

## **CONTRIBUTIONS OF EXPORTS, FDI AND EXPATRIATES' REMITTANCES TO REAL GDP OF BANGLADESH, INDIA, PAKISTAN AND SRI LANKA**

*Matiur Rahman, McNeese State University*

### **ABSTRACT**

This paper re-examines the effects of exports, FDI and expatriates' remittances on real GDP of Bangladesh, India, Pakistan and Sri Lanka. Annual data from 1976 through 2006 are utilized. The Autoregressive Distributed Lag (ARDL) procedure is implemented for cointegration of variables with different orders of integration. The results reveal close similarities of long-run and short-run dynamics of the variables between Bangladesh and India. The same apply to Pakistan and Sri Lanka in terms of their short-run dynamics with no significant long-run causal flows.

**JEL Classifications:** F10, F21, F22, F24

### **INTRODUCTION**

The issue of economic growth asymmetry across countries continually draws academic interest and intellectual curiosity. What really contributes to this asymmetry has puzzled the minds of economists and politicians for centuries. The new millennium raises more questions and concerns about this issue. As a result, there is a growing need to study it with more rigor and depth. Many less developed countries (LDCs) have adopted outward- and forward-looking policies to promote economic growth and employment. The roles of exports, foreign direct investment (FDI) and the concomitant remittances of emigration are recognized as important economic growth-enhancing factors (Afzal, 2004; Hulugalle et al., 2005).

Although the adoption of such policies by LDCs is expected to exert positive influences on overall GDP, it is uncertain how much is contributed by surging exports, FDI, and remittances. The empirics of their effects on GDP generate mixed and ambiguous inferences across countries over different sample periods and across different developing countries. Therefore, this paper re-examines the roles of these causal variables in promoting real GDP of Bangladesh, India, Pakistan and Sri Lanka. These four developing countries of South Asia have been selected because of emphasizing active policies of export promotion and diversification, increasing manpower exports and enticing FDI to boost economic growth as important members of SARC (South Asian Regional Cooperation). The remainder of the paper is organized as follows: section II reviews some of the related literature. Section III outlines the empirical methodology. Section IV reports the empirical results. Finally, section V offers conclusions and policy implications.

### **SOME RELATED LITERATURE REVIEW**

The existing literature studying the impacts of exports, FDI, and remittances on economic growth is vast. The effect of each variable on economic growth has generally been investigated in a bi-variate context for many countries using various sample periods and econometric procedures. Studies that focused on exports and FDI promotion have shown promising results in their contributions to economic growth in LDCs (Balassa, 1985; Sengupta and Espana, 1994; Yue, 1999). The benefits associated with exports and FDI have lent support to the export-led growth hypothesis (ELGH) and FDI-led growth hypothesis (FLGH) respectively. These theories are based on the idea that exports and FDI are key variables in determining economic growth. Federici and Marconi (2002) point out that many of these studies confuse causation and association. As a result, they expressed serious reservations about their influences on economic growth.

The studies examining the relationship between exports and GDP have found strong support for ELGH, which conclude that export promotion can greatly benefit LDCs by generating "greater capacity utilization, economies of scale, improving allocation of scarce resources, and technological progress (Smith, 2001)." A cross-sectional study by Smith (2001) on the Four Tigers of South-East Asia (South Korea, Singapore, Hong Kong, and Taiwan) found that outward-oriented policies have allowed these countries to sustain high rates of economic growth since the 1960s until 1997-98 financial crises. A study by Ghimay and others (2001), consisting of 19 LDCs, found a long-run relationship between exports and economic growth in 12 of the 19 countries. Export promotion also attracted investment and increased GDP in 15 countries. Some Southeast Asian countries found little impact of exports on overall GDP. Mamun and Nath (2003) found a "long-run unidirectional causality from exports to growth in Bangladesh, but no short-run effects on GDP." A study on Costa Rica found both long- and short-run effects from export promotion, but the effects had a limited impact (Smith, 2001).

