
Research

EFFECTS OF REMITTANCES ON PER CAPITA ECONOMIC GROWTH OF PAKISTAN

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Abstract

This study investigates the effects of remittances on per capita economic growth of Pakistan for the period 1976 to 2013. The Auto Regressive Distributed Lag (ARDL) Bounds testing model was employed to explore short run and long run liaison of remittances with per capita economic growth. The analyses evidence statistically significant positive long run and short run impacts of remittances on per capita economic growth. Based upon the empirical results, this study suggests that government should formulate and adopt policies which can further motivate and enhance remittances inflow, and hence a more promising economic growth.

Keywords: Remittances, Per Capita Economic Growth, Pakistan, ARDL.

JEL Classification: Z000

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Introduction

Over the last few decades, remittances became an important and alternative source of financial development for most of the developing countries. The remittances inflows to countries observed a significant growth in the recent few years. According to World Bank statistics, the remittances received by developing countries in 2013 were about \$404 billion while expected figures to be received in 2014 and 2016 are \$436 billion and \$516 billion respectively. The global remittances of high income countries were \$542 billion in 2013 and are estimated to be \$581 billion in 2014 and are expected to reach a figure of \$681 billion in 2016. These were the figures of remittances that were transferred through registered channels worldwide. According to Nyamongo et al. (2012), there would be more money transfers in billions through unregistered channels that might be not accumulated to official figure that is accounted.

The increasing tendency of remittances inflows has led the researchers to know whether remittances inflow leads to enhance the economic growth of the receiving country. The empirical literature shows that remittances inflows tend to have both positive and negative effects on the economic health of an economy. The positive effect, according to most researchers, is due to the fact that the inflow received has been used for the purpose of investment. This positive favorable effect of remittances on economic growth has been concluded by various studies (see, Qayyum et al. 2008; Rahman 2009; Junaid et al. 2011; Javid et al. 2012; Al Khathlan 2012; Marwan et al. 2013; Cooray 2012). The negative effect has been reported by Chami et al. 2008. They argued that working abroad and sending money tends to reduce the worker participation in development of the country and may adversely affect the economic growth of that economy. Kumar (2011), also found evidence of the short run negative effect of remittances on GDP of Pakistan. He concluded that the unfavorable effect of remittances in short run is due to the fact that money received through remittances is first saved and then invested later on.

The theoretical consensus between remittances inflow and economic growth shows that remittances have three major effects on the economic health of the recipient country i.e. capital accumulation, total factor productivity (TFP) growth and labor force growth. The argument about capital accumulation points to the fact that when the recipient country's situation is not going well, so in this case, the recipient will move towards accumulation of capital. The other effect of remittances on economic growth is represented in terms of total factor productivity (TFP) growth. This effect can be quantified in terms of remittances inflows that has been used for the purpose of investment i.e. the remittances received by the recipient has been used for the purpose of investment in already established businesses. This act will lead to enhance the TFP growth of the recipient economy. The third effect of remittances inflow on economic growth is that it leads to decrease labor force growth. The expected phenomena would be that remittances will reduce participation of labor because the funds received will be used as substitute of labor income which will create moral hazard problems. This will induce recipient to divert funds received into consumption of leisure, which will further reduce the labor market effort leading further to decrease labor supply to market (Barajas et al. 2009; Paravithana 2014).

