Exploring the Nexus Between Interest Rates and Poverty in Pakistan: A Macroeconomic Analysis of Transmission Channels and Policy Implications

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Abstract

Poverty remains a persistent challenge in Pakistan, undermining sustainable economic development and social welfare. Understanding the macroeconomic determinants of poverty is crucial for effective policy formulation. This study aims to examine the impact of interest rate fluctuations on poverty levels in Pakistan over the period 1980–2024. Using the Autoregressive Distributed Lag (ARDL) bounds testing approach, the analysis explores both the short-run dynamics and long-run relationship between interest rates and poverty. The results reveal a significant and positive long-run relationship, between selected variables, indicating that higher interest rates exacerbate poverty. Short-run results show mixed effects of interest rate changes on poverty, reflecting complex transmission mechanisms. The study underscores the critical role of interest rate policy in influencing poverty outcomes and highlights the importance of aligning monetary policy with inclusive growth objectives. These findings offer important insights for policymakers to design strategies that mitigate the adverse effects of interest rate fluctuations on vulnerable populations.
Keywords: Interest Rate, Poverty, Pakistan, ARDL, Cointegration, Error Correction Model

Introduction

Poverty continues to be a persistent and pervasive challenge in Pakistan, undermining human welfare, social stability, and inclusive economic growth. Recent evidence suggests a reversal of prior progress: according to a 2025 report by World Bank (WB), the national poverty headcount rose to 25.3 percent in 2023–24, reflecting a marked increase over the preceding years (World Bank, 2025). These realities of demographics and economies necessitate greater insight into the macroeconomic determinants of poverty that extend beyond traditional determinants of poverty, like income, employment, or education. In this regard, the importance of monetary policy especially the dynamics of the interest rates becomes a possibly significant yet unexplored determinant of the dynamics of poverty. Interest rates determine the cost of borrowing, saving, access to credit, and investment as well as a factor of household consumption, business formation, and lastly, the element of income distribution, which is of particular importance to low-income and vulnerable households (Khan et al., 2020).

Although there is theoretical potential of the relationship between interest rate policy and poverty outcomes, very little empirical evidence has isolated this relationship, particularly in the Pakistani situation. The majority of current research is carried out on greater financial development indicators of the credit to the private sector, financial intermediation, or financial inclusion and various macroeconomic variables, and it is challenging to distinguish the isolated impact of interest rates. To take one example, a recent time series study of 19802024 has found a long-run relationship between the financial development (measured by private credit, depositors, and ATM penetration, etc.) and declines in poverty, although it has not decomposed the interest rate as an independent explanatory variable (Riaz, Mehmood and Munir, 2024). In a cross-country panel study of developing economies, similarly, authors discovered that greater financial intermediation decreases poverty, which varies based on the measure of poverty (Magwedere, Khan et al., 2023 and Marozva, 2021). In addition, more comprehensive reviews of the monetary policy in the developing countries indicate that central bank measures and policies such as interest rate change can impact growth and economic stability, yet their impact on welfare, distribution or poverty is unclear (Daoui, 2023; Mustafa et al., 2024). Elsewhere, according to theoretical premises, like the one advanced by Thomas Piketty, an increase in the interest rates above the growth rates ($r > g$) will lead to a higher increase in income and wealth inequality, which is disproportionately benefiting capital owners at the expense of wage earners or vulnerable families (Alvi, Raza & Khan, 2025). All these hints at the possibility of interest rates playing a role in socioeconomic inequality and poverty without direct, conclusive empirical evidence of this effect, which exists in Pakistan, are still lacking.

Therefore, the gap that this paper attempts to fill is the absence of empirical studies that can investigate the direct and independent effects of the interest rate changes on poverty rates in Pakistan. Unless this sort of analysis is conducted, policymakers can be unaware of significant distributional implications of a monetary policy decision. This question is especially timely when the macroeconomic stress is characterized by interest rate changes which might have been introduced perhaps to solve inflation, exchange rate strains or external imbalances, but instead have some unintended negative impact on the poor and vulnerable members of the population.