Studies on FDGH have discovered that FDI promotion can greatly benefit LDCs by introducing new technology and skills, increasing employment creation, surging domestic competition and expanding access to international marketing networks (Mallampally, 1999; Sauviant and Athukorula, 2003). These benefits were found in the case of Morocco, where Balamoune-Lutz (2004) concluded that FDI had positive effects on economic growth as well as a bidirectional relationship between exports and FDI. This means that another benefit associated with the promotion of FDI is that it can promote exports and vice versa. On the other hand, a regression analysis on Sri Lanka found that FDI has a positive but weak effect on GDP and a unidirectional causality flowing from GDP to FDI. This suggests that GDP has a greater impact in attracting FDI (Anthukorala, 2003).

Research examining the impacts of exports and FDI on GDP within the same model has also concluded ambiguous results. For example, a study on Turkey found that economic performance was consistent with ELGH, but did not confirm FLGH because no spillover effects from FDI to output were found (Alia and Deal, 2003). In the Latin American countries of Argentina, Brazil, and Mexico, the empirical data did not support the ELGH, but did find that FDI promotes economic growth and trade (Alguacil, et al., 2000). Dritsaki and Adamopoulos (2004) discovered a unidirectional causal relationship from FDI to GDP and a bidirectional causal relationship between exports and GDP of Greece.

Yao (2006) found a strong relationship among exports, FDI, and GDP for

China. He found that the devaluation of the Yuan led to export and FDI promotion, stimulating growth. This study also found that FDI and exchange rates have a "simultaneous relationship with GDP." This means that currency devaluation may enhance economic growth by attracting FDI and encouraging exports.

Over the past several years, the amount of migrants' remittances has increased substantially. In 2005 alone, remittances totaled to \$160 billion dollars. The impact of remittances can depend on several factors, such as the "skills among employment of migrants, policies of remittance-receiving and source countries, investment climate, and size and geographic locations of countries are a few (World Bank, 2006). The World Bank report has found that remittances can impact a variety of macroeconomic variables, as well as have direct and indirect effects on other economic factors. The report also mentions several positive effects associated with international migration, including a reduction in poverty and income inequality, increase in per capita income, promotion of entrepreneurial activities, and strengthening of financial development in cash-dependent countries (Page and Adam, 2003; Hulugalle, and Maimbo, 2005; World Bank, 2006).

A cross-sectional study (Page and Adam, 2003) conducted on 74 low-and middle-income developing economies found a reduction in poverty and income inequality, as a share of a country's GDP. Statistically, the study found that on average 10% increases in remittances lead to a 1.6% decrease in poverty. A time series study on Ghana found similar evidence that remittances decrease severity of poverty. The study did find one exception to the positive effects of the variable, in which international remittances reduce poverty more than internal migration. The author reasoned that the impact of the two types of remittances varied on different households (Adams, 2006).

Some other studies have found that remittances spur growth by encouraging entrepreneurial activity and strengthening of financial development in cash-dependent countries (Hulugalle and Maimbo, 2005). Remittances are found to be more procyclical in less developed financial markets than in their counterparts, meaning the impact of remittances is larger in less developed financial systems (Giuliano and Arranz, 2005).

Chami et al., (2003) found negative effects of remittances on economic growth in the cross-sectional paper on 101 developing countries. They argued that remittances resulted in incentives leading to moral hazard problems, which severed economic growth. The study also stated that remittances move countercyclically in a majority of countries causing negative effects in individual economies. Another study (World Bank, 2006) found that large inflows of remittances cause appreciation of exchange rates resulting in decreasing exports and contracting economic growth. This study found this to be true in 22% of the countries. Many researchers believe that adverse effects are more probable in small economies where dependence on remittances is higher. Other variables that remittances may impact negatively include interest rates, balance of payments, and other macroeconomic variables (World Bank, 2006). In Syria and Egypt, inflation has also increased due to remittance inflows (Wahba, 1996).

## **EMPIRICAL METHODOLOGY**

The steps involved in empirical methodology are briefly outlined as follows;

First, the simple ADF test, as outlined by Dickey and Fuller (1981), is implemented by estimating the following regression for each variable.

$$\Delta X_t = \alpha + \beta_0 X_{t-1} + \sum_{i=1}^L \beta_i \Delta X_{t-i} + U_t \quad (1)$$

where,  $\Delta$  = first difference operator,  $L$  = number of optimum lags,  $t$  = time subscript, and  $U$  = random disturbance term. The ADF test is performed on  $\beta_0$  to accept or reject the null hypothesis of unit root (nonstationarity) against its alternative of no unit root (stationarity). Some definitive inference on stationary/nonstationarity property of each variable of interest is necessary to determine an appropriate estimating statistical procedure by avoiding the problem of spurious correlation.

