REMITTANCE AND ECONOMIC GROWTH NEXUS: AN ECONOMETRIC INVESTIGATION IN DEVELOPING COUNTRIES

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ABSTRACT

This study examines the nexus between remittance and economic growth in developing countries. The study used panel data set of 20 developing countries across the six world's regions from 2010 to 2020. This study considered gross domestic product as dependent variable, remittances, gross fixed capital formation, human labour force, foreign direct investment and trade openness as the independent variables. The panel data study is carried-out using fixed effect model, random effect model and the pooled OLS. But after robustness test, this study choose pooled OLS among other models of fixed effect and random effect models. Findings reveal that remittance has a significant positive impact on economic growth when the pooled OLS is considered. It recommends in this study that governments in developing countries should employ means of reducing informal flow of remittances and encourage the use of formal flows. Secondly, governments should ensure good accountability of the flow of remittances in their respective countries.

Keywords: Gross Domestic Product, Remittances, Fixed Effect Model, Random Effect Model and Pooled Ordinary Least Square Model

1. INTRODUCTION

International Monetary Fund (IMF) defines workers' remittances as the value of monetary transfers that is sent from the workers residing abroad for more than one year to the home country and are recorded in different sections of the balance of payments. Nowadays, remittances become an important and reliable source of external funding and capital accumulation in the developing economy (Sutradhar, 2020).

Migrants' remittances are considered as the important and reliable source of external funding and capital accumulation in the developing economies. Remittances are considered to be reasonably stable, anti-cyclical and more reliable source of capital

flows for many countries in the world. The continue increase in remittance flows into developing countries prompted researchers such as Tolcha and Rao (2016), Adams and Klobodu (2016), and Topxhiu and Krasniqi (2017) to investigate the remittances' short run and long run impacts on the economic growth of remittance receiving countries. The money sent from migrants to households in the country of origin which is simply term as remittances, have begun to be a significant source of external financing for developing countries. Therefore, the increase in the amount of international migration over recent decades has led to an unprecedented increase in financial flows to labour-exporting countries. Remittances are used to increase national savings, counter-act the constraints associated with foreign exchange and balance of payments, and add to development projects (Adams and Klobodu, 2016).

It was evidence that documented data on remittances are incomplete and underestimate the actual flows. This is due to the fact that some of the developing countries do not report remittances in their balance of payments (e.g. Afghanistan, Cuba). Usually, people use two types of channels to transfer funds: formal and informal. Ideally, the remittances should be channelling through formal means such as bank drafts, money transfer companies, and others in order to have the full records of the inflow of remittances (Azam, 2015). It was gathered that since fees for sending money (bank or transfer operators' fees) are relatively high, remittances are often sent via informal channels such as friends, relatives and the Hawala system. Qorchi (2003) asserted that informal flows are in the range of 10% to 50% of recorded remittances in the world. Informal channels like traders, friends or relatives without legal status should be avoided because they are difficult to be accounted by the monetary authorities.

Some empirical studies such as Rodriguez and Tiongson (2001), Vargas-Silva, Jha and Sugiyarto, (2009) and Ratha (2013) considered that remittances have a negative impact on the economies of receiving countries. For instance, it has negative impact on the labour supply decision of receiving family members, particularly female members. It can also raise inequality between families whom are getting remittances and those are not. This procedure makes recipient families dependent on remittances and takes them away from productive activities. This means that this money is used for consumption rather than productive investment. The negative relationship between remittances and economic growth implies the altruistic motive of remittances while it specifies the productive motive if positively related (Sutradhar, 2020).

