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The Effect of Migrant Remittances on Economic Growth: an ARDL Approach

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Migrant remittances are the main source of financial inflow to any economy. This study intended to scrutinize the effect of remittance inflow on Pakistan's economy over the period 1976–2016 by employing the autoregressive distributed lag (ARDL) model. The ARDL method was applied to scrutinize the long-term and the short-term effect of worker remittances on Pakistan's economy. The examined results indicated that remittance inflow, foreign direct investment, and the gross domestic saving have a positive effect on the economic growth of Pakistan in the long-term, while inflation and consumption have a negative effect on the economic growth of Pakistan in the long-term. The positive effect of remittances on economic growth is recognized through financial sector development and the education of the migrant's families. To further improve the economic development of Pakistan's economy, it is suggested that policymakers in Pakistan encourage and motivate migrants to send remittances through proper channels to Pakistan so that inflows of remittances can be used in profitable investments that will help to improve economic growth.

Keywords: *Migrant Remittances; Foreign Direct Investment; Gross Domestic Saving; Economic Growth; ARDL.*

Introduction

Developing countries are facing the problem of foreign fund inflow constraints. Remittances and foreign direct investment are essential resources of foreign fund inflow to emerging countries. The inflows from developed countries to developing countries change with time. The largest sources of foreign funds are migrant remittances for developing economies. The developing countries' gross domestic product (GDP) is supported by inflows of worker remittances about quarterly. Remittances play a very important role, especially for low-income and middle-income countries compared to high-income countries (World Bank, 2016). According to the International Monetary Fund (IMF), migrant remittances are categorized into workers' remittances, employee compensations and migrants' transfers to their countries (World Bank, 2016). The remittance inflow from the migrants has a significant effect on Pakistan's economy. International remittance inflows promptly increase if we compare remittances with other sources of foreign funds. According to the remittance inflow survey, Pakistan received US $ 1 billion remittances in 2000 and US $ 19 billion in 2015 Economic Survey (2016). According to the annual report of the World Bank (2016), developing countries of the world received an officially estimated amount of US $ 429 billion in 2016 that declined approximately 2.4 % compared to 2015 Ratha.

Rao and Hassan (2012) stated that worker remittances are the main source to remove poverty from the economy and the liquidity constraints of migrant families, which plays an effective role in reducing inequality in income and wealth in migrant countries. Migrants send remittances that play a similar role for welfare benefits to their countries. Remittance inflow affects the economic motivation pattern which changes the economic behavior of receivers in home countries. The effect of remittance inflow on economic growth is unclear. Chami et al. (2005) examined the impact of remittances on economic growth for different countries by using panel data. The examined results indicated that remittances have a negative impact on the economic growth. Grabel (2009) stated that the political system of any country can affect the inflow of remittances. This situation happens whenever the migrant families or administration of the home country reduce the struggle toward improving the economic growth. However, migrant families directly depend on remittances as a source of income that is mostly used to fulfill daily life consumption. Use of remittances for daily consumption causes the decrease of economic growth of the home country.

Fayissa and Nsiah (2010) examined the impact of migrant remittances on the economic growth of African countries. The examined results showed that remittances have a positive and significant effect on the economic growth of African countries. Waheed and Aleem (2008) examined the effect of migrant's remittances on the economic growth of Pakistan. The examined results showed that remittances have a positive and significant effect on the economic growth of Pakistan in the short-term. Rapoport (2002) stated that remittances are utilized as a source of finance for human and physical capital investment.

Gapen et al., (2009) used ordinary least squares OLS and the fixed effect model; Catrinescu et al., (2008) used OLS; Cruz Zuniga (2011) used panel VAR; Ramirez (2013) applied FMOLS; and Hargreaves (1994) and Marwan et al., (2013) used the Johansen cointegration technique for checking the long-run effect of remittances on economic growth. One of the major problems with the Johansen cointegration technique is that it requires a large number of observations for analysis.

