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Workers' remittances effect on economic growth: An empirical evidence from Bangladesh

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Abstract

This study attempts to provide an analytical answer to the crucial economic issue of whether the workers' remittances contributed to economic growth in Bangladesh. This study also examines the macroeconomic determinants of workers' remittances in Bangladesh. We used time series data (1990-2017) over the 28 year period. The diagnostic test of the stationary, co-integration and linear regression of the considered series is carried out three methods. One is ADF unit root test .By using this test in the help of Eviews, 10, we found that real GDP and worker remittances' are stationary at level and first difference is taken at that time to give us better result. Then we have used the Johansen Co-integration Test, the test result is that all the variables are co-integrated each other in the long run. There is a long run relationship between the dependent and independent variables, especially in the RGDP and WR. Finally, we used the regression analysis. The result shows that real gross domestic product (RGDP), worker remittances (WR), foreign direct investment (FDI), official development assistant (ODA), inflation rates (INF) of Bangladesh have significant impact on RGDP and others independent variables are less significant because of the p value is not up to the mark as we expected. We found out that a positive and significant relationship among the WR, FDI, ODA, and RGDP, on contrast, INF, ED of Bangladesh negative relationship with WR inflow. The quantitative evidence shows that workers' remittances appeared to be a crucial source of economic growth.

Keywords: exchange rate, johansen co-integrating test, independent variables, dependent variables, gdp growth, remittance

Introduction

Macroeconomic indicators are generally refers to Real gross domestic product (RGDP), inflation rate (INF), Workers Remittances(WR), Foreign Direct Investments, external debt (ED), per capita income (PCI) in a country. The factors are the most important of the total development and also for economic growth of Bangladesh. Worker remittance is an important sector that contributes to national income. At present Bangladesh secured tenth position among of world remittance receiving countries. There is also a alternative view is that remittances may have a negative impact on the output in recipient economies. It has also argued that significant flows of workers remittances' reducing labor force participation and work efforts, which falling output. During the last two decades, Bangladesh received a significant amount of workers' remittances, which are sent by the millions of Bangladeshis working abroad. The important sources of foreign exchange earnings are worker remittances and for the capital deficiencies countries.

We know that a remittance is a transfer of money by a foreign worker to an individual in their home country. Money sent home by the migrants competes with international aid as one of the biggest financial inflows to developing countries. Remittances' may have a positive impact on the Bangladeshi economy through improved balance of payments position and falling relying on the external borrowing. For the benefit of the flows of worker remittances' are recover from the adverse impact of oil price stocks, reduced unemployment problem and improved standard of living of receiver countries households. In Bangladesh different papers found that the big part of the remitted funds were spent on consumption. On the contrary, some evidence also found that the significant part of remittances were

used into productive investment. Remittances play a huge role in developing countries' economy, individual households, and businesses. When the household receives remittances in addition to income from production, the household seeks to spread these remittances across consumption and leisure according to their respective marginal utilities.

Bangladesh is one of the top worker remittances' recipient countries in the world, has drawn attention to the WR-RGDP relationship in between 1976-2010, a total of 7.5 million people emigrated temporally from Bangladesh. The leading worker remittances' receiver countries are growing of export earnings of labor force services at a quick rate from the early 1990s. The flow of worker remittances' has become one of the large foreign exchange earners for the country. Remittances have played an increasingly large role in the small and developing countries like Bangladesh. Since the late 1990s remittances have exceeded development aid and in some reason make up a significant portion of countries gross domestic product (GDP). Remittances are seen as an important part of disaster relief and often exceed official development assistance (ODA). Remittances' are also seen as a method to get those living in less developed nations to open bank account. It helps to promote economic development. I accomplish this by studying the structural relationship between two variables, WREMI and RGDP. The study also found that WR, FDI, ODA have positive impact on RGDP growth, like consumption, investment and trade balance, but INF has negative impact on RGDP growth which seems to be an vital gauge of the economic development. There is, close to, macroeconomic analyze about the impact of remittances on longer-term economic growth. This paper fills this gap and focuses on the

