Do the Migrant Workers' Remittances foster Economic Growth in the South Asian Countries? A Panel Analysis

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ABSTRACT

The purpose of this study is to investigate the effect of migrant workers' remittances on economic growth in South Asian countries using panel data from 1980 to 2020, resulting in 123 observations. I consider here the top three remittance-receiving countries in South Asia, namely Bangladesh, India, and Pakistan. The growth model is estimated using pooled ordinary least squares (OLS), fixed-effects, and random-effects approaches. The empirical results did not support the hypothesis and it indicates that migrant workers' remittances inflow growth does not lead to growth in the three South Asian countries based on the fixed-effects method since the random-effects model is rejected in statistical tests. The analysis suggests that a 1% increase in growth of remittance inflows decreases the economic growth by approximately 1.1%, and a 1% increase in foreign direct investment inflow decreases the economic growth of sample countries by roughly 0.14%. The regression results also indicate a positive impact of trade openness on economic growth. Additionally, the study shows no significant relationship between inflation and economic progress.

Keywords: Economic Growth, Remittance, Pooled Ordinary Least Squares Model, Fixed Effect Model, Random Effect Model
JEL Classifications: F24, O47, C33, F21

1. INTRODUCTION

Remittances made by migrants to support their families at home, whether in the form of cash or goods, are referred to as workers' or migrant remittances. South Asia is the largest remittance-receiving region among all regions. South Asian nations yearly send a significant number of migrant workers, and the remittances they send are an important source of funding for the growth of their economies. According to World Bank, workers' remittances in South Asia have accelerated from 1975 to 2020. In 1975, remittances sent home by migrant workers were 438 million USD which was 147.11 billion USD in 2020. Inflows of official remittances to South Asia increased by roughly 5.2%, primarily due to a jump in Bangladeshi and Pakistani inflows. In 2020, during the Covid-19 pandemic, India was the top recipient of remittance amounts in South Asian countries, although remittance fell by

0.2%. India received US$83.15 billion in remittances, which is 3.12% of the GDP. With $87 billion, India was the top remittance recipient among the low-and middle-income countries in 2021, way ahead of China and Mexico's 53 billion US dollar, the Philippines (36 billion US dollars), and Egypt (33 billion US dollars) (World Health Organization, 2022). Moreover, Pakistan ranked second (26.09 billion US dollars), and Bangladesh ranked third (21.75 billion US dollars) among South Asian nations in 2020.

The stock of migrant workers from Bangladesh was 2.1 million, which is 1.3% of the total population in mid-2020, and it was 1.4 million in 2015. Most of them (just over 88%) live in other Asian countries, and more than half reside in the Middle East. The top destination countries for Bangladeshi are India (33.3%), Saudi Arabia (17.3%), the United Arab Emirates (14.8%), Malaysia (5.6%), and Kuwait (5.1%). On the other hand, a total of 4.9

million migrant workers went abroad from India in mid-2020.[1] Most recently, the Middle East and Western counties have been top destinations for Indians. It is estimated that 3.3 million Pakistani are currently working abroad. However, the number of migrants from Pakistan decreased by 5.7% in 2020 due to the effect of the Covid-19 pandemic.

The remittance inflows primarily help poor families to ease the adverse effects of income shock (Yang and Choi, 2007). The primary issues for developing countries are a shortage of foreign exchange reserves and import bills. The necessary amount of foreign exchange reserves must be available to pay import bills. Remittances sent home by employees offer a chance to alleviate the shortage of foreign exchange reserves. There is controversy and disagreement about the impact of remittance on economic growth. From a positive perspective, it is found that remittance has an impact on growth operating through domestic investment and human capital development in developing Asia-Pacific countries Jongwanich (2007). Fayissa and Nsiah (2010) also find that worker remittances are the main cause of the rapid economic growth in many developing countries. On the contrary, Sutradhar (2020) shows that remittance inflows have a negative impact on economic growth in Bangladesh, India, Pakistan, and Sri Lanka using panel estimations, i.e., Pooled OLS, fixed effect model, and random effect model. Jawaid and Raza (2012) argue that remittances have a significant negative impact on economic growth in China by applying Johansen and Jeuuselius's cointegration technique, error correction model, and sensitivity analysis.

