EUROPEAN ACADEMIC RESEARCH
Vol. VIII, Issue 8/ November 2020

Impact Factor: 3.4546 (UIF)
DRJI Value: 5.9 (B+)

ISSN 2286-4822
www.euacademic.org

Impact of Worker's Remittances on Poverty Alleviation in Pakistan

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Abstract

Workers remittances considered the major and sustainable source of financial inflow and earning to many developing economies like Pakistan. Remittances income has momentous and favorable impacts upon growth rate and put pressure over poverty reduction. Therefore, the present study has been devised for examine the effects of worker's remittances over poverty alleviation in context of Pakistan, during time span of 1980-2016. Autoregressive Distributive Lagged approach is employed for obtaining long run and short run results because of small sample size. The results of long run reveal negative significant relationship of variables such as worker's remittances, gross domestic product and inflation with poverty head count except official development assistance which holds negative sign but insignificant for poverty alleviation. On the other hand, short run results reveal negative significant association of gross domestic product and inflation with poverty as head count ratio whereas workers' remittances and official development assistances hold negative signs although but statistically insignificant for poverty. The government should design and implement a policy in a manner from which the remittances may properly utilized and through which the chronic issue of poverty can be alleviated.

Keywords: Poverty, Worker's Remittances, Autoregressive Distributed Lagged Model.

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1. INTRODUCTION

Migrant workers send income to their home countries are the transferred earnings and this is given the term as workers remittances which considered the mainstream of external finance. Over the past three decades the flow of remittances into developing economies of the world have augmented remarkably outside the year 2009.[2] They are now thought-out the major source for financial inflow and earning to many developing economies, next to foreign direct investment. Workers' remittances are reckoned the sturdy international financial inflow to labor exporting nations. Asia is a foremost supplier of exporting cheap labor in the international market specifically for Central European nations and Gulf nations. In many developing nations, the share of 2/3 from total global remittances is transferred from Gulf nations and having its substantial impact over households' level of consumption and living standard of recipients as well as it has structure wise effect on demand at local market (World Bank Report, 2015). The remittances inflow recorded officially towards developing countries were estimated $440 billion in 2015, which are expected to be expanded $479 billion in 2016 (World Bank Report, 2015). Remittances are the second formidable source of income and have proved resilient during economic declines as compared to other inflows of capital like official development assistance, foreign direct investment, and foreign aid.

Over a last decade, during 1999-2000 and 2008-09 remittances had divulged the rising trend in Pakistan. In particular, the recipient families' welfare amended through inflows of remittances income. This remittance inflows enhanced the income of recipient households, liquidity constraints and ease credit whereas permitted them to ameliorate consumption expenditures and living standard as well. However, the increase in level of consumption by recipients' households which produces demand that heartens the producers for further investment. Such lead to markets development, production enhancement, contraction of unemployment and raises growth of economy. When government utilized respective surplus moderately

[2] Because of financial crisis in 2008 remittances in many developing economies declined by 5.5 percent and recover again in 2010. For detailed discussion see also Fact Book 2015.

may lead to shrinking poverty and strengthen physical infrastructure of a country. The growing trend in debt of the country is prevail by the way of remittances at stable level. Remittances income has momentous and favorable impacts overgrowth rate and put pressure over poverty reduction recommended by empirical studies. Flow of remittances contributed pivotally in Pakistan's growth progress during last one decade. The worker's remittances of Pakistan in FY 2010 are comparatively approached at top of dollar 8.9 billion containing with 14% of increment than FY 2009 in spite of world crisis at economically. From last some years the strong persistent increments in remittances figures have been recorded which stimulated in expanding the external position of the nation with the growth of outward current account balances. Process of transferring earnings by immigrants to origin countries from out of countries raised significantly to $2.98 billion from 1975 to 2003 indicates that remittances income has been turned into the flourishing superior source of income for workers to developing economies next to foreign direct investment. Remittances are deemed to be steadier and more active source of outer earnings throughout the economic slump (Yang, 2006) and having no harmful effects (Rajan & Subramanian, 2005). Fluency of remittances encourages the households' proceeds in origin nation, investment acceleration, betterment of human development via melioration of health and education, reduction of incapability of household's borrowings. This leads to economic soundness and poverty alleviation (Stark & Lucas, 1988; Taylor, 1992; Faini, 2002; Jongwanich, 2007; Calaro, 2008; Gupta *et al.* 2009). During the decade of nineties, the poverty increased in Pakistan as a result of remittances reduction (Siddique & Kemal, 2006). The level of poverty influenced by an important factor of remittances with respect to alteration of consumption as well as income along with augmentation of the stock of capital (Kemal, 2001). Remittances flow rose keenly in Pakistan from the time of 9/11 event which is from $1075 m to $6000 m during 2000 to 2007 respectively. The respective gigantic remittances flow cause to decline the deficits in current account, steadying the rate of exchange and decreases the poverty level. Poverty in Pakistan reduced by an effective rate that is 17.3% between 2001 and 2008 that is from 34.5% in 2001-2002 to 17.2% in 2007-2008. Empirically investigation displays that income of workers remittances having strong effect over poverty while a slightly effect over gross domestic product. From various channels the economic