It was gathered that Bangladesh, India, Pakistan and the Philippines have been the major sources of migrant workers who are generally spread worldwide and in particular, to Middle Eastern countries. These countries have experienced a

remarkable increase in remittance flows in the last three decades. India is considered to be the world's largest recipient of remittances earning 55.5 in recent years (Chowdhury, 2011). The Philippines is the 4th largest (US$21.3 billion), Bangladesh (US$11.1 billion) the 5th and Pakistan (US$10.56 billion), the 6th largest remittance recipients in the world (Chowdhury, 2011). Bangladesh's, remittances account for 2% of global remittances and these remittances grew by a staggering 24% during 2009 but during the global financial crisis (GFC), the number of migrant workers declined by 7% as people returned home. It was gathered that remittances contribute more than 12% of Bangladesh's GDP (Chowdhury, 2011).

As stated earlier, in these literature reviewed, there is no unique consensus on the impact of remittances on economic growth in developing countries. Although developing countries have the largest share of the total global remittances, literature involving these countries are still inadequate and a few are ended up with different conclusions.

This very recent study is an attempt to add the number of the existing literature in this area by revisiting remittance-growth nexus in the emergence-region. In addition, this study methodologically contributes by estimating this relationship in the very recent time which to the best of our knowledge, no other study has so far, reached this current years. Therefore, this study also boasts a methodological contribution by using the most recent data (1977-2012) with alternative specification and application of a very advanced econometric technique hardly used in the area. Since the labour market for migrants for the developing countries there exist significant structural similarities among these economies, thus, there is high potential need for cross sectional dependence (panel data).

2. LITERATURE REVIEW

In the empirical studies, the macroeconomic effects of remittances have been the subject of renewed attention in recent years. Until this time there was no consensus on whether remittances have positive and/or negative effects. Some argued that remittances can have both positive and negative effects in developing countries, while others are on the assertion that they have only positive impact on the economy, and the remaining scholars criticised that growth effect of remittances is either negative or at best zero. That is to say they may increase investments, affect human capital accumulation and alleviate poverty. They may also significantly reduce work effort, create moral hazards or lead to 'Dutch disease' effects.

The decline in remittance inflows in 1990's was a major contributor to increasing poverty in Pakistan (Siddiqui and Kamal, 2002). It was investigated that remittance flows are the second largest source of external funding for Pakistan behind FDI and have considered to have played an important role in economic growth. They contribute significantly to foreign exchange reserves which in turn significantly stabilise its financial sector (Qayuum et. al. 2008). Pakistan's remittance earning increased from US$1 billion in 2000 to US$10 billion in 2010. Similar to Bangladesh, Pakistan after the GFC witnessed a temporary 23% growth in remittances in the first half of 2009 as many workers returned home.

Imai et al. (2014) for instance investigated the empirical link between economic growth, remittances and poverty using annual panel data for 24 Asian and Pacific countries. The GMM-IV model was used and they found that remittances spur economic growth and reduce poverty in the region. Marwan et al. (2013) using time series study for Sudan used Johansen Cointegration technique to investigate the link between export, aid, remittances and growth and found that there is a long-run a significant positive relationship between growth, export and remittance. While Salahuddin (2013) used the pool OLS method to analyse the growth effects of remittances in Bangladesh, India, Pakistan and the Philippines and found significant positive relationship.

Ramirez (2013) examined the impact of remittances on the economic growth, using panel data of 23 upper- and lower-income Latin American and Caribbean (LAN) countries for the period 1990 to 2007. The findings suggest a significant positive relationship between remittances and real per capita GDP growth. Topxhiu and Krasniqi (2017) used data of six communist countries of Western Balkan (Albania, Kosovo, Macedonia, Montenegro, Bosnia and Herzegovina and Serbia) in order to analyse the impact of remittances on economic growth. They use balanced panel data for the period 2005 to 2015 and found a significant positive impact of remittances on economic growth. Cooray (2012) reported a positive and significant relationship between remittances and economic growth in South Asia by employing panel data over the period of 1970–2008. Azam (2015) analysed the role of remittances in fostering economic growth in Bangladesh, India, Pakistan and Sri Lanka and found the significant positive impact of remittances on economic growth in all countries.

