

Impact of Remittances on Economic Growth: Time Series Evidence from Pakistan

Dr. Syed Wahid Ali, Muhammad Shoaib, Muhammad Waseem

Abstract: *This paper focuses to design the large picture of money supply (M2) effect on GDP of Pakistan. The macro variables comprise of GDP and money supply (M2) were tested by using secondary data, covering forty-six yearly periods from 1972 to 2018. The current study applied unit root test to see the stationarity of the given data. The Auto Regressive Distribution Lag (ARDL) approach was conducted to see the link between long run and short run relationship as a speed of adjustment to the long run equilibrium. The finding showed that money supply (M2), capital investment (CI), labour force (LF) and Gross Domestic product (GDP) were stationary with $I(1)$ level and inflation (INF) was stationary with $I(0)$ level. Positive effect on GDP has been observed in case of Pakistan. The finding suggests that policy makers should take into consideration the different monetary policy tools to control the excess money supply and to get the economic stability.*

Keywords: Money Supply (M2), Inflation Rate, Capital Investment, Labour Force, Pakistan, ADF, ARDL

1. Introduction

Remittance is the act of sending money home from migrants living overseas to their relatives. It differs from other types of capital intake, such as loans, grants, and foreign direct investment. For developing nations, it is the most significant source of foreign exchange income. Several developing countries have noticed a significant increase in remittances during the past 20 years. By exporting labour, they generate remittances. Remittances from abroad aid in eradicating poverty and advancing healthcare and education. The main driver of rising investment and consumption in receiving nations is remittances. An indication of a thriving economy is a rise in investment and consumption.

People may invest more in their physical and human resources with the aid of remittances. Remittances can, however, be harmful if they are spent instead of invested, as is typical in developing countries. They cannot produce the necessary savings for economic expansion. Remittances support economic expansion. Remittance inflows are essential for economic growth in developing countries, which may be reached by dealing with the balance of payments problem, restricting foreign borrowing, and dealing with the countries' current deficit problems. (Iqbal and Sattar 2010; Azizi 2020).

Many residents of developing countries look for work opportunities in other countries, such as the Middle East, Europe, and America. The majority of the time, the remittances received as compensation for services provided overseas are used to make sure the employees and their families are happy. However, because there are competent workers working abroad, they are able to make more money and send home more money than they require, which helps to finance investments in small businesses and increase the standard of living for their families.

Every nation in the world strives for economic growth because it raises the standard of living. Foreign direct investment, foreign remittances, inflation, and the exchange rate are the main factors influencing Pakistan's

economic growth. One of the top 10 countries receiving remittances is Pakistan. The amount of money that Pakistani migrants send home is gradually increasing. Numerous empirical research have demonstrated that GDP Increases when remittance inflow rises. According to my research, Pakistan is one of the top 10 countries that receive remittances, but it also has a less growth of economy.

2. Relevant Literature Review

Ahmad and Khan (2021), Examining how foreign direct investment (FDI) and remittances from outside affect Pakistan's economy. For this motive, study use Annual Data from 1990 to 2018. The data comprises from different variables including, foreign direct investment, foreign remittance and economic growth. The data analyzed by using ADF, PP, ARDL and Bound test. Results demonstrate a long-term connection between Pakistan's economic growth and FDI, foreign remittances, and both.

Imran et al (2021), Examine how remittances affect growth metrics including employment, exports, and inflation in the countries of the South Asian region (SAARC). The panel data set from 12/1994 to 12/2017 is utilised for this purpose. Using the Hausman (1978) specification test, our panel models are estimated using either the Fixed Effect Model (FEM) or the Random Effect Model (REM). The data comprises from different variables including, Export, foreign remittance, CPI, Employment and economic growth. The findings indicate that remittances have a statistically significant beneficial influence on the SAARC region's economic growth. Although the coefficient is not very high, this may be because remittances are sent through unofficial methods. Employment and export both have positive and noteworthy effects on GDP. However, in our sample, inflation had no discernible influence on GDP.

