

**Are remittances good or bad: migrant's remittances, real exchange
rate and financial sector development**

By

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(MMS143069)

**MASTER OF SCIENCE IN MANAGEMENT SCIENCES
(Finance)**



**DEPARTMENT OF MANAGEMENT & SOCIAL SCIENCES
CAPITAL UNIVERSITY OF SCIENCE & TECHNOLOGY
ISLAMABAD
JUNE, 2017**

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A research thesis submitted to the Department of Management & Social
Sciences, Capital University of Science & Technology, Islamabad

In partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT SCIENCES

(Finance)



DEPARTMENT OF MANAGEMENT & SOCIAL SCIENCES

CAPITAL UNIVERSITY OF SCIENCE & TECHNOLOGY, ISLAMABAD



C.U.S.T.

**CAPITAL UNIVERSITY OF SCIENCE & TECHNOLOGY
ISLAMABAD
JUNE 2017**

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Are remittances good or bad: migrant's remittances, real exchange rate and
financial sector development

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Dedication

This thesis is dedicated to my great father, beloved mother, my elder brother, teachers and all those friends who have supported me since the beginning of this thesis. I thank my father and brothers for the interest they showed in my studies and the motivation they gave me during those trying times when I had doubts about my abilities.

Acknowledgement

All praises to Almighty Allah, The most Gracious, Compassionate and Ever Merciful, Who endowed me with the potential to complete this research.

I would like to express some word to gratitude to people who contributed in some ways to its achievement.

First and foremost, I want to express my deepest gratitude to my supervisor Dr. Junaid Ahmed for having given me the opportunity to work on this exciting research topic. I am also very grateful to him for the time he spent listening, reading and commenting my works, and also for his many constructive criticisms that enriched me. Thanks for all my teachers as well as all faculty members.

Also, I would like also to thanks to all my friends for their advices during MS studies at Capital University and Technology, Islamabad.

Last but not least, thanks to my family for their endless love, social and financial support and encouragement throughout my studies.

Shams Ur Rehman

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Abstract

This study examines the impact of migrant remittances on real exchange rate through the role of financial development. For this purpose, the study used panel data analysis of 37 remittances dependent countries for the time period of 2000 to 2015. The study employed both static and dynamic model. For static model, fixed effect model has been referred based on Hausman test. However, to tackle the endogeneity issue, the study further used Difference (GMM) and System Generalized Method of Moment (GMM). Firstly, the study reveals the positive relationship between real effective exchange rate and remittances. This means that the foreign exchange in term of remittances increase the value of recipient currency which referred as Dutch Disease effect. This Dutch Disease effect would worsen the recipient's country trade competitiveness in the global market. However, the effect would be attenuated in the recipient's countries with deeper and more sophisticated financial market.

Keywords: Migrant remittances, real exchange rate, financial development

INTRODUCTION

1.1 Background of the study

The labors exporting developing countries receive benefit from migration in the form of remittances. Remittances represent the amount of income earned by emigrants from abroad, and sent back to their home countries. Over the last decade the remittance flows has increased by more than tenfold sent to developing countries. The migrant remittances are vital source of foreign exchange for many labor exporting economies. Remittances are transferred through various channels such as official bank channels, Money Transfer Operators MTO's (Western Union, MoneyGram etc.). However, the significant portion of remittances are unrecorded that transfer via informal *Hawala and Hundi* channel. Due to the informal channels of transfer, the actual size of remittances is difficult to measure. If migrants remittances sent through unofficial channels are included, the remittances would be 50 percent more in amount (World Bank 2010). Therefore, the limitation of the study in using the portions of remittance flows that is reported in the official statistics. In 2015, recorded remittances reached to USD 440 billion to developing countries, showing an increase of 0.9 percent over the preceding year (The World Bank 2015). Similarly, officially flows of remittances recorded USD 406 billion in 2012, USD 351 billion in 2011, and USD 325 billion in 2010 accordingly (World bank, 2013). The significant increases in remittances may be blessing for many developing countries in easing the credit constraints, and overall improving the welfare of the recipients. Ratha, (2005); (Mughal and Makhoulf 2011) suggested that flow of these remittances compared to the flow of other resources have proved remarkably resilient. Therefore, we intend that a remittance depends on high developed financial

sector economies, because such economies can effectively channel the flow of remittances for more productive activities. We thus anticipate that real exchange rate appreciation due to capital inflows. Similarly, Orozco (2003) and Ratha (2007) suggested that during recessive stages in the economic cycle, the remittances are considered as an important source of finance because migrants sent more money back to their home countries from abroad to support their families. From a development country perspective remittances are measured as an important source of finance because it is used directly for household's consumption. World Bank, (2006) suggested that remittances may therefore contribute to the stability and smooth consumption of receiving economies. De et al., (2015) suggested that in the development economic perspective remittances may generates several important contributions such as enhanced financial sector development and tend to reduce poverty, improved access to education and health services, in addition numerous multiplier effects by higher household expenditures. Rapoport and Docquier, (2006) suggested that due to the expected benefits in the flow of remittances, it is also assumed that remittances may discourage labor supply and induce conspicuous consumption. Also, the financial flows appreciate the domestic currency, thus have minimal impact on country development.

Lartey and Acosta (2008 and 2007) and Montiel (2006) suggested that the significant inflows of remittances has also destabilizing outcome, in term of appreciation in real exchange rate where (the significance share spent on nontrade-able goods and services), which depreciates the export competitiveness of the recipient country and the phenomena so called Dutch Disease. The capital flows appreciation discourages investment that can further destabilize macroeconomic environment of the recipient's economies (Cordons, 1994). An exchange rate appreciation with significant influx will not only affects the exports competitiveness but will

increase the gap in lead to current account deficits (Combes & Ebeke, 2011). Moreover, Barajas et al., (2009) suggested that remittance also decreases the labor supply due to the increase in the wealth of recipients household.

In a nutshell, the inflow of large amount of remittances have negative effect on the labor exporting economies, thus the economic development of the countries are reducing due to the real exchange rate appreciation in thereby depreciation of exports competitiveness. Different studies have taken attention into the Dutch disease phenomena of labor sending developing countries, by using different applied techniques, such as panel and time series data models. However, still the issue is debatable empirically as still no consensus exist that remittances always affect positively the real exchange rate. We can provide numerous studies from the empirical literature. If the remittances increase by 1 percent in result the real exchange rate appreciate by about 22% for Latin American and Caribbean regions (Amuedo-Dorantes & Pozo 2004). In another study, Lopez-Cordova and Olmedo, (2005) suggested that a 1 percent increase as a percentage of GDP in the inflow of remittance would decrease exports approximately between 0.2 percent and 0.4 percent. Moreover, Bourdet and Falck (2006) found for Cape Verde that remittances have negative effect on external competitiveness.

On the other hand, World Bank, (2006) and Rajan and Subramanian (2005) suggested that the increase in the flow of remittances have no affecting on export competitiveness. The appreciation in real exchange rate creates negative effect on the flow of remittances, where the significant amount spent on non-tradable good and services. The real exchange rate would attenuate or disappear, in the event that such funds were channeled through investments. We assume for our study that such decline in the recipient country depends on the level of financial sector development (Acosta, et al., 2009a). In another study, (Mundaca 2009) explained that the

effect of migrant remittances on growth can also depends on the level of financial sector development. Different studies such as Levine and Zervos (1998); Otker-Robe et al, (2007); King and Levine, (1993) and Levine et al., (2000) explained that the rate of investments are generally high in countries with high-developed financial sector. Therefore, we intend that a remittance depends on high developed financial sector economies, because such economies can effectively channel the flow of remittances for more productive activities. We thus anticipate that real exchange rate appreciation due to capital inflows such as remittances would be weaker in countries with deep and active financial sectors. In this study using more updated time period and the sample of developing countries with at least 4 percent of remittances relative to GDP. The figure is based on the median statistics. With the recent data and different sample we intend to extends the earlier studies Christian, S. (2011) real exchange appreciation via capital inflows (focused on FDI) and Acosta,et al., (2009b) on remittances flows.

