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EMPIRICAL NEXUS BETWEEN ECONOMIC GROWTH AND REMITTANCE OUTFLOWS: EVIDENCE FROM BANGLADESH

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Abstract

This article employs Johansen co-integration technique, Vector Error Correction and Granger causality approach using yearly data from 1995 to 2017, with an aim to investigate the relationship between economic growth and remittance outflows. The findings obtained from the empirical analysis reveals the existence of a co-integrating relationship between variables of interest. The result indicated that in the long run, remittance outflows have a positive and significant effect on the economic growth of Bangladesh. Vector Error Correction Mechanism (VECM) by contrast suggests that approximately 2.5 percent error of economic growth is adjusted from any disequilibrium situation every year. Impulse response function confirms the short run positive relationship between these two variables, which is quite similar to co-integration results. Moreover, Granger causality analysis provides evidence that a unidirectional causal relationship exists from economic growth to remittance outflows. Motivating the foreign employees to invest in the host country along with pragmatic policies regarding inflation and exchange rate can be an effective policy option to deal with remittance outflows.

Keywords: Remittance outflows, Economic growth, Foreign employees, Co-integration, Granger causality

Introduction

Remittances are one of the largest international flows of financial resources. Migrant workers from developing nations had sent $466 billion as remittances in 2017 (World Bank 2017). According to the World Bank (2018), it is estimated that officially recorded global remittances are expected to grow by 10.8 percent. The growth of remittance flows have created a perpetual argument concerning its economic consequences. Some studies claimed that remittance-receiving countries could improve the well-being of their workers' family members. A study by Yoshino *et al.* (2017) revealed that a 1% increase of remittance share in GDP led to a 22% drop in poverty in ten Asian developing countries from 1981–2014. Some other studies, by contrast, pointed out that the receiving countries become dependent on the host countries that reduce labour supply, hurts exports and exchange rate (Dornates 2014). In recent times, remittance flows to high-income countries is anticipated to proliferate by 10.3 percent in 2018 (World Bank 2018). Therefore, it is importance to study the impact of remittance outflows from developing nations since unrestrained remittance outflows from developing nations can offset the economic development from the remittance inflows. Moreover, the impact of remittance outflows was not merely a matter of fact for the world economy in previous years. The earliest study was the impact of remittance outflows on the economic growth of Russia in 2013 (Naufal & Genc 2017). The reason for this neglect is partly that the monetary flows were chiefly from developed countries to developing countries. Though the absolute sum of remittance outflows may seem large, it was inconsequential for the developed countries in relative terms of GDP. Some recent studies (Alkhathlan 2013; Rahmouni & Debbiche 2017; Razali *et al.*

2016 and Taghavi 2012) focused on the impact of remittance outflows on the host countries. While some researches provide empirical evidence on the existence of positive nexus between economic growth and remittance outflows, the others by contrast show opposite relations. Indeed, whether the effect of remittance outflows on economic growth is positive, negative or neutral (in both the short run and long run) in the host country are subject to macroeconomic conditions.

Remittances have mixed impact on a country's macroeconomic variables such as inflation, interest rate, exchange rate, consumption and government expenditure. In the past, increasing remittance outflows were considered as an indication of the country's economic growth. Recently, the thoughts are changing because of the simultaneous macroeconomic effect on the host country. In fact, sometimes the waves of remittances can have a greater influence on the host country's macroeconomic indicators compared to the home country (Vargas-Silva & Huang 2006). For instance, economies of Saudi Arabia, the United Arab Emirates, and Qatar have been negatively influenced because of high remittance outflows (Edrees 2016). On the other hand, migrant workers' remittances have a significant influence on Bangladesh's economy because remittance inflows is the second prime source of foreign exchange after the garments sectors' export earnings (Bangladesh Bank 2017). Besides that, Bangladesh has been reported as one of the growing economies in the world, requiring a large pool of skilled and efficient workforce (PwC 2017). At the same time, with technological inefficiency, there exists an acute shortage of skilled labour force, especially in agro-food, construction and Ready-Made Garments sectors (Murshid 2016). With an aim to meet the extra demand for labour, the country largely as well as critically depends on foreign skilled labour and thus, providing a scope to foreigners to earn a great deal of money from a growing economy like Bangladesh. Staying for a short period, they send a large share of their earnings back to their home country. Under these circumstances, remittance outflows from Bangladesh has been increasing since 2000 according to World Bank.

This paper intends to examine the effect of an increasing number of foreign workers and the remittance outflows on the economic growth of Bangladesh using reliable econometric techniques. As such, this study is organized as follows: after this introduction section, employment procedure of foreign workers/employees are discussed. Then the current state of remittance flows in Bangladesh is discussed. A brief review of existing literature is provided subsequently. Using the Johansen Co-integration, Vector Error Correction model and Granger causality approach, the long run relationship and causation between economic growth (proxied by GDP) and remittance outflows are investigated in the next section. Moreover, possible stimulus on the macroeconomic indicators is evaluated due to increasing remittance outflows. Finally, the study concludes with a summary of empirical findings and some policy suggestions.

Employment of Foreign Workers/Employees in Bangladesh

Recent empirical evidence suggests that the local supply of skilled labour force in Bangladesh is inadequate in various technical positions of different sectors (Murshid 2016). According to Exporters Association of Bangladesh (EAB) and Bangladesh Garment Manufacturers and Exporters Association (BGMEA), local labour are not well acquainted with modern production methods and technologies of the clothing industry and findings from the clothing industry are quite similar for other sectors such as agro-foods, constructions, IT, leather sectors, and others. Furthermore, higher frequency of adopting new technologies and continuous up gradating of the existing technologies, with inadequate training for the local labour to adapt with modern technologies can be attributed to the higher demand for foreign expertise. Since the 1990s, the Bangladesh government undertook congenial policies and declared special benefits and incentives (http://bida.gov.bd/?page_id=133) to attract foreign direct investment (FDI) (Abdin 2015). With higher FDI, the foreign employment also increases.

Work permission issuance authority

Currently, three government authorities – Bangladesh Investment Development Authority (BIDA), Bangladesh Export Processing Zone Authority (BEPZA) and Non-governmental Organizations (NGOs) Affairs Bureau, are involved in the issuing of work permit to foreign employees (Table 1). With reference to Foreign Private Investment (Promotion and Protection) Act, 1980, the Government's policy framework increased the number of foreign companies' established in Bangladesh, which led to an increase in foreign workers in Bangladesh. Within 2017,

considering both the industrial and commercial units, 49,976 foreign workers were provided work permit and registered under BIDA alone (Table 2, showing new and renewed foreign companies).

Table 1: Work permit issuance authority

Name of organization	Authorized sectors for issuing employment
Bangladesh Investment Development Authority (BIDA)	Private sector industrial enterprise, branch office, and liaison office, outside of Export Processing Zone (EPZ)
Bangladesh Export Processing Zones Authority (BEPZA)	Export Processing Zone (EPZ)
Non-Governmental Organization (NGO) Affairs Bureau	Any Non-Government Organizations (NGOs)

Source: Bangladesh Investment Development Authority (BIDA).

