2 GDP_{t-1} \\ & + \lambda_3 INF_{t-1} + \lambda_4 GCF_{t-1} + \lambda_5 GDS_{t-1} + \varepsilon_t\end{aligned}$$

In this equation, Δ is the First finite difference operator That is the steady of order in a variable with a non-stop operator. The coefficients are α1, α2, α3, α4i and α5 constitute the dynamics for short run of the version while the parameters are λ1, λ2, λ3, λ4 and λ5 represent the long-term relationship. So, for this version for the null hypothesis is written as;

$H_0$: $\lambda_1=\lambda_2=\lambda_3=\lambda_4=\lambda_5=0$ (it shows no relationship between the variables)

$H_1$: $\lambda 1\neq\lambda_2\neq\lambda_3\neq\lambda_4\neq\lambda_5\neq 0$

To keep analysing the long run interconnection as presented in equation (2), we applied positive test of equation (three) the usage of F-Statistics data with the help of lower and upper bounds. Further, If the F-statistics records fee can be more than the higher positive so $H_0$ is rejected and in case the F-statistics data falls among better & decrease high-quality so the test is definite the result and if it is far lots much less than decrease wonderful then $H_0$ cannot be inadequate. After finding the long-time interconnection, we predicted mistakes of correction model (ECM) which pi point the adjustment rate returned to long-term equilibrium after short run disturbance. consequently, ECM of equation (3) is given below;

$$\begin{aligned}\Delta POV_t = {} & \beta_0 + \sum_{i=1}^{p} \delta_i\ \Delta EDU_{t-i} + \sum_{i=1}^{p} \emptyset_i\, \Delta GDP_{t-i} + \sum_{i=1}^{p} \omega_i\, \Delta INF_{t-i} \\ & + \sum_{i=1}^{p} \gamma_i\, \Delta GCF_{t-i} + \sum_{i=1}^{p} \theta_i\, GDS_{t-i} + \alpha\, ECM_{t-1} + U_t\end{aligned}$$

This study is used data of last 25 years in time series data for Pakistan to look at the effect of fundamental factors correlated with poverty. The data collection is done from the different issues of economic databases & world indicators databases like WDI. The variables used absolute poverty, GDS, GDP, GCF, inflation, education in the present study.

# 4 Estimation of Results

## 4.1 Descriptive statistics

The descriptive statistic revealed that the variables were normally distributed within reasonable limitations. Heteroscedasticity was eliminated prior to estimation. It is evident from looking at the greatest and lowest numbers that each variable changes. Furthermore, the EDU and GCF standard deviations are becoming closer to their averages, according to the descriptive statistics in Table 2.

**Table 2: Descriptive Analysis**

| | EDU | GCF | GDP | GDS | INF | POV |
|---|---|---|---|---|---|---|
| Mean | 6.688978 | 1.344799 | 7.143909 | 4.648480 | 0.807074 | 1.074999 |
| Median | 6.708166 | 1.421345 | 7.555515 | 4.522840 | 0.848882 | 0.735837 |
| Maximum | 6.827324 | 2.595001 | 9.848047 | 9.154729 | 1.718487 | 3.668323 |
| Minimum | 6.299071 | 0.213828 | 4.490595 | 2.973064 | 0.113711 | 0.355613 |
| Std. Dev. | 0.130197 | 0.565607 | 1.533027 | 1.431106 | 0.431766 | 0.914240 |
| Skewness | -1.518453 | -0.072672 | -0.189598 | 1.277279 | 0.286486 | 1.876156 |
| Kurtosis | 4.944172 | 2.823431 | 1.984059 | 4.957473 | 2.378588 | 5.244938 |
| Jarque-Bera | 13.54438 | 0.054481 | 1.224922 | 10.78903 | 0.744219 | 19.91624 |
| Probability | 0.001145 | 0.973127 | 0.542015 | 0.004541 | 0.689279 | 0.000047 |