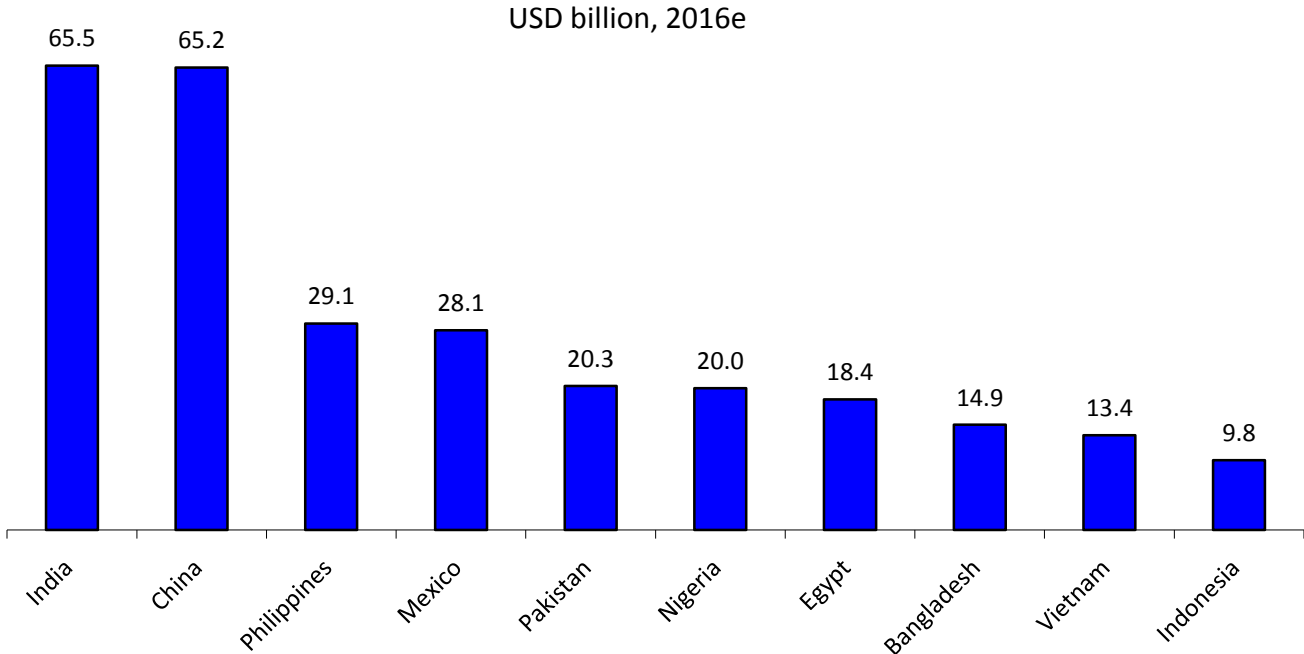
1.2 Migrant remittances to the developing world

The movement of people across Worldwide has major economic, demographic and cultural effects for both destination and origin countries. The United Nations (2015) analyzed that the size of migrants from abroad, reached to 244 million in 2015, which is 175 million in 2000 and 154 million in 1990. This flow has been increased by 41 percent in the last 15 years from 2000 to 2015. In term of population, the accounts of migrant across worldwide stock for a relatively small share of total population, comprising around 2.9 % in 1990 to 3.3 % in 2015 of the world's population.

Among the recipients, the top ten countries in 2016 India on the top of receiving about 65.5 billion USD following China receives about 65.2 billion USD of foreign remittances. At the same time (in 2016) the collectively account of these two countries for approximately to one-

third amount of total remittances sent to emerging countries. Philippines is on the third place receive about 29 billion USD followed by Mexico with 28 billion USD , Pakistan 20.3 billion USD, Nigeria with 20 billion USD , Egypt with 18 billion USD , Bangladesh with 15 billion USD, Vietnam with \$13 billion, and finally Indonesia received 10 billion (World Bank, 2016).

Figure 1.1 Top ten remittance recipients developing countries.



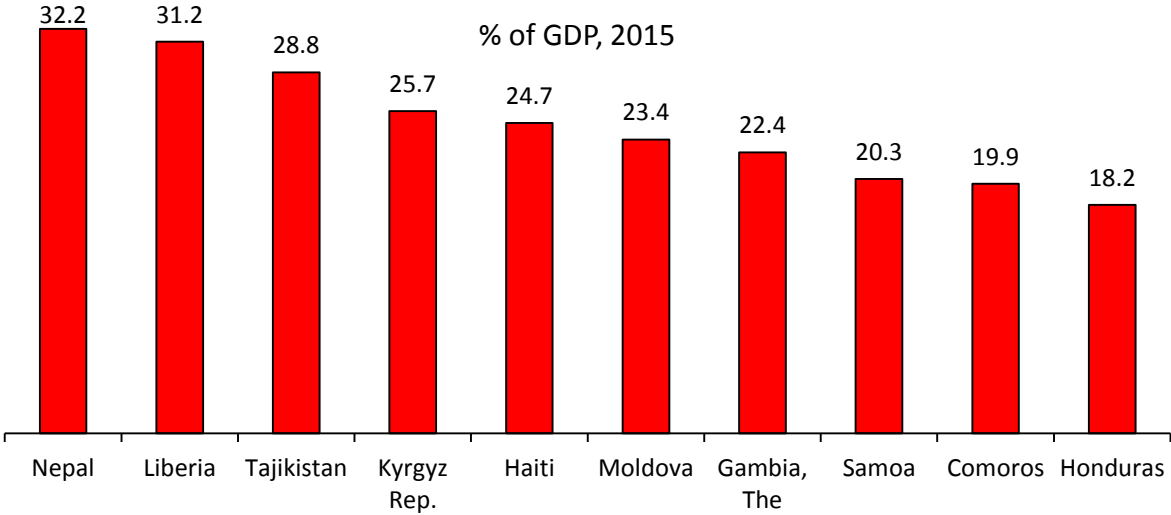
Source: World Bank, 2016

In particular, as compared to high developing countries, remittances are considered as a key source of financial development for smaller countries.

In Figure 1.2 top recipients in 2015 relative to the GDP were Nepal (32 percent), Liberia (31 percent), Tajikistan (29 percent), Kyrgyz Republic (26 percent), Haiti (25 percent), Moldova (23 percent), Gambi, The (22 percent), Samoa and Comoros (both 20 percent) and Honduras

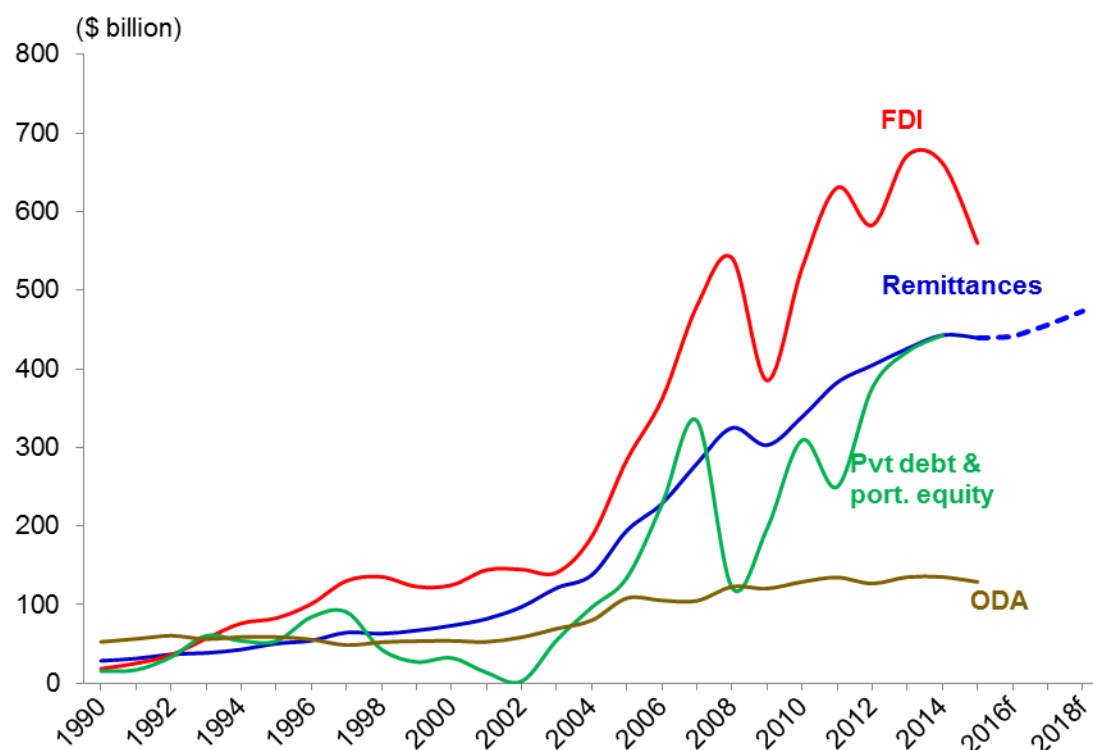
received 18 percent of remittances relative to economic size (The World Bank 2016). Comparing remittances with other financial flows, its account the second largest source of foreign exchange earnings for emerging after (FDI), and surpass (ODA). Moreover, the flows of these remittances compared to the other flow of resources have shown remarkably resilient. For instance, during the global financial crises in 2009 remittances were dropped by 4.5 percent but rebounded in 2010. On the other hand, FDI declined by 32.8 percent in 2009 from 2008. Similarly, the recorded flow of FDI to emerging countries are estimated to have reached to 560 billion in 2015, decreased from 671.79 billion in the preceding year, the flow of official development assistance (ODA) reached to 135 in 2014 (Figure 1.3).

Figure 1.2: Top 10 remittances recipient’s developing countries in 2015 (percent of GD



Source: World Bank, 2016

Figure 1.3. Financial flows to developing countries



Source World Bank 2016

1.3 Objective of the Study

- To examine the relationship between remittances and real effective exchange rate.
- Furthermore, to examine how financial sector development plays its role in weakening the effect of real effective exchange rate in remittances dependent economies.

