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**The Impact of the Real Effective Exchange Rate
on Real Export Earnings in Bangladesh**

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Abstract

The purpose of this study is to estimate the long run and short run effects of the Real Effective Exchange Rate (REER) on real export earnings of Bangladesh. This paper uses the unit root tests, cointegration techniques, and the Error Correction Model (ECM) with time series data for the period from 2003M6 to 2015M5. The main findings of the study demonstrate that the REER has a significant impact on real export earnings in the long run while it has no effect in the short run. The study shows that appreciation in the REER has a negative impact on real export earnings in Bangladesh. This study has policy implications in designing monetary framework to influence the REER in other developing economics as well as in Bangladesh.

Keywords: Real effective exchange rate, cointegration, export earnings, VECM

JEL Classification: C22, F31, F43

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1. Introduction

The Real Effective Exchange Rate (REER) is an important determinant of measuring the global competitiveness of a country and, therefore, has a strong influence on export earnings, improvements in balance of payments and long term growth (Soutar and Santoya 2011). Hence, the impact of the REER on real export earnings is an important issue of discussion for many developed and developing countries. Guechari (2012), for instance, finds a significant positive and negative impact of the REER in the long and short run respectively in Algeria's total trade balance. Aziz (2012) explores the impact of real devaluation on the trade balance in Bangladesh during the period of 1976-2009 and finds a significantly positive impact of the REER devaluation on the trade balance. Younus and Chowdhury (2014) estimate the depreciation effect of the real exchange rate on Bangladesh's exports, imports and trade balance. The estimated result shows that the real exchange rate has a significant impact on export, import and trade balance in the short and long run indicating a reverse L-shaped impact. The empirical results, however, does not find any significant relation among the REER, trade balance, imports and exports. This raises a number of questions such as: 1) how does an appreciation or depreciation of the REER impact on real export earnings in the short and long run in Bangladesh? 2) Can Bangladesh maintain export competitiveness by intervening in the foreign exchange market?

As part of the trade policy reform, Bangladesh formally adopted a floating exchange rate regime since May 31, 2003 (Circular no. 01, 2003). To keep exports competitive, Bangladesh Bank continues to operate a managed floating of the Bangladeshi taka. But in recent time between FY12 to FY14, the REER has appreciated by 17.29 percent (Bangladesh Bank, Annual Report 2013-14). Overall, the REER has been appreciated by 27.77 percent from FY06 to FY14.

Numerous empirical studies show how the REER affects the trade balance in the long and short run (Guechari 2012, Aziz 2012, Younus and Chowdhury 2014). But, this paper tries to analyze the effect of the REER on real export earnings. It should be noted that there is no published paper on the effect of the REER, only on real export earnings for the economy of Bangladesh. Hence, this study aims to fill this gap.

This paper can be differentiated from the mentioned studies by the sample size, types of data, base year of the REER (base year is 2010-11), and the number of countries included in the currency basket for calculating the REER. This study finds convincing evidence in support of the loss of competitiveness of exports due to the REER appreciation in Bangladesh.

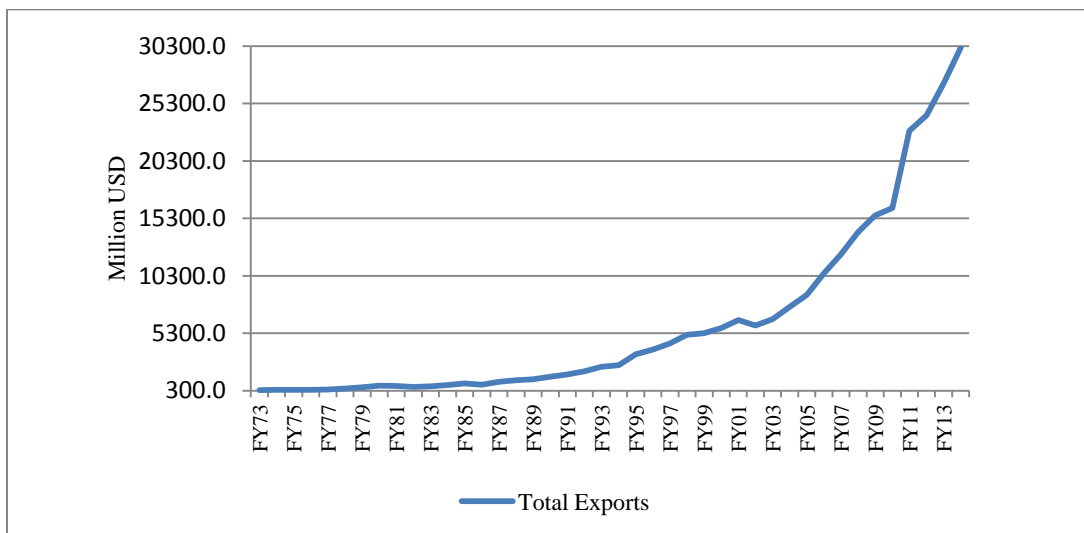
The rest of the paper is organized as follows: section 2 provides an overview of policies related to exports and exchange rates. Section 3 presents the empirical studies related to the paper, section 4 contains

