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The Macroeconomic Determinants of Remittances in Pakistan

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ABSTRACT: *This study attempts to explore the relationship between remittances and the macroeconomic variables of Pakistan using gravity model for the period 2002–2013. The bilateral remittances from twenty-three major source countries were selected, which covered 90 percent of total remittances. The key findings of this study reveal that the economic performance of home countries has a positive and significant impact on remittances as revealed in migrants' investment behavior. Moreover, the flow of remittances to Pakistan responds mainly due to the macroeconomic variables of remittance-receiving countries instead of the remittance-sending countries. Consequently, remittance receipts have become an important factor in promoting the economic growth of Pakistan. It is thus suggested that Pakistan should diversify migration destinations to stabilize remittance flows, promote the transfer of skilled migrants, improve the remittance transfer system, and use advanced technology to decrease the cost of remittance.*

Key words: *Remittances, Gravity model, Macroeconomic variables*
JEL Classification: *F22 F24 F31 G15*

1. Introduction

Remittances play a significant role in stabilizing the external sector, make up for the import bill and the cover current account deficit. Unfortunately Pakistan has failed to put the inflow of remittances to her own best use and has been unable to use its financial resources efficiently to generate a developmental momentum. Moreover, Pakistan has been facing a serious scarcity of foreign exchange for a long time and remittances may fill this gap. To effect structural changes in Pakistan's economy, remittances can provide a large amount as financial resources.

Before the 1980s, the inflow of remittances was limited in Pakistan. However, the flow of remittances significantly increased during the 1980's decade. The reason was substantial flows of bilateral aid to Pakistan following its alliance with the US in the wake of the Soviet Union's invasion of Afghanistan. This decade also saw the boom in the Middle East, which attracted a significant number of skilled and unskilled workers from abroad. As a result, the inflow of remittances to Pakistan increased. This is recognized as the period when the role of remittances in helping to revive Pakistan's economy and increase its household income started. GDP growth in this decade increased to 6.5 percent, the manufacturing sector contributed 8.2 percent and the agriculture sector added 5.4 percent. The headcount ratio was reduced up to 21 percent and the Gini coefficient drifted at around 0.37.

The 1990s decade is known as the "lost decade" of Pakistan's economy, and it was characterized by the lowest growth in its history, while welfare indicators such as headcount ratio and inequality deteriorated and unemployment increased. The major cause of this deterioration was the macroeconomic instability and lack of consistency in public policies due to frequent changes in the government. GDP growth in the 1990s came

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down to an average of 4.6 percent, and the investment-to-GDP ratio was 18.3 percent. Besides this, the fiscal-deficit-to-GDP ratio increased to 6.9 percent; poverty level and the Gini coefficient both increased to 27.3 percent and 0.39, respectively.

In the beginning of 1990s, the Gulf adversity and slowdown in construction activities declined the earning opportunities for workers and also influenced supply of unskilled Pakistani workers to the Middle East which decreased the remittances flow. A rapid turn down in remittances can be noticed during 1998 to 2000, when Pakistan's foreign exchange accounts were detained subsequent to nuclear detonation.

The post 9/11 era (after 2001) saw a revival of the Pakistan economy as GDP growth increased to an average 9.5 percent during 2000 to 2016. The features of this phase were a sustained growth in the manufacturing sector at 5.85 percent; a reduction in the ratio of fiscal deficit to GDP from 6.9 percent to 5.22percent; and a marginal improvement in poverty and inequality. The unemployment level however, increased to 7.1 percent, which is the highest since the 1970s, due to structural changes in the economy, i.e., from obsolete practices in the industrial sector toward increased capital intensity and greater product sophistication.