The implications of these findings are to know whether remittances appreciate the local currency that further destabilize this affect would be reduced with a deep financial sector development other than large and active stock market. Therefore, we intend to show whether remittances can more effectively channel by well-developed financial sectors into investment opportunities.

1.4 Research Questions

1-Analyze whether the real effective exchange rate appreciates from the flow of remittances?

2-Analyze whether appreciation in real effective exchange rate can be prevented with high developed financial sector, as availability of financial services helps remittances to channel in a productive use?

1.5 Testing Hypothesis

H_0 = the flow of remittances are not related to real effective exchange rate depreciation.

H_A = the flow of remittances are related to real effective exchange rate appreciation.

H_0 = the real effective exchange appreciation are not related with financial sector development

H_A = the real effective exchange rate appreciation can attenuates with the availability of developed financial sector.

CHAPTER 2

LITERATURE REVIEW

2.1 Remittances and real effective exchange rate

The existing literature relates remittances and real effective exchange rates in using both time series and panel data. The roles of remittances for the receiving countries are considered to be an important subject of empirical research, in order to formulate the appropriate policies to channel these resources into productive investment.

The Salter (1959), Swan (1960), Corden (1960) and Dornbusch (1974) model used as theoretical support to empirically test the impacts of the flows of external capital (i.e. remittances) on exchange rate for the sample of remittances dependent economies. This model reveals that how external capital flows would appreciate the real effective exchange rate in increasing the wise in economic growth. The study also shows that worker's remittances through financial development increases economic growth and also found that in the appearance of financial liberalization and trade openness the worker remittances plays a greater role in international level is constant, the income increase following the capital flows result an increase in spending, that further put pressure on the domestic demand in the economy. This process would be named as a spending effect (Caves et al., 1982). The increase in the value of non-tradable goods relative to tradable goods cause real exchange rate to appreciation. Similarly, inputs such as labor and capital probably switch into domestic non-traded goods productions that come across the rise in domestic demand. The resource movement effect generates from the rise of non-traded sector.

Arize, et al., (2000) examined the relationship between real exchange rate volatility and trade, in particular on the flow of exports. The study used quarterly data over the period 1973-1 to 1996-4 of 13 less developed countries. The study employed Johansen's multivariate method for empirical analysis. The study exhibits that there is negative relationship between remittances and real exchange rate volatility in both short run and long run time period.

Lucas and Stark (1985) argued remittances involves the formal mutually agreement between family and the migrant. The latter send the money to his family in cash for basic needs as well as for several different special motives. The migrant needs to ensure that his assets at home are appropriately oversight, and his wants to enhance his family relationship so as to be capable to return home self -respect. This study shows a positive relationship between recipient income and remittances.

Kandil and Mirzaie (2003) examined that the effect of exchange rate fluctuations that decomposed into trend and cyclical components. The demand sides of unanticipated exchange rate fluctuation were primarily determined by exports, imports and local currency demand. However, on the supply sides, the cost related to the imported intermediate goods. The study shows that unanticipated exchange rates were more significant having manifold impacts on growth and inflation.

Amuedo-Dorantes and Pozo (2004) studied the effect of migrants' remittances on the real exchange rate for 13 Caribbean and Latin American countries. The study used panel data for the analysis. The study reveals that remittances influx to these countries result a significant percent increase in the real exchange rate. Moreover, the study shows that exchange rate appreciation due

to remittances, also cause loss in international competitiveness in the remittance receiving countries.

Bussolo et al., (2007) examined remittances and real exchange rate for selected Latin American economies based on highest remittances relative to output. . The study concludes with empirical results that remittances significantly cause real exchange rate appreciation.

Muktarbek (2012) finds that remittances inflow can have an effect on domestic economy, particularly in real exchange rate. Similarly, increase in remittances flow cause appreciation in real exchange rate. These effects in general put upward pressure on the real effective exchange rate, as receiving enormous financial flows originated from natural resource booms, remittances or foreign aid. Lartey, Mandelman, and Acosta (2008) studied the effect of remittances on real exchange rate regimes, and the Dutch Diseases effect. The study used panel data of 109 developing countries over the period 1990 to 2003. They empirical analyzed GDP per capita, trade openness and GDP growth rate in using the Generalized Method of Moments (GMM). The study shows trade openness is statistically insignificant. However, increased in remittances would increase spending in developing economies that in results cause increase in non –tradable goods, which further intensify the real exchange rate appreciation. The rise in the price of non-tradable goods would results in resource shifts and thus decreases productivity in the manufacturing (tradable) sector.

Bach and Solomon (2008) studied labor migration at a global level by using panel data from 1990 to 2006. The study examined that whether remittances transfer responds to exchange rate uncertainty, political risk and other macroeconomic determinants. They argue that remittances and exchange rate have negative relationship. For instance, an increase in exchange

rate uncertainty. Likewise, political risk is negative with remittances flows, but statistically insignificant. Finally, they suggest that favorable economic condition and sound political environment are important factors to attract considerable share of the financial flows.

Acosta, et al., (2009a) suggested that the increase in remittances results to macroeconomic volatility in the context of has on Salvadorian economy. They observed that rise in remittances shows that rise in household income and as a result the non-tradable products also rise. The study finds the usual exchange rate appreciation is established.

Acosta et al., (2009) also studied on the remittances and real exchange rate and suggested that remittances lead to rise in real exchange rate. The study finds that the countries with more advanced financial market are enhanced to improve the macroeconomic to test of increase of the local currency as maintaining a competitive position. The study also assumes by using the same data that if decrease in the currency occur, the amount by which currency decreases depends on the capability of domestic economy to channel remittances in the direction of investment.

Rehman et al., (2010) examined foreign exchange and real exchange rate equilibrium in the Pakistani context. The monthly data was collected for analysis from the periods 1993 (M7) to 2009 (M3). The study finds that real exchange rate would be appreciated substantially in case of both migrant remittances and foreign direct investment (FDI).

Barrett, K. (2014) suggested that remittances and real exchange rate have negative effect on the labor exporting economies, thus the economic development of the countries are reducing due to the real exchange rate appreciation in thereby depreciation of exports competitiveness. Different studies have taken attention into the Dutch disease phenomena of labor sending developing countries, by using different applied techniques, such as panel and time series data

models. However, still the issue is debatable empirically as still no consensus exist that remittances always affect positively the real exchange rate. We can provide numerous studies from the empirical literature. If the remittances increase by 1 percent in result the real exchange rate. The study suggests that the government spending, capital inflows and terms of trade in the long term appreciate the real exchange rate. Nevertheless, insignificant relationships have been found between remittances and real exchange rate in the short horizon.

Tuuli, M. (2015) observed for Ghana economy on the impact of remittances and real exchange rate. The study used time series error correction model approach. The study found appreciation of the real exchange rate due to remittances flow in both the long run and in the short run.

Hyder and Mahboob (2006) investigated in case of Pakistan, on exchange rate misalignment and equilibrium real effective exchange rate (EREER). They employed annual data from the periods FY1978 to FY2005 by using Engle Granger co-integration technique. The study shows that equilibrium real effective exchange rate (EREER) is determined by trade openness, terms of trade, relative productivity differential, net capital inflows, workers' remittances, and government consumption. Trade openness shows that the increase in capital inflows and government consumption results in the depreciation of real effective exchange rate (REER), while increase in improvement in terms of trade, migrants' remittances, and total factor productivity relative to trading partner results in the appreciation of real effective exchange rate (REER). A 1 percent increase in migrants' remittances with respect to GDP is associated with 0.16 percent appreciation in REER. A 1 percent increase in net capital inflows with respect to GDP is associated with 0.02 percent depreciation in REER.

Hassan and Holmes (2013) studied on the long run relationship between remittances and real exchange rate, through panel data selection for less-developed countries. The study is collected through sample data and finds that remittances have significant effect on real exchange rate appreciation for high- remittance recipient's countries.

Roy, R., and Dixon, R. (2016) studied the Dutch disease and remittances flows in the South Asia context. They find that remittances have significant effect on real exchange rate. The study finds that in less developed countries the growth can be enhances through financial development thus remittances improving the financial resources.

Prakash, K. A., and Mala, A. (2016) study the Fiji economy in examines the impact of remittances on real exchange rate. They found no impact of real exchange rate appreciation in the long run. The study argued that significant flows of remittances channeled to productive investment to increase domestic capacity which exerts no pressure on the domestic exchange rate to appreciate. However, they argued that in the short run it appreciates due to increase in remittances.

