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International Fund Inflows, Economic Growth and Health Care Development: The Case of Bangladesh

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Inflow of foreign currencies is believed to generate multidimensional impacts in shaping the economy of the recipient nations, particularly the underdeveloped nations that are unable to finance their development investments. To the best of knowledge, no previous study has focused simultaneously on all the four sources of foreign inflows and their individual effects on Bangladesh's economic growth and healthcare development prospects. This paper fills this gap by investigating the effectiveness of the foreign inflows in generating favorable impacts on the two utmost imperative macroeconomic targets in Bangladesh during the period 1983-2014.This paper attempts to analyze the individual influences of all the sources of foreign currency inflows on economic growth and health sector development in context of Bangladesh during the period from 1983 to 2014. As per the methodology, the Augmented Dickey Fuller (ADF), Phillips-Perron (PP), Johansen Cointegration tests were followed by the Granger Causality test and the Vector Error Correction Model (VECM) approach. The findings reveal that most of the sources of foreign currency inflows affect both economic growth and health care development in the long run but are ineffective in the short run. Thus, there is a scope for further studies to identify the factors attributing to the ineffectiveness of foreign inflows in the short run and design effective policies in rectifying the problems to attainment of socio economic goals both in the long run and short run.

Field of Research: Economics

1. Introduction

Traditionally, all underdeveloped nations have experienced growth constraints in the form of inadequate funds to finance necessary investments. Thus, all developing nations are vastly dependent on foreign inflows which primarily mitigate the savings-investment gaps in the recipient nations. It has been empirically acknowledged that efficient management of inward foreign currency inflows can help a developing nation that is striving to attain economic growth and development. However, inefficient and inappropriate use of those funds can also boomerang making the recipient countries worse-off than before. Thus, researchers and policy initiators all over the globe have endeavoured their knowledge in investigating the effectiveness of foreign inflows in coinciding to the targets that are ought to be reached. Bangladesh, like all other underdeveloped nations, has had the misfortune of not being able to finance its investments due to its insufficient national savings. Thus, the country's dependence on external

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foreign financing is not something new. There are four main categories in which foreign inflows can be classified in context of Bangladesh. These include Foreign Aid (FAID), Foreign Direct Investment (FDI), Portfolio Investment (PI) and inward Remittance (REMIT). However, there had not been any general consensus on the effects of these inflows on the recipient country's macroeconomic indicators, especially economic growth and health care development sectors. For instance, empirical findings in a study by Kallon (2012) for Sierra Leone it has been empirically revealed that inflow of foreign aid proved to be effective in enhancing the economic growth of the nation. In addition, Mansoor and Quillin (2007) have concluded that inflow of remittances influences the growth prospects of the recipient economies. On the other hand, many studies like those by Fielding and Gibson (2012) for 26 Sub-Saharan African countries and Hassan and Holmes (2013) for Pakistan have linked inflows of foreign aid and remittances respectively to the Dutch disease problem whereby the economic growths of the recipient nations were hampered.

Bangladesh's terrific performance in attainment of sustainable economic development can be attributed to the large foreign inflows the country has received following its independence in 1971. Bangladesh has been maintaining an annual GDP growth rate of 6.34% on average since 2011 (Amin and Murshed, 2016) and by the end of this fiscal year it is expected to reach 6.9% (International Monetary Fund, 2016). Bangladesh is currently the 34th largest economy in the world and it presumably would be the 23rd largest economy in course of the next three decades. It is referred to as the lighthouse in growth rate achievement amongst the South Asian nations. Apart from its progress in terms of economic growth, Bangladesh has also displayed a tremendous improvement in its health indicators over the years. The life expectancy at birth in Bangladesh is at present around 71 years which is 5 years more than that of the neighbouring country, India. In addition, the infant mortality rate have almost halved in the last 15 years, from 64.4 in 2000 to 32.1 in 2015 (World Development Indicators, 2016). The government has ensured that currently 97% of the population of Bangladesh has access to safe drinking water which is also contributing to the nation's progress in the health sector. All these positive trends in Bangladesh are driven via the country's commitment to undergo both economic and financial liberalization whereby it has globalized and engaged in both bilateral and multilateral trade. Therefore, it is presumed that inflow of foreign currencies over the years in Bangladesh must have played a positive role in driving its economic and health sector development.