After reviewing the previous studies, it is found that remittances have mixed effects on economic growth. This needs more investigation analysis, and this study examines the relationship between migrant remittances and economic growth in the top three remittance-receiving countries in the South Asian region using the long-time panel data from 1980 to 2020 controlling inflation, foreign direct investment, and trade openness. I employ pooled ordinary least square (OLS), fixed effect model, and random effect model for this panel analysis. The findings of this study suggest that a 1% increase in remittance inflows decreases the economic growth by approximately 1.1%, and a 1% increase in foreign direct investment inflow decreases the economic growth of sample countries by roughly 0.14%. It also reveals that trade openness and inflation are positively linked with economic growth.

The remainder of this paper is organized as follows: Section 2 presents how the effect of remittances on economic growth is typically estimated in the previous literature. Section 3 describes the methodology and data used in this paper. Section 4 presents the empirical results and analysis. Section 5 provides concluding remarks.

2. LITERATURE REVIEW

Generally, remittances now represent the largest source of financial flows to developing countries after foreign direct investment (FDI).

There are vast literatures regarding the impact of remittances on economic growth. Olubiyi (2014) examines causal relationships among GDP, export, imports, and remittances by investigating the rationality of export-led and remittances-led growth theories. Using VECM Granger Causality for time span of 1980-2012 the study finds that remittances considerably Granger-caused GDP in the short and remittances matter for economic growth. Sobiech (2019) finds that the impact of remittance on economic growth is higher in the more financially developed country than smaller developed country.

Rao and Hassan (2012) and Senbeta (2013) find that the direct effect of remittances on economic growth is zero, but these remittances may affect GDP per capita using different channel effects like investment, financial development, output volatility, total factor productivity (TFP) and the real exchange rate. Senbeta (2013) also claims that the insignificant remittance impact on TFP validates the lack of significance of migrants' transfers on long-run economic growth.

Catrinescu et al. (2009) get contradictory findings when looking at the remittances-growth link due to an omitted variable bias. Particularly, they find that remittances contribute to long term growth in countries who have high quality political and economic policies and institutions. Cazachevici et al. (2020) conduct a quantitative survey of 538 estimates of 95 studies. They find that almost 40% of the studies report that the effect of remittances on growth is positive, 40% report no effect, and 20% report a negative effect. They also find that remittances are growth-enhancing in Asia but not in Africa. Kratou and Gazdar (2016) find that that remittances have a positive effect on economic growth in the long run and a negative effect in the short run. They also find that the impact of remittances on economic growth is conditional to promote economic growth only in countries with good financial system.

Cruz Zuniga (2011) conducts a study controlling endogeneity problems with the use of panel vector autoregression (panel VAR) in developing countries. This study finds that remittances have a smaller positive impact on economic growth without considering the role of institutions and even after including, the pattern of response remains unchanged. Moreover, the economies with high remittances participation, appreciation of the exchange rate occur. Peprah et al. (2019) examine the relationships among remittances, financial development, and economic growth in Ghana using dynamic heterogeneous autoregressive distributed lag (ARDL) model. They find that a certain level of financial development can drag down economic growth in the long term and the combined effect of financial development and remittances should be of concern to policymakers. Nwaogu and Ryan (2015) investigate how remittances, foreign direct investment and foreign aid affect the economic growth of 53 African and 34 Latin American and Caribbean countries. They find that remittances affect growth when all variables are estimated simultaneously, and results confirm that growth in one country depends on the growth of its neighboring countries because of interdependence of economic growth. Azam (2015) finds that there is a positive and significant relationship between migrant workers' remittances and economic growth,

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1   United Nations Department of Economic and Social Affairs, UN DESA, Population Division, *International Migrant Stock 2020.*

and also the impact of FDI, infrastructure and openness to trade show a positive and significant impact on economic growth in developing countries. Mohammad and Jeff (2015) find a highly significant long-run positive relationship between remittance and economic growth using the most recent panel data of 1977-2012 of Bangladesh, India, Pakistan and the Philippines who are remarkably the largest recipient countries of foreign remittances in the world.