Pradhan et al. (2008) proved a positive growth effect of remittance using a panel of 39 developing countries. This study also suggests that international migration and remittances may be endogenous to poverty meaning variations in poverty cause changes in both the share of migrants going to work abroad and in the level of remittances sent home. Additionally, it was investigated that remittances have

significant positive effect both on level and growth rates of GDP per capita, rates of savings and public expenditure (Ziesemer, 2010). Pradhan et al. (2008) investigated the impact of remittances on economic growth using panel data of 25 years from 39 developing countries for the period of 1980–2004 and concluded that there is a significant positive impact of remittances on economic growth.

Shaikh et al. (2016) main objective is to analyse the relationship between remittances and economic growth of Pakistan using time series data of 35 years for the period 1980–2014. These researchers found that personal remittances have no effect on economic growth of Pakistan.

Singh et al. (2011) explained that the impact of international remittances on economic growth is significant negative. However, countries with good governance have more opportunity to unlock the potential for remittances to improve economic growth. In a related study, using annual panel data for 64 African, Asian, and Latin American-Caribbean countries from 1987-2007, Fayissa and

Nsiah (2012) concluded that remittances enhance growth in countries with less developed financial systems, by providing an alternative way to finance investment and helping overcome liquidity constraints. Ziesemer (2012) studies countries with per capita income less than US$1200 and investigated the direct and indirect impacts of remittances. His panel analysis showed that the total effect of remittances on levels and growth rates of GDP per capita, investment and literacy are positive. Vargas et al. (2009) used annual data of Asia and investigate the effects of remittances on growth and poverty. His findings prove that remittances spur economic growth and reduce poverty. Adams Jr. and John Page (2005) showed that international migration and remittances have a strong, statistically significant positive impact on reducing poverty in the developing world. Gupto, Patillo and Wagh (2009) analysed the effect of remittances at the aggregate level in sub-Saharan Africa. The study have documented that remittances have a direct poverty-mitigating effect and a positive impact on financial development. Gupta et al. (2009) used random effect and fixed effect models for a panel of Sub-Saharan African countries and concluded that remittances have direct poverty mitigating effect and it promoted financial development as well. Chowdhury (2011) using time-series cointegration and vector error correction mechanism for Bangladesh found that remittances contribute positively towards the development of financial system which also help in achieving economic growth in the country. Combes and Ebeke (2011) in his analysis of System GMM-IV model for a cross sectional panel of 87 developing countries investigated that remittances significantly reduce consumption instability and its effect which is the component of economic growth. He also found that remittances also increase the capacity to cope

with natural disasters and macroeconomic shocks which in turn enhance economic growth.

Hasan and Shakur (2017) had used on a dataset of Bangladesh for the years 1976–2012 and identified a non-linear significant relationship between remittances and per capita GDP growth. They found a significant negative growth effect of remittances at first and the effect became positive at a later stage.

Guha (2013) applied the Dutch Disease Theory to explain the effects of remittances on the economy and introduced a micro-macro framework to establish channels of transmission of remittances through the economy. Their findings highlight the fact that remittances may lead to real exchange rate appreciation leading to sectoral production reallocation. The study further argues that multiple shocks in remittances may take the economy towards a negative growth path resulting from the weakening of the traded sector. Barajas et al. (2009) examined the growth impact of remittances in 84 recipient countries based on annual observations during 1970-2004 and found a significant negative effect on growth.

In another research Catrinescu et al. (2009) in panel study of 114 countries found neither significant positive nor significant negative relationship between remittances and growth. Siddique et. al (2010) concluded that growth in remittances does not has impact on economic growth in Bangladesh.

Chami et al. (2003) in a study on 113 countries found a significant negative impact of remittances on economic growth as was also found by Rajan and Subramaniam (2005). An IMF study in 2005 on 101 countries found no statistical link between remittances and economic growth. Barajas et al. (2009) found that workers' remittances do not have any significant impact on economic growth in developing countries by employing the panel dataset of 84 countries over the period from 1970 to 2004.

