EXCHANGE RATE UNCERTAINTY AND WORKERS' REMITTANCES: EVIDENCE FROM PAKISTAN

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Abstract

The importance of remittances is multifold for resource deficient developing countries. Exchange rate levels are key determinant of remittances inflow to a country and a handful literature is available dealing the issue. Gauging the impact of exchange rate uncertainty on remittances, however, is relatively new strand and the area remains ignored for Pakistan. This study uses a time series data over the period of 1973-2008 for Pakistan and ten major remitting partners. The study uses conditional variance of real effective exchange rate, generated through Generalized Autoregressive Conditional Heteroscedastic (GARCH) method, as proxy of exchange uncertainty. Further, the final estimation strategy is based on two estimation approaches. Firstly, we employ Generalized Method of Moments (GMM) to avoid bias stemming from endogeneity of variables. Secondly, at next step we compute posterior information (estimated βs) by employing Empirical Bayesian (EB) approach where GMM estimates are used as priors. In comparison to the GMM estimates, EB estimates are found to be more efficient in terms of significance and correct signs for modeled variables. The findings of the study are suggestive of a significant role of home and host country characteristics in most of the cases. Similarly, exchange rate uncertainty is found affecting inflow of remittances negatively for Pakistan and the relation is significant statistically. We further document the insignificant impact of political instability over the inflow of remittances. This study recommends diverse policy for different countries. Apart from Middle East other regions (like USA, Canada, and Germany etc.) must be considered separately (while devising policy) to encourage more inflow of remittances. Volatile exchange rates can curtail remittance inflows so stabilization thereof must be set as priority by the concern authority.

To My Parents

And

Brother!

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For any errors or inadequacies that may remain in this work, the responsibility, of course, is entirely mine.

Muhammad Jalib Sikandar

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Declaration

I hereby declare that this thesis, neither as a whole nor as a part thereof, has been copied out from any source. It is further declared that I have carried out this research by myself and have completed this thesis on the basis of my personal efforts under the guidance and help of my supervisor. If any part of this thesis is proven to be copied out or earlier submitted, I shall stand by the consequences. No portion of work presented in this thesis has been submitted in support of any application for any other degree or qualification in International Islamic University or any other university or institute of learning.

Muhammad Jalib Sikandar

CHAPTER-1: INTRODUCTION

1. INTRODUCTION:

Remittances are the financial inflows to the home country from abroad by the emigrants[1]. The primary motive of remittances is to fulfill the needs of dependents left behind by the emigrants. Despite the fact that this whole process revolves around some specific number of individuals, remittances are considered to be one of the major reflectors of economic situation in home country. Remittances are also considered to be one of the key sources of foreign exchange earnings for the developing countries.

Over the past two decades, developing countries have enjoyed an unmatched rise in workers' remittances. According to the World Bank (2006) estimates, remittances received by developing countries increased from US$31.2 billion in 1990 to US$221.3 billion in 2005, registering an annual growth rate of over 13 percent. Remittances are considered to constitute approximately 35 percent of total financial flows to developing countries and have surpassed the official development aid flows and non-FDI flows. Moreover, the true size of remittances – if unrecorded remittance flows are included– is estimated to be at least 50 percent larger than past years.

A number of studies have been undertaken to estimate and analyze the impact of relative rates of return on the level of worker's remittances in the form of capital gains

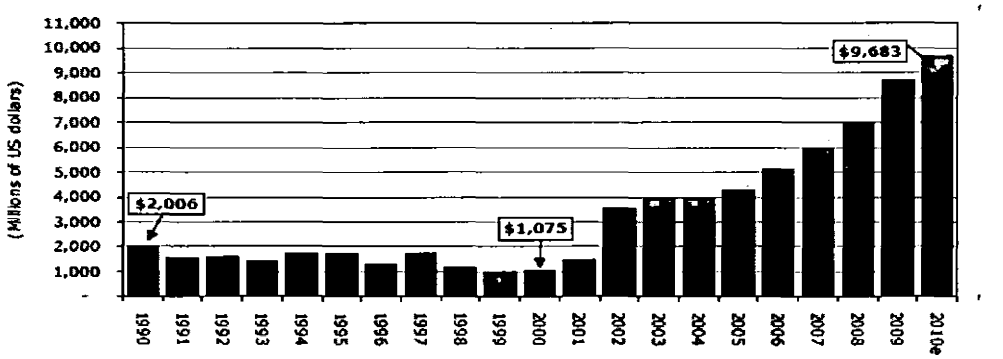
[1]"Remittances are the sum of workers' remittances, compensation of employees and migrants' transfers. They are classified as current private transfers from migrant workers resident in the host country for more than a year, irrespective of their immigration status, to recipients in their country of origin; compensation of employees is the income of migrants who have lived in the host country for less than a year; migrants' transfers are defined as the net worth of migrants who are expected to remain in the host country for more than a year" (IMF 1993).

and individual's welfare for which many find evidence that immigrants respond to economic variables and remit more to their countries of origin when the expected rates of return is higher (with the lowering exchange rate in home). However, we could not locate any study including uncertainty about returns as determinant of remittances especially for Pakistan. Theoretically it has been argued that migrating workers are behaving as investors with the assumption that they are risk neutral in their preferences (Pozo et al, 2004). The present study is an attempt to incorporate uncertainty about rate of return into a model explaining the inflows of remittances.

1.1. BACKGROUND OF THE STUDY:

Workers' remittances for capital deficient countries like Pakistan are considered to be an important source of foreign exchange. As is evident from figure1.1, during the last three decades, Pakistan received a significant amount of workers' remittances that reached the highest figure of $9.1 billion during July 2010 to April 2011, which are expected to hit $11 billion mark this year[2].

Figure: 1.1: Formal Yearly Remittances Inflows to Pakistan



Source: Remittances Data, Development Prospects Group, World Bank, 2011

[2] Figures as reported by Economic Survey of Pakistan 2010-11

These inflows may have a positive impact on economy through an improved balance of payments position on one hand and reduced dependence on external borrowing on the other. Significant inflows of remittances have also helped Pakistan recover from the adverse effects of oil price shocks, reduce the severe unemployment problem, and improve standard of living of recipient households.

Table 1.1: Top 15 Remittances-Receiving Countries

By amount of remittances, 2010e (US$million)			By share of Gross Domestic Product, 2009		
	World	440,077		World	0.7%
1	India	53,131	1	Tajikistan	35.1%
2	China	51,300	2	Tonga	30.3%
3	Mexico	21,997	3	Samoa	26.5%
4	Philippines	21,373	4	Lesotho	26.2%
5	Bangladesh	10,804	5	Nepal	23.8%
6	Nigeria	10,045	6	Moldova	22.4%
7	Pakistan	9,683	7	Lebanon	21.9%
8	Lebanon	8,409	8	Kyrgyz Republic	21.7%
9	Vietnam	8,000	9	Haiti	21.2%
10	Egypt, Arab Rep.	7,725	10	Honduras	17.6%
11	Indonesia	7,250	11	El Salvador	16.5%
12	Morocco	6,452	12	Jamaica	15.8%
13	Ukraine	5,595	13	Jordan	14.3%
14	Russian Federation	5,477	14	Guyana	13.7%
15	Serbia	4,896	15	Serbia	12.6%

Source: Migration Facts Report, Migration Policy Institute, 2011

Pakistan is ranked 7th among largest remittance recipient countries across the world. The remittances are the second major component of Pakistan's external resources after Foreign Direct Investment (FDI)[3]. Remittances are primarily used in Pakistan for household consumption and a very meager share thereof is invested to boost the economic activity in the country. The economic and political conditions[4] in Pakistan are supposed to be the major determinants of foreign remittances over the recent past. The current political and economic scenario has been instrumental in motivating us to

[3] Foreign Direct Investment during July-April 2010-11 is $1.232 million showing the decline of 29 % due to volatile security conditions (Economic Survey of Pakistan 2010-11).

[4] Special section of "Cost of War on Terror for Pakistan Economy", indicates the importance of Political Problems. Details available at Pp 219-220 Economic Survey of Pakistan 2010-11

undertake the study and to examine the effect of uncertain conditions (both political and economic) on remittances inflow. This study investigates the impact of political uncertainty and exchange rate uncertainty on the inflow of remittances to Pakistan.

1.2 OBJECTIVES:

The exchange rate volatility can significantly affect the remittances. This study evaluates the impact of uncertain economic and political conditions in Pakistan on the flow of remittances. The specific objectives are as under:

- To find out the key determinants of remittances for Pakistan.
- To analyze the impact of exchange-rate uncertainty on the inflows of remittances.
- To evaluate the impact of political instability on remittances inflows to Pakistan.
- To draw policy implications based on the findings of the study.

1.3 HYPOTHESES TO BE TESTED:

This study, broadly, tests for the following hypotheses.

i. H_0: Uncertainty (Exchange rate and political) has negative impact on remittances.

And

ii. H_0: Remittances are sensitive to exchange rate fluctuations.

1.4 SUMMARY AND STRUCTURE OF THE STUDY:

This study broadly explores the impact of exchange rate uncertainty on the inflow of remittances with other key determinants using annual data from 1973 to 2008. This study also considers political instability as an indicator of political uncertainty affecting the remittances flow to Pakistan. Apart from these two uncertainty indicators, economic

conditions in home and host country have also been considered important in explaining the inflow of remittances. To construct the exchange rate uncertainty variable, we employ Generalized Autoregressive Conditional Heteroscedastic (Engle, 1982 and Bollerslev, 1986) on monthly data for real effective exchange rate. A separate model for each of the modeled country[5] has been used to analyze the impact of major determinants for each of the country. Two-step methodology has been adopted to ensure the consistent parameter estimates. First, the model has been estimated by adopting Generalized Method of Moments (GMM) and the results are then used as prior information in Empirical Bayesian (EB) to extract posterior information.

With this overview of the whole study, rest of the thesis is structured as follows: Chapter2 provides a detailed general review of the existing empirical literature that revolves around the effect of real effective exchange rate and exchange rate uncertainty over remittances with some other factors. Simultaneously, literature over impact of different economic and political conditions has been reviewed in this chapter. Chapter3 gives an account of major determinants of remittances for Pakistan with an econometric model and variables definition. Chapter4 provides details about data and their sources with the steps involved in methodology adopted. Analysis of the results is furnished in Chapter5 while 6 concludes the study and draws policy implications along with recommendations.

[5] Ten countries included in analysis are United Arab Emirates, Saudi Arabia, Bahrain, Oman, United States of America, United Kingdom, Germany, Norway, Canada and Kuwait.