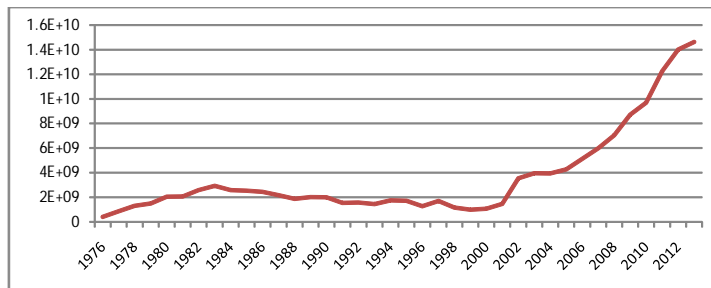
Pakistan has also has been accounted for one of the largest recipient amongst remittances recipient countries. The World Bank Statistic showed that Pakistan received 14.6 billion dollar inflows of remittances in 2013. Figure 1 below shows the trends in remittances from 1976 to 2013. It clearly exhibits that remittances showed robustness till the last few years most clearly since 2001. The sudden increase in inflows is due to the fact that overseas migration has been increased. According to the bureau of emigration and overseas employment of Pakistan; the total numbers of overseas migrants were 0.13 million in 2001 which increased to 0.75 million till 2014. These figures were based on those individuals that were registered through worker visa. The increasing trend in overseas migrations is due to poor economic conditions, unemployment and low income of

individuals. Remittances also play an important role in economic growth, because after foreign direct investment, remittances are considered another important alternative source of financing that may accelerate the economic growth of an economy.

In the context of Pakistan, numerous studies have examined remittances and economic growth relationship. Statistically significant long and short run positive impact on economic growth caused by remittances in Pakistan have been concluded in the studies by Qayyum et al. 2008; Rahman 2009; Junaid et al. 2011; Javid et al. 2012; Al Khathlan 2012. There are also studies which employed the regression model and found favorable effect of remittances on economic growth (see for example; Raza et al. 2011; Ahmad et al. 2013; Dilshad 2013; Hussain and Anjum 2014). However Kumar (2011) found positive effect in the long run while significant negative effect in the short run. He concluded that the negative effect in the short run is due to the fact that people while receiving money, save it in the short run, and then finance their capital after some time.

Figure 1

Remittances received in current US dollars



Source: World Development Indicator

The importance of unveiling the favorable and unfavorable effect caused by remittances on economic growth has motivated this study. This study is contributing to the literature in terms of the impact of remittances on per capita economic growth over long and short run. Previous literatures in this aspect provide evidence on the relationship of remittances with various economic growth indicators like, real Gross Domestic Product, Gross Domestic Product in local currency and GDP in dollars. The novelty of this study is in terms of taking GDP per capita. The top remittances receiving countries are China and India but their per capita remittances received are less than Pakistan, which makes Pakistan an interesting case for investigating the role of remittances in its economic growth. Results from the Auto Regressive Distributed Lag (ARDL) Bounds testing model suggest statistically significant positive long and short run impacts of remittances on per capita economic growth. This study also has some implications for the policy makers and suggests that they should formulate and adopt policies which can further motivate and enhance remittances inflow, and hence a more promising economic growth.

The rest of the paper is organized as follows. Section 2 reviews the relevant literature. Section 3 describes the data and methodology. Section 4 discusses the results in detail and Section 5 concludes the study with some policy implications.

Review of Literature

Numerous researchers have investigated the effect of remittances on economic growth of the receiving country. Here we review some of the most prominent studies in this regard as Acosta et al. (2008) used large scale and cross country panel data set, they found that remittances in Latin American and Caribbean (LAC) have helped reduce poverty, inequality and have increased economic growth. They concluded that remittances are now a source of income for the poor people in developing countries.

Le (2009) examined the effect of remittances, institution and trade on growth and development. By employing both cross country and dynamic panel data, their study provided clear evidence of an effect of remittances, institution and trade on growth.

Giuliano and Ruiz-Arranz (2009) studied the association of remittances with financial sector development. Analyzing a data set of about 100 developing countries, they found that remittances can be another source to finance investment and can be used to boost economic growth.