This paper contributed to the literature in two ways. First, little empirical research has been done on how remittances affect economic growth and vice versa, directly

or through other channels, although the remittances-growth nexus has been the subject of several empirical works. Second, we set ourselves apart from the previous literature with the causal links between remittances and economic growth in the econometric method. Indeed, we used the advanced developed ARDL method, correcting for the endogeneity problem associated with remittances which has been stressed in the recent literature. The main advantage of ARDL is that it can be used for a small sample size (Pesaran & Shin, 1998). The autoregressive distributed lag (ARDL) cointegration method has different advantages compared to traditional cointegration methods. The autoregressive distributed lag (ARDL) approach makes its application possible, regardless of the considered variables being stationary at level or at first difference I(0), I(1) or both (Pesaran and Shin, 1999). The main objective of this study is to investigate the effect of remittances on the economic growth of Pakistan. This is the first study in which we are filling the research gap by using worker remittances with other macroeconomic variables to scrutinize its effect on the economic growth of Pakistan by applying the autoregressive distributed lag (ARDL) approach from 1976–2016. Consequently, the obtained estimates possess desirable properties and allow making final conclusions. Different macroeconomic variables have a different effect on economic growth, but these variables were ignored in previous studies.

Literature Review

Mansoor and Quillin (2006) stated that the main remittance receiving countries are developing countries; consequently, developing countries are in the process of conversion of their current infrastructure with a newly developed setup, demographics and a secure government organization setup.

Mughal and Makhlouf (2013); Adams and Page (2005); Jongwanch (2007) stated that remittances have a positive effect on the economic growth of developing economies. The examined results indicated that remittances from foreign countries have a negative effect on the recipient country's labor force.

Khawaja and Hiranya (2010) examined the effect of remittances on the economic growth. The examined results showed that remittances have a positive and effective impact on the economic growth and on the per capita growth.

Anyanwu and Erhijakpor (2010) classified the impact of remittance inflow into national, community and household level perspectives. The examined results indicated that remittances help to reduce poverty through household income and consumption. Ratha (2003) and Imai et al., (2014) examined the effect of remittances on the economic growth. The examined results indicated that remittance inflow boosts the saving and the investment. The authors stated that remittances have an effective impact on the economic growth and remittances are probably spent on the consumption of domestically produced goods.

Rodrick et al., (2008) examined the effect of remittances on the economic growth of developing countries. The examined results indicated that remittance inflow has a positive and nonsignificant effect on the economic growth of developing countries. Wouters (2010) scrutinized the impact of remittances on poverty reduction, social welfare and inequality in Burkina Faso by using the Gini coefficient and concentration coefficient decomposition approach. The examined results indicated that remittance inflow decreases income inequality, remittances increase the inequality gap in Burkina Faso while remittances help to decrease the level of poverty. Siddiqui and Kamal (2006) investigated the role of decline in remittance inflow with trade liberalization shocks on the poverty and welfare in Pakistan. The examined results indicated that a decrease in remittance inflow to Pakistan led to an increase in poverty levels.

Data Source and Econometric Model

This study scrutinized the effect of worker remittances on Pakistan's economic growth. Time series data were used for analysis from 1976 to 2016 obtained from WDI (2017). Following the recent literature, GDP (current US$) is used as a dependent variable while the migrant remittance inflow percent of GDP, foreign direct investment inflow percent of GDP, exchange rate (LCU per US$, period average), inflation, consumer prices (annual %), expenditure on household consumption (% of GDP) and gross domestic savings (% of GDP) are used as independent variables. Some of the variable data were converted to log form to make the data smooth and remove the problem of heteroskedasticity from the data.

The basic econometric model is the following.

$$\mathrm{gdp}_t = \beta_o + \beta 1\mathrm{fdi}_t + \beta 2\mathrm{exc}_t + \beta 3\mathrm{inf}_t + \beta 4\mathrm{remit}_t + \beta 5\mathrm{gds}_t + \beta 6\mathrm{cons}_t + \mu_t$$

where t is an indicator for the period and μt is the error term, GDP is gross domestic product, FDI is foreign direct investment, exchange rate is represented by Exc, inflation is Inf, remittances is remit, GDS is the gross domestic saving and cons is the consumption. β_o is constant while $\beta 1 fdi_t + \beta 2 exc_t + \beta 3 inf_t + \beta 4 remit_t + \beta 5 gds_t + \beta 6 cons_t$ are foreign direct investment, exchange rate, inflation, remittances, gross domestic saving and consumption respectively.

