An Econometric Analysis on Remittance and Economic Growth in Bangladesh

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Abstract

In Bangladesh, migrant worker's remittances constitute one of the most significant sources of external finance. This paper investigates the existence of relation between remittance inflow and GDP and the causal link between them in Bangladesh by employing the Granger causality test under a VECM framework. Using time series data over a 38 year period, we found that growth in remittances does lead to economic growth in Bangladesh. In addition to the relationship, this paper also points out some issues that are working as impediments in getting remittance and give some recommendations to overcome those impediments.
Keywords: Remittance; Economic growth; VECM; Granger causality.

1. Introduction

According to the World Migration Report-2020 of International Organization for Migration, there are more than 272 million migrants around the world in 2019 and there is enough evidence to show that the rate of international migration is increasing with globalization. This is the source of remittances for many developing countries. With some exceptions, the recipients of remittances usually rely on them for living expenses, education and investments. This will have a significant development impact on the guest as well as the host countries; economically, politically and socially.

The importance of remittances to the Bangladesh economy can be gauged by comparing them to other macroeconomic indicators of the economy. In 2018, remittances were equivalent to 45% of total export earnings, could finance 37% of total imports, and were almost five times the FDI flows to the country. At this stage of economic development, remittances play a critical role as a source of external finance. Migrated workers also contribute to the economic development of Bangladesh by reducing unemployment.

In this paper we intend to investigate short and long-run dynamic impact of remittance on GDP growth of Bangladesh, using the Cointegration and Granger Causality in a VECM framework to analyze the relationship.

2. Aim and Objectives

The aim of the research is generally to asses the performance of remittance in economic growth in Bangladesh and relationship between them using cointegration and error correction model. The specific objectives are as follows:
  i. To find out the relationship between remittance and economic growth.
  ii. To find out the nature of the relationship between remittance and economic growth.
  iii. To find out the problems of labor migration and give some policy implications.

3. Literature Review

Economic development is the most important issue in current world. As a result, much of the current literature on the workers' remittances has concentrated on two broad strands: Impact of remittance on growth and the determining factors of remittance inflows.

Various studies on the effect of remittances to economic growth have shown mixed results. For instance, Chami et al. (2003), found that remittances had a negative effect on growth. They explained this adverse effect as the creation of the moral hazard problem. According to the study, remittance inflows reduce the productivity of the receiving families.

Glytsos in a study in 2005 using data for 1969-1998 for five countries illustrates that the impact of remittances are different in different countries. The study also shows that significant volatility in the real remittance inflows contribute to instability in the economies concerned significantly.

Kadir (2009), investigated that whether workers' remittances have growth impact on Turkish economy, by using data belong to 1970-2005 period. The time series regression findings show that remittance flow to Turkey has

statistically meaningful but negative impact on growth. Annual data on workers' remittances, per capita GDP, gross capital formation (gross domestic investment), and net private capital flows are used for this paper.

IMF (2005) studied over 101 developing countries and found no link between remittances and other variables.

In two different studies Faini (2002) found positive impact of remittance on growth. Faini (2002) states that remittances help to overcome imperfections in the capital.

4. Theoretical Study

4.1. Trends of Migration from Bangladesh

Bangladesh has two main types of migrants. The first includes immigrants and permanent residents to industrialized countries—a process that began in the 1950s with the United Kingdom and has gained momentum in recent years with the increase in the size of the Bangladeshi diasporas in other countries. This cluster of people consists of who have got foreign citizenship and are professionals and semiprofessionals. The second type of migrant includes short-term migrants to the Middle East and Southeast Asian countries—a process that began in the wake of the 1973 oil price hike and the emergence of Middle East countries as affluent economies. These migrants, who usually return after completing their contracts, are mainly nonprofessionals. Due to the lack of records, information on each group is limited. According to the Bureau of Manpower Employment and Training (BMET), in 2018 a total of 734,181 Bangladeshi workers moved to different countries of the world and the amount was about 27% more than the previous year. In 2017, the total number of workers who went abroad from Bangladesh stood at 1,008,525.

Bureau of Manpower, Employment and Training (BMET) has classified temporary migrant population into five categories. These are professional, skilled, semi-skilled, and less-skilled and others. Doctors, engineers, nurses and teachers are considered as professionals. Industrial workers are treated as skilled; while tailor, mason etc. as semi-skilled workers; housemaid, cleaner, laborers are classified as less-skilled. The following figure shows the category-wise overseas employment in 2019.