Nyamongo et al. (2012) extended the literature considering 36 African countries covering the period of 1980-2009 and examined the impact of financial development and remittances on economic growth of the economy. They found that remittances are the most important source of economic growth for most countries. Further on they concluded that volatility of remittances has negative effect on the economic growth. Remittances also help in financial development. Barguelli et al. (2013) used a modified version of (Giuliano and Ruiz-Arranz 2009) to revisit the association between remittances, education and economic growth. Data is taken from 1990-2006 for two groups of countries. They concluded that remittances have both a direct and an indirect impact on economic health for that group of countries which consists of countries having largest remittances-recipient in GDP percentage, as compared to that group which has high remittances in value. Cooray (2012) examined the effect of remittances on economic health for south Asia by employing data from 1970 to 2008. Remittances showed a significant favorable effect on economic growth. He concluded that the positive interaction between remittance and economic growth can be identified through financial sector development. Paranavithana (2014) explored the effect of worker's remittances on economic growth of Srilanka by taking time series annual data for the period 1977-2012. The analyses of vector error correction model showed a positive direct and also an indirect long run association between economic growth and remittances. Wald test

shows the opposite case, that there is no short- run association between economic growth and worker's remittances either directly or indirectly. Marwan et al. (2013) examined the effects of Overseas Development Aid (ODA) and remittances on economic growth in Sudan using Johansen Co-integration technique for the period of 1977-2010. They concluded that remittances positively affected the economic growth of Sudan. Ahamada and Coulibaly (2011) examined the remittances effects on GDP growth volatility through the channel of financial improvements. They used PSTR (panel smooth transition regression) approach. Their results show that remittances effect GDP growth rate. As the financial system is developing, remittances have a more stabilizing impact. Therefore the recipient countries have to implement such policies that may promote financial development to get a high and more stabilizing benefit from remittances. Rao and Hassan (2011) tested the commonly held believe among economists that remittances tends to boost the growth and development of an economy over the long run. They investigated the effect of remittances on the receiving country's growth but found a different conclusion. They concluded that remittances tend to have some indirect and small effect on growth but it does not evidence a significant and direct effect on growth.

In case of Pakistan many studies has been undertaken to study the effect of remittances on economy. Qayyum et al. (2008) investigated inflow of remittances and its effects on poverty and economic growth of Pakistan. They have taken data from 1973-2007 and analyzed using ARDL method. Their study showed that remittances have favorable effect on economic growth and negative effect on poverty over long run. Rahman (2009) examined the stated relationship for four countries including Pakistan. He analyzed data from 1976 to 2006 using ARDL model and found long run and short run statistically significant positive association of remittances with economic growth in Pakistan. Junaid et al. (2011) studied the association of financial development, remittances, and exports with economic growth of Pakistan by considering data from 1976-2009.

Their results indicated that remittances have both short run as well as long run positive effects on economic growth. Kumar (2011) explored the remittances effect on economic growth over long run. Analyzing a data set from 1980 to 2009, he reported evidence of a long run association between remittances and economic growth, however in the short run a significant negative effect of remittances on economic growth. Al Khathlan (2012) also examined relationship of economic growth and remittances by using ARDL model over the period 1976-2010. He also found evidence of short and long run significant positive impacts of remittances on economic growth of Pakistan. Javid et al. (2012) focused on the inflow of remittances and its effect on economic growth and poverty for Pakistan. Data for the period 1973-2010 was taken and analyzed by using ARDL approach. Their results showed that remittances are positively associated with economic growth while negatively associated with poverty over the long run. Raza et al. (2011) investigated the impact of foreign capital inflow on the economic health of Pakistan by taking data for the period 1985-2010. By using multiple regression technique, they provided evidence of positive and significant remittances effects on economic growth. Ahmad et al. (2013) extended the literature of remittances effects on economic growth for Pakistan for the period 1978-2011 by employing multiple regression technique. They found clear evidence of significant worker's remittances effect on GDP. Dilshad (2013) has taken data from 1991-2012 and analyzed the remittances effects on economic growth. By using regression model, he documented positive and significant remittances effects on economic growth. Hussain and Anjum (2014) used data from 1973-2011 and analyzed the relation between worker's remittances and GDP growth by using generalized method of moments (GMM). Their study revealed that worker's remittances boost GDP growth positively and it is also playing a key role in the development of Pakistan's economy.