2.2 Remittances and financial development

The present work is on the rapport between remittances and financial sector development. There are several studies that established the ability of financial intermediaries. In general, Banerjee and Newmann, (1993), and Greenwood and Jovanovic (1990) studies focused on credit to household and private firms through financial intermediaries from banks and nonbank or access to loans. Generally, financial markets and growth has robust relationship and received attention in the empirical literature. Schumpeter (1911) examined that financial sectors, promotes economic growth and technological innovation by reallocating resources to entrepreneurs. Levine and Zervos (1998) analysed that different services are provided by banks and stock markets, although both stock market liquidity and banking development positively predict productivity improvements, growth and financial accumulation. Beck et al., (2000) empirically explained that financial development and growth have positive relationship and these relationship works through total factor productivity. Wurgler (2000) suggested that investment does not directly increased by financial development, but the economic growth would be increases if the existing investment is better. The deep financial market is not the only way to increase economic growth but high developed stock markets are also important factors for economic growth (Beck & Levine 2004) and (Rousseau and Wachtel 2000). Demirguc-kunt et al., (2011) illustrate that both stock market development and bank are associated independently with growth. Billmeier and Massa (2007) suggested that stock market development is also a measure of financial sector, which further associated with output growth. To measure the financial sector development in the used both banking and financial sectors variables.

Mundaca (2009) analyzed growth and remittances nexus for Latin America and Caribbean regions. They used panel data techniques over the period 1970 to 2003. The study established that the growth effect of remittances will be strong in those countries with robust financial sector.

Ruiz-Arranz, M., and Giuliano, P. (2005) analyzed the empirical relationship of remittances, financial development and economic growth for selected emerging economies. . The study employed the data from 1975 to 2002. To control the endogeneity issue, they used System GMM. The study finds that in less developed countries the growth can be enhanced through financial development. Furthermore, the results also suggest that remittances improving the allocation of financial resources, facilitate in easing credit constraints for the poor, substituting the lack of financial development, and thus accelerating economic growth.

There are different studies on remittance which shows in different aspects these are like impact of remittances on growth, education & health, income inequality. (Ratha 2013a) observed that remittance enhancing the growth rate in the developing countries like Pakistan. The study shows that remittance creates potential advantages related to the international migration for poor people of the recipients in the developing countries like Pakistan.

Frank et al., (2009) studied on the links between remittances and insurance health care in the America and find that either remittances received by the house hold were spending by health care or not. The people living in the household that received remittances and they spend the money on healthcare were more likely to be insured and in these case the remittances plays significant difference effect between the receiving remittances and the non- receiving remittances. While on the other hand the people living in the house hold and received remittances but they did not spend the receiving money on health care were more likely to be

uninsured and in these case there were no significant difference effect between the receiving remittances and the non-receiving remittances.

Ratha (2013b) studied on the impact of remittances on economic growth in the Africa development context by using unbalanced panel data techniques from the period 1980 to 2004 for 37 African countries and found that in the less developed financial system the remittances increases the growth rate by providing another source of finance investment. This study shows that remittances have positive effect on economic growth rate and exactly important influence on economic growth rate and the current level of gross domestic product (GDP) as financing of human and physical capital. On the other hand Chami et al., (2003) studied 113 countries concluded thirty year period and find that remittances and economic growth have negative relationship, while IMF (2005) found no relationship between remittances and economic growth. Similarly, Chami et al., (2003) also observed that remittances have a negative effect on economic growth.

Giuliano and Ruiz-arranz (2006) suggested the links between economic growth and remittances that how financial development influences the size of the economies. The study covered 100 developing countries data and found that remittance rise growth in economy with deep financially developed. It also suggests that remittances promote financial system where there is no need of credit to the population. The study also analyzed the repeated properties of remittance shows that they are mainly profit driven and usually procyclical.

Aggarwal et al., (2006) studied, economic growth and remittances that they have positive and significant effect in the long run on the income growth while in the short run ODA has cause positive with respect to income growth, remittances and financial development have negative

effect on the income level in the short run. This study observed that a remittance to financial development gives the vast information of that remittances reducing poverty and enhancing growth rate in economy. This study also observed that impact of remittances to the private sector on bank deposit and on bank credit. In this study they show that a remittance plays a significant role on bank deposit and credit to GDP. The study gives highly supported idea that remittances promote financial development in developing countries.

Shahbaz (2007) studied on the relationship between remittances and financial development by using time series data from the period 1971 to 2001 and finds the long run relationship by employing Johansen co-integration technique and autoregressive distributed lag (ARDL) approach. The result suggests that financial development can be promoted from remittances. Furthermore, the study also suggests gross national product (GNP) per capita and increase in exports promote the performance of financial sector development while increases in inflation cushion the effects.

Service, E. (2014) analyzed the impact of remittances on financial development substitute in economic growth by using panel data model of 66 developing countries for the period 1970 to 2005. They study found that financial development determines the effectiveness of national banking system and displayed that the impact of remittances on economic growth is negative in countries where bank efficiency is low and high in countries where bank efficiency is high.

Aggarwal et al., (2011) studied on the relationship between worker remittances and financial sector development by share of deposit and credit to GDP, by using panel data of 109 developing countries data from the period 1975 to 2007. The study uses the fixed effect and generalized method of moment (GMM) estimation in order to examine the relationship between

remittances and financial development. The study found that the impact of remittances on financial development plays an important role in the economy because it enhances the growth rate effects of financial development. The study also finds that there is a positive and significant relationship between worker remittances and financial development in the receiver developing countries after controlling opposite connection and dimension error effect.

Chowdhury, M. B. (2011) analyzed on the relationship between worker remittances and financial development for Bangladesh. The study used a time series data over the period 1971 to 2008. The study found that the impact of worker's remittances on financial development plays an important role in the economy and it is the 2nd largest source of foreign exchange earnings. Furthermore, the study reveals direct and significant relationship between remittances and financial development.

Own and Me (2011) examined the interplay between remittances and financial development. The data are collected in this study from Pakistani by using time series data from the period 1980 to 2010, including Auto Regressive Distribution Lagged (ARDL), Ordinary Least Square regression model and Error Correction Model approach to analyze the role of trade openness and foreign aid in raising financial development to analyze the linkage between trade openness and foreign aid in promoting financial development and also the linkage among financial development and worker remittances. The study shows that there is no relationship in the long run among worker remittances and financial development while in the short run there is a significant and positive relationship among worker remittances and financial development. The study also examined the ODA, trade openness and remittances that they have positive and significant effect in the long run on the income growth while in the short run ODA has cause

positive with respect to income growth effect but trade openness, remittances and financial development have negative effect on the income level in the short run.

Oke, et al., (2011) studied the impact of workers' remittances on financial development in Nigeria from 1977 to 2009 by using ordinary least square estimation (OLS) and generalized method of moment (GMM) estimation techniques and used two indicators to measure the financial development. One is the ratio of money supply to GDP and the other is ratio of private credit to GDP. The study found that remittances and financial development having positive and significant effect on financial development in Nigeria with the exclusion of the ratio of private credit to GDP. Remittances used for consumption purpose in the economy rather than production function in the economy. It increases the liquidity as compared to loanable fund.

Fayissa and Nsiah (2012) studied the financial development and remittances with control variable of exchange rate, size of migrant stock in both Africa and American regions. The study uses panel data from 1985 to 2007 period including of 44 countries in which 25 countries were from Africa and 19 countries from America. They find that financial development, exchange rate and size of migrant stock have positive effect on remittances in both regions.

Cooray, A. (2012) studied the migrant remittances and financial development. The study posits that remittances cause to increase in both size and efficiency of the financial sector development.

Akkoyunlu, Ş. (2012) studied the direct relationship between remittances and financial by taking evidence from turkey. The study is discovered by using time series data to find the relationship between remittances and financial development. The study is conducted in the small

level as well as in high level. At the end of the study observed that there is no association between financial development and remittances.

Brown et al., (2013) studied on the impact of remittances and financial development in the micro as well as macro level by using panel data. In the macro level the data of 138 countries used over the period 1970 to 2005. The study shows a negative relationship between remittances and financial development in developing countries. In the micro level study the data are taken between 1990 and 2007 and examine the relationship between remittances and household financial literacy for two countries, Azerbaijan and Kyrgyzstan. In this level the study shows that remittances and financial literacy having a negative relationship among remittance- receiving households.

Sharif et al., (2013) studied that impact of remittances and financial development in the case of Latin America and Caribbean region by using panel data method through using fixed and random effect model. In order to investigate this effect the study taken the data from 1991 to 2010 from 29 Latin American and Caribbean region. The study found in research that there is positive and significant relationship between remittances and financial development.

Kakhkharov, J. (2014) studied on the impact of remittances and financial development in Central and Eastern Europe by using panel data through taking sample of 27 countries from the period 1996 to 2003. The study shows that remittances have a significant and positive effect on financial development and also analyzed that the effect of remittances on financial development is particularly more in those countries where there are high share of remittances to GDP ratio.

Aziz et al., (2015) studied on the migrant's remittances and economic growth rate in the role of financial development by using unbalanced panel data over the period 1980 to 2010 for

72 countries. After including the entire variable the data for 54 to 56 countries are shows valid while other are invalid in dissimilar empirical mode. The study shows that financial development make easy the change of worker remittances which may facilitate in productive investment and there wise increases in economic growth. The study also shows that worker's remittances through financial development increases economic growth and also found that in the appearance of financial liberalization and trade openness the worker remittances plays a greater role in economic growth as well as it's significantly and positively increases economic growth.