CHAPTER-2: REVIEWOFLITERATURE

The role of workers' remittances in economic development of the recipient countries is considered to be an important area of research as this will be helpful in formulating the adequate policies to channel these resources into productive investment. Remittances to developing countries have gained increased importance since 1970's as significant source of foreign exchange earnings. The availability of foreign exchange through remittances has not only helped the recipient countries in achieving a reasonably high economic growth by reducing the current account deficit, but it has also reduced their dependence on external borrowing as well as external debt burden.

Researchers have focused a lot over the inflow of remittances and tried to investigate the factors responsible for fluctuations in the inflow of remittances. Though there is paucity of such literature for Pakistan, but for other developing countries, the research work on the determinants of remittances can be found in abundance. Broadly speaking, we focus on the macroeconomic and political conditions that affect the inflow of remittances. Specifically, we focus on the uncertainty of exchange rate and politically risky situations as factors underlying behavior of remitters to remit to their home countries. Therefore, we intend to go through the literature that corresponds to the following reported area i.e.

i. Real effective exchange rate
ii. Remittances flow and its determinants
iii. Response of remittances to different economic and political conditions.

Brzozowski (2006) analyzed the effect of reduction in the variability in exchange rate (which was the outcome of European Monetary Union accession) over the flow of foreign direct investment into the concerned countries. Author's theoretical model shows a doubtful overview about the inflow of FDI due the exchange rate uncertainty and instability. This analysis resulted in significantly negative in such a way that the decision to place investment in transition accession countries is negatively affected by exchange rate uncertainty and variability (particularly nominal exchange rate).

Jackman et al. (2009) examined the relationship between remittances and economic volatility. Their analysis comprised of 20 Small island Developing States (SIDS) containing the data for the period of 1986 to 2005. The findings of the study suggested that the inflow of remittances have a mitigating effect on output volatility and investment volatility. However considering the importance of the inflow of these remittances to SIDS, investment and consumption volatility is positively and significantly affected by the volatility in remittances. Authors' analysis further suggested that policy makers need to consider the proper monitoring and forecasting of the inflow of remittances in future while making any policy i.e. fiscal or monetary.

Higgins et al. (2004) investigated the potential link between remittances and risk variables. Authors' test the data from nine western hemisphere nations considering that how the inflow of remittances responds to the risk variables in general and exchange rate uncertainty in particular. This work used nonparametric estimator based on monthly exchange rate to estimate the annual exchange rate uncertainty. Due to the presence of endogeniety, an instrumental variable technique of Pagan and Ullah (1988) was used to assure the consistent estimation of the model. They found that the inflow of remittances

is significantly affected by risk variables which need to be removed via proper policy implications.

Solomon(2008) using panel data from the eight Latin American countries for the period leading from 1990 to 2006 tested the proposition that the remittances transfer respond to exchange rate uncertainty and political risk while controlling the other macroeconomic determinants for the inflow of remittances. The findings of study support negative relationship between exchange rate uncertainty and remittances i.e. an increase in uncertainty in exchange rate reduces the inflow of remittances. On the other hand, the impact of political risk is negative but statistically insignificant on the flow of remittances. The author concludes that the policy managers must try to reduce the uncertain economic conditions and that governments should normalize the political environment for the attraction of more and more remittances.

Moore et al. (2008) evaluated the effect of remittances inflows on the economic volatility for 95 selected developing countries. The findings of this work are confirmatory to the fact that the inflow of remittances can help reducing the unpleasant output shocks but at the same time it had no effect over consumption and investment volatility. Moreover, important gaps in the impacts were found due to various country groupings.

Kandil and Mirzaie (2005) evaluated the effect of exchange rate fluctuations on real output and prices for 33 economically struggling nations. Exchange rate fluctuations were decomposed into anticipated and unanticipated components. The demand side of unanticipated exchange rate variability was determined by exports, imports and demand for local currency while supply side was determined by the cost related to the imported intermediate goods. Similarly anticipated depreciation in exchange rate was determined

by supply side and resulted into the limited impact on output growth ant price inflation. On the other hand, unanticipated exchange rate fluctuations were found more significant having multiple impacts on growth and inflation across all the countries in consideration.

Arize et al. (2000) examined the empirical relationship effect of real exchange rate volatility on trade and particularly flow of exports. They tested the quarterly data from 13 less developed countries (LDC's) for the period of 1973 to 1996. The Cointegration results were computed by using Johansen's multivariate technique. The short-run fluctuations were captured by using error correction model (ECM) for each of the member country of the model. Their findings suggested that export demand in short-run and long-run for the selected 13 less developed countries is negatively and significantly affected by uncertain conditions of real effective exchange rate. Hence policy needs to be improved to mediate the adverse effects of exchange rate uncertainty.

Sopemi (2006), on theoretical arguments evaluated historically with trends in data, he concluded that International migrant remittances are a very important source of capital for developing countries. They are less important than foreign direct investment, but surpass by far official development assistance and capital market flows. Moreover, remittances are a very stable source of capital.

El-Sakka (2008) focused on Jordanian economy and tested the inflow of remittances for the years 1970 to 2002 by using log-log model and concluded the following main results:

i. Economic growth in the home country of emigrants is an important determinant of the inflow of remittances. Economic growth will help the country attract

different types of capital and remittances. This in turn, helps to ease foreign exchange bottlenecks and improve the position of the balance of payments.

ii. Interest rates policy should be carefully designed to attract remittances to official Channels, policy makers should not only look at nominal interest rate differentials, but also nominal interest rates should be adjusted to reflect inflationary pressures.

iii. Emigrants seem to be sensitive to exchange rate misalignment. Policy makers need to be careful about deviations of exchange rate levels from their equilibrium long run levels.

Hau (2003) examined the degree of relationship between real exchange rate volatility and trade openness of the economy. The author focused over cross section data from 48 countries. Author's theoretical analysis inserts an intertemporal monetary model normally for small open economies with very nominal restrictions. This study evidenced that monetary supply shocks were shown to produce lesser real effective exchange rate movements if the country is more open to trade. All of their analysis and theoretical evidence was duly confirmed via testing it for all the 48 countries and that trade openness elucidate the variability in exchange rate.

Quinn (2005) examined the potential linkage between remittances, savings, and relative rate of returns for Mexican economy. This analysis focused over the remittees from USA as about 75% of remittances to Mexico are from USA. This study analyzed the migrant behavior and that remittances are normally made for household consumption and rest for the saving purpose. The analysis confirmed empirically that level of sending money to home is largely effected by the level of rate of returns and at the same time the

need for consumption and also if savings are high today than remittances tends to increase in future because of higher rate of return in home country.

Toseef et al. (2005) defined volatility as "instability, fickleness or uncertainty" and is a measure of risk, whether in asset pricing, portfolio optimization, option pricing, or risk management, and presents a careful example of risk measurement, which could be the input to a variety of economic decisions. They used GARCH method to measure volatility of exchange rate and analyzed the impact of this volatility on growth and economic performance of Pakistan for years 1973 to 2003. They concluded that over the years flexible exchange rate arrangements (encouraging market forces to play without fear of intervention) have positively affected the pace of economic performance. Though the effect of exchange rate uncertainty on GDP growth cannot be measured, they obtain evidence on its effects by tracing the impact of exchange rate uncertainty on manufacturing production.

Faini (1994), evaluated impact of real exchange rate over the inflow of remittances selected sample of five Mediterranean countries. The author analyzed the likely impact of relevant macroeconomic variables over the level of remittances and found that exchange rate has played the key role in explaining the level of remittances. All this confirms the importance and significant determinacy of exchange rate while modeling remittances. Moreover, they suggested the policy mangers to properly manage the exchange rate so that desired level of remittances could be met.

Catalina et al. (2006), tried to find the answer that either remittances works as insurance for the remitter or not. They focused over the Mexican worker working in USA while risk variables were incorporated into the model. They evidenced that Mexican

worker is highly responding to the fluctuations in host country's economy i.e. USA. They also evidenced that as the risk in incomes arose, the earnings sent back to home increased significantly.

Aydas et al.(2005), evaluated the major determinants for workers' remittances belonging to turkey. Their tested data resulted in having the mixed but significant relationship black market premium, inflation rate, home and host country income levels, interest rate and more importantly military regimes in turkey with remittances. Further they found the significant and negative impact of black market premium, military regimes and inflation. They suggested the policy makers to focus on the both economic and political stability for the stable state of remittances inflow and economy so on.

Blue (2004), investigated the responsiveness of remittances to comparatively non-economic determinants for Cuba. Author found the evidence that in literature focal person is the sender but the case is not as such for Cuba as concentration over the reaction of remitter is far much lesser than due. This analysis comprised of household data from Havana, where author tested that how remittances inflow is responding to economic conditions with other political conditions indicators in particular in the remitter's home country. This study resulted into the positive while considering crucial economic conditions and female gender left behind in home. The study recommended that family ties play an important role in boosting the level of emigrants' remittances to home.

Catrinescu et al. (2006) elucidated the potential linkage between remittances, institutions and economic growth. They used a dynamic data set for larger number of countries and for longer period of time to have a clear view over the effect of remittances

over the longrun growth. They interestingly found no significant long-term growth linkage caused via remittances as others did in past. They argued that such results were obtained because previous literature did not either bothered about the presence of endogeniety or it is not efficiently controlled. They reported that macroeconomic growth has been affected positively but the relationship is weak enough to be rejected. Furthermore, they argued stabilized economic and institutional setup does have a positive relationship with remittances and policy implied must focus these two areas in particular.

Hysenbegasi & Pozo (2004) examined the relationship between workers' remittances from abroad with economic conditions in general and exchange rate in particular. They analyzed the data for the period of 1980 to 2003 taken from 23 Latin American and Caribbean countries. They reported that during the unfavorable economic conditions and when exchange rate is uncertain in nature, the level of remittances is low. Their study results were consistent that remitters do take the future returns into consideration. They also argued that, according to their analysis, remittances may not be an essential item of external finance earnings for all economies.

Bugamelli and Patern (2011) examined the relationship between volatility in output growth and remittances. They analyzed the data for 60 economically struggling nations and for the period of 1980 to 2003. They reported that growth, overall welfare and poverty are negatively affected by the uncertain conditions in output growth. Their analysis suggested that due to the higher volume of remittances inflow to developing economies, it may help in the reduction of fluctuating output growth conditions. Their reported their results in negative relationship of remittances with volatility in output

growth. Their study concluded with remarks of promotion of remittances for the country's better economic prospects in future.