Data and Methodology

This study intends to examine the effects of remittances on per capita GDP of Pakistan. The annual time series data is taken from World Development Indicator for the time period 1976 to 2013. The dependent variable is GDP per capita as proxy of economic growth. The data for remittances is in total remittances received annually as percentage of GDP. The other variables identified from the literature including investment and exports are also used in our model. The proxy used for investment is gross fixed capital formation and the data is taken as percentage of GDP (gross domestic product). The exports data is annually and is percentage of GDP (gross domestic product). The inclusion of control variables are based on various studies. All the variables have been transformed with natural logarithm.

The model specification can be written as

$$Y = f(\text{REM}, \text{INV}, \text{EXP}) \quad (1)$$

Where Y represents output, which is per capita GDP. REM represents remittances. INV is the investment as gross fixed capital formation. EXP represents total exports.

Equation (1) can be converted into log linear form as follow

$$\ln \text{GDP}_t = \beta_0 + \beta_1 \ln \text{REM}_t + \beta_2 \ln \text{INV}_t + \beta_3 \ln \text{EXP}_t + \varepsilon_t \quad (2)$$

In equation (2), all the variables have been expressed in natural log form. $\ln \text{GDP}_t$ represents GDP per capita, β_0 represents constant, $\ln \text{REM}_t$ represents remittances, $\ln \text{INV}_t$ represents investment, $\ln \text{EXP}_t$ represents exports and ε_t is disturbance term. The signs for all the coefficients are expected to be positive.

The order of integration of variables can define which of the econometric model can be used for analyses. If the variables are found to be integrated of order $I(1)$, then analyses can be performed either by Johansen cointegration method or by Bounds testing procedure i.e. Autoregressive Distributed Lag model (ARDL). In this particular study, analyses is aimed to be carried out by ARDL (Autoregressive Distributed Lag) Bounds testing procedure proposed by (Pesaran et al. 2001). The main reason behind using ARDL model is that, it is an advance econometric technique for dealing with time-series data and this model is useful for very small sample (Pesaran et al. 2001) such as our sample which comprise of only 38 observations, while Johansen cointegration technique is suitable for large sample size. The other importance of using ARDL model is that it involves Bounds testing which is first carried out to capture whether the variables exhibits long run relationship or not. ARDL model automatically assign suitable lag value to specific variable in a model to get desirable results through specific model.

Before estimating ARDL model, it is necessary to estimate vector autoregressive (VAR) procedure of order p which is represented as VAR (p) for the growth equation

$$X_t = \alpha + \sum_{j=1}^k \beta_j x_{t-j} + \varepsilon_t \quad (3)$$

Where X_t represents all variables (i.e. GDP, REM, INV, EXP), α is vector of constant term, β_j is matrix of VAR parameters for lag j , and ε_t is error term. The DV (dependent variable) must be integrated of $I(1)$, means at first difference and the other explanatory variables will be a mixture of $I(1)$ & $I(0)$. The VECM (vector error correction model) model can be estimated as

$$X_t = \alpha + x_{t-1} + \lambda \sum_{j=1}^{k-1} \lambda_j \Delta x_{t-j} + \varepsilon_t \quad (4)$$

Where Δ represents the 1st difference and λ is long run multiplier as

$$\lambda = \begin{bmatrix} \lambda_{yy} & \lambda_{yx} \\ \lambda_{xy} & \lambda_{xx} \end{bmatrix} \quad (5)$$

The Wald test or F- statistic is carried out to know about the long run association between the variables. The null and alternative hypotheses of long run relationship among variables using Bounds testing procedure are given below.

$$H_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$$

$$H_1 = \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq 0$$

The estimated F-test value is compared with the tabulated critical values of Pesaran et al. 2001. The assumption is based on the criteria that all the variable should be integrated of either $I(0)$ or either $I(1)$. The upper bound values reveal that the variable are integrated of order one while lower bound reveal to be integrated of order zero. If the estimated value of F-statistic is higher than upper bound then it points towards the rejection of null hypothesis and there exists stable long run association between variables. If the estimated value of F-statistic is lower than the lower bound then the null hypothesis cannot be rejected and hence there will be no long run association between variables and the decision should be based on short run estimation. After identification of long run liaison between variables, the ARDL model and long run coefficient are estimated between remittances and per capita GDP as represented in the equation (6).