It is against this background that the current study aims at filling this gap by empirically examining the long-run and short-run correlation between interest rate and poverty in Pakistan between 1980 and 2024. Namely, the research will attempt to test the hypothesis that fluctuations in interest rates (taken out of the context of other macroeconomic indicators) have a statistically significant impact on poverty rates. Through the use of the Autoregressive Distributed Lag (ARDL) bounds testing method, the analysis not only looks at the long-run equilibrium relationship but also dynamic short-run adjustments to elicit a holistic picture of how interest rate policy can cause a change in poverty over a period of time. The study takes the isolated effect of interest rate changes by only analyzing a bivariate relationship, thus removing confounding effects of other factors like financial development, inflation, or growth.

This study is of twofold importance. It has an academic contribution to the literature as offering one of the first rigorous time-series studies in Pakistan to isolate interest rate as a cause of poverty; in such a way, this contribution assists in understanding whether and how monetary policy influences social welfare outside aggregate economic growth or financial sector development. On the policy front, the findings can be used to educate monetary authorities (including State Bank of Pakistan) and government decision makers regarding the distributional effects of interest rate changes. In the event that a positive long-run correlation between interest rates and poverty is established as preliminary empirical evidence indicates then monetary policy must be geared towards social equity and poverty reduction as opposed to maintaining inflation control or macro-stability. In addition, the implications of these findings can be applied to inform future studies on transmission channels (e.g., access to credit, investment, consumption) and the mitigation policies (e.g., specific social safety nets, policy of complementary financial inclusion) to ensure vulnerable groups are not negatively affected by monetary contraction.

The current research contributes to the knowledge of the macroeconomic factors of poverty in Pakistan by assessing empirically the effect of change in interest rates on poverty across a historical long-run period. In such a way, it aims to fill a much-needed gap in the literature and to educate a more socially responsible monetary policy.

Literature Review

The distributional implications of monetary policy have become empirically popular since the global financial crisis and COVID-19, generating a literature that attributes distributional effects of monetary policy tools to such outcomes as poverty, inequality, and household wellbeing. Recent cross-country research shows that the traditional monetary policy may be non-neutral in its welfare effects through asset prices, the labour market, access to credit, and consumption. In developing nations, panel studies indicate that expansionary monetary policies can alleviate certain types of poverty (e.g., energy poverty) through investment promotion and service availability, but with region-specific impacts and contingent on financial infrastructure and institutional quality.

There is another strand that looks at inequality effects of monetary shocks. Based on identification strategies, Boitani et al., (2024) determines that interest-rate shocks work in the channel of income composition (differentiating household exposure to interest and wage income) and the channel of asset-price (ownership of capital and financial assets). Contractionary policy in the middle- and developing-economy setting tends to increase the short-run income inequality by squeezing wages and jobs in the labor-intensive industries and favoring the people who hold financial assets. These processes impact directly on poverty because households with lower incomes have fewer credit privileges, are less apt to possess financial assets and are susceptible to employment shocks (Mustafa et al., 2024). The usefulness of interest rates in poverty dynamics is supported by country-level and regional ARDL/time-series studies. Tipping toward ASEAN countries, panel ARDL findings indicate that interest rates and exchange rates have significant impacts on long-run levels of poverty as money supply has short-run consequences, underlining the fact that monetary impact will be dependent on credit market development and financial intermediation (Nasution et al., 2022). Individual country studies, e.g., Nigeria, tell that high policy rates are a hindrance to poverty reduction and increase the cost of borrowing funds and restrain microfinance and small-business lending (Abdulrahman, 2023). These results highlight that the interest-rate nexus poverty is conditional on financial organization and policy channels.

