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An Empirical Assessment of the Nexus between Terms of Trade and Inflation in Bangladesh

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Terms of Trade is inextricably linked to the export performance of countries like Bangladesh that have heavily banked on their respective export sector. This paper empirically examines the nexus between terms of trade improvement and possible inflationary pressures associated using annual time series data over 1980 to 2014. This study is especially important in the context of LDC graduation of Bangladesh and loss of preferential market treatment in important markets. As a result, better terms of trade can play a key role in strengthening export competiveness and raising export volumes. In light of the estimated results in this study, an inverted-U shaped non-linear association between terms of trade improvement and inflation is unearthed. The finding can be a starting point for Bangladesh to adopt relevant export-boosting policies via terms of trade enhancement without the fear of triggering inflationary pressures.

Keywords: Terms of Trade, Inflation, Causality, Bangladesh, India
JEL Classification: F00, F10, F14, F40, E31

I. INTRODUCTION

Exports have played a strong role in Bangladesh's development. However, as the country is poised to move out of LDC status and become a developing country by 2024, its exports are set to face new challenges, resulting from loss of preferential market access. Terms of Trade (ToT) improvement could be crucial for Bangladesh to hold on to its existing export share in the world market.

A ToT improvement is a relatively healthier macroeconomic tool to stimulate exports compared to trade liberalisation. This is because, although a rise in the trade openness index is sometimes associated with rising trade volumes (Hozouri 2016), it can also trigger a rise in the volume of imports at a faster rate than that of exports, leading to growing trade deficits (Parikh and Stirbu 2004). As a

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consequence, the ultimate objective of export-led development strategies pursued by the governments of developing nations can be offset. Under such circumstances, an improvement in the TOT index is presumed to be a relatively more dependant macroeconomic variable in this regard since it is specifically targeted as enhancing exports.

However, a TOT improvement does not always guarantee a favourable outcome. The empirical literature suggests a positive correlation between the TOT index and inflation (INF) within the local economy (Fatima 2010). Despite the fact that INF plays a positive role in incentivising investments required for catalysing domestic industrialisation drivers, it is generally viewed as a negative determinant of crucial socioeconomic indicators. More importantly, it tends to distort export competitiveness. Thus, the TOT-INF nexus has been a crucial field of research amongst academics and policy makers all around the globe. However, a TOT improvement is not always INF-promoting. Thus, the ambiguous relationship between a country's TOT and its domestic INF rate is evident in the existing literature as no unanimity exists regarding the nature of this relationship.

The exact nature of association between a country's TOT and INF is also believed to depend on the type of exchange rate regime followed. According to Stevens (1992), under a fixed exchange rate system followed in Australia, there was a positive relationship between TOT and INF as a rise in TOT was associated with a rise in the rate of INF and vice-versa. However, under a floating exchange rate arrangement, the relationship was not so pronounced and rather was reversed after a certain period of time. Thus, the author concluded that the dynamics encompassing the TOT-INF nexus is, to some extent, determined by the local economy's exchange rate framework. Therefore, the investigation of the relationship between TOT and INF in the context of Bangladesh is of immense significance since Bangladesh historically followed a fixed exchange rate policy before making its transition to a floating exchange rate arrangement from May 2003 onwards. At present, Bangladesh adheres to a managed floating system whereby the equilibrium exchange rate is market determined but the Bangladesh Bank does retain some discretionary powers to intervene if needed to reduce exchange rate volatilities.

As in the theoretical literature, the association between TOT shocks and INF within the local economy can be explained in light of the "factor-reallocation effect" of a TOT improvement and can also be compared to the concept of the

'structural-change induced economic growth' in the less developed countries (Robinson 1971). The impact of a TOT enhancement on domestic INF can also be comprehended from the fact that following a rise in the TOT index a corresponding depreciation in the real exchange rate (RER) of the local economy is expected to occur. As a result, the volume of exports is likely to increase which in turn would stimulate factor reallocation from production of non-traded goods to production of traded goods. Thus, the fall in supply of non-traded goods in the local market would drive their prices up, triggering INF in the local economy. Gruen and Dwyer (1995) had made conclusions in support to the factor-reallocation effect of a TOT improvement by stating that a rise in the TOT value in the Australian economy is inflationary only if the associated rise in RER is below a threshold level.