Rao and Hasan (2011) employed panel cointegration technique using unbalanced panel of 40 countries and analysed the direct effects of remittances and the channels through which remittances affect growth. The findings of their research suggest that although there have been short to medium term transitory growth effects, there are no long run growth effects of remittances. These findings are in line with the findings of Giudiano and Ruiz Arranz (2009).

The neoclassical theory of migration explained that labour moves from low-wage countries to relatively high-wage countries because of wage differences among countries. Remittances provide a way of poverty reduction and economic development when immigrants send remittances to the home country. On the other

hand, the theory explained further that this type of migration to abroad could damage the development process when the home country loses highly educated and skilled workers which is called brain drain. Thus, losses of human capital may affect economic growth negatively as reflected in the neoclassical growth theory (Solow, 1956).

3. METHODOLOGY

The data sources, sample selection procedure, justification of the variables, model specification and empirical implementation are discussed in this section. Therefore, this section is headed as data and methodology. The paper uses a panel regression analysis of 20 countries from 2010 to 2020. The data for this study were generated through secondary sources extracted from annual financial report of World Development Indicators published by World Bank. The scope of this study covers ten years from 2010 to 2020. In order to account for heteroscedasticity and other estimation problems, Logarithmic transformation is used for all the variables.

Sample selection

This paper investigates the impact of remittances on economic growth in some selected developing countries namely Nigerian, Bangladesh, India, Pakistan, Sri Lanka, Algeria, Egypt, Iran, Iraq, Israel, Jordan, Lebanon, Malta, Morocco, Palestine, Syria, Tunisia, Turkey Ghana and Yemen. These countries were chosen for being the top emigration countries in their respective regions, and also countries for which relevant data on remittances inflows was available over the period of our investigation.

Variables Justification and Measurement

To reflect the international nature of this research, all the variables used in this study are measured in US dollar. In order to normalise the series, the variables are analysed in log form.

Model Specification

This study uses a panel data set of 20 developing countries for the years 2010 to 2020. The choice of countries and time frame as stated above are guided by data availability and the significance of remittance in the particular country.

We specify our model as;

$$\text{LR}GDP_{it} = \alpha_0 + \alpha_1 \text{LREM}_{it} + \beta \text{L}X_{it} + \varepsilon_{it} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(1)$$

Where, LRDPG represents the log of real GDP per capita in constant US\$ (which proxy for economic growth). LREM represents the log of remittances. While the LX is the log of the set of control variables as included by growth theories which reflect the nature of developing countries' growth process. These control variables comprise of capital (proxies by Gross Fixed Capital Formation (GFCF) in constant US\$), Labour Force (proxies by Adult population, 15-64 as a % of total), Foreign Direct Investment (FDI) and Trade Openness as percentage of GDP.

In specified model of equation (1) above, subscript i represents cross sectional index while subscript t indicates the time index. ε is the error term. Equation (1) can be breakdown as;

$$\mathbf{LR}GDP_{it} = \alpha_0 + \alpha_1\mathbf{LREM}_{it} + \alpha_2\mathbf{LG}FCF_{it} + \alpha_3\mathbf{LH}LF_{it} + \alpha_4\mathbf{LF}DI_{it} + \alpha_5\mathbf{LT}_{it} + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots(2)$$

Solows growth model proved a positive stimulation of capital and labour growth based on growth of output in the economy; FDI is also expected to enhance economic growth in the host country (Fayissa and Nsiah, 2013), not only by providing direct capital financing but also by creating positive externalities and the procurement of new technology from abroad. TO is trade as a percentage of GDP which captures the impact of openness of the economy on economic growth and it is expected that a positive relationship exists between both variables.

4. RESULTS AND DISCUSSIONS

This section is designed to present and discuss the empirical results. This section is divided into sub-section as descriptive statistics, results of fixed effect model, results of random effect model and the results of 2 stage lease square model.