activities influence by remittances (Burgess *et al.* 2005). The poverty level, poverty depth and poverty severity alleviated at large in 71 developing economies cause of remittances (Adams & Page, 2005). Perhaps remittances income utilized in proper manner that caused in reducing poverty in Pakistan economy (Lucas, 2005).

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1.2. Significance and Contribution of the Study

A bulk of literature is available to study the role of migrant's remittances on economic performance. However, little attention has been paid to analyze its impact on poverty eradication in the context of Pakistan. The current study is an effort to examine the impact of remittances along with other important determinants such as inflation rate, gross domestic product and official development assistance on poverty, in order to augment the already available literature especially in Pakistan. The study will assist the policymakers to formulate policies to poverty reduction which would obviously trigger an economic growth with improvements in the standards of living of the people.

1.3 Hypothesis of the Study

H_0: There's negative relationship between worker's remittances and poverty alleviation in Pakistan.

H_1: There's positive relationship between worker's remittances and poverty alleviation in Pakistan.

H_0: The poverty does not alleviate by rest of the selected variables with respect to Pakistan.

H_2: The poverty alleviates by rest of the selected variables with respect to Pakistan.

2. REVIEW OF LITERATURE

Some researcher demonstrated that worker's remittances cause's poverty reduction while some revealed that these remittances are ineffectual for poverty alleviation in Pakistan. Amjad and Ahmad (1986) emerged from study that the improvement in worker's remittances which received from Middle East raised the national savings of Pakistan during 1976-1986. Burney *et al.* (1987) concluded that worker's remittances effect the gross national product (GNP) positively and significantly and performed crucial role in shrinking the deficit of current account, used time series data over time span of 1969-1986 regarding Pakistan. Adams (1989) studied over the Household Survey data from the year 1986 to 1987, from which they evaluated that remittances sent by workers to their homelands are adversely associated with income distribution of rural in Egypt. Bilgrami *et al.* (1991) suggested that the elements such as Gross National Product (GNP), consumption expenditure, investment expenditure and imports are strongly and positively interrelated with remittances of the workers by employing the Keynesians macroeconomic model over the time period from 1959 to 1960 & 1987 to 1988 used for study. Faini (1994) investigated that the worker's remittances are effective for real exchange rate in 5 Mediterranean such as Turkey, Tunisia, Morocco, Portugal and Yugoslavia, from the year 1977-1989. Rashid *et al.* (1997) analyzed that the level of poverty affects from the elements such as rate of remittances, inflation rate, industrial output, terms of trade for agriculture sector, employment, tax rate, wages, economic and agricultural growth rate(s), in Pakistan. All the respective variables are very much beneficial in reducing the Poverty. The expansion in remittances, employment and economic growth led to alleviate poverty of Pakistan from the year 1963-1964 & 1992-1993. Hunte (2004) used the data over the panel of 18 less developed countries, time series ranges from 1983 to 2001 and applied the Ordinary Least Square (OLS) method, from which it is considered that the worker's remittances slow down with rise in the income of the households. In other words, the flow of remittances income sent by emigrants to homelands put adverse impact upon the income level of the households in developing countries. Sattar and Iqbal (2005) selected the data over the time period of 1972-1973 to 2002-2003 and applied OLS (Ordinary Least Square) technique. They digged that in Pakistan gross domestic product