CHAPTER-3: DETERMINANTS OF REMITTANCES AND ECONOMETRIC MODEL

3.1 DETERMINANTS OF REMITTANCES FOR PAKISTAN:

To evaluate the determinants of remittances and in particular the impact of risk variables, it is useful to consider the economic conditions not only in the home but also in the host countries where Pakistani workers have migrated overtime in search of jobs. In general, the connection between risk levels and the volume of remittances is difficult to capture without identifying the economic and political factors both in home and host countries.

An additional reason for studying the risk factor is the issue of political and economic stability in Pakistan. The country is facing the episodes of financial crises, high inflation, and volatile exchange rate regimes and besides exposure to wars and conflicts, terrorism and political instability. High variability in these factors is likely to affect the inflow of remittances. Thus it makes sense to investigate the impact of political instability on remittances besides economic factors and this state of affairs motivates to incorporate the factors related as explanatory variables which can better explain the ups and downs of remittance flows.

It is expected that the analysis undertaken in this study provides a better explanation of the effects of macroeconomic factors on remittances and shed light on the relationship of political and economic uncertainty on workers' remittances of Pakistan. A combing of the literature suggests that a final form of equation of the determinants of remittances will incorporate the following variables. A measure of the ability of migrant worker to remit

sum home, a measure of the economic well-being in home country, exchange rate uncertainty, and the exchange rate.

3.2 THE MODEL:

As discussed above, it is appropriate to incorporate relatively naive set of variables in the model, namely the political uncertainty as well as the variability of exchange rate in addition to the usual economic factors responsible for inflow of remittances. Hence, the following general model is applied:

$$R = f\{Eco_{(Host)}, Eco_{(Home)}, ER, Exr, Pol\} \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where R represents the remittances, $Eco_{(Host)}$ and $Eco_{(Home)}$ denote the economic conditions in the host and the home countries respectively, ER and 'Exr' stand for the bilateral real exchange rate, and the exchange rate uncertainty. Pol denotes political instability. Exchange rate uncertainty will be measured by GARCH method. The final model for econometric estimation can be written as under:

$$R = \alpha_0 + \alpha_1 Eco_{(Host)} + \alpha_2 Eco_{(Home)} + \alpha_3 Pol_{(Home)} + \alpha_4 (\sigma^2) + \alpha_5 E + \mu \ldots\ldots\ldots\ldots (2)$$

In the above equation, all other variables stand as usual and explained in eq (1) above. We incorporate '$\sigma 2$' measure of uncertainty in the real exchange rate $(Pol)_{Home}$ refers to the political risk. The intercept 'α_0' captures the impact of unobserved but time constant factors somehow affecting the level of remittances. These factors include, among others, the geographic distance between country of emigration and country of origin, the availability of reliable channels or the ease of sending remittances home and the domestic family conditions of the emigrants. The stochastic term 'μ' is added as usual with all the standard assumptions about mean and variance. Next we explain the variables used in this study in some detail.

3.3 EXPLAINING THE VARIABLES:

3.3.1. Economic Conditions in Host Country:

We consider the economic conditions of host country (where the emigrant is residing or from where he sends money home) as our primary variable because of its utmost importance while modeling the remittances inflow. As evident from the review of literature, this variable has been widely used in research work as it provides the rationale as to why the specific country has been chosen by the worker to emigrate. However the literature does not reveal a specific measure for this important variable. Instead the researchers have used different proxies such as GDP, per capita income, the general level of employment or unemployment. Constrained by availability of the data, the present study considers per capita income of the host country to be an appropriate measure or proxy for the economic conditions.

In case the conditions in host country are very good (keeping any of the proxy in mind mentioned above), it will attract migrants from abroad i.e. better the economic conditions in host country, greater will be the inflow of emigrants. Obviously the workers respond to better income opportunities along with economic security in the host country. On the other hand people will avoid taking risk of migration, if economic conditions in host country are not favorable.

3.3.2. Economic Condition in Home Country:

Economic condition in home country is used to measure the chances or tendencies of workers to migrate. Adverse economic conditions in the home country compel workers to migrate. The literature suggests similar proxies as explained above for

economic conditions in host country. Both home and host country conditions are equally important in modeling the inflow of remittances.

An inverse relationship in remittances inflow and economic conditions of home country can be postulated while keeping economic theory in view. When conditions in home country get improved, lesser is the inflow of remittances to home country as remittances are supposed being countered cyclical. This can also be based on the presumption that whenever the prevailing economic conditions of home country are better, the tendency of workers to migrate abroad in search of job opportunities will be discouraged. The converse may also be true, if there are discouraging economic situations i.e. high rate of unemployment or low wages in home country, this will ultimately increase the willingness of workers to switch to other countries for better economic conditions.

3.3.3. Political Conditions in Home Country:

This study considers political conditions in the home country as important non-economic factor defining the inflow of remittances. Smooth political conditions generally facilitate the economic agents to utilize the economic opportunity which is available in the home and efficiently. It is also a source of encouragement for a worker abroad to remit more of his earnings to home country. In contrast, the inflow of remittances may be adversely affected by political instability in home country. In that case, people may try to settle abroad permanently and invest their savings somewhere else.

Political stability provides a kind of surety to the workers, about the appropriate utilization and security of the money sent home. In most of the developing countries, uncertain political conditions also persist over time which is adversely affecting the inflow of remittances. In this study, we try to find out the response of remittances towards different political conditions in Pakistan and we use appropriate dummies[6] for the purpose.

3.3.4. Real Effective Exchange Rate:

The naked eye of an ordinary individual working abroad only sees a rate of return and that too in terms of bilateral exchange rate. We use real effective exchange rate (REER)[7] in the analysis rather than the simple nominal exchange rate so that the local currency could be truly compared with foreign currency for sound analysis. Theoretically, the level of remittances increases with depreciation in home country currency.

3.3.5. Exchange Rate Uncertainty:

Normally a worker employed abroad responds to the single dominant factor and that is rate of return he or his family is going to get by sending the remittances home. In simple words, an ordinary worker keeps focus on the exchange rate and the monetary reward of what he is earning abroad. We include exchange rate uncertainty as the second major factor along with the exchange rate, which is the primary factor. By

[6] Taking Pakistan's political conditions as '1', if it is politically "partly free" or "free", and '0', if it is politically "not free" in certain year. Categorization of an year into free, partly free and not free is taken from an index given by Freedom House (USA).

[7] See detailed explanation in chapter-04

doing this, we try to explore the hidden factors associated with the impact of exchange rate on remittances and we consider the variability and uncertainty in the value of exchange rate to be appropriate indicator in this regard.

The more volatile is the exchange rate, the lesser is the inflow of remittances and vice versa. The common wisdom leads to the conclusion that as the home currency depreciates the inflow of remittances increases.

We try to explore the impact of uncertain situations associated with exchange rate fluctuations and investigate the aggregate response of remittances to these complicities. We observe that simple standard deviation or unconditional variance, to measure variability in exchange rate, have been used in most studies. However, the sophisticated techniques, where variations in exchange rate series are conditional upon the information available in past, are widely used now days for the purpose. We prefer to compute exchange rate uncertainty variable by employing GARCH[8], which is considered to be the most effective measure of uncertainty.

[8] See detailed explanation in the next chapter.

CHAPTER-4: DATA AND METHODOLOGY

4.1 THE DATA:

To investigate the determinants of foreign remittances to Pakistan, we need segregated data from countries that account for major part of remittances. It is observed that overall there are large remittance inflows from the UAE (GCC)/KSA/UK/Europe to Pakistan.

We use a time series data from 1973 to 2008 for analysis. The data for remittances is taken from various issues of Economic Survey of Pakistan. While going through the reported literature as also discussed in the last chapter, different measures have been used by researchers to indicate economic conditions of host and home countries. Some major indicators/proxies used in this regard are country's GDP, per capita income (GDP per Capita), employment or employment rate.

In our analysis, we found per capita income (PCI) as the best measure for economic conditions for both Pakistan and other host countries. The data for per capita income (PCI) is taken from "World Economic Outlook" (WEO) issued by the "International Monetary Fund" (IMF).

Data for monthly nominal exchange rate is extracted from "International Financial Statistics" (IFS) and following Alfredo et al. (2004), we calculate real effective exchange rate(REER)[9]. As exchange rate uncertainty is one of the major and primary variables in this study, we calculate it via Generalized Autoregressive Conditionally Heteroscedastic (GARCH) method from the original values given for real effective exchange.

[9] $REER = Official\ Exchnage\ rate * (USApriceindex) / (Localpriceindex)$

Considering the role of non-economic variable, we use political conditions of the home country as an important variable. The data for political uncertainty/instability is taken from the 'Freedom House' (USA based organization conducting annual survey about "political rights" and "civil liberties" since 1972) of freedom country ratings. The variables reported in this survey are: political rights, civil liberties and freedom status of citizens. With regard to political rights, the survey attempts to assess the degree to which citizens participate in the political process. The degree of civil liberties is gauged by the ability of citizens to 'develop view, institutions, and personal autonomy apart from the state.[10]Countries are rated as "Free", "Partly Free" and "Not Free" by the scores allotted to each of the country in world. Country political freedom is broadly divided in to two parts i.e. Civil Liberties and Political Rights and both of these are given weights which ranges from '1' to '7' deciding the political status of the country. We further constructed dummies by taking '1', if Pakistan is rated as "free" or "partly free" in certain year and '0', if it is rated as "not free".

4.2 THE METHODOLOGY:

Evaluating variability in real effective exchange rate will be our focused variable. It is explained in terms of US dollar, showing the real devaluation in local currency. The calculation of real effective exchange rate is given by Alfredo et al.(2004)

$$Official\ exchange\ rate * (USA\ price\ index) / (Local\ price\ index)$$

It is appropriate to give a brief account of GARCH before we proceed further.

[10]www.freedomhouse.org

4.2.1 Generalized Autoregressive Conditional Heteroscedasticity (GARCH):

The classical assumption about the error term is its normal distribution with mean zero and constant variance is known as homoscedasticity i.e.

$$var(\mu_t) = \sigma^2 \qquad 4.1$$

However, if the variance of the errors is not constant and it is Heteroscedastic in nature, this would imply that OLS coefficient estimates could be wrong. The assumption about consistency of variance of the error term generally does not hold for real world economic data. The simplest solution for this kind of problem is to use a model which does not rely on the assumption of variance consistency. This leads to the autoregressive conditionally Heteroscedasticity (ARCH) model for the variance of the errors:

$$\sigma_t^2 = \alpha_0 + \alpha_1 \mu_{t-1}^2 \qquad 4.2$$

This is known as an ARCH (1) model. But still some problems are found in ARCH models like non-negativity constraints might be violated. When we estimate an ARCH model, we require $\alpha_i > 0 \ \forall i = 1, 2, ..., q$ (since variance cannot be negative). The simplest solution for such problems is given by Bollerslev (1986), which allows conditional variance of a data series to be dependent upon previous lags of its own. It is an extension of ARCH(q) model to resolve some of these problems.. The variance equation is now given by;

$$\sigma_t^2 = \alpha_0 + \alpha_1 \mu_{t-1}^2 + \beta \sigma_{t-1}^2 \qquad 4.3$$

This is a GARCH (1, 1) model, ARMA (p, q) model is used for mean equation to generate the residuals to be used in the variance equation. GARCH provides superior

estimations of the local variance (volatility) but it is not essentially apprehensive to better forecasts (Pozo, 2004). It can also be incorporated into ARMA models whereas it is valuable in modelling financial time series.