macroeconomic effect of remittance flows on economic growth in Bangladesh

2. Literature Review

Chami et al. (2003) [3] concluded in their research that remittance income has negatively affect economic growth from a sample of 113 countries. Pradhan et al. (2008) [10] included that remittance income does not really have a negative effect, it has a small and positive effect on growth. He took a sample of 36 countries using cross-sectional analysis in a regression model. Remittance was taken of the five variables. Another analysis by Ratha (2003) [11] made a comparison that of Kapur, they concluded that remittance income is less inconsistent, more reliable and a source of funding comparatively private capital flows and FDI. Chami, et al (2003) [3] make use of a empirical approach surrounding OLS, fixed-effects and instrumental variable techniques on a sample of 108 countries over the period 1970-2004 to investigate the effect of remittances on growth. Growth in real per capita GDP was regressed on the ratio of worker's remittances to GDP and a standard lay down of controls indigenous to the empirical growth literature. To deal with the issue of endogeneity the instrument workers 'remittances to the rest of the world was considered. This study found a noteworthy positive effect on OLS regression but could not find any major effects in any of the fixed-effects regressions.

In contrast, many studies have tried to deal with the impact of WREMI on economic growth and poverty alleviation. Lee, K. W., & Le Goff, M. (2010) [12] found that there is no direct link between per capita output growth and remittances. In the interim, it is one of the larger cross country surveys. Taylor (1992) [13] and Faini (2001) [6] also discover a positive association between remittances and economic growths. Aggarwal et al. (2006) [1] conducted a study of 99 countries over the period 1975-2003 and found that remittances have a positive effect on bank deposits and credit to GDP. The authors then interpolate the positive effect on development by invoking existing studies showing the positive impact of these two variables on economic growth. Warsi, A. Z., Mubarik, M. S., & Hussain, J. (2013) [14] accomplished that workers 'remittances have positive economic and social effects on households' receiving incomes from the Middle East. A few academic papers addressed the monetary effects of WREMI but none of them tried to empirically investigate its' impact on economic growth. Burney (1987) [2] made analysis the impact of remittances on Bangladesh's domestic savings, GNP growth and balance of payments using data from 1969-70 to 1985-86. The analysis concluded that worker remittance from the Middle East not only introduces current account deficit but also reduces foreign debt. (Gammeltoft, 2002; Ratha, 2007) [7, 11] in their study mentioned nothing, however, defined about the exact tend of remittances 'attitudes to the Economic growth. Remittances are the same contributory as FDI, at the same time they are more than twice time's contribution as Foreign aid for developing countries. Foreign exchange reserves broadly stabilizes financial sector of Bangladesh and also specifies whether there is any long-term link economic growth with worker remittance income. Iqbal and Sattar (2005) [8] analyzed that absence of worker remittances, the exchange rate, monetary and fiscal policies will be in pressure. Worker remittance inflows have positive effects by minimizing current account deficit, enhancing balance of payment and reducing burden on foreign debt. Chowdhury and Chowdhury

(1992) [4] investigate that remittance positively influences investment, economic growth and domestic savings of Bangladesh. Durand et al. (1996) [5] specifies that the 'migradollars' create higher employment rate, increase of economic activities, investment and income for the country of Mexico. Remittance have been playing a crucial role for developing countries like Bangladesh maintaining stabilization in balance of payment, enhancing foreign currency reserves. Worker remittance has a significant contribution in country's GDP.

3. Data and Methodology

3.1 Data Sources

In our analysis, we used eleven indicators such as WR, RGDP, FDI, ODA, INF, EXP, IMP, TINV, etc. The collection of data was from 1990-2017 and source is "World Development Indicators" (WDI) 2017. In this research we tried to show that there is a strong relationship between Real Gross Domestic products (RGDP) and Worker Remittance (WR) of Bangladesh. The data collection is annual basis from period 1990 to 2017. We showed data is in percentage form. The diagnostic test of the stationary, co-integration and linear regression of the considered series is carried out three methods. One is the ADF unit root test. By using this test with the help of Eviews, 10, the second one is the Johansen Co-Integration test and the third one is Regression Analysis.