data analysis, model specifications and section 5 includes empirical results and diagnostic tests. Finally, section 6 presents policy recommendations and concluding remarks.

2. An overview of policies related to exports and exchange rate related policies

After its independence in 1971, Bangladesh took innovative trade policies to establish and expand the export-oriented industry and import substitution industry (Bangladesh Bank, Annual Report 1980). In order to achieve higher growth, Bangladesh liberalized its market during the late '70s. This resulted in a significant rise in exports since the 1990s (Figure-1). Exporters enjoyed credit facilities at 12 percent when the prevailing market lending rate was 15.5 percent in the 1980s (Bangladesh Bank, Annual Report 1981). By adopting policies to lower tariff rates, various types of rebate and convertibility in exchange rates helped to achieve a momentum in export growth (Bangladesh Bank, Annual Report, 1981 and Aziz 2012). The Export Development Fund (EDF) was established in 1988 to encourage exporters to diversify the export basket (FE Circular no. 25, December 22, 2009). Figure 1 shows over time, the export development of Bangladesh. The other important variable we need to examine is exchange rate.

Figure 1: Trend of Exports



Source: Economic Trends, Bangladesh Bank, 2015.

To encourage exporters and to accelerate the export industry, Bangladesh started to manage its exchange rates system in 1979. In order to improve the balance of payments, the Taka was devalued about 130 times between 1972 to 2002 (Younus and Chowdhury 2006). However, due to a rise in official trade, the demand for the U.S Dollar consistently increased. For this reason, in 1985, U.S. dollar replaced the pound sterling as an intervention currency for Bangladesh's trade (Younus and Chowdhury 2014). From May 2003, Bangladesh started to use the floating exchange rate according to demand and supply pressures for foreign

currencies in the inter-bank market in Bangladesh to stabilize the exchange rate (Bangladesh Bank, Annual Report 2004). Bangladesh Bank often intervenes in the inter-bank market to control the volatility of the money market to ensure market friendly exchange rates. Actually, exchange rate policies influence Bangladesh's trade balance which means exchange rate policies may have a significant impact on the export (Aziz 2008).

3. Literature Review

In the last fifteen years, researchers have been studying this interesting topic (Guechari 2012, Genc 2014, Fidan 2006, Cheung and Sengupta 2012, Mehare and Edriss 2012, Fang, Lai and Miller 2005, Aziz 2012, Alam 2010, Younus and Chowdhury 2014). Guechari (2012) investigates the short and long run effects of the REER on Algeria's trade balance. The study is divided into two cases: the general case (Algeria-world case) and the specific case (Algeria-France and Algeria-US case). Using the cointegration, Error Correction Model (ECM) and impulse response techniques with time series data covering 1981Q1-2009Q4, the author finds that the REER has a significant impact (positive in the long run and negative in the short run) on the Algeria's bilateral trade balance with US and France, and on the total trade balance.

Exchange rates can affect not only exports but also imports but the relationship varies from country to country and region to region. Using the panel cointegration method, Genc (2014) explores the impact of the exchange rate on imports and exports in economically developing countries separately for the period of 1985-2012. The findings indicate that in the long run, there is a cointegrated relationship between effective exchange rates and exports-imports of emerging countries. In the case of Turkey, Fidan (2006) uses similar techniques and observes a smaller impact of the REER on exports and imports in the short run.