Coulibaly, D. (2015) suggested on the links between remittances and financial development in the context of Sub-Saharan African by using panel data from the period 1980 to 2010. The study shows that remittances have positive linkage with financial development in 4 countries; these are Sierra Leone, Senegal, Sudan, and Niger. While in Gambia the financial development have positive linkage on remittances. The study also shows through credit to measure that only in Sudan remittances have positive and significant linkages with financial sector development.

Ahmed and Martínez-Zarzoso (2016) studied that remittances and transaction cost using gravity model approach. The study used bilateral data on remittances of 23 countries flows to Pakistan. They find that transaction cost is negative associated with remittances, as higher cost refrains each migrants from sending money back home. Moreover, they established that remittances are significantly and positively related to financial sector development. Their finding claims that well developed financial market positively impact remittances in the host and home countries.

2.3 Remittances, real effective exchange rate and financial development

The explanation on the relationship among the migrant remittance inflows, financial sector development and real exchange rate was explored by Acosta et al., (2009). The study is collected through using a panel data set for 109 developing countries from the period 1990 to 2003 to transition economies. The study gives evidence real exchange rate might be appreciated from the migrant's remittances. Furthermore, this effect is not stronger with deeper and active financial market, which seems to remain external competitiveness.

CHAPTER 3

METHODOLOGY

3.1 Data and Sample selection

This chapter shows the data collection, variables and methodology used to measure the migrant remittances effect on real exchange rate and thier role of financial development. The study employs panel data estimation techniques to test the relationship between migrant remittances and real effective exchange rate with the role of financial development. We take the data of top annual remittances-receiving countries of atleast 4 percent of remittances relative to GDP over the period 2000 to 2015.

Moreover, to examine the impact of financial sector development on the exchange rate, we employ the measures—private credit as a share of GDP as proxies for financial development. The data of remittances, domstic credit of GDP, real effective exchange rate, GDP per capita, trade openness, general government final consumption as percentage of GDP, GDP growth, gross capital formation, and market capitalization in percent of GDP proxied for capital market development. All the data taken from World Development Indicators, World Bank (2016). However, the term of trade data retrieved from Data Market website and the real and nominal effective exchange rate data accessed from Brugel database. The detailed definaition of the variables are presented in Table 3.1.

Table. 3.1 Description of the variables

Variable	Description	Source
Real effective Exchange rate	REER is the nominal effective exchange rate divided by a price deflator or index of costs.	World Bank
Migrants remittances	A remittance is a transfer of money by a foreign worker to a family back home.	World Bank
GDP Per Capita	GDP per capita is gross domestic product relative to population. Data are in constant 2010 USD.	World Bank
Trade Openness	Trade is the sum of exports and imports of goods and services measured as a share of GDP.	World Bank
GDP growth	Annual percentage growth rate of GDP at market prices. Aggregates are based on constant 2010, U.S. dollars.	World Bank
Terms of trade	The links between the directory of import prices and the directory of export prices.	Data Market
General government final consumption expenditure	Its comprehensive are depends on constant consumption 2010 USD. For purchases of goods and services its shows all current expenditures of the government such as spending on country wide defense and security.	World Bank
Gross fixed capital Formation	It's based on constant 2010 USD. It consist of includes plant, equipment purchases, land improvement; and machinery; and the construction of hospitals, offices, private residential dwellings, railways, roads, and the like, including schools, industrial and commercial buildings.	World Bank
Domestic credit to private sector by banks	It's provided financial resources to the sector by other depository corporations, such as through trade credits, purchases of non-equity securities, loans, and other accounts receivable, that establish a claim for repayment.	World Bank

Market Capitalization of listed domestic Companies relative to GDP	Market capitalization (also known as market value) is the share price times the number of shares outstanding (including their several classes) for listed companies divided by GDP.	World Bank
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3.2 Empirical Strategy

We first applied Pooled OLS as benchmark to estimate the model specifications outlined earlier. However, pooled OLS regression is used it typically overstates the exactness improvement which lead to underestimated standard error and t-statistic (Cameron and Trivedi 2009). The pooled OLS, however, is only consistent if there is no correlation between unobserved fixed effects and explanatory variables (Wooldridge, 2005). To deal with unobserved heterogeneity, panel data approach is employed. Panel data are the repeated observations of same cross-sectional time series dataset in which the different entities that is country, firms and individuals carried out for several times periods.

Panel data may have time effect, individual country effect or both which can be study through Fixed effect to deal with heterogeneity or random effect model if the country specific effect is assumed to be random or uncorrelated with the independent variable or predictor in the model.

Subsequently, we include fixed-(FE) and random-effects (RE) models. Hausman test is used for finding that whether pooled OLS random effect model or fixed effect model. If null hypothesis as insignificant relationship between individual effect and other regressors are not rejected then random effect model should to be preferred over fixed effect model. On the other hand, if the results were significant after running Hausman test for random and fixed effect models then fixed effect model should to be used.

In contrary to static model, Fixed and Random effect, dynamic GMM (Generalized Method of Moments) deals the issue of endogeneity than in the static and OLS models that do not let the routine of internal instruments. Moreover, the variables used in regression are not correlated with the error term (including lagged variables) can be possibly used as valid instruments (Arellano, 2003; Baltagi, 2005). It's challenging to find an external instrument to address with endogeneity problem. However, one solution is to used System GMM approach of Arellano and Bover, (1995) and Blundell and Bond (1998), which uses appropriate lagged levels and lagged first differences of the regressors as their instruments.

3.3 Model Specification

The benchmark panel regression specification is as follows

$$\begin{aligned}
 REER_{it} = & \alpha_0 + \alpha_1 \ln\left(\frac{REM}{GDP}\right)_{it} + \alpha_2 \ln(GDPPC)_{it} + \alpha_3 \ln(TradeOpeness)_{it} + \alpha_4 \ln(TOT)_{it} + \\
 & \alpha_5 \ln\left(\frac{GovtSpend}{GDP}\right)_{it} + \alpha_6 \ln\left(\frac{GFCF}{GDP}\right)_{it} + \alpha_7 \ln(GDPG)_{it} + \mu_i + \\
 & \varepsilon_{ijt} \qquad \qquad \qquad (3.1)
 \end{aligned}$$

In the second we includes the financial sector development variable interacting with remittances

$$\begin{aligned}
REER_{it} = & \alpha_0 + \alpha_1 \ln\left(\frac{REM}{GDP}\right)_{it} + \alpha_1 \ln\left(\frac{REM}{GDP}\right)_{it} * \ln\left(\frac{FinDev}{GDP}\right)_{it} + \alpha_2 \ln(GDPPC)_{it} \\
& + \alpha_3 \ln(TradeOpeness)_{it} + \alpha_4 \ln(TOT)_{it} + \alpha_5 \ln\left(\frac{GovtSpend}{GDP}\right)_{it} \\
& + \alpha_6 \ln\left(\frac{GFCF}{GDP}\right)_{it} + \alpha_7 \ln(GDPG)_{it} + \mu_i \\
& + \varepsilon_{it} \tag{3.2}
\end{aligned}$$

Where REER is the real exchange rate index, $\frac{REM}{GDP}$ represents personal remittances received in percentage of GDP , $GDPPC$ represents GDP per capita, $\frac{FinDev}{GDP}$ represents financial development (bank credit or deposits as a share of GDP) and market capitalization of listed domestic companies in a percentage of GDP , $TradeOpeness$ shows trade openness, TOT represents term of trade, $\frac{GFCF}{GDP}$ represents general government final consumption expenditure in percentage of GDP , $\frac{GFCF}{GDP}$ represents gross fixed capital formation in percentage of GDP , and $GDPG$ represents GDP growth. μ_i is unobserved country-specific effect, \ln represents variable in the logarithmic form.

CHAPTER NO.4

RESULTS AND DISCUSSION

This chapter includes descriptive statistics, correlation matrix and finally empirical analysis.

4.1 Descriptive statistics

Descriptive statistics is used to check the pattern of all dependent and independent variables. The result of descriptive statistics (includes number of observation, mean, standard deviation, minimum, and maximum) are shown in Table 4.1.

Table 4.1: Descriptive Statistics

Variables	Obs.	Mean	S.D	Min	Max
REER	752	103.1874	15.60139	47.6	251.5
Rem/GDP	725	11.81785	9.133609	0.2	61.9
REM	698	2895.508	4318.391	1.2	25531.17
GDPPC	746	2853.564	2305.213	270.3	14243.6
trade openness	726	87.7051	38.2871	24.2	321.6
TOT	608	1.000381	0.1602595	0.447826	2.01538
Govt Spend/GDP	691	14.13401	5.581017	3.5	39.6
GFCF/GDP	680	21.81279	6.803871	4	48.4
GDPG	746	4.103887	3.950883	-30.1	33.7
DCPSB	744	34.48683	21.58436	0.8	114.7
MCLDC (GDP)	234	30.89316	71.65459	0.1	890.8

Table 4.1 shows the statistics pattern of dependent variable which is real effective exchange rate, and independent variable which are personal remittances, remittances to GDP, financial development, term of trade, GDP per capita, trade openness, trade % of GDP, general government final consumption expenditure % of GDP, gross fixed capital formation, domestic credit to GDP, market capitalization of listed domestic companies.”