FAID inflow in Bangladesh has had a rising trend throughout the nation's post-independence period. The nation's reliance on employing foreign capital for productive investments is clear from the statistical records of its development assistance inflows. According to the World Bank, the total amount of Net Official Development Assistance (NODA) flowing into Bangladesh was around 1.13 billion US dollars in 1985 which grew exponentially and reached 2.4 billion US dollars by 2014 (WDI, 2016). The progress is even more highlighted in the fact that NODA in Bangladesh had rose by almost 1.4 times in the last decade. As far as FDI inflow is concerned, Bangladesh has managed to ensure business-friendly environment in attracting significant amount of FDI over the years. Total inflow of FDI in Bangladesh was calculated to be around 2.4 million US dollars in 1986 which reached to a staggering 2.55 billion US dollars by 2014 (WDI, 2016). On the other hand, inflow of PIs into Bangladesh also grew significantly over the years. In the year 1986, the total amount of PI in Bangladesh was worth 7.2 million US dollars

and this reached the highest by the end of 2006, amounting up to 515 million US dollars (WDI, 2016). However, an opposite trend is being observed currently as the volumes of PIs have started to experience a fall. Finally, the inflow of emigrant workers' REMITs have surged enormously at present and it is believed that apart from the nation's export earnings, its remitted funds are the largest source of foreign exchange. The aggregate personal REMITs in Bangladesh was worth 15.4 billion US dollars in 2015 which is more than the other three international flows mentioned before.

To the best of knowledge, no previous study has focused simultaneously on all the four sources of foreign inflows and their individual effects on Bangladesh's economic growth and healthcare development prospects. This paper fills this gap by investigating the effectiveness of the foreign inflows in generating favorable the two utmost important macroeconomic targets in Bangladesh during the period 1983-2014. The following questions are specifically addressed in this paper:

1. Are foreign inflows effective in attributing to Bangladesh's economic growth and healthcare development performances?
2. What are the directions of causalities running between the four sources of international inflows and the two macroeconomic indicators, GDP and life expectancy at birth?

The remainder of the paper is organized as follows. Section 2 provides the literature review followed by a discussion on the attributes of data and the methodology of research given in section 3. Moving on, section 4 provides discussions on the econometric results and finally section 5 draws concluding remarks.

2. Literature Review

The literature review section has been divided into two subsections. First of all, theoretical frameworks are provided to support the arguments regarding the pros and cons of international inflows on the recipient country's macroeconomic indicators. This is followed by empirical findings in which some of the previous papers on similar topics have been summarized.

2.1 Theoretical Framework

There have been many theories suggesting foreign inflows being a catalyst of economic growth in the aid-recipient less developed nations. Historically, foreign aid was the main source of foreign funds for the underdeveloped nations. In the early 1940s, foreign aids were flowing from the developed to the developing nations but it was interrupted with the initiation of World War II. However, following the war, foreign aid reincarnated with the Marshal Plan under the Organization for European Economic Co-operation (OEEC) whereby the United States transferred a major portion of its national income to restore the economies of the war-affected European countries. The tremendous success of this plan later on gained popularity and it spilled over amongst the developing countries and as a result economic growth attainment strategies via the channel of foreign aid were implemented from 1960 onwards. Foreign aid's positive pressures on economic growth and development is in line with the Millennium Development Goals (MDG) declaration adopted in 2000 with the implicit motive of mobilizing billions of dollars to mitigate extreme poverty around the globe.

According to John Maynard Keynes in 1930s, the growth prospects of developing countries are mainly constrained by inadequacy of capital accumulation condemning the amount of investment required for boosting the economy. Foreign inflows are interconnected with economic growth attainment in the sense that it fills out the gaps experienced by the developing countries. Three types of gaps were identified responsible for upholding economic growth in the less developed countries.

The Savings-Investment (SI) gap theory discussed in Harrod-Domar model of economic growth assumed that poor developing countries usually have nominal income levels and as a result have low savings as well. Therefore, their required levels of investments are inhibited by this resource constraint. This implies that there exists a resource gap as savings is less than the desired value of investment in monetary terms. Thus, foreign assistance in the form of aid and/or foreign direct investment can be the appropriate financial solution to this anti-growth factor (Meier and Stiglitz, 2001). The second gap is the Foreign Exchange (FE) gap developed by Chenery and Strout (1966). The core theory behind this gap is that less developed countries usually do not have adequate export receipts that could be used to import capital goods. Thus, deficits in the foreign exchange reserves of these countries restrain their growth prospects as capital accumulation is believed to be a major determinant of growth. Following this notion, emigrants' remittances, especially in Bangladesh, can easily sort out this gap and help financing of the required capital goods. The third resource gap called the Fiscal gap was discovered by Bacha (1990) and Taylor (1990) is created due to the difference between a developing country's government revenue and its proposed expenditure. In the less developed countries that are open to external finance there is a tendency in their governments to declare deficit budgets with the hope that the excess expenditure costs would be financed through foreign capital inflows. Moreover, these governments are sometimes incapable of generating enough revenues through taxation policies which is also a reason attributing to the fiscal gap. Once again, foreign aid can be useful in supplementing this deficit which would stimulate investments and contribute to growth.