Cheung and Sengupta (2012) examine the effects of the REER on specific types of exports instead of total exports. Their study explores the effects of the REER on the share of exports of Indian non-financial sector firms for the period 2000 to 2010. The empirical analysis reveals that firms with small export shares are more affected by the real effective exchange rate fluctuations.

With the help of annual time series data (1992-2010) from various institutions in Ethiopia's and using the autoregressive distributive lag (ARDL) method, Mehare and Edriss (2012) show that the effect of the exchange rate variability on export of oilseeds of Ethiopia. The hypothesis is that 'there is no short run and long run relationship between export of oilseeds and explanatory variables included in the model'. The outcome shows a negative relationship between oilseeds' exports and exchange rates variability. The terms of trade (TOT) is found to be negative and significant. The underlined hypothesis is rejected confirming that there is only a long run relationship between export of oilseeds and other explanatory variables.

Due to the limitations or unavailability of relevant data, particularly the REER index data in Bangladesh, studies explain the dynamics of the REER changes in the context of Bangladesh. Aziz (2012) explores the impact of real devaluation on the trade balance in Bangladesh during the period of 1976-2009. The empirical results show a significant positive impact of the REER devaluation on the trade balance in Bangladesh. Error correction model, multivariate cointegration tests and impulse response functions are used to test the impact of the exchange rate policy in both the short and long run. The author also finds the existence of a J-curve effect in Bangladesh.

Alam (2010) uses cointegration test, Granger causality test from the VAR model. The author concludes that the real exchange rate and export earnings have no significant relation in Bangladesh using yearly data from 1977-2005.

Younus and Chowdhury (2014) estimate the depreciation effect of the real exchange rate on Bangladesh's exports, imports and trade balance. The paper includes real exchange rate, REER, domestic income and foreign income in the model to examine the behavior of the trade balance. Authors use cointegration techniques, vector error correction model and impulse response functions derived from the unrestricted VAR for time series data covering 2003M6-2014M6. The estimated result shows that the real exchange rate has significant impact on exports, imports and trade balance both in the short run and the long run which also indicates the reverse L-shaped impact. But the empirical result does not find any significant relation among the REER, trade balance, imports and exports.

It is important to note that, almost all past studies are based on the impact of the real exchange rate and other variables on trade balance and used yearly or quarterly data. In this paper, monthly data has been used which should better represent the relationship between the REER and real export earnings. Younus and Chowdhury (2014) show that trade-weighted REER has no significant effect either on the trade balance or exports or imports. This paper is different from the study of Younus and Chowdhury due to the sample size of data, base year and number of countries included in the currency basket for calculating the REER.

During the period from June 2003 to May 2015, the data for the REER is available in two base periods 2010-11 and 2000-01. Therefore, in the study, all values of REER have been converted into 2010-11 base instead of 2000-01 base within the period. The previous study used eight major trading partner countries' exchange rates and the consumer price index for calculating the REER (Younus and Chowdhury 2014). In the study, the REER is calculated by using ten major trading partner countries' exchange rates and the consumer price index which indicates an increased competitiveness of Bangladesh in the international market.

The ten major trading partners (India, Japan, Euro Area, China, Singapore, USA U.K, Malaysia, Korea and Canada) together account for almost 80 percent of total trade with Bangladesh whereas the eight major trading partners account for 60 percent of total trade with Bangladesh. The three newly added countries (Malaysia, Korea and Canada) account for about 12 percent of total trade with Bangladesh (Policy Note, MPD, BB 2014). So, the reasons mentioned above may differ with the results in this study from the findings of other mentioned papers. In the following section we will discuss the data, model specification and empirical results that will help to understand the relationship between real export earnings and the REER.

4. Data, Model Specification and Empirical results

4.1 Data:

The variables of the REER and real export earnings have been collected from the Bangladesh Bank. This series starts from June 2003 and ends in May 2015. The data for real export earnings is constructed using export earnings adjusted by consumer price index (CPI) of Bangladesh. CPI data is collected from the International Financial Statistics Site published by IMF (2015). The REER and real export earnings - both variables - are expressed in log form and real export earnings are in million taka terms. Base years 2010-11 and 2010 have been used for the REER and CPI respectively. The REER, itself is an index calculated by using the exchange rate and consumer price indices of ten major trading partner countries.