Table 2: Number of new and renewed foreign companies under BIDA (2009–2017)

Year	Industries		Commercials	
	New	Renewed	New	Renewed
2009	1,191	1,565	777	919
2010	1,268	1,745	851	962
2011	1,197	1,691	835	965
2012	1,381	1,974	872	667
2013	1,330	1,994	1108	913
2014	1,346	1,897	993	1,458
2015	1,568	2,175	982	1,272
2016	1,830	2,570	1,092	1,308
2017	1,862	2,755	1,309	1,358
Total	12,969	18,366	8,819	9,822

Source: Author's calculation using data from BIDA.

Work permission regulation act

Representative foreign offices can remit earnings outward (mostly to their home countries) from the host sources through maintaining the regulations under section 18(B) of the Foreign Exchange Regulation Act, 1947 of Bangladesh Bank. After the approval, contingent upon Bangladesh Bank's permission, the approved foreign companies can employ foreigners and Board of Investment (BOI) would issue work permit according to section 18(A) of the Foreign Exchange Regulation Act, 1947. Moreover, the permitted foreign offices have to take authorization for renewal/extension from Bangladesh Bank when it is necessary.

Opportunities provided to foreign companies and industries

Bangladesh government facilitates some incentive as well as benefit schemes to foreign employees to increase investment in the economy.

- ***Investment incentives:*** To promote new investment and export, the government provides tax incentives and benefits to foreign companies and industries, under the 'Free Trade Zone Regime'. Eligible companies at

the Economic Zones (EZs) are entitled to benefit from a tax holiday (tax exemption on income) up to 10 years. Moreover, reasonable percentages of exemptions on electricity VAT, Domestic Tariff Area (DTA) VAT (Value Added Tax) on products, custom/excise duty, stamp duty, dividend tax and income tax on services charge are granted (BIDA).

- ***Benefits****:* Within two months of permission from BOI, the approved companies must bring minimum $50,000 worth of foreign exchange or an equivalent amount of initial establishment cost including six-month operational expenses into the country as an inward remittance. According to the guideline of Foreign Exchange transaction, the foreign offices have to open a bank account in any listed bank of Bangladesh. Additionally, documents of quarterly return of income and expenditure from the remittances need to be submitted to BOI, NBR and Bangladesh Bank.

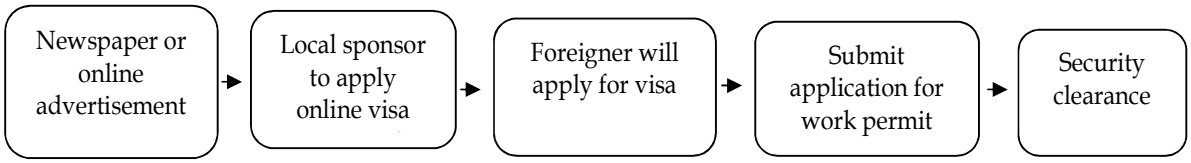
Work permit process

Foreigners with 'specialized knowledge" in different professions and trades are given work permission as follows:

1. Experts/consultants/high officials
2. Engineers/ production inspectors/technicians/designers/operators
3. Quality controllers/merchandiser/quality inspectors/ production supervisors.

Bangladeshi nationals are given high priority for employment in local and foreign industries/companies. When experts are locally unavailable and/or inadequate, only then foreign expertise can be hired. Employment ratio should be 10:1 (local: foreign) in the project implementation period but during the regular operational period 20:1 (local: foreign) ratio is encouraged. Moreover, the authority discourages renewing the work permit of foreigners for more than five years. BIDA has a guideline for issuing work permits to foreigners, which were implemented in 2011. There are five steps to complete the work permit procedure (Figure 1).

Figure 1: Work permit procedure



Source: Bangladesh Investment Development Authority Guideline (2011).

At first, the industry has to publish an advertisement in the newspaper or online to ensure that the essential experts are locally unavailable. After complying with that process, the local sponsor can apply online for issuing E/PI or any other type of visa recommendation for the required foreign employees. Subsequently, the foreigners can apply for the recommended visa in his/her respective Bangladesh Embassy or High Commission in their country. After that, the foreign national can enter into Bangladesh with an aim to be employed. Within 15 days of arrival, work permit application needs to be submitted to BIDA. In this process, foreign doctors and nurses in private hospitals have to register temporarily in Bangladesh Medical and Dental College (BMDC) and Bangladesh Nursing Council (BNC) respectively. Work permit for entertainment in the hotel and other organization has to take No Objection Certificated (NOC) from the Ministry of Cultural Affairs. In addition, the details of remuneration must be included in the application. Work permit fee of BDT 5,000 per person is applicable in this regard. Finally, the copy of the work permit will be sent to the Ministry of Home Affairs for security clearance and within 45 days of investigation, the security clearance is issued. Initially, foreign nationals are given work permit for two years while it is three years for top officials. Further essential extensions are usually given for two years with conditions.

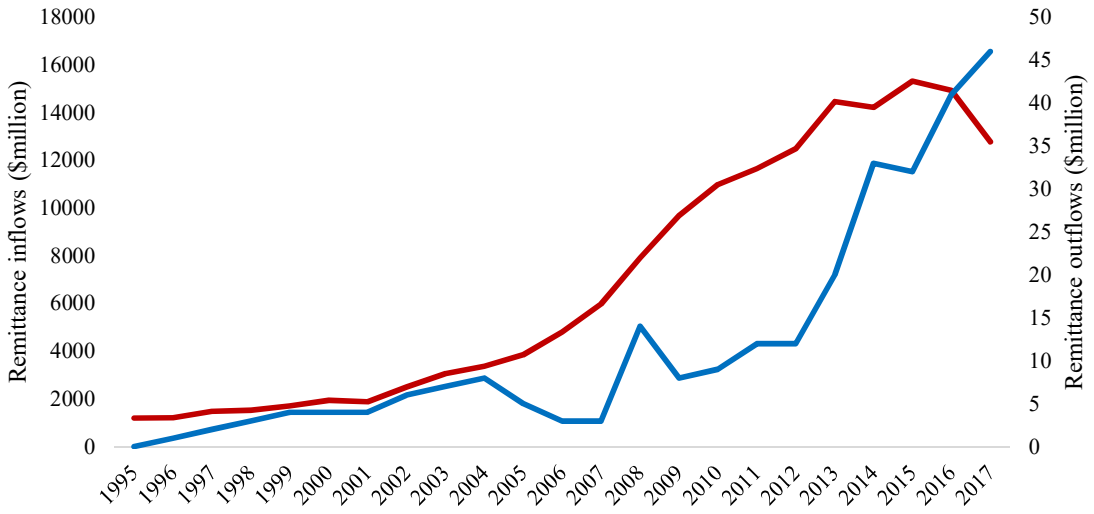
Foreign companies have to obtain Taxpayer Identification Number (TIN) for the deduction of taxes at the source of income and VAT. Foreign employees from the approved offices must submit income tax exemption certificate under

section 107 of Income Tax Ordinance, 1984. According to the act, companies hiring unauthorized foreign workers have to pay a certain penalty – 50% of the total payable income tax of the foreign workers and give up all the tax benefits accorded to them.