The second stage of remittance growth began in 2001. Workers' remittances increased from 2001 to 2004 and reached to $4.23 billion for the first time in the comparable time period. The main reasons behind this growth were the incident of 9/11 and depreciation of Pakistani rupee which has attracted migrants to obtain the advantage of currency differences. Another reason of this surge in remittances was the tightening of informal money markets after 9/11 incident in 2001 which increased the inflow of remittances through bank channels. An increasing trend can also be observed in the later periods till 2016. According to SBP reports workers' remittances reached a record level of $20 billion in 2016. About one thirds of these remittance s originated merely from Saudi Arabia. Another main source of remittances is USA and Middle East. Remittances from Middle East increased in 2009 due to asset crises bringing remittances close to the remittances from the USA. The rise in remittances from all expatriate countries during current years is attributed to many important factors including increase in skill composition of Pakistani workers as well as the ability of the young generation of Pakistani emigrants to enter into additional contemporary occupations in USA and UK.

The citizens of Pakistan utilize remittances for their consumption, investment, insurance, saving and other financial targets. According to Rashid (1986) the household of migrant's spends 63 percent of remittances on their consumption, 9.8 percent on marriages and Hajj, invest on real state about 17 percent and 8 percent invest in the home country when they return back.

On the basis of above discussion, it seems that there is a growth effect of remittances. Many studies focus the relationship between growth and remittances. Despite a large number of literatures on the remittances-growth nexus, the remittances-growth relationship is still ambiguous. Some empirical studies have found that remittances and growth are positively related like Pradhan et al., (2008); Loxley and Sackey, (2008); Giuliano and Ruiz-Arranz, (2009); Ziesemer, (2006). Other studies like Rajan and Subramanian (2005), Barajas et al. (2009), and Chami et al. (2003) argued that the growth effect of remittances is either negative or there is no effect. Therefore, the existing literature on the remittances-growth nexus has contradictory findings. Hence it will be interested to study the relationship between economic growth and remittances in Pakistan's economy.

The rest of the paper is organized as follows: research methodology is given in section two, section three explains the research methodology section four outlines data description, analysis of relation between remittances and economic variables given section five, and conclusions, suggestions and recommendations are given in section six.

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2. Review of literature

Despite a large number of literatures on the remittances-growth nexus, the remittances-growth relationship is still ambiguous. Some empirical studies have found that remittances and growth have positive relation[1]. Other studies argued that the growth effect of remittances is either negative or no effect[2]. Therefore, the existing literature on the remittances-growth nexus has contradictory findings.

Using the data from 1970 to 1986 Burney (1987) investigated the impact of Middle East's worker's remittances on different Macroeconomic variables i.e. GNP growth, domestic saving and balance of payments

[1] Pradhan et al., (2008); Loxley and Sackey, (2008); Giuliano and Ruiz-Arranz, (2009); Ziesemer, (2006).
[2] Rajan and Subramaniam (2005), Barajas et al. (2009), and Chami et al. (2003)

of Pakistan. The results indicated that the remittances from the Middle East help not only in reducing the current account deficit but also to reduce the debt burden. However, his study did not empirically conduct the impact of remittance on economic growth.

Nishat and Bilgrami (1991) examined the impact of remittances on Pakistan economy. They used Keynesian macroeconomic model for the period 1960 to 1988 and found significant positive relationship between remittances and investment, GNP, consumption, and imports. Moreover, they determined a multiplier of 2.4 and operate primarily through consumption among all variables. They discovered that the largest impact received by consumption and smallest by private investment.

Adams (1998) study was survey base study. He conducted 14 interviews from 469 household from rural areas of Pakistan that is Badin (Sindh Province), Attock and Faisalabad (Punjab province), and Dir (North West Frontier province). He found that migrant invest their remittances money on land, lives stock and non-farm assets. These avenues of investment yield high rate of returns.

Arif's (1999) study focused on the remittances and investments nexus at the households level of Sindh, Punjab, NWFP (Present name is Khyber Pakhtunkhwa) and Azad Jammu and Kashmir. He used the ILO/ARTEP (1986) survey of return migrants. The data set consist of 1251 household. The study found that migrant remit about 78 percent of their total earnings and 68 percent of migrants save and invest a larger portion of their earnings.

Siddiqui and Kemal (2002) conducted their study between remittances and poverty in Pakistan. They employed 1993 HIES data and applied the impact of two shock i.e. liberalization and decline in remittances on poverty in Pakistan. They observed that the deterioration in remittance was a major cause to boost poverty in Pakistan.

