

Workers' Remittances Inflows And Per Capita Income: Does U-Shaped Relationship Exist In Case Of Pakistan?

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Abstract

This study empirically investigated existence of U-Shaped relationship between workers' remittances inflows(WRI) and per capita income(PCI) in Pakistan. WRI can increase or decrease growth in per capita income depending on whether positive effects outweigh negative effects or vice versa. It is possible that in initial phase remittances affect growth negatively and in the later phase positively or vice-versa implying non-linearity. The study applied Johansen's Cointegration method to find long run relationship among variables using time series annual data from 1991-2017. The Error Correction Method was used to reconfirm long run relationship. The sources of time series data were World Development Indicators, World Bank and Pakistan Labour Force Survey (Various issues), Pakistan Bureau of Statistics. The results indicated that at first stage WRI affect per capita income negatively and later on after threshold level (WRI as percentage of GDP equal to 2.34) affect positively thus confirming existence of U-shaped relationship in case of Pakistan. The negative and significant coefficient of lagged ECM term in short run model confirmed convergence of the series towards equilibrium. It takes time for the benefits of WRI to outweigh their costs in the developing countries. The policy implication of the study is that optimal use of WRI is important for improvement in PCI in Pakistan. Policy makers need to understand nonlinear relationship where remittances affect growth positively after achieving certain threshold level.

Keywords: Workers' Remittances, Per Capita Income, Cointegration, Time Series, U-Shaped Relation

INTRODUCTION

Workers' remittances inflows (WRI) are unrequited current transfers which are the sum of personal remittances and compensation of employees. WRI are considered an important and stable source of funds for developing countries like Pakistan. They have grown to become one of the largest sources of financial inflows in developing countries. Globally, \$702 billion remittances were received in 2020 and \$540 billion were received by low-and middle-income countries (LMIC). Pakistan received \$26 billion and ranked 6th largest recipient of remittances. The top remittance receiving countries in dollar terms were India

(\$83b), China (\$60b), Mexico (\$43b), Philippines (\$35), Egypt (\$30b), and Pakistan (\$26b). (Migration and Development Brief, 34).

Current account deficit in Pakistan during FY 2019 was recorded US\$ 13.43 billion that was mainly caused by trade deficit of US\$27 billion which resulted depletion of foreign exchange reserves and depreciation of rupee. However, WRI of \$21billion during FY2019 acted as an important source of curtailing current account deficit. During FY 2020 WRI in Pakistan increased to US\$23.1billion and expected to approach **US\$30 billion in FY2021**. During COVID19 period, high inflow of workers

remittances helped to manage shortage of foreign exchange inflows thus proving largest and most stable source of foreign exchange for Pakistan.

Pakistan received a major proportion of remittances from a few remittance source countries. The major remittance source economies included Saudi Arabia, UAE, UK

and USA which contributed almost 76 percent of total remittance share. Among them, Saudi Arabia is the largest remittance source economy which contributed 23 percent of remittance inflow (see Table 1). Any shock to these economies affects the foreign exchange inflows and growth of Pakistan.

Table 1: Country-Wise Share of Remittances' Inflows in Pakistan

Countries	1980s	1990s	2000s	FY2019
Saudi Arabia	46	40	18	23
UAE	11	12	18	21
USA	6	11	26	16
UK	8	9	8	16
Others	29	28	30	24

Source: Various issues of SBP's Annual Report

The inflow of remittances is highly associated with the external conditions of remittance source economies. During the mid-1970s, Pakistan was considered among the high labor exporting to the Middle East. During the 1970s the average official remittances reached to 3.9 percent of GDP, whereas, during 1980s remittances reached 7.5 percent of GDP. The possible justification for high remittance flow was a significant increase in the trend among workers to go abroad. However, this trend reversed during the 1990s due to the reduction in oil prices and economic recession in major oil-importing countries. During 2000s average remittances received as percentage of GDP stood at 3.8 percent of GDP. More recently, official remittances again picked up and reached the level of 6.7 percent of GDP due to high growth in major remittance source economies.

There are a number of positive impacts of WRI. These inflows tend to solve balance of payment problem by providing foreign exchange to the receiving countries. WRI finance consumption at household level and help the families to meet their basic needs thus

they tend to decrease poverty, (Beaton et al., 2018). Besides positive effects of WRI there are negative effects also. WRI tend to decrease labor force participation because of labor migration. Moreover, WRI cause to decrease labor force participation because of moral hazard problem as workers in the family leave jobs when they receive remittances. They also create problem of 'Dutch disease' Chami et al. (2018). Mughal and Makhoulf (2011) argued WRI decreased the competitiveness of export sector and increased the share of non-tradeable sector in Pakistan.