Current State of Remittance Flows in Bangladesh

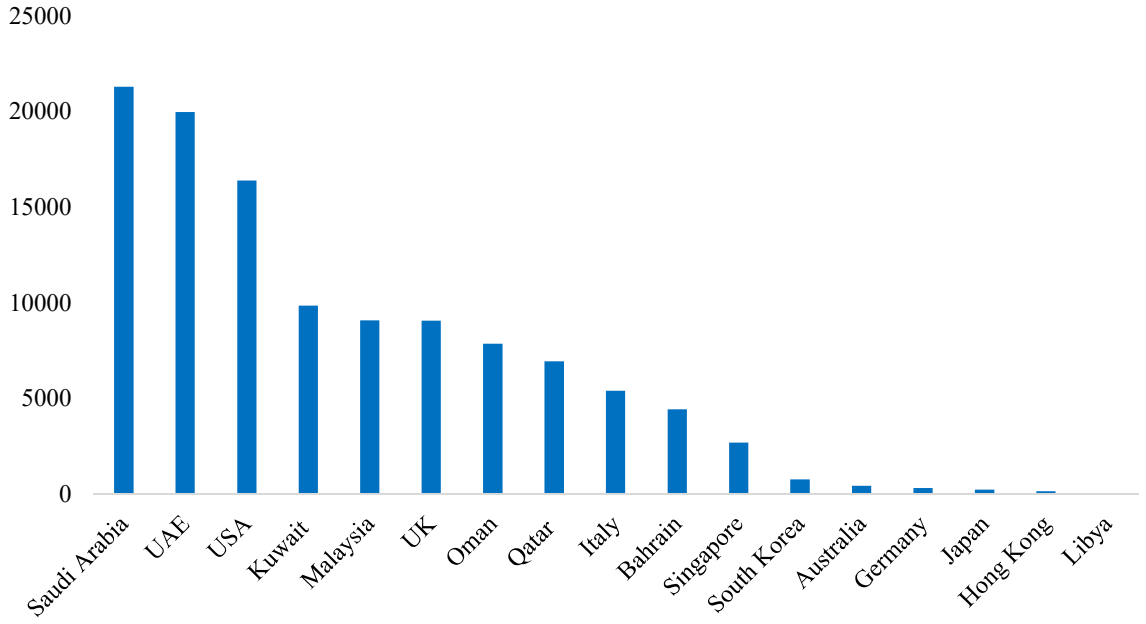
Over time, the remittance inflows (red line) are declining while the remittance outflows (blue line) are increasing in Bangladesh (Figure 2). Surprisingly, the pace of remittance outflow is increasing very fast in recent years. People from Bangladesh work in overseas countries namely Bahrain, Italy, Japan, Jordan, Kingdom of Saudi Arabia, Kuwait, Lebanon, Libya, Malaysia, Oman, Qatar, Sudan, Singapore, South Korea, the United Arab Emirates and the United Kingdom, etc. (Figure 3).

Figure 2: Remittance inflows and outflows trend in Bangladesh



Source: Bangladesh Bank and World Bank.

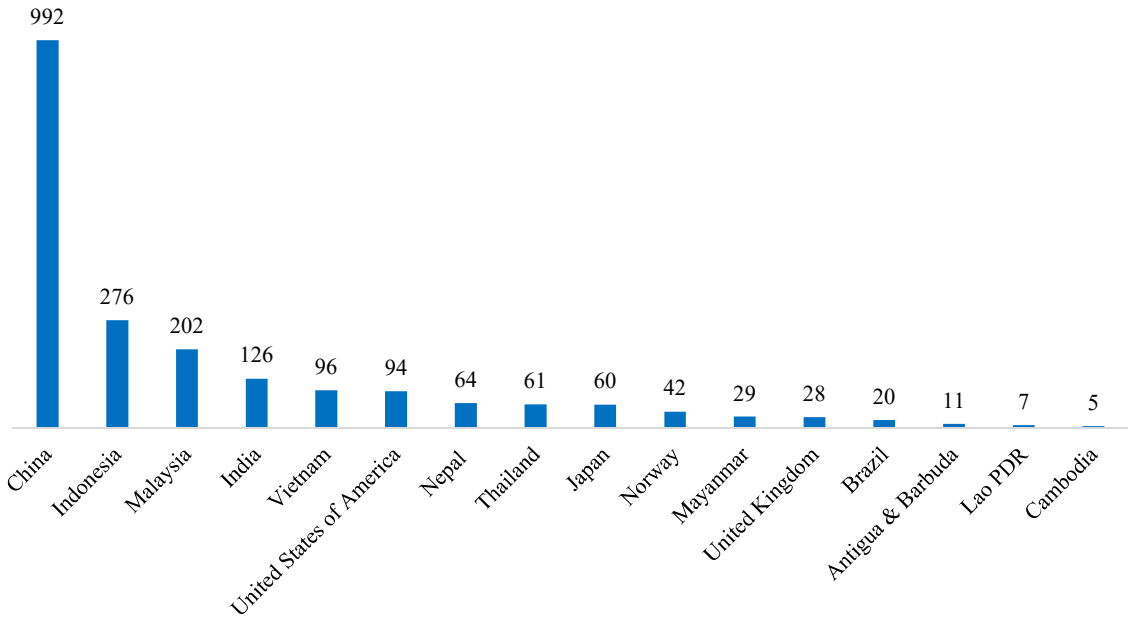
Figure 3: Remittance sending countries to Bangladesh, 2017–2018



Source: Bangladesh Bank (2017–2018).

According to Bangladesh Bank (2017–2018), for Bangladeshi expatriates, the largest remittance-earning source is the Kingdom of Saudi Arabia ($2.6 billion worth of remittance). Despite the dynamic role the remittance inflows play in economic development and balance of payment adjustment, the increased remittance outflows can offset the significance of the remittance inflows to some extent. In 2017, remittance inflows in Bangladesh dropped to a five-year low to $12,769.45 million while there has been a noticeable rising trend of remittance outflows (Bangladesh Bank, 2012–2017 & World Bank, 2017). On the contrary, China, India, Indonesia, Malaysia, the United States, Vietnam are among the major remittance receiving countries from Bangladesh (Figure 4). The highest amount of remittance ($992 million) is outflowed to China.

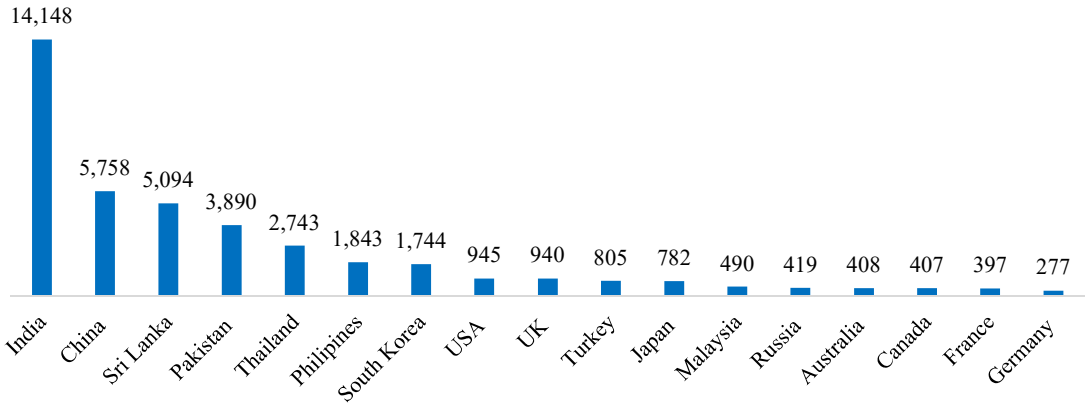
Figure 4: Remittance receiving countries from Bangladesh, 2017 ($ million)



Source: World Bank (2017).