Nyamongo et al. (2012) conduct a study about the role of remittances and financial development on economic growth taking panel data of 36 countries over the period 1980-200. They find that remittance is an important source of growth and Volatility of remittances has a negative effect on the growth of these countries in Africa. Shirazi et al. (2018) investigate the impact of remittance inflows on economic growth and poverty reduction for seven African countries using simultaneous equation model (SEM) for the annual time period of 1992-2010. They find that remittances have statistically significant effect on economic growth that reduce poverty. Ramirez (2013) conducts a study using recently developed panel unit root and panel cointegration tests and the Fully-Modified OLS methodology (FMOLS in selected upper and lower income Latin American and Caribbean (LAC) countries for time period of 1990-2007. He finds that remittances have a significantly positive effect on economic growth in both groups of countries. And effect is stronger in the presence of financial variable.

Some studies have investigated the growth effects of remittances but reached different conclusions. Ahamada and Coulibaly (2013) examine the causality between remittances and economic growth in Sub-Saharan African (SSA) countries. This paper using annual data over the period 1980-2007 for 20 SSA countries finds that there is no causal relationship between remittances and economic growth. The reason is that remittances do not increase physical capital investment. Rao and Hassan (2012) regress both remittances and the channels through which remittances affect growth but they find that there are indirect and direct growth effects of remittances, only have some small indirect growth effects. Saurai (2015) examines the existence of the long run relationship using the Johansen co-integration test to determine the direction of causality between personal remittances, banking sector development and economic growth both in the long and short run using vector error correction model (VECM). The findings of this study are that there is a significant long run causal relationship between GDP per capita and banking sector development towards personal remittances and there is an insignificant long run causa relationship between personal remittances and GDP per capita towards banking sector development.

3. DATA AND METHODOLOGY

3.1. Data
This study uses secondary data sources to investigate the relationship between remittance inflows and economic growth of top three remittance receiving South Asian countries from 1980 to 2020. The rationale for choosing this time period is purely

based on the most current available data. The details related to the data, description of variables and related sources are listed below in Table 1.

3.2. Hypothesis
There is no guidance in the existing theoretical framework that provides the choice of controls variables to incorporate in the growth regression. The empirical growth literature suggests a vast range of growth determinants. Levine and Renelt (1992) find that there are over 50 variables which are significantly correlated with growth in at least one regression. As a result, I consider the most used variables in the empirical growth theory. More precisely the study relies on the following hypotheses:

Hypothesis 1 (H1): Workers' remittances contribute to economic growth

Hypothesis 2 (H2): Inflation has negative effect on the economic growth

Hypothesis 3 (H3): Foreign direct investment has a positive effect on the economic growth

Hypothesis 4 (H4): Trade openness has a positive effect on the economic growth.

3.3. Econometric Model and Methodology
In order to look at the impact of the migrant remittance and other control variables on economic growth, this study follows multiple regression analysis. In multiple regression, GDP per capita growth is regressed on all variables to examine their impact. To find out the effect of independent variables on the dependent variable, three estimation tools are used. The study uses the methods of panel analysis by estimating the pooled regression OLS model, the fixed effect model, and random effect model.

3.3.1. Pooled regression model (PRM)
In this model, it is assumed that regressors are non-stochastic (fixed in repeated samples). The pooled OLS regression can be specified as follows:

$$GDP_{it} = \beta + \beta_1 R_{it} + \beta_2 FDI_{it} + \beta_3 TO_{it} + \beta_4 INF_{it} + \varepsilon_{it} \qquad (1)$$

Where *GDP* is the GDP per capita growth in the *ith* country for some time-period, which is the measure of economic growth and R_{it} is growth of remittances (percentage of GDP); FDI_{it} is the growth of foreign direct investment (percentage of GDP) used to capture the effect of external sources of capital on growth; TO_{it} is the growth of the terms of trade for each country under consideration and it is measured by the ratio of the sum of export and import by total GDP that capture the openness of the economy on economic growth; and INF_{it} is the inflation rate, and. β is an unobserved country-specific effect and ε_{it} is error term of each observation.

