Interconnections between Remittances, Inflation, and Poverty in Pakistan and India

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Abstract
The study aims to explore the interconnection between remittances, inflation, and poverty in Pakistan and India. The study employed an Autoregressive Distributed Lag model to estimate the short-run and long-run results from 1972 to 2020. The study uses the poverty headcount ratio (as a dependent variable while the variables remittances, GDP deflator, Gini Index, foreign direct investment, tax revenue, unemployment rate, and Urbanisation are used as explanatory variables. The study has also used Granger Causality analysis. The findings of the study indicate that remittances and foreign direct investment has a negative impact on poverty. On the other hand, poverty is positively impacted by the GDP deflator, Gini Index, tax revenue, unemployment rate, and Urbanisation in both Pakistan and India. The result also shows that in both Pakistan and India, remittances do not Granger cause poverty, and poverty Granger causes remittances. GDP deflator does not Granger cause poverty and poverty does not Granger cause GDP deflator. Policymakers should make policies to improve the remittances in both Pakistan and India. The planners should also make and implement policies that reduce the inflation rate in both Pakistan and India to reduce poverty.
Keywords: Poverty, Remittance, GINI, Tax, FDI, Inflation, Urbanization

1. Introduction

Remittances inflows and foreign direct investment play an important role in poverty reduction. In the developing world, international migration and remittances are the most suitable and stable sources of income for the developing world. To get the better reward of services people used to migrate. After that, they remit their money to home countries to the people left behind. The impact of remittances has deeply been analysed. Many articles have been written about the impact of remittance and inflation on poverty. It is argued that remittance has a very close impact on poverty reduction in almost all economies. Remittance has a positive impact on the supply as well as the demand side. In the case of augmenting domestic investment, by enhancing investment level remittance plays an important role. On the other hand, if we go towards the consumption side and balance the deficit remittance is useful for poverty reduction. A huge literature is available about the impact of remittance and inflation on poverty but proper importance is not given to remittance to overcome the income distribution problem. This is an important issue because even economic growth at a higher level is also of no use if income distribution is not distributed properly. To check that remittance is working properly in the country we can check the poverty rate at different intervals (Morton et. al. 2010).

Poor people can't migrate due to financial issues and are unable to send their remittances to their loved ones but people who are already rich can move abroad and earn and send remittances to home. This creates more poverty and the gap between the poor and the rich becomes more and more (Cooray, 2007), It is seen that people who are receiving remittances cannot pay attention to their children because males are abroad and children do have not proper checks and balances on them. This creates poverty because educated and skilled people are less in the economy (Kalaj, 2010). In developing countries, Pakistan and India are among the major recipients of remittance in the world (Bayes et al., 2015). In Pakistan, remittances increased from 5069 USD million to 5747 USD million in the 2nd quarter of 2019, from 2002 to 2019 remittances received by Pakistan averaged 2928.59 USD million. Remittance for Pakistan is lower by 906 USD million in 3rd quarter of 2003 (State Bank of Pakistan, 2019). In rural areas of Pakistan, the Poverty rate and unemployment rate are notably higher than in urban areas, this stress becomes the cause of migration. Currently, almost 8.8 million Pakistanis are now working and living abroad as migrants and sending income to families in Pakistan (Kundu, 2016). In the case of India, the country is the largest remittance receiver country in the world almost 12% of world remittances were received by India in 2015. In 2017 remittance to India stood at 68.968 USD billion and remittance outflow from India to other countries is 5.710 USD billion. (Ministry of overseas Indian affairs, 2017). India has experienced a sharp remittance growth. In 1991 remittance for India was valued at 2.1 USD billion, about 22 USD billion in 2006 which increased to 67.6 USD billion in 2012-2013. India provides many facilities to people sending remittances to India through mobile accounts and online media and some banks offer various affordable and cheap services to facilitate remittance inflows (Gupta, and Jian, 2021).

Prices of necessities and basic needs rise, and it becomes difficult for poor people to afford goods and services at this price level. The purchasing power of poor people decreases due to increases in price level but income does not increase in the same period (Wilson, 2021). Suppose that a person is spending half of his income on some item whose price suddenly increases by a quarter. This is the way inflation affects the poor in countries in developing countries. When you are affected by high inflation, the only choice for the poor is to cut off on food and many other vital needs such as health care and education fees. (Azhar, 2020).

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The inflation rate in Pakistan increased to 12.55% in September 2019 as compared to 11.63% in August 2019, It's the highest inflation rate since 2011. On a monthly basis, prices increased by 0.75%, following a 1.38% rise in the previous month. Inflation in Pakistan averaged 7.77% from 1957 to 2019. Inflation was highest in December 1993 at 37.81% and the lowest value of inflation was -10.32% in December 1973 in Pakistan. In the case of India in August 2019 3.21% as compared to the previous month which was 3.30%. The average Inflation rate in India is 6.02% from 2012 to 2019. The highest rate of inflation during this period was 12.17% in November 2013 and the lowest value of inflation was 12.71% in June 2017 (World bank, 2018).