Moreover, the neoclassical "two-country, two-currency, two-goods model" (Goodfriend and King 1997) can also ideally explain the mechanisms by which a monetary expansion induced INF can affect the TOT index within the local economy context. In the case of both demand and supply-side channels, a rise in INF is believed to result in deterioration of a country's TOT. According to demand-side economics, an increase in INF can lead to speculative actions in people as they would expect the rate of INF to increase further in future. As a result, the demand for capital goods in the economy would increase leading to a rise its associated prices. Thus, the import prices, *ceteris paribus*, would go up resulting in a decline in the country's TOT value. In contrast, according to supply-side economics, a rise in INF rate would reduce the purchasing power of the local people whereby a budget reallocation from consumption expenditure to non-consumption expenditure can be expected. This in turn would result in over supply of exportables causing the price of exports to decline. As a result, the country's TOT index is likely to deteriorate as well.

Against this background, this paper aims to bridge gap in the empirical literature by probing into the nature of the relationship between TOT shocks and inflationary movements in the context of an emerging country like Bangladesh through employing relevant time series econometric methodologies on annual data for 1980 to 2014. In addition, this study attempts to shed light on the difference, if any, in the nature of the TOT-INF nexus resulting from Bangladesh's transition from a fixed exchange rate policy to a floating exchange rate framework from May 2003 onwards. Finally, cointegrating and causality

analyses are also done to check the robustness of the association. The following questions have been specifically addressed in the paper:

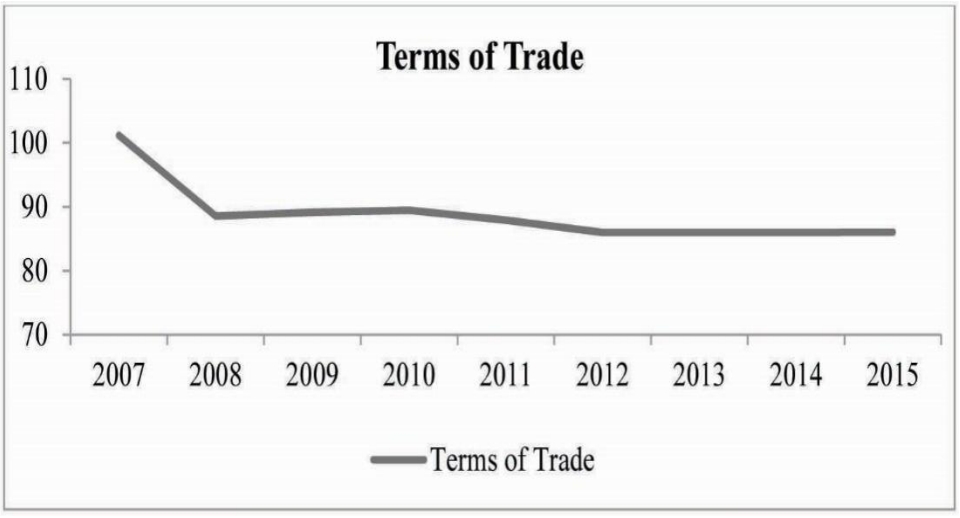
1. Does the relationship between TOT and INF exhibit linearity in context of Bangladesh?
2. What is the form of causal association between TOT and INF in the context of Bangladesh?
3. Did transition in the export rate regime affect the association in Bangladesh?

The remainder of the paper is structured as follows. Section II provides an overview of the trends in Bangladesh's TOT and INF figures. Section III gives the empirical model employed in the paper and also puts forward the attributes of the dataset used. Section IV provides the methodological approach, while section V presents the estimated results. Section VI concludes by emphasizing the findings and their implications for policy.

II. AN OVERVIEW OF THE RECENT TRENDS IN TOT AND INF MOVEMENTS IN BANGLADESH

Over the years, Bangladesh has generally experienced a symmetric trend in its TOT index and rates of INF. Figure 1 shows the trends in Bangladesh's TOT indices between 2007 and 2015. From the figure, an important point to note is that the changes in Bangladesh's TOT indices, during the last one decade and a half, do not imply severe volatility which indicates that the country is yet to face a major TOT shock. In 2007, the country's TOT figure was just a little over 101, suggesting that the difference between the corresponding export and import price indices, although positive, was significantly small. However, Bangladesh's TOT index went below the 100 mark thereafter, and hovered close to around 90. The sharp fall in the country's TOT index from about 101.2 in 2007 to around 88.5 in the following year could be attributed to the deterioration of the local INF scenario in Bangladesh towards the end of 2007. Moreover, it also needs to be mentioned that, the import price indices in the country always registered a lower value compared to the corresponding export price indices in the post-2007 period, implying that the nation had failed to significantly improve its TOT index which could well have kept its export performance below the potential level.