Second, on the evidence of nonstationarity in each variable and the same order of intergration of all the variables, the most appropriate procedure to pursue is the cointegration methodology and the subsequent estimation of the associated error-correction model (Engle and Granger, 1987). The absence of a cointegrating relationship (long-run equilibrium) among the variables allows the application of simple Ordinary Least Squares (OLS) to estimate the model without risking misleading inferences stemming from spurious correlation.

Third, for cointegrating relationship, the following regression is estimated to retrieve error terms for subsequent uses:

$$y_t = \alpha + \beta x_t + \phi z_t + \varepsilon w_t + e_t \quad (2)$$

where,  $y$  = natural log of real GDP,  $x$  = natural log of FDI,  $z$  = natural log of remittances,  $w$  = natural log of exports,  $e$  = random error term, and  $t$  = time subscript. If the variables have different orders of intergration, the ARDL (autoregressive distributed lag) model is implemented following (Pesaran and Shin, 1995; Pesaran, Shin and Smith, 2001) instead of the standard cointegration procedure, as outlined in Engle and Granger (1987). The ARDL model is specified as follows:

$$\Delta y_t = \alpha + \theta_1 y_{t-1} + \theta_2 x_{t-1} + \theta_3 z_{t-1} + \theta_4 w_{t-1} + \sum_{i=1}^m \beta_i \Delta y_{t-i} + \sum_{j=1}^n \beta_j \Delta x_{t-i} + \sum_{k=1}^k \beta_k \Delta z_{t-i} + \sum_{l=1}^l \beta_l \Delta w_{t-i} + u_t \quad (3)$$

Fourth, the testable null hypothesis is  $\theta_1 = \theta_2 = \theta_3 = \theta_4 = 0$  for no cointegration. The accompanying alternative hypothesis for cointegration is that each of these parameters is non-zero. This is inferred by the significance of the F-test. Pesaran et. Al (2001) propose the use of the standard F-test with new critical values tabulated through Monte Carlo experiments which assume that all variables in the cointegration space are  $I(1)$  or integrated of the order one. They tabulate an upper-bound critical value for the F-test that depends upon the number of regressors in equation (3). For cointegration, the calculated F-statistic is greater than the upper-bound critical value. When all variables are assumed to be  $I(0)$ , the lower-bound critical value of F-statistic is reported. As the calculated F-statistics falls below the lower bound of the critical F-value, the null hypothesis of no cointegration cannot be rejected. In the event of the calculated F-value being in-between the critical upper and lower bounds of F-statistics, the evidence on cointegration is inconclusive. On the evidence of cointegrating relationship, the error-correction term ( $\hat{e}_{t-1}$ ) is obtained utilizing equation (2) as follows:

$$\hat{e}_{t-1} = y_{t-1} - (\hat{\alpha} + \hat{\beta}y_{t-1} + \hat{\phi}z_{t-1} + \hat{\varepsilon}w_{t-1})$$

The ARDL procedure is applicable since macroeconomic variables are quite likely to possess unequal orders of integration due to symmetric economic infrastructures across countries. On the evidence of cointegration, the following error-correction model is estimated by OLS for long-run causal flows:

$$\Delta y_t = \theta_0 + \theta_1 \hat{e}_{t-1} + \sum_{i=1}^m \pi_i \Delta y_{t-i} + \sum_{i=1}^n \eta_i \Delta x_{t-i} + \sum_{i=1}^k \Omega_i \Delta z_{t-i} + \sum_{i=1}^l \xi_i \Delta w_{t-i} + \varepsilon_t \quad (4)$$

If  $\hat{\theta}$  of  $\hat{e}_{t-1}$  (error-correction term) is negative and significantly different from zero in terms of the associated t-value, there is evidence of a long-run unidirectional causal flow from the independent variables to the dependent variable. In the case of no evidence of cointegration, the error-correction term is dropped from model (4). In essence, the standard VAR model is then estimated. If  $\pi_i$ 's are not all zero movements in  $y_t$  will lead those in  $x_t$ ,  $z_t$  and  $w_t$  in the short run. If  $\eta_i$ 's,  $\Omega_i$ 's and  $\xi_i$ 's are non-zero, changes in  $x_t$ ,  $z_t$  and  $w_t$  lead those in  $y_t$  in the short run (Engle and Granger, 1987).