According to BIDA, the number of foreign employees from different nations is increasing every year. Currently, professionals and workers from about 100 countries are working in the industrial and services sectors of Bangladesh (BIDA, 2017). However, Indians are playing the dominant role in the Bangladesh job market. Moreover, employees from China, Pakistan, Philippines, Sri Lanka, and Thailand, for example, are increasing too (Figure 5).

Figure 5: Countrywide foreigners' work permit issued by BIDA (2010–2017)



Source: Authors' calculation using data from the Bangladesh Investment Development Authority (BIDA).

A study conducted by Olney (2013) revealed that domestic workers' wage declined by about 0.19 percent with approximately 1 percent increase in remittance outflows in Germany. As the hired foreigners in Bangladesh are more

competent than locals, the basic salary of foreigners is higher than that of local employees for the same employment status. Because of an increasing number of foreign employees, the wage remittance outflows are escalating every year. During the last five years, wage remittance outflows from Bangladesh have enlarged noticeably (Table 3). Nevertheless, the basic salary structure given by the authorities' shows that the salary of foreign employees is much higher when compared with the local employees (Table 4). Higher salary becomes an incentive and encourages foreign labour force.

Table 3: Wage remittances outflow from Bangladesh (2013–2018)

Year	Wage remittances outflow (million $)
2013–2014	28.40
2014–2015	24.04
2015–2016	37.12
2016–2017	41.61
2017–2018	46.28

Source: Bangladesh Bank.

Table 4: Comparison between basic salary structure of foreigners and locals

Occupation	Local people (BDT)	Foreign nationals (BDT)
Foreign Investors/Managing Director/Company Chairman/Director/Chief Executive Officer etc.	26,933	130,033–167,500
Officers with higher technical & professional knowledge	17,396	103,291–125,625
Mid-level officers with technical & professional qualification	-	71,187–100,500
Skilled occupation	-	54,437–83,750

Sources and notes: Labour Force Survey, 2015–16 and BIDA guideline, 2011. The above-mentioned salary structure of foreigners is not applicable in the case of MNCs, airlines, shipping lines, etc. '-' means information is not available.

Nexus between Macroeconomic Scenario and Remittance Outflows in Bangladesh

Remittance outflows can have a profound effect on the overall economic scenario of both the home and host country. Usually, the remittance sending countries are economically large and developed. Remittance outflows from Russia are three times larger than the inflows; in fact, the outflow from Russia is approximately 2% of their GDP, which is ignorable for a developed country (Naufal and Genc 2017). Mainly, the remittance recipients are the developing ones and remittance inflows into the developing countries help to ease the budget deficit, enhanced productive economic activities and boost up local consumption. For instance, approximately 97 percent of migrant workers from Bangladesh have substantial attachment with their home and they send a considerable portion of their income back to Bangladesh according to Bangladesh Manpower, Employment, and Training (BMET). It also reports that nearly 44.9 percent of expatriates' income is sent back to the home country while about 29.8 percent of income is spent abroad for personal consumption and the rest is saved. On the contrary, developing countries like Bangladesh hire foreign employees due to a shortage of skilled labour force. These results in two effects – firstly, foreign employees remit a large volume of remittance to the home country; secondly, hiring foreign employees cannot reduce the unemployment problem of Bangladesh.

According to the Hecksher-Ohlin theorem (1991), shortage of skilled labour force in the host country and the differences in the labour cost determine the migration of workers. This can be witnessed in the case of the Kingdom of Saudi Arabia. Shortage of skilled labour force induces Saudi Arabia to hire a large number of foreign workers,

which in turn increase remittance outflows and causing harm to the economic growth of that country (Alkhathlan, 2013). In the case of Bangladesh, according to BGMEA, hiring foreign employees especially in the RMG sector is greatly credited to skill shortage. The share of remittance outflows in Bangladesh's GDP was relatively small, 0.016% (Bangladesh Bank, 2017 & World Bank, 2017) and it is increasing every year along with the increased GDP. This increasing remittance outflows can be attributed to declining inflation rate according to the World Development Indicator. It has been studied that in the Kingdom of Saudi Arabia, remittance outflows was affecting inflation in the long run (Taghavi 2012). Apart from that, remittance outflows can lead to real effective exchange rate depreciation overtime (Espinoza 2013). Exchange rate in Bangladesh is increasing every year along with the up-surging remittance outflows. Government spending has been increasing in Bangladesh, for instance, Power System Master Plan (PSMP) 2016, postulates that the government is going to implement 10 mega projects of 15,000MW capacity by 2030 (Hossain, 2014). With a view to completing these projects successfully, more foreign employees would be hired because of the need for their expertise. Foreign workers have definitely helped in boosting the production of goods and services. Therefore, production has increased which enhanced GDP and exports from Bangladesh. Nonetheless, foreigners stay temporarily with the employment visa and remit most of their income back to their home country and thereby reducing the investment in the host country. As a result, along with the increased expenditure, remittance outflows would also tend to increase in the upcoming years. It is a matter of concern that continuous remittance outflows can reduce government-spending multiplier. Likewise, at the time of recession, increased government spending cannot bring the expected outcome because of the remittance leakage (Naufa and Termos 2009).

Review of Relevant Literature

Existing literature suggests that there has been a growing debate on the question of whether increasing remittance outflows from the host countries have positive or negative impacts on the economy. Recently, the impact of remittance outflows is getting much attention but mostly for the Gulf Cooperation Countries (GCC). Most of the studies on GCC countries showed that increasing remittance outflows have weakened the economic growth in the short run but have no effect in the long run. Moreover, remittance outflows reduce inflation in GCC countries. This finding cannot be generalized for all the countries referring to the limited studies. Instances can be provided like, Taghavi (2012) who showed the impact on macro indicators in the GCC countries because of the increasing remittance outflows, using Vector Auto regression model taking data from the World Bank covering period 1990–2010. Data on other macroeconomic variables had been collected from the respective GCC countries' central bank except for the series of GDP per capita. The study result showed that at the period of global recession, an estimated remittance size did not show any effect on economic recovery. In all the cases, inflation tends to decline because of remittance outflows for a short period. However, the other macroeconomic indicators namely government spending, money supply, and exchange rate tend to cope with the economic shock due to increasing remittance outflows. Moreover, in the study, there was no significant impact of remittance outflows on the real effective exchange rate, but inflation had declined due to remittance outflows for a short period. Kaabi (2016) showed the nexus between remittance outflows and GDP as well as inflation among the six GCC countries by using panel data from the period 2004–2014. The effect was assumed the same among most of the GCC countries except Saudi Arabia and Bahrain. Because of increasing remittance outflows, there was a negative impact on GDP and inflation in Saudi Arabia and Bahrain respectively. Alkhathlan (2013) in a paper validated the negative impact of remittance outflows on Saudi Arabia's economic growth using the autoregressive distributed lag (ARDL) and unrestricted error correction model (UECM). Furthermore, the result showed that government expenditure and the export revenue have a more positive and noteworthy effect on the country's economic growth.