Whether remittances promote growth in the long run or not it depends upon households' preferences between consumption and savings. Remittances augment total disposable incomes of the households, which affect consumption expenditures and savings of the households. As a result, consumption expenditures to GDP and national savings rise at aggregate level. The rise in national savings cause to rise in gross fixed investment to GDP ratio that leads to rise in capital accumulation. If remittances are merely used for unproductive consumption,

then they will not boost growth in the long run. If WRI are saved for productive investment in human and physical capital, then they can affect growth positively.

WRI can affect growth mainly through three channels: capital accumulation, labor force participation and total factor productivity. WRI affect capital accumulation through easing financial constraints of recipient households, generating savings and investment. However, in the initial phase recipient households use this money for consumption purposes, investing on health and education and mainly on repayment of the migration debt. In the first phase, savings are negative but when the migration debt is payed savings become positive in second phase that contribute to long run economic growth. These saving dynamics over the period of time give explanation of U-Shaped relationship between WRI and economic growth. WRI can also affect growth through total factor productivity. Remittances spent on acquiring education and health lead to higher rate of human capital accumulation that gives rise to total factor productivity and thus growth. Recent literature has found evidence for both U-shaped and inverted U-shaped relationship between WRI and economic growth (Hassan and Shakur, 2017; Hassan, Chowdhary and Bhuyan, 2016; Kumar, Stauvermann, Kumar and Shahzad, 2018).

In case of Pakistan, there are many studies which have measured the effects of WRI on economic growth and most of them found positive impact of remittances on growth. A few studies have also investigated negative macroeconomic implications of WRI in Pakistan. However, less attention was given to non-linear growth effects of WRI. To fill the existing gap in the empirical literature for Pakistan, the current study investigated existence of U-Shaped Relationship (USR) between WRI and per capita income using time series data from 1991-2017.

LITERATURE REVIEW

Chami et al. (2005) has comprehensively reviewed the role played by workers' remittances inflows (WRI) in the growth of economies. The study highlighted that the motivation for WRI played a crucial role in determining the exact relationship between WRI and economic growth. The study argued that WRI have negative consequences for GDP per capita as WRI are compensatory transfers and used as substitute of labor income.

Konte (2014) analyzed relationship between WRI and economic growth in developing countries for the period 1970-2010. The study assumed different countries follow different growth regime and the impact of WRI depends upon the answer to which growth regime a country belongs. Beside GDP per capita and WRI, inflation, investment, trade openness and population growth were included in the model. The study used liquid liabilities, an index of broad money and an index for domestic credit, all three variables were taken relative to GDP.

Bouoiyour, Selmi and Mifah (2016) found that WRI have countercyclical behavior in Tunisia. In the short run, WRI have positive relationship with consumption and negative relationship with investment and growth, whereas, WRI have positive effects on growth in long run. Hassan et al. (2016) found that there exists U-shaped relationship between WRI and economic growth. Remittances have negative effects on growth until the remittances to GDP ratio is eight percent and when the ratio exceeds 14 percent growth effects of WRI become positive. The study concluded that it takes time for the benefits of WRI to outweigh their costs in the developing countries like Bangladesh.

Hassan and Shakur (2017) investigated nonlinear association between WRI and per capita growth. WRI affected growth negatively at first stage but at later stage WRI affect growth positively. The justification of this nonlinear relationship was that in the first stage unproductive use of WRI was seen while in

later stage WRI were utilized productively in Bangladesh.

Chami et al. (2018) have assessed WRI curtail labor force participation and increase informality of labor supply whereas on the demand side WRI reduce unemployment. Beaton, Catao and Koczan (2018) found WRI are least volatile component of balance of payment. The countries that receive more amount of WRI experience less volatility in their current accounts compared to those countries which receive less amount of WRI.

Kumar, Stauvermann, Kumar and Shahzad (2018) explored the effects of WRI on the total factor productivity (TFP) in Bangladesh and India for the period 1980-2012 and 1977-2012. Results of the study found long run association between WRI and TFP. The study confirmed U-Shaped Relationship (USR) between WRI and TFP in Bangladesh while an inverted USR between WRI and TFP in India. Both countries have different tipping points of WRI with Bangladesh 5.3% and India 1.8% as percentage of GDP.