Annual data on exports, remittances, and real GDP are obtained from the World Economic Indicators. Annual FDI data are collected from the United Nations Trade and Development Statistics website. All data are in 2000 US constant dollars (2000 = 100). Since all the variables are in the U.S. dollars, exchange rate has not been included in this study. The sample period runs from 1976 through 2006.

## EMPIRICAL RESULTS

To determine the nature of the data distribution of each variable, the usual descriptive statistics are reported in Table 1 on the next page.

Panel (A) indicates that exports have near-normal distribution for Bangladesh and India since the kurtosises for it are more than three and are slightly skewed to the right. For Pakistan and Sri Lanka, exports are not normally distributed based on their kurtosises. For Pakistan and Sri Lanka, the distributions are also slightly skewed to the right, though the mean to median ratios are almost equal to unity. Panel (B) shows that for Bangladesh and Sri Lanka, FDI records high kurtosis indicating near-normal distribution with positive skewness. For Pakistan and India, it is not normally distributed. For Pakistan, it has little or no skewness, but in the case of India the skewness is positive. Panel (C) shows that remittances are normally distributed for Bangladesh, India, and Pakistan. No normal distribution is evidenced for Sri Lanka. For all countries, it is significantly skewed to the right. Panel (D) indicates no normal distribution of real GDP for all countries. For Bangladesh, India, and Sri Lanka, it is positively skewed. No skewness is evidenced for Pakistan. In short, the above descriptive statistics for all the above variables depict a mixed picture, in general.

**TABLE 1  
DESCRIPTIVE STATISTICS**

<b>Panel A: EXPORTS</b>				
	<b>Pakistan</b>	<b>Bangladesh</b>	<b>India</b>	<b>Sri Lanka</b>
<b>Mean</b>	6.91E+09	3.04E+09	2.84E+10	3.44E+09
<b>Median</b>	6.34E+09	1.95E+09	1.80E+10	2.86E+09
<b>Std. Dev .</b>	3.63E+09	2.30E+09	2.32E+10	1.70E+09
<b>Skewness</b>	.3612	.9439	1.3281	.5925
<b>Kurtosis</b>	2.3377	2.4614	3.6624	1.9771
<b>Panel B: FDI</b>				
<b>Mean</b>	287.6067	46.4964	1064.54	99.7794
<b>Median</b>	217.1726	6.9700	224.5050	60.9000
<b>Std. Dev.</b>	267.9841	83.3871	1395.84	96.3878
<b>Skewness</b>	.0870	1.8448	.9979	1.5736
<b>Kurtosis</b>	2.6496	4.9969	2.4420	5.9806
<b>Panel C: REMITTANCES</b>				
<b>Mean</b>	1.88E+09	1.01E+09	5.25E+09	5.58E+08
<b>Median</b>	1.73E+09	7.66E+08	2.71E+09	3.80E+08
<b>Std. Dev .</b>	7.88E+08	8.01E+08	4.53E+09	4.21E+08
<b>Skewness</b>	.7501	1.1347	1.1210	.5661
<b>Kurtosis</b>	3.5936	3.7887	3.1155	2.1254
<b>Panel D: REAL GDP</b>				
<b>Mean</b>	4.90E+10	3.04E+10	2.83E+11	1.05E+10
<b>Median</b>	4.88E+10	2.77E+10	2.61E11	9.53E+09
<b>Std. Dev .</b>	1.88E+10	1.05E+10	1.24E+11	3.81E+09
<b>Skewness</b>	.0546	.6174	.5860	.3934
<b>Kurtosis</b>	1.7012	2.2321	2.1195	1.8987

**Table 2  
Unit Root Test (ADF)**

<b>Variables</b>	<b>ADF Statistics</b>				<b>Order of Integration</b>			
	<b>Bangladesh</b>	<b>India</b>	<b>Pakistan</b>	<b>Sri Lanka</b>	<b>Bangladesh</b>	<b>India</b>	<b>Pakistan</b>	<b>Sri Lanka</b>
<b>Exports</b>	-8.9878	0.1550	-6.4274	-10.2386	I(2)	I(3)	I(2)	I(2)
<b>FDI</b>	-3.5318	-2.8112	-4.9863	-6.1798	I(2)	I(3)	I(2)	I(1)
<b>Remittances</b>	-8.1338	-3.7110	-8.0673	-3.5481	I(2)	I(2)	I(2)	I(2)
<b>GDP</b>	-6.8460	-7.2126	-8.3026	-4.0068	I(2)	I(2)	I(2)	I(1)

ADF critical values: -3.7379 (1 % level), -2.9919 (5% level), -2.6355 (10% level).