Jena, N. R., & Sethi, N. (2021), investigates the contribution that foreign investment, remittances, and aid have made to the South Asian region's chances for economic progress. For this study, a sample of eight South Asian nations from the years 1990 to 2017 is being taken into consideration. The data comprises from different variables including, GDP, Foreign Aid, Remittance, FDI inflow, Domestic Investment, Inflation Rate, Financial Development and Trade. Results indicate a link between foreign aid, economic growth, and other macroeconomic factors over the long and short terms. Furthermore, we discovered that there is unidirectional connection between foreign aid and economic development, FDI inflows and economic growth, but no short-run causality between remittances and economic growth using the Granger causality paradigm.

Hassan et al (2021), examine the relationship between Investment Portfolio, Democratic Accountability, Poverty and Income Inequality in Pakistan. For this motive, study use Annual Data of 35 years from 1984 to 2019. The data comprises from different variables including, Employment, Population, Remittances, Investment Portfolio, Democratic Accountability, Poverty and Income Inequality. The data analyzed by using ADF, PP, ARDL and Bound test. According to research employing the Autoregressive Distributed Lag technique to cointegration, Pakistan's poverty is both long- and short-term reduced through democratic accountability and investment portfolios. Additionally, democratic accountability aids in the reduction of income inequality, although the importance of the investment portfolio is little. While inflation worsens poverty and economic inequality, the literacy rate contributes to these issues. Both urbanisation and remittances widen the gap between rich and poor.

Butkas et al (2020) elaborate the outcome of remittances on poverty in CEE countries. Consider seven CEE countries for panel data from period 2006-2015. To examine their nexus Pooled OLS, fixed effects, random effects, and 3-stage least squared estimators are employed. There is significant impact of remittance on poverty. The results confirm that remittance decrease the poverty, it is negatively related to each other. It is recommended that countries should lessen the transaction cost to increase the remittances.

Onoja and Chagwiza (2020) interrogated that in Nigeria how poverty affected by inflow of remittance and macroeconomic stability. To identify their impact, time series data is applied by using econometric modelling approach (ARDL, cointegration analysis) from period of 1977-2014. The result shows that there is negative relationship between remittance inflow and macroeconomic factor on reduction of poverty in Nigeria. The study suggest that Nigerian government should make suitable policies to manage remittance to decrease the poverty.

ALADEJANA et al (2020) study the impression of foreign remittance on poverty alleviation an econometric analysis of Nigeria. Time series data is employed for this study. An ARDL approach is used to check out their impact in Nigeria over a period 1986-2014. The conclusion show that remittances have negative impact on decreasing the poverty. Government of Nigeria should plan the policies that would improve the measure of remittances by lessen the rate of exchange and cost of transferring remittance through proper channel.

Ali and Yasmin (2020), focuses on how well remittances from abroad affect inflation and economic growth. The data utilised for this study were gathered on an annual basis from 1972 to 2018. For this motive, study use Annual Data of 35 years from 1972 to 2017. The data comprises from different variables including, GDP, Inflation, Investment, GFCF, Trade, Labor Force, and Remittances. The data analyzed by using ADF, PP, ARDL and Bound test. According to the study's findings, overseas remittances have a positive and significant relationship with Pakistan's economic expansion. The study at hand came to the conclusion that remittances boost economic growth by increasing individual spending.

Elahi and Omer (2020), examines how remittances from employees might help Pakistan's economy flourish. . For this motive, study use Annual Data from 1976 to 2017. The data comprises from different variables including, Remittances Received, FDI, Money Supply (M2), Inflation, Population Growth, Investment, and Economic Growth. The data analyzed by using Generalized Method of Moments (GMM). Remittance inflows are estimated to have a favourable impact on Pakistan's economic development. The rise in low-income beneficiaries' spending may be the main factor behind the per capita GDP increase. Although the study was unable to determine the effect of remittances on investment activity, it is likely that this consumer demand encourages it.

Seriño and Ratilla (2018) explore that either remittances increase or decrease the poverty in developing countries. For panel data analysis 66 developing countries were taken and data across the period 1981-2005. To check the significance of remittances on poverty, Pooled ordinary least square method is employed. The finding revealed that remittances have negative relationship on poverty alleviation. Remittances are helpful to reduce the poverty in developing countries.

