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#### Do Remittance Reduce Poverty? The Role of Education, Inflation, and Unemployment. Time Series Evidence from Pakistan Shahid Munir<sup>1\*</sup>, Hajra Bibi<sup>2</sup>, Abdurrehman<sup>3</sup>, Komal Khattak<sup>4</sup>

	<b>Abstract</b>
<p><b>Shahid Munir (Correspondence Author)</b> Department of Economics, Government Postgraduate College Kohat, 26000, KP, Pakistan. Email: shahidmunirshahid@gamil.com</p> <p><b>Hajra Bibi</b> Department of Economics, Government Postgraduate College Kohat, 26000, KP, Pakistan.</p> <p><b>Abdurrehman</b> Department of Economics, Government Postgraduate College Kohat, 26000, KP, Pakistan.</p> <p><b>Komal Khattak</b> Department of Economics, Government Postgraduate College Kohat, 26000, KP, Pakistan.</p>	<p>In many emerging economies, poverty is considered a major socio-economic issue, limiting access to crucial resources for a large share of population. In Pakistan, nearly 40% of the people's lives under the national poverty line, confined in a cycle that's hard to break without reinforcement. Reducing poverty requires not only increasing the per capita income, but effective policies that increase education, reduced inflation and unemployment. Therefore, the study examines the relationships between poverty, remittance, inflation, education and unemployment by utilizing the annual time series data from the period of 1995-2024. Using the Autoregressive Distributed Lag (ARDL) model, the. Several diagnostic tests like unit root test, normality test, multi-collinearity, heteroscedasticity, serial autocorrelation and specification bias are applied on the data to ensure its validity and reliability. The result shows that remittances significantly reduced poverty, while inflation and unemployment exacerbate it. Meanwhile education contributes to reducing poverty levels. The study offers valuable insights based on the results of the study for policy makers advocating the role of remittance poverty, education, inflation and unemployment to reduce poverty.</p>
<b>Keywords:</b>	Poverty; Remittances; Inflation; Education; Unemployment



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### Introduction

Poverty is a multifaceted socio-economic challenge marked by inadequate access to fundamental goods and services, comprising food, housing, healthcare, and education (World Bank, 2020). The root causes of poverty include unemployment, low-paying jobs, inflation, and inequitable resource allocation, which exacerbate vulnerability and deprivation (Sen, 1999). Poverty is the key hurdle of the evolving nations. Poverty is a critical unethical or malicious that describes certain proportion of the individuals that can acquire basic standards of living (Ali & Ali, 2018). As a developing nation, Pakistan also have poverty as its main concern. Poverty effects are severe, leading to poor living conditions, malnutrition, school dropout and cause limited access to health. The impact of poverty extends beyond material derivation; it affects health outcomes, reduced educational attainment, and leads to long term social exclusion (Sen, 1999). Nowadays poverty is a pervasive global menace which describes and exhibits insufficiency in well-being of individuals (Ali & Ali, 2018). Poverty significantly erodes household purchasing power, limiting access to essential goods and services (World Bank, 2020). Due to limited income, many families are pressurized to assign resources to their basic needs like food and shelter, having an ignoring impact on health, education, and savings (Javed & Chaudhry, 2018). Poverty limited access to education and healthcare maintain inequality and reduce economic mobility, entrap families in poverty chain (Asim & Ahmed, 2018).

Poverty in Pakistan, has directly been linked with decline in school enrollment, early dropouts, and child labor, mainly in rural sectors where exits limited access to quality education and services (Aslam & King don, 2012). Furthermore, this poverty cycle can be cross-generational, because children growing up in poverty are more likely to remain in poverty in their adult era (Engle et al, 2007). So, numerus cross-border organizations like United Nations or the World Bank are working for decline in poverty (Ali & Ali, 2018). Among rural and urban region their exits significant disparities, with rural regions often experiencing greater poverty incidence (Amjad & Kemal, 1997). Pakistan as a developing nation where rural areas bear the shocks of poverty, intensified by insufficient infrastructure and hard to find occupation opportunities. The rural economy relies heavily on agriculture and provides for a significant proportion of the inhabitants, while the urban economy is characterized by a robust presence of industrial and service sectors (Khan & Qureshi, 2015). Lack of opportunities in rural regions will make its population lacking from the attainment of those facilities that the urban sector population is already enjoying. Many Pakistanis, particularly from the rural areas, migrated to the middle east or other region for employment, sharing remittances back home to helping their families. These remittances help decrease household poverty, improve access to education and healthcare and balanced consumption (Amjad, 2010). Meanwhile, migration can alleviate short term financial pressure, but it may also lead to societal hurdles which include family detachment and addiction of foreign income sources (Gazdar, 2003). To reduce poverty, effective implementation of policies that prioritize and target job creation opportunities, reforms in education, control on inflation and social safety nets.