3.3.2. Fixed effect model (FEM)
The fixed effects (FEM) approach has the feature that the intercept differs between cross section units assuming the same slopes and constant variance across cross section units. The FEM model has the following form:

$$GDP_{it} = \beta_1 R_{it} + \beta_2 FDI_{it} + \beta_3 TO_{it} + \beta_4 INF_{it} + \beta_i + \varepsilon_{it} \qquad (2)$$

Table 1: Description of variables and sources

Symbol	Variables	Description	Source
GDP	GDP per capita growth (annual %)	Annual percentage growth rate of GDP per capita based on constant local currency	World Development Indicator, World Bank
R	Personal remittance, received (% of GDP)	Personal remittances comprise personal transfers and compensation of employees.	World Development Indicator, World Bank
INF	Inflation, consumer prices (annual %)	Inflation is measured by the consumer price index that reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services	Penn World Table 10.0
FDI	Foreign direct investment, net inflows (% of GDP)	Foreign direct Investment is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments.	World Development Indicator, World Bank
TO	Trade openness	Trade Openness is measured by the ratio of the sum of export and import and total GDP[2]	World Development Indicator, World Bank

Where, the constant β_i integrates all unobserved and time invariant factors that influence the dependent variable, economic growth.

3.3.3. Random effect model (REM)

Random effect model assumes the individual effect (heterogeneity) is not correlated with any regressors and then estimates error variance specific to groups (or times). The following equation represents a random effects model for this study:

$$GDP_{it} = \beta_0 + \beta_1 R_{it} + \beta_2 FDI_{it} + \beta_3 TO_{it} + \beta_4 INF_{it} + \alpha_i + \varepsilon_{it} \quad (3)$$

Where I explicitly include an intercept β_0 and the intercept and slopes of the regressors are the same across individual. The difference among individuals (or time periods) lies in their individual specific errors. Here, α_i is the individual specific or cross-sectional error component and ε_{it} is the combined time series and cross-sectional error component.

3.3.4. Choosing the appropriate model

To determine the most suitable model between fixed effect and random effect model, Hausman Test is used, which was suggested by Hausman (1978). The hypotheses of this test are as follows:

Null hypothesis (H0): Random effect model is appropriate

Alternative hypothesis (H1): Fixed effect model is appropriate.

If P-value is larger than 0.05, H0 should not be rejected, and this means that random effect model is appropriate. On the other hand, if P-value is <0.05, H0 should be rejected that means fixed effect model is appropriate. That means individual effects are significantly correlated with at least one regressors in the model.

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2 According to UNCTAD (2022), the trade openness index is calculated as the ratio of the arithmetic mean of merchandise exports (x) and imports (m) to GDP (y):

$$TOI_{i,t} = \frac{1/2(x_{i,t} + m_{i,t})}{y_{i,t}}$$

where i designates the economy and t the year.

4. EMPIRICAL RESULTS

4.1. Descriptive Analysis

Table 2 below provides descriptive statistics (e.g., mean, standard deviation, and maximum minimum) of panel data. The total number of observations is 123 for GDP per capita growth and inflation. The total number of observations is 122 for growth of FDI, growth of remittance, growth of trade openness. Because there are three countries and 41 time periods. The mean value of GDP per capita growth across the study period is positive. The highest value is 7.299 and the minimum value is −7.516. The mean of growth of remittance (percentage of GDP) is 0.042, and its standard deviation is 0.273, indicating that it has deviated across time and remittances have evolved significantly with each new period. Moving on to INF, the mean of inflation is 56.171, and the standard deviation is 35.374. Between maximum and minimum foreign direct investment inflow, the highest value of growth of FDI (percentage of GDP) over the study period is 10.900, and the lowest value is −2.275. On the other hand, the mean and the standard deviation of growth of TO are respectively 0.006 and 0.099.

4.2. Correlation Analysis

The findings of the correlation matrix are presented in Table 3. The diagonal line illustrates the connection of variables among themselves, which is "1" and perfectly correlated. Economic growth has a negative association with growth of remittances, and growth of foreign direct investment, and positive association with growth of trade openness and inflation rate according to the correlation matrix analysis.