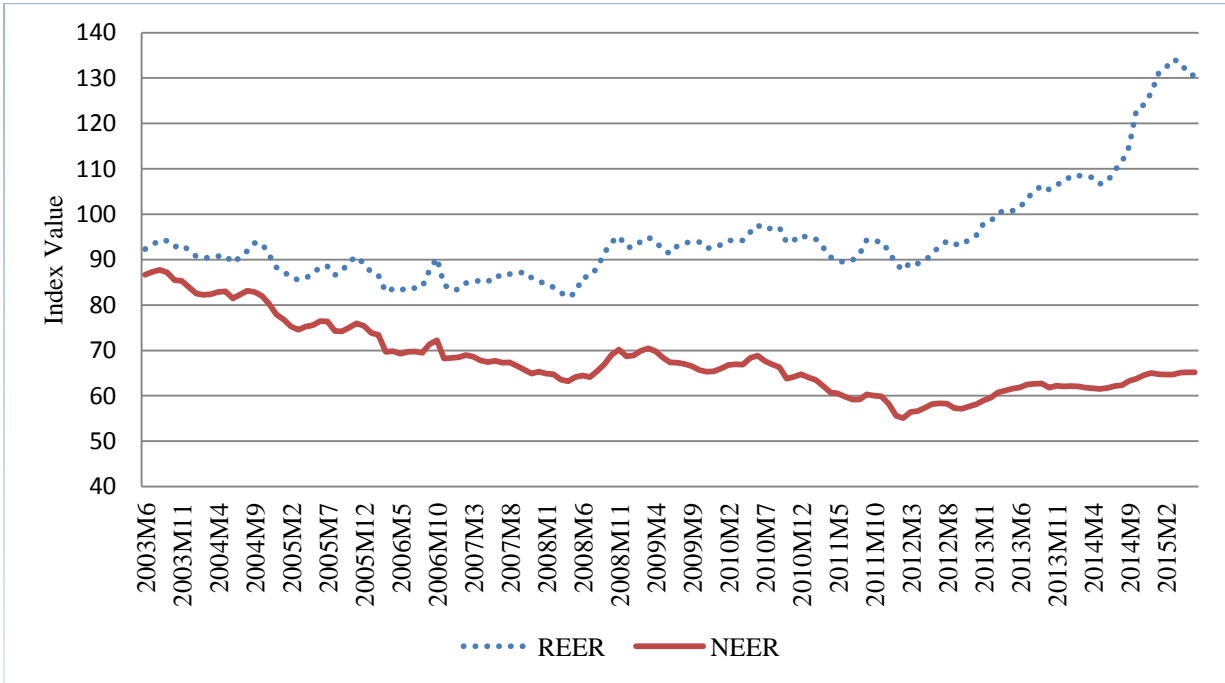
The REER has been calculated by using following formula:

$$REER_{jt} = \sum_{i=1}^k NEER_{jit} (p_{it}/p^*_{jt})$$

where, $NEER_{jit} = \sum_{i=1}^k w_i E_{it}$, j implies the home country, i stands for trading partner countries (i=1.....k), t indicates time, w_i is the trade weight of trading partner countries, E_i indicates the bilateral exchange rates between the home country and its trading partner countries, p_{it} indicates the price level of home country and p^*_{jt} implies the price level of trade partner countries.

The following figure delineates the movement of both the REER and the NEER in Bangladesh for the period of June 2003 to May 2015. It shows the NEER is steadily declining over the sample period, while the REER follows a steadily upward trend. Thus, an appreciation of the REER indicates that the domestic price level in Bangladesh is rising over the reported period compared to its trading partner countries.

Figure 2: Trends of the REER and NEER in Bangladesh



Source: Monetary Policy Department, Bangladesh Bank, 2015

4.2 Model Specification

The empirical model can be written as,

$$REXP = f(REER)$$

where,

REXP = Real Export Earnings

REER = Real Effective Exchange Rate

A log-linear time series specification for studying the real effective exchange rate effects is given by:

$$\ln REXP = \beta_0 + \beta_1 \ln REER + \varepsilon_t$$

where, β_0 is the constant, β_1 is the co-efficient of the REER and ε_t indicates error term with zero mean and constant variance.