Remittances represent the cross-border transfer of funds from migrant workers to their families in their home countries (World Bank, 2006). This money usually travels through banks or official transfer companies, but sometimes people use private, informal ways to send it (IMF, 2009). For the families receiving the money, it provides a big boost. It helps them pay for the basics like food, doctor visits, a place to live and school fee (Adams & Page, 2005). Remittance income also acts as a form of insurance by stabilizing household consumption during periods of economic instability or income shocks (Taylor, 1999). However, excessive dependence on remittances may reduce labor force and increase income inequality in recipient economies (De Haas, 2010). Remittances help reduce poverty by putting more cash directly into hands of poor families (World Bank, 2006). When these families have extra money, they can spend it on education and healthcare which help them earn more money in the future (United Nations, 2019). Studies show that as more money remittance comes into a country, the number of people living in poverty starts to drop (Adams, 2011). In rural and underdeveloped areas, remittances help reduce poverty by supporting local farms and small business (World Bank, 2006). However, the poverty-reducing impact of sending money home relies on access to relocation opportunities and how wisely the money is spent (De Haas, 2010). Overall, remittals play a major role in poverty alleviation by boosting earnings, reducing financial risk, and improving household welfare (Adams & Page, 2005).

Remittances affect poverty by boosting the disposable beneficiary household income, which improves their capacity to meet basic needs (Adams & Page, 2005). By financing education and skill development, remittances help reduce poverty over a long period by building more capable workforce (United Nations, 2019). At the national level, the flow of remittances helps build up foreign exchange reserves. This indirectly contributes to the goal of poverty reduction (IMF, 2009). The Governments can encourage the flow of remittances by lowering the cost of sending remittances. This can be achieved through encouraging competition among money transfer operators and improving the use of digital payment systems (World Bank, 2006). It is equally important to encourage more people to have access to banking services or mobile banking (United Nations, 2019). Creating special plans for investing for migrants can encourage them to invest in big projects like building roads or schools (Ratha, 2003). Teaching people how to manage their money better can encourage them to save more and invest better (World Bank, 2006). A Stable macroeconomic environment can encourage migrants to send remittances through official channels (IMF, 2009). Protecting the rights of migrant workers in their countries of destination can encourage them to send remittance to their home countries (United Nations, 2019).

Parallel to remittances, this research study incorporates multiple considerable control variables that are widely reported within the poverty literature to simplify an extensive analysis. Inflation is also considered because of its damaging effect on real purchasing power, which have an inadequately effect on low- income households and intensifies their exposure to poverty, especially in the environment of Pakistan (Ali & Sajjad, 2018). Education was measured by secondary school enrollment, because of its central role in human capital development and amplification of individuals' income- generating potential, thus mitigating poverty over time (Khalid et al., 2005). Moreover, unemployment is integrated as it clearly affects the stability of household income along with economic security, often outcome in lasting poverty and social marginalization (Nahar & Arshad, 2017). By incorporating these control variables analysis, the study offers more demanding examination of poverty dynamics in Pakistan, while empowering a more rational detachment of the precise effects of remittance inflows.

Although a growing body of literature investigating the relationship among poverty and remittances in Pakistan, numerous significant gaps stay. Multiple former studies rely on older and concise datasets, which restrict their capacity to reflect present economic realities. For instance, Ali et al. (2021) investigates the impact of remittances on poverty using data up to year 2018, but their study doesn't explain for the post-2018 period characterized by primary economic shocks such as the COVID-19 pandemic, climbing inflation, changing migration patterns, and swings in universal remittance flows. Correspondingly, Irfan (2011) provided early experimental insights based on data only up to year 2009, leaving an extended period free from updated analysis. Additionally, existing studies exhibit restricted consensus regarding the role of macroeconomic determinants that affect poverty. Even though some research uses the ARDL methodology, many studies analyze remittances alone or include only the limited control variables. Crucial elements such as education, inflation, and unemployment—important factors of household welfare—are hardly ever analyzed jointly within a single short-run and long-run structure for Pakistan. To handle these gaps, the present study uses annual time series data from the period of 1995 to 2024, providing a longer and more current dataset. It encompasses inflation, education and unemployment along with remittances within the ARDL framework to investigate both short-run and long-run relationships. This approach offers a more exhausting and updated appraisal of poverty determinants in Pakistan and delivers more credible evidence for productive poverty declination policies.