In Pakistan, there is concentration on intermediary channels financial inclusion, interest-rate pass-through and access to credit- that mediate the impact of policy rates on households. Weak pass-through of policy rates to retail rates and poor formal access to credit is undermining or obstructing anticipated measures of welfare. Financial evidence on financial inclusion, such as the digital services, indicates that an increase in access helps to reduce poverty, whereas high borrowing expenses (via high policy rates) can negate the progress (Mahmood, 2023). Therefore, any bivariate interest-rate analysis of the poverty situation in Pakistan will be a product of the direct price impact

and the structural financial environment (Mustafa and Shah, 2024). Both cross-country panel and single country time-series methodologies are applied methodologically. The panel studies (fixed effects, IV, panel ARDL) are used to study cross-country heterogeneity and institutional differentiation whereas the analyses of single country ARDL/ECM are used to study the long-run cointegration and short-run adjustment. ARDL can also be used with mixed integration orders $(I(0)/I(1))$ and small samples, which allows estimating long-run interest-rate elasticity and error-correction rates (Mustafa et al., 2024).

Although there is increasing evidence, it is diverse and situational. There are studies which show that expansionary monetary policy alleviates poverty through investment and employment; and there are studies with little or unclear impacts in shallow financial markets or where households do not have formal credit. The important factors that determine heterogeneity are measures of poverty (headcount vs. gap), the level of financial intermediation, the extent of policy-to-retail pass through, the presence of microfinance/social programs, and macroeconomic factors (inflation, exchange rate shocks, fiscal policy). They are especially applicable in the case of Pakistan where the recent macro shocks have changed the household vulnerability and instead policy responses have been prioritized on macro-stability, as opposed to distributional outcomes.

Reviewing the modern literature (2021-2025): (i) the current evidence on cross-country links between monetary policy and poverty and energy deprivation indicates strong regional heterogeneity (Du et al., 2025); (ii) interest-rate shocks alter the income composition and asset values, which indirectly change poverty; (iii) ARDL/panel ARDL research studies in developing nations (ASEAN, Nigeria) show that interest-rate effects on poverty are of strong long-run interest-rate → poverty links, depending on the financial structure (Nasution et al). In general, though the monetary policy is found to be related to poverty and inequality in developing nations, there is limited study in the long run that could isolate interest rate as the independent variable in Pakistan. The vast majority of studies deal with poverty through financial inclusion, analyze pass through without modeling poverty or consider interest rate as one of the covariates. As Pakistan is facing shallow credit markets, incomplete pass-through, recurrent macro shocks, and an increase in poverty since 2020 a strict ARDL/ECM analysis (1980-2024) to isolate interest rate and estimate long-run cointegration and short-term dynamics is timely and necessary towards such socially responsive monetary policy.

Data and Variables Description

This research exploits time series annual data of Pakistan over a long period of time, 19802024, which is long enough to include various monetary policy regimes, structural changes and macroeconomic shocks that affect poverty. Poverty is quantified with the national poverty headcount ratio, the proportion of the population living below the official national poverty line with most of the data being provided by the World Bank through its World Development Indicators with efforts being made to fill gaps using best practices of interpolation as commonly practiced in poverty time-series analysis. The interest rate is the main explanatory variable, which is measured using the policy interest rate or its closest historical equivalent, which is provided by the State Bank of Pakistan and international financial databases because it reflects the position of the monetary policy directly, and the overall costs of lending and borrowing experienced by households and firms in the economy. Both variables are that of percentages and where necessary then the poverty series will be expressed in logarithmic form to stabilize variance and also the elasticities will be interpreted, but the interest rate will be left in levels to show how it is used as a policy tool. To identify the distributional effects of monetary policy more explicitly, the study takes a bivariate approach by directly isolating the direct effect of interest rate changes on the level of poverty, holding other macroeconomic factors constant. This modeling approach together with the Autoregressive Distributed Lag (ARDL) model that was used in the further analysis is very appropriate to the structure of the data in Pakistan, and it allows testing both long-run balance relations as well as short-run behavior between interest rates and poverty during the study period.

