Available Online
Journal of Economic Impact
ISSN: 2664-9764 (Online), 2664-9756 (Print)
https://www.scienceimpactpub.com/jei

# FISCAL CONSOLIDATION AND INCOME INEQUALITY NEXUS: EVIDENCE FROM PAKISTAN

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**ARTICLE INFO**

**Article history**
Received: September 25, 2023
Revised: December 12, 2023
Accepted: December 20, 2023

**Keywords**
Fiscal consolidation
Income inequality
Pakistan
ARDL model

**ABSTRACT**

The distribution of income provides a succinct overview of the economy, revealing how individuals or groups receive specific shares of the national income. Consequently, achieving a fair income distribution has become a central goal for most global economies. The study examines the effect of fiscal consolidation on income inequality in Pakistan. Time series data from 1988 to 2022 is used to estimate the relationship of variables. The ARDL method is used to test the existence of cointegration and to estimate the coefficients of fiscal consolidation and other independent variables. Other variables include minimum wage and trade union density. Per capita GDP and square of per capita GDP are also included in the model to verify the Kuznet hypothesis. The estimates show that fiscal consolidation has a positive impact on income inequality. It implies that if the difference between government expenditures and revenues (i.e., fiscal consolidation) increases, it will enhance income inequality. It may possibly happen by minimizing expenditures or increasing revenues. The empirical results of the study show the existence of an "inverted U-shaped" Kuznet's curve in Pakistan. Additionally, minimum wage significantly affects income inequality, whereas trade union density is negatively related to income inequality.

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https://doi.org/10.52223/econimpact.2023.5314


## INTRODUCTION

Income distribution depicts a concise picture of the economy that shows who receives what part of the national income. Thus, fair income distribution became the primary objective of most of the world's economies. After 1970, the main concern of developed nations is to study the quality of life and harmful effects of economic growth, but developing economies are puzzled about the correlation between income inequality and economic growth. Income inequality rises in developing economies due to a rise in profit motive and wage differences among the labour force. The historical trend of income distribution in Pakistan also shows rising income inequality. It is hampering the growth process and the economy's socio-political and cultural aspects. It is also responsible for raising the number of poor in the economy (Ali et al., 2010).

Neoclassical economists considered that fiscal policy has a limited role in the determination of the distribution of income. They believed that fiscal policy had a temporary effect on growth and income inequality. However, endogenous growth models open new prospects by looking into the role of fiscal policy in affecting income inequality (Khan and Hashmi, 2015). Empirical evidence advocates that the composition of fiscal consolidation is an element of rising income inequality that causes a deteriorating distribution of income. When a consolidation package is made to a small share of GDP, it leads to raised income gaps. Growing the share of taxes in the volume of GDP can significantly control income inequality. Moreover, a reduction in government spending as a large portion of GDP deteriorates the distribution of income (Agnello and Sousa, 2011).

Fiscal policy is a fundamental tool for the government to affect the distribution of income. Through changes in the level of taxes and expenditures, fiscal policy can affect the level of gross domestic product, resource allocation, saving, consumption, employment, distribution of income, etc. Taxes are the main source of government revenue. There are two types of taxes in Pakistan: direct taxes and indirect taxes. Indirect taxes are a key source of government revenue, accounting for 60% of total revenue (FBR, 2021). It is consensus that these taxes can severely affect low-income people as compared to high-income people. This phenomenon shows that the taxation system in Pakistan is regressive in nature (Bilquees, 2004).

With the help of taxes and spending strategies, the government can change the distribution of income in the short term and medium term. Questions regarding the redistributive role of different kinds of taxes, such as direct or indirect taxes and government expenditures like development and non-development expenditures, current or capital expenditures, can jointly determine the level of income inequality. There are different kinds of fiscal policies in different parts of the world. A country can be selected for such a distributive fiscal policy that can achieve the goal of economic growth along with fair distribution of income based on the economic and political interests of policymakers. Therefore, fiscal policy in advanced economies can play a vital role in reducing income inequality. Most of the reduction in inequality in advanced countries is targeted through the expenditure side, whereas only one-third

of income inequality is controlled by direct taxes and targeted transfers (Lustig et al., 2014).