## 4.2 Unit Root Test Results

Before using co integration investigation, the unit root test must be completed. Before evaluating the fluctuating interaction among the independent and dependent variables, every parameter's stationarity was evaluated. Variables that are stationary at the level, at first difference, or at both can be addressed using the ARDL paradigm. The first ever step in unit root for testing the significance & the order of integration for variables we used ADF test (Lau, 2009). All the available variables are at level or first difference and none of the variable is on 2$^{nd}$ difference for ARDL model, therefore ARDL method to co integration can be the most accurate approach for the estimation method. The Unit root test is also used in different studies (Ali, ur Rahman, & Anser, 2020; A. Bakar, 2019; N. A. A. Bakar, 2019; N. S. Hafiza et al., 2022; Hassan, Sheikh, & Rahman, 2022; Y. Khan, 2022; Khoula, ur Rehman, & Idrees, 2022; Li et al., 2022; mWaheed Muhammad Waheed, 2022; S. Rahman & Idrees, 2019; S. u. Rahman, Chaudhry, Meo, Sheikh, & Idrees, 2022; Rehman, Ali, Idrees, Ali, & Zulfiqar, 2022; Sarwar, Ali, Bhatti, & ur Rehman, 2021; Shafique, Rahman, Khizar, & Zulfiqar, 2021; Shahid, Muhammed, Abbasi, Gurmani, & ur Rahman, 2022; ur Rahman, 2018; Younas et al., 2023; Zhu, Fang, Rahman, & Khan, 2023; Zulfiqar et al., 2022). The unit roots had been tested using the Philip Peron (PP) (Leybourne & Newbold, 1999) and augmented Dickey-Fuller (ADF) methods. One percent and five percentage points are both separate significance thresholds.

**Table 3: Unit Root Tests**

| Variables | I(0) | | I(1) | |
|---|---|---|---|---|
| | ADF Test | PP Test | ADF Test | PP Test |
| Pov | 0.00*** | 0.03** | 0.00*** | 0.01** |
| EDU | 0.17 | 0.01** | 0.02** | 0.00** |
| GDS | 0.00*** | 0.19 | 0.18 | 0.01** |
| GCF | 0.00*** | 0.00*** | 0.01** | 0.01** |
| GDP | 0.01** | 0.09 | 0.00*** | 0.00*** |
| Inf | 0.03** | 0.10 | 0.00*** | 0.00*** |

The ARDL method id based on the Pesaran, Shin, and Smith (2001). if we use the criteria of leg AIC then the result are given in the table 4. The test of ARDL develop the long run interconnection among the dependent & independent variable of this research.

## 4.3 Results of Cointegration Bound Test

The value of F statistics is more than the upper bound value. As a consequence, it is found which the null hypothesis, or the one according to which there is not a long-term association among the factors, gets dismissed. The computed value of F statistics is great as compared to upper bound critical values based on at the available level of significance.

**Table 4: F-Bounds Test**

| Test Statistic | Value | Significance | I(0) | I(1) |
|---|---|---|---|---|
| F-statistic | 4.72 | 10% | 2.08 | 3 |
| K | 5 | 5% | 2.39 | 3.38 |
| | | 2.5% | 2.7 | 3.73 |
| | | 1% | 3.06 | 4.15 |

Table 4 presents the ECM results of the selected ARDL model; the short run elasticities are represented by Δ with a variable value. In the short term, education has a beneficial and considerable influence on poverty. Growth has a major detrimental influence on poverty. Although neither the former nor the latter is significant in explaining Pakistan's transient variations in poverty, inflation has a negative impact. The important coefficient of ECM. It suggests that the poverty of Pakistan behaves erratically.

**Table 5: ECM Regression**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| CointEq(-1)* | -0.743 | 0.354 | -2.095 | 0.035 |
| POV(-1)* | -0.196 | 0.092 | -2.131 | 0.042 |
| INF** | 2.112 | 0.953 | 2.221 | 0.037 |
| GDS** | 2.817 | 0.887 | 3.115 | 0.008 |
| GDP** | -1.206 | 0.290 | -4.212 | 0.001 |
| GCF** | 2.551 | 0.948 | 2.682 | 0.025 |
| EDU** | 0.954 | 0.217 | 4.129 | 0.000 |

Regarding the short-term approach, the value of ECMt−1 is significant. Furthermore, we found that price inflation had a significant impact on poverty in Pakistan. It shows that while GDS has a statistically significant and favourable short-term impact of 2.817% on poverty in Pakistan, while a 2.112% increase in inflation results in a 0.09% increase in poverty. The results of the GDS showed that a 2.817% rise in gross domestic savings was associated with a considerable drop in Pakistan's poverty rate. These results are aligned with N. Hafiza, S., Rahman, Sadiq, Shoukat, and Ali (2023), Chaudhary, Nasir, ur Rahman, and Sheikh (2023), S. M. Khan, Rehman, and Fiaz (2023), Usman, Rahman, Shafique, Sadiq, and Idrees (2023), Ilyas, Banaras, Javaid, and Rahman (2023), Bashir, Ahmad, and Hussain (2018), and Javed, Bashir, Nawaz, and Hussain (2022).