3. The Methodology of the Study and Data Source

To find the link between Foreign Remittances and Economic Growth with other different Macroeconomic indicators (like Remittances, Unemployment, Gross Fixed Capital Formation and Secondary School Enrolment) in Pakistan, the present study involved annual and secondary, time series data from the time span of 1980 to 2021. It was taken from various sources as WDI, SBP, Pakistan Bureau of Statistics (PBS) and multiple Economic surveys of Pakistan. Transparency of data sources in present study is that data is obtained from those sources which are generally accepted or worldwide approved. Model of the study is using the Gross Domestic Product (GDP) as a dependent variable but the Remittances, Unemployment, Gross Fixed Capital Formation and Secondary School Enrolment as independent variables.

Description of Variables

Summary of variables which are used in present study, their abbreviation and their measurement unit are given below in table 4.1

Table: 4.1 Summary of Variables

Variables	Explanation	Units
GDP	Gross Domestic Product	Millions Dollar \$
REM	Remittances	% of GDP
UN	Unemployment	% of Population
SSE	Secondary School Enrolment	Gross % of Population
GFCF	Gross Fixed Capital Formation	% of GDP

Model Specification

To interrogate the impact of Remittances effect on GDP of Pakistan, the model can be written as:

$$GDP = f(REM, UN, SSE, GFCF)$$

The econometric model can also be written as:

$$GDP_t = \beta_0 + \beta_1 REM_t + \beta_2 UN_t + \beta_3 SSE_t + \beta_4 GFCF_t + \varepsilon$$

Here,

- GDP = Gross Domestic Product
- REM = remittances
- UN = Rate of Unemployment
- SSE = secondary School Enrolment
- GFCF = Gross Fixed Capital Formation
- μ_i = Disturbance Term
- β_0 = Intercept
- $\beta_1, \beta_2, \beta_3, \beta_4$ = Slope of Coefficients

General Equation of ARDL

The general equation of ARDL can be shown as:

Short Run Equation

$$\Delta(GDP) = \alpha_0 + \sum_{i=1}^A \alpha_{1i} \Delta(GDP)_{t-i} + \sum_{i=1}^B \alpha_{2i} \Delta(REM)_{t-i} + \sum_{i=0}^C \alpha_{3i} \Delta(UN)_{t-i} + \sum_{i=0}^D \alpha_{4i} \Delta(SSE)_{t-i} + \sum_{i=0}^E \alpha_{5i} \Delta(GFCF)_{t-i} + \mu_i$$

Long Run Equation

$$\alpha_6(GDP)_{t-1} + \alpha_7(REM)_{t-1} + \alpha_8(UN)_{t-1} + \alpha_9(SSE)_{t-1} + \alpha_{10}(GFCF)_{t-1}$$

The mentioned equation represents the general equation of ARDL:

Where,

α_0 = Intercept

$\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5$ = Short run co-efficient of variables

$\alpha_6, \alpha_7, \alpha_8, \alpha_9, \alpha_{10}$ = Long run co-efficient of variables

μ_i = Disturbance term

We are making null and alternative hypothesis to establish long run link between variables.

Null Hypothesis

$$H_0 = \alpha_6 = \alpha_7 = \alpha_8 = \alpha_9 = \alpha_{10} = 0$$

(Long run r/p between variables does not exist)

Alternative Hypothesis

$$H_1 = \alpha_6 \neq \alpha_7 \neq \alpha_8 \neq \alpha_9 \neq \alpha_{10} \neq 0$$

(Long run r/p between variables exists)

4. The Data Analysis, Empirical Results and Interpretation

In this section, we examine estimation of various tests. Table 1 shows estimated descriptive statistics. ADF test estimation elaborated in table 2. While estimation of ARDL Bound Testing F-statistics mentioned in table 3. Table 4 points out the results of long time period co-integration and short-short time period co-integration estimation evaluated in table 4 and 5.

Table 4.2. Descriptive Statistics

	GDP	REM	UN	SSE	GFCF
Mean	4.733515	5.162576	0.897699	8.194897	28.71660
Median	4.839699	5.018078	0.678864	7.882675	26.66811
Max	10.21570	10.24763	3.668323	20.28612	47.06602

Min	-1.329520	1.310692	0.102667	2.529328	16.99289
Std. Dev	2.214230	2.241773	0.778503	3.722591	8.458330
Skewness	-0.193571	0.185117	2.239832	0.655797	0.550777
Kurtosis	3.378220	2.214997	7.728406	3.815766	2.337117

The Descriptive Statistics of selected indicators is given in Table 4.1. The first row shows the average of GDP, REM, UN, SSE and GFC respectively. The mean value of GDP, REM, UN, SSE and GFC respectively.