**Figure-1.** Category-wise Overseas Employment in 2019
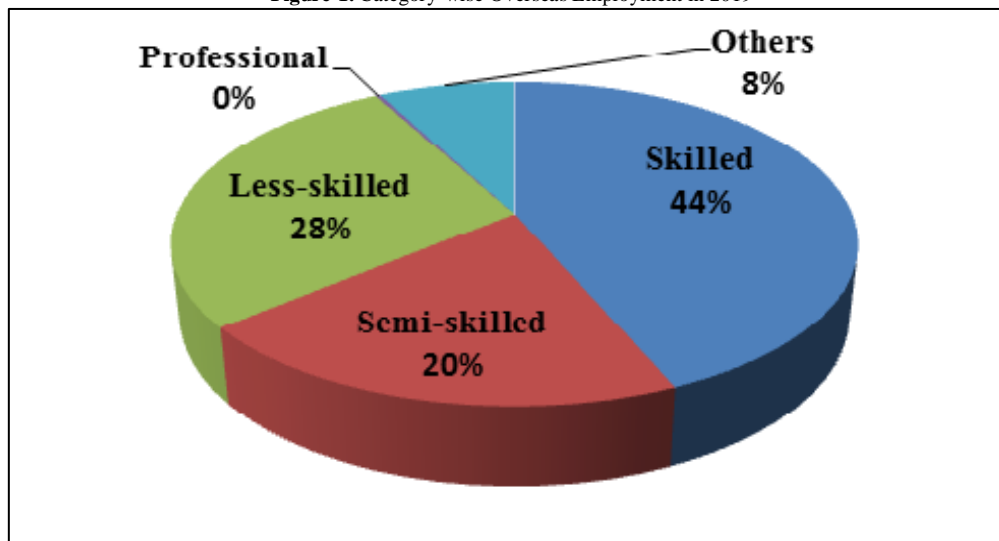
In 2019, 44 percent workers were in skilled category, 48 percent were in semiskilled and less-skilled category, other constitutes 8% and number of professional was almost 0% of the total overseas employment. The manpower export increased gradually after 1990 and the number of skilled workers also increased but it was not that significant proportionately to that of semiskilled and less-skilled workers. Increase in the flow of semi-skilled and unskilled workers in proportion to professionals indicates two things. Firstly, Bangladesh hardly took into account that in order to advance and protect its international market of professional and skilled workers it needed to invest in development of its human resources in accordance with the market need. Failing to do so has resulted in losing its traditional market to other competing countries and also to newly emerging ones. Secondly, according to migration experts, during the early years of the oil price hike, the Middle Eastern countries mostly needed professional and skilled persons for their rapid infrastructure development. The 1990s saw the gradual slowing down of the pace of infrastructure development. This does not mean that there has been an overall reduction in the need for labor. Rather, these economies now need more semi-skilled and unskilled labor for maintenance purpose and domestic work. Both the arguments hold some ground.

4.2. Remittance and Economic Growth

In Bangladesh, the greater inflow of remittances helped to sustain macroeconomic stability by improving the country's current account position, foreign currency reserves, and external debt servicing capability. From a 'bottomless basket' in 1971, Bangladesh was become a lower-middle income country in 2017. International migration and the remittances sent by the Bangladeshi labour migrants have played a critical role in this breakthrough. Migrated workers and remittance flow helped in alleviating poverty in the country. Bangladesh requires huge amount of foreign currency reserve to import different commodities and finance external debt. In

FY2017, the ratio of imports to GDP was 17.61% and exports to GDP 15.73%, resulting in trade deficits. But because of the strong inflow of remittances, the current account balance showed a surplus in 2017. The following figure illustrates the pattern of remittance flow and GDP.

Figure-2. Trend of remittance and GDP
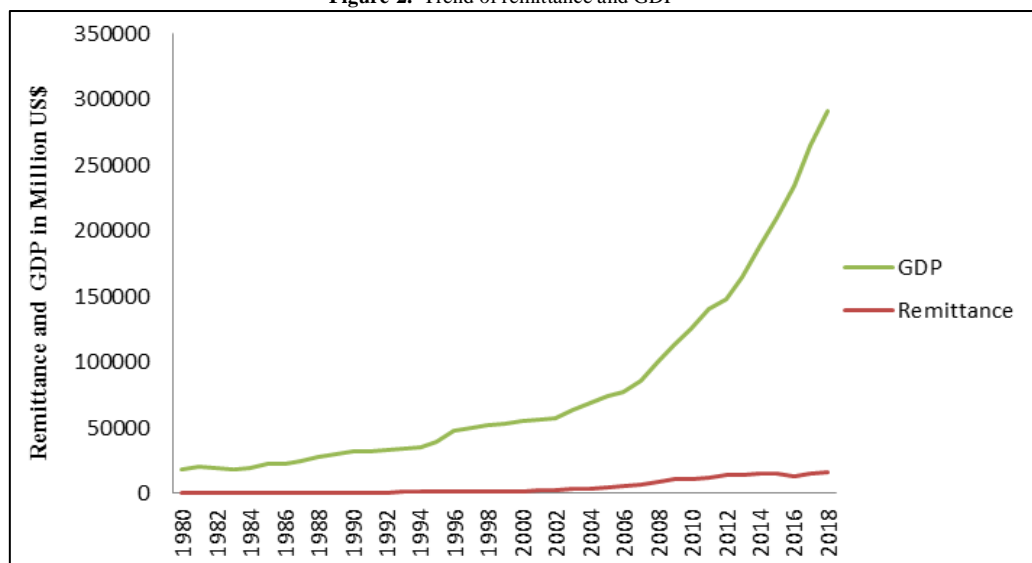
5. Methodology