2. Literature Review

This section explains the literature review of the studies on remittances, inflation and poverty. Table 1 shows the summary of the literature review on remittances, inflation and poverty.

Table 1: Summary of the Studies on Remittances, Inflation and Poverty

Reference(s)	Country	Time Period Covered	Methodology	Main Results
Kousar et al. (2019)	Developing Countries	1980-2016	ARDL	A positive relationship between poverty and inflation was found.
Kumar (2019)	Bangladesh	2014-2018	Binary Logistic Regression Model	A Positive association between inflation and poverty and while the negative link between remittances and poverty was the key finding of the study.
Kousar et. al. (2019)	Pakistan	1972-2017	ARDL	Remittance and financial development were negatively related to poverty and inflation.
Mehedintu et. al. (2019)	9 Emerging Countries of the European Union	2004-2017	OLS	Remittances had a negative relation with poverty while inflation had a positive relation with poverty.
Kalim and Shahbaz (2009)	Pakistan	1973-2006	FMOL Method and DF-GLS Method	Remittances had a negative relation while inflation had a positive relation with poverty.
Muhibbullah and Das (2019)	42 Less Developing Countries	1990-2015	Co-integration and VECM technique	The study found that there was a positive relationship between inflation and poverty.
Ajide et al. (2017)	71 Emerging and Developing Countries	1996-2012	GMM	There was a positive relationship between inflation and poverty.
Pekovic (2017)	9 Developing Countries	2002-2013	LSDV and panel-corrected standard errors model	Remittance and poverty were negatively related.
Pradhan and Mehesh (2016)	25 Developing Countries	2001-2014	OLS	A negative association between remittance and poverty was found.
Elbadawi (2015)	72 Developing Countries	2000-2012	OLS	A positive relationship between inflation and poverty was found.
Monnin (2014)	52 Developing Countries	1971-2010	Co-integration	The findings showed that there was a negative relationship between poverty and inflation.
Shilpakar (2014)	77 Developing Countries	1980-2008	OLS	Remittance had a negative relation with poverty.
Fujii (2013)	78 Developing Countries	1989-2008	OLS	There was a positive relationship between poverty and inflation.
Thalassions et. al. (2012)	62 Low-Income Countries	2000-2009	OLS	The study found a positive relationship between inflation and poverty.
Ackrill and Colemen (2012)	92 developing countries	1981- 2009	OLS	There was a positive relationship between inflation and poverty.
Brempong and Asiedu (2009)	106 Less Developed Countries.	1990-2006	Pseudo-panel Estimates	Poverty and remittances had a negative relationship.

Adams et. al. (2008)	82 Under-Developed Nations	1987-2008	Polychotomies-Choice Model	Poverty had a negative relation with remittance.
Acosta et. al. (2007)	10 Latin American Countries	2000-2004	OLS	Remittance and poverty were negatively related.

The existing literature reveals consistent patterns regarding the effects of inflation and remittances on poverty across developing and emerging countries. Most studies demonstrate a positive relationship between inflation and poverty, suggesting that higher inflation rates tend to worsen poverty levels. Conversely, remittances generally have a negative association with poverty, indicating that they help alleviate poverty. The methodologies used vary, including ARDL, OLS, and GMM, among others, but the results remain consistent across different techniques. Studies cover a range of regions, from specific countries like Bangladesh and Pakistan to broader groups like emerging European nations and low-income countries. Despite the diversity in geographic focus and analytical methods, the overarching findings align, emphasizing the detrimental impact of inflation on poverty and the beneficial role of remittances in reducing poverty.

3. Model Specification, Data and Methodology

The functional form of the model explaining the relation between remittances, inflation and poverty is a follows:

$$PHCR = f(REMIT, GDPD, GINI, FDI, TAX, UNP, URBAN) \tag{1}$$

The econometric form of the model is given as:

$$PHCR_t = \beta_0 + \beta_1 REMIT_t + \beta_2 GDPD_t + \beta_3 GINI_t + \beta_4 FDI_t + \beta_5 TAX_t + \beta_6 UNP_t + \beta_7 URBAN_t + \mu_t \tag{2}$$

The study employed the data from 1972 to 2020. Different studies use different techniques to determine the results of studies based on inflation, remittance and inequality, different approaches and techniques are applied to the data to manipulate the results but all approaches have some drawbacks and some benefits over others. Some studies have used a simultaneous equation approach and some used various cointegration techniques and most of the studies have used the OLS technique, but these all have some weaknesses and are not able to handle data. For example, if one or more variables are stationary at a level while others are at first difference Johnsen technique can't be used but you can still use ARDL to examine the long-run relation among the variables. ARDL is a general approach useable even if your variables are stationary at different levels so we use the ARDL (autoregressive distributed lag) model because we found it as the most appropriate approach. This study uses the Auto regressive Distributed lag (ARDL) model. This model can overcome the problem of stationary in a dataset. This technique provides us with long-run cointegration among variables and doesn't lose short-run information in data. Moreover, error correction terms show the significant convergence of the equilibrium point of the economy. We use the ARDL (autoregressive distributed lag) model for to following reasons.