The effectiveness of international inflows in determining the recipient nation's growth can also be evaluated in the light of the Dutch disease problem. According to Barder (2006) Dutch disease can be referred to as an appreciation in the real exchange rate, of the aid-recipient country, following huge inflow of foreign currency whereby causing harm to the economic growth prospects of the nation. A real exchange rate appreciation is synonymous to loss of export competitiveness which tends to mitigate economic growth in the underdeveloped nations. Following inflow of foreign exchange there is a spending effect (Corden and Neary, 1982) whereby the local demand for both tradables and non-tradables increases which in turn exerts pressure on prices. Since price of non-tradables is determined locally, such pressures result in inflation in the home country. On the other hand the price of tradables remain constant due to it being exogenously determined in the international markets. As a result, the recipient country's RER would have a tendency to appreciate.

2.2 Empirical Findings

Although many empirical results across studies have provided conclusions supporting the effectiveness of international inflows in stimulating growth and development in the recipient

countries, there has not been a general consensus as many studies have also taken a contradictory stand whereby such inflows were addressed to be ineffective in meeting their targets.

Arndt *et al.* (2010) have argued that inflow of foireign development assistances generate positive impacts on growth indicators within the aid-receiving countries in the long run. Thir conclusions regarding the positive impacts of FAID on economic growth were similar to those made by Frot and Perotta (2012) and Temple (2010). Moreover, has been acknowledged in a study by Clemens *et al.* (2012) that inflow of FAID in developing countries tends to play a crucial role in their infrastructure development which in turn contributes to the growth perfomances in those countries. Thus, an indirect but effective impact of FAID on the recipient nation's growth prospects has been highlighted in this study. It is also believed that FAID augments the total public expenditure budgets in the recipient economies and is considered synonymous to foster economic growth in those countries (Collier and Dollar, 2001). Conversely, there have also been studies where the effectiveness of FAID was questioned in the light of the Dutch disease problem. For instance, Jayaram *et al.* (2014) and Johnson-Kanu (2012) have concluded that a rise in the inflow of FAID leads to a simultaneous appreciation in the real exchange rate of the aid-recipient nations which in turn hampers their economic growth prospects. Furthermore, many researchers have also shed light on the FAID-Healthcare development nexus and have asserted that inflow of foreign assistances more often than not improve the health indicators of the underdeveloped nations. In addition, in a study by Razmi and Yavari (2012) a negative relationship between FAID inflow and LEXP was put forward questioning the concept of health aid-effectiveness. In addition to FDI, foreign PI are also considered to foster economic growth in nations that are on the verge of being developed. According to Baghebo and Apere (2014), a long run relationshp was found to exist between PI and GDP of Nigeria. On the other side of the coin, Tokunbo and Lloyd (2010) asserted that foreign PI actually led to a sluggish growth in African countries.

Remittances, although a stable and relatively dependable source of foreign inflow for the developing nations, do not always necessarily generate postive pressures on economic growth indicators. According Hassan and Holmes (2013) inflows of remittances in Pakistan appreciate the recipient nation's real exhage rate creating a Dutch Disease effect in those countries. Their results coincided to that by Barajas *et al.* (2010) in context of African underdeveloped economies. However, their results were in contradiction to those by Ameudo-Dorantes and Pozo (2004), Lopez *et al.* (2005) and Mongardini and Rayner (2009) who have opined that inflow of emigrant workers' remittances is crucial in generating positive impacts on the recipient country's growth. This could be mainly because of the fact that remittance inflows do not appreciate the real exchange rates in the remittance-receiving countries (Loser *et al.*,2006).