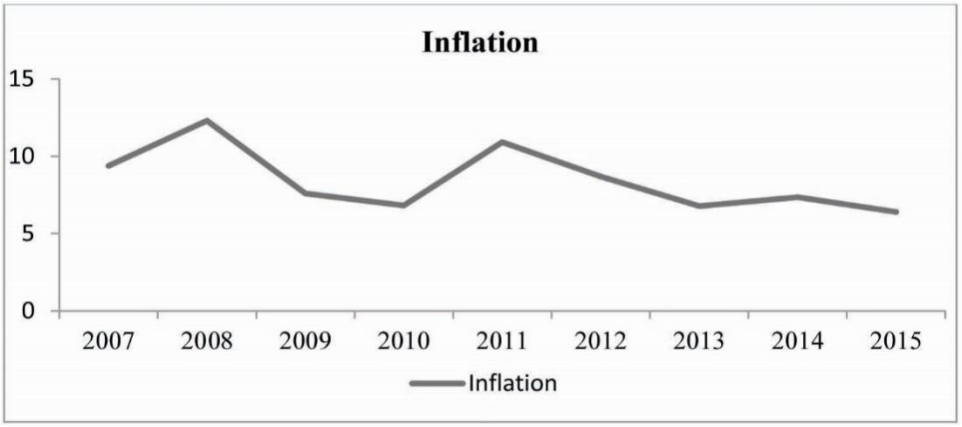
Figure 1: **Bangladesh's TOT and INF Trends between 2007 and 2015**



Source: Ministry of Finance (2017).

In contrast to the TOT indices, the INF trends, as shown in Figure 2, exhibited relatively more volatility. Historically, INF was a problematic issue for Bangladesh ever since the country's independence in 1971. Bangladesh had experienced substantial fluctuations in its domestic INF rate over the years. However, the country managed to effectively curb the rate in recent times. Between 2007 and 2015, the country experienced its worst INF rate scenario in 2008 as the rate went up to more than 12 per cent. That was the time when Bangladesh recorded the highest rate of INF amongst all the South Asian counterparts. Since then, the government of Bangladesh has managed to bring down the national INF rate by almost half the rate and as a result, the current rate of INF in Bangladesh is around 5.6 per cent (as of July 2017). The country experienced its lowest INF rate of 3.4 per cent in ten years on September 2016. Controlling the volatility in INF rate is crucial in order to maintain macroeconomic stability in the economy which in turn would enhance the investment climate within the country. Thus, it can be said that though Bangladesh has recently achieved an impressive feat in ensuring low INF rates, there is still scope for improvement. Between 2007 and 2015, the inflationary rate was reduced by more than 30 per cent, on average, indicating improvement in the economic stability of the country.

Figure 2: **Bangladesh's TOT and INF Trends between 2007 and 2015**



Source: Ministry of Finance (2017).

III. EMPIRICAL MODEL AND DATA

The model employed in this paper is an augmented version of the one used by Ramzan, Fatima and Yousaf (2013). Basically, in the model, INF is expressed as a function of TOT, controlling for the real fundamentals that are likely to exert inflationary burdens on the economy of Bangladesh. Annual time series data of all the variables are incorporated from the year 1980 to 2014. The empirical linear regression model is given as follows:

$$\mathrm{INF}_t = \alpha_0 + \alpha_1 \mathrm{TOT}_t + \alpha_2 \mathrm{RER}_t + \alpha_3 \mathrm{M2}_t + \alpha_4 \mathrm{GDP}_t + \alpha_5 \mathrm{INT}_t + \alpha_6 \mathrm{OPEN}_t + \alpha_7 \mathrm{IMP}_t + \alpha_8 \mathrm{EXP}_t + \varepsilon_t \quad \text{(i)}$$

where INF and TOT are INF and terms of trade figures of Bangladesh. The rate of INF in Bangladesh is proxied by its consumer price index. RER represents the real exchange rate calculated by multiplying the nominal exchange rate with the ratio of consumer price indices of Bangladesh and the United States. M2 denotes broad money and it is used as a measure of money supply in the economy. The gross domestic product of Bangladesh is denoted by GDP which is considered a proxy for the level of economic growth in the country. Open refers to trade openness in the country. IMP and EXP are the volume of imports and exports in the country.