This study has tested nonlinear relationship between WRI and Per Capita Income to fill the existing gap in the empirical literature related to Pakistan. A large body of previous literature has investigated the impact of WRI on growth and other macroeconomic variables but less attention has been given to nonlinear relationship. Among these studies, Ahmed, Zaman and Shah (2011) examined the effects of WRI, exports and broad money supply on economic growth in Pakistan using time series data for the period 1976-2009. The estimation results based on ARDL approach showed that WRI have significant relationship with growth. Khan, Rahim, Bakhtiar and Nawab (2007) investigated the association between workers' remittances and consumption by taking data for years 1980-81, 1990-91, 2000-01, 2003-04 and 2004-05. The study argued that WRI are mainly used for consumption purposes. Marginal propensity to consume (MPC) was

found 0.84%, which means 84% of the remittances are consumed in Pakistan. Mughal and Makhoul (2013) studied the impact of WRI on labor market in Pakistan by using 2007-2008 data from Household Integrated Economic Survey (HIES). Using Probit Model and Propensity Score Matching techniques, the study found negative association between WRI and labor force participation. Moreover, strong negative impact of WRI on women and young age in rural areas compare to urban areas was seen.

Ahmad, Ahmad and Hayat (2013) probed the association between WRI and economic growth of Pakistan using data for the period 1978-2011. Remittances, economic growth, FDI, inflation and exchange rate were included in the model. The study found that WRI have direct and significant relationship with GDP. The results showed that 1 percent increase in WRI leads to rise in GDP by 0.25 percent.

Shafqat, Ahmad and Bano (2014) illustrated the contribution of WRI in the growth of Pakistan during the period 1991-2010. The study incorporated WRI, GDP per capita M2, gross domestic savings, current account balance and household final consumption expenditures in the regression. Except GDP per capita other variables were taken as a percentage of GDP. The findings showed a positive association between WRI and per capita GDP growth in Pakistan. Similarly, Hussain and Anjum (2014) found the relationship between WRI and GDP growth.

Jebran, Abdullah, Iqbal and Ullah (2016) estimated the effects of WRI on per capita economic growth of Pakistan for the data period 1976-2013. Besides GDP per capita and WRI, gross capital formation and exports were included in the model. ARDL technique was used to estimate the model. The study found there exists significant and positive association between GDP per capita and WRI in Pakistan. Investment and exports were also found

positively and significantly related to GDP per capita.

Munir, Mureed, Dar and Gardezi (2016) conducted a study for estimating the impact of WRI on growth for the period 1980-2014 in Pakistan. FDI and human capital (HC) were used as control variables in the model. By using Johansen Cointegration and Granger causality test, the long run association among WRI, economic growth, FDI and HC was found significant and unidirectional causality running from WRI to economic growth was found.

RESEARCH METHODOLOGY

The study used following model inspired by Hassan and Shakur, (2017) to empirically test USR regarding WRI and PCI in Pakistan for the data period 1991-2017.

$$Y_t = \beta_0 + \beta_1 WRI_t + \beta_2 M2_t + \beta_3 OPEN_t + \beta_4 GCE_t + \beta_5 LFPR_t + \mu_t \dots\dots\dots(1)$$

Where Y_t is the per capita income, WRI is our core independent variable that is remittances to GDP ratio, $M2_t$ is broad money supply to GDP ratio, $OPEN_t$ is imports plus exports to GDP ratio, GCE_t is government consumption expenditure to GDP ratio and $LFPR_t$ is labor force participation rate. To capture the role of domestic financial development and government size in the growth process we have added $M2$ and GCE , respectively.

To capture the nonlinearity between Y_t and WRI_t we have added square of Workers' Remittances Inflows (WRIS) in equation (2).

$$Y_t = \beta_0 + \beta_1 WRI_t + \beta_2 M2_t + \beta_3 OPEN_t + \beta_4 GCE_t + \beta_5 LFPR_t + \beta_6 WRIS_t + \mu_t \dots\dots\dots(2)$$

Different signs of estimated β_1 and β_6 imply non-linearity between WRI_t and Y_t . In above equation, U-Shaped Relationship between WRI_t and Y_t is proved if estimated β_1 and β_6 have negative and positive signs, respectively. In USR case, minimum threshold level of remittances is estimated which indicates

remittances are growth enhancing for amounts greater than the minimum threshold level. If estimated β_1 and β_6 have positive and negative signs, respectively then the inverse U-Shaped relationship may hold. In case of inverse USR, maximum amount of remittances is estimated as threshold level which implies remittances above than threshold level is growth retarding.