Jamal (2004) replicated the study of Nishat and Bilgrami (1991) and estimated a large remittances multiplier, 3.07, and found a positive relationship between remittances and GNP.

Iqbal and Sattar (2005) studied the impact of remittances on a different macroeconomic variables that is real GDP growth, private and public investment, inflation rate, terms of trade, per capita income and external debt. He applied the data from 1973 to 2003 and divided data into four decades namely 1970s, 1980s, 1990s, and 2000 to 2003. The results indicated a positive and significant relationship between remittances and real GDP growth, private and public investment. However, inflation rate is significantly negative relation to remittances.

Arif (2009) focused on survey based migration data (HSOMR-2009)[3] and estimated the impact of inflow of remittances from Saudi Arabian to Pakistan during the period from 1994 to 2006. The results of his study indicated that 18 percent of total remittances were spent for family consumption while 22 percent for real estate and Agricultural machinery, 17 percent for marriages and only 14 percent utilize for saving.

Ahmed and Martinez-Zarzoso, (2014) used Gravity Model approach, to analyze the impact of remittance on selected macroeconomic indicators in Pakistan. They have taken 23 countries which sent 90 percent remittances to Pakistan and found positive and significant effect of remittances on the economic activity of remittances-receiving country while poor response with the economic condition of remittance-sending country. Moreover, geographical distance and bilateral exchange rate are in significant with the remittances. In addition to this the stock migrant in the destination country is positive and significant effect on remittances, while interest rate differential have positive and significant impact on remittance, employment and political stability. They concluded that remittance has positive and significant impact on financial sector development.

3. Methodology

The gravity models are used in this studies. The reason is the gravity model focus on the bilateral trade and have positive relationship with the economic sizes (measures as either GDP or GNP) of trading partners and negative relationship with the geographical distance (reflecting transportation cost) between the capitals of the trading partners. According to this model

$$X_{ij} = A\frac{Y_i^{\beta_1} Y_j^{\beta_2}}{D_{ij}^{\beta_3}} \qquad (1)$$

[3] The survey was conducted between July-August 2009. The survey includes 549 migrants who migrated to Saudi Arabia during the period 1994-2006.

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Where

Y_i and Y_j are the economic sizes of trading partners measured by their GDP and GNP

D_{ij} is the geographical distance between the trading partners

Now equation (1) can be written in logarithmic form

$$\ln(X_{ij}) = \beta_0 + \beta_1 \ln(Y_i) + \beta_2 \ln(Y_j) - \beta_3 \ln(D_{ij}) + u_t \qquad (2)$$

The gravity model further extended by incorporating other control variables to concentrate on migration, international flow of remittances, flow of foreign direct investment etc.

In this study the penurious gravity model has been applied with commonly used determinants of remittances which proposed by Lueth & Ruiz-Arrange (2006, 2008). In the basic gravity model, remittance and the economic sizes of the source and recipient countries are directly related while geographical distance between the two countries is inversely related with remittances (Lueth & Ruiz-Arranz (2008). Thus the adopted gravity model for the analysis of determinants of remittances flows to Pakistan is given below:

$$REM_{ij} = A\frac{GDP_{st}^{\beta 1} * GDP_{rt}^{\beta 2}}{D_{sr}^{\beta 3}} Z_{srt} \qquad (3)$$

Where "GDP" is the Gross Domestic Product of recipient countries over a time period (t). "D" is the dummy variable for distances between the Pakistan and foreign countries and "Z" is the control variables over the same time period. The logarithmic form of equation (3) is given below

$$\ln(REM_{srt}) = \beta_0 + \beta_1 \ln(GDP_{st}) + \beta_2 \ln(GDP_{rt}) + \beta_3 \ln(D_{sr}) + \beta_4 \ln(mig\_s) + u_t \qquad (4)$$

The above gravity model shows that the bilateral remittances is related with the economic size of Pakistan and the economic sizes of the source countries at time period(t), the geographical distances between the Pakistan and the source countries, the migrant stock in the source countries at the time period (t).