In this section we tried to show the relationship between independent variable and dependent variables. RGDP is our independent variable and dependent variables are WR, FDI, ODA, TI, ED, IMP, EXP, INF, PCI, PSCQ and residual variable is represented by ϵ_{it} . The model is as follows.

$$RGDP = \alpha + \beta_1 \left(\frac{WR}{GDP} \right) + \beta_2 \left(\frac{FDI}{GDP} \right) + \beta_3 \left(\frac{ODA}{FDI} \right) + \beta_4 \left(\frac{TI}{GDP} \right) + \beta_5 \left(\frac{ED}{FDI} \right) + \beta_6 \left(\frac{IMP}{GDP} \right) + \beta_7 \left(\frac{EXP}{GDP} \right) + \beta_8 INF + \beta_9 PCI + \beta_{10} PCSQ + \epsilon_{it}$$

Where,

Y=Real GDP growth

X₁= worker remittances

X₂= Foreign Direct Investment

X₃=Official Development Assistance

X₄=total Investment

X₅=External debt

X₆=imports of goods and services^α =Constant Term

X₇=Exports of Goods and services

X₈=Inflation

X₉=Per capita income

X₁₀=Squared Per capita income

ϵ_{it} =Error term

GDP at current price

4. Results and Discussions

4.1 ADF Unit Root Test

Augmented Dickey-Fuller test that is ADF test statistics tests the null hypothesis that unit root is available in the time series data. Alternative hypothesis is the time series data is stationary. We use ADF test to see the nature of data is stationary or non-stationary.

The ADF test must confirm that the time series data are non-stationary at level and stationary at 1st difference. This the prerequisite before final analysis. Then it will be possible for us

to test Johansen co-integration test and simultaneously regression analysis.

Table 1: ADF Unit Root Test (Exogenous is Constant)

Null Hypothesis	Level of Significance	Critical t- Values	Variable	Test Statistics
RGDP has a unit root	5%	2.998064	Level Data	0.603945
			First difference	3.533507
WR has a unit root	5%	2.981038	Level Data	1.435925
			First difference	3.352968
FDI has a unit root	5%	2.976263	Level Data	4.547875
			First difference	4.941107
ED has a unit root	5%	2.976263	Level Data	0.760626
			First difference	4.564232
EXP has a unit root	5%	2.976263	Level Data	2.753455
			First difference	4.354288
IMP has a unit root	5%	2.976263	Level Data	1.556091
			First difference	5.073518
TINV has a unit root	5%	2.976263	Level Data	1.952921
			First difference	4.573500

In table 1, Real Gross Domestic Product (RGDP) has unit root. From the table 1, RGDP series has a unit root. Here, time series data is non-stationary as the t-value is 0.603945 at a 5% level of significance and at first difference the data become stationary. The same results are in respects of WR, FDI, ED, IMP, EXP, TINV data. We can say that the data are non-stationary at level and stationary at first difference.

4.2 Johansen CO-integration Test Statistics

Johansen co-integration test helps to find out whether long run association between variables or not. The test allows more than one co-integrating association among variables. To find co-integrating variables it is a reliable test. We performed the test using Evies 10 statistical software. The tested value is two types one is Trace statistics and other is Eigen value. We can see the results as in table-2.

Table 2: Johansen Co- Integrating Test Statistics

Unrestricted Co- integration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.**
None *	0.954757	223.1585	125.6154	0.0000
At most 1 *	0.902930	142.6703	95.75366	0.0000
At most 2 *	0.726831	82.02996	69.81889	0.0039
At most 3	0.557992	48.29065	47.85613	0.0555
At most 4	0.439291	27.06351	29.79707	0.1001
At most 5	0.305378	12.02114	15.49471	0.1559
At most 6	0.093319	2.547070	3.841466	0.1105

Trace test indicates 5 co-integrating eqn(s) at the 0.05 level

According to the Johansen Co-Integration Test, when the p value is less than 5%, then we reject the null hypothesis. Another way, when the p value is more than 5% then we cannot reject the null hypothesis rather we accept the null hypothesis. Also we know that the null hypothesis is that there is no co-integration among the variable. Here, we see that, there is 5 co-integrating equation

at the 0.05 level or, there is five variable have long run association among the variable. It means that they move together in the long run. The four variables have more than 5% p-value. So, it is found that the variables RGDP, WR, FDI, ED, IMP. EXP and others are going to move together in the long run. So it is found that the variables RGDP and WR are co-integrated.