Razali *et al.* (2016) showed that the remittance outflows and economic growth of Malaysia from 1982–2014 by analysing data of exchange rate, FDI, export and labour force from World Bank Indicator (WDI) and Department of Statistic Malaysia. Different sets of technique had been used to conduct the research like – Ordinary Least Square (OLS) method, t-test, Augmented Dickey-Fuller Unit Root, Philip-Perron's test, Johansen Co-integration and Vector Error Correction Model (VECM). Results of the study demonstrated the existence of a positive relationship between economic growth and remittance outflows in Malaysia in the long run. Besides, in the short run exports, remittance outflows and labour force have a significant effect on the economy but the exchange rate and FDI inflows have an insignificant effect on the economy. The analysis also concluded that there is a positive relation between remittance outflows and exports in Malaysia. Hathroubi and Aloui (2016) used lead/lag interactions between workers' remittance outflows and macroeconomic variables and performed wavelet variants. They showed workers' remittance outflows has a positive relationship with real economic growth, government expenditure and government spending affect

outflows positively in the short run. Moreover, changes in active population had a great impact on the remittance outflows. Lastovetska (2015) researched the impact of remittance outflows on the economy of Poland. Non-structural VAR-model had been used to study the quarterly records from the period of 2000 to 2014. The VAR result showed that increasing remittance outflows have a positive effect on economic growth but neutral on the interest rate and inflation of Poland. Additionally, the currency of Poland was devaluated because of remittance outflows. Rahmouni and Debbiche (2017) studied the effects of remittance outflows on Saudi Arabia's economic growth from 1970–2014. Data of real per capita gross domestic product, gross fixed capital formation, consumption expenditure, trade openness, human capital had been collected from World Development Indicator (WDI). The Autoregressive Distributed Lag approach to Error correction modeling (ARDL-ECM) has been employed. The study was conducted for both short run and long run period. The results suggest that the remittance outflows have no significant effect on the real per capita GDP of Saudi Arabia in both the short run and long run. The study indicated that remittance outflows have reduced both inflation and Real Effective Exchange Rate in Saudi Arabia.

Majority of the existing literature from the perspective of Bangladesh have highlighted the effects of remittance inflows on economic growth, poverty, and inequality, but very few researches studied the major economic issue of the economic impact of remittance outflows. Lately, an increasing number of foreign workers and remittance outflows from Bangladesh are being acknowledged. Recently, some research think tank like Center for Policy Dialogue (CPD) is showing concern on this excessive resource flights through remittance outflows. Considering this backdrop, this study attempts to investigate the effect of remittance outflows on the economic growth of Bangladesh.

Research Methodology

Data Description

Analysing remittance outflows' impact on the economic growth of Bangladesh, some vital macroeconomic indicators' data have been collected for the period 1995–2017. Remittances might have an impact on gross domestic product (GDP), inflation, current account, foreign exchange reserve, real exchange rate, and some other relevant and important macroeconomic indicators. Remittance outflows affect the money supply of the economy by resulting in low inflation rate that can affect positively or negatively on the economy (Rahmouni & Debbiche 2017). Moreover, remittances can show a significant real exchange rate appreciation (Lopez *et al*. 2007). As foreign employees in Bangladesh are recruited mostly in the industrial and service sectors, there should be an impact on the production rate of goods and services. Hence, the effect on economic growth because of remittance outflows can be positive or negative or no relation (Razali *et al*. 2016). To test the existence of a long-run relationship between the remittance outflows and economic growth, Johansen co-integration approach is used.

Data for all the variables are collected from Bangladesh Bank and World Development Indicators (WDI) whereas remittance outflows data is collected from World Bank (Table 5).

Table 5: Data specifications and sources

Variables	Description	Source
REM	Remittance outflow	World Bank
GDP	Gross Domestic Product	World Development Indicator (WDI)
INF	Inflation (consumer prices, annual %)	World Development Indicator (WDI)
EX	Exchange rate (taka per dollar)	Bangladesh Bank

Model Specification

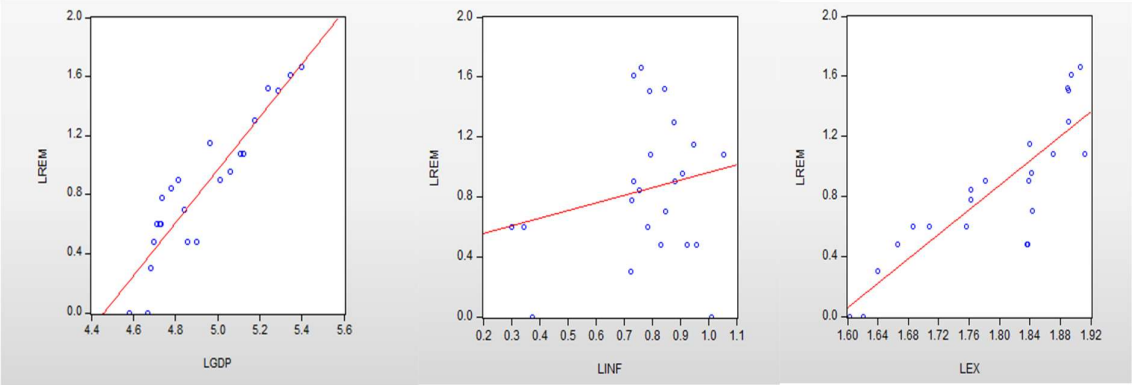
The aforementioned discussion leads to specify the following model to fulfil the objective of the study.

$LGDP_t = \beta_0 + \beta_1 LREM_t + \beta_2 LEX_t + \beta_3 LINF_t + \varepsilon_t$

The expected sign for the coefficient β_1 and β_3 is positive while it is negative for β_2. Moreover, the relationship between remittance outflows and inflation as well as exchange rate are expected to be positive.

The Scatter plot shows that GDP and remittance outflows are positively correlated, and both the variables follow an increasing trend while the findings for the remittance outflows and inflation as well as remittance outflows and exchange rate are as same as the findings of remittance outflows and GDP (Figure 6).

Figure 6: Scatter plot – (GDP vs Remittance Outflows, Inflation vs Remittance Outflows and Exchange rate vs Remittance Outflows)



Source: Bangladesh Bank and the World Bank.

Descriptive Statistics

Table 6 shows that the standard deviation of all the variables highly deviates from their respective mean values. The distribution of GDP, REM are positively skewed while the distribution of INF and EX are negatively skewed. For GDP, REM, EX the distribution with kurtosis is platykurtic. For INF, the distribution of kurtosis is leptokurtic. Here, according to the Jarque-Bera test, all the variables except inflation are normally distributed (Table 6).

Table 6: Descriptive statistics of data

Particulars	LGDP	LREM	LEX	LINF
Mean	4.932312	0.848954	1.794639	0.779161
Median	4.856239	0.845098	1.837588	0.793651
Maximum	5.397419	1.662758	1.912859	1.054345
Minimum	4.579097	0.000000	1.603144	0.302547
Std. Dev.	0.242450	0.472282	0.098261	0.196721
Skewness	0.465981	0.053179	-0.615140	-1.247265
Kurtosis	1.961190	2.310324	2.076623	3.981684
Jarque-Bera	1.866526 (0.393268)	0.466674 (0.791887)	2.267623 (0.321804)	6.886948 (0.031953)
Sum	113.4432	19.52594	41.27669	17.92070
Sum Sq. Dev.	1.293209	4.907096	0.212414	0.851386
Observations	23	23	23	23

Source and note: Authors' calculation. The values in the parentheses indicate P-values.