Therefore, although GDP appears to have a short-term negative impact on poverty, GDS appears to have a short-term positive influence on the decrease of poverty. However, a 2.551% increase in GCF lead to raise the poverty in poverty in the short run. Poverty is negatively and significantly impacted by GCF. This suggests that a lifetime education can lower poverty by a percentage of 0.954% per year. The results show that a 10% rise in Education makes Poverty to decrease 0.09 % in the short run.

**Table 6: ARDL Long Run**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| INF | 1.023 | 0.229 | 4.456 | 0.000 |
| GDS | 0.789 | 0.253 | 3.120 | 0.000 |
| GDP | 0.943 | 0.529 | 1.782 | 0.096 |
| GCF | 0.399 | 0.173 | -2.306 | 0.034 |
| EDU | 0.799 | 0.263 | 3.120 | 0.006 |

Table 6 shows that macro-economic variables had significant effect on the dependent variable Poverty.  The Inflation can raise poverty. If inflation is in negative then poverty can be reduced. The coefficient of Inflation indicates that a 10% increase in inflation leads the poverty to increase by 1.023%. The variable education has a good effect on poverty during statistical testing. If 10% can be increased in GDS among nation then poverty can be reduced at 0.7%. As education provides skills and knowledge to peoples and enable them to start business .in addition if economic growth of the country is going upward then poverty will be in control because a growing economy creates jobs and business opportunities. So, if 10% Increase in GDP growth than 0.9% poverty will be reduced. As such, the result challenges the economic theory as well as the consequences that have been studied in previous studies. This may be the outcome of the macroeconomic statistics used in the research. Likewise, if 10% increase in gross capital formation (GCF) then 0.3% poverty can be reduced in Pakistan. These Findings are align with the previous studies (Afzal et al., 2012; Chaudhary et al., 2023; Dawood, ur Rehman, Majeed, & Idress, 2023; Ilyas, Banaras, et al., 2023; S. M. Khan et al., 2023; Meo et al., 2023; Qadri et al.; Shahid, Gurmani, Rehman, & Saif, 2023; Shahzadi, Sheikh, Sadiq, & Rahman, 2023; Škare & Družeta, 2016; Ullah, ur Rahman, & Rehman, 2023; Usman et al., 2023; Zahra, Nasir, Rahman, & Idress, 2023; Zhao et al., 2023). So the grieved policies from these findings will have good impact on the economy of Pakistan and the reduction of poverty among the peoples.The results of these evaluations, which include tests of heteroscedasticity, normality, and overall serial correlations, are shown in Table below.

**Table 7: Diagnostics Test**

| Name of the Test | Value of F-Statistics | Value of Probability |
|---|---|---|
| The Normality | 1.23 | 0.01 |
| Serial correlation | 1.504 | 0.03 |
| Heteroskedasticity | 1.06 | 0.01 |