Table (2), as shown above, reveals nonstationarity in all variables for Bangladesh, India, and Sri Lanka as the calculated ADF statistics in each case is less than its critical values at 1, 5 and 10 percent levels of significance. But they possess

different orders of integration. In contrast, Pakistan displays stationarity in all variables at the aforementioned levels of significance. This inference justifies the appropriateness of implementing the ARDL procedure for Bangladesh, India and Sri Lanka, as explained earlier.

**TABLE 3**  
**ARDL PROCEDURE\***

Country	Lagged GDP	Coefficient	T-Statistic	Adjusted R <sup>2</sup>	Durbin-Watson	F-Statistic
Bangladesh	GDP(-1)	.0827	.8406	.8803	2.4626	10.7616
India	GDP(-1)	.1446	2.3843	.6869	1.8783	8.5104
Pakistan	GDP(-1)	.0076	.0859	.1751	2.1282	3.3397
Sri Lanka	GDP(-1)	-.0361	-.1452	.6304	1.9168	5.7292

\*The upper-bound critical value of F-statistics at 5 percent level of significance is 4.85.

Table 3 shows there is evidence of cointegration for all 3 countries with an exception of Pakistan based on the estimates of the autoregressive distributed lag (ARDL) model as the null hypothesis of no cointegration cannot be rejected at 5 percent level of significance when the calculated F-values are compared with its upper-bound critical value at 4.85.

Table 4A displays no significant long-run causal flows from exports, FDI and remittances to real GDP of Bangladesh in terms of t-test, though the error-correction term has expected negative sign. However, exports seem to unleash some positive influences on real GDP as the sums of its current and lagged coefficients are positive, although the t-values of some of its individual coefficients are not statistically significant. FDI appears to exert even more subdued effects on real GDP by similar interpretations. Remittances seem to have some insignificant and ambiguous effects on real GDP. The overall F-statistics reveals short-run causal effects of these variables on real GDP. The adjusted R<sup>2</sup> at 0.76 is also quite high. The optimum log-structure is determined by AIC (Akaike, 1969).

Table 4(B) shows the exports, FDI and remittances have long-run unidirectional causal flows to India's real GDP. This is confirmed by the negative sign of the error-correction term and its statistical significance in terms of the associated t-value. The sums of the coefficients of exports, FDI and remittances in current and lagged forms are positive, although some of their coefficients are negative and have insignificant t-values. The overall net short-run effect of these variables on real GDP is quite significant in terms of F-value. Adjusted R<sup>2</sup> at 0.65 is also reasonably high. Again, the optimum lags are determined by AIC (Akaike's Information Criterion).

Table 4(C) presents the estimates of VAR model for Pakistan. The sum of the coefficients of current and lagged exports is positive. However, the associated individual t-values are statistically insignificant. By similar interpretation, FDI seems to have net negative effect on real GDP. In contrast, remittances have more positive effect on real GDP relative to exports. The F-statistic shows significant overall effect of these variables on real GDP in the short run. R<sup>2</sup> seems to be unrealistic and exorbitantly high due possibly to high multicollinearity.

**TABLE 4A**  
**EVIDENCE OF VEC MODEL: BANGLADESH**

Variable	Coefficient	T -Statistic	Probability
C	3.50E+08	1.6754	.1197
EC ( $\hat{e}_{t-1}$ )	-.0345	-.4951	.6295
$\Delta$ (GDP(-1))	.3335	1.4390	.1757
$\Delta$ (GDP(-2))	.0584	.2183	.8309
$\Delta$ (EX)	.6987	2.1758	.0503
$\Delta$ (EX(-1))	.4321	1.0787	.3019
$\Delta$ (EX(-2))	.8330	1.6527	.1243
$\Delta$ (FDI)	.5960	.3394	.7401
$\Delta$ (FDI(-1))	-1.5604	-.7279	.4806
$\Delta$ (FDI(-2))	3.7116	.1696	.8682
$\Delta$ (R)	.6971	.5429	.5972
$\Delta$ (R(-1))	1.0055	1.0766	.3028
$\Delta$ (R(-2))	-.6963	-.5795	.5730
Adjusted R-Square			.7594
Durbin-Watson Statistic			2.1814
Akaike info criterion			42.4094
Schwarz criterion			43.0432
F -Statistic			7.3135
Probability (F -Statistic)			.0008