- The ARDL cointegration is more efficient and unbiased.
- ARDL model is most suitable for checking long-run and short-run relationships between time series (Giles, 2013).
- ARDL model is the best estimator when we have a mixture of stationary and non-stationary values.

To calculate the long-run coefficient and error correction model it is compulsory to know whether the long-run relationship exists or not. For this purpose, the study used a bounds-testing approach through F-statistics. If the F-statistics value is greater than other values at 5% and 10% then the long run exists. Then from error correction analysis, the study found how much time is required to converge or diverge towards the equilibrium. Then VAR lag order section criteria are used to find the optimum lag. After that Granger causality analysis is applied.

The error correction model is given as:

$$\Delta(PHCR)_k = a + b_1(PHCR)_{k-1} + b_2(REMIT)_{k-1} + b_3(GDPD)_{k-1} + b_4(GINI)_{k-1}$$

$$b_5(FDI)_{k-1} + b_6(TAX)_{k-1} + b_7(UNP)_{k-1} + b_8(URBAN)_{k-1} + \sum_{i=1}^{a_1} g_1 \Delta(PHCR)_{k-i}$$

$$+ \sum_{i=0}^{a_2} g_2 \Delta(REMIT)_{k-i} + \sum_{i=0}^{a_3} g_3 \Delta(GDPD)_{k-i} + \sum_{i=0}^{a_4} g_4 \Delta(GINI)_{k-i} + \sum_{i=0}^{a_5} g_5 \Delta(FDI)_{k-i} \tag{3}$$

$$+ \sum_{i=0}^{a_6} g_6 \Delta(TAX)_{k-i} + \sum_{i=0}^{a_7} g_7 \Delta(UNP)_{k-i} + \sum_{i=0}^{a_8} g_8 \Delta(URBAN)_{k-i}$$

$$+ \in_k$$

In this equation b are parameters that show the multiplier of the long-run and g_i are the short-run dynamic coefficients of the ARDL model. The $\in_k$ is the error term and shows the first difference operator. If the long-run relationship exists then long-run coefficients are estimated by using the following equation.

$$\Delta(PHCR)_k = a + \sum_{i=1}^{a_1} n_1 (PHCR)_{k-i} + \sum_{i=0}^{a_2} n_2 (REMIT)_{k-i} + \sum_{i=0}^{a_3} n_3 (GDPD)_{k-i} + \sum_{i=0}^{a_4} n_4 (GINI)_{k-i} \quad \text{(4)}$$
$$+ \sum_{i=0}^{a_5} n_5 (FDI)_{t-i} + \sum_{i=0}^{a_6} n_6 (TAX)_{k-i} + \sum_{i=0}^{a_7} n_7 (UNP)_{k-i} + \sum_{i=0}^{a_8} n_8 (URBAN)_{k-i} + \in_k$$

The short-run results are estimated through the following equation.

$$\Delta(PHCR)_k = a + \sum_{i=1}^{a_1} \zeta_1 \Delta(PHCR)_{k-i} + \sum_{i=0}^{a_2} \zeta_2 \Delta(REMIT)_{k-i} + \sum_{i=0}^{a_3} \zeta_3 \Delta(GDPD)_{k-i} + \sum_{i=0}^{a_4} \zeta_4 \Delta(GINI)_{t-i} \quad \text{(5)}$$
$$+ \sum_{i=0}^{a_5} \zeta_5 \Delta(FDI)_{k-i} + \sum_{i=0}^{a_6} \zeta_6 \Delta(TAX)_{k-i} + \sum_{i=0}^{a_7} \zeta_7 \Delta(UNP)_{k-i} + \sum_{i=0}^{a_a} \zeta_8 \Delta(URBAN)_{k-i} + \varpi ECM_{k-1} + \in_k$$

Parameters with signs summation denote the short-run coefficients and error correction model (ECM). ω is the speed of adjustment.

4. Result and Discussion
This section explains the results of the study.
4.1. Summary Statistics and Correlation Analysis
Table 2 provides the summary statistics of the key variables for the case of Pakistan and India. In terms of the poverty headcount ratio (PHCR), Pakistan has a lower mean value of 25.45% compared to India's 31.44%, indicating less overall poverty in Pakistan. Both countries exhibit moderate skewness in their PHCR distributions, but India has a higher standard deviation, suggesting greater variability in its poverty levels. Remittances (REMIT) play a more significant role in Pakistan's economy, with a mean of 5.16% of GDP, substantially higher than India's 1.98%. This suggests a higher reliance on remittances in Pakistan. Furthermore, the GDP deflator (GDPD) is higher on average in Pakistan (9.74%) than in India (7.63%), but Pakistan also exhibits higher variability and skewness, indicating more inflation. Analyzing income inequality through the GINI index, India shows a higher mean value (34.95) compared to Pakistan's (0.414 on a different scale), indicating greater income inequality in India. The GINI index in Pakistan is more negatively skewed, suggesting that inequality levels tend to be higher but more concentrated around the mean, whereas India's higher kurtosis suggests occasional extreme inequality. Foreign direct investment (FDI) is almost similar in both countries, but Pakistan shows higher skewness and kurtosis, suggesting occasional spikes in FDI.