ARDL Model Estimation

The autoregressive distributed lag model (ARDL) was proposed by Pesaran et al., (2001). The autoregressive distributed lag model has various advantages compared to other time series cointegration models; e.g., Johansen's approach (1988), the Engle and Granger cointegration (1987) approach which is used to check the long-run relationship between two variables, while Johansen's cointegration test is applied to check the long-run relationship for multiple variables, respectively. Johansen and Juselius (1990) improved the VAR model for checking cointegration. The Johansen and Juselius method is appropriate for specific situations, i.e., it does not deal with a small sample size and all variables should be integrated in the same order, such as the first difference while ARDL can be used for a small sample size (Pesaran & Shin, 1998). The advantage of the ARDL model is the ability to estimate short-run and long-run parameters simultaneously. ARDL can be applied if the series are I(0) and I (1) or combination of both Pesaran (1997). Ouatarra (2004) stated that ARDL cannot be used if any variable is stationary at I (2), otherwise the results of ARDL will be invalid Pesaran et al., (2001). Unit root tests are used

to examine the stationarity of each variable. ADF Dickey D.A., Fuller, (1979, 1981), PP Phillips and Perron (1988) were applied for an examination of stationarity for each variable. ADF and PP are commonly applied for verifying the stationarity of variables. It is necessary to check that none of the study variables are stationary at the second difference I(II). The error correction term (ECT) derived from ARDL integrates the short-run dynamic with the long-run equilibrium without losing any long-run information.

Cointegration was examined through F-statistics. F-statistics examine the joint significance of one period's lagged value of variables. F-statistics assumes the null hypothesis of no cointegrating relationship between the dependent and the independent variables in the long-run. The asymptotic distribution of critical values in the bound test approach is derived from regressors. Thus, the regressors are purely integrated in order I(1) or I(0) or mutually integrated Pesaran (1997). Pesaran et al. (2001) revealed that I(1) indicates the upper bound and the lower bound is represented by I(0). Cointegration exists among the study variables if the calculated F statistics value is greater than I(1) and if the calculated F statistics value is less than the lower bound; so that no cointegration exists among the variables, sometimes the calculated value is between the I(0) and I(1); thus, the decision for cointegration is uncertain. The error correction term (ECT) is a helpful method to scrutinize the long-run relationship among the study variables Pesaran and Shin (1999), and the error correction term value should be negative and significant. However, before proceeding to the bound F-test for cointegration, the optimal lag length is selected through the Schwarz information criterion (SIC). This is the equation of bound test cointegration.

$$\Delta gdp_t = \theta + \sum_{i=1}^{p} \theta 1i\Delta gdp_{t-I} + \sum_{i=1}^{q} \theta 2i\Delta fdi_{t-I} + \sum_{i=1}^{q} \theta 3i\Delta exc_{t-I} + \sum_{i=1}^{q} \theta 4i\Delta remit_{t-I} + \sum_{i=1}^{q} \theta 5i\Delta gds_{t-I} + \sum_{i=1}^{q} \theta 6i\Delta cons_{t-I} + \sum_{i=1}^{q} \theta 7i\Delta inf_{t-I} + \theta_8 gdp_{t-1} + \theta_9 fdi_{t-I} + \theta_{10} exc_{t-I} + \theta_{11} inf_{t-I} + \theta_{12} remit_{t-I} + \theta_{13} gds_{t-I} + \theta_{14} cons_{t-I} + \mu_t$$

The first part of the above equation $\theta 1$ *to* $\theta 7$ represents the error correction dynamics, while the second part of equations $\theta 8$ to $\theta 14$ shows the long-run associations between the dependent and independent variables of the model. The ARDL technique is dependent on the Wald F-Statistics value; thus, the following are the null and alternative hypotheses of cointegration.

($H0$:$\theta 1 = \theta 2 = \theta 3 = \theta 4 = \theta 5 = \theta 6 = \theta 7 = 0$)

($H1$:$\theta 1 = \theta 2 \neq \theta 3 \neq \theta 4 \neq \theta 5 \neq \theta 6 \neq \theta 7 \neq 0$).