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### Literature Review

Remittances defined as financial transfers made by migrant workers to their household in their home countries have become among of the most significant resources of outermost financial inflows for developing countries. Global remittance transfers to nations classified as low- and middle-income attained an estimated total of \$589 billion in 2021, significantly surpassing the contributions of official development assistance and, in numerous contestants, even the equivalent of foreign direct investments (World Bank, 2021; Ratha et al., 2022). The significant growth in remittance flows has obtained significant academic and policy attention towards comprehending their developmental implications, especially regarding their influence on poverty reduction. The relationship between remittances and poverty follows a complex and multi-layered process that necessitates the need to examine the theoretical underpinnings as well as the empirical evidence in order to comprehend the relationship between remittances and poverty. This literature review will aim to synthesize the various studies on the effects of remittances in alleviation of poverty. This will include the examination of theoretical underpinning of mechanisms that govern the behavior of remittances as well as the mechanisms of alleviating poverty.

### Theoretical framework

The theoretical literature on remittances and poverty reduction begins with understanding why migrants send money to their home countries, as different motives lead to different effects on poverty. One important explanation is the altruism hypothesis, proposed by Lucas and Stark (1985) and based on Becker's (1974) work. This theory suggests that migrants send remittances out of concern for their family's welfare, with transfers increasing when households face economic hardship, which helps families manage hard times and reduces the risk of falling into poverty. In contrast, self-interest theories propose that remittances may represent investments in origin country's assets. According to Stark (1991), migrants may send money as an investment in land, property, or businesses in their home country. In this case, poverty reduction is not the main purpose of remittances, and the poorest households may receive less benefit. Exchange theory, developed by Cox (1987) and Cox and Jimenez (1992), explains remittances as payments for services such as childcare, property care, or support for elderly family members. This theory suggests that families with better income and services are prone to receive higher remittances. However, Cox et al. (1998) identified that concern for family is stronger among economically weaker households whereas exchange motives are stronger among wealthier individuals leading to important awareness for targeting poverty reduction.

The theoretical framework regarding insurance and risk-sharing proposed by Stark and Levhari (1982) remittances reflect an implicit familial insurance contract in which migrants provide financial support to their households as a form of risk sharing, where families sending members to earn income in different areas, allowing support to be sent to those experiencing economic shocks. This construct of "tempered altruism" assumes that remittances provide mutual insurance, with financial flows shifting direction dependent upon which family members are experiencing economic hardship, a mechanism that holds particular significance for poverty reduction considering the lack of formal insurance markets predominant in numerous developing nations (Rosenzweig, 1988; Rosenzweig and Stark, 1989). modern theoretical inquiries acknowledge that the motivations behind remittances are likely mixed, with elements of altruism, exchange, insurance, and investment all influencing decision-making processes that differ among households, mature throughout the migration cycle, and in response to economic conditions. (Rapoport and Docquier, 2006).

Understanding the mechanisms through which remittances reduce poverty is essential for predicting impacts and designing effective policies. The most direct channel is the income effect, through which remittances increase household income and may lift recipient families above the poverty thresholds (Stark, 1991). Adams and Page (2005) demonstrated theoretically and empirically that remittances reduce not only poverty incidence (headcount) but also its poverty depth (poverty gap) and severity (squared poverty gap). Their findings suggest that remittances are especially effective in improving the conditions of the poorest households. Beyond increasing income, remittances enable smooth consumption over time, functioning as an informal insurance and stabilize consumption during periods of income shocks caused by weather variability events, health crisis, or economic downturns (Yang and Choi, 2007). Such consumption-smoothing has important dynamic poverty effect by preventing transient poverty from becoming chronic and helping households avoid harmful coping mechanisms, such as selling productive assets, withdrawing children from school, or reducing food consumption below nutritional adequacy (Dercon and Krishnan, 2000).