Table 2: Summary Statistics of Key Variables (1972-2020)

	Mean	Median	Max	Min	Std. Dev.	Skewness	Kurtosis	JB	Prob.
Pakistan									
PHCR	25.45	23.96	34.60	17.32	4.21	0.65	2.66	3.59	0.16
REMIT	5.16	5.02	10.24	1.45	2.14	0.15	2.24	1.31	0.51
GDPD	9.74	8.58	25.43	0.40	5.90	1.13	3.84	11.53	0.00
GINI	0.41	0.42	0.45	0.30	0.03	-1.77	5.08	33.10	0.00
FDI	0.79	0.59	3.66	-0.06	0.79	2.14	7.61	77.84	0.00
TAX	11.37	11.02	13.70	8.61	1.71	-0.10	1.46	4.69	0.09
UNP	5.18	5.37	8.30	2.62	1.71	0.05	1.77	2.97	0.22
URBAN	31.54	31.83	36.66	25.35	3.28	-0.22	1.90	2.72	0.25
India									
PHCR	31.44	30.53	45.30	21.90	5.65	0.65	2.83	3.30	0.19
REMIT	1.98	1.76	4.17	0.44	1.12	0.26	1.62	4.16	0.12
GDPD	7.63	7.93	17.83	-1.65	3.85	0.42	3.67	2.21	0.33
GINI	34.95	33.06	49.12	30.10	4.23	1.86	5.93	42.91	0.00
FDI	0.73	0.39	3.62	-0.03	0.89	1.24	3.94	13.42	0.00
TAX	9.66	9.44	12.11	8.08	0.95	0.34	2.51	1.32	0.52
UNP	3.06	2.73	6.96	1.66	1.08	1.90	6.44	50.44	0.00
URBAN	26.70	26.50	33.60	20.32	3.67	0.12	2.05	1.84	0.40

Tax revenue (TAX) is higher in Pakistan, with a mean of 11.38% compared to India's 9.66%. Unemployment (UNP) rates are also higher in Pakistan (5.18%) compared to India (3.06%), but with less variability. Urbanization (URBAN) is slightly more advanced in Pakistan, with a mean of 31.55% compared to India's 26.70%, indicating a larger urban population percentage-wise. These statistics highlight the different economic and social challenges each country faces, with Pakistan showing higher variability in several indicators, while India deals with higher levels of poverty and greater income inequality.
Table 3 illustrates the correlation matrix of the key variables for Pakistan and India.

Table 3: Correlation Matrix of Key Variables in Pakistan (1972-2020)

				Pakistan				
Variables	PHCR	REMIT	GDPD	GINI	FDI	TAX	UNP	URBAN
PHCR	1.00							
REMIT	-0.31	1.00						
GDPD	0.33	-0.33	1.00					
GINI	-0.74	0.04	-0.37	1.00				
FDI	-0.30	-0.33	0.04	0.35	1.00			
TAX	-0.08	-0.01	-0.05	0.11	-0.33	1.00		
UNP	-0.17	-0.33	-0.26	0.52	0.41	-0.42	1.00	
URBAN	-0.43	-0.14	-0.23	0.67	0.54	-0.56	0.83	1.00
				India				
PHCR	1.00							
REMIT	-0.20	1.00						
GDPD	0.02	-0.35	1.00					
GINI	-0.33	-0.07	0.03	1.00				
FDI	-0.29	0.87	-0.27	-0.05	1.00			
TAX	-0.58	0.38	-0.08	0.03	0.55	1.00		
UNP	-0.23	-0.28	-0.18	0.28	-0.31	0.01	1.00	
URBAN	-0.26	0.89	-0.40	-0.13	0.82	0.58	-0.25	1.00

In the case of Pakistan, PHCR has a moderate negative relation with REMIT, FDI and URBAN while a moderate positive association with GDPD. PHCR has a strong positive relationship with GINI. The variables TAX and UNP have a weak negative correlation with PHCR. On the other hand, in the case of India, the variables REMIT, FDI, UNP and URBAN have weak negative while the variable GDPD has a weak positive association with PHCR. The variables GINI and TAX have a moderate negative association with PHCR.

4.2. Unit Root Analysis

In this section, the results of the unit root test are explained. The findings show that there is a mixed order of integration in Pakistan and India.