4.2.2 Estimating Exchange Rate Uncertainty & GARCH:

While going through the literature on volatility, variability and uncertainty, we observe that most studies have considered the simple standard deviation of the data series as a measure of movements in exchange rate. In more sophisticated models, a rolling standard deviation is also used as a measure of exchange rate variability. But all these measures of volatility are unconditional. Standard deviation in modern era is though considered as good measure of variability but it is unable to provide a true answer to the uncertainty in exchange rate. It can be argued that the term unpredictability and variability differ very much in the sense that it is possible for a series to be very volatile/variable but at the same time it can be easily predicted.

The simple variance or unconditional volatility of a series might normally be very high in a series but yet it is very much possible to estimate the variance easily. As compared to the standard deviation or simple variance, the estimates attained via GARCH are superior measures of uncertainty in time series since the estimations are conditional upon the information available in past.

Keeping in view the discussion, the exchange rate uncertainty is measured by the variance of the exchange rate return conditional on information observed by agents. The sample mean returns are also not significantly different from zero. Therefore, the mean is given by

$$E_{t-1}(r_t) = 0 \qquad 4.4$$

And variance as

$$var_{t-1}(r_t) = E_{t-1}(r^2) = \sigma_t^2 \qquad 4.5$$

Where '$E_{t-1}(r_t)$' and '$var_{t-1}(r_t)$' denote expected mean and variance conditionally depending on the information available in the past time period. The conditional variance 'σ_t^2' is the unobserved exchange-rate volatility measure. This variance is often specified in literature to follow the Generalized ARCH (p, q) model of Engle (1982) and Bollerslev (1986).GARCH is most widely used technique to model the time varying volatility in high frequency data. The generalized ARCH model, the GARCH (p, q) model, is specified as follows:

$$y_t = f(x_t;\ \delta) + \varepsilon_t \qquad 4.6$$

Where

$$\varepsilon_t / \psi_{t-1} \sim D(0, h_t^2)$$

and

$$h_t^2 = \alpha_0 + \sum_{i=1}^{q} \alpha_i \varepsilon_{t-1}^2 + \sum_{i=1}^{p} \delta_i h_{t-1}^2 \qquad 4.7$$

Where $f(x_t;\ \delta)$ is conditional mean and x_t is matrix of explanatory variables while δ is vector of parameters. Error term e_t has D-distribution and is conditional on information available till point of time $t-1$ i.e.Ψ_{t-1}. In other words, error term has zero mean and time changing variance h_t^2. Equation 4.7 explains the GARCH process i.e. GARCH (p, q).It is applied that GARCH (1, 1) and α_0, ε_{t-1}^2 and h_{t-1}^2 are mean level volatility, ARCH and GARCH terms included in GARCH equation.

The model of volatility presented above has been widely used because it captures the variability clustering and excess kurtosis so frequently observed in high frequency exchange rate data. it is not feasible to estimate GARCH models for the annual

exchange-rate return uncertainty because of its low frequency so we use monthly exchange rate data to achieve the higher frequencies for our data.

4.3 ESTIMATING THE MODEL:

Before analyzing any time series regression model, some necessary steps are suggested to be performed so that criteria for time series analysis are ensured to get meaningful results. The time series data are generally believed to be non-stationary and have unit roots.

4.3.1. Testing for Stationarity:

As mentioned above, we first check to see if the series is stationary or otherwise. Augmented Dickey-Fuller (ADF) test for unitroot is applied. An ADF test is the advanced version of the Dickey-Fuller (DF) test for a larger and more complicated set of time series models. The ADF test differs from DF test in that the later doesn't take into account the possible autocorrelation in errors [Naseeb et al.(2012)]. The simple autoregressive model is given as;

$$y_t = \alpha y_{t-1} + \epsilon_t \qquad 4.8$$

The hypothesis to be tested is 'H_0: $\alpha=1$' i.e. series has unitroot against the alternative 'H_1: $\alpha<1$' i.e. series is stationary. Extending above for ADF i.e. adding the lags to avoid the problem of possible autocorrelation, the general form can be written as

$$\Delta y_t = \alpha y_{t-1} + \alpha_1 \Delta y_{t-1} + \ldots\ldots\ldots\ldots \alpha_k \Delta y_{t-(k+1)} + \epsilon_t \qquad 4.9$$

Or

$$\Delta y_t = \delta + \alpha y_{t-1} + \sum_{i=1}^{k} \alpha \Delta y_{t-i} + \epsilon_t \qquad 4.10$$

"The ADF statistic used in the test is negative number. The more it get negative, the stronger the rejection of the hypothesis that there is a unitroot at some level of confidence" [Greene, (1997)].

4.3.2. Co-integration Testing:

Before stepping into time series regression analysis, it is considered necessary to check the variables for the mutual longrun relationship. It is justified on the grounds that if the specified set of variables to be analyzed do not have any longrun relationship than the specified economic model is meaningless. For this purpose, we apply Johansen Cointegration test to check the set of variables for each country included in the analysis for longrun relationship among them.

4.3.3. Final Estimation Methodology:

While looking into our model, it is clear that we cannot apply Ordinary Least Square (OLS) for consistent estimates because of the presence of endogeniety between remittances and exchange rate. It leads us to adopt the estimation methods which avoid the problem of endogeniety for consistent estimates. The preferred methods are Three Stage Least Square (3SLS), Full Information Maximum Likelihood (FIML) and Generalized Method of Moments (GMM). We prefer to use the GMM technique that it not only overcomes the problems of endogeniety but also captures the unobserved country specific effects. Proper instruments i.e. internal lags of variables have been used to completely specify the model. We follow Serven (2003) and use standard deviation as an instrument for uncertainty measure as lags

are considered as weak instrument for GARCH based conditional variance which considers previous and future forecasts[11].

It is argued, that GMM is one of the sophisticated versions that avoids many of the time series problems associated with time series analysis. Carrington and Zaman (1994) suggested the use of Empirical Bayesian (EB) method which is believed to be efficient with several advantages for small samples. Their analysis recommended the more frequent use of EB method. So we extend our analysis one step forward and use EB in the second step and use the information obtained from GMM estimation as prior. The density function of prior information is given as;

$$\hat{\beta}i/_{\beta_i} \sim (\beta_i, \Lambda_i) \qquad 4.11$$

Where '$\hat{\beta}i$' (estimated values) is normally distributed with mean β_i and variance 'Λ_i'. EB estimator can be obtained with the assumption that 'β_i'has normal distribution as;

$$[\beta_i|\mu, \Omega] \sim N(\mu, \Omega) \qquad 4.12$$

Where 'μ' is mean and 'Ω' is variance of the prior density obtained via GMM.

$$\Omega = \left[\sum_{i=1}^{10} \Lambda_i^{-1}\right]^{-1} \qquad 4.13$$

And

$$\mu = \Omega^{-1}\left[\sum_{i=1}^{10} \Lambda_i^{-1}\hat{\beta}i\right] \qquad 4.14$$

Using the above equations we obtain mean and variance of prior density leading us to find the posterior density of the data given as

[11] See "Uncertainty, FDI and Economic Growth: Evidence from Developing Asia" PhD thesis(2012) by Sajid Amin Javed, IIIE, IIU Islamabad for detailed discussion.

$$f(\beta_i) \sim N(m, V) \quad 4.15$$

Where 'm' is mean and 'V' is variance, using the prior information we calculate posterior density with

$$V = [\Lambda_i^{-1} + \Omega^{-1}]^{-1} \quad 4.16$$

And

$$m = V[\Lambda_i^{-1}\hat{\beta}i + \Omega^{-1}\mu] \quad 4.17$$

Where '$\hat{\beta}i$' are GMM estimates, 'μ' and 'Ω' are mean and variance of prior density respectively. While following is the final form for calculating '$\hat{\beta}$' for the posterior;

$$\hat{\beta}^{EB} = V[\Lambda_i\hat{\beta}i + \Omega^{-1}\mu]^{12} \quad 4.18$$

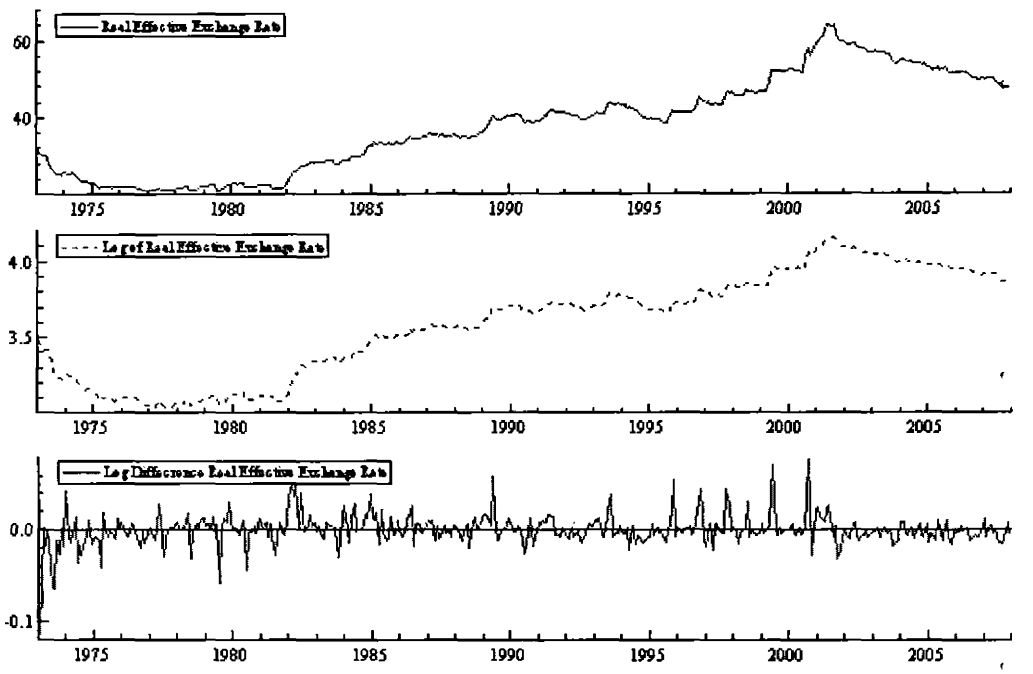
[12] See for details, Carrington and Zaman(1994), "Statistical Foundation for Econometrics" by Asad Zaman and Naseeb et al.(2012).