improved through worker's remittances positively. On the other hand, the rest of the selected variables such as external debt, rate of inflation and terms of trade are negatively linked with worker's remittances. Vadean and Thomas (2006) evaluated that poverty alleviates through remittances which sent by international migrants towards developing countries, directly, and minimizes the foreign exchange deficiencies, improves the deficits in balance of payments, encourages the investment level and so on. International remittances are also affective for the migrants sending areas, positively and directly. Hashmi *et al.* (2008) conducted the study from which it is obtained that by expansion in families' size and dependency ratio are the main causes to enhance the poverty. While the poverty alleviates by increase in the rate of male and female education in Punjab regions, used the Logistic Regression technique and picked the data from International Food Policy Research Institute (IFPRI) and Pakistan Rural Household Survey (PRHS) with respect to Attock and Faisalabad (Provinces of Punjab) from the years 1986 to 1987, 1990 to 1991. Anwar *et al.* (2009) extracted that the international remittances lead to enhance the poverty level via direct and indirect channels. Particularly, the foreign assistance causes in spreading the poverty in the long run and in the short run as well. Hence, both foreign remittances and foreign assistance positively interrelate with poverty, in Pakistan, gathered the data of time series that ranges from 1973 to 2008 and applied the Auto Regressive Distributed Lag (ARDL) Approach. Fayissa *et al.* (2010) suggested that the remittances sent by the workers effect the growth of the economy positively in various 36 African regions during 1980 to 2004, under the Neo-Classical Growth Model. Irfan (2011) studied that remittances is a significant factor that slowdowns the poverty rate in Pakistan. The rate of inflation and population size both have positively contributed for poverty. But the population size is the strongest one variable that enhanced the level of poverty in Pakistan from 1975 to 2009, by applying OLS method. Paterno and Bugamelli (2011) empirically investigated that there's an inverse relationship of the growth of output volatility with poverty, welfare and growth. They obtained the data over sixty developing nations while time series selected from 1980-2003 and employed Ordinary Least Square (OLS) method. It is also revealed that the growth of output volatility and remittances are adversely interrelated with each other in sixty developing nations. Umaima *et al.* (2012) examined that poverty alleviated extensively through supplied

remittances income in the different provinces of Pakistan like Sindh, Punjab, KP, and Baluchistan, used the secondary data over the time-span of 1973-2010 and applied Autoregressive Distributed Lagged (ARDL) technique. Also found that growth rate is affected from the remittances positively in Pakistan. Kundu (2013) argued that inflows of workers' remittances cause in enhancing the standards of living of the migrant's families increase the distribution of income and strengthen the balance of payments (BOP's). Poverty also alleviates by the marvelous element of worker's remittances and contributes in the development of the Bangladesh economic growth rate, collected the primary data from the survey of Comilla district in Bangladesh through questionnaires, time spanning from May-June 2013 and employed Logistic Model. Mehmood and Faridi (2014) revealed that the level of poverty declines with the expansion of migrant's remittances, foreign assistance, gross domestic product, consumer price index as well as expenditures of private investment, government and education in Pakistan. They concluded from the study that in order to reduce poverty if supplied workers' remittances allocate in appropriate manner for which the government having a pivotal function, taken secondary data over the time span of 1972 to 2010 while employed Ordinary least Square (OLS) technique. Gaaliche and Zayati (2014) demonstrated from study by applying various appropriate econometric techniques such as Fully Modified Ordinary Least Square method and panel Johansen Cointegration test that the effect from international remittances on poverty eradication is slight as compare to the opposite effect which is more powerful. The two-way association present in remittances and poverty in the fourteen less developed regions from 1980 to 2012. Zakir *et al.* (2015) emerged that poverty having significant inverse alliance with remittances in the long run as well as in short run in Pakistan, selected secondary data over time spanning 1973-2006 and employed Auto Regressive Distributed Lagged (ARDL) and Vector Error Correction (VEC) techniques.

2.1. Theoretical Framework

Workers' remittances are the cause to alleviate poverty at large in Pakistan. Remittances affect the economic growth of Pakistan positively as well (Umaima *et al.* 2012). At one side remittances are playing role to curb the poverty and at another side remittances are the main cause of migration. The gap in wage rates induces migration

revealed by John Hicks (1932). The efforts of Amartya Sen revealed that poverty means when a person with income from which its basic needs can't be fulfilled including social essentials and situations in environment instead of considering poverty by surviving under fictitious poverty line like a dollar or twice per day (Sen, 1981). The 1.44 billion poverties at global share calculated by World Bank whereas 1.71 billion people found poor according to Amartya Sen. Actually, distinction is measurement of poverty.[3]

2.1.1. Measurement(s) of Poverty

i) Poverty as head count measure (poverty incidence)

It exhibits the ratio of individuals who exist beneath the poverty line. Symbolically,

$$HC = N_p \ / \ N$$

N_p represents number of individuals fall beneath poverty line
N is total households/persons.

ii) Poverty gap index

This is a gross decline in income of entire poor(s) from the certain poverty line. Although this calculates poverty depth while not same intensity. Emblematically,

$$PGI = \sum_{i=1}^{N}(Y_p - Y_i)$$

Here Y_p stands as defined/absolute poverty line
Y_i is the income of ith poor person or ith individuals under the certain poverty line.

iii) Foster greer thorbecke index (FGT index)

The depth of poverty may also be calculated from the Foster Greer Thorbecke Index method. Emblematically demonstrated as,

$$P\alpha = \frac{1}{N} + \sum_{n=1}^{N}\left(\frac{Y_p - Y_i}{Y_p}\right)^{\alpha}$$

Or

$$P\alpha = \frac{1}{NY_p^{\alpha}} + \sum_{n=1}^{N}\left(Y_p - Y_i\right)^{\alpha}$$

$Y_p - Y_i$ is the poverty gap
Y_p is poverty line
α is parameter
N represents total population.