3. Methods and Data

3.1 Methodology

At first, data of all the variables were tested for unit root in order to determine the stationarity of the variables that were considered in this study. ADF and PP unit root tests were used to detect possible existence of unit roots, if any, in the data set. Once the variables were found to

be stationary, cointegration test was run to find possible linear combinations of the variables which could be considered stationary. Moreover, following confirmation of cointegration between the concerned variables, the Granger Causality tools were employed for determining the direction of causalities between the variables. It is important to test data, especially time series data, for stationarity since non stationarity of time series data leads to spurious regression unless there is the existence of at least one cointegrating relationship. It is important to mention that unit root tests tend to have non-standard and non-normal asymptotic distributions, which are highly affected as the deterministic terms such as constant, time trend etc. are included. A time trend is considered as an extraneous regressor and the power of the test could be reduced by its inclusion. However, if the true data generating process were trend stationary, then failing to include a time trend could also result in a reduction in power of the test. Moreover, this loss of power due to the exclusion of a time trend when it should be present is more severe than the reduction in power associated with the inclusion of a time trend when it is extraneous (Lopez et al., 2005). While conducting the unit root test, it is important to choose the optimum lag length based on the Schwartz Information Criterion (SIC).

Furthermore, the Johansen procedure was applied to test for cointegration, which is known to provide a unified framework for estimation and testing of cointegration relations in the context of VAR error correction models. An Unrestricted Vector of Autocorrelation of the following form for this purpose is estimated:

$$\Delta x_t = \alpha + \theta_1 \Delta x_{t-1} + \theta_2 \Delta x_{t-2} + \theta_3 \Delta x_{t-3} + \cdots\cdots + \theta_{k-1} \Delta x_{t-k+1} + \theta_k \Delta x_{t-k} + u_t \qquad \text{.....(i)}$$

where Δ is the difference operator; x_t is a (n x 1) vector of non-stationary variables (in levels); and U_t is the (n x 1) vector of random errors. The matrix θ_k contains the information on long run relationship between variables, for instance, if the rank of $\theta_k = 0$, the variables are not cointegrated. On the other hand if rank (usually denoted by r) is equal to 1, there exists one cointegrating vector and finally if $1 < r < n$, there are multiple cointegrating vectors. Johansen (1988) derive two tests for cointegration, namely the trace test and the maximum Eigen value test. The trace statistic test evaluates the null hypothesis that there are at most r cointegrating vectors whereas the maximum Eigen value test, evaluates the null hypothesis that there are exactly r cointegrating vectors in x_t.

According to cointegration analysis, when two variables are cointegrated then there exist at least one direction of causality. Granger-causality, introduced by Granger (1969), is one of the important matters that have been much studied in empirical macroeconomics and empirical finance. The presence of non stationarity can lead to ambiguous or misleading conclusions in the Granger causality tests (Engel and Granger, 1987). Only when the variables are cointegrated, it is possible to deduce that a long run relationship exists between the non-stationary time series.

Taking x and y as variables of interest, then the Granger causality test (Granger, 1969) determines whether past values of y add to the explanation of current values of x as provided by information in past values of x itself. If previous changes in y do not help explain current changes in x, then y does not Granger cause x. In a similar way, it can be examined if x Ganger causes y just be interchanging them and carrying out this process again. There could be four

probable outcomes: (i) x Granger causes y (ii) y Granger causes (iii) Both x and y granger causes the other and (iv) neither of the variables Granger causes the other.

In this paper, the causality tests among all the concerned variables are conducted. For this the following two sets of equation are estimated:

$$x_t = \alpha_0 + \alpha_1 x_{t-1} + \cdots\cdots + \alpha_l x_{t-l} + \beta_1 y_{t-1} + \cdots\cdots + \beta_l y_{t-l} + u_t \quad \text{..... (ii)}$$

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \cdots\cdots + \alpha_l y_{t-l} + \beta_1 x_{t-1} + \cdots\cdots + \beta_l x_{t-l} + v_t \quad \text{..... (iii)}$$

The above sets of equation are considered for all possible pairs of (x, y) series in the group. The reported F-statistics are the Wald statistics for the joint hypothesis. After confirming the long run causalities between the variables considered in the model, the VECM approach provides the short run causal relationships.