Here we see that GDP is negatively skewed. All independent indicators like REM, UN, SSE and GFC are positively skewed.

In statistics, kurtosis is used to measure flatness of data set relative to Normal distribution. Kurtosis general value is 3. If the value found greater than 3, this situation referred as Leptokurtic. If the value found less than 3, this situation referred as Platykurtic.

In the Descriptive Statistics REM and GFCF value is less than 3, it means platykurtic and rest of indicators GDP, UN and SSE are Leptokurtic.

Table 4.3. Results of ADF

Indicators	Level		1st Difference		
	Intercept	Trend & Intercept	Intercept	Trend & Intercept	
GDP	-----	-----	-9.032844 (0.0000)	-----	I(1)
REM	-----	-----	-3.888497 0.0207	-----	I(1)
UN	-4.922577 0.0012	-----	-----	-----	I(0)
SSE	-----	-----	-5.249977 (0.0001)	-----	I(1)
GFCF	-----	-----	-6.558288 (0.0000)	-----	I(1)

All above finding shows that all indicators are not stationary at same level. It is observed that GDP, REM and GFCF are stationary at first difference and intercept and UN is stationary at level and intercept. This is the reason, we applied Auto Regressive Distributive Lag (ARDL).

AutoRegressive Distributive Lag(ARDL)

According to ADF test, the ARDL technique will be applied to check the co-integration link. So, in our analysis, ARDL technique can be used to measure complex nature of indicators

Table 4.4. Bound Test

Lag	f-statistics value	
ARDL(1, 2, 4, 2, 0)	11.62600	
Significant Level	Critical Values	
	Lower Bound	Upper Bound
1 %	3.68	5.26
5 %	2.78	3.97
10 %	2.34	3.42

The table shows F-statistics was formulated by Pesaran et al. (2001), they formulate two critical bound values, upper bound value and lower bound value. There will be long time period exists or the existence of co-integration in indicators, the f-statistics value is greater than upper bound value its mean that long time period exists.

Table 4.5. ARDL Model Long-run Results

Indicators	Coefficient	Std. Error	t-Statistic	Prob.
REM	0.000039	0.000011	3.422173	0.0019
UN	-0.044764	0.023599	1.896834	0.0678
SSE	0.000068	0.000029	2.352570	0.0256
GFCF	0.055470	0.009667	5.737831	0.0000
C	8.719841	0.251564	34.662474	0.0000

In this table, the value of coefficient of Remittances shows that the positive and significant link with the dependent indicators (GDP). The empirical finding shows that one-unit increase in remittances will (0.000039) percent increase in GDP. Study also shows the positive and significant link with GDP in long time period. Unemployment Rate is significance negatively with the GDP. Study also shows the positive and insignificant link with GDP in long time period.

The value of coefficient of Secondary School Enrolment is also shows positive and significant link with the dependent indicator GDP. If one-unit increase in capital investment, it will have (0.000068) increase in economic growth. The value of coefficient of Gross Fixed Capital Formation is also shows the positive and significant link with the DV(GDP). The results show that, if one-unit increase in GFCF, it will bring (0.055470%) increase in GDP.

Table 4.6 ECM Results

Indicators	Coefficient	St. Error	T-Ratio	Prob.
d(REM)	0.000008	0.000003	2.720116	[0.0109]
d(REM(-1))	0.000015	0.000005	3.195292	[0.0034]
d(UN)	0.008492	0.001355	6.268634	[0.0000]

d(UN)	0.000892	0.001089	0.819046	[0.4194]
d(UN)	0.001891	0.001158	1.633199	[0.1132]
d(UN)	-0.001724	0.001069	-1.613268	[0.1175]
d(SSE)	0.000007	0.000006	1.260937	[0.2174]
d(SSE(-1))	-0.000011	0.000005	-2.132216	[0.0416]
d(GFCF)	0.009111	0.003064	2.973860	[0.0059]
Ecm(-1)	-0.164243	0.041278	-3.978963	[0.0004]
R-squared	0.999	F-statistics 2292.7		
Adjusted R-squared	0.998	Schwarz criterion -3.178		
Akaike info criterion	-3.628	Durbin-Watson stat 2.168		

The term ECM (-1) shows the speed of adjustment of the estimated mode which is significant (statistically) and it has negative sign. The coefficient of ECM (-1) shows that almost 16 % error will have corrected from short time period to long time period equilibrium per year.