Once the results of cointegration confirm the long-run relationship between the study variables, we test the short-run coefficients. This is the short-run and the long-run ARDL equation:

$$\Delta gdp_t = \theta + \sum_{i=1}^{p} \theta 1i\Delta gdp_{t-I} + \sum_{i=1}^{q} \theta 2i\Delta fdi_{t-I} + \sum_{i=1}^{q} \theta 3i\Delta exc_{t-I} + \sum_{i=1}^{q} \theta 4i\Delta remit_{t-I} + \sum_{i=1}^{q} \theta 5i\Delta gds_{t-I} + \sum_{i=1}^{q} \theta 6i\Delta cons_{t-I} + \sum_{i=1}^{q} \theta 7i\Delta inf_{t-I} + \eta 1 ECT_{t-I} + \mu_t$$

In the equation above, ECT indicates the error correction term; ECT examines the speed of dynamic adjustments of the short-run deviations of the variables from the long-term, and how much time it will take to reach its equilibrium path in the long-run. $\eta 1$ *is* the coefficient of the error correction term. The cumulative sum (CUSUM) and cumulative sum of squares (CUSUMsq) were applied to investigate the stability of the coefficients in the short-run and the long-run Brown et al. (1975). Although the bound test for cointegration does not need to verify the stationarity of variables, it is necessary to examine that none of the variables are stationary at second difference I(II); if any variables of study are stationary at second difference, the results of ARDL will be biased; to obtain stable results in the bound test, we apply the unit root tests to examine the stationarity of each variable through ADF and PP.

Results and Discussions

Table 1

Stationarity Tests of Variables

	ADF		PP	
		Level		
Variables	**Int**	**Trd & Int**	**Int**	**Trd & Int**
GDP	-0.4879	-1.8813	-0.4945	-2.1373
FDI	-2.5242	-2.2648	-2.4835	-2.4499
EXC	-0.3412	-1.5637**	-0.3626	-2.0054
INF	-2.8697	-2.7614	-2.9705	-2.8686
REMIT	-1.4463	-1.5402	-1.7684	-1.9322
GDS	-1.6777	-1.4964	-1.6008	-1.4964
CONS	-1.5888	-1.5073	-1.5195	-1.4023
		First Difference		
ΔGDP	-5.1804***	-5.0995***	-5.1760***	-5.0944***
ΔFDI	-4.8973***	-5.0866***	-4.8929***	-5.0866***
ΔEXC	-4.4942***	-3.9465**	-4.4360***	-4.3387***
ΔINF	-7.4467***	-7.3698***	-7.5015***	-7.4252***
ΔREMIT	-5.8795***	-5.8466***	-5.9358***	-5.8774***
ΔGDS	-7.2255***	-7.2341***	-7.2255***	-7.2794***
ΔCONS	-7.4535***	-7.4799***	-7.4071***	-7.4584***

*, ** and *** indicate 10 %, 5 % and 1 % level of significance, respectively.

Table 1 indicates the results of ADF and PP for checking the stationarity of each variable. The examined results of ADF and PP indicate that none of the variables are stationary at second difference I(II), which confirms that the ARDL model can be applied. The examined results show that all variables are nonstationary at the level but become stationary at the first difference, with the exception of the exchange rate, which is stationary at level. The basic

assumption used to conduct the ARDL model is that all variables will be stationary at level or at the first difference or both; the rationale behind this is to check that none of the variables are stationary at second difference.

Table 2

Tests for Lag Order Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-288.3899	NA	0.01332	15.5468	15.8485	15.6542
1	-26.6441	413.2828	1.9100	4.3496	6.7629*	5.2083*
2	30.5297	69.2105*	1.6300*	3.9195*	8.4444	5.5294

** indicates lag order selected by the criterion*

Table 2 indicates the results of lag order selection criteria. Five different lag order selection methods were applied to select a suitable lag for the dependent and the independent variables. In time series data, the AIC and SIC methods are the most popular. In this study, we select lag through SIC, since it has been applied in most of the existing literature that lag length selected by AIC always leads to a long model which results in a decrease of the freedom in regression.