CHAPTER-05: ANALYZING THE RESULTS

5.1 FITTING THE GARCH:

After the series were confirmed to be stationary[13] and co-integrated[14], we start our final analysis by applying GARCH. Before going into the final model it is necessary to explain the fitted GARCH model and a little explanation of the result. As discussed in previous chapter few conditions must be fulfilled before applying GARCH. The trends in the exchange rate of Pakistan are shown in the figure below;

Figure: 5.1



[13] See Appendix-1

[14] See Appendix-2

We can see from the upper most part of Figure-5.1 of original real effective exchnage rate series that there exist san upward trend violating the criteria to fit an efficient model of GARCH on statinary series of returns. In the middle part of the figure, log transformed data have been plotted and no improvement can be observed with existance of same problem of positive upward trend as observed in origional series. But in the last portion, after D-Log transformation the return series become stationary.

The study focuses primarily on the impact of exchange rate uncertainty over the inflow of remittances with other major detreminants. Before going into fitting of GARCH model, it is necssary confirm the presence of ARCH effect in the return series. Summarized table of all steps taken to fit the efficient GARCH model to extract conditional variance series is given next.

Table-5.1: GARCH (1, 1); Stepwise Fitting

1	**Descriptive Analysis**	**Real Effective Exchange Rate**	**Log Transformation**	**D-log Transformation**
	Mean			0.00076792
	Min			-0.11507
	Max			0.076816
	St-dev			0.016464
	Skewness			-0.29918
	Kurtosis			9.0697
2	**ADF Test-Stat**			
	No Intercept and no trend	0.80749	0.930027	-9.97446***
	Intercept and no trend	-0.56771	-0.481697	-10.0263***
	Intercept and time trend	-2.21617	-2.5651	-10.0143***
3	**L-M ARCH**			
	ARCH 1-2	70652	107000	10.492
		[0.0000]**	[0.0000]**	[0.0000]**
	ARCH 1-5	29630	43607	8.8149
		[0.0000]**	[0.0000]**	[0.0000]**
4	**Mean Equation**		**Variance Equation**	
	M	-0.000297	Ω	1.527593***
		(0.00059952)		(0.74027)
	AR(1)	-0.041776	ARCH(Alpha1)	0.759811***
		(0.054187)		(0.40487)
	MA(1)	0.318604***	GARCH(Beta1)	0.134686**
		(0.066836)		(0.079123)
	Student(DF)	2.636438***	**Alpha(1)+Beta(1)**	0.8945
5	**Model Diagnostic**			
	ARCH 1-2			0.35912
				[0.6985]
	ARCH 1-5			0.2351
				[0.9470]

1: Descriptive have been taken for original, log transformed and D-Log transformed exchange rate series.
2: ADF test for Stationarity with null of H0=I (1), ***, ** and * shows acceptance of null at critical values 1%, 5% and 10% respectively.
3: p-values are in brackets. ARCH test is chi-square tests for autoregressive conditional Heteroscedasticity with null of No ARCH effect.
4: Mean Equation ARMA (1, 1) and Variance Equation GARCH (1, 1), ***, ** and * shows significance at 1%, 5% and 10% respectively. Standard Errors are given in parenthesis.

Table-5.1 shows brief summary of the whole GARCH process. In upper section no.1, descriptive analyses have been reported. It is evident from this section that d-log transformation of exchange rate behaves leptokurtic. This allows us to assume non-normal distribution and apply student-t distribution entering strongly significant in our model.Section-2 checks for the Stationarity of the series. Time series data, dominated by stochastic trends, are likely to have unit roots. Augmented Dickey Fuller (ADF) test is, therefore applied to serve the purpose of examining the Stationarity. The original exchange rate and the series after log-transformation reject the null of ADF that series is stationary but accepted for d-log transformation of exchange rate.

Before proceeding in to fit a GARCH model, presence of ARCH effect was confirmed. LM-ARCH with null of "no ARCH" is applied and results are furnished in section-3 of table 5.1confirming the presence of ARCH effect.

There are three major components in generating the conditional volatility (as measure of uncertainty) i.e. mean, ARCH term (lagged squared residual from mean equation) and GARCH term (conditional variance from t-1 period). Mean equation in Table 5.1 is ARMA specification where exchange rate is regressed on its own lagged values to generate residual series to be used in variance equation to generate conditional volatility. Both ARCH and GARCH terms appear to be significant indicating that news about volatility from previous periods is a significant determinant of exchange rate uncertainty. Greater coefficient of ARCH term as compared to GARCH term indicates that news from previous periods explains more volatility than conditional variance of last period.

Section-5 is the final diagnostic of the model, where the residuals are tested for the ARCH effect. The step is considered necessary so that fitted model is diagnosed that there must be no ARCH effect left in the residuals. The results are evident that there is no ARCH left in the model and that GARCH (1, 1) model is well specified in our case. This allowed us to use the conditional variance series from the model as measure of volatility (proxy for uncertainty), in our final model.

5.2 GMM ESTIMATES:

After estimating the exchange rate uncertainty through GARCH, the final econometric model is reproduced below;

$$R = \alpha_0 + \alpha_1 Eco_{(Home)} + \alpha_2 Eco_{(Host)} + \alpha_3 Pol_{(Home)} + \alpha_4 E + \alpha_5 (\sigma^2) + \mu$$

The data ranges from 1973 to 2008 for a set of ten (10) countries where majority of Pakistani emigrants are working and sending remittances home. The intercept term(α_0) captures the fixed effects in this model(showing the impacts of variables not included in the model explicitly like the distance between home and the respective country where the emigrants are employed, and the means of sending money home, their social relatives and family conditions). (α_1) is coefficient of economic conditions in Pakistan, (α_2) is the coefficient of economic conditions in respective host country, (α_3) is the estimate of political conditions in Pakistan, while (α_4) is the coefficient of real effective exchange rate and (α_5) is exchange rate uncertainty coefficient. The results of GMM estimations are reported next:

TABLE-5.2: GMM ESTIMATES

Variable	$Eco_{(Home)}$	$Eco_{(Host)}$	$Pol_{(Home)}$	E	σ^2	C	R^2	D-W	J-Statistics
Country	α_1	α_2	α_3	α_4	α_5	α_0			
UAE	-0.471	0.966*	-0.130*	2.010*	-931.650*	-3.558*	0.839	1.630	7.953
	(0.312)	(0.234)	(0.063)	(0.607)	(249.640)	(1.352)			
Saudi Arabia	-0.567*	0.231	-0.035	-1.302*	84.892	5.680*	0.896	1.341	8.039
	(0.229)	(0.204)	(0.033)	(0.299)	(109.931)	(1.006)			
Bahrain	-1.932*	1.885*	0.119**	-3.445*	3.362	5.520*	0.854	2.069	7.285
	(0.476)	(0.477)	(0.062)	(0.703)	(105.727)	(2.543)			
USA	1.307**	0.586	0.127**	1.658*	-1288.30*	-6.283*	0.910	1.521	7.038
	(0.697)	(0.757)	(0.070)	(0.643)	(347.815)	(1.643)			
Germany	3.573*	0.460*	-0.042	1.383*	5.896	-19.712*	0.909	1.220	5.311
	(0.452)	(0.218)	(0.045)	(0.534)	(144.900)	(8.090)			
Canada	-6.043*	7.956*	-0.252*	-7.334*	-228.702	-4.556*	0.606	1.375	6.530
	(0.948)	(1.053)	(0.068)	(1.223)	(757.080)	(0.971)			
Norway	1.520*	-0.440	0.045	-1.59**	-37.915	1.770*	0.868	1.647	6.292
	(0.666)	(0.353)	(0.046)	(0.869)	(194.540)	(2.437)			
UK	0.079	1.498*	0.043	0.847	-532.653*	-6.151*	0.867	1.972	7.998
	(0.524)	(0.430)	(0.037)	(0.493)	(103.067)	(2.276)			
Kuwait	-2.572*	1.946*	-0.169	0.059	-13.122	1.032**	0.726	2.588	6.014
	(0.989)	(0.315)	(0.118)	(2.217)	(431.282)	(5.738)			
Oman	-3.126*	3.728*	0.299*	-1.267*	-738.488*	-1.857*	0.586	1.703	7.971
	(0.425)	(0.419)	(0.096)	(0.380)	(248.047)	(0.849)			

Standard Errors are given in parenthesis.

(*), (**) and (***) indicate significance at 1%, 5% and 10% respectively.

5.2.1 Home Economic Conditions:

As is evident from Table-5.2, income per capita, as proxy for economic conditions at home country plays major role in defining the inflow of remittances to Pakistan. The sign of coefficient is generally negative (6 out of 10 countries) and the migrant in Canada seems to be more responsive to Pakistan's economic conditions. All this means that as the per capita income in Pakistan decreases, the inflow of remittances increases and vice versa confirming the counter cyclical nature of remittances.

The magnitude it carries is fair enough with proper sign and that Canadian Pakistani is responsive up to 6% if the per capita income of his dependent left behind decreases by a single point. The sign for Germany is positive i.e. with the increase in the income of his dependent, the inflow of remittances also increased with the higher magnitude. It might be the case of safety of the remittances sent and that Pakistani migrant feels safe enough that the money sent by him would not get wasted and that it will be used as source for generation of further income. Similar positive signs can be observed for other countries like United Kingdom (UK), Norway and United States of America (USA) but with insignificance for UK. Correct signs were found via GMM for all other nations and that Pakistani migrant is negatively responding GDP per capita in decision for when to send money to Pakistan. Our results show that most of the migrants working in Middle East countries are responding to economic conditions at home as expected.

5.2.2 Host Economic Conditions:

As justified earlier while modeling the inflow of remittances, it is not only the home country conditions but also the host country conditions which is a matter of concern for a worker working abroad. An interesting fact can be observed from the results that same Pakistani working in Canada which is responds to home country conditions with higher concern is actually responding more seriously to the Canadian economic conditions. This means that Pakistani workers at Canada are more responsive to the existing economic conditions in Canada herself. The Canadian remittances case resulted with the expected positive sign indicating that Pakistani emigrant to Canada

is more efficient as compared to others in case of making right decision with highest coefficient and that too with significance level of one percent.