If estimated $\beta_6 = 0$ then there exists linear relationship between Y_t and WRI_t either positive or negative depending upon the sign of β_1 . For the estimation of threshold level of WRI, following Kumar and Stauvermann (2016) we take first order partial derivative of Y_t with respect to WRI_t that is $\frac{\partial Y_t}{\partial WRI_t} = \beta_1 + 2\beta_6 WRI_t$. By setting first order partial derivative equal to zero and then solving for WRI_t we get..... $WRI_t = (-\beta_1) / (2\beta_6)$ as threshold level of WRI.

At threshold level, if second partial derivative of equation $\frac{\partial^2 Y_t}{\partial^2 WRI_t} > 0$ then the function is said to be minimum implying U-Shaped Relationship while if $\frac{\partial^2 Y_t}{\partial^2 WRI_t} < 0$ then the function is maximum implying inverse U-Shaped Relationship between Y_t and WRI_t .

The selection of explanatory variables in our empirical model are mostly inspired by Hassan and Shakur (2017). WRI_t can affect Y_t positively or negatively; it depends upon their productive and unproductive uses. There are a number of positive implications of WRI on economic growth at macro level. WRI provide foreign exchange and give strength to balance of payment. They are considered very important for economic stabilization in Pakistan. They curtail current account deficit of the economy in the presence of huge trade deficit and provide support to the country's precarious current account balance.

WRI increase consumption and savings at household's level. Khan, Rahim, Bakhtiar and Nawab (2007) found marginal propensity of consumption of 0.84, meaning that 84% of the

WRI are consumed and rest is saved in Pakistan.

There are a number of negative implications of WRI also as they cause to appreciate local

Table 2: Descriptive Statistics

Statistics	PCI	WRI	OPEN	LFPR	M2	GCE
Mean	948.7	4.20	32.98	30.42	48.85	10.62
Median	923.9	3.93	32.93	30.41	48.20	10.51
Maximum	1225.3	7.13	38.74	32.98	58.86	14.31
Minimum	757.8	1.45	25.30	27.46	38.59	7.78
Standard.dev	137.7	1.78	3.57	2.02	5.55	1.64
Skewness	0.33	0.18	-0.44	-0.07	-0.05	0.11
Kurtosis	1.80	1.88	2.62	1.40	2.23	2.58
Jarque-Bera	2.09	1.55	1.06	2.86	0.67	0.24
Probability	0.35	0.45	0.58	0.23	0.71	0.88

Source: Author's calculations.

currency thus make imports cheap and exports expensive. Makhoulf and Mughal (2011) tested the Dutch disease phenomenon in Pakistan and found WRI decreased the competitiveness of export sector and increased the share of non-tradeable sector in the economy.

They also deteriorate social balance and affect family structure. There are some studies which argued WRI have negative association with human capital formation in case of Pakistan. Hassan, Mehmood and Hassa (2013) found absence of father gives freehand to children and they indulge in negative activities due to negligence of parental care.

WRI cause the problem of brain drain, as highly skilled workers migrate to foreign countries it results in low productivity in the country and it also decreases work force which negatively affect growth. Mughal and Makhoulf (2013) found negative association between WRI and labor force participation.

But as WRI not necessarily have linear relationship with growth so it can be possible that in first stage WRI affect growth negatively

and after some period positively or vice versa. In the first case, USR will exist and in the later case inverse USR can exist respectively. It will depend upon relative strength of both opposite forces negative and positive. In case of Pakistan there is probability of existence of USR between WRI and Per Capita GDP as well

as existence of inverse USR.

Among control variables, LFPR is expected to affect PCI positively. Remaining control variables can affect Y_t positively or negatively. Financial development has expected positive and significant impact on growth. Moreover, it is argued that WRI can affect growth positively in the countries having less developed financial sector rather in countries having strong financial sector. Trade openness can affect

growth positively through increase in capital accumulation, domestic investment and by increase in productivity through technology transfer (Grossman and Helpman, 1991). Openness can have negative implication for remittances led growth as in the literature it is discussed that in more integrated economies remittances do not affect growth positively. So, this variable can have positive or negative relation with per capita income. Another control variable governmental expenditure can decrease the per capita income if it is unproductive. So, this variable can affect per capita income negatively or positively depending upon preferences of government

regarding productive and unproductive expenditures.

except labor force participation rate (LFPR) which is taken from Pakistan Bureau of Statistics (PBS).