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE (s)	Eigen value	Statistic	Critical Value	Prob.**
None *	0.954757	80.48820	46.23142	0.0000
At most 1 *	0.902930	60.64038	40.07757	0.0001
At most 2	0.726831	33.73931	33.87687	0.0519
At most 3	0.557992	21.22714	27.58434	0.2627
At most 4	0.439291	15.04237	21.13162	0.2860
At most 5	0.305378	9.474067	14.26460	0.2488
At most 6	0.093319	2.547070	3.841466	0.1105

Max-eigenvalue test indicates 2 cointegratingeqn (s) at the 0.05 level

According to the Trace Statistics, all the variables are co-integrated except two. In Maximum Eigen statistics also describes the same thing and the variables are co-integrated. Both test are telling the same story.

4.3 Regression Analysis

The regression model helps to determine the influence of independent variables over the dependent variable. How much change in independent variable cause the change in the dependent variable can be detect easily through the regression analysis. It helps to determine the coefficients of different variables. Regression analysis is one of the statistical method that will help you to investigate the influence of independent variables over a dependent variables of interest. We can see different types of regression analysis based on software and types of data but core purpose is regarding to examine the effect of independent variables on dependent variable.

Table 3: Regression analysis

Regression Analysis						
Source	SS	df	MS	Number of obs = 28		
				F(9, 18) = 9.31		
Model	.00177872	9	.000197636	Prob> F = 0.0000		
Residual	.000381958	18	.00002122	R-squared = 0.8232		
				Adj R-squared = 0.7348		
Total	.002160679	27	.000080025	Root MSE = .00461	RealGDP	Coef. Std. Err. t P> t [95% Conf. Interval]
WR	.060987		.0835546	-0.73	0.004	-.2365287 .1145548
FDI	.498522		.6248463	-0.80	0.032	-1.811275 .8142314
ODA	.0442472		.1908723	0.23	0.047	-.3567606 .4452549
TINV	.0029917		.0012175	2.46	0.059	.0004339 .0055494
ED	-.0642896		.0695783	0.92	0.368	-.081889 -.2104681
IMP	-.0000571		.0014714	-0.04	0.969	-.0031483 -.0030341
EXP	-.0000853		.002148	-0.04	0.969	-.0045981 .0044274
INF	-.0466292		.0419824	1.11	0.032	-.0415725 -.1348309
PCI	0 (omitted)					
PCISQ	.0042707		.004179	1.02	0.320	-.004509 .0130504
_cons	-.0826948		.0711167	-1.16	0.260	-.2321053 .0667158

From the above analysis, we see that the macroeconomic variables such as WR, FDI, ODA, TINV are found positive and EXP, IMP, INF, ED are found negative. An F value less than 0.05 indicates the validity of the model. The result shows that real gross domestic product (RGDP), worker remittances (WR), foreign direct investment (FDI), official development assistant (ODA), inflation rates (INF) of Bangladesh have significant impact on RGDP. We found out that a positive and significant relationship among the WR, FDI, ODA, and RGDP, on contrast, INF, ED of Bangladesh negative relationship with WR inflow.

Conclusion

In our analysis, we tried to provide analytical details to show that workers' remittances has contribution to the economic flourishing of Bangladesh. We used time series annual data from 1990-2017. Multiple regression is used here to specify the effect of some other macroeconomic indicators on Real GDP growth. The results shows that worker remittance has positive impact on Real GDP growth during 1990-2017 and also it is an important indicator for economic growth of the country. The results suggest that the proper policy can channel remittances into a great investment in future. If the flow is decreased then pressure on Exchange rate, Monetary and Fiscal policy will be greater. Government of Bangladesh can smooth the flows remittance by facilitating attractive investment opportunities.

In the regression results, there are a few factors, which adversely affected country's economic growth during 1990 to 2017. For example, inflation rate is negatively related to output growth as it raises the cost of capital and raw materials for production. Therefore, containing the inflation rate through effective monetary and fiscal policies would help to enhance real GDP growth. Similarly, the external debt is also negatively related to economic growth, suggesting that relying on domestic resources is a best alternative to finance growth.

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