On the other hand, the only opposite and statistically insignificant sign was observed for Norway. Other countries with insignificant estimates but with correct signs are USA and Saudi Arabia. It might be because of the fact that these countries portray higher levels of incomes and better economic conditions for larger period of times and that very little fluctuation can be observed over the data span. But for all other countries the Pakistani migrant is wise enough in making the decision as when to remit and when not to remit to home country. This obviously depends on his income level, which in turn depends on the economic conditions, particularly employment opportunities available in host country.

5.2.3 Political Conditions in Home Country:

While evaluating the major determinants for remittances inflows to developing country like Pakistan, it is logical to consider that non-economic indicators are equally important. As can be concluded from the review of literature, it was observed that inflow of remittances increases with the worsening political conditions in home country. Though, theory suggests that political stability would promote the level of remittances but the ground realities for smaller country analysis oppose these theories in most of the cases. It might be due to the fact that the dependency burden over the migrant increases as the political instability in his or her home country increases. Expected positive sign for political instability is observed in case of remittances from Bahrain, USA and Oman, which means that the inflow of remittances increased from these three countries with increase in political instability in Pakistan. All in all, mix

results were obtained while analyzing the impact of political instability over the inflow of remittances to Pakistan.

5.2.4 Real Effective Exchange Rate:

Exchange rate plays an important role in defining the inflow of remittances. The higher magnitudes for most of the countries across the table show the importance of this factor involved in the process. The expected sign of the coefficient is negative i.e. the level of inflow of remittances to Pakistan increases with decrease in value of Pakistani rupee. Mixed results can be observed for this variable both in sign and statistical significance.. Canadian migrant is increasing his response up to 7% if the Pakistani rupee is lowering by one percent. Correct negative and strongly significant estimates can be observed for half of the analyzed countries whereas for the remaining countries i.e. UAE, USA, Germany, UK and Kuwait the sign of coefficient is positive.

5.2.5 Exchange Rate Uncertainty:

As the title indicates, the major part of the study is devoted to an assessment of impact uncertainty in exchange rate on remitting behavior of workers working abroad. The coefficients for exchange rate uncertainty appear with wide range of values, the lowest for Bahrain and the highest for USA. Such results can be justified on theoretical distinction explained by Brzozowski (2006)[15]and also being uncertainty

[15] Brzozowski(2006) while quantifying uncertainty, explained three possible environments that influence the decision i.e. "certainty", "risk" and "uncertainty" .Furthermore, certainty is the obvious result of making economic decision and risk is explained as where the probability of possible outcomes are known but for uncertainty the probability are not known or does not even exists. The paper reported coefficients for exchange rate exceeding 4000. *(Eastern European Economics,* vol. 44, no. 1, January–February 2006, pp. 5–24.)

measure, the unexpectedly higher estimates can be expected with varying signs for every observation[16].The only explanation extracted from such estimates is the sign and significance for the inflow of remittances. This coefficient is very important as explained by Brzozowski where the ordinary migrant is unaware of the unpredictability associated with exchange rate. Highest coefficient for USA means that Pakistani worker in is strongly responding to the uncertainty in exchange rate of Pak-rupee. As the uncertainty associated with exchange rate increases by a single unit, the response is higher reduction in remittances send back to home country; Pakistan in this study. Overall, the concerned coefficients for six major countries are either having negative signs (for UAE, USA, Canada, Norway, UK, Kuwait, Oman) or insignificance. But it is important to mention here that results for UAE, USA and UK are significant at 1% and the coefficient carry the expected negative sign. A probable reason for this may be that well of families background of the workers working in USA and UK (deployed in highly skilled professions) as compared to unskilled or semiskilled workers working in Saudi Arabia and other countries. These semi or unskilled workers belongs to generally poor families and they have to send amounts to the households left behind primarily for consumption purpose leaving exchange rate uncertainty ineffective.

Summarizing for GMM estimates, the coefficient for countries like UAE, Canada and Oman appeared to be significant and expected signs. However, GMM is not free of biasedness as it is considered an efficient estimator provided the sample size is sufficiently large. Though the data span is sufficiently large for estimation through

[16] See for example Osinubi and Amaghionyeodiwe, (2009).

GMM, yet we try to explore the Empirical Bayesian Estimator for more authenticity and prediction of the efficient estimator.

5.3 EMPIRICAL BAYESIANESTIMATION:

In Table-5.3 results of Empirical Bayesian technique are reported. As mentioned in methodology, we use GMM estimates as prior information for the Bayesian technique to extract posterior estimates. Significant improvement can be observed in the results for all the variables across different countries with proper signs and acceptable magnitudes of the coefficients.

Table-5.3: Empirical Bayesian Estimates

Variable	$Eco_{(Home)}$	$Eco_{(Host)}$	$Pol_{(Home)}$	E	σ^2	C
Country	α_1	α_2	α_3	α_4	α_5	α_0
UAE	-0.492*	0.953*	-0.011	-0.373*	-238.931*	-1.523*
	(0.125)	(0.092)	(0.016)	(0.163)	(49.744)	(0.428)
Saudi Arabia	-0.514*	0.811*	-0.01	-0.737*	-158.411*	-0.129
	(0.117)	(0.09)	(0.015)	(0.147)	(46.086)	(0.412)
Bahrain	-0.604*	0.991*	0.005	-0.714*	-170.265*	-1.089*
	(0.131)	(0.098)	(0.016)	(0.164)	(45.761)	(0.444)
USA	-0.429*	0.945*	0.003	-0.414*	-232.772*	-1.646*
	(0.133)	(0.099)	(0.016)	(0.163)	(50.23)	(0.435)
Germany	-0.158	0.866*	-0.008	-0.381*	-186.657*	-1.354*
	(0.13)	(0.091)	(0.015)	(0.161)	(47.907)	(0.45)
Canada	-0.607*	1.014*	-0.017	-0.684*	-210.371*	-1.875*
	(0.134)	(0.1)	(0.016)	(0.167)	(50.648)	(0.409)
Norway	-0.415*	0.847*	0.002	-0.595*	-199.301*	-1.195*
	(0.133)	(0.096)	(0.015)	(0.166)	(49.117)	(0.444)
UK	-0.459*	0.979*	0.004	-0.41*	-273.22*	-1.48*
	(0.131)	(0.098)	(0.015)	(0.16)	(45.538)	(0.442)
Kuwait	-0.534*	1.043*	-0.006	-0.553*	-207.595*	-1.282*
	(0.135)	(0.095)	(0.016)	(0.168)	(50.414)	(0.45)
Oman	-0.739*	1.101*	0.005	-0.674*	-231.521*	-1.42*
	(0.129)	(0.097)	(0.016)	(0.154)	(49.731)	(0.398)

Standard Errors are given in parenthesis.

(*),(**) and (***) indicate significance at 1%, 5% and 10% respectively.

Now we discuss the result briefly:

1. The Empirical Bayesian estimates for economic conditions in the home country show much improvement over the GMM estimates. One can easily observe the

consistency in results throughout with expected sign and all values significant except one case, which is negligible.

2. As compared to the mixed results obtained via GMM estimation, the estimates against the economic conditions in the host countries (from where Pakistani worker is remitting money) are very much consistent and highly significant. The signs are positive as expected from theory and there seems to be one to one relationship between volume of remittances and economic conditions of host countries.
3. The political conditions in the home country seem to have negligible impact on the volume of remittances by Pakistani working abroad. This is because the primary objective of home remittances is to fulfill the basic consumption needs of families left behind by the emigrant rather than investment and business.
4. The impact of real exchange rate of Pakistan currency has also turned clear in the Bayesian approach. The coefficients carry the correct negative sign for all countries and these are well significant as compared to former GMM estimates.
5. The variability/uncertainty in the exchange rate is our main factor that is supposed to affect the inflow of remittances negatively. As against the mixed results obtained from GMM approach, the Bayesian estimates are more consistent and carry the correct negative signs for all countries.

CHAPTER-06: CONCLUSION AND RECOMMENDATIONS

We examined time series data starting from 1973 to 2008 for 10 countries. Our work starts with the introduction of issue for analysis and tries to explore the trends in remittances inflow to Pakistan initially. The higher inflow of remittances has been reported by World Bank (2006) to developing countries from developed world. A sharp increase in these inflows can be observed for Pakistan after every political mishap. Our estimation starts with the first step by calculating real effective exchange rate with formula given by Alfredo et al.(2004). We then shift to our second phase i.e. the calculation of uncertainty in exchange rate. We use GARCH method for calculation of exchange rate uncertainty. This method requires higher frequency of data, so we use monthly exchange rate and then modeled as annual by taking the annual averages of the original conditional variance series. Our constructed model use GMM for overall estimation of each of the variable with the view of avoiding much of the problems than occurs with Ordinary Least Square, by taking into account the problems of endogeniety, and heterogeneity. Exchange rate uncertainty shows mixed result via GMM accompanied with some of the wrong signs. Apart from exchange rate uncertainty, economic conditions in host and home country were also found insignificant for Saudi Arabia, UAE and USA which are primarily expected to have significant impact over the inflow of remittances.

As mentioned in previous chapters, we follow two-step methodology for estimation. Our second step leads us to estimate the parameters via Empirical Bayesian method as proposed by Carrington and Zaman (1994). In contrast to GMM estimates, EB

method appeared with correct signs for all of the variables across countries. Furthermore it clarified the concern about negative effects of uncertainty over the inflow of remittances to Pakistan.

Summing up, exchange rate and exchange rate uncertainty appear to be the important determinant of remittances flow to Pakistan. The remittances inflows to Pakistan are somehow more responsive to exchange rate uncertainty and the level of incomes in host and in Pakistan. The output of political instability effect over the inflow of remittances is insignificant even at 10% and hence the hypothesis built can be rejected taking significantly negative impact of political uncertainty over the inflow of remittances. Remittances from European and North American along with Canada were found more responsive to the determinants stated in the model. Moreover the study resulted with the least response from Middle Eastern region; especially the results contradicted our expectations about Saudi Arabia.

6.1 CONCLUSION:

A major contribution of this study is the exploration of insignificant effect of political conditions over the inflow of remittances to Pakistan. Starting this study with the importance of political conditions impact over the remitter to Pakistan being negative is completely rejected in the second step of our EB estimated measures and in most of the cases by GMM.

Another key conclusion drawn from the study is about the effect of economic conditions. We found to have far much greater magnitude for the economic conditions. This implies that the economic conditions (either in host country or in Pakistan) are major

determinants of remittances back to Pakistan. We can simply draw a conclusion that remittances response to income levels is of higher magnitude and that any increase or decrease in income level of Pakistan and host country affects the remittances inflow more than uncertainty factors.