Moreover, in order to verify whether the TOT-INF relationship is linear or non-linear in nature, a second alternative regression model includes the squared term of the variable TOT (as TOT^2):

$$INF_t = \beta_0 + \beta_1 TOT_t + \beta_2 TOT^2 + \beta_3 RER_t + \beta_4 M2_t + \beta_5 GDP_t + \beta_6 INT_t + \beta_7 OPEN_t + \beta_8 IMP_t + \beta_9 EXP_t + \varepsilon_t \quad \text{(ii)}$$

In order to capture whether the TOT improvement effect on INF could also be attributed to Bangladesh's transition from a fixed exchange rate regime to a flexible exchange rate regime**,** a dummy variable is introduced (DUM) into equation (i). Since the flexible exchange rate policy in Bangladesh was adopted from May FY 2003/04, the dummy variable has a value of zero from 1980 to 2003 and a value of one from 2004 onwards. Thus, a third alternative regression model augments equation (i) with a new variable which is given as a multiple of TOT and DUM:

$$INF_t = \rho_0 + \rho_1 TOT_t + \rho_2 (TOT^* DUM)^2 + \rho_3 RER_t + \rho_4 M2_t + \rho_5 GDP_t + \rho_6 INT_t + \rho_7 OPEN_t + \rho_8 IMP_t + \rho_9 EXP_t + \varepsilon_t \quad \text{(iii)}$$

Table I presents the sources and units of the variables included in the data set.

TABLE I

INFORMATIVE DETAILS OF VARIABLES INCLUDED IN THE DATA SET

Variable	Units	Source
INF	Index	Int. Financial Statistics, International Monetary Fund (2015)
TOT/TOT^2	Index	Bangladesh Economic Review, Ministry of Finance (2017)
RER	BDT/USD	Bangladesh Bureau of Statistics (2017), Bangladesh Bank
M2	Bangladeshi Taka	World Development Indicators, World Bank (2017)
GDP	Current billion US$	World Development Indicators, World Bank (2017)
INT	Percentage	World Development Indicators, World Bank (2017)
OPEN	Percentage (of GDP)	World Development Indicators, World Bank (2017)
IMP	Current US$	World Development Indicators, World Bank (2017)
EXP	Current US$	World Development Indicators, World Bank (2017)

The theoretical justification for employing the different controlled variables in the regression models is as follows:

- **Real Exchange Rate (RER):** The association between INF and RER can simply be perceived from the method of RER calculation which invloves the Nominal Exchange Rate (NER) being deflated by the corresponding price index. Evidence of exchange rate movements stimulating movements in INF figures is well documented in the existing literature. In a study by Berument and Pasaogullari (2003), RER depreciation in Turkey was opined to have caused inflationary pressures within the Turkish economy, suggesting a positive relationship between the two variables.

- **Money Supply (M2):** The association between M2 and INF can be explained using the 'quantity theory of money' which states that holding velocity of currency circulation and output constant, a rise in the M2 is expected to instigate a proportional escalation in the domestic rate of INF (Friedman 2017). A real life example of a monetary expansion induced hyperinflation in Zimbabwe in 2008 can also be used to understand the underlying relationship between these macroeconomic variables (Hanke and Kwok 2009).
- **Economic Growth (GDP):** According to the advocates of Keynesian economics, a surge in aggregate demand can stimulate inflationary stimulus within the local economy. Such demand-pull INF can be explained using the Keynesian Aggregate Demand–Aggregate Supply (AS-AD) framework (Keynes 1937). However, another school of thought, the monetarists, had criticized the Keynesian theory by asserting that the price level in an economy is ultimately governed by the growth of money.
- **Interest Rate (INT):** Adjustment to INT is considered to be a monetary policy tool which is adopted by the central bank with the aim of altering M2 in the economy while, to a large extent, keeping INF in check. According to Keynesian theory (1937), an expansionary monetary policy undertaken through lowering down the lending INT can be effective in enhancing aggregate demand without affecting the rate of INF in the economy (Cioran 2014). However, the relationship between INT and INF can also be understood from the perspective of purchasing power of the people.
- **Trade Openness (OPEN):** The negative association between OPEN and INF was postulated in a seminal paper by Romer (1993), in which the author opined that countries that have high degrees of openness to international trade are likely to encounter lower rates of INF. It is believed that more open economies experience lower INF rate volatilities as well, providing justification to Romer's (1993) claim (Bowdler and Malik 2017).
- **Export (EXP): E**mpirical evidence in the literature suggests a negative impact of rising EXP levels with respect to INF. The "resource-movement" hypothesis by Corden and Neary (1982) asserts that following a rise in the international demand for local goods, there will be a reallocation of resources towards production of exportables which in turn would drive up the rate of INF in the local economy (Amin and Murhsed 2018). The positive linkage