[3] Originator of various concepts of poverty "Amartya Sen" explained in its superior book Poverty and Famines (1981).

The value of α if presumed to be 0, 1 and 2 ascribes head count criterion, poverty gap criterion and poverty severity criterion, respectively.

α > 0 meaning that poor's standard of living lessening; α >1 that is more people considered to be poor caused by decline in somebody's living standard. In short FGT-Index range from 0 to 1 implies that no one is poor, and all are poor respectively.

iv) Squared poverty gap index (poverty severity)

It is the mean of squared of poverty gap with respect to specified poverty line and reflects severity of poverty. Poverty gap index when squared it inexplicitly gives spare weight to those who lies satisfactorily under the certain line of poverty. Formally,

$$P_2 = \frac{1}{N} + \sum_{n=1}^{N} \left(\frac{Y_p - Y_i}{Y_p} \right)^2$$

2.2. Gap in Literature

Link between poverty as head count, worker's remittances, official development assistance, gross domestic product and inflation rate has yet not been explored in one study. Most of the empirical researches have shown the impact of foreign aid on poverty. However, the present study has been devised to check the effect of official development assistance on poverty. It is hoped that the study would bridge the gap in the literature and indicate new areas of interest for future research work.

3. MATERIALS AND METHODS

3.1. Data collection methods

The secondary data has conscripted for analysis and its time spanning considered from 1980 to 2016 regarding Pakistan. Data over the concern variables taken from the source of Pakistan Bureau of Statistics (PBS) and World Bank 'World Development Indicator' (WDI) and Federal Economic Research (FER).

3.2. Model specification

In present study model is designed to attain its objectives where poverty has grasped as dependent or regressand while rest of desired variables are taken as independent or regressors.

The functional form of the model is:

Poverty = f (Official Development Assistance, Workers' Remittances, Gross Domestic Product, Consumer Price Index)

The model is:

$$POR_t = \alpha + \beta_1 ODA_t + \beta_2 WRM_t + \beta_3 GDP_t + \beta_4 INF_t + \varepsilon_t \quad [3.1]$$

First, make the model standard log-log by taking the natural logarithm on both sides of the model except inflation rate i.e.

$$LPOR_t = \alpha + \beta_1 LODA_t + \beta_2 LWRM_t + \beta_3 LGDP_t + \beta_4 INF_t + \varepsilon_t \quad [3.2]$$

Where; the *LPOR* represents natural log of poverty as head count ratio (HCR) at US $1.90 per day income is used as measure of poverty, *LODA* stands for natural log of official development assistance as a percentage of gross domestic product, *LWRM* is the natural log of workers' remittances as percentage of gross domestic product, *LGDP* is the natural log of gross domestic product, INF is the inflation rate and ε_t is the white noise error term.

While employing ARDL model in present study, after knowing mixed order of integration found in time series variables and co-integration is checked through bound testing approach which confirmed that long run relationships existed between variables then the long run (4.3) and short run (4.4) models expressed below and estimated concurrently,

$$LPOR_t = c_1 + \sum_{i=1}^{a} \delta_{1i} LPOR_{t-i} + \sum_{i=1}^{b} \theta_{1i} LODA_{t-i} + \sum_{i=1}^{v} \pi_{1i} LWRM_{t-i} + \sum_{i=1}^{w} \sigma_{1i} LGDP_{t-i} + \sum_{i=1}^{y} \gamma_{1i} INF_{t-i} + \varepsilon_{1t} \quad [3.3]$$

$$\Delta LPOR_t = c_2 + \sum_{i=1}^{a} \delta_{2i} \Delta LPOR_{t-i} + \sum_{i=1}^{b} \theta_{2i} \Delta LODA_{t-i} + \sum_{i=1}^{v} \pi_{2i} \Delta LWRM_{t-i} + \sum_{i=1}^{w} \sigma_{2i} \Delta LGDP_{t-i} + \sum_{i=1}^{y} \gamma_{2i} \Delta INF_{t-i} + \lambda ECT_{t-1} + \varepsilon_{2t} \quad [3.4]$$

Whereby; a, b, v, w and y represent optimal lag lengths; Δ is the first difference operator, ε_{1t}, ε_{2t} are the disturbance terms and 't' stands for current time period. The "λ" in equation (4.4) is the Error Correction Term (ECT) coefficient, also referred as coefficient of adjustment which shows the amount of disequilibrium being corrected in preceding period. ECT_{t-1} represents adjustment of the short run shocks towards the long run equilibrium.