In Table 4.1 the average value of real effective exchange rate is 103.1874 shows that the weighted average of country's relative to other major currencies are adjusted for the effects of inflation, minimum and maximum value are 47.6 and 251.5 respectively, with the standard deviation of 15.60139. The average value of remittances to GDP is 11.81785, minimum and maximum values are .2 and 61.9 respectively, with the standard deviation of 9.133609. The average value of real remittances in USD million is 2895.508, minimum and maximum value is 1.2 and 25531.17 respectively, with the standard deviation of 4318.391. The average value of GDP per capita constant 2010 is 2853.564, the minimum and maximum value are 270.3 and 14243.6 respectively, with the standard deviation of 2305.213. The average value trade openness is 87.7051, minimum and maximum values are 24.2 and 321.6 respectively, with the standard deviation of 38.2871. The average value of terms of trade is 38.2871, minimum and maximum values are .447826 and 2.01538 respectively, with the standard deviation of .1602595. The average value of general government final consumption with respect to GDP is 14.13401, minimum and maximum values are 3.5 and 39.6 respectively, with the standard deviation of 3.5. The average value of gross fixed capital formation with respect to GDP is 21.81279, minimum and maximum values are 4 and 48.4 respectively, with the standard deviation of 6.803871. The average value of GDP growth is 4.103887, minimum and maximum value are -30.1 and 33.7 respectively, with the standard deviation of 3.950883. The average value of domestic credit to

private sector by banks is 34.48683, minimum and maximum values are .8 and 114.7 respectively, with the standard deviation of 21.58436. Finally the mean value of market capitalization of listed domestic companies with respect to GDP is 30.89316, minimum and maximum are .1 and 890.8 respectively, with the standard deviation of 71.65459.

4.2. Correlation Matrix

To check the collinearity in the explanatory used in the analysis, we conduct the pair wise correlation of all independent variables. It shows the direction of relationship between two variables in the form of positive and negative series starting from 1 with highest correlation and 0 with lower correlation between independent variables. When the value of correlation is zero then there will be no correlation between variables similarly when the value of correlation is 1 then there is perfect correlation exists between variables. The problem of collinearity can reduce parameter variance estimates under certain conditions (Greene 1990, and Johnston, J., & DiNardo, J., 1984). The slightly significant correlation between the general government financial consumption and trade openness exists about 50.4 percent. However, when the values exceeds 70 percent of the correlation, than collinearity problem will be existed among explanatory variables (Kennedy, 1998).The result in Table 4.2 depict that no multi collinearity problem has been found among explanatory variable used in the study.

Table 4.2 Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10
1	1									
2	-0.08	1								
3	0.17	-0.15	1							
4	0.32	-0.36	0.16	1						
5	0.13	-0.34	0.039	0.44	1					
6	0.19	-0.44	0.34	0.50	0.20	1				
7	0.11	-0.41	0.16	0.39	0.31	0.16	1			
8	-0.11	0.02	-0.07	-0.04	0.073	-0.22	0.16	1		
9	0.03	0.06	0.40	0.42	0.32	0.07	0.28	0.10	1	
10	0.004	0.07	0.032	0.114	0.113	0.07	0.032	0.008	0.19	1

Note: 1 shows Remittances (% of GDP), 2 shows real remittances, 3 shows terms of trade, 4 shows GDP per capita (USD), 5 shows trade openness (GDP), 6 shows General Government final consumption expenditure (% of GDP), 7 shows Gross fixed capital formation (% of GDP), 8 shows GDP growth (annual %), 9 shows Domestic credit to private sector by banks (% of GDP), 10 shows Market capitalization of listed domestic companies (% of GDP).

4.3 Empirical Findings

In the final section, the relationship between remittances and real exchange appreciation has been examined. The study used a variety of panel regression model, such as static (Fixed and Random Effect) and dynamic model (Difference GMM and System GMM). This study checks the effect of different variable on real effective exchange rate using panel data techniques. Panel data having the two magnitudes of data such as cross sectional data and time series data. The empirical results presented below.

The study estimated real effective exchange rate on remittances/GDP one of our variable of interest, GDP per capita, trade openness, term of trade, general government final consumption relative to GDP, gross fixed capital formation relative to GDP and GDP growth.

Table.4.3 Baseline Model: Remittances (% of GDP) and the real effective exchange rate

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Pooled OLS	Fixed Effect	Random Effect	Difference GMM	System GMM
Ln (Rem/GDP)	0.0280 (0.0206)	0.0323 (0.0264)	0.0171 (0.0222)	0.0190*** (0.00613)	0.0119* (0.00623)
Ln (GDPPC)	0.116*** (0.0258)	0.389*** (0.0846)	0.0550*** (0.0166)	0.188*** (0.0270)	0.0389*** (0.0148)
Ln (trade openness)	-0.179*** (0.0641)	-0.215*** (0.0603)	-0.167*** (0.0534)	-0.121*** (0.0164)	-0.134*** (0.0162)
Ln (TOT)	-0.0658 (0.0469)	-0.00172 (0.0592)	0.0173 (0.0466)	0.0587*** (0.0189)	0.0752*** (0.0191)
Ln (Govt Spend/GDP)	0.0479 (0.0569)	0.0606 (0.0468)	0.0370 (0.0459)	0.0654*** (0.0169)	0.0472*** (0.0150)
Ln (GFCF/GDP)	0.0869** (0.0430)	0.0795 (0.0494)	0.0808** (0.0376)	0.0669*** (0.0136)	0.0749*** (0.0133)
Ln (GDPG)	-0.00416* (0.00218)	-0.00253 (0.00160)	-0.00185 (0.00188)	0.00135* (0.000731)	0.00219*** (0.000757)
Observations	561	561	561	554	561
R-squared		0.514			
Number of country	37	37	37	37	37
Country FE		YES	YES	YES	YES
Year FE		YES	YES	YES	YES
Hausman Test		Prob>chi ² = 0.0032			

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

GGFC shows general government final consumption, GFCF shows gross fixed capital

formation (GDP)

The coefficient in Column 5, Table 4.3 is 0.0119* shows that remittances have positive relationship with real effective exchange rate and statistically significant at 10 percent level. The intuition behind the positive and significant result that increased in remittances would increase in spending in non –tradable goods. This further increases the value of local currency to appreciate, which is the main indication of cause disease phenomena. The results are in line with the previous remittances and exchange rate literature((Barajas et al., 2009). However, in contrary Özcan, B. (2011) using a data of 10 recipient shows that remittances and real exchange rate have negative and significant on real exchange rate , thereby increasing the trade competitiveness.

GDP per capita having a positive and has a highly significant effect on real exchange rate, thus implying that higher income level tend to appreciate the exchange rate as predicated by Balssa and Samuelson effect.

The coefficient in Column 5 in Table 4.3 is 0.0389*** shows that GDP per capita is positive and statistically significant relationship with real effective exchange rate at 1 percent significance level. (Muktarbek, A. 2012) also found significant relationship between real effective exchange rate and GDP per capita. However, Louis et al, (2011) suggested that GDP per capita not always significant although it has the expected signs.

The coefficient in Column 5 in Table 4.3 is -0.134***shows that trade openness are negative and statistically significant relationship with real exchange rate at 1 percent level. Trade openness increase in quota and decrease in tariff, decrease the domestic price of tradable goods and thus results in both substitution and income effect, the depreciation in trade leads to depreciation in real exchange rate.

Calderon, C. a, and Kubota, M. (2009) also found that trade openness have the negative and significant relationship with real exchange rate. The study further shows that trade openness helps to attenuate shocks and the ability to smooth shocks to real effective exchange rate is weaker in countries with greater level of output concentration. It may be due to that trade openness reduces the difficult chances of declining in the real exchange rate.

Similarly, (Hau 2002) in relating real effective exchange rate and trade openness, finds that it has negative and statistically significant relationship, that if economic integration across the spreading of world trade decreases the real exchange rate. Martins (2012) also established that increase in trade openness cause to decrease in real exchange rate.

The coefficient in Column 5 in Table 4.3 is 0.0752*** shows that term of trade persuades the real exchange rate appreciation having a statistically significant relationship at one percent significance level. It can be explained that the positive distress of price of exports comparative to imports may results in real exchange rate appreciation.

Regarding government consumption and real exchange rate, the study finds positive and statistically significant effect. It reveals that if government spending increases by 1 percent with respect to GDP then real effective will also be appreciate about 4.7 percent it means that government consumption is dominated by non-tradable goods.

The coefficient in Column 5 in Table 4.3 is 0.0749*** shows that real effective exchange rate and gross fixed capital formation having a positive and statistically significant relationship with 1 percent significance level.

The coefficient in Column 5 in Table 4.3 is 0.0219*** shows that GDP growth and real exchange rate have positive and significant relationship with exchange rate with 1 percent.

Finally, the GDP growth have positive and significant sign suggest that more the economic grows; more the exchange rate would appreciate.