4.1 Descriptive Statistics

This section begins with the descriptive statistics which comprises of the mean, standard deviation minimum, maximum, skewness, kurtosis and Jarque-Bera test. In the Table 4.1 it observed that the dependent variable (LRGDP) posited a mean value of 4.2380218 with a standard deviation value of 0.527282. It indicates also that the LRGDP has a minimum value of 02.673528 with corresponding value maximum value of 5.038620. With respect to the data distribution of our independent variables, it was observed that their mean values are not far from their standard deviation values.

Table 4.1: Descriptive Statistics

	LRGDP	LREM	LGFCF	LHLF	LFDI	LTO
Mean	4.2380218	4.315520	4.465943	4.363146	3.388872	2.311089
Standard Dev.	0.527282	1.261392	1.269857	1.264243	1.328741	2.232431
Minimum	2.673528	1.995679	2.111733	2.074140	0.769232	-0.516186
Maximum	5.038620	6.158307	6.187802	6.151285	5.145185	4.718671
Skewness	-1.122817	-0.047523	-0.067234	-0.056845	-0.608607	-0.188552
Kurtosis	3.603360	1.438794	1.374563	1.389723	2.487234	1.234567
Jarque-Bera	11.262540	3.060799	3.506823	3.371723	3.160245	4.182345
Observation	200	200	200	200	200	200

Source: Researcher's computed results

It indicates in the Table 4.1 the mean value of all the variables has ranged from 2.3 to 4.5. However, the Trade Openness has the lowest mean value but acquired the highest standard deviation. While Growth Fixed Capital Formation has the highest mean value and RGDP has the lowest standard deviation. In addition, all the skewness values are found to have negative signs which implies that the distribution has a long left tail (skewness to the left). It was theorised that Kurtosis of the normal distribution is 3. If the kurtosis is greater than 3, the distribution is peaked (leptokurtic) relative to the normal; if the kurtosis is lower than 3, the distribution is flat (platykurtic) relative to the normal. Therefore, from the Table 4.1 the kurtosis value of LRGDP exceeds 3 which implies that the distribution is peak. While kurtosis values of LREM, LGFCF, LHLF, LFDI and LTO are less than 3 which signifies that the distribution is flat (platykurtic) relative to the normal. The results of Jarque-Bera test indicate that all the series are normally distributed except the LRGDP which is not normally distributed. These results of descriptive statistics which reveal that data for all countries are fairly dispersed which signified that we can proceed further with the analysis.

4.2 Regression Analysis

For any analysis to choose the best fitted model in panel data analysis, it is important to run series of regression model tests. In this regard, fixed effect model, random effect model and pooled OLS were run. Therefore, the robustness test of Hausman test was

carried-out choose between fixed effect model and random effect model. While the LM test is used to choose between random effect model and pooled OLS.

4.3 Hausman and LM tests discussion

The Hausman test results indicates that Hausman Ho which states that 'difference in coefficients not sysmatic' and from the result it is insignificant which means that we can accept our null hypothesis. Therefore, this proved that the random effect GLS regression model will be consider. Furthermore, LM test results is insignificant which testified that the pooled OLS result will be presented and reported for analysis because it is proved more appropriate.

Table 4.2 Pooled Ordinary Least Square (OLS) Result

Variables	Coefficient	T	P>|t|	Model Summary
LREM	1.6823	3.0623	0.0032	
LGFCF	3.2345	2.2345	0.0313	
LHLF	4.3456	2.1020	0.0178	
LFDI	2.2345	3.4512	0.2312	
LTO	3.2789	2.2345	0.0235	
R-square				0.6723
Adj. R-square				0.6012
F-statistics				8.43
Prob>F				0.0000

Source: Researcher's computed results

Table 4.2 presents the computed results of pooled OLS. In the table it is observed that the value of F-statistics is 8.43 with corresponding probability of 0.0000. Any regression result is consider fitted if the value of F-statistics is two of more than two. Where the F-value is more than two (and is significant at 1%) which signifies that the model is fit and free from error. Furthermore, the R-square value of 0.6523 signifies that about 65% of the variation in the value of GDP in developing countries over the period under study is affected by the independent variables considered in the study. This indicates that the remaining about 35% is explained by other variables not captured in this analysis.