5. Conclusion and Suggestions

The intent of the present paper is to explore the Remittances effect on GDP in Pakistan. The present study uses the data for time period of 1980 to 2021. The present study reviews various literatures which are related to Remittances and GDP. Through the previous literature reviews, the study investigated the positive link between Remittances and GDP. Firstly, we find the result of descriptive statistics. In the next step, the findings of ADF test shows that all indicators are stationary at level and 1st difference. The present study also applies Bound Test and ARDL technique to co-integration and to find the long time period and short time period link between dependent indicators and independent indicators. In long time period and short time period findings remittances, secondary school enrolment and gross fixed capital formation changes put positive and significant impression on GDP of Pakistan and unemployment has significantly negative impression on GDP.

The cost of sending remittances through official channels has to be decreased, and money laundering needs to be subjected to closer inspection. This will make it easier for academics and professionals to calculate the precise quantity of remittances. Similar to this, those working overseas are unaware of the trustworthy sources of investment back home. At the same time, policymakers in the host nations may give incentives to these groups by enhancing property rights for expatriates and improving investment prospects to entice these prospective development partners' participation and support their long-term economic growth.

REFERENCES

- Ahmad, S., & Khan, M. W. (2021). Investigating the Effect of Foreign Direct Investment (FDI) and Foreign Remittances on Economic Growth in Pakistan (1990-2018): A Time Series Analysis Using ARDL Model Approach. *Bulletin of Business and Economics (BBE)*, 10(3), 1-7.
- Imran, M., Zhong, Y., & Moon, H. C. (2021). Nexus among foreign remittances and economic growth indicators in south Asian countries: an empirical analysis. *Korea International Trade Research Institute*, 17(1), 263-275.
- Jena, N. R., & Sethi, N. (2021). Foreign capital and growth nexus revisited: empirical evidence from South Asian countries. *Transnational Corporations Review*, 13(3), 269-292.
- Hassan, M. S., Mahmood, H., Saeed, M. I., Alkhateeb, T. T. Y., Arshed, N., & Mahmoud, D. H. I. (2021). Investment Portfolio, Democratic Accountability, Poverty and Income Inequality Nexus in Pakistan: A Way to Social Sustainability. *Sustainability* 2021, 13, 6411.
- Butkus, M., Matuzevičiūtė, K., & Raupytė, K. (2020). Effects of Remittances on Poverty: Evidence in CEE Countries. *Organizations and Markets in Emerging Economies*, 11(1), 69-82.
- Onoja, A. O., & Chagwiza, C. (2020). Impact of Remittances Inflows and Macroeconomic Stability on Poverty in Nigeria (1977-2014).
- ALADEJANA, S. A., OLUWALANA, F. A., ALABI, J. A., & BOLAJI, S. A. AN ECONOMETRIC ANALYSIS OF EXTERNAL REMITTANCES ON POVERTY REDUCTION IN NIGERIA, 1986-2018.

Ali, H., & Yasmin, F. (2020). The Foreign Remittances, Long Term Sustainable Economic Growth Nexus in Pakistan: An Empirical Analysis Using Bound Testing Approach. *Pakistan Journal of Economic Studies (PJES)*, 3(2), 187-204.

Ellahi, S., & Omer, M. (2020). DO WORKERS'REMITTANCES PROMOTE ECONOMIC GROWTH? A CASE STUDY OF PAKISTAN. *Journal of Islamic Monetary Economics and Finance*, 6(4), 713-728.

Seriño, M. N., & Ratilla, T. (2018). Do International Remittances Alleviate or Aggravate Poverty in Developing Countries?. *Review of Socio-Economic Research and Development Studies*, 2(1), 43-64.