Fiscal consolidation is a term in economic literature which refers to all the steps taken by the government in order to minimize its budget deficit and debt stock. The government collects its revenues by applying different kinds of taxes and spends its revenues on different development and non-development projects. The role of fiscal consolidation in developing countries is limited due to the limited volume of tax collection in those countries. Government spending on social sectors like health and education is more progressive than other expenditures as it is helpful in reducing income inequality. Fiscal consolidation may worsen the distribution of income. A policy mix of progressive taxation and progressive spending is helpful to offset the adverse effects of fiscal consolidation. Government expenditures include subsidies, social welfare programs, infrastructure expenditures, and expenditure on health, food, and poverty reduction plans. All such expenditures significantly reduce income inequality. Mostly, taxes are used to finance such expenditures (Woo et al., 2017).

Aye and Odhiambo (2022) studied the dynamic impact of fiscal policy on wealth inequality in panel data of middle-income countries. Government expenditures and taxes on income, profits and capital gains were used as fiscal policy instruments. They found that taxes play a role in reducing wealth inequality, whereas government expenditures play no role at all in reducing wealth inequality. Clifton et al. (2020) investigates the role of fiscal policy in reducing income inequality in Latin America during 1990-2014. They analyze the impacts of various fiscal policy instruments on income inequality in 17 Latin American countries. The study finds that fiscal policy has a direct impact on lowering income inequality. Public spending on education and personal income taxes played an important role in lowering income inequality.

Park and Shin (2017) conducted comprehensive research to find the relationship between government taxes, transfers, and inequality in Asia. He suggested that inequality might be controlled by adopting optimum combinations of taxes and social transfers. Taxes and social transfers might have an immediate effect on the distribution of income while spending on education, health, and infrastructure might have a long-term effect. He suggested that the distribution of income might be fair through social transfers, by targeting low-income people and through effective progressive taxation. Lei et al. (2016) studied the effect of transfer payments on the income gap between rural and urban areas of China. They used data from 1054 locations in 15 provinces of China from 2000-2007. They applied discontinued regression analysis in order to examine the pre-post test effect of transfer payments on rural and urban areas' Gini coefficients. Results indicated that transfer payments in western China were more than in eastern regions. But at the same time, the income gap in rural and urban areas increased by 20% in the western area. They argued that the income gap between rural and urban areas could be overcome by the provision of transfer payments to target the rural population and by correcting urban-biased policies.

Davtyan (2016) tried to explore the relationship among income inequality, fiscal performance and economic growth in Anglo–Saxon countries like the USA, UK and Canada. He used a VAR structural methodology to find the interrelationship among these variables. He collected data from 50 years of these countries, from 1960 to 2010. He found that there was a negative relationship between income inequality and economic growth in UK, while it is positive in USA and Canada. The results showed that increasing income inequality among Anglo–Saxon countries may worsen fiscal performance. Hayes and Vidal (2015) used the database of taxes and government spending in USA between 1976 and 2006. They used these data to measure state-level inequality. They found that government spending on compensation for unemployment may reduce inequality. Similarly, increasing corporate tax inequality reduces while sales tax revenue helps the wealthy class increase their income, which increases income inequality. These findings suggested that the government can influence the redistribution of income by using effective fiscal policy.

Khan and Hashmi (2015) tried to explore the relationship between fiscal policy and income inequality in Pakistan from 1980 to 2012. Results showed that higher government developmental expenditures and financial growth lead to reduced income inequality, whereas fiscal deficit and urbanization increase it in Pakistan. Bhatti et al. (2015) highlighted the relationship between inequality and fiscal policy. They used the (CGEM) method to account for market interaction. To investigate the effect of fiscal policy on income inequality, different simulations are used. Inequality was measured by Theil and Hoover's index. The results showed that a mixture of direct and indirect taxes and government expenditure were needed in order to reduce inequality.

Salotti and Trecroci (2015) have studied the effect of fiscal policy on income inequality and poverty. They used the data of 20 OECD countries for 40 years. The results showed that when the government focuses more on fiscal policy, then these efforts are helpful to reduce income inequality. They used fixed and random effect models. Government policies for narrowing down the gap between government expenditures and incomes might be costly for equality in case of income distribution. It means when the government wants to control its budget deficit by reducing its expenditure; it enhances income inequality in the panel of advanced OECD countries. Agnello and Sousa (2014) tried to investigate the relationship between income inequality and fiscal consolidation by using the data of 18 industrialized nations which belong to G-20 countries. They found that fiscal consolidation size has a significant impact on income inequality. During the period of fiscal consolidation, there might be rising income inequality. When there is a small size of fiscal consolidation, it can lead to increased income inequality.