Checking Stationarity

Generally, non-stationarity is one of the fundamental characteristics of most of the time series variables. As a result, the investigation of long-run relationship among time series variables requires the testing of stationarity – unit root testing of each time series variables. This paper employs the Augmented Dickey-Fuller (ADF) test for checking stationarity (Dickey & Fuller 1981).

ADF unit root test is conducted using the following equation:

$$\Delta Yt = \eta_0 + \rho_0 t + \pi Yt\text{-}1 + \sum_{j=1}^{k} \mu j \ \Delta Yt\text{-}j + u_t$$

Where k stands for a number of lagged first difference term of the dependent variable, π symbolizes ADF test statistic while Δ is used to represent the differenced terms of the series.

The null hypothesis is defined as H_0: π = 0 (unit root or non-stationarity) against the alternative H_1: π < 0 (no unit root or stationary).

Table 7: Checking stationarity

Variables	ADF	P-value
GDP	1.815775	0.997
REM	-1.076291	0.712
INF	-2.963564	0.07
EX	-2.057216	0.362
Δ GDP	-3.550782	0.016
Δ REM	-4.989276	0.000
Δ INF	-4.977183	0.000
Δ EX	-4.129116	0.004

Source and notes: Authors' calculation. Δ is the first difference operator. Both the Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC) has been used.

Empirical evidence obtained from ADF test suggests that all the variables are non-stationary at their level form while stationary in the first-differenced form. As a result, we can apply the Johansen co-integration approach to investigate the long run relationship among the variables.

Exploring long run Relationship

Johansen Cointegration Analysis

Since stationarity checking suggests that all the variables are stationary at their first differenced form, Johansen cointegration technique can be applied to explore the long run relationship among the considered variables (Johansen & Juselius, 1990). Two tests – Trace test and Maximum Eigenvalue, are performed to identify the long run relationship. Before inspecting that, lag length has to be selected. Appropriate lag length for cointegration analysis is 2 based on the values of Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC) and adjusted R^2 values.

Table 8: Johansen co-integration results

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.953107	89.87634	47.85613	0.0000
At most 1	0.642706	28.67850	29.79707	0.0669
At most 2	0.296818	8.094601	15.49471	0.4554
At most 3	0.051231	1.051804	3.841466	0.3051

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

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.953107	61.19784	27.58434	0.0000
At most 1	0.642706	20.58390	21.13162	0.0595
At most 2	0.296818	7.042797	14.26460	0.4841
At most 3	0.051231	1.051804	3.841466	0.3051

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

Both Trace test and the Maximal Eigen value test rejects the null hypothesis of no co-integrating vector and both do not reject the null hypothesis of one (1) co-integrating vector. Hence, there exists one cointegrating relationship among variables. It is noted that no intercept or trend in CE or test VAR is assumed.

Table 9: Estimated co-integrating vector

LGDP	LREM	LEX	LINF
1.000000	-0.525299	1.227841	-0.373960
	(0.02903)	(0.28223)	(0.04700)

Source and note: Author's estimation. Standard errors are in the parentheses.

The estimated co-integrating vector from Johansen cointegration analysis reveals that in the long run, GDP is positively related with REM and INF while negatively related with EX. The findings imply that remittance outflows have a significant positive effect on the host country's economic growth in the long run. In short, the higher the remittance outflows, the higher the economic growth. Like remittance outflows, inflation has a significant positive effect on the economic growth. On the contrary, despite rising exchange rate depresses economic growth its effect is insignificant.

Vector Error Correction Mechanism (VECM)

When the same integrated ordered non-stationary variables are co-integrated, Vector Error Correction is used to show the short-run adjustment dynamics of the endogenous variable to examine whether the variables would converge to their co-integrating relationship in the long run (Engle & Granger, 1987). VECM is a restricted VAR (Vector Autoregression) that has co-integrating term known as the 'Error Correction Term' (ECT) shows the deviation from the long run equilibrium that adjusts through short run adjustment. Therefore, in the long run, the ECT has to be zero at the equilibrium. In addition, the coefficient of the ECT measures the adjustment speed.
The following equation is used to conduct VECM analysis:

$$\Delta Y_t = \sigma + \sum_{i=1}^{k-1} \gamma \, \Delta Y_{t-i} + \sum_{j=1}^{k-1} \eta \, \Delta X_{t-j} + \sum_{m=1}^{k-1} \theta \, \Delta R_{t-m} + \lambda ECT_{t-1} + \varepsilon_t$$

Where ECT_{t-1} stands for the Error Correction Term and the coefficient term of ECT (λ) measures the speed at which any deviation from the long-run equilibrium is corrected at each year.

Table 10: Vector Error Correction Estimates

Error Correction	D(LGDP)	D(LREM)	D(LINF)	D(LEX)
ECT_{t-1}	-.0254207*	-.0184519	-.0106997	-.5750797**
D(LGDP(-1))	0.465972	-0.281463	-0.073126	-0.790683
D(LGDP(-2))	0.160247	-4.924642	-0.848137	0.054966
D(LREM(-1))	-0.012992*	0.197040	-0.418064	-0.019758*
D(LREM(-2))	-0.015965*	0.111158	0.065196	-0.018946*
D(LINF(-1))	-0.005135*	0.406693	0.121310	-0.005898*
D(LINF(-2))	0.011814*	0.087655	-0.483114	-0.016781*
D(LEX(-1))	-0.486460	-1.612426	0.156567	-0.323001
D(LEX(-2))	0.231038	-2.996021	-0.995835	-0.798763
C	0.020000*	0.287328	0.067999	0.057035*

Source and notes: Authors' calculation. ** and * denote significance level at 1 percent and 5 percent respectively.

The adjustment term (λ = -0.025) for LGDP is statistically significant (P-value = 0.009) at the 5% significance level, suggesting that any deviation or error from long run equilibrium is corrected at a convergence speed of 2.5% in every period in the short run (Table 10). This speed of adjustment for LREM, LINF, and LEX is about 1.85%, 1.07% and 57.5% respectively.

Examination of a Causal Relationship

Examination of causal relationship among the time series variables is performed using the Granger causality test (Engle & Granger 1987). Since our interest variables are GDP and remittance outflows, it is needed to check whether GDP Granger causes remittance outflows or vice-versa. The selected lag order is 2 according to AIC to perform Granger causality test (Table 11).