Table 3

ARDL Bounding Test

F-Statistics	**8.4165**	
	Critical Value bounds	
Significance	I(0) Lower Bounds	I(I) Upper Bounds
10 %	2.53	3.59
5 %	2.87	4
2.50 %	3.19	4.38
1 %	3.6	4.9

Table 3 demonstrates the results of the ARDL bounding test. The critical value for the ARDL bound test is extracted from Narayan (2005). The conclusion of the ARDL bound test is based on the comparison of results of F statistics with the critical value given above. The examined results of cointegration indicate that a long-run relationship exists between the study variables, because the calculated F statistics value is greater from the upper bounds value I(1), which confirmed that cointegration exists among the study variables

Table 4

Long-run Coefficients for ARDL Approach

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	0.8019	0.4414	2.8163	0.0430
INF	-0.0025	0.0569	-0.0442	0.9651
REMIT	0.2071	0.1683	2.4002	0.0245
EXC	-0.0984	0.0614	-1.6040	0.1230
CONS	-0.0314	0.0937	-0.3345	0.7412
GDS	0.1838	0.0831	2.2113	0.0377
C	4.0165	7.5977	2.5286	0.0060
R Square	0.9982	**F-statistic**	1582.552 (0.0000)	
	Durbin-Watson		2.2064	

Table 4 indicates the results of a long-run ARDL model. The examined results of long-run ARDL indicate that foreign direct investment has a positive and significant effect on the economic growth of Pakistan. The coefficient of FDI specifies that a one-percent increase in the rate of foreign direct investment boosted the economic growth of Pakistan approximately 80 % in one year. FDI helps to boost the physical capital accumulation inflow and technology spillover. FDI enhanced the market size and strengthened the incentives for investors through which the economy develops. Examined results of FDI are similar to previous researchers. Bende et al., (2003) investigated the long-run effect of FDI inflow on economic growth for less developing countries (Thailand and Philippines) and developed countries (Taiwan and Japan); the study results revealed that FDI has a positive and significant effect on economic growth in less developing countries while a negative and insignificant effect in developed countries.

The examined results of inflation show a positive and insignificant effect on the economic growth of Pakistan. The results of inflation demonstrate that a 1 % increase in inflation causes a decrease in economic growth of 0.25 % in Pakistan. The negative results of inflation are similar to previous researchers. Ali and Kheir-El-Din (2009) examined the elements of economic growth. The investigated results of the study indicated that inflation has negative effect on economic growth. Anyanwu (2104) investigated the factors of economic growth in Africa. The examined results of the study indicated that inflation has a negative effect on the economic growth of Africa. Bruno and Easterly (1998) stated that inflation has a negative effect on economic growth. They recommended that it is necessary for economic policymakers to control the inflation rate at a minimum level.

The examined results indicate that migrant remittances have a positive and significant effect on the economic growth of Pakistan. The results of the remittances coefficient show

that a 1 % increase in remittance inflow toward Pakistan increases the economic growth by 20.71 % per annum. Most Pakistani skilled and unskilled workers are working in Gulf countries. Migrants send their monthly salary to Pakistan, which increases the level of foreign reserves in Pakistan and helps to boost the balance of payment. Remittances also increase the domestic investment of migrant families because most received remittances are invested in different businesses through which the economic growth of Pakistan increases. The examined results of remittances are similar to Habib and Nourin (2006). Habib and Nourin (2006) investigated the effect of remittance inflow on the economic growth of the south and southeast Asian countries. The examined results indicated that remittance inflow has a negative effect on the economic growth of Thailand, Sri Lanka, India and Indonesia, while remittances have a positive effect on the economic growth of Bangladesh, Pakistan and The Philippines.

The exchange rate coefficient shows a negative and statistically insignificant effect on the economic growth of Pakistan. The results of the exchange rate revealed that a 1 % increase in the exchange rate causes a decrease in the economic growth of Pakistan of approximately 9.84 %. Due to an unfavorable balance of payment and the burden of external debts, the Pakistani rupee is facing the problem of devaluation. The inspected results of the exchange rate contradict with previous researchers' results. Aman et al., (2017) stated that exchange rate appreciation helps to improve the economy and causes economic growth in Pakistan. Rodrik (2008) investigated the relationship of the exchange rate to economic growth, and the examined results pointed out that the deprecation of the exchange rate compared to other currency in developing countries strongly affects the economic growth.