Remittances can generate long-term poverty reduction by enabling investment in human capital. Building on human capital theory (Becker, 1964), studies show that remittance helps overcome credit constraints that prevent poor households from making optimal investments in education and healthcare (Becker and Tomes, 1986; Cox-Edwards and Ureta, 2003). By relaxing these constraints, remittances enable households to invest more in children's education and family health, which can help break intergenerational poverty cycle by enhancing future productivity and earning capacity. Another avenue through which physical capital accumulation and entrepreneurship are employed includes the improvement of housing, the purchasing of land, the acquisition of productive capital like farming equipment and business (Woodruff and Zenteño, 2007). When the poor are unable to acquire loans due to poor market conditions, remittances are employed to bridge the gap and facilitate income-generating activities among poor (McKenzie and Woodruff, 2008). Furthermore, remittances create multiplier effects within local economies, as recipient households spend more on locally produced goods and services, generating income for non-recipient households and extending poverty-reduction benefits beyond direct recipients (Durand et al., 1996; Taylor and Adelman, 2003).

### Empirical evidence

Cross-national empirical investigations provide significant macro-level evidence that broadly support the poverty-reduction effects of remittances, while also describe contextual variables that may enhance or limit these impacts. The influential study by Adams and Page (2005) based on data from seventy-one developing countries, found that a 10% increase in per capita formal remittances associated with 3.5% reduction in the deprivation headcount and a 5% decrease in depth of poverty, thereby it represent that remittances are more effective in reducing poverty than reducing inequality, and indicating that these financial flows tend to benefit poor households, though not limited only to the poorest Their implementation of instrumental variable estimation effectively addressed concerns relate to endogeneity by using migrant stock data within OECD nations and the geographic distance to financially developed destinations, with findings indicating that remittances have stronger impact on reducing the depth and severity of poverty than on lowering the overall incidence of poverty, thereby suggesting that they facilitate the advancement of the most poor households away from extreme poverty. Regional studies have confirmed these trends, though with some variations.

Empirical evidence from cross-country studies shows that remittances play a great role in reduction of poverty. Acosta et al. (2008) examined eleven Latin American countries, found that remittances reduced poverty ratio by 0.4 and 0.9 percentage points on average, with particularly strong effects in countries with high remittance-to-GDP ratios, including Ecuador, Guatemala, Honduras, and Nicaragua. Similarly, Gupta et al. (2009) analyzed 47 Sub-Saharan African countries over 1990–2005 period and showed that 1% increase in remittances as a share of GDP lowered poverty by about 0.4%, with effects strongest in countries with better financial sector development, suggesting institutional capacity mediates poverty impacts.

Country-specific studies provide more detailed evidence on mechanisms and heterogeneity than cross-country analyses allow Taylor et al. (2005), examining Mexican rural households and found that remittance income has a larger marginal impact on poverty reduction than equivalent domestic income. Their analysis shows that eliminating international remittances would increase extreme poverty by 14% and moderate poverty by 6%, indicating that remittances play a protective role for households close to the poverty line. Adams (2004) analyzed household survey data from Guatemala and found that both internal and international remittances significantly reduced poverty level, depth, and severity, with international remittances having particularly strong effect due to their typically larger transfer amounts.

Yang and Martinez (2006) provided compelling causal evidence from the Philippines, who used exchange rate fluctuations as a natural experiment. They found that favorable exchange rate shocks increased the local value of remittances, leading to higher school enrollment, reduced child labor, and increased entrepreneurship activities among remittances-receiving households, indicating that remittances support investments in human capital that can help break intergenerational poverty. Likewise, Adams et al. (2008) reported in Ghana that both internal and international remittances contributed to poverty reduction with strong effects on poverty gap, indicating that remittances can help the poorest of the poor move further out the poverty, stronger effects were reported in rural areas where poverty rates are the highest.

Household studies provide further evidence of how remittances lead to poverty reduction through various channels. For instance, it has been established through various studies that receiving remittances increases investment in education. Cox-Edwards and Ureta (2003) found that remittances increased school attendance and reduced dropout rates in El Salvador, especially among vulnerable children. Similarly, health investments are also increased through receiving remittances. For example, Hildebrandt and McKenzie (2005) found that receiving remittances in Mexico reduced infant mortality rates and improved birth outcomes, Especially in communities with poor health infrastructure where receiving remittances enabled households to seek private healthcare facilities. Remittances also increased investment in microenterprises, as found by Woodruff and Zenteño (2007) in urban Mexico, where receiving remittances financed 20% of the capital invested in microenterprises. However, it should be noted that receiving remittances also depends on various factors, as found by yang (2008), where receiving remittances financed business activities when the recipient had experience or a high level of education. Finally, receiving remittances acts as a insurance mechanism against poverty, especially during economic crisis, as found by Yang and Choi (2007) in the Philippines, where receiving remittances enabled households to maintain consumption levels after rainfall shocks and thus avoid.