Engle and Granger (1987) showed that a vector error correction model (VECM) is an appropriate method to model the long-run as well as short-run dynamics among the cointegrated variables. Causality inferences in the multi-variate framework are made by estimating the parameters of the following VECM equations.

$$\Delta Y = \alpha + \sum_{i=1}^{m} \beta i \Delta Y_{t-i} + \sum_{j=1}^{n} \gamma_j \Delta X_{t-j} + \sum_{k=1}^{0} \delta \Delta M^s + \sum_{l=1}^{p} \zeta \Delta N + \theta Z_{t-1} + \varepsilon_t \quad \text{.....(iv)}$$

$$\Delta X = a + \sum_{i=1}^{m} b_i \Delta Y + \sum_{j=1}^{n} c_j \Delta X_{t-j} + \sum_{k=1}^{0} d \Delta M^s + \sum_{l=1}^{p} e \Delta N + f Z_{t-1} + \xi_t \quad \text{..... (v)}$$

z_{t-1} is the error-correction term which is the lagged residual series of the cointegrating vector. The error-correction term measures the deviations of the series from the long run equilibrium relation. For example, from equation (iv), the null hypothesis that X does not Granger-cause Y is rejected if the set of estimated coefficients on the lagged values of X is jointly significant. Furthermore, in those instances where X appears in the cointegrating relationship, the hypothesis is also supported if the coefficient of the lagged error-correction term is significant. Changes in an independent variable may be interpreted as representing the short run causal impact while the error-correction term provides the adjustment of Y and X toward their respective long run equilibrium. Thus, the VECM representation allows us to differentiate between the short- and long-run dynamic relationships. The Chi-Square test statistic is used to determine the short run causalities between pairs of variables in the model.

3.2 Empirical Model

In this paper, four econometric models were considered in which each of the four sources of international inflows in Bangladesh were expressed as functions of GDP and LEXP. The four models are as follows:

$FAID_t = \alpha_0 + \alpha_1 GDP_t + \alpha_2 LEXP_t$ .....(vi)

$FDI_t = \alpha_0 + \alpha_1 GDP_t + \alpha_2 LEXP_t$ .....(vii)

$PI_t = \alpha_0 + \alpha_1 GDP_t + \alpha_2 LEXP_t$ .....(viii)

$REMIT_t = \alpha_0 + \alpha_1 GDP_t + \alpha_2 LEXP_t$ .....(ix)

Data of all the six variables used in the paper have been accumulated from the World Development Indicators (WDI), 2016.

4. Results

At first, all the variables considered were tested for stationarity usine two commonly used methodologies: Ausgmented Dickey Fuller (ADF) and Phillips-Perron (PP) unit root tests. It is to be noted that only the variables those were found to have unit roots under the ADF test were retested using the PP test. From the unit root tests' results the authors find that all the variables, only LEXP being an exception, are stationary at the first differeced form, I(1). The stationarity of the variables FAID, PI, GDP and LEXP is confirmed from the ADF test results while FDI and REMIT data are found to be stattionary under the PP test. The unit root test results are shown in table 1A and 1B.

Table 1A: Augmented Dickey Fuller (ADF) Unit Root Test (Lag=7)

Panel 1: Levels - I(0)					
Variables	**ADF Statistics (only constant)**	**Prob. Value**	**ADF Statistics (constant and trend)**	**Prob. Value**	**Decision on stationarity**
FAID	-1.847	0.352	-1.957	0.601	Non-stationary considering both constant & constant and trend
FDI	3.739	1.000	3.262	1.000	Non-stationary considering both constant & constant and trend
PI	1.648	0.999	0.120	0.996	Non-stationary considering both constant & constant and trend
REMIT	2.444	0.999	1.607	1.000	Non-stationary considering both constant & constant and trend
GDP	7.035	1.000	2.768	1.000	Non-stationary considering both constant & constant and trend
LEXP	-2.381	0.156	-4.168	0.014	Non-stationary considering constant & stationary considering constant and trend
	Panel 2: First Difference - I(1)				
Variables	**ADF Statistics (only constant)**	**Prob. Value**	**ADF Statistics (constant and**	**Prob. Value**	**Decision on stationarity**
FAID	-6.353	0.000	-0.997	0.927	Stationary considering constant & non-stationary in constant and trend
FDI	1.387	0.998	-0.354	0.984	Non-stationary considering both constant & constant and trend
PI	-12.278	0.000	-13.382	0.000	Stationary considering both constant & constant and trend
REMIT	-0.552	0.866	-2.592	0.286	Non-stationary considering both constant & constant and trend
GDP	-1.667	0.438	-3.687	0.038	Non-stationary considering constant & stationary considering constant and trend
LEXP	-0.640	0.846	-1.851	0.652	Non-stationary considering both constant & constant and trend

Note: All regressions are estimated with and without trend. Selection of the lag is based on Schwartz Information Criterion (SIC). EViews 7.1 software automatically selects the most significant lag length based on this criterion.