Model Specification

The functional relationship between interest rates and poverty in Pakistan is specified as

$$POV_t = f(IR_t)$$

The linear econometric form of the model is expressed as:

$$POV_t = \beta_0 + \beta_1 IR_t + \mu$$

Where POV_t denotes the poverty headcount ratio and IR_t represents the interest rate at time t. This functional form reflects the study's objective of examining the direct and isolated impact of interest rate fluctuations on poverty outcomes over time.

Econometric Methodology

This paper is based on annual time-series data and uses the Augmented Dickey-Perron (ADF) and Phillips-Perron (PP) unit root tests to establish the order of integration of the variables before estimation. It would require testing of stationarity to help to prevent spurious regression findings and to ascertain the suitability of the econometric method. They are both tested at levels and first differences with specifications such as an intercept (and a deterministic trend, where appropriate). The validity that the variables are integrated either of order I(0) or I(1), but not I(2) fulfills the precondition of the application of the Autoregressive Distributed Lag (ARDL) approach (Javed et al., 2024).

After the unit root analysis, the researcher uses the ARDL bounds testing process which is developed by Pesaran et al. (2001) to test the presence of a long run co integrating relationship between interest rate and poverty. The method is especially appropriate with small samples and when dealing with the variables of mixed orders of integration. The test of cointegration is determined by the F-statistic which tests the joint significance of lagged level variables; when the null hypothesis of no cointegration is rejected, it is assessed by comparing it with the upper and lower critical bounds. After incorporating the cointegration, the ARDL framework estimates the long-run relationship and the dynamics surrounding the same over a short run via an error correction system so that the impacts of interest rates on poverty can be completely examined.

Diagnostic Tests

Various diagnostic tests are conducted to make the estimated ARDL model reliable and robust. Breusch-Godfrey LM test is applied to test serial correlation and the Breusch-Pagan-Godfrey test to test heteroskedasticity. The Jarque-Bera tests are applied to test the normality of the residuals and the

model specification is tested by Ramsey RESET test. Moreover, the CUSUM and CUSUMSQ tests are used to study the parameter stability. The lack of serial correlation, and heteroskedasticity as well as parameters stability proves the suitability of the model and statistical inference validity.

Results and Discussion

Table 1:   *Unit Root Test Results (ADF and PP)*

Variable	ADF Level (Stat, p-value)	ADF First Difference (Stat, p-value)	PP Level (Stat, p-value)	PP First Difference (Stat, p-value)	Order
POV	−2.11 (0.23)	−6.48*** (0.00)	−2.04 (0.26)	−6.51*** (0.00)	I(1)
INT	−1.97 (0.29)	−5.92*** (0.00)	−1.88 (0.32)	−6.07*** (0.00)	I(1)

Note: *** denotes significance at the 1% level. ADF and PP tests are conducted with intercept and trend.

Source: Author's calculations.

The results reported in Table 1 show that poverty (POV) and the interest rate (INT) are non-stationary in levels, as both the Augmented Dickey–Fuller and Phillips–Perron tests fail to reject the null hypothesis of a unit root. After first differencing, the series become stationary at the 1 percent significance level, indicating that both variables are integrated of order I(1). Importantly, none of the variables is integrated of order I(2), thereby satisfying the key precondition for applying the Autoregressive Distributed Lag (ARDL) bounds testing methodology.

Cointegration (ARDL Bounds Test) Results

Following confirmation of the stationarity properties of the variables using the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) tests, the study proceeds to examine the existence of a long-run equilibrium relationship between poverty (POV2) and the interest rate (INT). Since both variables are integrated of order I(1) and none is I(2), the Autoregressive Distributed Lag (ARDL) bounds testing approach developed by Pesaran et al. (2001) is employed to test for cointegration.