Claus et al. (2014) had put light on the possible effect of government spending and taxation on income distribution. They used multivariate regression techniques to find out the effect of taxes and government spending on income distribution. Findings showed that corporate tax and progressive income tax could reduce inequalities. Consumption tax, customs duties, and exercise duties had a negative correlation with income distribution. In comparison, a greater share of government spending on education, health, welfare and housing has a positive effect on income distribution. Muinelo-Gallo and Roca-Sagalés (2011) examined the impact of different fiscal policy instruments on income inequality. They used data from 43 upper-middle-income and high-income countries for the period of 1972 to 2006. There was a significant relationship between fiscal policy and income inequality. Empirical analysis showed that increasing public expenditure (current or public investment) or direct taxes could reduce income inequalities.

Samanta and Cerf (2009) tried to investigate the phenomenon of why fiscal policy can affect inequality. They used time series data from 1991 to 2003 of 10 transitional economies. The results showed that increasing government spending led to an increase in GDP of that economy. It had a positive impact on income inequality, while on the other hand, there was a negative relationship between income inequality and fiscal policy multiplier. Shirazi et al. (2001) found the impact of public

expenditures and public taxes on income distribution in rural and urban areas of Pakistan. The data had been taken from HIES 1992-93. Results showed that government expenditures benefit the lowest income group more than other groups. In case of the burden of taxes, the high-income group bears more tax burden, while the lower-income groups bear a lesser burden of tax. The absolute burden of tax may increase from the lowest income group to the higher income group.

This study shows the relationship between fiscal policy and income inequality in Pakistan. The essential aim of this study is to explore the effect of fiscal consolidation on income inequality in Pakistan and to test the inverted "U" shaped relation of per capita income with income inequality.

## METHODOLOGY

### Data Sources

Time series data is collected from secondary sources: State Bank of Pakistan, Federal Bureau of Statistics, 50 years of statistics of Pakistan, International Monetary Fund, World Bank and ILO for the period 1988-2022.

### Empirical Model

The study used the following empirical model.

$$\text{gini}_t = \alpha_0 + \alpha_1 \text{lfis}_t + \alpha_2 \text{lmwg}_t + \alpha_3 \text{ltud}_t + \alpha_4 \text{lpcy}_t + \alpha_5 \text{lpcy\_sqr}_t + \varepsilon_t \quad (1)$$

Where, *gini* is Gini coefficient proxy for income inequality, *lfis* is log of fiscal consolidation, the difference between government revenues and expenditures, *lmwg* is the log of minimum wage, *ltud* is the log of trade unions density, while *lpcy* is log of per capita GDP proxy for economic development and *lpcy_sqr* is log of square of per capita GDP which is included in the model to verify Kuznet hypothesis.

### Econometric Strategy

The stationary of the data is checked by applying the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron test. The ARDL approach is adopted to test cointegration and to estimate the long-term relationship of the empirical model's variables.

The ARDL technique incorporates lags of independent variables as well as lags of dependent variable in the same model. It is usually denoted as ARDL (p,q,….,qk).

Where p = lags of dependent variable
q = lags of independent variables

If q=0, it means there is no lag term for independent variables, such variables are called fixed or static regressors; on the other hand, independent variables have at least one lag term and is called dynamic regressors.

ARDL model can be written in its generalized form as under:

$$y_t = \alpha + \sum_{j=1}^{p} \gamma_i \, y_{t-i} + \sum_{j=1}^{k} \sum_{i=0}^{q} x_{j,t-i} \, \beta_{j,i} + \varepsilon_t \quad (2)$$

The selection of lags length of the ARDL model depends upon the Akaike information criterion (AIC) and Bayesian information criterion (BIC). The best selected model among the top twenty models is the one with the lowest AIC and BIC value.

The model uses all variables which are stationary at level or at first difference or a mixture of both, i.e. stationary at level and at first difference in the estimation. If all variables are stationary at level, then "OLS" is the best estimation method; when all or some of the variables are stationary at the second difference, then we cannot apply ARDL. The ARDL model is used to show long-run relationships among variables. The long-run relationship among different variables is called cointegration. The ARDL Bound test is a procedure to test the cointegration among variables.

### ARDL Bound Test Procedure

In the first step of cointegration analysis, F-Test is utilized in order to confirm the presence of cointegration among variables.