The coefficient of consumption indicated a negative and nonsignificant effect on the economic growth of Pakistan. The results of the consumption's coefficient show that a one-percent increase in consumption causes the economic growth in Pakistan to decrease by 3.13 % per year. Most of the migrants working in other countries send remittances to home countries to sustain their families' daily expenses and migrant families use these remittances for daily life needs instead of investment in profitable businesses. The majority of young and educated peoples in Pakistan are jobless so they rely on foreign remittances as a source of income. Yue Li (2010) revealed that there is a significant inequality in urban and rural sectors that is caused by extra per-capita consumption and extra per-capita investment. The main solution for this problem is to encourage the current consumption level and the realization of sustainable economic growth.

The gross domestic savings have a positive and significant effect on the economic growth of Pakistan. The coefficient of gross domestic saving shows that a 1 % increase in GDS positively increases the economic growth by approximately 18.38 % in Pakistan. Savings have long been considered to be an engine for economic growth. An increase in the percentage of savings causes the investment level to increase and helps to boost economic growth.

R squares results indicate that a 0.99 % variation is explained by the independent variables in the dependent variable. The problem of serial correlation AR(1) is checked by the Durbin Watson statistics that show that there is no problem with serial correlation.

Table 5

Short-Run Coefficient for ARDL Approach

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ΔFDI	2.1617	0.7684	2.8134	0.0101
ΔINF	-0.0164	0.0805	-0.2038	0.8404
ΔREMIT	0.9590	0.2919	3.2851	0.0034
ΔEXC	-0.2010	0.0930	-2.1600	0.0419
ΔCONS	-0.0469	0.1418	-0.3308	0.7439
ΔGDS	0.2752	0.1172	2.3467	0.0283
ECM(-1)	-1.4970	0.2370	-6.3162	0.0000

Table 5 shows the coefficients for the short-run ARDL model. The foreign direct investment coefficient specifies positive and statistically significant effects on the growth of Pakistan's economy. The FDI coefficient shows that a 1 % increase in FDI increases economic growth in Pakistan by 2.16 % per annum in the short-run. The inflation and consumption coefficients indicate a negative and statistically nonsignificant effect on Pakistan's economic growth. Exchange rates have a negative and statistically significant effect on economic growth. Remittance inflows toward the economy in Pakistan increase economic growth. Remittance inflow indicates that a 1 % increase in remittances increases the economic growth in Pakistan up to 95.90 % in the short-run. Gross domestic saving has a positive and significant effect on the Pakistan economic growth in the short-run. The error correction term coefficient is negative and highly significant, which indicates that the speed of adjustment is 1.49 % and shows that recovery speed from disequilibrium to long-run equilibrium is quite fast. In short, the system will respond quickly to reach its equilibrium in the long-run when facing disturbance in the short-run.

Table 6

Heteroskedasticity Test and Serial Correlation Test

F-statistic	1.1953	**Prob. F(13,24)**	0.3398
Obs*R-squared	14.9346	**Prob. chi-square(13)**	0.3114
Serial Correlation Test			
F-statistic	0.8248	**Prob. F(1,23)**	0.3732
Obs*R-squared	1.3156	**Prob. chi-square(1)**	0.2514

Table 6 indicates the results of heteroskedasticity and serial correlation. The Breusch Pagan-Godfrey test was applied to examine the problem of heteroskedasticity in the residuals. The examined results of heteroskedasticity indicate that no problem of heteroskedasticity exists in our data based on the calculated P-value of chi-square.

The serial correlation problems in the data were examined through the Breusch Godfrey serial correlation LM test. The examined results indicated that there is no serial correlation in the study data because the calculated P value is higher than 0.05.