The bounds testing procedure evaluates the joint significance of the lagged level variables by testing the null hypothesis that no long-run relationship exists against the alternative of cointegration. Formally, the hypotheses are stated as:

Table 2:   *ARDL Bounds Test Results*

Test Statistic	Value	K
F-statistic	**12.599**	1
Significance Level	**I(0) Bound**	**I(1) Bound**
10%	3.02	3.51
5%	3.62	4.16
2.5%	4.18	4.79
1%	4.94	5.58

Source: Author's computations

The findings presented in Table 2 indicate that the value of the calculated F-statistic is 12.599, and it is greater than the upper-critical value at the 1 percent level of significance. This will offer serious statistical support against this null hypothesis of no cointegration. The study therefore validates the ability to exist and have a stable long-run relationship between interest rates and poverty in Pakistan.

Table 3:   *ARDL Long-Run Results*

Dependent Variable: Poverty (POV)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INT (Interest Rate)	**0.599726**	0.007525	79.69517	0.0000
C	9.346653	0.786538	11.88328	0.0000

Source: Author's own computation

Long-Run Results Discussion

Table 3 shows estimated long-run relationship between poverty and interest rates in Pakistan. The coefficient of the interest rate is positive and statistically significant at the 1 percent level which means that a long-run increase in the interest rate causes the rise of poverty. In particular, a one unit rise in the interest rate raises poverty by about 0.60 units other things held constant. This observation is consistent with the economic theory according to which an increase in interest rates increases the cost of borrowing money, limits the access of the poor to credit facilities, discourages personal investment activities, and diminishes the level of employment, causing an aggravation of poverty rates. In a poor country, such as Pakistan, where poor households are highly credit-constrained and rely on informal or high costs financing, contractionary monetary policy is more likely to impact the vulnerable population disproportionately. The affirming relationship in the long run validates the importance of the interest rate policy to the distribution of consequences and vitality in determining the dynamics of poverty in the long run.

Table 4:   *Short-Run ARDL-ECM Results*

Dependent Variable: ΔPOV

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INT)	0.109655	0.078481	1.397214	0.1714
D(INT(-1))	**-0.534242**	0.114018	-4.685587	0.0000
D(INT(-2))	-0.183698	0.105766	-1.736841	0.0915
D(INT(-3))	**-0.377396**	0.075634	-4.989762	0.0000
CointEq(-1)*	**-0.813054**	0.128520	-6.326277	0.0000

Source: Author's Calculations

Short-Run Results Discussion

Table 4 gives the short-run dynamics according to the ARDL Error Correction Model (ECM). The error correction term (ECM-1) is negative and it is extremely significant, its coefficient (-0.81) shows that around 81 percent of short-run disequilibrium between interest rates and poverty is adjusted within one year. This proves that there is a stable long-run equilibrium. Alterations in interest rates have both positive and negative impacts on poverty in the short run; the contemporaneous change is not significantly different, but lagged changes are significantly different and negative. These findings are indicative of slow transmission of monetary policy indicating adjustment lags in credit markets, in the labour markets and in the channels of household income. Though the short-run effect of increased interest rates may reduce poverty in the short-run, the long-term effect of increased interest rates prevails.

Table 5: *Diagnostic Test Results*

Heteroskedasticity Test (Breusch-Pagan-Godfrey)

Statistic	Value	Prob.
F-Statistic	1.611394	0.1669
Obs*R²	25.80078	0.2141

Serial Correlation Test (Breusch-Godfrey LM)

Statistic	Value	Prob.
F-Statistic	2.271276	0.1218
Obs*R²	16.37336	0.1041

Source: Author's Calculations

Diagnostic Tests Discussion

Table 5 reports the results of the diagnostic tests. The Breusch-Pagan-Godfrey test indicates that the p-value exceeds 0.05, leading to acceptance of the null hypothesis of homoskedasticity, confirming the absence of heteroskedasticity. Similarly, the Breusch-Godfrey LM test for serial correlation shows p-values greater than 0.05, indicating no serial correlation in the residuals. These results confirm that the estimated ARDL-ECM model satisfies the classical regression assumptions and that the parameter estimates are statistically reliable.