**TABLE 4B**  
**EVIDENCE OF VEC MODEL: INDIA**

Variable	Coefficient	T -Statistic	Probability
C	1.14E+10	3.6184	.0035
EC ( $\hat{e}_{t-1}$ )	-.1116	-2.2129	.0470
$\Delta$ (GDP(-1))	-.2180	-.8961	.3878
$\Delta$ (GDP(-2))	-.2066	-.8684	.4022
$\Delta$ (EX)	1.0757	2.0848	.0591
$\Delta$ (EX(-1))	2.1786	3.5795	.0038
$\Delta$ (EX(-2))	-.3920	-.5354	.6021
$\Delta$ (FDI)	-.1656	-.4121	.6875
$\Delta$ (FDI(-1))	5.8040	1.3639	.1976
$\Delta$ (FDI(-2))	1.1840	2.5191	.0270
$\Delta$ (R)	1.9196	.8686	.4021
$\Delta$ (R(-1))	1.1792	.6004	.5594
$\Delta$ (R(-2))	-1.4169	-.6424	.5327
Adjusted R-Square			.6524
Durbin-Watson Statistic			1.5001
Akaike info criterion			48.1490
Schwartz criterion			48.7828
F -Statistic			4.7543
Probability (F -Statistic)			.0057



**TABLE 4C  
EVIDENCE FROM VAR MODEL: PAKISTAN**

Variable	Coefficient	T -Statistic	Probability
C	1.87E+09	1.9045	.0776
$\Delta$ GDP(-1)	.4663	1.9474	.0718
$\Delta$ GDP(-2)	.5644	2.2413	.0417
$\Delta$ EX	.3912	1.2910	.2176
$\Delta$ EX(-1)	.2483	.6625	.5184
$\Delta$ EX(-2)	.2064	.6292	.5393
$\Delta$ FDI	1.1460	.7354	.4742
$\Delta$ FDI(-1)	1.1428	.5902	.5644
$\Delta$ FDI(-2)	-2.9815	-1.2652	.2264
$\Delta$ R	.6358	1.5670	.1394
$\Delta$ R(-1)	.2905	.5034	.6225
$\Delta$ R(-2)	.6081	1.3674	.1930
Adjusted R-Square	.9983		
Durbin-Watson statistic	2.3434		
Akaike info criterion	43.9413		
Schwarz criterion	44.5219		
F -Statistic	13.6891		
Probability (F -Statistic)	0		

**TABLE 4D  
EVIDENCE FROM VEC MODEL: SRI LANKA**

Variable	Coefficient	T -Statistic	Probability
C	1.57E+08	1.764	.1099
EC ( $\hat{e}_{t-1}$ )	-.2749	1.5900	.1378
$\Delta$ (GDP(-1))	.1715	.5151	.6158
$\Delta$ (GDP(-2))	-.2034	-.7354	.4762
$\Delta$ (EX)	.3073	1.0852	.2991
$\Delta$ (EX(-1))	.5287	2.0076	.0677
$\Delta$ (EX(-2))	.2604	.7374	.4751
$\Delta$ (FDI)	-.3816	-.7921	.4437
$\Delta$ (FDI(-1))	-.5550	-.1028	.9198
$\Delta$ (FDI(-2))	-.7934	-.1344	.8953
$\Delta$ (R)	4.1667	2.7897	.0164
$\Delta$ (R(-1))	1.1601	.6747	.5127
$\Delta$ (R(-2))	2.4990	1.5760	.1410
Adjusted R-Square	.6908		
Durbin- Watson Statistic	2.08		
Akaike info criterion	2.0038		
Schwarz criterion	40.7859		
F -Statistic	5.4692		
Probability (F -Statistic)	.0031		

Finally, table 4(D) indicates no significant long-run causal flows from exports, FDI and remittances to real GDP of Sri Lanka in terms of the coefficient of the error-correction term and its associated t-value. For Sri Lanka, remittances play a more prominent role than exports in exerting positive effects on its real GDP. Surprisingly, FDI seems to have consistently negative effects on real GDP. The F-value at 5.47 indicates short-run significant effects of these variables on real GDP.  $\bar{R}^2$  at 0.69 is also quite high.