Community and macroeconomic dynamics extend the poverty-reduction influence of remittances beyond direct recipient through multiple channels. Durand et al. (1996) estimated local multiplier effects within Mexican communities to range from 1.5 to 3.0, indicating that for every dollar remitted, an additional local income of between \$0.50 and \$2.00 was generated through successive rounds of expenditure; however, the magnitude of these multipliers is critically depend upon the local economic infrastructure, with more pronounced effects observed when local production satisfies consumption rather than relying on imports. Aggarwal et al. (2011) found that remittances promote the advancement of the financial sector and enhance financial inclusion, bringing more households into formal financial systems, which enables asset accumulation and access to credit, with positive implication for poverty reduction beyond remittance recipients. Nevertheless, the macroeconomic consequences are not uniformly positive. Acosta et al. (2009) identified evidence of real exchange rate appreciation in Latin American nations characterized by high remittance inflows, the so-called Dutch disease effect, with potentially negative consequences for export competitiveness and employment within the manufacturing sector; however, the implications for poverty are depend upon the sectoral distribution of employment and whether poor households primarily work in tradable or non-tradable sector.

### Research Methodology

### Data and Variables

This study examines the impact of remittances on poverty reduction in Pakistan using annual time series data from 1995-2024, sourced from the World Development Indicators (WDI) (World Bank, 2024). This main objective of the study is to examine the impact of remittances on poverty reduction in Pakistan. The Dependent variable is poverty. While the Independent variables include Remittances, Inflation, Education and Unemployment. These indicators encompass various dimensions of poverty alleviation, influencing Pakistan’s economic trajectory (Khan & Ahmed, 2018; World Bank, 2022). Previous studies have employed similar variables in poverty-remittance analyses, such as poverty headcount ratio and remittances (% of GDP) in ARDL studies on Pakistan (Azam & Gamage,2017) and Indonesia (Suryahadi et al., 2018). Other research has incorporated inflation and unemployment alongside remittances (% of GDP) in panel data analyses of South Asian countries (Javed & Chaudhry,2018), while education has been included as a key determinant in multinomial logit models of poverty in Pakistan (Khan & Qureshi, 2020). The variable sources and descriptions of their data are summarized in Table 1.

**Table 1. Variable Descriptions**

Variables	Abbreviation	Descriptive	Source
Poverty	POV	Poverty headcount ratio at national poverty lines (% of population).	WDI (2025)
Remittances	REM	Personal Remittances, received (current US\$)	WDI (2025)
Inflation	INF	Inflation, consumer prices (Annual %).	WDI (2025)
Education	EDU	School enrollment, secondary (% gross).	WDI (2025)
Unemployment	UNEMP	Unemployment, total (% of total labor force)	WDI (2025)

### Estimation Techniques:

Time series data often encounter various econometric issues such as Unit root test, Normality test, Multi-collinearity, Heteroscedasticity, Serial Autocorrelation and Specification bias. To address the concerns, the following techniques have been employed. The unit root test is used to determine where the variables of the study are stationary or non-stationary. To examine stationarity of variables, the Augmented Dickey Fuller (ADF) test (Dickey & Fuller, 1979), has been utilized following the methodologies of (Kousar et al, 2019) and (Ali et al, 2021) in their ARDL studies. The normality of the residuals has been checked by using the Jarque Bera statistics (Jarque & Bera, 1980), as applied by (Siddique et al, 2016). The multi-collinearity between variables has been checked by VIF (Variance Inflation Factor) (O'Brien, 2007), consistent with diagnostic procedures in (Ali and Ali, 2018). The heteroscedasticity between the residuals has been checked by Breusch-Pagan Test (Breusch & Pagan, 1979), following (Nahar & Arshad, 2017). The autocorrelation in the residuals has been checked by Breusch-Godfrey Serial Correlation LM Test (Breusch, 1978), as utilized by (Kousar et al, 2019). The specification bias has been checked by Ramsey RESET test (Ramsey, 1969), consistent with model validation in (Ali et al, 2021). Given the mixed order of integration revealed by unit root tests, the Autoregressive Distributed Lag (ARDL) model developed by (Pesaran, Shin and Smith, 2001) is employed. This methodology has been successfully applied in similar contexts by Kousar et al, (2019) and Musakwa & Odhiambo, (2019) for Botswana. The relationship between the study variables has the following econometric form, given in equation 1.