between rising EXP levels and greater inflationary pressures on the local economy is documented in the existing literature (e.g. Kiganda, Adhiambo and Obange 2017).

- **Import (IMP):** A surge in the volume of IMP, assuming it to outpace the corresponding increment in the volume of EXP, would curb domestic demand-pull inflationary pressures. Thus, a negative association between IMP and INF can be explained in light of a net-export deficit scenario, reducing the overall demand within the local economy. Moreover, the effectiveness of import prices in explaining movements in the domestic rate of INF is also reflected in the existing literature (Mishkin 2008).

IV. METHODOLOGY

At first, all the variables in the entire data set were tested for unit roots, if any, using the Augmented Dickey-Fuller (ADF) test of stationarity. This was followed by the Ordinary Least Squares (OLS) method to estimate the unknown parameters in equations (i), (ii) and (iii), respectively. The results from OLS provided the relationship between the dependent and the explanatory variables considered in the paper. Tests for structural breaks, using Chow break-point test and CUSUM test, were then conducted to identify possible impacts of break dates in the estimated results. In accordance to existing literature asserting that exchange rate regime in an economy affects its nature of TOT-INF relationship (Catao and Chang 2013), a possible break-point date in this paper could be 2004, the time when Bangladesh made a transition from a fixed to a flexible exchange rate policy. Thus, the Chow break-point test was conducted using 2004 as the specified break date. Then the Johansen cointegration test, a prerequisite for conducting causality tests, was performed to understand whether, or not, the variables are related in the long run. Finally, the Granger causality test was employed to deduce the long run causal relationship between the variables in the paper.

V. RESULTS AND DISCUSSION

The results from the ADF unit root test, as shown in Table II, suggest that all the variables in the regression models are stationary in first difference forms, I (1). Thus, the possibility of the regressions being spurious is nullified to a large extent. The stationarity of the variables clears the way towards performing the regression analysis.

TABLE II

ADF UNIT ROOT TEST RESULTS

Var.	ADF Stat.[a]	ADF Stat.[b]	Decision on Stationarity
First Difference I (1)			
INF	-9.112	-8.984	Stationary considering both constant and constant and trend
TOT	-5.884	-5.944	Stationary considering both constant and constant and trend
TOT^2	-6.209	-6.247	Stationary considering both constant and constant and trend
RER	-4.105	-4.394	Stationary considering both constant and constant and trend
M2	6.556	2.140	Stationary considering only constant
GDP	3.564	-2.445	Stationary considering only constant
INT	-4.198	-4.183	Stationary considering both constant and constant and trend
OPEN	-3.593	-4.495	Stationary considering both constant and constant and trend
IMP	-1.166	-6.258	Stationary considering only constant and trend
EXP	-0.839	-6.084	Stationary considering only constant and trend
DUM	-5.745	-5.725	Stationary considering both constant and constant and trend

Notes: (a) Considering only constant; (b) Considering both constant and trend; Critical Values are given at 95% level.

Results from the OLS estimations are presented in Table III. According to the OLS estimations of equation (i), a positive relationship between TOT and INF is established, as perceived from the statistically significant estimated coefficient of 0.119 for TOT. This implies that an improvement in the TOT index does exert some inflationary pressures on the economy of Bangladesh.