Finally, the evidences from impulse response analyses (Appendix) on the convergent and divergent influences of exports, FDI and remittances from their one-time shock by  $\pm 2$  standard deviation on real GDP are mixed.

### **CONCLUSIONS AND POLICY IMPLICATIONS**

All the variables are nonstationary in levels in three countries excepting Pakistan. The ARDL procedure confirms cointegrating relationship among variables in these three countries. The estimates of vector error-correction model reveal a unidirectional causal flow from the regressors to the regressand. The short-run net effects of exports on real GDP of Bangladesh are more visible than those of FDI and remittances. The same apply to India as well with some minor exceptions for relatively stronger short-run effects. In the case of Pakistan, the estimates of VAR models depict that remittances play a greater role than exports in influencing its real GDP. FDI is found to exert net contractionary effects on its real GDP, though not highly significant.

For Sri Lanka, the explanatory variables appear not to have any significant long-run causal effects on real GDP. In the short run, remittances seem to have more influences on real GDP than exports. Counterintuitively, FDI is found to have consistently contractionary effects on real GDP.

For policy implications, Bangladesh should place relatively more emphasis on exports of products in conjunction with policies to encourage exports of people and to entice FDI. India should also emphasize the same. Pakistan, on the other hand, should rely more on exports of people than those of products. This country should not also rely too much on FDI to enhance real economic growth. Sri Lanka should also pursue similar policies like Pakistan.

In closing, there are close economic and policy similarities between Bangladesh and India. At the same time, Pakistan and Sri Lanka have more in common on these fronts.

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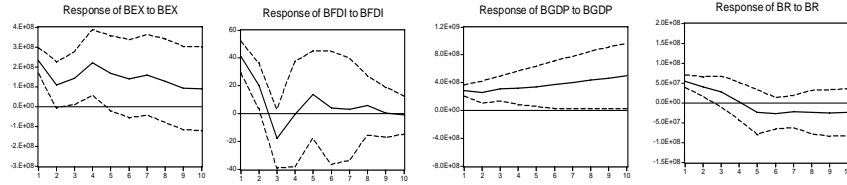
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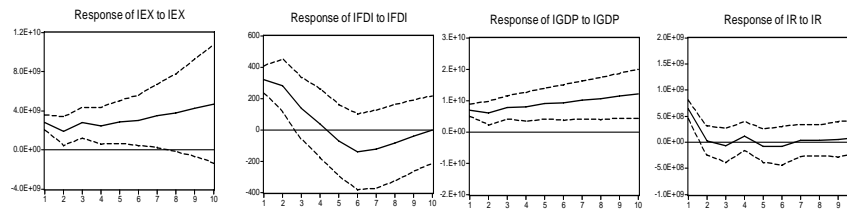
*Contributions of Exports, FDI and Expatriates' Remittances to Real GDP  
Of Bangladesh, India, Pakistan and Sri Lanka*

**APPENDIX**

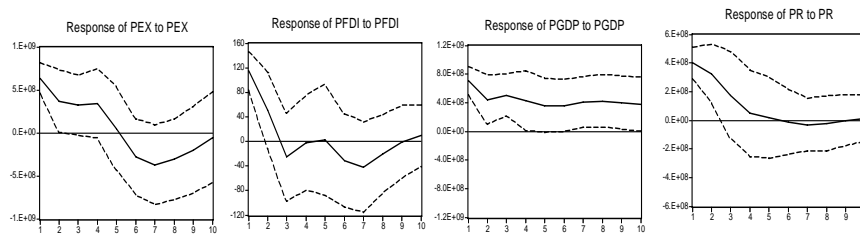
Response to Cholesky One S.D. Innovations  $\pm 2$  S.E.



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Response to Cholesky One S.D. Innovations  $\pm 2$  S.E.