### Econometric Model:

$$POV = \beta_0 - \beta_1 REM + \beta_2 INF - \beta_3 EDU + \beta_4 UNEMP + u_t$$

Where the  $\beta_0$  is intercept and  $\beta_i$  are slope coefficients and  $u_t$  is error term

### Results and discussion:

The results of ADF test indicate that inflation is stationary at level denotes as I (0), whereas poverty, unemployment, education and remittances are stationary at the first difference denotes as I (1). Consequently, the model comprises a mixture of I (0) and I (1) variables. The results are shown in Table 2. Several diagnostic tests were applied on the regression model to ensure the validity of the model. The normality test yielded an f-statistics of 1.004 and a p-value of 0.60, indicating that the residuals are normally distributed. The heteroscedasticity test resulted in an f-statistics of 0.52 and p-value of 0.85 suggested that there is no incidence of heteroscedasticity. Furthermore, the serial autocorrelation test shows no strong evidence of the serial autocorrelation with having f-statistics value 80.00 and p-value 0.08. The value of F-statistics 0.31 and the p-value 0.58 shows that the model is correctly specified which insures the specification biasness. The results are shown in Table 2.

**Table 2. Result of ADF Test**

Variables	Level	Prob.	1st difference	Prob.	Decision
POV	-1.59	0.48	-7.95	0.00	I(1)
INF	-3.83	0.01	----	-----	I(0)
UNEMP	-1.86	0.34	-5.47	0.00	I(1)
EDU	-0.47	0.88	-5.76	0.00	I(1)
REM	0.56	0.99	-4.71	0.00	I(1)

### Diagnostic tests:

The table below represents multi-collinearity diagnostics test for a regression model with variables including Remittances, Inflation, Education and Unemployment along with constant term (C). Variance inflation factors (VIF) help check for multi-collinearity between variables in a model. Remittances with a Coefficient variance = 0.45 (moderate uncertainty), Un-centered VIF = 8.72 indicates some multi-collinearity involving the intercept, Centered VIF = 1.69 acceptable collinearity among predictors. Inflation Coefficient variable = 0.453 and Un-centered VIF = 8.72, Centered VIF = 1.69 (Similar to the education manageable when centered). Education Coefficient variance = 0.077 and Un-centered

**Table 3. Diagnostic tests Results**

Tests	F-Statistics	P-value	Result
Normality Test	1.004	0.60	Residuals appear to be normally distributed.
Heteroscedasticity test	0.52	0.85	There's no indication of heteroscedasticity.
Serial Autocorrelation	80.00	0.08	No strong evidence of serial autocorrelation.
Specification bias	0.31	0.58	Model is correctly specified.

VIF = 57.50 (Pretty high indicating potential multi-collinearity issues), Centered VIF = 1.69 below the common threshold of 10, suggesting manageable multi-collinearity when centered). Unemployment Coefficient variance = 0.28 Un-centered VIF = 4.42, Centered VIF = 1.05 low multi-collinearity. C constant Coefficient variance = 60.03 Un-centered VIF = 40.65, Centered VIF = NA not applicable for constant. Education has a high Un-centered VIF but a manageable centered VIF inflation, remittances, unemployment have relatively low centered VIFS indicating minimal multi-collinearity issues when centered data is considered. High Un-centered VIF for education and C might need attention depending on the model context.

**Table 4. Results of Multicollinearity**

Variables	Coefficient variance	Un-centered VIF	Centered VIF
REM	0.45	8.72	1.69
INF	0.06	6.19	1.05
EDU	0.08	57.50	1.69
UNEMP	0.28	4.42	1.05
C	60.03	40.65	NA