Table 1B: Phillips – Perron (PP) Unit Root Test (Lag=7)

Panel 1: Levels - I(0)					
Variable	**PP Statistics (only constant)**	**Prob. Value**	**PP Statistics (constant and trend)**	**Prob. Value**	**Decision on Stationarity**
FDI	1.200	0.997	-0.231	0.989	Non-stationary considering both constant & constant and trend
REMIT	3.040	1.000	-0.001	0.994	Non-stationary considering both constant & constant and trend
Panel 2: First Difference - I(1)					
Variable	**PP Statistics (only constant)**	**Prob. Value**	**PP Statistics (constant and trend)**	**Prob. Value**	**Decision on Stationarity**
FDI	-6.128	0.000	-7.792	0.000	Stationary considering both constant & constant and trend
REMIT	-3.437	0.0174	-4.989	0.002	Stationary considering both constant & constant and trend

Note: All regressions are estimated with and without trend. Selection of the lag is based on Schwartz Information Criterion (SIC). EViews 7.1 software automatically selects the most significant lag length based on this criterion.

Following the unit root test, Johansen cointegration test was employed to identify possible long run cointegration between the variables considered in all the four models. The test results confirm that the variables considered are cointegrated which allows us to go for the Granger causality test and the VECM. The results of Johansen cointegration test are shown in table 2 below. According to the results, under the Trace test three cointegrating equations are found revealing long run cointegration between the variables considered in models 1, 2, and 3 while two cointegrating equations are found in context of model 4. Moreover, under the maximum Eigenvalue test, one cointegrating equation for models 1 and 3, three for model 2 and two for model 4 exist.

Table 2: Johansen Cointegration Test Results (Lag interval 1)

Model: 1 - Johansen Test for Cointegration (Trace Test)				
Null	**Alternative**	**Trace Statistic**	**95% Critical Value**	**Conclusion**
r = 0	r = 1	73.978	29.797	3 cointegrating equations
r <=1	r = 2	22.703	15.495	
r <=2	r = 3	10.749	3.841	
Model: 1 - Johansen Test for Cointegration (Maximum Eigen value Test)				
Null	**Alternative**	**Max-Eigen Statistic**	**95% Critical Value**	**Conclusion**
r = 0	r = 1	51.274	21.132	1 cointegrating equation
r <=1	r = 2	11.954	14.265	
r <=2	r = 3	10.749	3.841	
Model: 2 - Johansen Test for Cointegration (Trace Test)				
Null	**Alternative**	**Trace Statistic**	**95% Critical Value**	**Conclusion**
r = 0	r = 1	78.028	29.797	3 cointegrating equations
r <=1	r = 2	32.043	15.495	
r <=2	r = 3	9.904	3.841	
Model: 2 - Johansen Test for Cointegration (Maximum Eigen value Test)				
Null	**Alternative**	**Max-Eigen Statistic**	**95% Critical Value**	**Conclusion**
r = 0	r = 1	45.985	21.132	3 cointegrating equations
r <=1	r = 2	22.139	14.265	
r <=2	r = 3	9.904	3.841	
Model: 3 - Johansen Test for Cointegration (Trace Test)				
Null	**Alternative**	**Trace Statistic**	**95% Critical Value**	**Conclusion**
r = 0	r = 1	68.407	29.797	3 cointegrating equations
r <=1	r = 2	21.961	15.495	
r <=2	r = 3	10.650	3.841	
Model: 3 - Johansen Test for Cointegration (Maximum Eigen value Test)				
Null	**Alternative**	**Max-Eigen Statistic**	**95% Critical Value**	**Conclusion**
r = 0	r = 1	46.445	21.132	1 cointegrating equation
r <=1	r = 2	11.311	14.265	
r <=2	r = 3	10.650	3.841	
Model: 4 - Johansen Test for Cointegration (Trace Test)				
Null	**Alternative**	**Trace Statistic**	**95% Critical Value**	**Conclusion**
r = 0	r = 1	85.892	29.797	2 cointegrating equations
r <=1	r = 2	28.133	15.495	
r <=2	r = 3	2.499	3.841	
Model: 4 - Johansen Test for Cointegration (Maximum Eigen value Test)				
Null	**Alternative**	**Max-Eigen Statistic**	**95% Critical Value**	**Conclusion**
r = 0	r = 1	57.759	21.132	2 cointegrating equations
r <=1	r = 2	25.634	14.265	
r <=2	r = 3	2.499	3.841	

The long run causalities between the four sources of international inflows and the two macroeconomic variables examined were analysed using the Granger causality test. Table 3 shows the results obtained from the test. According to the findings it can be seen that there is no causality between FAID and GDP but a unidirectional casuality is found to be running from FAID to LEXP. In context of FDI, a bidirectional causality and a unidirectional causality run from FDI to GDP and from FDI to LEXP, respectively. In addition, a unidirectional causality also runs from PI to GDP while no causality is seen between PI and LEXP. Finally, bidirectional

causalities between REMIT and GDP and between REMIT and LEXP are also found in light of the estimated results.