4. RESULTS AND DISCUSSIONS

4.1. Descriptive Analysis:

Table 1: Descriptive statistics of the selected variables

	POR	ODA	WRM	GDP	INF
Mean	26.43	2.01	5.06	4.88	8.27
Median	25.07	1.65	4.92	4.85	7.84
Maximum	36.10000	4.612594	10.24763	10.21570	20.28612
Minimum	17.60000	0.854920	1.453638	1.014396	2.539516
Std. Dev.	5.01	0.86	2.27	2.13	3.88
Observations	37	37	37	37	37

Table (1) demonstrates that the POR is 26.43 on average with standard deviation of 5.01. The average ODA is 2.01, WRM is 5.06, GDP is 4.88 and INF is 8.27 with variability of 0.86, 2.27, 2.13 and 3.88 respectively. During 1980 to 2016 the poverty, official development assistance, worker's remittances and inflation become maximum at 36.10000, 4.612594, 10.24763, 10.21570 and 20.28612 respectively. And respective variables tend to reach at minimum level i.e. 17.60000, 0.854920, 1.453638, 1.014396 and 2.539516 respectively. While the median or middle value of the Poverty is 25.07 and official development assistance is 1.65. Similarly, the median value 4.92 is captured for worker's remittances, 4.85 for gross domestic product and 7.84 for inflation as well.

4.2. Correlation Matrix and Variance Inflation Factors:

Table 2: Correlation matrix

Correlation Probability	**POR**	**ODA**	**WRM**	**GDP**	**INF**
POR	1.000000				

ODA	-0.340	1.000000			
	(0.040)	-----			
WRM	-0.386	0.284	1.000000		
	(0.018)	(0.088)	-----		
GDP	-0.428	0.421	0.463	1.000000	
	(0.008)	(0.010)	(0.004)	-----	
INF	-0.286	-0.002	-0.141	-0.182	1.000000
	(0.087)	(0.993)	(0.406)	(0.280)	-----

Table (2) reports that few variables having inverse and some having positive correlation with one another. The poverty (POR) having inverse relation with all variables such as official development

Assistance, worker's remittances, gross domestic product and inflation which is 34%, 38%, 43% and 29% correlation respectively and their probabilities are statistically significant that is less than 0.05 except Inflation. It may also observe that there's no presence of multicollinearity issue in this study advocated by the values of correlation in table 2. Likewise, Table (4.2.1) suggests that the problem of multicollinearity is not present in current study. Because each variable holds the value of variance inflation factor which is lower than 10 indicates that the model is devoid from the problem of multicollinearity.

Table 4.2.1: Variance Inflation Factors

Variables	VIF
REM	1.33
ODA	1.14
GDP	1.33
CPI	1.04

4.3. Results of Diagnostic Tests:

Table 3: Diagnostic tests results

Normality test	Jarque Bera test	**J.B statistic:** 0.703	**Prob.** 0.70
Serial correlation test	Breusch-Godfrey serial correlation LM test	**F-statistic:** 0.514	**Prob.** 0.617
Hetroscedasticity test	Breusch-Pagan-Godfrey test	**F-statistic:** 1.640	**Prob.** 0.211
Model specification test	Ramsey Reset test	**F-statistic:** 0.008	**Prob.** 0.93

The above Table (3), reveal all the results of diagnostic tests such as the p- value of Jarque Bera 0.70 is greater than 5% level of significance which confirms that data is normally distributed. The LM test applied to investigate the problem of serial correlation; the p-value of F-statistic tend to be insignificant because it is beyond 5% i.e. 0.617 suggests that our data is free from serial correlation issue. The result of hetroscedasticity test (i.e. Breusch P.G. test) shows that estimates are homoscedastic or there's no prevalence of hetroscedasticity in model. Likewise, Ramsey test confirms that the model is specified correctly.

4.4. Unit Root Test Results

Before applying ARDL technique, it is necessary to identify and confirm that all the variables under consideration are not integrated of the order, greater than one i.e. $I_{(2)}$ or above as a preliminary step, by making use of Augmented Dickey-Fuller (ADF) test (Dickey and Fuller; 1979). The ADF test results are depicted in Table (4) which demonstrates that all variables except for LPOR and LWRM are integrated of order one whereas LODA, LGDP, LINF are integrated of order zero. Since all variables are integrated of mixed order, using ARDL is most appropriate technique.