There are two hypotheses to test cointegration among variables, which are as under:

H0: λ1 = λ2=---------- = λk = 0 (absence of cointegration)

H1: λ1 ≠ λ2 ≠---------- ≠ λk ≠ 0 (cointegration among variables)

where k = number of parameters

There are two bounds for critical values, i.e. lower bound and upper bound, having different pairs of critical values at different level of significance. F-calculated value is compared with F- critical value. If the F-calculated value is greater than the upper bound of the critical value, then reject H0 and accept H1, which means cointegration exists among variables. When F-calculated value is lower than upper bound of the critical value, then H0 is not rejected which means there does not exist cointegration among variables. On the other hand, when F-calculated value is in between the lower and upper bound of critical value, then results are inconclusive. When the integration among variables is confirmed by using F-Test, then the model is estimated to find long run estimates.

The study also develops a short-run ARDL model to explain the short run relationship by using different lags operators; it uses the following error correction model to estimate this relationship.

$$\Delta gini_t = \Theta_0 + \sum_{i=1}^{n} \Theta_1 \, \Delta gini_{t-i} + \sum_{i=0}^{n} \Theta_2 \, \Delta lfis_{t-i} + \sum_{i=0}^{n} \Theta_3 \, \Delta lmwg_{t-i} + \sum_{i=0}^{n} \Theta_4 \, \Delta ltud_{t-i} + \varphi ECM_{t-1} + \varepsilon_t \quad (3)$$

Here:

Θ = short run coefficient

φ = correction rate toward equilibrium

Δ= first difference operator

The error correction term may be defined as the amount of disequilibrium of a previous period that is corrected in the current period. This term is used as an equilibrium error for reconciling short-run disequilibrium towards long-run equilibrium. Error correction term ($EC_t$) may be written as:

$$\text{ECMt} = gini_t - \alpha_0 - \sum_{i=1}^{n} \alpha_1 \, gini_{t-i} - \sum_{i=0}^{n} \alpha_2 \, lfis_{t-i} - \sum_{i=0}^{n} \alpha_3 \, lmwg_{t-i} - \sum_{i=0}^{n} \alpha_4 \, ltud_{t-i} \quad (4)$$

Here $EC_t$= Error correction term

ECM equation expresses that the dependent variable depends on independent variables as well as on equilibrium error term. A positive value of $EC_t$ term shows divergence, while a negative value of $EC_t$ shows convergence toward equilibrium.

## RESULTS AND DISCUSSION

It is necessary to confirm the order of integration of time series before any cointegration analysis for time series data analysis. The most widely used tests for stationarity of time series are the Augmented Dickey-Fuller Test (ADF) and Phillips-Perron Test (PP test) applied in this study, and estimates are presented in Table 1 and Table 2, respectively.

The ADF estimates with intercept show that all the variables are stationary at first difference except Gini coefficient, which is stationary at level with intercept. On the other hand, when we want to check the stationary time series with trend and intercept, all the variables are stationary at the first difference.

Table 1. ADF test.

| Variables | At Level | | 1st difference | |
|---|---|---|---|---|
| | With Intercept | With Trend and Intercept | With Intercept | With Trend and Intercept |
| gini | -8.07*(0) | -2.05(6) | -1.51(5) | -5.10*(8) |
| Lfis | -3.56*(0) | -3.48(0) | -8.69*(0) | -8.59*(0) |
| Lmwg | -2.78(0) | -2.74(0) | -6.72*(0) | -7.59*(0) |
| Ltud | -1.99(0) | -2.92(0) | -4.70*(0) | -4.58*(0) |
| Lpcy | 0.52(0) | -1.89(0) | -4.13*(0) | -4.07*(0) |
| lpcy_sqr | 1.45(0) | -1.64(0) | -3.79*(0) | -3.89*(0) |

Note: * significant at 5% level.

Table 2. PP-test.

| Variables | At Level | | 1st difference | |
|---|---|---|---|---|
| | With Intercept | With Trend and Intercept | With Intercept | With Trend and Intercept |
| gini | -8.07*(0) | -1.75(1) | -1.85(1) | -3.84*(2) |
| Lfis | -3.49*(3) | -3.49(3) | -8.82*(3) | -8.69*(3) |
| Lmwg | -2.70(1) | -2.61(2) | -6.72*(0) | -8.85*(5) |
| Ltud | -1.93(1) | -2.92(0) | -4.70*(1) | -4.59*(1) |
| Lpcy | 0.52(0) | -1.89(0) | -4.13*(0) | -4.09*(1) |
| lpcy_sqr | 1.29(1) | -1.70(1) | -3.80*(1) | -3.92*(1) |

Note: * significant at 5% level.