An appreciation of the REER of taka is expected to lower the demand for Bangladesh's products. Depending on the absolute value of β_1 , Bangladesh's exports can be price-elastic ($|\beta_1| > 1$) or price inelastic

($|\beta_1| < 1$).¹ If the coefficient on the REER is not different from zero, Bangladesh's exports can be interpreted as unresponsive to the real exchange rate-based trade liberalization.

5. Empirical Results and Diagnostic Tests

5.1 Test for order of Integration

Nelson and Plosser (1982) find that unit-root processes distinguish most macroeconomics variables. The time series behavior of each of the series using the Augmented Dickey-Fuller is represented in the table below.

Table 1: Augmented Dickey-Fuller Test

Variables	Model	Level	First Difference	Integration
lnREXP	Intercept and Trend	-1.40 (0.58)	-2.88 (0.04)**	I(1)
lnREER	Intercept	-0.35 (0.91)	-8.61 (0.00)*	I(1)

Note: The null hypothesis states that the variable has a unit root. p-values are shown in the parentheses following each adjusted t-statistics. * and ** indicate significant at 1 percent level and 5 percent level respectively.

The above results show (in table 1) that both variables are non-stationary and exhibit unit roots. Thus, all of them are integrated of order one, I(1) and ready for the cointegration test.

5.2. Granger causality test

Granger causality test is used to examine the causality between real export earnings and the REER, especially in the short-run (Yaya and Lu 2012). Based on this test, it's possible to determine the direction of causality between two variables.

Table 2: Granger Causality Test

<u>Null Hypothesis</u>	<u>Observations</u>	<u>F-Statistic</u>	<u>Prob</u>
DREER does not Granger Cause DREXP	122	0.96	0.049*
DREXP does not Granger Cause DREER		1.25	0.026*

Note: * indicates 5 percent level of significance.

¹ Asian Development Bank (2007) has developed a view: "The depreciation (appreciation) of a currency lowers (raises) the foreign-currency price of exports but also increases (reduces) the home currency price of component imports. To the extent that import content costs rise (decline), this will offset any expansion in demand induced by depreciation (appreciation)".

In the above table the results indicate that DREER does granger cause of DREXP as well as DREXP does granger cause of DREER. The findings imply that in the short run, a change in the REER does cause a movement in the real export earnings and vice versa.

5.3. Cointegration test

The Johansen cointegration test procedure uses two tests to determine the number of cointegration vectors: The Maximum Eigen value test and the Trace test (Asari, Baharuddin, Jusoh, Mohamad, Shamsudin and Jusoff 2011). The Maximum Eigen value statistic tests the null hypothesis of cointegrating relations against the alternative of $r+1$ cointegrating relations for $r = 0, 1, 2 \dots n-1$.

This test statistics are computed as:

$$LRmax (r / n + 1) = -T * \log (1 - \hat{\lambda})$$

where λ is the Maximum Eigen value and T is the sample size. Trace statistics investigate the null hypothesis of r cointegrating relations against the alternative of n cointegrating relations, where n is the number of variables in the system for $r = 0, 1, 2 \dots n-1$.

The equation is computed according to the following formula:

$$LRtr (r / n) = -T * \sum_{i=r+1}^n \log (1 - \hat{\lambda}_i)$$

In some cases Trace and Maximum Eigen value statistics may yield different results, in which case the results of Maximum Eigen value test should be preferred (Asari et.al 2011).

Table 3: Johansen's Co-integration Test

Null Hypothesis	Alternative Hypothesis	Trace test Statistics	5% Critical Value
$r = 0^*$	$r = 1$	29.86	25.87
$r \leq 1$	$r = 2$	7.04	12.52
		Maximum Eigen Value Statistics	5% Critical Value
$r = 0^{**}$	$r = 1$	22.82	19.39
$r \leq 1$	$r = 2$	7.04	12.52

Note: r denotes the number of cointegrating relations. * and ** denote rejection of null hypothesis at the 5 percent level.

Based on the Schwarz Bayesian Criterion (SBC) and minimum lag requirement for stability, thirteen lags [just over a year] are selected for both variables as the optimal lag length. Both Trace and Maximal Eigen Value tests exhibit no evidence of cointegration under option 3 but they indicate one cointegration under option 4.