I first test the stationarity properties of the variables under consideration, then test for cointegration among the variables. Short-run relation will be identified using error correction mechanism. At last, I will test Granger Causality among the variables in a VECM framework.

The empirical analysis of this study has been conducted with a sample of annual data covering remittance and growth of Bangladesh from 1980 to 2018. The data utilized for this study are obtained from UN statistical division, Monthly Economic Trend of Bangladesh Bank and Bureau of Manpower, Employment and Training (BMET).

5.1. Stationarity Test

Practically most econometric time series data shows trends and are non-stationary (Phillips, Perron, 1988). Therefore, as first step in empirical analysis with any time series is to test for the presence of unit roots in order to remove the problem of spurious regression. In this stage, it is needed to explore the order of each variable to establish whether it contains unit roots and how many times it needs to be differenced to draw a stationary series.

We used unit root test to check whether our variables (Remittance- REM and Gross Domestic Product -GDP) are non-stationary. Both the variables are used in logarithmic form ($\ln GDP$, and $\ln REM$). To examine whether the data series are stationary, many types of tests can be performed like the Dickey - Fuller Test, the Augmented Dickey – Fuller (ADF) Test, and Phillips – Perron Test.

This ADF test statistic checks the null hypotheses that the time series has a unit root, under the alternative hypotheses of stationary time series. If the null hypothesis is rejected, then the series is stationary and no differencing in the series is necessary to induce stationary. The result is also cross-checked by Phillips – Perron (PP) Test. The results of these tests are presented in the Table 1 and Table 2.

Table-1. Unit Root Test (Augmented Dickey-Fuller)

	Level	p-value	First Difference	p-value	Critical Values
$\ln GDP$	2.4372	*1.0000*	*-4.6612*	0.0006	-3.62 (1%)
$\ln REM$	-0.3078	0.9144	-4.9024	0.0003	-2.94 (5%) -2.61(10%)

Table-2. Unit Root Test (Phillips-Perron)

	Level	p-value	First Difference	p-value	Critical Values
$\ln GDP$	3.0612	1.0000	-4.6612	0.0006	-3.62 (1%)
$\ln REM$	-0.3253	0.9116	-4.8156	0.0004	-2.94 (5%) -2.61 (10%)

Note: Null hypothesis rejected when the p-value lower than 0.05.

The results reveals that the time series $\ln GDP$ and $\ln REM$ are non-stationary at their levels, while first difference made them stationary. Both the ADF and the PP test provide the same result.

5.2. Cointegration Test

The concept of cointegration was introduced by Granger (1981) and the statistical analysis of cointegrated process was organized by Engle and Granger (1987). Cointegration means that despite being individually non-stationary a linear combination of two or more time series can be stationary. When a linear combination of non-stationary variables is stationary, the variables are said to be cointegrated and the vector that defines the stationary linear combination is called a cointegrating vector. A necessary condition for cointegration is that the data series for each variable involved exhibit similar statistical properties, that is, to be integrated to the same order with linear combination of the integrated series.

There are two methods which are widely used for testing cointegration:

1. Engle-Granger Residual based ADF method.
2. Johansen Full Information Maximum Likelihood Method (Johansen, 1988; Johansen and Juselius, 1990).

In this study for finding cointegration we test the Johansen Full Information Maximum Likelihood Method.

Table-3. Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.466098	23.77306	15.49471	0.0023
At most 1	0.014861	0.553994	3.841466	0.4567

Trace test indicates 1 cointegrating equation(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
** MacKinnon-Haug-Michelis (1999) p-values

Table-4. Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.466098	23.21906	14.26460	0.0015
At most 1	0.014861	0.553994	3.841466	0.4567

Max-eigenvalue test indicates 1 cointegrating equation(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The Max-Eigen value and Trace statistic test reject the hypothesis of no cointegration and indicate that there is one cointegrating equation at the 5% significance level. So there is a long run relationship between gross domestic product and remittance in Bangladesh.