Table 4: Results of unit root test

Variables	*At level*			*At 1st difference*			*t-statistic*	*P-values*	Conclusion
	1%	5%	10%	1%	5%	10%			
LPOR	---	---	---	-2.633*	-1.951	-1.611	-6.103	0.000	$I_{(1)}$
LODA	-3.627	-2.946*	-2.612	---	---	---	-3.425	0.017	$I_{(0)}$
LWRM	---	---	---	-3.633*	-2.948	-2.613	-5.208	0.000	$I_{(1)}$
LGDP	-3.627*	-2.946	-2.612	---	---	---	-3.868	0.005	$I_{(0)}$
INF	-3.670*	-2.964	-2.621	---	---	---	-4.428	0.002	$I_{(0)}$

'*' Shows significance level.

Table (4) having the mix order of integration among desired variables. The LODA, LGDP and INF become stationary at level along with most significant p-values that are less than 5%. While the remaining two variables such as LPOR and LWRM proved stationarity at first difference. However, this mixture of co-integration orders of all variables addressing the ARDL technique.

4.5. Results of ARDL

To assessment of long-run relationship between headcount poverty, official development assistance, workers' remittances, gross domestic product and inflation the Bounds test approach is applied. The bound test makes use of F-test to test the null hypothesis of no cointegration against the hypothesis of cointegration. If the calculated F-statistic exceeds upper critical bound, it is in contradiction to null hypothesis, meaning that there is cointegrating relationship and vice versa. Because of small sample size (n=30-80), it is reasonable to use the critical values reported by Narayan (2004). Akaike Information Criterion (AIC) has been utilized to choose the optimal lag length for the model. The lags recommended by AIC for poverty as head count

ratio, official development assistance, workers remittances, gross domestic product and inflation are 4,4,3,4 and 3 respectively.

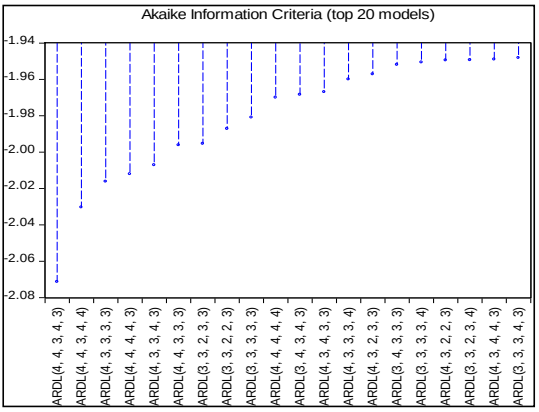

Figure 4.1: Optimal lag lengths of variables

Table 5: The bounds test results

F-statistic	4.319835	
Critical Value Bounds		
Significance	Lower Bounds (I_0)	Upper Bounds (I_1)
10%	2.2	3.09
5%	2.56	3.49
2.5%	2.88	3.87
1%	3.29	4.37

Table (5) extracts the results that value of F-statistic 4.319835 exceeds the upper bound value 3.87 at 2.5 percent level of significance confirming presence of significant long-run relation amid the variables of the model under consideration. Now, as long-run association between the said variables is ascertained, ARDL technique is applied to procure the long- and short-run coefficient results. The following tables (5.6) and (5.7) consist of short-run and long-run results respectively.

Table 6: Short run dynamics based on ARDL

Regressors	Coefficients	p-values
$\Delta LPOR_{t-1}$	0.856	0.003
$\Delta LPOR_{t-2}$	0.666	0.000
$\Delta LPOR_{t-3}$	0.342	0.052
ΔINF_t	-0.086	0.059
ΔINF_{t-1}	-0.180	0.010
ΔINF_{t-2}	-0.199	0.002
$\Delta LGDP_t$	-0.044	0.000
$\Delta LGDP_{t-1}$	-0.299	0.002
$\Delta LGDP_{t-2}$	-0.192	0.022

$\Delta LGDP_{t-3}$	-0.080	0.142
$\Delta LODA_t$	-0.109	0.088
$\Delta LODA_{t-1}$	-0.085	0.209
$\Delta LODA_{t-2}$	-0.217	0.103
$\Delta LODA_{t-3}$	-0.096	0.145
$\Delta LWRM_t$	-0.091	0.353
$\Delta LWRM_{t-1}$	0.330	0.004
$\Delta LWRM_{t-2}$	0.253	0.025
ECM_{t-1}	-0.206	0.000
Constant	8.636	0.001

$R^2 = 0.638$

Adjusted $R^2 = 0.431$

Durbin Watson Stat = 1.875 F-Statistic (overall significance of the model) = 3.086 {0.011}