The data sources of all the variables is World Development Indicators (WDI), World Bank

RESULTS

Table 3: ADF Test Results (t values)

Variable	Level	First difference	Decision
WRI	-0.72 (0)	-4.41***(0)	I(1)
WRI ²	-0.50 (0)	-4.16***(0)	I(1)
GCE	-2.46 (0)	-5.13***(0)	I(1)
LFPR	-1.05 (0)	-5.19***(0)	I(1)
OPEN	-1.20 (0)	-5.93***(0)	I(1)
PCI	1.20 (0)	-2.73* (4)	I(1)
M2	-1.60 (0)	-4.10*** (0)	I(1)

Note: *** shows significance at 1%, ** shows significance at 5%, * shows significance at 10% level of significance. Values in parenthesis show optimal lag length selected by SIC.

Table 2 shows that all probability values of Jarque Bera test are greater than 0.05 thus confirming normality. Table 2 shows the results of ADF test to check stationarity of the variables. Our findings show that at first difference absolute value of ADF-Stat is greater than critical values so all variables are integrated of order one i.e. I(1).

In the next step, to apply Johansen cointegration test, the optimal lag length 2 was

determined through SIC, HQ, AIC and FPE lag selection criteria applied on Vector Autoregressive (VAR) model as presented in Table 4. The results of Trace test and Maximum Eigenvalue tests given in Tables 5a and 5b showed existence of cointegration among selected variables. The results confirmed existence of 4 cointegrating equations at the 0.05 level of significance. By normalizing cointegration vector with respect to PIC, the long run relationship was obtained as reflected in Table 06.

Table 4: VAR Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-468.27	NA	4594145	35.20	35.54	35.30
1	-300.15	236.61	768.591	26.38	29.06	27.18
2	-206.10	83.59*	64.814*	23.04*	28.08*	24.54*

Note: * shows optimal lag length, Author's own calculations.

Table 5a: Johansen's Cointegration Test Results (Rank Test, Trace)

Hypothesis Number of CE(s)	Trace	Test statistics	
		0.05 Critical Value	P value

None*	212.8825	125.6154	0.0000
At most 1*	143.2210	95.75366	0.0000
At most 2*	94.32366	69.81889	0.0002
At most 3*	59.66570	47.85613	0.0027
At most 4	28.98374	29.79707	0.0618
At most 5	12.18441	15.49471	0.1483
At most 6	0.781764	3.841466	0.3766

Source: Author's calculations.

Table 5 b: Johansen Cointegration Test Results (Rank Test, Maximum Eigenvalue)

Hypothesis		Test statistics	
Number of CE(s)	Max Eigen	0.05 Critical Value	P value
None*	69.66148	46.23142	0.0000
At most 1*	48.89738	40.07757	0.0040
At most 2*	34.65796	33.87687	0.0403
At most 3*	30.68196	27.58434	0.0194
At most 4	16.79933	21.13162	0.1817
At most 5	11.40265	14.26460	0.1351
At most 6	0.781764	3.841466	0.3766

Trace test indicates 4 cointegrating equations at 5 percent level of significance, * denotes rejection of the null hypothesis at 5 percent level of significance.

Table 6: Long Run Results

Dependent Variable: PCI			
Variables	Coefficient	Standard error	t-Statistics
WRI	-95.44	14.96	-6.37
WRIS	20.41	1.86	10.92
OPEN	15.24	2.78	5.48
LFPR	4.60	3.90	1.18
M2	-1.02	0.96	-1.06
GCE	-24.91	3.57	- 6.97

Authors' own calculations.

Table 7: Short Run Analysis

Dependent Variable: DPCI				
Variables	Coefficient	Std. Error	t-statistic	Prob.
DWRI	30.22	14.26	2.11	0.04

DWRIS	-4.98	1.89	-2.62	0.01
DOPEN	-1.26	0.94	-1.34	0.19
DLFPR	-2.29	4.59	-0.49	0.62
DM2	-1.46	1.06	-1.38	0.18
DGCE	12.11	3.63	3.32	0.00
C9	15.77	3.70	4.26	0.00
DUM1997	-36.15	12.62	-2.86	0.01
ECM (-1)	-0.13	0.03	-3.88	0.00
R ²		0.74		
ADJ R ²		0.61		
S.E of Regression		10.9		
F-Statistic		5.53		
Prob.(F-Statistic)		0.00		

Source: Author's own calculations.