6.2 POLICY IMPLICATIONS:

Summarized policy implications and recommendations of the study are as under;

i. Economic conditions in home country appear to be one of the major determinants in our study. Policy managers must keep an eye that it has negative relationship with the inflow remittances to Pakistan. So, the policy must ensure that any step taken to increase per capita income must not discourage the inflow of remittances to Pakistan.

ii. Another key policy implication of the study is the role of economic condition in host country defining the inflow of remittances to Pakistan. Across all the countries, it showed positive signs, and that so, with one to one relationship with remittances. This implies that Pakistani manager must promote the emigration to the countries with higher per capita income.

iii. For better specification of the model, apart from economic determinants, non-economic determinant i.e. political instability was incorporated. Against theoretical relationship between such variable and remittances inflow, it turns out to be completely insignificant in case of Pakistan. Government and economic policy makers need not to consider it as an important factor as far as remittances

inflow is concerned yet it cannot be ignored for long run economic growth of Pakistan's economy as whole.

iv. Theoretically, exchange rate is the primary motivational factor for a remitter to remit sums home. Our study somehow appears with lower magnitudes for exchange rate in comparison to economic conditions. Yet its primary role cannot be ignored and that instability in exchange rate might slow down the pace of remittances to Pakistan. A wise policy recommendation in this regard is to mediate both remittances and exchange rate levels as such that the inflow of remittances must be maximized.

v. Uncertainty in exchange rate is found to have significantly negative impact on remittances inflows to Pakistan. Desirable strategy for policy makers is the lowering of exchange rate uncertainty as much as possible. As the uncertainty increases, level of remittances decreases to Pakistan. So there is proper need of stabilizing the exchange rate so that uncertainty factor can be eliminated for attraction of more and more remittances to Pakistan.

vi. Another major focus of the study is to analyze the country wise remittances inflow to Pakistan. It appeared that diverse policy is much needed and those regions, showing the encouraging signs with proper magnitudes for most of the determinants of remittances should be focused. The study results suggest that apart from Middle East, USA and Canada are also important destinations and remittances can be further increased from these specific regions.

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Appendix-1. Unit Root Results:

	Intercept		CV				Intercept + Trend		CV			
Variable	level	1st Difference	0.01	0.05	0.10	I*	Level	1st Difference	0.01	0.05	0.10	I*
Bahrain												
Rem	-3.04	-3.52	-3.65	-2.95	-2.62	I(1)	-0.76	-1.75	-4.37	-3.60	-3.24	I(2)
Ehme	-1.26	-3.71	-3.65	-2.95	-2.62	I(1)	-2.96	-3.34	-4.26	-3.55	-3.21	I(1)
Ehst	-1.52	-4.05	-3.65	-2.95	-2.62	I(1)	-2.36	-2.51	-4.27	-3.56	-3.21	I(2)
Pol	-1.67	-5.62	-3.65	-2.95	-2.62	I(1)	-1.92	-5.54	-4.26	-3.55	-3.21	I(1)
Reer	-0.98	-4.62	-3.65	-2.95	-2.62	I(1)	-3.30	-4.53	-4.26	-3.55	-3.21	I(1)
Reru	-0.09	-3.35	-3.69	-2.97	-2.63	I(1)	-4.03	-3.12	-4.32	-3.58	-3.23	I(0)
Canada												
Rem	-1.50	-5.17	-3.65	-2.95	-2.62	I(1)	-1.90	-0.36	-4.32	-3.58	-3.23	I(2)
Ehme	-1.26	-3.71	-3.65	-2.95	-2.62	I(1)	-2.96	-3.34	-4.26	-3.55	-3.21	I(1)
Ehst	-0.09	-3.95	-3.65	-2.95	-2.62	I(1)	-1.78	-3.81	-4.26	-3.55	-3.21	I(1)
Pol	-1.67	-5.62	-3.65	-2.95	-2.62	I(1)	-1.92	-5.54	-4.26	-3.55	-3.21	I(1)
Reer	-0.98	-4.62	-3.65	-2.95	-2.62	I(1)	-3.30	-4.53	-4.26	-3.55	-3.21	I(1)
Reru	-0.09	-3.35	-3.69	-2.97	-2.63	I(1)	-4.03	-3.12	-4.32	-3.58	-3.23	I(0)
Germany												
Rem	-2.22	-2.96	-3.65	-2.95	-2.62	I(1)	-2.27	-2.74	-4.26	-3.55	-3.21	I(2)
Ehme	-1.26	-3.71	-3.65	-2.95	-2.62	I(1)	-2.96	-3.34	-4.26	-3.55	-3.21	I(1)
Ehst	-0.81	-3.27	-3.68	-2.97	-2.62	I(1)	-2.05	-3.16	-4.31	-3.57	-3.22	I2
Pol	-1.67	-5.62	-3.65	-2.95	-2.62	I(1)	-1.92	-5.54	-4.26	-3.55	-3.21	I(1)
Reer	-0.98	-4.62	-3.65	-2.95	-2.62	I(1)	-3.30	-4.53	-4.26	-3.55	-3.21	I(1)
Reru	-0.09	-3.35	-3.69	-2.97	-2.63	I(1)	-4.03	-3.12	-4.32	-3.58	-3.23	I(0)
Kuwait												
Rem	-2.32	-6.53	-3.65	-2.95	-2.62	I(1)	-2.23	-6.55	-4.26	-3.55	-3.21	I(1)
Ehme	-1.26	-3.71	-3.65	-2.95	-2.62	I(1)	-2.96	-3.34	-4.26	-3.55	-3.21	I(1)
Ehst	-0.69	-4.91	-3.65	-2.95	-2.62	I(1)	-1.32	-4.61	-4.27	-3.56	-3.21	I(1)
Pol	-1.67	-5.62	-3.65	-2.95	-2.62	I(1)	-1.92	-5.54	-4.26	-3.55	-3.21	I(1)
Reer	-0.98	-4.62	-3.65	-2.95	-2.62	I(1)	-3.30	-4.53	-4.26	-3.55	-3.21	I(1)
Reor	-0.09	-3.35	-3.69	-2.97	-2.63	I(1)	-4.03	-3.12	-4.32	-3.58	-3.23	I(0)
Norway												
Rem	-2.35	-2.65	-3.65	-2.96	-2.62	I(2)	-2.28	-2.23	-4.27	-3.56	-3.21	I(2)
Ehme	-1.26	-3.71	-3.65	-2.95	-2.62	I(1)	-2.96	-3.34	-4.26	-3.55	-3.21	I(1)
Ehst	-0.47	-3.86	-3.65	-2.95	-2.62	I(1)	-2.87	-3.74	-4.26	-3.55	-3.21	I(1)
Pol	-1.67	-5.62	-3.65	-2.95	-2.62	I(1)	-1.92	-5.54	-4.26	-3.55	-3.21	I(1)
Reer	-0.98	-4.62	-3.65	-2.95	-2.62	I(1)	-3.30	-4.53	-4.26	-3.55	-3.21	I(1)
Reru	-0.09	-3.35	-3.69	-2.97	-2.63	I(1)	-4.03	-3.12	-4.32	-3.58	-3.23	I(0)

	Intercept		CV				Intercept + Trend		CV			
Variable	level	1st Difference	0.01	0.05	0.10	I*	level	1st Difference	0.01	0.05	0.10	I*
Oman												
Rem	-3.28	-5.02	-3.65	-2.95	-2.62	I(0)	-2.35	-5.01	-4.26	-3.55	-3.21	I(1)
Ehme	-1.26	-3.71	-3.65	-2.95	-2.62	I(1)	-2.96	-3.34	-4.26	-3.55	-3.21	I(1)
Ehst	-3.45	-4.29	-3.65	-2.95	-2.62	I(0)	-3.88	-4.21	-4.26	-3.55	-3.21	I(0)
Pol	-1.67	-5.62	-3.65	-2.95	-2.62	I(1)	-1.92	-5.54	-4.26	-3.55	-3.21	I(1)
Reer	-0.98	-4.62	-3.65	-2.95	-2.62	I(1)	-3.30	-4.53	-4.26	-3.55	-3.21	I(1)
Reru	-0.09	-3.35	-3.69	-2.97	-2.63	I(1)	-4.03	-3.12	-4.32	-3.58	-3.23	I(0)
Saudi Arabia												
Rem	-2.42	-2.16	-3.65	-2.95	-2.62	I(2)		-2.71	-4.31	-3.57	-3.22	I(2)
Ehme	-1.26	-3.71	-3.65	-2.95	-2.62	I(1)	-2.96	-3.34	-4.26	-3.55	-3.21	I(1)
Ehst	-2.27	-3.51	-3.69	-2.97	-2.63	I(1)	-1.35	-3.46	-4.32	-3.58	-3.23	I(1)
Pol	-1.67	-5.62	-3.65	-2.95	-2.62	I(1)	-1.92	-5.54	-4.26	-3.55	-3.21	I(1)
Reer	-0.98	-4.62	-3.65	-2.95	-2.62	I(1)	-3.30	-4.53	-4.26	-3.55	-3.21	I(1)
Reru	-0.09	-3.35	-3.69	-2.97	-2.63	I(1)	-4.03	-3.12	-4.32	-3.58	-3.23	I(0)
UAE												
Rem	-4.30	-4.34	-3.65	-2.95	-2.62	I(0)	-0.23	-3.79	-4.36	-3.60	-3.23	I(1)
Ehme	-1.26	-3.71	-3.65	-2.95	-2.62	I(1)	-2.96	-3.34	-4.26	-3.55	-3.21	I(1)
Ehst	-0.87	-4.24	-3.65	-2.95	-2.62	I(1)	-1.05	-3.51	-4.27	-3.56	-3.21	I(1)
Pol	-1.67	-5.62	-3.65	-2.95	-2.62	I(1)	-1.92	-5.54	-4.26	-3.55	-3.21	I(1)
Reer	-0.98	-4.62	-3.65	-2.95	-2.62	I(1)	-3.30	-4.53	-4.26	-3.55	-3.21	I(1)
Reru	-0.09	-3.35	-3.69	-2.97	-2.63	I(1)	-4.03	-3.12	-4.32	-3.58	-3.23	I(0)
UK												
Rem	-0.79	-4.85	-3.65	-2.95	-2.62	I(1)	-2.68	-4.76	-4.26	-3.55	-3.21	I(1)
Ehme	-1.26	-3.71	-3.65	-2.95	-2.62	I(1)	-2.96	-3.34	-4.26	-3.55	-3.21	I(1)
Ehst	-1.05	-4.14	-3.69	-2.97	-2.63	I(1)	-3.17	-3.90	-4.32	-3.58	-3.23	I(1)
Pol	-1.67	-5.62	-3.65	-2.95	-2.62	I(1)	-1.92	-5.54	-4.26	-3.55	-3.21	I(1)
Reer	-0.98	-4.62	-3.65	-2.95	-2.62	I(1)	-3.30	-4.53	-4.26	-3.55	-3.21	I(1)
Reru	-0.09	-3.35	-3.69	-2.97	-2.63	I(1)	-4.03	-3.12	-4.32	-3.58	-3.23	I(0)
USA												
Rem	-1.19	-4.48	-3.65	-2.95	-2.62	I(1)	-2.36	-4.40	-4.26	-3.55	-3.21	I(1)
Ehme	-1.26	-3.71	-3.65	-2.95	-2.62	I(1)	-2.96	-3.34	-4.26	-3.55	-3.21	I(1)
Ehst	-6.11	-2.02	-3.68	-2.97	-2.62	I(0)	-2.37	-1.08	-4.31	-3.57	-3.22	I(2)
Pol	-1.67	-5.62	-3.65	-2.95	-2.62	I(1)	-1.92	-5.54	-4.26	-3.55	-3.21	I(1)
Reer	-0.98	-4.62	-3.65	-2.95	-2.62	I(1)	-3.30	-4.53	-4.26	-3.55	-3.21	I(1)
Reru	-0.09	-3.35	-3.69	-2.97	-2.63	I(1)	-4.03	-3.12	-4.32	-3.58	-3.23	I(0)