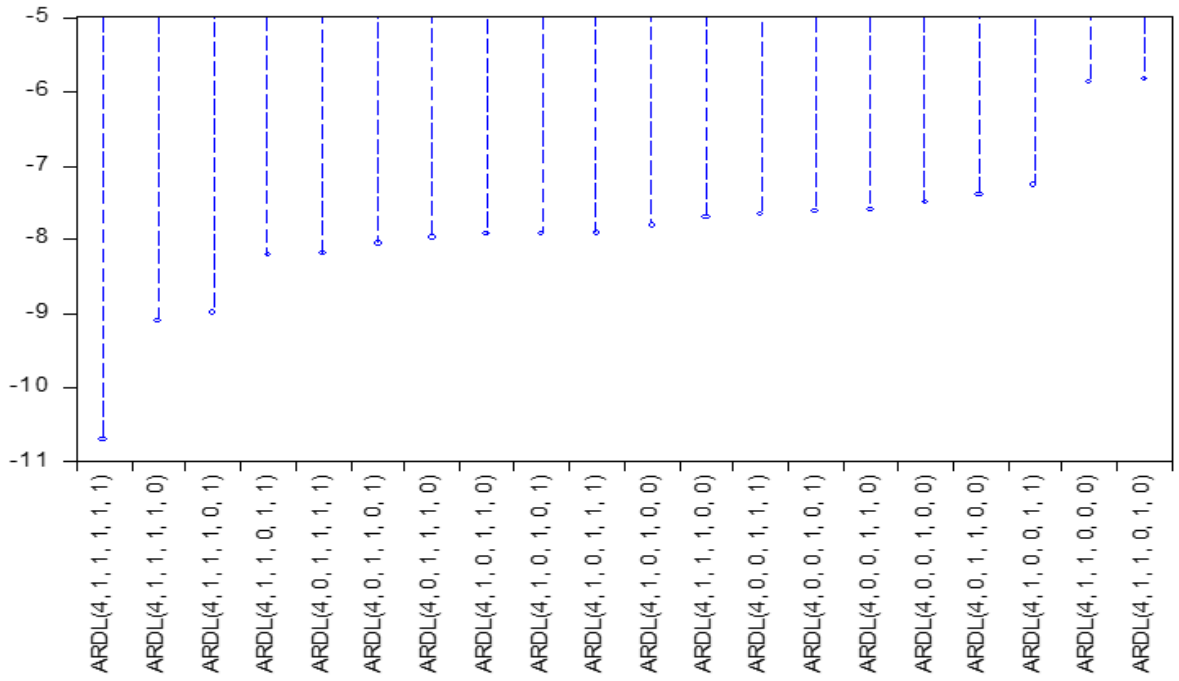


Figure 1. Top twenty models.

Similarly, estimates of the PP Test with intercept show that all the variables are stationary at first difference, but Gini Coefficient is stationary at level with intercept. On the other hand, when stationary is checked with trend and intercept, all variables are stationary at first difference. Therefore, it is confirmed from the above two tests (ADF and PP test) that the most appropriate technique for estimation is the Auto Regressive Distributive Lag Model. It is also confirmed that no variable is stationary at 2nd difference.

The selection of lag length of the ARDL model is based on AIC and BIC. The best-selected model among the top twenty models is the one with the lowest AIC and BIC values. The top 20 models are presented in Figure 1. It shows that ARDL (4,1,1,1,1,1) is the best among all possible models because it has the lowest AIC.

**Cointegration Analysis**

The bound test is applied to test cointegration among variables. Table 3 shows the value of the F-Statistic is greater than the upper bonds of all the significant levels, such as 1%, 5%, and 10%. The value of F-statistic greater than critical values means we are rejecting the null hypothesis (absence of cointegration) and accepting the alternative hypothesis (presence of cointegration). So, bound test results have confirmed the existence of cointegration among variables in the model.

Table 3. Bound test.

| Significance level | K | Bound Critical values | | F-statics |
|---|---|---|---|---|
| | | I(0) | I(1) | |
| 1% | 5 | 2.82 | 4.21 | |
| 5% | 5 | 3.12 | 4.25 | 5.31 |
| 10% | 5 | 1.81 | 2.93 | |

Long-run coefficient estimates are shown in Table 4. The long-run coefficient of fiscal consolidation is significant and shows a positive impact on income inequality. This finding is in accordance with Pashourtidou et al. (2014), Agnello et al. (2016), and Ciminelli et al. (2019).