The short run results of present study are reported in Table (6). Here it is revealed that lagged effect from poverty as head count ratio ($\Delta LPOR_{t-i}$) on current level of poverty ($\Delta LPOR_t$) in Pakistan is positive and significant. The inflation (ΔINF_t) contributed negatively to poverty ($\Delta LPOR_t$) that is a 1% increase in inflation (INF) leads to decrease the poverty by 0.086%. It is argued that as inflation raises which reduces the real wages from which unemployment shrinks and thus poverty alleviates (Cutler & Kutz, 1991; Cardoso, 1992; Datt & Ravallion, 2002; Clara, 2012). The negative impact emerged from gross domestic product ($\Delta LGDP_t$) for present level of poverty ($\Delta LPOR_t$) which is 0.043%. That is the expansion in gross domestic product decreases poverty in short run (Paterno *et al.* 2011; Ali *et al.* 2011; Ammara *et al.* 2012; Mehmood *et al.* 2014). As for as official development assistance is concerned, the present study reveals an inverse relationship between official development assistance (ODA) and poverty (POR) but tend to be statistically insignificant. The same result explored by (Mehmood and Faridi, 2014). And the past year's coefficients of official development assistance ($\Delta LODA_{t-i}$) having negative signs but mostly insignificant for head count poverty (ΔPOR_t). Finally, the short run association between worker's remittances ($\Delta LWRM_t$) and poverty (ΔPOR_t) is found to be negative but insignificant. Because the income of the remittances takes time to implement and then may alleviate poverty but due to short period of time the respective remittances can't exhibits developments immediately (Irfan, 2011; Umaima *et al.* 2012; Hussain *et al.* 2015). While previous years effect of worker's remittances ($\Delta LWRM_{t-i}$) on current poverty found to be positive and significant. This statement is similar to Azam *et al.* (2016). The reason is that since the remittance's income are implement properly during more than one year. So, along with other benefits respective remittances raise inflation (Roy *et al.*

2014) and this rising inflation enhances poverty (Romer & Romer, 1998; Pervaiz *et al.* 2011; Mehmood *et al.* 2014). The ECM_{t-1} coefficient is the speed of adjustment and exhibits the pace of recovery towards long run equilibrium which is -0.206 indicating that disequilibrium in the last year head count poverty will be adjusted or corrected in current year with speed of 21% while the significance of ECM_{t-1} suggesting the existence of cointegration between proposed variables. The model is good fit as unconcealed by observed R^2 and adjusted R^2.

Table 7: Long run coefficients based on ARDL (4,4,3,4,3)

Regressors	Coefficients	p-values
INF_t	-0.212	0.000
$LGDP_t$	-0.230	0.017
$LODA_t$	-0.070	0.189
WRM_t	-0.093	0.012
Constant	4.188	0.000

Table (7) indicates the long- run findings of current study. The inflation (INF) is adversely and significantly interrelated with poverty (POR). Other things remaining the same, a 1% rise in inflation is expected to enhance the poverty by 0.21 percent. Grier and Tallack (1989); De-Gregorio (1993) and Fischer (1991) showed the negative impact of inflation for poverty. This outcome can be reasoned by different grounds. The inflation lowers down the real wages which creates more jobs. As a result, unemployment shrinks and hence poverty alleviates argued by Romer & Romer (1998), Ahmad & Golam (2005) and Talukdar (2012). Furthermore, in 2010 the UN Report occurred on world social situation in which it is mentioned that inflation slowdowns the real wages which raises the level of employment in the economy. Hence for the workers the additional income earnings opportunities disclose. So that the inflation effects the employment (more jobs are launch at lower cost of labor) and thus poverty shrinks. Secondly, it is also reasoned that as majority of the poor people are net borrowers (or debtors), with inflation the real value of respective debt decreases. So, in such a way the inflation having inverse and indirect relation with poverty. Whereas the coefficient of gross domestic product (GDP) indicates that economic growth has negative and significant impact over poverty in Pakistan. It implies that if all the other things remaining unchanged, the 0.23% of people resides below the poverty line reduced by adding Pakistani rupees of 100 in per capita income.

Numerous studies document inverse association between poverty and economic growth such as Ali *et al.* (2011), Ammara *et al.* (2012) and Ayad (2016). Moreover, the result of the study suggests that official development assistance (ODA) has a statistically insignificant and negative impact over the poverty. Similar result has been explored by Mehmood *et al.* (2014). The result can be justified on following grounds. Firstly, the improper utilization, mismanagement and corruption are the major causes of ineffectiveness of official development assistance in Pakistan (Anwar *et al.* (2009). The equivalent arguments are also given by Boone (1996), Kraay *et al.* (2005) and Masud *et al.* (2005). According to Professor Deaton (2013); the official development assistance can contribute to alleviate poverty, but the major portion of official development assistance is used to return the previous debts. It is also suggested that the presence of official development assistance led to corruption and hence rarely poverty emerged. Hence, the given official development assistance turns into more harmful than advantageous, in Pakistan[4]. As far as the relation between worker's remittances and poverty is concerned, it has been found that, with increase in worker's remittances by 1 percent decreases poverty by 0.093 percent. The same results conducted by Hassan (2010), Irfan (2011), Umaima *et al.* (2012), Ratha (2013), Kundu (2013), Mehmood *et al.* (2014) and Dr. Hussain (2015). Similarly, Raza (2008) revealed from its study that remittances income boosts up the demand for local market products and the supply also need to be rise. So, in this way the new jobs emerge, and unemployment shrinks which assists in alleviating poverty indeed. Finally, stability of the model's parameters has been scrutinized via application of Cumulative Sum of Recursive Residual (CUSUM) and Cumulative Sum of Squares of Recursive Residual (CUSUMQ) techniques. The movement path of test statistics is lying within the limits of critical bounds. So, the model is stable and reliable Fig (5.2) and (5.3).