#### ARDL Estimation results

Given the mixed order of integration indicated by the ADF test results, we employ the Autoregressive Distributed Lag (ARDL) model to examine the relationships among variables (Pesaran et al., 2001). The ARDL approach is an econometric technique for analyzing both short-run as well as the long-run relationship between the time series variables. It is particularly useful when variables have different orders of integration, such as I (0) and I (1). This model allows for a flexible and efficient examination of both the long-run and the short run dynamics between the variables. The Bound test inclusion is to identify long run co-integration and an Error Correction term that indicates how quickly the system adjusts to the equilibrium following short term shocks given these benefits. ARDL is a popular choice to examine dynamics relationship in economics time series data. The ARDL result presented in Table 5 indicates the outcome of a bound test for co-integration. The f-statistics value is 7.33, which is compared against the critical value bounds for significance level of 10%, 5%, 2.5% and 1%, at the 10% significance level the lower bound I (0) is 2.68 and the upper bound I (1) is 3.53 at the 10% significance level its suggests there is evidence of co-integration among the variables. This implies that there exists a long run relationship between the variables under consideration the number of variables (K) is 4. This result supports the existence of a co-integration relationship which is a crucial finding for further analysis in the research thesis.

**Table 5. ARDL Bound Test Results**

Test Statistic	Value	Significant	I (0)	I (1)
F-statistics	7.33	10%	2.68	3.53
		5%	3.05	3.97
		2.5%	3.4	4.36
		1%	3.81	4.92

Table 6 shows the results of ARDL test in long run estimated from bound test which examines the relationship between variables. The remittances have significant negative coefficient having P-value 0.04, presents that the remittances have a negative outcome. When the remittance rises by 1%, poverty will fall by about 10%. The ARDL Model results indicate a positive long run relationship between inflation and poverty, suggesting that high inflation exacerbates poverty in Pakistan (Javed & Chaudhry, 2018). Inflation has a positive coefficient which is significant at the 10% level its P-value is 0.0582, suggesting inflation is positively related to the outcome, Inflation worsens poverty by 1.3%. The ARD Model reveals a significant negative long-run relationship between the education and poverty, indicating that increased educational attainment reduces poverty in Pakistan (Asim & Ahmed, 2018). Education has non-significant negative coefficient with P-value of 0.4177 indicates that education does not have a statistically significant effect in the long run. The long run ARDL estimates reveal a significant positive relationship between unemployment and poverty, indicating the high unemployment contributes to poverty persistence (Rahman & Mustafa, 2019). Unemployment shows a significant positive coefficient having P-value 0.0304 shows that unemployment is positively linked with the result in the long run. A 1% rise in unemployment the poverty will rise by 2.4%. So, it is concluded that there is a mixed long-run relationship among the variables. More remittances and education mean fewer poor families in the economy while inflation and unemployment make the poverty situation miserable for the country.

**Table 6. ARDL Long Run Coefficients**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REM	-10.03	2.81	-3.57	0.04
INF	1.28	0.43	2.99	0.06
EDU	-0.30	0.32	-0.94	0.42
UNEMP	2.40	0.62	3.88	0.03

Table 7 shows the short run result of ARDL test conducted on the data. Remittances have a significant short run impact on poverty reduction, as they provide immediate financial support to households (Azam & Gamage, 2017). Remittances have a coefficient = -13.78 and P-value = 0.00, which indicates that 1-unit rise in the remittances will lessen the poverty by 13.77-units which shows a strong and significant negative effect. Remittance plays an impactful role in the cutback of poverty in the short run. High inflation in the short run exacerbates poverty, particularly among the urban poor (Awan & Qasim, 2020). Inflation has a coefficient = 0.72 and P-value = 0.05 which shows that when there is 1-unit increase in the inflation poverty will be increased by 0.72-units. The positive relationship shows that inflation increases poverty in the short run. Its P-value is also marginally significant. In the short-run, education has a limited influence on poverty deduction, as the benefits of education take time to materialize (Asim & Ahmed, 2018). Education has its coefficient = 1.06 and P-value = 0.05 in short run which indicates that 1-unit rise in education will direct to 1.06-units increase in poverty, this is unexpected because education is typically expected to reduce poverty. A short-run increase in education expenditure does not significantly affect poverty incidence (Khan & Qureshi, 2020). The P-value indicated that the result is not statistically significant but marginally significant. In the short run, unemployment has a significant positive relationship with poverty, as job losses immediately affect household income (Raham & Mustafa, 2019). Unemployment coefficients = 2.27 and P-value = 0.01 which indicates a 1-unit increase in unemployment poverty by 2.27-units. The relationship is statistically significant at the 5% level, which tells us that higher unemployment leads to a higher increase in poverty. So, the conclusion states that remittances negatively, unemployment positively affects poverty, and both are statistically significant, while education and inflation show a positive impact on poverty and are marginally significant.