Appendix-2. Cointegration Results:

Country	Trace Statistics	Critical Values	Maximum Eigen Value	Critical Values
	H0: r=0		H0: r=0	
	H1:r>1	5%	H1:r>1	5%
Bahrain	131.4392	95.75366	43.73611	40.07757
Canada	131.0721	95.75366	45.52319	40.07757
Germany	103.5126	95.75366	46.33822	40.07757
Kuwait	143.1416	95.75366	57.72369	40.07757
Norway	122.2776	95.75366	50.03148	40.07757
Oman	140.2191	95.75366	55.23929	40.07757
Saudi Arabia	137.5473	95.75366	42.83162	40.07757
UAE	179.9452	95.75366	75.06402	40.07757
UK	175.4373	95.75366	70.99663	40.07757
USA	152.654	95.75366	55.39724	40.07757

Appendix-3. Correlation Matrix of Pakistan with its Major Remitting Countries:

Bahrain	REM	PCI	BH_PCI	POL	REER2
REM	1	0.486829	0.609188	0.107279	0.433868
PCI	0.486829	1	0.623736	0.027459	0.469582
BH_PCI	0.609188	0.623736	1	0.163752	0.634943
POL	0.107279	0.027459	0.163752	1	0.032018
REER2	0.433868	0.469582	0.634943	0.032018	1

Canada	REM	PCI	CN_PCI	POL	REER
REM	1	0.46565	0.529428	0.008329	0.408459
PCI	0.46565	1	0.664675	0.027459	0.469582
CN_PCI	0.529428	0.664675	1	0.0216	0.502203
POL	0.008329	0.027459	0.0216	1	0.032018
REER	0.408459	0.469582	0.502203	0.032018	1

Germany	REM	PCI	GER_PCI	POL	REER
REM	1	0.588874	0.416482	0.142493	0.104042
PCI	0.588874	1	0.662199	0.027459	0.469582
GER_PCI	0.416482	0.662199	1	-0.03405	0.534115
POL	0.142493	0.027459	-0.03405	1	0.032018
REER	0.104042	0.469582	0.534115	0.032018	1

Kuwait	REM	PCI	KUW_PCI	POL	REER
REM	1	0.565935	0.58376	0.092983	0.349091
PCI	0.565935	1	0.473974	0.027459	0.469582
KUW_PCI	0.58376	0.473974	1	0.157915	0.394675
POL	0.092983	0.027459	0.157915	1	0.032018
REER	0.349091	0.469582	0.394675	0.032018	1

Norway	REM	PCI	NOR_PCI	POL	REER
REM	1	0.449277	0.374413	-0.26235	0.106443
PCI	0.449277	1	0.65964	0.027459	0.469582
NOR_PCI	0.374413	0.65964	1	0.061664	0.477439
POL	-0.26235	0.027459	0.061664	1	0.032018
REER	0.106443	0.469582	0.477439	0.032018	1

Oman	REM	PCI	OM_PCI	POL	REER
REM	1	0.450887	0.622383	0.002511	0.120346
PCI	0.450887	1	0.635459	0.027459	0.469582
OM_PCI	0.622383	0.635459	1	0.085132	0.663871
POL	0.002511	0.027459	0.085132	1	0.032018
REER	0.120346	0.469582	0.663871	0.032018	1

Saudi Arabia	REM	PCI	KSA_PCI	POL	REER
REM	1	0.295337	0.539411	0.068055	-0.02046
PCI	0.295337	1	0.507097	0.027459	0.469582
KSA_PCI	0.539411	0.507097	1	0.525486	0.074975
POL	0.068055	0.027459	0.525486	1	0.032018
REER	-0.02046	0.469582	0.074975	0.032018	1

UAE	REM	PCI	UAE_PCI	POL	REER
REM	1	0.449076	0.53312	0.210354	0.511012
PCI	0.449076	1	0.693485	0.027459	0.469582
UAE_PCI	0.53312	0.693485	1	0.349431	0.286644
POL	0.210354	0.027459	0.349431	1	0.032018
REER	0.511012	0.469582	0.286644	0.032018	1

UK	REM	PCI	UK_PCI	POL	REER
REM	1	0.448432	0.454885	0.04017	0.439317
PCI	0.448432	1	0.648199	0.027459	0.469582
UK_PCI	0.454885	0.648199	1	0.11214	0.555771
POL	0.04017	0.027459	0.11214	1	0.032018
REER	0.439317	0.469582	0.555771	0.032018	1

USA	REM	PCI	USA_PCI	POL	REER
REM	1	0.488179	0.483089	0.10723	0.598214
PCI	0.488179	1	0.638354	0.027459	0.469582
USA_PCI	0.483089	0.638354	1	0.099771	0.626201
POL	0.10723	0.027459	0.099771	1	0.032018
REER	0.598214	0.469582	0.626201	0.032018	1

Appendix-4. Descriptive Statistics of Pakistan with its Major Remitting Countries:

Bahrain	REM	PCI	BH_PCI	POL	REER2
Mean	45.47139	470.4586	10520.49	4.861111	38.3275
Median	38.395	471.74	9643.545	4	39.75755
Maximum	140.51	1018.15	28096.96	7	61.73757
Minimum	2.46	121.14	2735.42	3	21.17883
Std. Dev.	31.36195	198.7957	5284.388	1.417297	12.09589
Observations	36	36	36	36	36

Canada	REM	PCI	CN_PCI	POL	REER
Mean	15.90694	470.4586	19429.23	4.861111	38.3275
Median	7.485	471.74	19926.3	4	39.75755
Maximum	100.62	1018.15	45051.11	7	61.73757
Minimum	2.12	121.14	5721	3	21.17883
Std. Dev.	24.11886	198.7957	9831.488	1.417297	12.09589
Observations	36	36	36	36	36

Germany	REM	PCI	GER_PCI	POL	REER
Mean	31.62333	470.4586	19636.18	4.861111	38.3275
Median	32.08	471.74	21161.82	4	39.75755
Maximum	76.87	1018.15	44524.95	7	61.73757
Minimum	1.32	121.14	4585.71	3	21.17883
Std. Dev.	19.80456	198.7957	11131.64	1.417297	12.09589
Observations	36	36	36	36	36

Kuwait	REM	PCI	KUW_PCI	POL	REER
Mean	126.8297	470.4586	16329.92	4.861111	38.3275
Median	117.515	471.74	13865.31	4	39.75755
Maximum	384.58	1018.15	42994.61	7	61.73757
Minimum	6.93	121.14	7960.51	3	21.17883
Std. Dev.	93.54021	198.7957	7454.327	1.417297	12.09589
Observations	36	36	36	36	36

Norway	REM	PCI	NOR_PCI	POL	REER
Mean	13.15694	470.4586	30409.91	4.861111	38.3275
Median	13.435	471.74	27500.14	4	39.75755
Maximum	29.16	1018.15	93235.22	7	61.73757
Minimum	0.67	121.14	5523.25	3	21.17883
Std. Dev.	7.365575	198.7957	21327.78	1.417297	12.09589
Observations	36	36	36	36	36

Oman	REM	PCI	OM_PCI	POL	REER
Mean	87.42778	470.4586	6796.269	4.861111	38.3275
Median	69.005	471.74	6325.76	4	39.75755
Maximum	224.94	1018.15	21648.74	7	61.73757
Minimum	12.2	121.14	922.59	3	21.17883
Std. Dev.	51.0529	198.7957	3958.145	1.417297	12.09589
Observations	36	36	36	36	36

Saudi Arabia	REM	PCI	KSA_PCI	POL	REER
Mean	643.3619	470.4586	9695.155	4.861111	38.3275
Median	573.025	471.74	8699.895	4	39.75755
Maximum	1441.96	1018.15	19156.86	7	61.73757
Minimum	7.87	121.14	2754.1	3	21.17883
Std. Dev.	392.1334	198.7957	3925.862	1.417297	12.09589
Observations	36	36	36	36	36

UAE	REM	PCI	UAE_PCI	POL	REER
Mean	288.0095	470.4586	22608.98	4.861111	38.3275
Median	205.215	471.74	19834.73	4	39.75755
Maximum	1088.62	1018.15	53388.04	7	61.73757
Minimum	0	121.14	10795.2	3	21.17883
Std. Dev.	259.8417	198.7957	9086.677	1.417297	12.09589
Observations	36	36	36	36	36

UK	REM	PCI	UK_PCI	POL	REER
Mean	167.365	470.4586	18229.38	4.861111	38.3275
Median	136.5	471.74	17403.83	4	39.75755
Maximum	458.87	1018.15	46118.06	7	61.73757
Minimum	49.29	121.14	3263.97	3	21.17883
Std. Dev.	111.7526	198.7957	12065.92	1.417297	12.09589
Observations	36	36	36	36	36

USA	REM	PCI	USA_PCI	POL	REER
Mean	339.2994	470.4586	24326.01	4.861111	38.3275
Median	141.505	471.74	23422.64	4	39.75755
Maximum	1762.03	1018.15	47155.32	7	61.73757
Minimum	9.98	121.14	6517.68	3	21.17883
Std. Dev.	490.1921	198.7957	12245.22	1.417297	12.09589
Observations	36	36	36	36	36