Table 4: the ADF Unit Root Test Results

			Pakistan				
			Unit Root Test on Level				
Variables	Intercept	Lags	Intercept and Trend	Lags	None	Lags	Conclusion
PHCR	-2.527 (0.115)	1	-2.509 (0.322)	1	-0.840 (0.346)	1	I(1)
REMIT	-1.839 (0.357)	0	-1.863 (0.656)	0	-0.2413 (0.593)	0	I(1)
GDPD	-4.591 (0.000)	0	-4.808 (0.001)	0	-1.789 (0.070)	0	I(0)
GINI	-2.642 (0.092)	1	-2.267 (0.442)	1	1.105 (0.927)	1	I(1)
FDI	-2.965 (0.046)	1	-3.348 (0.071)	1	-1.781 (0.071)	1	I(0)
TAX	-1.481 (0.533)	0	-2.477 (0.337)	0	-0.197 (0.609)	0	I(1)
UNP	-1.651 (0.448)	0	`-2.811 (0.200)	0	0.365 (0.786)	0	I(1)
URBAN	-1.733 (0.407)	1	-3.175 (0.102)	1	1.049 (0.920)	1	I(1)
			India				
PHCR	-3.632 (0.133)	1	-3.872 (0.432)	1	-0.965 (0.646)	1	I(1)
REMIT	-1.753 (0.644)	0	-1.964 (0.765)	0	-0.763 (0.829)	0	I(1)

GDPD	-5.721 (0.000)	0	-5.877 (0.000)	0	-1.976 (0.009)	1	I(0)
GINI	-3.521 (0.086)	1	-3.876 (0.406)	1	1.976 (0.287)	1	I(1)
FDI	-3.752 (0.054)	1	-4.986 (0.081)	1	-1.976 (0.081)	1	I(0)
TAX	-1.989 (0.644)	0	-3.862 (0.432)	0	-0.066 (0.873)	0	I(1)
UNP	-1.966 (0.567)	0	-3.972 (0.399)	0	0.976 (0.754)	0	I(1)
URBAN	-1.732 (0.504)	1	-3.373 (0.105)	1	1.572 (0.976)	1	I(1)

4.3. Bounds Test Analysis

Table 5 shows the results of the bounds test based on F-statistics.

Table 5: Bounds Test based on F-Test

		Pakistan				
		5% Critical Value Bounds		**10% Critical value Bounds**		
Model	**F-Statistic**	**I(0)**	**I(1)**	**I(0)**	**I(1)**	
PHCR/ REMIT GDPD GINI FDI TAX UNP URBAN	6.09	2.69	3.83	2.38	3.45	
		India				
PHCR/ REMIT GDPD GINI FDI TAX UNP URBAN	6.78	2.32	3.50	2.03	3.13	

The result shows that the value of F-statistics is greater than the upper bound for both 5% and 10% critical value in Pakistan and India, indicating that there exists a long-run relationship.

4.4. Long-Run Analysis

The long-run error correction results are presented in this section for both Pakistan and India. Table 6 presents the results of the long-run analysis. The dependent variable is poverty measured by headcount ratio while the independent variables are remittances, inflation measured by the GDP deflator, income inequality measured by the GINI coefficient, foreign direct investment, tax revenue, unemployment and urbanization.

Table 6: Long Run Estimates of Remittances, Inflation and Poverty Nexus in Pakistan and India
Dependent Variable: PHCR
Selected Model: ARDL (4, 2, 2, 3, 3, 2, 3, 3)
Pakistan

Variable	Coefficient	Std. Error	t-Stat	Prob.
REMIT	-0.945	0.475	-1.991	0.070
GDPD	0.041	0.022	1.889	0.083
GINI	1.337	0.193	6.939	0.000
FDI	-2.466	1.139	-2.164	0.051
TAX	3.937	1.332	2.955	0.012
UNP	1.264	0.133	9.484	0.000
URBAN	0.285	0.092	3.111	0.009
C	-608.495	209.345	-2.907	0.013

Selected Model: ARDL(1, 3, 2, 3, 3, 3, 2, 3)
India

REMIT	-6.919	2.714	-2.550	0.022
GDPD	1.060	0.385	2.751	0.015

GINI	1.712	0.333	5.143	0.000
FDI	-1.079	0.907	-1.189	0.076
TAX	11.562	1.863	6.205	0.000
UNP	1.621	0.273	5.938	0.000
URBAN	3.275	0.725	4.520	0.000
C	91.877	12.462	7.372	0.000

Remittances are negatively related with poverty that is statistically significant in both Pakistan and India. Remittances, which are funds sent by migrants to their home countries, can significantly reduce poverty for several reasons. Firstly, remittances provide direct financial support to families, offering an immediate income boost that helps cover essential needs such as food, housing, healthcare, and education. This influx of funds ensures that basic living standards are met and provides economic stability by reducing households' vulnerability to economic shocks (Adams et al., 2008). Secondly, remittances are often invested in human capital, as families use the funds to access better education and healthcare. Improved education leads to higher earning potential and job prospects, while better healthcare outcomes enhance productivity, both of which contribute to breaking the cycle of poverty (Chimhowu et al., 2005). Thirdly, remittances stimulate local economic development by funding small businesses and entrepreneurial activities, generating employment opportunities, and fostering community development. Additionally, pooled remittances can improve local infrastructure, such as water supply and transportation, enhancing the quality of life and economic opportunities for entire communities (Banga and Sahu, 2010)