5.3. Error Correction Mechanism

From the cointegration test we found that $\ln GDP$ and $\ln REM$ are cointegrated; that is, there is a long run relationship between the two. Of course, in the short run there may be disequilibrium. There for we can treat the error term $\hat{u}_t$ as the "equilibrium error". And we can use this error term to tie the short run behavior of $\ln GDP$ to its long run value. If two variables are cointegrated, then the relationship between the two can be expressed as error correction mechanism (Granger representation theorem). So, when long run equipoise relation between variables may be found through cointegration analysis, but the regulating speed is unable to be obtained when these variables depart from their common random trend. This problem may be solved using error correction mechanism. The error correction model including correction term should be made based on cointegration test so as to study the short run dynamic regulating relation between gross domestic product and remittance in Bangladesh.

For this study the error correction model is estimated as follows:

$$\Delta \ln GDP_t = 0.302 + 0.08 \Delta \ln REM_t - 0.54 \hat{u}_{t-1} \tag{1}$$

R-squared = 0.806;   Durbin-Watson stat = 2.008;

The result of the Error Correction Model estimation above revealed that the coefficient of remittance is significant at 5% level. A 1 percentage increase in the remittance raises economic growth by 0.08 percentages. The coefficient of error correction term was rightly signed (i.e. negative) with the economy recovery rate of 54 percent and significant at 5% level. The Adjusted R-squared indicated that 80 percent variation in Bangladesh"s economic growth is explained by the explanatory variable. In this model value of R^2 is 0.806 which is less than the Durbin-Watson statistic (d=2.008) indicating the model is significant.

5.4. Granger Causality Test

There is a cointegration relation between remittance and gross domestic product or these two variables have long run equilibrium relation. The next step is to investigate the short-run dynamics via the analysis of Granger Causality tests. Granger causality test of these two variables is needed to make sure whether this long run equilibrium relation is causality, or whether remittance promotes economic growth and economic growth drives remittance or both exist.

F statistics and its corresponding probability used for rejecting of accepting the null hypothesis. The present study posses two null hypothesis:

a) $\ln REM$ does not Granger Cause $\ln GDP$
b) $\ln GDP$ does not Granger Cause $\ln REM$

The results of the Granger causality are shown in the following Table 5.

Table-5. Results of Granger Causality

Null Hypothesis:	Lags	F-Statistic	Probability
LN REM does not Granger Cause LN GDP	2	5.26493	0.010
LN GDP does not Granger Cause LN REM	2	0.44794	0.642

The former hypothesis "$\ln REM$ does not Granger Cause $\ln GDP$" is rejected. These results suggest that the direction of causality is from remittance to GDP growth. On the other hand, there is no 'reverse causation' form GDP growth to remittance, since the F-statistic is statistically insignificant and the probability is larger than .05. So it can be seen from the result that one way causality exist from remittance to economic growth in Bangladesh during the period of 1980 to 2018.

6. Conclusions

We try to investigate the causal nexus between remittance and GDP growth for Bangladesh using annual data from 1980 to 2018. This study uses time series econometrics tools to find the relationship. The growth of remittance has become a crucial issue in context of economic growth.

Time series analysis indicates remittance cause GDP growth both in the short run and in the long run. Using Johansen's approach to cointegration, our findings suggest that GDP and remittance are cointegrated for Bangladesh, implying a long run relationship between the variables. However, causal relationship between them is unidirectional, as can be seen from the result that one way causality existing from remittance to economic growth in Bangladesh during the period of 1980 to 2018.

Nowadays, though remittance transfer process has improved, for efficient transmission barriers should be removed to promote the use of official channels.

1. Access in originating countries: better access to the Bangladeshi network of banks and exchange houses needs to be provided in certain areas in the Middle East, Greece, Italy, Republic of Korea or Spain;
2. Infrastructure and technology challenges: widespread use of new technology must replace manual processing of remittances to prevent delay in transmission and disbursement of funds;
3. Educational issues: financial literacy needs to be enhanced to help remitters explore the formal channel; information material in the form of booklets, brochures, and leaflets needs to be made available to Bangladeshi migrants, and briefing arrangements need to be introduced by banks, the post office, or money transfer operators about remittance methods and investment options;
4. Governance: governance for remittances handled by commercial banks and the post office needs to be improved to eliminate fraud and delays in remittances by streamlining the administrative mechanisms to address such issues; and
5. Access in receiving country: more branches of commercial banks, particularly private banks, need to be opened in remote areas in Bangladesh. In order to handle remittances efficiently, cooperation is needed between private banks and state-owned commercial banks.

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