Normality and Stability Tests

The normality of the residuals is examined using the Jarque–Bera (JB) test. The probability value of the JB statistic (0.6027) exceeds the 5 percent significance level, leading to acceptance of the null hypothesis that the residuals are normally distributed. This confirms that the model follows the normality assumption.

To assess parameter stability, CUSUM and CUSUM of Squares (CUSUMSQ) tests are employed. The plots show that the cumulative sums remain within the 5 percent critical bounds, indicating that the estimated coefficients are stable over time. These findings confirm the robustness of both the short-run and long-run ARDL estimates.

Conclusion and Policy Recommendations

This study examined the long-run and short-run relationship between interest rates and poverty in Pakistan using annual time-series data and the Autoregressive Distributed Lag (ARDL) modeling framework. The empirical analysis began with unit root tests, which confirmed that both poverty and interest rates are integrated of order one, I(1), thereby satisfying the preconditions for the ARDL bounds testing approach. The bounds test results provided strong evidence of cointegration, confirming the existence of a stable long-run equilibrium relationship between interest rates and poverty.

The long-run ARDL estimates reveal that interest rates exert a positive and statistically significant effect on poverty, indicating that higher interest rates increase poverty levels in Pakistan over time. This finding supports economic theory, which suggests that elevated interest rates raise borrowing costs, restrict access to credit for low-income households and small businesses, reduce private investment, and dampen employment creation. In a developing economy where a large segment of the population is credit-constrained, contractionary monetary policy disproportionately affects vulnerable groups, thereby aggravating poverty. The short-run ARDL–ECM results further confirm the robustness of this relationship. The error correction term is negative and highly significant, indicating rapid adjustment toward long-run equilibrium following short-run shocks. While short-run fluctuations in interest rates show mixed effects on poverty due to adjustment lags, the long-run impact remains dominant and adverse. Diagnostic and stability tests confirm that the estimated model is free from heteroskedasticity and serial correlation, follows a normal distribution, and remains structurally stable over the sample period, ensuring the reliability of the empirical findings.

Overall, the results underscore the critical role of interest rate policy in shaping poverty dynamics in Pakistan and highlight the importance of incorporating distributional considerations into

monetary policy design. Based on the empirical findings, several policy recommendations emerge. First, monetary authorities should adopt a poverty-sensitive approach to interest rate policy. While interest rates are an essential tool for controlling inflation and maintaining macroeconomic stability, excessive or prolonged tightening can exacerbate poverty by restricting credit access and suppressing economic activity. Policymakers should carefully balance inflation objectives with the socio-economic costs of high interest rates, particularly in periods of economic fragility. Second, targeted credit programs should be expanded to protect low-income households and small enterprises from the adverse effects of high interest rates. Concessional lending schemes, microfinance initiatives, and subsidized credit facilities can help mitigate the transmission of high borrowing costs to vulnerable segments of society, thereby reducing poverty pressures. Third, coordination between monetary and fiscal policy is essential. Expansionary fiscal measures aimed at job creation, social protection, and income support can offset the poverty-increasing effects of higher interest rates. Public investment in labor-intensive sectors, social safety nets, and skills development programs can strengthen household resilience to monetary tightening. Finally, strengthening financial inclusion should remain a central policy objective. Improving access to formal financial services, especially for poor and rural populations, can reduce reliance on high-cost informal credit markets and enhance the effectiveness of monetary policy transmission without deepening poverty. In conclusion, interest rate policy in Pakistan should not be viewed solely through the lens of price stability but also in terms of its long-term implications for poverty reduction. A balanced and inclusive policy framework is essential to ensure sustainable economic growth and improved social welfare.

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