Inflation is positively associated with poverty which is statistically significant in both Pakistan and India. Inflation is positively associated with poverty for several reasons. Firstly, inflation erodes the purchasing power of money, meaning that as prices rise, the same amount of money buys fewer goods and services. This disproportionately affects low-income households, which spend a larger share of their income on necessities such as food, housing, and utilities. As the cost of these essentials increases, impoverished families struggle more to meet their daily needs (Talukdar, 2012). Secondly, inflation often leads to higher interest rates as central banks attempt to control rising prices. Higher interest rates increase the cost of borrowing, making it more difficult for individuals and small businesses in poor communities to obtain loans for education, housing, or entrepreneurial ventures. This limits economic opportunities and exacerbates poverty (Cahyani and Sitorus, 2024). Thirdly, inflation can reduce real wages if wages do not keep pace with rising prices. Workers, particularly those in low-paying jobs, find that their income does not stretch as far, resulting in a decline in their standard of living. This wage stagnation makes it harder for families to escape poverty, as their earnings fail to cover increasing costs (Sugema et al., 2010).

Income inequality has a positive impact on poverty which is statistically significant in both Pakistan and India. Income inequality has a positive impact on poverty for several reasons. Firstly, income inequality often means that wealth and resources are concentrated in the hands of a few, leaving a large portion of the population with limited access to economic opportunities. This concentration of wealth can result in insufficient investment in public goods and services such as education, healthcare, and infrastructure, which are crucial for reducing poverty and enabling upward mobility (Sehrawat and Giri, 2018). Secondly, high-income inequality can lead to social and economic policies that favor the wealthy, perpetuating a cycle where the rich get richer while the poor have fewer chances to improve their situation. This can manifest in tax policies, labor laws, and social programs that do not adequately support those in poverty (Heshmati, 2007). Thirdly, income inequality can create social tensions and reduce social cohesion, leading to an unstable economic environment. This instability can deter investment and economic growth, which in turn limits job creation and wage growth for low-income individuals. As a result, those at the bottom of the income distribution face greater challenges in escaping poverty (Nolan and Whelan, 2014)

Poverty is negatively affected by foreign direct investment which is statistically significant in both Pakistan and India. Poverty is negatively affected by foreign direct investment (FDI) for several reasons. Firstly, FDI brings capital into a country, which can lead to the creation of new jobs and industries. This job creation helps reduce unemployment and provides stable income sources for local workers, thereby lifting many out of poverty (Shamim et al., 2014). Secondly, FDI often comes with the transfer of technology and skills. Multinational companies bring advanced technologies and practices that can enhance productivity and efficiency in local industries. This technological and skills transfer helps improve the quality of the workforce and fosters economic growth, which benefits low-income individuals by creating better job opportunities and higher wages. Thirdly, FDI can stimulate economic development by improving infrastructure such as roads, ports, and telecommunications. Enhanced infrastructure facilitates trade, reduces costs, and increases market access for local businesses, including small and medium-sized enterprises. These improvements contribute to economic expansion and development, which can significantly reduce poverty levels by increasing overall economic activity and providing more opportunities for the poor (Israel, 2014).

Tax revenue also has a positive relation with poverty which is statistically significant in both Pakistan and India. Tax revenue positively impacts poverty alleviation by providing governments with the necessary resources to fund essential public services and social programs, such as healthcare, education, and social safety nets, which directly improve the living conditions of the poor (Gnangnon, 2024). Additionally, increased tax revenue allows for the development and maintenance of infrastructure, facilitating economic activities and connecting people to markets, jobs, and services, thereby fostering economic growth and reducing regional disparities(Gnangnon, 2022). Moreover, a well-structured tax system can promote economic stability and reduce inequality through progressive

taxation, ensuring wealthier individuals contribute more, enabling targeted poverty reduction initiatives. These combined effects help create a more inclusive economic environment where poverty can be effectively addressed (Gemmell and Morrissey, 2005).

Unemployment rate has a positive relation with poverty which is statistically significant in both Pakistan and India. The unemployment rate has a positive relation with poverty for several reasons. Firstly, high unemployment means that a significant portion of the population lacks a steady income, which directly leads to increased poverty as individuals and families struggle to afford basic necessities such as food, housing, and healthcare (Priambodo, 2021). Secondly, unemployment can lead to long-term economic hardship, as extended periods without work deplete savings and reduce the ability to invest in education or training, further limiting future employment prospects and perpetuating the cycle of poverty (Bala et al., 2020). Thirdly, high unemployment often correlates with reduced economic growth, as fewer people earning wages leads to lower overall consumer spending, which can result in businesses cutting back on production and hiring, thereby exacerbating the economic downturn and increasing poverty levels. Therefore, high unemployment contributes to higher poverty rates by reducing income, limiting future opportunities, and stifling economic growth (Martínez, 2001).