Moreover, RER, M2, OPEN and IMP are also observed to have a positive impact on INF, while GDP, INT and EXP are negatively related to INF. However, only in the cases of INT, EXP and IMP, the associations with INF are found to be statistically significant. The negative association between INT and INF found in this paper is in line with the theoretical explanation concerning these two variables, implying that a monetary expansion (or contraction) through a cut (or increase) in the lending INT would trigger (dampen) domestic INF, *ceteris paribus.* Thus, this finding contradicts the conventional Keynesian theory of a monetary expansion leading to a growth in the aggregate demand without affecting the price level in the economy (Keynes 1937). On the other hand, the positive and statistically significant linkage found to exist between EXP and INF implies that as Bangladesh experienced robust growth in its export sector, it might not have suffered from negative externalities arising from possible 'factor-reallocation' towards the export sector as hypothesized by Corden and Neary (1982). Finally, in light of the statistical estimates, the positive connection between the country's IMP and domestic INF could well be interpreted as an aftermath of economic growth taking place in the economy whereby an associated rise in the purchasing power in the country could well have increased the demand for both imported and domestic products, thus, driving up the price of local goods and services as well.

TABLE III

THE OLS ESTIMATION RESULTS (DEPENDENT VARIABLE: INF)

Regressors	Eqn. (i)	Eqn. (ii)	Eqn. (iii)
TOT	0.119	0.204	0.121
	(0.379)**	(0.228)*	(1.610)**
TOT^2		-0.001	-0.001
	-	(-0.095)*	(-0.096)*
TOT*DUM			0.004
	-	-	(0.110)
RER	0.006	0.001	0.005
	(0.028)	(-0.004)	(0.023)
M2	2.29E-12	2.29E-12	2.18E-12
	(0.660)	(0.648)	(0.597)
GDP	-0.023	-0.022	-0.026
	(-0.152)	(-0.147)	(-0.167)
INT	-1.215	-1.212	-1.214
	(2.437)*	(-2.378)*	(-2.386)*
OPEN	0.129	0.135	0.115
	(0.377)	(0.381)	(0.308)
IMP	6.12E-9	6.13E-9	6.11E-9
	(3.386)*	(3.320)*	(3.312)*
EXP	-8.62E-09	-8.64E-9	-8.56E-9
	(-3.157)*	(-3.096)*	(-3.021)*
	R^2=0.553	R^2=0.554	R^2=0.554
	Adjusted R^2=0.416	Adjusted R^2=0.393	Adjusted R^2=0.393

Note: Figures in the parentheses are the t-statistics. * and ** denote the statistical significance of the t-statistics at 10% and 5% levels of significance, respectively.

The regression results reported in Table III provide further confirmation regarding the fact that the positive linkage between TOT and INF, as found in the regression outputs in the context of equation (i), does not sustain over time since the inclusion of the squared term of the TOT variable, in equation (ii), reverses the relationship. The OLS estimations relating to equation (ii) provide statistically significant positive and negative slope coefficients for TOT and TOT^2 respectively. Thus, a non-linear (inverted U-shaped) symbiosis between TOT shocks and INF movement can be interpreted in light of the estimates. Taking the corresponding estimated coefficients into consideration, the threshold level of TOT index can be calculated at $\frac{0.204}{2(0.001)}$ which equates to a TOT index value of 102. This suggests that it is ideal for Bangladesh to outweigh its IMP price indices via the corresponding EXP price indices in order to negate the short-term inflationary pressures associated with positive TOT shocks. Moreover, the estimated coefficients of the remaining explanatory variables in the context of both equation (i) and (ii) bear the same signs. The coefficient of determination increases marginally improves in equation (ii), implying a slightly better fit.

Furthermore, the inclusion of the dummy variable to encapsulate the effect of a change in exchange rate regime in the country does not inflict a significant change in the TOT-INF relationship and retains the non-linear association between these variables. This is evident from the fact that the results from OLS estimation of equation (iii) reveal that a transition from a fixed to flexible exchange rate policy increases the slope coefficient of TOT by a meager 0.0024 index value, thus making no significant impact on the overall TOT-INF relationship in Bangladesh.

The regression analyses are followed by the tests for structural breaks in the dataset. According to Chow break-point test for structural breaks in time series data, as reported in Table IV, the assumption of a possible structural break in the dataset in the year 2004 could not be proved as the estimated F-statistic is found to be statistically insignificant at 10% level of significance. This provides richness to the regression findings regarding the ineffectiveness of exchange rate regime transition with respect to altering the TOT-INF nexus in Bangladesh.