**Table 7. ARDL Short Run Results**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(REM)	-13.77	2.09	-6.60	0.01
D(INF)	0.72	0.23	3.09	0.05
D(EDU)	1.06	0.35	3.04	0.06
D(UNEMP)	2.27	0.45	5.02	0.02

### Conclusion and Recommendations

This research investigated the impact of remittances on poverty reduction in Pakistan from the period of 1995-2024, by applying the Autoregressive Distributed Lag (ARDL) model, with poverty as the target variable and remittances, inflation, education and unemployment as explanatory variables. The ARDL methodology was selected because it allows the analysis of both long-run dynamics and short-run relationships among variables with mixed levels of integration. The results confirm the presence of a stable long-run relationship between poverty and the selected determinants. However, in short run, remittances support households oversee their financial up and down along with job insecurity. There are many developing countries in the world that are struggling with the threatening challenge of poverty including Pakistan for which it is considered as a sophisticated and versatile issue that has kept going for ages. Regardless of the development in many sectors, poverty is still considered a crucial challenge in the way of achieving development and improving the well-being of its residents. According to the reports of World Bank (2020), an estimated 39% of Pakistan's population lives below the line of poverty, with rural areas being inadequately affected. The circumstances are getting worse by constraining access to education, healthcare, and employment opportunities, lasting the poverty cycle that is demanding to break. There are multifaceted factors with which poverty is complicatedly connected, including remittances, inflation, education, and unemployment.



# Advance Journal of Econometrics and Finance

## Vol-4, Issue-1, 2026

Remittances have been considered as a vital source of foreign income for many households, which helps them in reducing poverty and making their lives better by upgrading their living standards (Azam & Gamage, 2017). However, inflation has an unfavorable impact on poverty, humiliating the purchasing power of the marginalized and fragile portion of society (Javed & Chaudhry, 2018). Education is an essential agent in poverty deduction, whenever there is an increase in educational achievement will lead to better carrier opportunities and handsome earnings (Asim & Ahmed, 2018). On the other hand, unemployment also has its main contribution in the poverty reduction, increasing rate of unemployment will lead towards a damaging impact on household income and their well-being (Rahman & Mustafa, 2019).

The relationships between the above-mentioned variables are multifaceted and complicated. Remittances have a down sloping relationship with poverty, pointing that increased remittances will lead towards poverty reduction (Hussain & Anjum, 2019). Inflation has a hopeful relationship with poverty, suggesting that high inflation escalate poverty (Awan & Qasim, 2020). Education has an unfavorable relationship with poverty, pointing out that increased education will decrease poverty (Khan & Qureshi, 2020). Unemployment has a positive relationship with poverty, denoting that high unemployment adds to poverty endurance (Siddique & Ahmed, 2021). Insight into these multifaceted relationships is essential for policymakers to design successful strategies for decline in poverty along with sustainable breakthroughs. Dealing with Pakistan poverty requires a comprehensive approach that considers the interaction between remittances, inflation, education, and unemployment. Policymakers should concentrate on the techniques that encourage education, stabilize inflation, improve employment opportunities, and ensure the significant usage of remittances. By covering these interconnected issues, Pakistan can boost sustainable economic growth and poverty declining, along with improving the prosperity of its people.

### Policy Recommendations

The study offers some policy recommendations for the improvement and advancement in the poverty situation in the country. The administration should purify and prompt formal banking along with the digital channels for remittances movement to ensure that more funds are attained by households in a smooth and safe way, that diminishes reliance on the informal methods. Policies should be initiated to direct households in using remittances not only for expenditure but also for investment in small businesses, education and health, which can contribute to prolonged poverty diminishing. As inflation adversely impacts poverty levels, there is a need for productive monetary policies to balance prices and defend the purchasing power of low-income households. High unemployment raises poverty level, so the government should spend in jobs creation programs, particularly in rural areas, to lower reliance solely on remittances. Since education shows a favorable impact in the short term, efforts must be made to boost both approach and standard of education to make it a more productive equipment for poverty reduction. Training programs should be initiated to help remittance-receiving families handle their finances improved, allow them to save, invest and plan for the upcoming. Moreover, in Pakistan employees whose are working abroad should inspire to invest back home through incentives, such as tax benefits or investments schemes, to elevate regional advancement and decrease poverty sustainably.

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