$$GDP_t = c + \beta_1 GDP_{t-1} + \beta_2 REM_{t-1} + \beta_3 INV_{t-1} + \beta_4 EXP_{t-1} + \varepsilon_t \quad (6)$$

$$GDP_t = c + \alpha_1 \sum_{i=1}^p \Delta GDP_{t-i} + \alpha_2 \sum_{j=1}^q \Delta REM_{t-j} + \alpha_3 \sum_{k=1}^q \Delta INV_{t-k} + \alpha_4 \sum_{l=1}^q \Delta EXP_{t-l} + \psi ECM_{t-1} + \varepsilon_t \quad (7)$$

The short run relationship is examined by using equation (7) in which α_i to α_1 represents short run coefficients, Δ represents the first difference of variables and ψECM_{t-1} is error correction term, which measures the disequilibrium that has been adjusted over the long run.

Empirical Results

This study considers time series data, so the first step is to check stationarity of the data. The two commonly used methods for checking stationarity of the data are Phillips and Perron (1988) test and Augmented Dickey and Fuller (1979) test. This study has employed Augmented Dickey and Fuller (1979) test for checking stationarity of the data. The analysis of unit root is represented in Table 1. The results reveal that all the underlying variables are non-stationary at level while become stationary at first difference. As our sample is small, so in this situation the ARDL model is the suitable technique to know about integration between variables (Pesaran et al. 2001).

Table 1

Unit root test results

Variables	Level	1 st Diff	Inference
GDP	-1.446681	-4.476430**	I(1)
REM	-1.541235	-5.521461**	I(1)
INV	-1.029434	-5.833033**	I(1)
EXP	-1.842441	-6.086219**	I(1)
Critical Values	1%	-3.626784	
	5%	-2.945842	

*and ** indicates p at 5% and 1%.

Before examining the relationship between underlying variables, the Bounds testing approach is carried in order to know whether the variables (i.e. GDP per capita, remittances, investment and exports) exhibits relationship over the long run. The result of Bounds testing is presented in Table 2. The analysis evidence that the

estimated f statistic value is greater than the upper bound values tabulated by Pesaran et al. (2001). Hence according to (Pesaran et al. (2001), there exists stable long run liaison between variables. In this regard, we reject the null hypotheses and find evidence of long run association among per capita GDP (gross domestic product), remittances, investment and exports. We have also carried out Schwartz Criterion to know about the suitable lag value for estimating integration between remittances and per capita economic growth. The Schwartz Criterion shows lag 1 to be the suitable lag value for checking long run association between per capita GDP and remittances.

Table 2
Bounds Testing Results

Country		F-statistic value	Lag length	Significance level	Bound Critical Values	
					I(0)	I(1)
Pakistan	GDP	4.9564	1	1%	3.74	5.06
	per capita			5%	2.86	4.01
				10%	2.45	3.52

The next step is to estimate the long run relationship between remittances, investment, exports and per capita GDP. The empirical analysis of long run estimations is presented in Table 4. The results show that remittances have a significant positive effect on per capita GDP of Pakistan. In other words, higher value of remittances will lead to affect the economic growth favorably over the long run. This study found new evidence in terms of long run positive effect of remittances on per capita economic growth. The results also reveal long run effect of investment on per capita GDP. Furthermore, a statistically insignificant but positive effect of exports on per capita GDP over the long run is also observed.