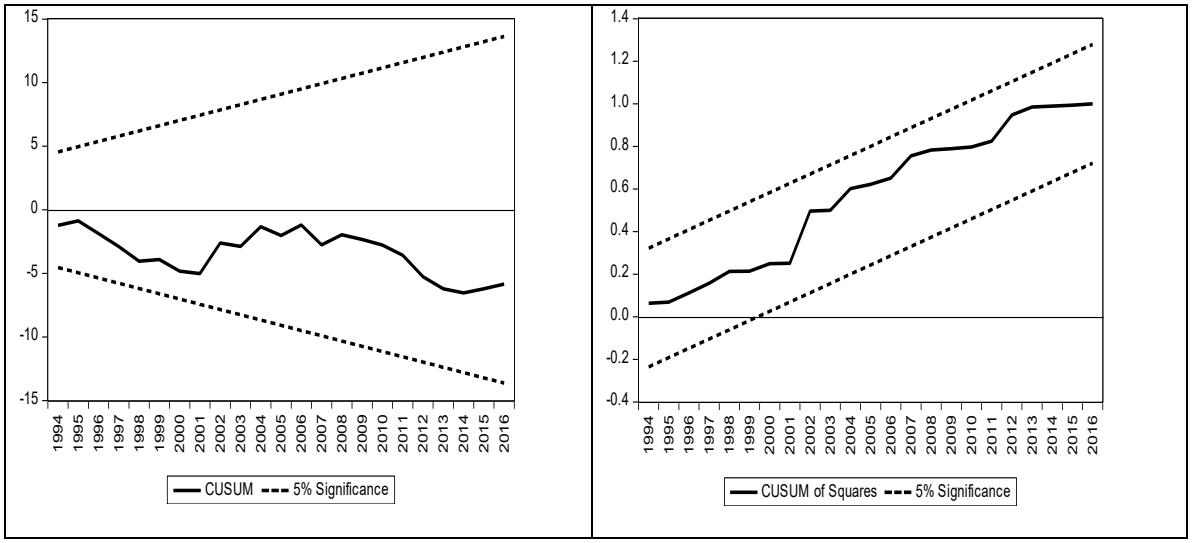

Figure 1. CUSUM and CUSUM of Squares

Figure 1 indicates the graphs of CUSUM and CUSUMSQ. CUSUM and CUSUMSQ were applied to examine the stability of the coefficient. Brown et al. (1975) revealed that graphs of CUSUM and CUSUMSQ are applied to examine the stability of coefficients of the long-run and the short-run ARDL. The CUSUM and CUSUMSQ graphs above indicated that the coefficients of the long-run are stable because the blue line is under the red lines.

Conclusions and Recommendations

Pakistan is ranked in the list of top five remittance-receiving countries of the world. Remittances are the main source of foreign funds to the developing economies of the world. Remittances play an essential part in the economic growth of receiving countries. This is the first study; we investigated the effect of remittances with other economic factors on the economic growth of Pakistan by using the newly developed method of cointegration autoregressive distributed lag for analysis. Previously, researchers used traditional methods such as Johansen cointegration and Engle and Granger cointegration. The results indicate that economic growth in Pakistan depends on the inflow of migrant remittances. Remittances have a significant and positive effect on the economic growth of Pakistan in the short-run and the long-run. Foreign direct investment and gross domestic saving have positive impacts on economic growth in Pakistan in the long-run, while Pakistan's economy is negatively affected by inflation and consumption in the long-run. The results of this study indicate that in Pakistan, remittances are mainly used for investment purposes which help to boost the economic growth. It is recommended to improve the economic growth in the following ways: the government of Pakistan should encourage the migrants in other countries to send the remittances through proper channels to Pakistan, because most migrants send remittances through agents who use unlawful channels. Policymakers in Pakistan should do labor force exchange with other developed countries of the world to send skilled and unskilled workers to developed countries through which remittances can be increased and unemployment problems could be solved in Pakistan. Efforts should also be made to monitor and manage remittance inflow for the economic growth in Pakistan. This target can be achieved by establishing a proper and supportive economic atmosphere for such remittances to be utilized for productive investments in the country. In future research, governance could be introduced, and skilled and unskilled labor used to explain and differentiate the relationship. In this context, it is also important to understand how policymakers could address this issue. Last, the government of Pakistan has to motivate the migrants in other countries to send remittances to stabilize the economy which will help in saving and investments in different projects, even in cases of financial hardship. The inflow of remittances cannot be boosted without a suitable policy. In the future, similar research can be carried out for south Asian countries because many south Asian workers are working in the Gulf countries and participate in the ir home countries' economic growth.

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