Table 3: Granger Causality Test Results (Lag=2)

Model 1			
Null	**F-Statistic**	**P-Value**	**Conclusion**
GDP does not Granger cause FAID FAID does not Granger cause GDP	2.246 1.667	0.209 0.127	No causality between FAID and GDP
LEXP does not Granger cause FAID FAID does not Granger cause LEXP	2.298 8.691	0.121 0.001	Unidirectional causality FAID → LEXP
LEXP does not Granger cause GDP GDP does not Granger cause LEXP	0.731 4.780	0.491 0.018	Unidirectional causality GDP → LEXP
Model 2			
Null	**F-Statistic**	**P-Value**	**Conclusion**
GDP does not Granger cause FDI FDI does not Granger cause GDP	40.029 2.905	0.030 0.073	Bidirectional causality FDI ↔ GDP
LEXP does not Granger cause FDI FDI does not Granger cause LEXP	0.512 4.220	0.616 0.026	Unidirectional causality FDI → LEXP
LEXP does not Granger cause GDP GDP does not Granger cause LEXP	0.731 4.780	0.491 0.018	Unidirectional causality GDP → LEXP
Model 3			
Null	**F-Statistic**	**P-Value**	**Conclusion**
GDP does not Granger cause PI PI does not Granger cause GDP	0.109 6.301	0.898 0.006	Unidirectional causality PI → GDP
LEXP does not Granger cause PI PI does not Granger cause LEXP	0.063 0.421	0.940 0.661	No causality between GDP and PI
LEXP does not Granger cause GDP GDP does not Granger cause LEXP	0.731 4.780	0.491 0.018	Unidirectional causality GDP → LEXP
Model 4			
Null	**F-Statistic**	**P-Value**	**Conclusion**
GDP does not Granger cause REMIT REMIT does not Granger cause GDP	4.342 4.131	0.024 0.028	Bidirectional causality REMIT ↔ GDP
LEXP does not Granger cause REMIT REMIT does not Granger cause LEXP	5.184 8.219	0.013 0.002	Bidirectional causality REMIT ↔ LEXP
LEXP does not Granger cause GDP GDP does not Granger cause LEXP	0.731 4.780	0.491 0.018	Unidirectinal causality GDP → LEXP

The short run causal relationships are evaluated using the results from the VECM approach which are given in table 4. According to the findings, no causal association between FAID and GDP is seen to prevail. However, a bidirectional causality is seen between FAID and LEXP. Conversely, evidence of a unidiectional causality running from FDI to GDP is found while no causal relationship is witnessed between FDI and LEXP. As far as PI is concerned, a bidirectional causality between PI and GDP is estimated along with a unidirectional causality running from LEXP to PI. Furthermore, a bidirectional and a unidirectional causalities are seen between REMIT and GDP and from LEXP to REMIT, respectively.