Poverty is positively impacted by urbanization which is statistically significant in both Pakistan and India. Poverty is positively impacted by urbanization for several reasons. Firstly, urbanization often leads to increased economic opportunities, as cities typically offer more jobs and higher wages compared to rural areas. The concentration of industries, services, and businesses in urban areas creates a diverse job market that can absorb a larger workforce, thus reducing unemployment and lifting people out of poverty (Ha et al., 2021). Secondly, urbanization tends to improve access to essential services such as healthcare, education, and social services. These services are more readily available and of higher quality in urban areas, contributing to better health outcomes, higher educational attainment, and overall improved living standards for the poor (Liddle, 2017). Thirdly, urban environments can foster innovation and entrepreneurship due to the close proximity of resources, markets, and networks. This can lead to the creation of small and medium-sized enterprises, which generate employment and stimulate economic growth, providing more opportunities for individuals to improve their economic situation (Shahbaz et al., 2010).

4.5. Error Correction Analysis

The error correction results are presented in this section. Table 7 illustrates the results of error correction estimates for both Pakistan and India. In both countries, the value error correction term is negative, close to 1 and statistically significant, indicates that it take about 1 year to converge toward the long-run equilibrium.

Table 7: Error Correction Estimates of Remittances, Inflation and Poverty Nexus in Pakistan and India

Pakistan				
Dependent Variable: PHCR				
Selected Model: ARDL(4, 2, 2, 3, 3, 2, 3, 3)				
Variable	Coefficient	Std. Error	t-Stat	Prob.
D(PHCR(-1))	0.503	0.174	2.888	0.014
D(PHCR(-2))	0.281	0.200	1.410	0.184
D(PHCR(-3))	0.255	0.216	1.184	0.259
D(REMIT)	-1.171	0.493	-2.377	0.035
D(REMIT(-1))	-1.054	0.388	-2.717	0.019
D(GDPD)	-0.065	0.080	-0.809	0.435
D(GDPD(-1))	-0.090	0.061	-1.463	0.169
D(GINI)	0.043	0.315	0.135	0.895
D(GINI(-1))	-0.069	0.277	-0.247	0.809
D(GINI(-2))	0.778	0.261	2.982	0.011
D(FDI)	-1.000	0.890	-1.123	0.284
D(FDI(-1))	-1.353	1.080	-1.252	0.234
D(FDI(-2))	1.757	0.941	1.866	0.087
D(TAX)	0.494	0.465	1.062	0.309
D(TAX(-1))	2.357	0.675	3.493	0.004
D(UNP)	-0.399	0.338	-1.182	0.260
D(UNP(-1))	-0.078	0.395	-0.198	0.847
D(UNP(-2))	0.679	0.371	1.830	0.092
D(URBAN)	-0.009	0.258	-0.035	0.973
D(URBAN(-1))	-1.093	0.624	-1.753	0.105
D(URBAN(-2))	0.639	0.331	1.932	0.077
D(@TREND())	-4.623	1.502	-3.079	0.010
ECT	-0.699	0.189	-3.703	0.003
India				
Selected Model: ARDL(1, 3, 2, 3, 3, 3, 2, 3)				
Variable	Coefficient	Std. Error	t-Stat	Prob.
D(REMIT)	1.518	1.529	0.993	0.337
D(REMIT(-1))	2.541	1.515	1.677	0.114

D(REMIT(-2))	2.936	2.072	1.418	0.177
D(GDPD)	0.384	0.150	2.572	0.021
D(GDPD(-1))	-0.191	0.125	-1.523	0.149
D(GINI)	-0.088	0.252	-0.351	0.731
D(GINI(-1))	0.255	0.175	1.461	0.165
D(GINI(-2))	0.127	0.127	0.998	0.334
D(FDI)	0.203	1.653	0.123	0.904
D(FDI(-1))	0.419	1.168	0.359	0.725
D(FDI(-2))	3.418	1.582	2.161	0.047
D(TAX)	-4.053	1.006	-4.031	0.001
D(TAX(-1))	1.788	0.989	1.807	0.091
D(TAX(-2))	0.791	0.873	0.907	0.379
D(UNP)	-0.211	0.521	-0.406	0.691
D(UNP(-1))	-0.893	0.552	-1.618	0.127
D(URBAN)	-47.035	26.169	-1.797	0.092
D(URBAN(-1))	-175.134	77.430	-2.262	0.039
D(URBAN(-2))	144.857	38.120	3.800	0.002
ECT	-0.789	0.143	-5.505	0.000

4.6. Lag Selection Criteria

Table 8 shows the VAR lag order selection criteria for both Pakistan and India. According to the results, the optimum lag is 4 for both countries.