The fiscal consolidation efforts (policies to reduce debt stock and fiscal deficit), either government expenditure reduction policy or government revenue raising policy, led to a fall in output driven by the negative response of investment, private consumption and level of employment, resulting in more income inequality.

Another important reason for the positive correlation between fiscal consolidation and income inequality is Pakistan's budget structure. High volumes of indirect taxes have a higher share in total tax revenue as compared to direct taxes, which enhances income inequality. On the expenditure side, high volume of non-development expenditures instead of development expenditures also causes a rise in income inequality.

The significant coefficients of per capita GDP and its square show the existence of "inverted U-shaped" Kuznet's curve in Pakistan. Moreover, minimum wage has a significant positive sign, while trade union density is significant, with a negative sign.

Table 5 shows the short-run results of the model. The variables like *lmwg*. *lpcy* and *lpcy_sqr* have a statistically significant effect on income inequality in the short run but *lfis* and *ltud* have not. The value of the error correction term is 0.08 with a negative sign. It means that eight percent of the disequilibrium of previous year is corrected in the current year.

Different diagnostic tests are utilized in the study to test heteroskedasticity, autocorrelation, and normality of the residual. The results of these tests are reported in Table 6. The White test for the detection of heteroskedasticity confirms no heteroskedasticity, and Breusch-Godfrey LM test for the detection of serial correlation reports no autocorrelation. The Jarque-Bera Test provides evidence of the normality of residual.

Table 4. Long run results (Dependent variable: Gini).

| Variables | Coefficient | SE | t-value |
|---|---|---|---|
| Lfis | 1.16* | 0.27 | 4.36 |
| Lmwg | 2.28* | 0.28 | 8.09 |
| Ltud | -0.70* | 0.22 | -3.25 |
| Lpcy | 5.76* | 0.44 | 13.09 |
| Lpcy_sqr | -0.25* | 0.04 | -6.44 |

Table 5. Short run results of variables.

| Variable | Coefficient | Std. Error | t-Statistic |
|---|---|---|---|
| D(gini (-1)) | 0.45 | 0.03 | 13.36 |
| D(gini (-2)) | -0.88 | 0.08 | -10.88 |
| D(gini (-3)) | -1.20 | 0.04 | -29.15 |
| D(lfis) | 0.02 | 0.01 | 1.53 |
| D(lmwg) | 0.30 | 0.01 | 22.73 |
| D(ltud) | -0.01 | 0.01 | -1.45 |
| D(lpcy) | 2.41 | 0.61 | 3.97 |
| D(lpcy _sqr) | -0.11 | 0.03 | -3.78 |
| CointEq(-1) | -0.08 | 0.01 | -9.14 |

Cointeq = gini - (1.16* lfis + 2.27* lmwg -0.70* ltud +5.76* lpcy - 0.24* lpcy _sqr ).

Table 6. Results of diagnostic tests.

| Heteroskedasticity Test: White | | | |
|---|---|---|---|
| F-statistic | 0.316923 | p-value | 0.9026 |
| n.R2 | 13.05716 | p-value | 0.6857 |
| Breusch-Godfrey Serial Correlation LM Test: | | | |
| F-statistic | 15.16059 | p-value | 0.1600 |
| n.R2 | 0.20994 | p-value | 0.3001 |
| Normality Test (Jarque-Bera Test) | | | |
| Jarque-Bera | 2.394707 | p-value | 0.301992 |

## CONCLUSIONS

The main objective of the study is to examine the influence of fiscal consolidation on income inequality in Pakistan by using the ARDL technique. Results show that the fiscal consolidation coefficient has a positive effect on income inequality. It means that changing the fiscal consolidation policy (minimizing expenditures or increasing income through taxes) increases income inequality.

The findings of the study have important policy implications. In order to get fruitful results from fiscal consolidation, the government must increase the volume of direct tax instead of indirect tax because direct taxes are helpful in reducing the income of the wealthy class and controlling rising income inequality. On the other hand, increasing the volume of indirect taxes, although they are easy to implement and collect, has a severe effect on the poor. This act of increasing indirect taxes deteriorates income distribution. Moreover, development expenditures are helpful in reducing income inequality by improving the living standards of the poor. That's why it is necessary to increase the share of development expenditure in total government expenditures.

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