DISCUSSION

Table 6 showed that all the coefficients of explanatory variables except LFPR and M2 are statistically significant ($t\text{-stat} > 2$). The sign of the coefficient of WRI is negative while the sign of coefficient of WRIS is positive which supports the U-shaped relationship between Workers' remittances Inflows (WRI) and Per Capita Income (PCI). Our results are similar to Hassan, Chowdhary and Bhuyan, 2016) which found U-shaped relationship between remittances and total factor productivity in Bangladesh.

In the initial stage, majority of remittances are used for consumption by households, investing on education and health and retiring debt caused by migration cost which has initially negative consequences for PCI. In initial phase, MPC is high that is why less is saved but with the passage of time when migration debt is payed, savings become positive. In the later years, households use these savings for productive investment and also realize benefits of investing in human capital during the first stage. Remittances spent on acquiring education and health lead to higher rate of human capital accumulation that gives rise to total factor productivity and thus economic growth (Chami, et al. 2009).

Among control variables trade openness is found positively and significantly related to per capita income. Openness can affect growth through many channels such as by achieving economies of scale, enlarging the productive capacity of the economy, adopting new technology and enhancing efficiency. Estimated value of OPEN is 15.24 which means if trade as a percentage of GDP increases by one-unit, per capita income will increase by 15.24 dollars. A number of previous studies have also found positive association between trade openness and economic growth in Pakistan (Din, Ghani and Siddique, 2003; Umer, 2014; Ahmad, Raza and Saher, 2017).

Government consumption expenditures (GCE) are found negatively associated with Per capita income with coefficient value of -24.91. If GCE as a percentage of GDP increases by one-unit, Per Capita Income will decrease by 24.91 dollars. In case of Pakistan, government put their larger proportion of consumption expenditures on non-development purposes which do not directly influence growth. Barro (1990) argued that unproductive expenditures of government can decrease the productivity.

As we have measured non-linear relationship between WRI and PCI to get the tipping point of WRI we incorporated the long run results of

VECM into equation 2. By taking first derivative of equation 2 with respect to WRI and then equating to zero we got tipping point of remittances 2.34 as a percentage of GDP. To check whether this tipping point is maximum threshold level of remittances or minimum threshold of remittances we took second derivative of equation 2. By taking second derivative we came to know that the tipping point is minimum threshold level of remittances. Our results confirm U-Shaped relationship between WRI and PCI. This minimum threshold level of remittances of 2.34 implies that amount of remittances below this threshold remittances decrease PCI while value above than threshold affects PCI positively.

The coefficient of lagged error term ECM (-1) in the short run model is found negative and significant (-0.13) which shows moderate speed of adjustment to equilibrium. In our results, adjusted R² value is 0.6 which indicates 60% of the variations in the dependent variable PCI is being explained by explanatory variables. The probability value of F-statistic is less than 0.05 which implies the significance of joint effect of explanatory variables on explained variable. Our results are supported by standard diagnostic tests, such as normality, serial correlation, heteroskedasticity and stability tests.

CONCLUSION

Our model includes per capita income as a dependent variable while explanatory variables are workers' remittances inflows, trade openness, government consumption expenditures and labor force participation rate. To capture the non-linearity between WRI and per capita income we added square of remittances inflows (WRIS) as an explanatory variable inspired by Hassan et al. (2017). We conducted ADF test to check the stationarity of the variables. The results of the study indicated existence of U-shaped relationship between WRI and PCI in Pakistan. In the first stage, WRI affect per capita income negatively while in the second stage WRI affect PCI positively.

From the long run results, the study measured threshold level of WRI which is 2.34 as a percentage of GDP. The threshold level implies that the amount of WRI as percentage of GDP less than 2.34 affects Per Capita Income negatively while WRI above 2.34 level affects Per Capita Income positively.

As findings of this study suggest existence of non-linear relationship between WRI and PCI, government should incorporate this evidence of nonlinearity in the remittances-growth nexus and design such policies that are suitable in short run as well as in the long run. This study has measured threshold level of WRI as 2.34 percentage of GDP. Pakistan has achieved WRI as 6% of the GDP well above threshold level of 2.34. So, there exists much opportunity for the government to enhance PCI by increasing the amount of WRI. In this context, government should design such programs which try to limit migration cost as well as remittances sending cost. Moreover, government should design such policies that attract remittances receiving families to use their remittances in productive investment in human as well as in physical capital.

When remittances will be used for productive investment, employment opportunities will generate which will cause to raise labor force participation rate, resultantly Per Capita Income (PCI) will also rise. Thus, WRI will be proved beneficial for investing families as well as the economy at macro level.

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