The literature indicates that the most important determinants of remittance are the Gross Domestic Product (GDP) of the source and the recipient countries. International migrant may enhance employment prospects in the improved economic conditions in the source country and hence remit more.

D_{sr} use for the geographical distance from the capital of the remittance sending country to Pakistan.

The relationship between remittance and migrant's stock is inconclusive so to overcome this problem the nature of migration i.e. temporary or permanent and whether migrant belongs to skilled, semi-skilled or unskilled group are incorporated. Dustmann & Metres (2010) indicate that temporary migrant remit more remittances and Faini (2007) argued that high-skilled migrant remit remittances.

Some studies like as Singh, Haacker, Lee, & Le Goff, (2011) used political stability indicator for institutional quality in the recipient country because the sound political stability encourages investment.

The two dummy variables are used for common official language and colonial linkages for cultural similarities. The reason is the majority Pakistani migrants belong to the Middle East. Sultonov (2013) sloted in unemployment rate in source and host economies investigate the impact of unemployment on the volume of remittances. After adding the above variables in equation (4) the model becomes.

$$\begin{aligned}\ln(REM_{srt}) = {} & \beta_0 + \beta_1 \ln(GDP_{st}) + \beta_2 \ln(GDP_{rt}) + \beta_3 \ln(D_{sr}) + \beta_4 \ln(mig\_s) + \beta_5(Common\_off) \\ & + \beta_6((Colony) + \beta_7(pol\_stb) + \beta_8(unemployment\_s) + \beta_9(unemployment\_r) \\ & + \beta_{10}(\text{inf}\,lation\_s) + \beta_{11}(\text{inf}\,lation\_r) + \beta_{12}(disaster\_s) + u_t \qquad (5)\end{aligned}$$

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In this study panel data has been used. A variety of empirical techniques may be employed to analyze the panel data. The simplest and easiest way to estimate the model is to use pooled OLS. However, in presence of correlation between unobserved fixed effect and explanatory variables the pooled OLS will not be consistent (Wooldridge, 2002). A pooled OLS receives unobserved heterogeneity bias when there is an association present between the individual effects and the error term (Hsiao, 2003). To keep the presence of unobserved heterogeneity, panel data analysis, fixed and random effects are used. Thus, the selection should be made among these three methods of estimation, i.e., pooled OLS, Fixed Effects and Random Effect.

For the fixed- effects, dummy variables are incorporated. To avoid the dummy variable trap the restricted "F" test is applied to check suitability of pooled OLS or fixed effect and then perform the Breuch Pagan (1980) and LM test.

The Hausman test is applied to investigate the random effects model is consistent with the null hypothesis. Pasaran CD (cross-sectional dependence) test is applied to check the presence of serial correlation and heteroscedasticity.

4. Data

The data on the selected variables were taken for the time period from 2002 to 2013 for twenty three source countries[4] which is accounted for ninety percent of the total remittances received by Pakistan during the study period. The reason to select these twenty three countries is availability of bilateral remittances data. The remittance data in US$ million from the State Bank of Pakistan (SBP) have some limitations. Those data on remittances has been selected which sends through official. This study is contradicted to Arif (2009) studies because in addition to formal channel he also has taken data which was sent by informal channels. The Gross Domestic Product (GDP) data collected from the world development indicator (WDI) for all the source and destination countries. The data of total stock of migrants in the source country is collected from different sources[5]. The Worldwide Governance Indicators (WGI) provides the information about the political stability of the countries. The World Development Indicator (WDI) database has provided the information for the unemployment and inflation rate both in the source and recipient countries. Finally, International Disaster Database (EM-DAT) is used for number of disaster in the remitting countries.

5. Results and Discussion

In the first baseline model, the causal relationship between remittance and GDPs of the source and recipient countries, geographical distances, political stability, stock of migrants, and number of disasters in the source countries and the common official language and colonial link as two dummy variables are conducted. The results of the OLS estimations are given in the table 1.