Table 4: VECM Test Results

4.a. Causality Test Statistics between FAID and GDP				
Dependent Variable	**Null**	**Chi-square Statistic**	**P-Value**	**Conclusion**
D(GDP)	FAID does not cause GDP	0.657	0.720	No short run causality between FAID and GDP
D(FAID)	GDP does not cause FAID	2.367	0.301	
4.b. Causality Test Statistic between FAID and LEXP				
Dependent Variable	**Null**	**Chi-square Statistic**	**P-Value**	**Conclusion**
D(LEXP)	FAID does not cause LEXP	14.412	0.001	Bidirectional short run causality FAID ↔ LEXP
D(FAID)	LEXP does not cause GDP	6.627	0.036	
4.c. Causality Test Statistics between FDI and GDP				
Dependent Variable	**Null**	**Chi-square Statistic**	**P-Value**	**Conclusion**
D(GDP)	FDI does not cause GDP	6.685	0.035	Unidirectional short run causality FDI → GDP
D(FDI)	GDP does not cause FDI	1.634	0.442	
4.d. Causality Test Statistics between FDI and LEXP				
Dependent Variable	**Null**	**Chi-square Statistic**	**P-Value**	**Conclusion**
D(LEXP)	FDI does not cause LEXP	0.243	0.886	No short run causality between FDI and LEXP
D(FDI)	LEXP does not cause FDI	2.850	0.241	
4.e. Causality Test Statistics between PI and GDP				
Dependent Variable	**Null**	**Chi-square Statistic**	**P-Value**	**Conclusion**
D(GDP)	PI does not cause GDP	9.583	0.018	Bidirectional short run causality PI ↔ GDP
D(PI)	GDP does not cause PI	10.577	0.005	
4.f. Causality Test Statistics between PI an LEXP				
Dependent Variable	**Null**	**Chi-square Statistic**	**P-Value**	**Conclusion**
D(LEXP)	PI does not cause LEXP	0.629	0.733	Unidirectional short run causality LEXP → PI
D(PI)	LEXP does not cause PI	4.601	0.100	
4.g. Causality Test Statistics between REMIT and GDP				
Dependent Variable	**Null**	**Chi-square Statistic**	**P-Value**	**Conclusion**
D(GDP)	REMIT does not cause GDP	9.548	0.008	Bidirectional shortrun causality REMIT ↔ GDP
D(REMIT)	GDP does not cause REMIT	8.995	0.011	
4.h. Causality Test Statistics between REMIT and LEXP				
Dependent Variable	**Null**	**Chi-square Statistic**	**P-Value**	**Conclusion**
D(LEXP)	Remit does not cause LEXP	0.498	0.778	Unidirectional short run causality LEXP → REMIT
D(REMIT)	LEXP does not cause REMIT	14.919	0.001	

5. Conclusions

The aim of this paper was focused on testing the effectiveness of international inflows into the Bangladesh economy in attainment of the nation's economic growth and healthcare development. Thus, the findings of this paper could provide important policy implications for

the government in designing startegies that would facilitae investment of the internalnational sources of currencies in productive sectors of the economy. In addition, it could also work as a guide for policymakers to choose the types of foreign funds that are effective in positively influencing the macroeconomic indicators, and to be least dependant on the foreign funds that tend to generate appreciative pressures on the exchange rate.

According to the findings, it can be concluded that most of the four sources of foreign inflow in context of Bangladesh are effective in influencing the country's GDP and life expectancies at birth both in the short and the long run. Thus, the findings are pretty much in line with the theoretical frameworks where foreign inflows were associated with improvement in the macroeconomic indicators of the recipient nations. However, the test estimates also reveal that the natures and directions of causalities between the dependent variable and the regressors differ across the time frames. A possible reason behind this phenomenon could be the fact that currently Bangladesh follows a managed float type of exchange rate regime in which although the exchange rates are market determined there is scope for intervention of the central bank to control over volatile changes in the exchange rate. This regime has been effective in preventing appreciation of the nation's Real Exchange Rate (RER) and as a result the Dutch Disease (DD) effect, which arises due to RER appreciation following inflow of foreign currencies, has been evaded. This implies that Bangladesh can continue to induce inflow of foreign currencies without the fear of having to experience any appreciation of its RER and rather the nation can utilize the inward foreign funds to enhance greater degrees of econmic growth and health care development.

However, inflow of foreign aid was also perceived to be ineffective in stimulating economic growth rate of Bangladesh neither in the short run nor in the long run but it attributed to improvement in the health sector in both time periods. The results obttained are in line with the conclusions made by Sy and Tabarraei (2009) and Outtara and Strobl (2008) for a panel of developing countries and twelve countries belonging to the Cooperation Financiere en Afrique centrale (CFA) Franc zone respectively. This could be because of misutilization of the official development assistances for non-productive purposes whereby such investments were not directly reflected into the generation of the country's national income. Conversely, all the other three sources of international inflow proved to be crucial in determing both economic growth and healthcare development in Bangladesh in the long run which implies that Bangladesh are well off attracting and facilitating foreign funds which would ultimately narrow down its financial contsraints that hold up its investments.

Due to unavailability of relevant data the sample size is relatively small compared to other time series studies done in different countries. This is one of the main limitations of this paper. In addition, lack of relevant data also restricited the possibility of considering some additional controlled variables within the models limiting the robustness of the findings. For further research, the authors of this paper would like to extend their current analysis incorporating other less developed countries to check the robustness of the findings.

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