However, in the Table 4.2 it depicts that our variable of interest which is remittance has coefficient value of 1.6823 with corresponding p-value of 0.0032. This means that at 1% level of significance, there is significant positive relationship between GDP and remittance in developing countries. On the other hand, it implies that for every one unit increase of remittance in developing countries there will be a 1.6823 corresponding positive increase on the gross domestic product. This result is not surprising because is in line with the priori expectation of the researcher. Additionally, this does not deviate from the reality that more remittances flow provide more funds in the business particularly for investment in the production of goods and services which subsequently lead to increase in GDP or enhance economic growth in developing countries.

In the Table 4.2 LGFCF has coefficient value of 3.2345 with corresponding p-value of 0.0313. This means that at 5% level of significance, there is significant positive relationship between GDP and growth fixed capital formation in developing countries. On the other hand, it implies that for every one unit increase of growth fixed capital formation in developing countries there will be a 3.2345 corresponding positive increase on the gross domestic product. This result is not surprising because is in line with the priori expectation of the researcher. Therefore, this is also in line with the reality that more capital flow is needed for reinvestment in the production of goods and services in order to have enhanced economic growth in developing countries.

In the Table 4.2 LHLF has coefficient value of 4.3456 with corresponding p-value of 0.0178. This means that at 5% level of significance, there is significant positive relationship between GDP and human labour force in developing countries. On the other hand, this means that for every one unit increase of human labour force in developing countries there will be a 4.3456 corresponding positive increase on the gross domestic product. This result is in line with the priori expectation of the researcher. Therefore, this is also in line with the reality that more human labour force is needed for reinvestment in the production of goods and services in order to achieve economic growth in developing countries.

The pooled OLS result indicate that LFDI has coefficient value of 2.2345 with corresponding p-value of 0.2312. This means that at 1% or 5% level of significance, there is insignificant positive relationship between GDP and foreign direct investment in developing countries. On the other hand, it implies that for every one unit increase of foreign direct investment in developing countries there will be a 2.2345 corresponding positive increase on the gross domestic product. This result is surprising because is not in line with the priori expectation of the researcher.

Therefore, this is also not in line with the reality as more foreign direct investment is needed in order to have enhanced economic growth in developing countries.

Lastly, in the Table 4.2 it depicts that trade openness variable has coefficient value of 3.2789 with corresponding p-value of 0.0235. This means that at 5% level of significance, there is significant positive relationship between GDP and trade openness in developing countries. On the other hand, it implies that for every one unit increase of trade openness in developing countries there will be a 3.2789 corresponding positive increase on the gross domestic product. This result is not surprising because is in line with the priori expectation of the researcher. Additionally, this does not deviate from the reality that trade openness is needed in order allow more flow of funds and technology for investment in the production of goods and services which subsequently lead to increase in GDP or enhance economic growth in developing countries.

5. CONCLUSION AND RECOMMENDATIONS

This research paper investigates the empirical relationship between remittances and economic growth in selected developing countries of the world's six regions by using the most recent panel data (2010-2020). The selection of countries was based on available data. The panel data study was estimated using the fixed effect model, random effect model and the pooled ordinary least square model in which the pooled OLS is taking for discussion. The study uses other variables as a means of controlled for conventional sources of growth. Findings reveal that remittances have a significant positive impact on economic growth when the pooled ordinary least square model is considered. The study recommends that governments in developing countries should employ means of reducing informal flow of remittances and encourage the use of formal flows. Secondly, governments should ensure good accountability of the flow of remittances in their respective countries.

Even though this research supports other research by confirming the positive and significant role of remittances in spurring economic growth, future research is needed in order to explore various indirect channels through which remittances impact GDP growth. Also the different microeconomic effects of remittances in the economy could be needed to be further investigated.

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