The results show that GDPs of recipient countries have positive and significant effect on remittances and GDP of source countries have insignificant effect. This implies that in poor economic conditions of home country, Pakistani migrants remit more. This is against the altruistic motivation of remittance. Moreover, the findings of the source countries contradicts with the findings of Straubhaar (1986), Schiopu and Seigfried (2006). Geographical distance is significantly adversely effects on remittance which is resemblance of the results of Lueth and Ruiz-Arranz, (2008). The result indicates that no relationship between geographical distance and remittance. Migrants' stock in the source countries is statistically significant which suggest that higher number of migrants sending countries receive large volume of remittances. Political instability in the home country has insignificant relationship with remittances indicated an altruistic motivation of remittance, whereas the relationship between disaster in host countries and remittances are insignificant. Now regarding the effects of two dummy variables, result shows that countries having common language linkages have tendency to remit more money. It implies that people feel easy to migrate those countries where they feel comfort with respect to languages, culture and social norms. The colonial linkages have positive and significant impact on the volume of remittances.

[4] Australia, Bahrain, Belgium, Canada, Denmark, France, Germany, Greece, Ireland, Italy, Japan, Kuwait, The Netherlands, Norway, Oman, Qatar, Saudi Arabia, Spain, Sweden, Switzerland, UAE, UK and US.

[5] Bureau of Immigration and Overseas Employment (BIOE, 2013), from the Organization for Economic Co-operation and Development (OECD, 2013) and from International Migration Stock, Population Division, United Nations. For Saudi Arabia, UAE, Bahrain, Kuwait, Oman and Qatar, the Gulf Labor Markets and Migration (GLMM) database is used.

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Table-1. Baseline Gravity Model

Variables		Pooled OLS	Fixed Effect	Random Effect
GDP (Home)	Coeff	1.2391	1.3583	1.2391
	SE	0.0000***	0.0000***	0.0000***
GDP (Source)	Coeff	0.1618	0.2197	0.1618
	SE	-0.1800	0.0857*	-0.1800
Distance (Capitals)	Coeff	-1.2148	-1.7189	-1.2148
	SE	0.0163**	0.0013***	0.0163**
Migration (Source)	Coeff	0.9358	0.8975	0.9358
	SE	0.0000***	0.0000***	0.0000***
Political Instability (Home)	Coeff	0.1073	0.5237	0.1073
	SE	-0.7140	0.0975*	-0.7140
Disaster (Home)	Coeff	0.0569	0.1338	0.0569
	SE	-0.6651	-0.3434	-0.6651
Common Official Language	Coeff	1.8569	2.1128	1.8569
	SE	0.0000***	0.0000***	0.0000***
Colonial Linkages	Coeff	0.9418	1.1809	0.9418
	SE	0.0438**	0.0170**	0.0438**
Residual variance:				0.8235
Joint significance of differing group means (F-statistics)		Coeff.		1.0272
		p-value		0.4365
Breusch-Pagan test statistic LM		Coeff.		0.4552
		p-value		0.4999
Hausman test statistic:		Coeff.		24.991
		p-value		0.0016

As mentioned earlier the pooled OLS estimation experiences several shortcomings such as unobserved heterogeneity bias, time-invariant etc. For improvement of model the Panel diagnostic checking test is applied which help to choose the best model among the three possible alternatives of Pooled OLS, fixed-effect model and random-effects model. The results are given in second part of table 1. The results reveal that F-statistic is insignificant which implies that the null hypothesis of pooled OLS estimation is satisfied and cannot be rejected in favour of fixed-effect model. Similarly, both the Breusch-Pagan LM test endorsed the better compatibility of the pooled OLS model as compare to random-effects model. Finally, the Hausman test verifies the random-effects.

Now for more comprehensive gravity model, some other control variables are added. These variables are unemployment rates in the source and recipient countries, inflation rates in the source and recipient countries along with all the variables of the baseline gravity model. The results depicted in table 2.