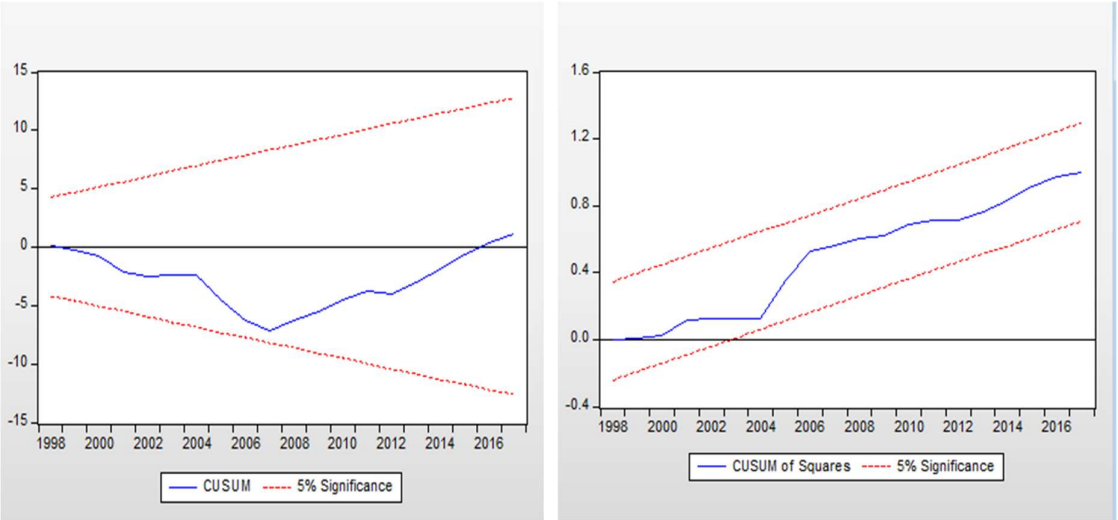
Table 11: Granger Causality test

Null Hypothesis	Obs.	F-Statistic	Prob.
LREM does not Granger Cause LGDP	21	0.11029	0.8962
LGDP does not Granger Cause LREM		**4.69138**	**0.0249**
LINF does not Granger Cause LGDP	21	0.27143	0.7657
LGDP does not Granger Cause LINF		2.18929	0.1444
LEX does not Granger Cause LGDP	21	15.0660	0.0002
LGDP does not Granger Cause LEX		0.25236	0.7800
LINF does not Granger Cause LREM	21	0.04009	0.9608
LREM does not Granger Cause LINF		0.81950	0.4583
LEX does not Granger Cause LREM	21	1.68450	0.2168
LREM does not Granger Cause LEX		0.88859	0.4306
LEX does not Granger Cause LINF	21	6.65607	0.0079
LINF does not Granger Cause LEX		2.05114	0.1611

Source: Authors' calculation.

According to the results obtained from the Granger causality test, it can be concluded that REM does not Granger cause GDP, but GDP Granger causes REM (GDP REM) in the long run. As a result, it provides substantial evidence that there exists a unidirectional causal relationship between GDP and remittance outflows. In terms of the direction of causality, growing GDP causes REM to increase in the long run (Table 11). CUSUM test and CUSUM of the square test result in both lies between 5% significance boundary levels, so the model is stable over time (Figure 7).

Figure 7: Parameter stability test

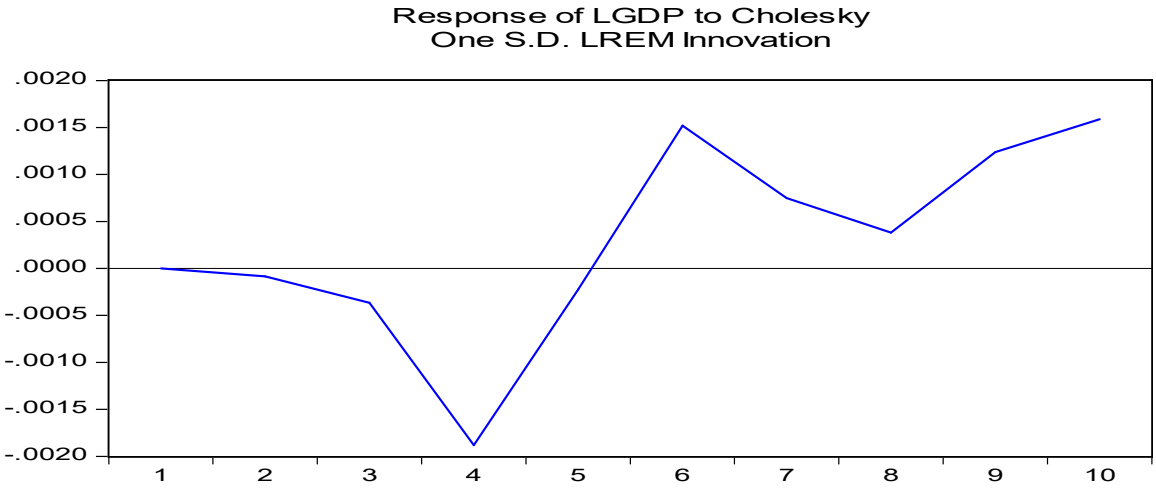


Source: Authors' presentation.

Impulse Response Function

Impulse response function provides evidence on whether innovation in an independent variable can have an impact on the variable of interest. A generalized one standard deviation innovation alternatively termed as a shock in remittance outflows negatively affects gross domestic product (GDP) very slowly in the first 3 periods followed by a sharp decline between period 3 and 4 (Figure 8). Afterward, it causes GDP to rise very steeply and followed by a downturn until period 8. Finally, the shock in remittance outflow will have a persistent and positive effect on GDP. Concisely, GDP is negatively affected in the short run and positively affected in the long run with slight fluctuations due to changes in remittance outflows.

Figure 8: Impulse response function – Response of GDP due to shock/innovation in Remittance outflows



Source: Authors' presentation.

Diagnostic Checking

Diagnostic test on autocorrelation and heteroscedasticity of residual suggest that the model does not suffer from autocorrelation and heteroscedasticity depending on the p-values at a significance level of 5 percent (Tables 12 and 13).

Table 12: Residual test of Heteroscedasticity (BPG test)

F-statistic	2.674774	Prob. F(3,19)	0.0765
Obs*R-squared	6.829381	Prob. Chi-Square(3)	0.0775
Scaled explained SS	2.583766	Prob. Chi-Square(3)	0.4603

Source: Authors' calculation.

Table 13: Residual test of Autocorrelation (LM test)

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	23.67938	16	0.0967	1.800895	(16, 15.9)	0.1255
2	19.12836	16	0.2621	1.297320	(16, 15.9)	0.3048

Source: Authors' calculation.

Summary of Empirical Findings

Based on the empirical findings presented above, all the variables are mostly normally distributed. Error variances of all the variables are homoscedastic and serially uncorrelated. From the econometric analysis, it is obvious that all the variables are stationary at their first difference form providing scopes to perform co-integration test with a view to investigating the long run relationship among the interest variables. Johansen Co-integration resulted in one co-integrating equation, which suggests that among the variables, there exists one long run relationship. Hence, there exists a positive and significant long run co-integrating relationship between economic growth (GDP) and remittance outflows (also indicated by scatter plot). The adjustment coefficient from VECM analysis suggests any deviation from the long run equilibrium will be corrected at a speed of about 2.5 percent in the short run. Granger causality test confirms the unidirectional causality between GDP and REM where the direction is from GDP to remittance outflows. Impulse response function suggests the existence of short run positive relationship between GDP and remittance outflows. Both CUSUM and CUSUM square test confirm the stability of the model's parameter over the period. Concisely, there is a long run positive relationship among GDP and remittance outflows and the increase in remittance outflows is caused by the growth of GDP in the long run for Bangladesh. This study supports the findings of Razali *et al.* (2016) and Hathroubi & Aloui (2016) whereas contradicts Alkhathlan (2013) and Kaabi (2016).