Table 8: VAR Lag Order Selection Criteria

Pakistan
Endogenous Variables: PHCR REMIT GDPD GINI FDI TAX UNP URBAN

Lag	Log L	LR	FPE	AIC	SC	HQ
0	-464.0382	NA	0.473461	21.95526	22.28293	22.07610
1	-53.96711	648.4844	5.09e-08	5.858935	9.384377	6.946430
2	29.11774	100.4747	2.87e-08	4.971268	10.54158	7.025425
3	133.7351	87.58666*	1.14e-08	3.082086	11.27371	6.102906
4	294.7143	74.87403	1.71e-09*	-1.428572*	8.807922*	2.558909*
			India			
0	-591.983	NA	353.4242	28.57061	28.9016	28.69193
1	-271.287	503.9505	0.001833	16.34701	19.32587	17.43888
2	-176.961	112.2929	0.000607	14.90291	20.52965	16.96533
3	-51.285	101.7378*	9.24E-05	11.96595	20.24057	14.99893
4	130.1256	77.7474	6.54e-06*	6.374971*	17.29747*	10.37850*

4.7. Granger Causality Analysis

The results of Granger causality tests for both Pakistan and India are shown in Table 9. In the case of Pakistan, REMIT does not Granger cause PHCR, and PHCR Granger causes REMIT. GDPD does not Granger cause PHCR, and PHCR does not Granger cause GDPD. Similar conclusions are drawn for India.

Table 9: Pairwise Granger Causality Tests

Pakistan
Pairwise Granger Causality Tests

Null Hypothesis:	Lags	F-Statistic	Lags	F-Statistic	Lags	F-Statistic	Conclusion
REMIT does not Granger Cause PHCR		2.19423 (0.1247)		3.89147 (0.0163)		1.67368 (0.1788)	REMIT does not granger cause PHCR
PHCR does not Granger Cause REMIT	2	5.88118 (0.0058)	3	5.20692 (0.0042)	4	3.75451 (0.0124)	PHCR granger cause REMIT
GDPD does not Granger Cause PHCR		0.92703 (0.4041)		0.62833 (0.6013)		1.11234 (0.3668)	GDPD does not granger cause PHCR
PHCR does not Granger Cause GDPD	2	1.09528	3	0.73455	4	1.05943	PHCR does not granger cause GDPD

		(0.3443)		(0.5381)		(0.3915)	
GDPD does not Granger Cause REMIT		2.12053 (0.1333)		1.80235 (0.1637)		1.51518 (0.2197)	GDPD does not granger cause REMIT
	2		3		4		
REMIT does not Granger Cause GDPD		1.25945 (0.2948)		1.13126 (0.3490)		0.95502 (0.4446)	REMIT does not granger cause GDPD

| **India** ||||||||

REMIT does not Granger Cause PHCR		2.02788 (0.1449)		1.79374 (0.1653)		1.42992 (0.2453)	REMIT does not granger cause PHCR
	2		3		4		
PHCR does not Granger Cause REMIT		2.11037 (0.13450		3.00846 (0.0424)		2.14942 (0.0960)	PHCR granger cause REMIT
GDPD does not Granger Cause PHCR		1.73196 (0.1899)		0.74339 (0.5331)		0.41420 (0.7972)	GDPD does not granger cause PHCR
	2		3		4		
PHCR does not Granger Cause GDPD		0.02411 (0.9762)		0.13333 (0.9396)		0.69759 (0.5989)	PHCR does not granger cause GDPD
GDPD does not Granger Cause REMIT		0.25792 (0.7739)		0.11491 (0.9508)		0.21793 (0.9266)	GDPD does not granger cause REMIT
	2		3		4		
REMIT does not Granger Cause GDPD		1.58953 (0.2166)		0.91986 (0.4408)		2.32656 (0.0761)	REMIT does not granger cause GDPD

5. Conclusions and Policy Implications

In conclusion, the study aims to analyze the impact of inflation and remittances along with some other variables including (the GINI index, foreign direct investment, Tax revenue, unemployment, and urban population) on poverty alleviation in Pakistan and India during the period 1972 to 2020. The study uses the ARDL (augmented Dickey-Fuller) model and the Granger causality test to analyze the relationship between variables. The findings of the study indicated that remittances and foreign direct investment have negative while income inequality, tax revenue, unemployment and urban population have positive impacts on poverty.

5.1. Policy Implications

Based on the results of the study, the policy implications are as follows:

- The result shows that poverty is negatively affected by remittances. So, the policymaker should make policies to improve the remittances in both Pakistan and India.
- There is a positive relationship between inflation and poverty. The planners should make and implement policies that reduce the inflation rate in Pakistan and India.
- Poverty has been positively impacted by income inequality. So the government should reduce income inequality to reduce the poverty rate in both countries.
- The findings show that poverty is negatively affected by foreign direct investment. So, the policymaker should make policies to improve the foreign direct investment in both Pakistan and India.
- There is a positive relationship between tax revenue and poverty. The planners should make and implement policies that reduce the tax rate in Pakistan and India.
- Poverty has been positively impacted by the unemployment rate. So the government should reduce unemployment to reduce the poverty rate in both countries.
- The findings show that poverty is positively affected by urbanization. So, the policymakers should make policies to reduce urbanization in both Pakistan and India.

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