The results did not show any significant differences in the baseline model of estimated Gravity Models. However, the relationship between the unemployment in both the source and recipient countries with remittance is positive and insignificant. With regards to the inflation in the recipient countries, it has been found that the higher inflation increase the sending of remittances. This is accepted economic phenomenon as higher level of inflation; the migrants send more money in order to combat with the increasing inflation at home countries. However, the relationship between inflation and remittance is negative and insignificant. The reason might be as the price level in the host country goes up the purchasing power decreases and thereby enabling them with smaller amount of money to be sent as remittances to home countries. No significant variation is found in the baseline gravity model.

For the panel diagnosis augmented gravity model, the results are given in second part of table 2.

The results indicate that a pooled OLS is better model as compared to fixed-effect and random-effects models on the basis of F-statistic and Breusch-Pagan LM test statistic because these are insignificant. However, the Hausman test verifies that the random-effects model is preferred over the fixed-effect model.

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Table-2. Augmented Gravity Model

Variables		Pooled OLS	Fixed Effect	Random Effect
GDP (Home)	Coeff.	1.9256	2.1020	1.9256
	SE	0.0019***	0.0011***	0.0019***
GDP (Source)	Coeff.	0.1461	0.2037	0.1461
	SE	-0.2355	-0.1204	-0.2355
Distance (Capitals)	Coeff.	-1.1444	-1.6416	-1.1444
	SE	0.0240**	0.0023***	0.0240***
Migration (Source)	Coeff.	0.9853	0.9294	0.9853
	SE	0.0000***	0.0000***	0.0000***
Political Instability (Home)	Coeff.	0.1628	0.5195	0.1628
	SE	-0.6537	-0.1709	-0.6537
Disaster (Home)	Coeff.	0.0398	0.1246	0.0398
	SE	-0.7693	-0.3972	-0.7693
Common Official Language	Coeff.	1.8339	2.0734	1.8339
	SE	0.0000***	0.0000***	0.0000***
Colonial Linkages	Coeff.	1.0035	1.2219	1.0035
	SE	0.0338**	0.0154**	0.0338**
Unemployment (Home)	Coeff.	0.2627	0.2882	0.2627
	SE	-0.1999	-0.1742	-0.1999
Unemployment (Source)	Coeff.	0.0201	0.0080	0.0201
	SE	-0.4169	-0.7615	-0.4169
Inflation (Home)	Coeff.	0.0142	0.0183	0.0142
	SE	-0.5443	-0.4487	-0.5443
Inflation (Source)	Coeff.	-0.0591	-0.0398	-0.0591
	SE	-0.1886	-0.3972	-0.1886
Residual variance:				0.8322
Joint significance of differing group means (F-statistics)	Coeff.			0.9472
	SE			0.5347
Breusch-Pagan test statistic LM	Coeff.			0.7207
	SE			0.3959
Hausman test statistic:	Coeff.			25.1203
	SE			0.0143
Variance Estimators	Between			0.0123
	Within			0.8322

6. Conclusion & Policy Implications

This paper examines empirically the relationship between remittance and economic growth of Pakistan. The bilateral remittances from twenty three major source countries were selected which covered 90 percent of total remittances of Pakistan for the period 2002 – 2013. The key findings of this study reveal that economic performance of home countries has positive and significant impact on remittances which revealed the migrant's investment behavior. Moreover, the remittances flow to Pakistan response mainly due to the macroeconomic variables of remittance receiving countries instead of the remittance sending countries.

This is concluded that international migration from Pakistan has stimulated the Pakistan's economy assimilation globally. It has also increased the significant volume of remittance flows to Pakistan. Consequently, the remittance receipts have become an important factor to promote the economic growth of Pakistan. This is suggested that Pakistan should diversify migration destinations to stabilize remittance flows, promote the transfer of skilled migrants, ease and enhance the remittance transfer system, improve and use the advance technology to decrease the cost of remit. In addition to that, government should ensure that remittances flow through official channels since this would maximize the development benefits to the economy. Moreover, bank account is made mandatory for all migrant workers. It will help to break down psychological barriers and attract more remittances through the formal channel. Reduction of transaction costs of remittances will increase the remittance size. Strengthening of the financial infrastructure will boost remittances.

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