## 5 Conclusion

The main purpose of this research is to make an econometric model of the dependent variable poverty to identifying the impact on the most vital macroeconomics variables like inflation, education, Economic Growth Formation and Gross domestic product in Pakistan during the 1998 to 2022. The approach of ARDL to co integration is used to analyse the interconnection among poverty and macroeconomics variables in the both long and short run. The outcomes recommend that relationship among education and poverty having a signification and statistically impact as the economic growth raise due to education and appears to be the fortune of just a few who have acquired the advantages of boom due to the superiority of massive spread inequalities in profits distribution that has accelerated to an alarming degree lately. financial growth has bad and statistically significant effect on poverty each in the long run and short run. but the inflation stays insignificant every long run and short run at the same time as the level of unemployment ratio is considerably and the inversely interconnection with poverty in the long run and short run. So, there can be ray of wish for beneath privileged humans and the insurance makers additionally. Gross capital formation has come out because the wonderful and impact determinant of poverty no longer handiest in short run however additionally in the long run length. some sectors with highest degree of employment elasticity and as a result can have maximum dent on poverty stage .This study outcomes are in align with these studies (Awan, Rahman, Ali, & Zafar, 2023; Fatima, Jamshed, Tariq, & Rahman, 2023; Ilyas, Awan, et al., 2023; Javaid, Noor, Hassan Iftikhar, Rahman, & Ali, 2023; Mukhtar et al., 2023; Nawaz, Rahman, Zafar, & Ghaffar, 2023; Shafqat, Idrees, Zaman, & Ghaffar, 2023; Shahzadi, Ali, Ghafoor, & Rahman, 2023; Tabassum, Rahman, Zafar, & Ghaffar, 2023).

## 6 Recommendations

With the help of finding the major subsequent guidelines are developed:

Govt have to set up education and workshop implementation are preferred to motivate the peoples to start business and assist to reduce poverty from Pakistan. In sustainable able development goals 2030 The tourism sector is one of main aim of SDGs 2030 so according to Awan, Arslan, and Hussain (2023) and Awan, Rahman, et al. (2023) tourism can boost economic growth by creating business opportunities for peoples. Because tourism have great protentional for economic growth (Awan, Bibi, Bano, & Shoukat, 2023). But govt should promote eco-tourism because according to Altaf, Awan, and Rehman (2023) tourism can increase environmental degradation . In addition Govt should implement rules of Islamic economic system to eliminate poverty in the Pakistan because Pakistan is a Islamic country and according to Awan, Ali, Rehman, and Idrees (2023). Islamic economic system one of best economic system in the world as compared to other economy systems. consequently, within the mild of findings of the prevailing look at authorities ought to introduce such guidelines which promote monetary boom inside the country simply so the prevalence of poverty may be lessened. For poverty reduction government must focus on green economy as according to Younas et al. (2023). Green economy can promote sustainable development and its leads to economy growth .As authorities need to identifying and announce a portion of finances to make investments for increase the capital based on human which in the end facilitates to reduce poverty of Pakistan. authorities have to manipulate the price of inflation with full awareness to lessen poverty. Governments at all levels should intervene in postulating appropriate regulations to reduce the problems of marketers through the supply of wished technological and enterprise information and advices to growth GDP. HEC need to mandate all Universities in Pakistan to create an Entrepreneurship improvement centre to put in area compulsory guides on Entrepreneurship for all undergraduate students‟ no matter their subject. The identical component needs to be finished for the Polytechnics and faculties of education.

### 5.2 Limitation and Future Research Direction

The findings of this look have the simplest scope in Pakistan but; the facts obtained from other countries may additionally have one-of-a-kind implications. future studies can use the proposed model in other sectors of the financial system and other international locations. furthermore, this examination used the handiest five macroeconomic variables to develop a framework for a poverty reduction. future research can include extra variables to enhance the consequences.

### 5.3 Implications of the current Study

This research model present a in depth an expertise of the relationship among establishments and poverty Alleviating in the country named Pakistan. So, this study gives a finding that can be of massive assist to advertising and create awareness regarding the business to boost GDP. so this study identifies five different important elements which help to reduce poverty as an example GDP, Trade opening among borders, and consumer price index has terrible relation with poverty discount, whereas inflation has tremendous and tremendous interconnection in Pakistan for the variable poverty.

### 5.4 Practical implementations

This Research is urging policymakers and executive companies to make investments greater in poverty index for elimination of poverty and offer possibility to eliminate poverty via implementing strong rules, moreover, the observe recommends that the government overview its guidelines & possibility for negative ones by lessen poverty by means of education, to control inflation and enhance GDP.

**Authors Contribution**

[1] Ayesha Awan: Core idea of the manuscript and Draft writing

[2] Sohaib Shahid: Reviewed and revised the overall quality of the manuscript

[3] Saif Ur Rahman: Provided guideline of the empirical analyses and supervised overall study

[4] Muhammad Ali Baig: Provide guidelines for data analyses and writeup of conclusion section

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