Conclusion and Suggestions

In recent years, growing economic activities have increased the number of foreign employees in Bangladesh. Moreover, it is presumed that the burgeoning economic growth will continue in the future years as well. Consequently, the demand for foreign employees will also continue to rise, as companies prefer to hire foreigners by paying higher wages not only for their expertise but also for their commitments towards job responsibilities. In addition, since the skill shortage in Bangladesh is considered as an inherent problem, enhanced supply response in the manufacturing sector demands a large number of skilled work force, which in turn increases the foreign employment. As a result, the volume of remittance outflow is increasing every year.

According to the findings of the study, there exists a positive relationship between economic growth and remittance outflows. With a view to tackling remittance outflows, foreign employees need to be motivated to invest more in the host country, which results in increased domestic production, employment, and finally positive spill over effects of skills among the local workers (Edrees 2016; Razali *et al.* 2016). Along with motivation, special incentives

and benefits should be provided to foreign investors. Furthermore, prudent policies concerning inflation and exchange rate can play a significant role in boosting up the economic growth.

Until now, the share of remittance outflows from Bangladesh is in a considerate position. Moreover, business associations like Bangladesh Garment Manufacturers and Exporters Association (BGMEA), Federation of Bangladesh Chambers of Commerce & Industries (FBCCI) and others need to make a long-term feasible plan in collaboration with the relevant government bodies to tackle the negative economic effects (i.e. reduction in consumption, low profit and drop in investments) due to rising remittance outflows (Rahmouni & Debbiche 2017). Finally, apart from all these, the establishment of a central database for foreign employees, income tax booths at immigration check posts of ports (i.e. land ports and airports), can greatly help to monitor whether the outflowed remittance are channelled through formal procedures.

Endnotes

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References

Abdin M. J. 2015. Foreign Direct Investment (FDI) in Bangladesh: Trends, Challenges and Recommendations. *International Journal of Economics & Management Sciences,* 4(8): 1-5.

Alkhathlan, K. A. 2013. The Nexus between Remittance Outflows and Growth: A study of Saudi Arabia. *Economic Modelling,* 33: 695-700.

Bangladesh Bank. 2017. Quarterly Report on Remittance Inflows. Research Department, External Economics Division.

Bangladesh Bank. 2018. Monthly Economic Trends.

BMET. Bangladesh Expatriate Workers and their Contribution to National Development.

Board of Investment (BOI) Guidelines. 2011.

CPD. 2016. Illegal Employment of Foreigners Hurting Bangladesh Economy. Available at http://rmg-study.cpd.org.bd/illegal-employment-of-foreigners-hurting-bangladesh-economy/

Dornates, C.A. 2014. The Good and the Bad in Remittance Flows. *IZA World of Labor, 97: 1-10.*

Edrees, A. 2016. The Impact of Foreign Workers, Outflow Remittances on Economic Growth in Selected GCC Countries: ARDL Approach. *Arabian Journal of Business and Management Review*, *6*(5): 1-4.

Engle, R.F. & Granger, C.W. 1987. Co-integration and Error Correction: Representation, Estimation, and Testing. *Econometrica: Journal of the Econometric Society*, 55(2): 251-276.

Fuller, W. A. 1976. *Introduction to Statistical Time Series*. New York: John Wiley and Sons.

Hathroubi, S. & Aloui, C. 2016. On Interactions between Remittance Outflows and Saudi Arabian Macroeconomy: New Evidence from Wavelets. *Economic Modelling*, 59: 32-45.

Heckscher, E.F. & Ohlin, B.G. 1991. *Heckscher-Ohlin Trade Theory*. Cambridge, MA: MIT Press.

Islam, M. N. 2010. Migration from Bangladesh and Overseas Employment Policy. Bureau of Manpower, Employment and Training (BMET) pp 1-25.

Johansen, S. & Juselius, K. 1990. Maximum Likelihood Estimation and Inference on Cointegration with Applications to Demand for Money. *Oxford Bulletin of Economics and Statistics,* 52: 169-210.

Kaabi, F. A. 2016. The Nexus between Remittance Outflows and GCC Growth and Inflation. *Journal of International Business and Economic*, *4*(1): 76-85.

Labor Force Survey Bangladesh. 2015–16. Bangladesh Bureau of Statistics

Lopez, Humberto; Molina, Luis; Bussolo, Maurizio. 2007. *Remittances and the Real Exchange Rate*. Policy Research Working Paper; No. 4213. Washington, DC: World Bank.

Murshid, K. A. S. 2016. *Skill Gap Analysis for Selected Sectors*. BIDS Research Almanac, 1-37.

Naufal, G. & Genc, I. 2017. *Impact of Remittance Outflows on Sending Economies: The Case for Russian Federation*. United Nations Economic and Social Commission for Asia and the Pacific, pp 1-29.

Naufal, G. & Termos, A. 2009. The Responsiveness of Remittance to the Oil Price: The Case of the GCC. Forschungsinstitut zur Zukunft der Arbeit Institute for the Study of Labor, pp 1-24.

Olney, W. W. 2013. Remittance and Wage Impact of Immigration. *Journal of Human Resources*, 50(3): 694-727.

Lastovetska, R. O. 2015. The Impact of Remittances Outflows on the Economy of Poland. *Austrian Journal of Humanities and Social Sciences*, (9-10):123-125.

PwC. 2017. The Long View, How will the global economic order change by 2050? Available at https://www.pwc.com/gx/en/world-2050/assets/pwc-world-in-2050-summary-report-feb-2017.pdf

Rahmouni, O. & Debbiche, I. 2017. The Effects of Remittances Outflows on Economic Growth in Saudi Arabia: Empirical Evidence. *Journal of Economics and International Finance*, 9(5): 36-43.

Razali, R., Arokiadasan, C., G., & Mahmud R. 2016. The Effect of Remittance Outflow towards Economic Growth in Malaysia. *Scholars Journal of Economics, Business and Management*, *3*(4): 217-229.

Søren, J. 1991. Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models. *Econometrica*, 59(6): 1551-1580.

Taghavi, M., 2012. The Impact of Workers' Remittances on Macro Indicators: The case of the Gulf Cooperation Council. *Topics in Middle Eastern and North African Economies*, 14: 49-73.

Vargas-Silva, C. and Huang, P. 2006. Macroeconomic Determinants of Workers' Remittances: Hostversus Home Country's Economic Conditions. *Journal of International Trade & Economic Development*, 15(1): 81-99.

World Bank. 2017. Record high remittances to low- and middle-income countries in 2017. Available at https://www.worldbank.org/en/news/press-release/2018/04/23/record-high-remittances-to-low-and-middle-income-countries-in-2017

World Bank. 2018. Accelerated remittances growth to low- and middle-income countries in 2018. Available at https://www.worldbank.org/en/news/press-release/2018/12/08/accelerated-remittances-growth-to-low-and-middle-income-countries-in-2018

Yoshino, N., Taghizadeh, H., F. & Otsuka, M. 2017. *International Remittances and Poverty Reduction: Evidence from Asian Developing Countries*. Asian Development Bank Institute.