4.3. Results and Discussion

Table 4 (column 1) shows the results of the regression analysis using the pooled regression model, which indicate that there is a statistically significant effect of all the model variable except inflation on economic growth. The value of R-squared, which is 0.0316, refers that 3.16% variation of economic growth is explained by the independent variables. Also, the results show that 1% increase in remittance inflows decreases the economic growth by 1.3%. Sutradhar (2020) also observed negative impact of remittances on economic development in Bangladesh in her South Asian study. Additionally, foreign direct investment inflow

Table 2: Descriptive statistics

Variable	Obs	Mean	SD	Min	Max
GDP	123	3.045	2.395	−7.516	7.299
R	122	0.042	0.273	−0.746	1.777
INF	123	56.171	35.374	1	117
FDI	122	0.431	1.753	−2.275	10.900
TO	122	0.006	0.099	−0.414	0.281

SD: Standard deviation

Table 3: Correlation analysis

Variables	GDP	R	FDI	TO	INF
GDP	1.0000				
R	−0.1340	1.0000			
FDI	−0.0600	−0.0407	1.0000		
TO	0.0610	0.1764	0.1387	1.0000	
INF	0.212	−0.0635	0.0192	0.0828	1.0000

Table 4: Panel data estimation results

Variables	Pooled OLS	Fixed effect	Random Effect
Dependent variable: Annual percentage growth of Real GDP			
R	−1.338***	−1.039	−1.338***
	(0.8049)	(0.7656)	(0.8049)
FDI	−0.108	−0.144	−0.108
	(0.1240)	(0.1194)	(0.1240)
TO	2.375	1.566	2.375
	(2.2517)	(2.141)	(2.2517)
INF	0.0003	0.0008	0.0003
	(0.0062)	(0.0058)	(0.0062)
Constant	3.155***	3.138***	3.155***
	(0.4149)	(0.3926)	(0.4149)
Model summary			
R-squared	0.0316	0.0289	0.0316
F-test	0.96	0.82	
Wald Chi-squared			3.82
Hausman (1978) specification test		14.04***	
Cross-sections included	3	3	3
Total panel observations	122	122	122

Standard errors in parentheses and ***P<0.01, **P<0.05, *P<0.1. OLS: Ordinary least square

is negatively and insignificantly associated with economic growth. Bangladesh has adopted trade openness and kept the inflation in control, concentrating expansion of market to attract more FDIs (Hasan and Nishi, 2019). On the other hand, inflation and trade openness are positively related to economic growth. It is noteworthy that the F-test of the regression table signifies whether the overall model is statistically significant or not. Since the F-test's value is 0.96, it indicates that the model is statistically insignificant.

Column 2 shows the results of the regression analysis using the fixed effect model, which indicate that there is a statistically insignificant effect of all the model variable on economic growth. The value of R-squared, which is 0.0289, refers that 2.9% variation of economic growth is explained by the independent variables. Also, the results show that a 1% increase in remittance inflows decreases the economic growth by approximately 1.1%. Additionally, foreign direct investment inflow is negatively associated with economic growth. On the other hand, inflation and trade openness are positively related to economic growth. It is

noteworthy that the F-test of the regression table signifies whether the overall model is statistically significant or not. Since the F-test's value is 0.82, it indicates that the model is statistically significant.

Finally, in column 3, the study uses a random-effect model. The results of the model also reveal that higher inflows of remittance have negative and significant effect on the economic growth of our panel countries.

In Table 4, the result of Hausman (1978) test show that the fixed effect model is an appropriate test for the analysis. It is evident from the fixed effect model that remittance, and FDI have negative and insignificant impact on the economic growth and inflation and trade openness have positive impact on economic growth of the panel countries.

5. CONCLUSION

This paper has attempted to analyze the impact of remittances on the economic growth in three South Asian countries namely Bangladesh, India, and Pakistan using yearly data from 1980 to 2020. The study has applied pooled OLS, fixed, and random effect regression models to know the aggregate impact. The OLS results indicate negative impact of growth of remittances on the GDP per capita growth. Growth of FDI has also negative relation with the GDP per capita growth while growth of trade openness and inflation rate have positive impact. Since a significant portion of the remittances is consumed and used for unproductive activities like building construction and a minimal amount is invested in the business, the influence on economic development is negative (Chowdhury et al., 2022). Long-term consequences could be negative due to the drain on qualified employees caused by the growing migrant populations in these nations. Too much reliance on remittances could impede economic development because it subtly deters people from starting businesses at home and lowers economic activity in receiving countries. Remittances must be invested in the productive sectors in Bangladesh, India, and Pakistan to decrease poverty and raise income per capita. A fixation on remittances leads to a brain drain (Asongu and Odhiambo, 2019), which hinders the rapid growth of the economy in the home country because skilled and semi-skilled people cannot contribute (World Bank, Asian Development Bank, 2018).

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