Table 3*Long run equation results*

ARDL model (1,1,0,0)			
Variable	coefficient	Standard error	t-statistics
REM	.074717	.025789	2.8971 **
INV	.30247	.10064	3.0054 **
EXP	.098575	.066215	1.4887
C	4.7069	.32678	14.4039**
T	.022504	.0010884	20.6763**

Dependent Variable= GDP

* P< 5% and ** P< 1%

After finding out the long run relationship, we also estimated the short run liaison between per capita GDP and remittances by employing the error correction model using ARDL and also estimated error correction term to know about the speed of adjustment over the long run. The analysis shows that $\psi ECT(-1)$ is significantly negative, which also confirm the existence of stable long run association between the underlying variables. The $\psi ECT(-1)$ show that approximately 32 % adjustment has been made over the long run after one year. The results evidence a short run positive liaison between per capita GDP and remittances. The coefficient of remittances is positive indicating that remittances affect the per capita economic growth of Pakistan positively in the short run as well. The results also points towards a short run positive investment effect on per capita GDP. The analysis however shows no evidence of short run significant effect of exports on per capita economic growth of Pakistan.

In the final step we checked the reliability of the ARDL results by employing cumulative sum (CUSUM) and cumulative sum of square (CUSUM Square) test. Figure 2 clearly shows that the critical values lies under 5 % level of significance. Similarly in Figure 3, the CUSUM square test lies under 5% significance level, which reveals that model is fit.

Table 4
Short run equation results

ARDL model (1,1,0,0)			
Variable	coefficient	Standard error	t-statistics
GDP(-1)	.67587	.079442	8.5077**
WR	-.015570	.012612	-1.2345
WR (-1)	.039787	.011455	3.4733**
INV	.098041	.037378	2.6229*
EP	.031951	.021722	1.4709
C	1.5257	.41174	3.7054**
T	.0072944	.0018004	4.0516**
ψ ECT(-1)	-.32413	.079442	-4.0801**
Dependent variable = Δ GDP			
R-square	0.50415		
Adjusted R-square	0.40498		
F-statistic	6.1005**		
LM test	3.513		
DW-stat	2.45		

* P< 5% and ** P< 1%

Plot of CUSUM

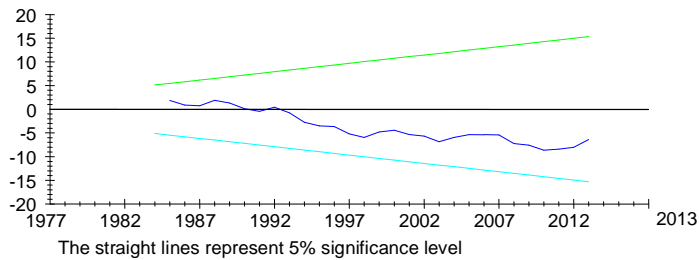


Figure 2

Plot of CUSUM Squares

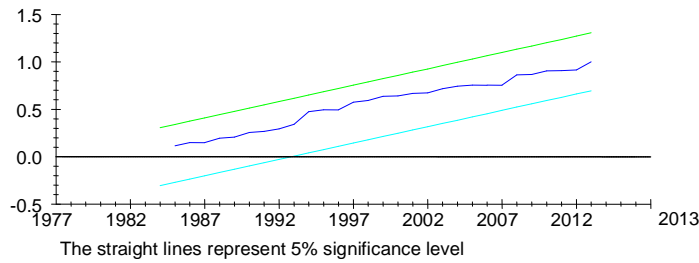


Figure 3

Conclusion and Policy Implications

This study is carried out to unveil the effect of remittances on per capita economic growth of Pakistan over the period 1976-2013. The auto regressive distributed lag (ARDL) bounds testing model is carried out to know about the short as well as long run liaison of remittances with per capita economic growth. The analyses revealed statistically significant long run as well as short run favorable positive remittances effects on per capita economic growth of Pakistan. This implies that remittances tend to boost the per capita economic growth of Pakistan both in the short as well as in the long run. This study also found significant positive long and short run effect of investment on per capita economic growth.

Based on the empirical results, it is suggested that remittances are also a source of external financing and ultimately a mean of economic benefits both in the short run as well as in the long run. In Pakistan remittances play an important role because it also contributes to fill the gap of fiscal deficit. Keeping in mind the economic benefits associated with remittances in terms of per capita income, government should formulate and adopt policies which can further motivate and enhance remittances inflow, and hence a more promising economic growth. We suggest to examine the effects of remittances on poverty reduction of recipient in Pakistan in future.

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