In Table 4.3 the result also shows that R- Squared value is 0.514 which shows that 51.4 percent variations explained by all independent variables used in the model. The Hausman test suggests using Fixed Effect model rather than using Random Effect as the p-value of Chi-square is less than 5 percent.

Table.4.4 Remittances, Banking sector development and Real effective exchange rate

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Pooled OLS	Fixed Effect	Random Effect	Differenced GMM	System GMM
Ln (Rem/GDP)	-0.0518 (0.0500)	0.0456 (0.0401)	-0.00972 (0.0438)	0.0540*** (0.0103)	0.0334*** (0.00968)
Ln (DCPSB* Rem/GDP)	0.0261** (0.0115)	-0.00485 (0.0118)	0.00838 (0.0114)	-0.0152*** (0.00342)	-0.0101*** (0.00316)
Ln (GDPPC)	0.0612*** (0.0210)	0.397*** (0.0900)	0.0391** (0.0170)	0.230*** (0.0281)	0.0523*** (0.0153)
Ln (trade openness)	-0.173*** (0.0598)	-0.208*** (0.0639)	-0.155*** (0.0534)	-0.0986*** (0.0178)	-0.124*** (0.0172)
Ln (TOT)	-0.0755* (0.0441)	-0.000923 (0.0602)	0.00774 (0.0475)	0.0538*** (0.0192)	0.0760*** (0.0195)
Ln (Govt Spend/GDP)	0.0392 (0.0500)	0.0672 (0.0466)	0.0333 (0.0426)	0.0877*** (0.0172)	0.0596*** (0.0152)
Ln (GFCF/GDP)	0.0680 (0.0420)	0.0787 (0.0488)	0.0705** (0.0347)	0.0720*** (0.0137)	0.0810*** (0.0135)
Ln (GDPG)	-0.00309 (0.00214)	-0.00233 (0.00157)	-0.00131 (0.00185)	0.00141* (0.000752)	0.00235*** (0.000784)
Observations	557	557	557	548	557
R-squared		0.512			
Number of country	37	37	37	37	37
Country FE		YES	YES	YES	YES
Year FE		YES	YES	YES	YES
Hausman Test		Prob>chi ² = 0.0000			

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.4 presents the augmented model with bank sector variable interacting with remittances. In this study we postulate that strong financial sector development can assist to channel remittances into productive use and thus offsets the real exchange appreciation effects.

We introduce the domestic credit to private sector by banks as proxy for financial development and interacted with remittances.

The result of System GMM is shown in the Table 4.4 Column 5. All the variables used in the regression exhibit the expected sign. The interaction term of remittances with financial development shows that an increase of 1 percentage in the remittances complementing by financial development originates the real exchange rate depreciation of about 1.0 percent points, the coefficient is statistically significant at 1 percent significance level. This means that exchange rate appreciation due to remittances flows will be attenuated in countries with stronger financial sector development.

Table 4.5 Remittances (% of GDP), market capitalization (% of GDP) and real effective exchange rate

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Pooled OLS	Fixed Effect	Random Effect	Difference GMM	System GMM
Ln (Rem/GDP)	0.0308 (0.0284)	0.0432* (0.0230)	-0.00832 (0.0319)	0.0366*** (0.00663)	0.0277*** (0.00780)
Ln(MCLDC *Rem/GDP)	-0.00702 (0.00534)	-0.0163*** (0.00370)	0.00510 (0.00652)	-0.00522* (0.00304)	-0.00274 (0.00249)
Ln (GDPPC)	0.369*** (0.0733)	0.513*** (0.0838)	0.00775 (0.0242)	0.335*** (0.0434)	0.132*** (0.0323)
Ln (trade openness)	-0.233*** (0.0838)	-0.153** (0.0704)	-0.0398 (0.0421)	-0.129*** (0.0239)	-0.0902*** (0.0254)
Ln (TOT)	0.0731 (0.0558)	0.105* (0.0545)	0.0640 (0.0786)	0.0366 (0.0303)	0.0211 (0.0324)
Ln (Govt Spend/GDP)	0.0267 (0.0736)	0.0883* (0.0510)	-0.0505 (0.0406)	0.0454** (0.0211)	0.0144 (0.0231)
Ln (GFCF/GDP)	0.138** (0.0625)	0.0867*** (0.0280)	0.0201 (0.0421)	0.0536** (0.0223)	0.0229 (0.0229)
Ln (GDPG)	-0.00638*** (0.00186)	-0.00427* (0.00232)	-0.00279 (0.00260)	-0.000242 (0.000995)	0.00262** (0.00114)
Observations	198	198	198	181	198
R-squared		0.832			
Number of country	37	37	37	37	37
Country FE		YES	YES	YES	YES
Year FE		YES	YES	YES	YES
Hausman Test		Prob>chi ² = 0.0000			

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.5 reports the results of regressing the real exchange rate on inflows of remittances keeping into account the role of capital market variable interacting with remittances. In this study, we postulate that strong capital market development can assist to channel remittances into productive use and thus offsets the real exchange appreciation effects.

We introduce the market capitalization with respect to GDP as proxy for capital sector development and interacted with remittances. In the following, we provide significance evidence for our argument. We find that remittances significantly depreciate the real exchange rate when an interaction term of remittances and market capitalization allowed for.

The result of Difference GMM is shown in the Table 4.5 Column 4. The interaction term of remittances with capital market development shows that an increase of 1 percentage in the remittances complementing by capital market improvement originate the real exchange rate depreciation of about 0.5 percent points, the coefficient is statistically significant at 10 percent significance level. This means that exchange rate appreciation due to remittances flows will be attenuated in countries with stronger financial sector development. However, the system GMM results exhibit negative relationship, but statistically trivial.

Furthermore, all the variable remittances as well as other control variable are statistically significant except government expenditure, government fixed capital formation and GDP growth.

Table 4.6 Remittance (% of GDP), financial development and real effective exchange rate

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Pooled OLS	Fixed Effect	Random Effect	Difference GMM	System GMM
Ln (Rem/GDP)	-0.0208 (0.0371)	0.0539* (0.0292)	0.00211 (0.0325)	0.0480*** (0.00811)	0.0378*** (0.00807)
Ln (FINDEV *Rem/GDP)	0.0189** (0.00895)	-0.0103 (0.00893)	0.00483 (0.00820)	-0.0122*** (0.00285)	-0.00360 (0.00273)
Ln (GDPPC)	0.0615*** (0.0200)	0.411*** (0.0894)	0.0391** (0.0168)	0.292*** (0.0208)	0.109*** (0.0146)
Ln (trade openness)	-0.161*** (0.0595)	-0.204*** (0.0610)	-0.148*** (0.0522)	-0.111*** (0.0169)	-0.154*** (0.0169)
Ln (TOT)	-0.0789* (0.0451)	0.00297 (0.0612)	0.00731 (0.0477)	0.0383** (0.0184)	0.0554*** (0.0197)
Ln (Govt Spend/GDP)	0.0417 (0.0516)	0.0697 (0.0464)	0.0331 (0.0433)	0.0851*** (0.0168)	0.0658*** (0.0155)
Ln (GFCF/GDP)	0.0700* (0.0420)	0.0791 (0.0484)	0.0705** (0.0344)	0.0639*** (0.0132)	0.0684*** (0.0136)
Ln (GDPG)	-0.00356 (0.00220)	-0.00237 (0.00156)	-0.00144 (0.00190)	0.00135* (0.000733)	0.00241*** (0.000795)
Observations	557	557	557	548	557
R-squared		0.516			
Number of country	37	37	37	37	37
Country FE		YES	YES	YES	YES
Year FE		YES	YES	YES	YES
Hausman Test		Prob>chi ² = 0.0000			

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Next in Table 4. 6, we combined both capital and banking sector proxy to measure the country overall financial development. The difference GMM result shows significant negative relationship of remittances and real exchange rate in allowing the importance of both capital and banking sector development. The result suggests that if the interaction term remittances with financial development changes by 1 percent point, the real exchange rate depreciate by 1.2 percent. The results corroborates the finding of Acosta et al., (2009), shows that financial development can attenuate real exchange rate appreciation that is generating with increase in remittances flows.

CHAPTER 05

CONCLUSION

Remittances flows are increasingly becoming an important source of international finance for several developing countries in comparing with other financial flows such as Foreign Direct Investment (FDI), and Official Development Assistance (ODA). This study examined the impact of migrant remittances on real effective exchange rate through the role of financial development. The study used panel data analysis of 37 remittances dependent countries for the time period of 2000 to 2015. For this purpose, we used both static and dynamic data technique and a panel of 37 top recipients' countries for the sample period 2000 to 2015. For static model, fixed effect model has been preferred based on Hausman test. However, to tackle the endogeneity issue, the study further used Difference and System Generalized Method of Moment (GMM). Finally, the study interprets our result based on System GMM.

To investigate the relationship between remittances and real effective exchange rate, we also used other control variable that is, GDP per capita, general government consumption expenditure relative to GDP, gross fixed capital formation relative to GDP, GDP growth, term of trade, and trade openness.