[4] Professor Deaton is an expert at global poverty and official development assistance. His opinions were published in Dawn report (2013). https://www.dawn.com/news/1053902.

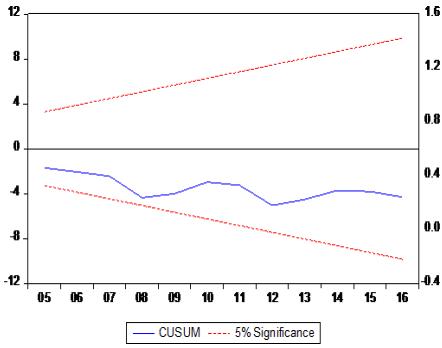

Figure 4.2

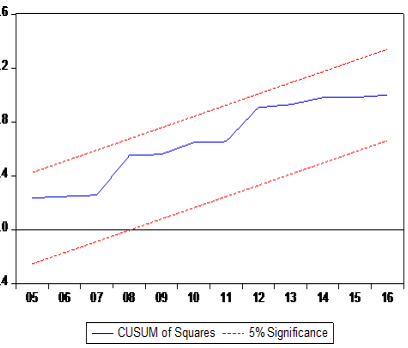

Figure 4.3

5. CONCLUSION AND POLICY RECOMMENDATIONS

Workers' remittances have been regarded as the most sustainable source and mainstream of external finance for many developing nations like Pakistan. These remittances become more than foreign direct investment, export earnings and other official aids and assistance. Migrants' remittances improve the economic growth and bring down the poverty rate (which is severe and chronic issue) in recipients' countries and provide capital for better education and human capital. Various factors are used along with worker's remittances in the determination of poverty, available in bulk of literature. However, the current study aims to check the impact of worker's remittances with some other variables such as inflation, gross domestic product, official development assistance and worker's remittances on poverty alleviation in Pakistan during the time span of 1980-2016. First of all, the stationarity properties of the data have been checked through ADF test. Since present study having the size of small sample then the Auto-regressive Distributed Lag approach has been used to obtain the short run and long run estimates. Various relevant diagnostic tests fulfilled to produce the results, stable and more realistic. The existence of co-integration between variables verified by bounds test. According to the long run results all the respective variables are found to be statistically significant for poverty reduction except official development assistance and all hold the negative coefficients signs. The short outcomes are accordance with the long run outcomes except worker's remittances and official development assistance. The short run results reveal that increase in gross domestic product and inflation rate negatively impact

the poverty as head count ratio in the short run. Whereas the official development assistances and worker's remittances holding negative signs but their impact for poverty is insignificant. The error correction term (ECT) with negative sign of its coefficient and statistically significant displays the pace of adjustment of the model in long run, hence ratifying the accuracy of the model. The key findings of the main model in study are that inflation, gross domestic product and workers' remittances are associated negatively and significantly while the official development assistance has negative and insignificant link with head count poverty.

Thus, empirical results of present study suggest the following recommendations. It is suggested that government should formulate and implement the policies from which the remittances income may fairly use such as in the field of production, investment that will enhance the economic growth and yield protection nets for poor and eventually lessen the level of poverty. Furthermore, government should design suitable mechanism regarding youth skill development particularly for rural regions and offer accurate licit opportunities to work in foreign parts and send back the remittance's income to homelands for objective of improving the poor masses. In less developed economies like Pakistan the worker's foreign migration is a sustainable and advantageous source and has widen and inflate impact over the economy. Hence, the government evolves a policy with respect to lower the cost of transaction by means of formal channels over transferring the remittances amount. As far as the official development assistance is concerned, it is also one of the major sources to feed the developing countries including Pakistan. The government and policy makers should concentrate on the accurate allocation of international assistance with rigorous accountability by lessening deficits in budget, reduce the inflation, boost the common people lives standard and alleviate the poverty.

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