The existence of a cointegration relationship among the two I(1) variables implies that there exists a long-term relation between real export earnings and the REER (Enders 2010). The estimated long run equation is given below:

$$REXP = -1.66*REER + 4.93$$

(0.21)

The cointegration equation shows a long run relationship between REXP and the REER in lag level form. The relationship between REXP and the REER is significant at 5 percent level and the value in parentheses against the coefficient is standard error. The coefficient of the REER appears with a negative sign in the cointegration equation, suggesting that, with the appreciation of the REER the price of domestic goods increase. So exports seem expensive to foreigners as a result of a decrease in real export earnings.

5.4. Vector Error Correction (VEC) Model

The vector error correction model restricts the long run behavior of the endogenous variables to converge to their cointegrating relationships while allowing for short run adjustment dynamics (Khan and Hossain 2010).

Since $\ln REXP$ and $\ln REER$ are cointegrated, a vector error correction model representation could have the following form:

$$\Delta \ln REXP = \beta_0 + \sum_{j=1}^M \beta_{1j} \Delta \ln REER_{t-j} + \alpha EC_{t-1} + u_t$$

where, Δ is the first difference and u_t is the error term with mean zero.

Table 4 presents VEC estimates with Bangladesh's real export earnings (REXP) and the REER. The corresponding sign of the first differenced REER is negative but insignificant. The error correction term has a negative sign as expected that is -.76 which is statistically significant. This implies that 76 percent of the last month's disequilibrium is corrected this month, requiring only 1.32 months to bring the system into the steady state once it is disturbed.

Table 4: VEC Estimates

Regressors	D(LREXP)	D(LREER)
Constant	-0.019 (0.017)	-0.00049 (0.0027)
D(LREXP (-1))	-0.12(0.21)	0.052 (0.034)
D(LREER (-1))	-0.40 (0.67)	0.45*(0.11)
Error correction terms	-0.76*(0.21)	-0.045 (0.035)
Adjusted R ²	0.65	0.16

Note: * denotes coefficients are significant at 5 percent level. All values in parentheses against each coefficient are standard errors.

5.5. Diagnostic Tests

In order to check the acceptability of the model, we carried out various diagnostic tests namely the normality test, serial correlation LM test and heteroscedasticity test. The Error-Correction Model was the only one which yielded residuals that are not normally distributed (Engle, R.F. and C.W.J. Granger 1987). This conclusion is arrived at, given that the Jarque-Bera statistic is significant at the 10 percent level. The Serial Correlation LM test confirms that there is no serial correlation in the residuals of the ECM regression up to thirteen lags. The heteroscedasticity test result shows that the test cannot reject the null hypothesis that there is no heteroscedasticity.

6. Recommendations and Concluding Remarks

The impact of the REER on real export earnings is an important issue as it is related to maintaining country's export competitiveness, macroeconomic stability as well as economic growth. In recent decades, in spite of maintaining nominal exchange rate stability, an appreciating trend in the REER has been observed. In this regard, this paper has sought to address whether this appreciation has caused a loss of competitiveness in exports both in the short run as well as in the long run.

We have employed monthly data and applied Johansen cointegration technique as well as VECM approach to study the effect of the REER on real export earnings of Bangladesh covering the period of June 2003 to May 2015. The estimated results from the paper indicate that the REER has a significant negative relationship on real export earnings in the long run in Bangladesh for the above mentioned period. This study finds convincing evidence of the loss of competitiveness of exports due to the REER appreciation has been established in Bangladesh.

The results have some insightful policy implications related to the loss of competitiveness emanated from increase in capital inflows which ultimately causes appreciation of the REER. In spite of keeping nominal exchange rates managed, appreciation of the REER for the mentioned period indicates that Bangladesh faces higher inflation than its trading partner countries. To control inflation and maintain

exchange rate stability, the central bank tries to sterilize the excess capital inflows through open market operation. However, open market operation has some practical limits which include high fiscal cost, ineffectiveness to sterilize the capital inflows. This ultimately encourages capital inflows further by raising interest rates and the lack of availability of financial instruments stems from less developed financial markets in developing countries. Capital inflows, therefore, can be sterilized partially and exchange rate stability can be achieved in the short run for developing countries (Lee, 1997). As a whole, long term policy measures are required to sterilize the capital inflows, maintain the exchange rate stability as well as export competitiveness in Bangladesh, such as:

- 1) Sterilization should be accompanied by increase in reserve requirement or tightening the access of central bank credit with a view to reducing the monetary base and containing inflation as well.
- 2) Bringing efficiency in the financial system, turning to more market based exchange rate-as well as making the economy financially more liberalized can be a step forward in developing the financial market.
- 3) Changing discount policy can be a way to contract the money supply as well as inflation. There remains the fear of increasing the lending rates, however, in case of developing countries, increased discount rates do not necessarily increase the lending rates, thereby, it helps to contract the money supply without reducing economic activity (Lee 1997).
- 4) In order to sterilize the persistent capital inflows, the central bank can take other policy measures such as encouraging private investment overseas and allowing the foreigners to borrow from the local markets.
- 5) Widening the exchange rate by allowing the exchange rates to appreciate to some extent can be a policy initiative also.
- 6) Along with the policy measures for reducing appreciation of the REER, other policy measures are required to boost exports in Bangladesh which comprises investment on human capital, widening the scope of technological innovation, reducing infrastructure inadequacies, promoting export diversification, more value addition to export and exploring new markets for exportable products etc.

Overall, the estimated result over the above sample period indicates that appreciation to the REER has an adverse impact on exports that is also similar to other studies on developing countries.

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Appendix

Diagnostic Tests

- **Autocorrelation LM test**

VEC Residual Serial Correlation LM Tests

H₀: no serial correlation at lag order h

Lags	LM-Stat	Prob
1	5.669758	0.2252
2	3.291659	0.5103
3	1.727989	0.7856
4	3.036031	0.5518
5	1.651971	0.7994
6	2.414120	0.6601
7	0.646436	0.9578
8	4.919712	0.2956
9	1.602262	0.8084
10	2.906541	0.5736
11	4.256999	0.3723
12	0.940214	0.9187
13	5.006007	0.2867

- **VEC Residual Normality Tests**

Orthogonalization: Cholesky (Lutkepohl)

H₀: residuals are multivariate normal

Component	Skewness	Chi-sq	df	Prob.
1	-0.362966	2.854461	1	0.0911
2	-0.247349	1.325599	1	0.2496
Joint		4.180060	2	0.1237

Component	Kurtosis	Chi-sq	df	Prob.
1	3.819563	3.638282	1	0.0565
2	3.355249	0.683592	1	0.4084
Joint		4.321874	2	0.1152

Component	Jarque-Bera	df	Prob.
1	6.492743	2	0.0389
2	2.009191	2	0.3662
Joint	8.501934	4	0.0748

- **VEC Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)**

Individual components:

Dependent	R-squared	F(54,75)	Prob.	Chi-sq(54)	Prob.
res1*res1	0.508174	1.435055	0.0736	66.06262	0.1257
res2*res2	0.466498	1.214452	0.2165	60.64468	0.2487
res2*res1	0.513565	1.466352	0.0623	66.76346	0.1139

Cointegration test:

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.160994	29.85649	25.87211	0.0151
At most 1	0.052689	7.036605	12.51798	0.3407

Trace test indicates 1 cointegrating eqn(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 Eigen value)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.160994	22.81988	19.38704	0.0152
At most 1	0.052689	7.036605	12.51798	0.3407

Maximum Eigen value test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by $b' \cdot S_{11} \cdot b = I$)

LREXP	LREER	@TREND
-25.6556	-42.71666	0.261096
7.515196	2.830351	-0.032138

Unrestricted Adjustment Coefficients (alpha)

D(LREXP)	0.029697	-0.011537
D(LREER)	0.001760	0.002994

Cointegrating Equation(s): Log likelihood 518.34

Normalized cointegrating coefficients (standard error in parentheses)

LREXP	LREER	@TREND
1.000000	1.665003	-0.010177
	(0.21541)	(0.00040)

Adjustment coefficients (standard error in parentheses)

D(LREXP)	-0.761903
	(0.21439)
D(LREER)	-0.045159
	(0.03467)

VECM:

Vector Error Correction Estimates		
Standard errors in () & t-statistics in []		
Cointegrating Eq:	CoIntEq1	
LREXP(-1)	1.000000	
LREER(-1)	1.665003	
	(0.21541)	
	[7.72946]	
@TREND(03M06)	-0.010177	
	(0.00040)	
	[-25.2062]	
C	-4.93	
Error Correction:	D(LREXP)	D(LREER)
CoIntEq1	-0.761903	-0.04516
	(0.21439)	(0.03467)
	[-3.55388]	[-1.30264]
D(LREXP(-1))	-0.11811	0.052581
	(0.20975)	(0.03392)
	[-0.56310]	[1.55024]
D(LREXP(-2))	0.440669	0.058841