The name of the countries are given below

Namely, Albania, Armenia, Bangladesh, Bosnia and Herzegovina, Comoros, Dominican Republic, Egypt Arab Rep., El Salvador, Fiji, Gambia the, Georgia, Guatemala, Guyana, Haiti, Honduras, Jamaica, Kyrgyz Republic, Latvia, Lebanon, Lesotho, Liberia, Moldova, Morocco, Nepal, Nicaragua, Nigeria, Philippines, Samoa, Senegal, Serbia, Sri Lanka, Tajikistan, Togo, Tonga, Vietnam, Yemen Rep., and Jordan.

Furthermore, the study uses interaction term of remittances with financial sector development to see its combined effects on real effective exchange rate appreciation.

Firstly, the study reveals the positive relationship between real effective exchange rate and remittances means the increase in the value of recipient currency which referred as Dutch Disease effect. This Dutch Disease effect would worsen the recipient's country trade competitiveness in the global market. However, we argue that the increase in magnitude of real effective exchange rate appreciation depends on how well financial development the recipient economy has to channel the financial flows into productive investment. Its means the effect would be attenuated in the recipient's countries with deeper and more sophisticated financial and capital market.

The current study has been carried out in finding of impact of migrant remittances on real effective exchange rate in contingent to the role of financial development. The study suggest that the real effective exchange rate appreciate would be weaker in the country with improved financial sector. The findings are not only statistically important but have also economic importance. Therefore, the main implication of this finding that the deeper capital and financial markets can mitigates the appreciation risk associated with the significant flows of remittances for top remittances recipient countries. This would protect the recipient economy from the loss of international competitiveness.

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APPENDIXES

Table. A1 Baseline Model: Remittances and the real effective exchange rate

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Pooled OLS	Fixed Effect	Random Effect	Difference GMM	System GMM
REM	0.0303** (0.0121)	0.0487** (0.0222)	0.0181 (0.0114)	0.0327*** (0.00519)	0.0412*** (0.00433)
Ln (GDPPC)	0.0935*** (0.0277)	0.355*** (0.0875)	0.0467** (0.0214)	0.245*** (0.0203)	0.0849*** (0.0141)
Ln (trade openness)	-0.160** (0.0657)	-0.219*** (0.0670)	-0.153*** (0.0556)	-0.140*** (0.0165)	-0.156*** (0.0163)
Ln (TOT)	-0.0541 (0.0465)	0.000532 (0.0622)	0.0165 (0.0459)	0.0365** (0.0179)	0.0537*** (0.0189)
Ln (Govt Spend/GDP)	0.0773 (0.0548)	0.0651 (0.0506)	0.0509 (0.0465)	0.0739*** (0.0163)	0.0910*** (0.0152)
Ln (GFCF/GDP)	0.0688 (0.0473)	0.0600 (0.0502)	0.0729* (0.0411)	0.0475*** (0.0129)	0.0548*** (0.0130)
Ln (GDPG)	-0.00428** (0.00215)	-0.00253 (0.00162)	-0.00201 (0.00185)	0.00143** (0.000706)	0.00180** (0.000758)
Observations	551	551	551	542	551
R-squared		0.527			
Number of country	37	37	37	37	37
Country FE		YES	YES	YES	YES
Year FE		YES	YES	YES	YES
Hausman Test		Prob>chi ² = 0.0000			

Table. A2 Remittances, Domestic credit to private sector by banks and real effective exchange rate

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Pooled OLS	Fixed Effect	Random Effect	Difference GMM	System GMM
REM	-0.0259 (0.0254)	0.0419 (0.0273)	-0.00811 (0.0224)	0.0396*** (0.00632)	0.0354*** (0.00611)
Ln DCPSB* REM	0.0126*** (0.00457)	0.00222 (0.00423)	0.00603 (0.00419)	-0.00274** (0.00139)	0.00170 (0.00124)
Ln (GDPPC)	0.0434* (0.0233)	0.336*** (0.0942)	0.0269 (0.0195)	0.262*** (0.0233)	0.0683*** (0.0156)
Ln (trade openness)	-0.183*** (0.0597)	-0.231*** (0.0680)	-0.161*** (0.0547)	-0.134*** (0.0197)	-0.164*** (0.0188)
Ln (TOT)	-0.0899** (0.0413)	-0.00516 (0.0607)	-0.00718 (0.0464)	0.0473*** (0.0183)	0.0695*** (0.0203)
Ln (Govt Spend/GDP)	0.0683 (0.0449)	0.0628 (0.0514)	0.0482 (0.0403)	0.0870*** (0.0165)	0.0916*** (0.0161)
Ln (GFCF/GDP)	0.0561 (0.0427)	0.0590 (0.0495)	0.0652* (0.0383)	0.0554*** (0.0130)	0.0489*** (0.0139)
Ln (GDPG)	-0.00250 (0.00207)	-0.00201 (0.00154)	-0.00113 (0.00179)	0.00166** (0.000737)	0.00204** (0.000827)
Observations	550	550	550	540	550
R-squared		0.527			
Number of country	37	37	37	37	37
Country FE		YES	YES	YES	YES
Year FE		YES	YES	YES	YES
Hausman Test		Prob>chi ² = 0.0000			

Table. A3 Remittances (% of GDP), market Capitalization (% of GDP) and real effective exchange rate

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Pooled OLS	Fixed Effect	Random Effect	Difference GMM	System GMM
Irem_10	0.0446** (0.0196)	0.0457* (0.0233)	-0.00816 (0.0195)	0.0391*** (0.00616)	0.0279*** (0.00642)
REM	-0.000105 (0.00249)	-0.000816 (0.00217)	0.00200 (0.00206)	0.00108 (0.000886)	-0.000617 (0.000785)
Ln(MCAP*REM)	0.284*** (0.0659)	0.425*** (0.0979)	-0.0108 (0.0195)	0.271*** (0.0427)	0.109*** (0.0279)
Ln (GDPPC)	-0.230*** (0.0849)	-0.144* (0.0815)	-0.0185 (0.0347)	-0.138*** (0.0248)	-0.0992*** (0.0257)
Ln (trade openness)	0.0585 (0.0684)	0.0708 (0.0572)	0.0275 (0.0697)	0.0244 (0.0305)	0.0278 (0.0327)
Ln (TOT)	0.0344 (0.0806)	0.0709 (0.0679)	-0.0572 (0.0494)	0.0510** (0.0212)	0.0378 (0.0245)
Ln (Govt Spend/GDP)	0.128** (0.0609)	0.0785** (0.0305)	0.0129 (0.0396)	0.0503** (0.0218)	0.0450** (0.0226)
Ln (GFCF/GDP)	-0.00617*** (0.00216)	-0.00296 (0.00236)	-0.00229 (0.00256)	6.76e-05 (0.000985)	0.00231** (0.00117)
Ln (GDPG)	2.617*** (0.509)	1.303 (0.757)	5.242*** (0.269)	0.479 (0.303)	0.453 (0.284)
Observations	191	191	191	174	191
R-squared		0.838			
Number of country	21	21	21	21	21
Country FE		YES	YES	YES	YES
Year FE		YES	YES	YES	YES
Hausman Test		Prob>chi ² = 0.0000			

Table. A4 Remittance (s % of GDP), financial development and real effective exchange rate

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Pooled OLS	Fixed Effect	Random Effect	Difference GMM	System GMM
REM	-0.00174 (0.0190)	0.0528** (0.0230)	0.00567 (0.0164)	0.0380*** (0.00566)	0.0438*** (0.00549)
Ln (FINDEV* Rem/GDP)	0.00694** (0.00331)	-0.00167 (0.00223)	0.00255 (0.00264)	-0.00198** (0.000947)	-0.000632 (0.000931)
Ln (GDPPC)	0.0534** (0.0228)	0.372*** (0.0917)	0.0315* (0.0190)	0.253*** (0.0217)	0.0774*** (0.0153)
Ln (trade openness)	-0.156*** (0.0603)	-0.211*** (0.0651)	-0.143*** (0.0529)	-0.142*** (0.0177)	-0.150*** (0.0180)
Ln (TOT)	-0.0800* (0.0445)	0.00400 (0.0626)	0.00252 (0.0467)	0.0461** (0.0181)	0.0767*** (0.0203)
Ln (Govt Spend/GDP)	0.0695 (0.0483)	0.0670 (0.0509)	0.0472 (0.0424)	0.0865*** (0.0164)	0.0905*** (0.0161)
Ln (GFCF/GDP)	0.0616 (0.0445)	0.0615 (0.0496)	0.0676* (0.0391)	0.0552*** (0.0130)	0.0501*** (0.0140)
Ln (GDPG)	-0.00366* (0.00216)	-0.00232 (0.00158)	-0.00160 (0.00186)	0.00182** (0.000725)	0.00186** (0.000822)
Observations	550	550	550	540	550
R-squared		0.527			
Number of country	37	37	37	37	37
Country FE		YES	YES	YES	YES
Year FE		YES	YES	YES	YES
Hausman Test		Prob>chi ² = 0.0055			