	(0.20990)	(0.03394)
	[2.09941]	[1.73355]
D(LREXP(-3))	0.361825	0.028991
	(0.20643)	(0.03338)
	[1.75280]	[0.86850]
D(LREXP(-4))	0.200135	0.026769
	(0.19200)	(0.03105)
	[1.04237]	[0.86218]
D(LREXP(-5))	0.224416	0.025966
	(0.18137)	(0.02933)
	[1.23734]	[0.88535]
D(LREXP(-6))	0.312096	0.030711
	(0.16554)	(0.02677)
	[1.88530]	[1.14724]
D(LREXP(-7))	0.330949	-0.00961
	(0.15867)	(0.02566)
	[2.08582]	[-0.37467]
D(LREXP(-8))	0.162009	-0.01403
	(0.15268)	(0.02469)
	[1.06108]	[-0.56811]
D(LREXP(-9))	0.100883	0.012300
	(0.14009)	(0.02265)
	[0.72014]	[0.54296]
D(LREXP(-10))	-0.047704	-0.00188
	(0.12382)	(0.02002)
	[-0.38526]	[-0.09368]
D(LREXP(-11))	0.112501	-0.03155
	(0.11452)	(0.01852)
	[0.98235]	[-1.70367]
D(LREXP(-12))	0.634778	-0.02283
	(0.11128)	(0.01800)
	[5.70412]	[-1.26855]
D(LREXP(-13))	0.342901	0.005296
	(0.09519)	(0.01539)
	[3.60233]	[0.34404]
D(LREER(-1))	-0.401568	0.452860
	(0.67432)	(0.10904)
	[-0.59552]	[4.15310]
D(LREER(-2))	1.124607	-0.09319
	(0.70857)	(0.11458)
	[1.58716]	[-0.81335]

D(LREER(-3))	-0.104324	0.048488
	(0.69962)	(0.11313)
	[-0.14912]	[0.42860]
D(LREER(-4))	0.204020	-0.05647
	(0.69097)	(0.11173)
	[0.29527]	[-0.50542]
D(LREER(-5))	-0.366436	0.061521
	(0.69229)	(0.11195)
	[-0.52931]	[0.54955]
D(LREER(-6))	1.126777	0.069226
	(0.67058)	(0.10844)
	[1.68031]	[0.63840]
D(LREER(-7))	0.475867	-0.26521
	(0.66934)	(0.10824)
	[0.71095]	[-2.45030]
D(LREER(-8))	0.212700	0.148548
	(0.68586)	(0.11091)
	[0.31012]	[1.33938]
D(LREER(-9))	0.062034	-0.07561
	(0.68958)	(0.11151)
	[0.08996]	[-0.67809]
D(LREER(-10))	-0.861108	0.064521
	(0.67686)	(0.10945)
	[-1.27222]	[0.58949]
D(LREER(-11))	1.021783	-0.18894
	(0.68130)	(0.11017)
	[1.49975]	[-1.71499]
D(LREER(-12))	-0.070913	0.041645
	(0.67689)	(0.10946)
	[-0.10476]	[0.38047]
D(LREER(-13))	-0.307611	-0.02342
	(0.60834)	(0.09837)
	[-0.50566]	[-0.23804]
C	-0.018766	0.000495
	(0.01711)	(0.00277)
	[-1.09677]	[0.17873]
R-squared	0.726566	0.340321
Adj. R-squared	0.654186	0.165701
Sum sq. resids	0.925918	0.024212
S.E. equation	0.095277	0.015407
F-statistic	10.03826	1.948917

Log likelihood	136.9307	373.7873
Akaike AIC	-1.675857	-5.3198
Schwarz SC	-1.058235	-4.70218
Mean dependent	0.004822	0.002109
S.D. dependent	0.162019	0.016868
Determinant resid covariance (dof adj.)		1.92E-06
Determinant resid covariance		1.18E-06
Log likelihood		518.3401
Akaike information criterion		-7.06677
Schwarz criterion		-5.76535