TABLE IV

CHOW BREAK-POINT TEST RESULTS

Specified Break Date	Null Hypothesis	F-Statistic	P-value
2004	No break-point at specified date	0.851	0.582

Since the exact location of possible structural break in the data set is not known, the CUSUM test is used to determine the stability of the regression. Results of the CUSUM test are shown in Figure A.1 (see appendix). It is interpreted from the CUSUM chart that the regression line, in the context of equation (i), is within the two limits (95% confidence interval), which implies the absence of any structural break affecting the relationships between the dependent and the independent variables considered in the paper. Following the completion of the structural break test, the cointegration analyses are conducted as prerequisites to performing the causality analyses.

The Johansen test of cointegration forms the backdrop of further causality tests. Thus, in order to deduce possible long-run associations between the variables, the Johansen cointegration test is done and the associated results are provided in Table V. According to each of the trace and maximum Eigen value tests under the Johansen cointegration framework, it is seen that at least 3 cointegrating relationships are found. Thus, it implies that all the variables are associated in the long run.

TABLE V
JOHANSEN TEST OF COINTEGRATION (LAG=2)

Trace Test				
Null	Alternative	Trace Statistic	95% Critical Value	Conclusion
r = 0	r = 1	412.386	197.370	3 cointegrating equation
r<=1	r = 2	268.606	159.530	
r<=2	r = 3	168.190	125.615	
r<=3	r = 4	111.509	95.754	
r<=4	r = 5	68.440	69.819	
Maximum Eigen Value Test				
Null	Alternative	Max-Eigen Statistic	95% Critical Value	Conclusion
r = 0	r = 1	143.780	58.434	3 cointegrating equation
r<=1	r = 2	100.417	52.363	
r<=2	r = 3	56.680	46.231	
r<=3	r = 4	43.068	40.078	
r<=4	r = 5	26.030	33.877	

Note: 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.

The Granger causality test shows a long-run causal relationship between the variables considered. Results from this causality test are presented in Table VI. According to the estimates, there is no long-run causal association between INF and TOT since the associated F-statistic is not statistically significant at 10% significance level. This implies that in the long run, a TOT improvement may not lead to a change in the country's rate of INF. Moreover, the other explanatory variables are also ineffective in inflicting causal stimulations on INF.

TABLE VI
GRANGER CAUSALITY TEST (LAG=2)

Null Hypothesis	F – Stat.	P-Value	Decision
TOT does not Granger Cause INF	0.511	0.605	
INF does not Granger Cause TOT	0.773	0.471	No Causality
RER does not Granger Cause INF	1.249	0.302	
INF does not Granger Cause RER	1.045	0.365	No Causality
M2 does not Granger Cause INF	0.069	0.933	
INF does not Granger Cause M2	0.139	0.871	No Causality
GDP does not Granger Cause INF	0.201	0.819	
INF does not Granger Cause GDP	0.011	0.989	No Causality
INT does not Granger Cause INF	0.796	0.461	
INF does not Granger Cause INT	1.815	0.182	No Causality
OPEN does not Granger Cause INF	0.149	0.862	
INF does not Granger Cause OPEN	0.881	0.425	No Causality
IMP does not Granger Cause INF	0.340	0.715	
INF does not Granger Cause IMP	0.203	0.817	No Causality
EX does not Granger Cause INF	0.120	0.888	
INF does not Granger Cause EX	0.001	0.989	No Causality

Note: The estimated F-Statistics are tested to be statistically significant at 10% level of significance.

VI. CONCLUSIONS

Globalisation in the form of widespread engagements in international trade agreements is a crucial macroeconomic policy tool that can be utilised in enhancing the pace of economic development within an economy. Similarly, for Bangladesh and other countries pursuing export-led growth strategies, TOT improvement is extremely important when it comes to the enhancement of their export volumes at a faster rate than their import volumes. Thus, TOT improvement goes hand in hand with policies aimed at ensuring a favourable current account balance in these economies, as a country's TOT improvement means that the country can purchase more units of imported items for each unit of its export, thus, benefitting the economy as a whole. However, such improvement in TOT can lead to domestic cost-push inflation whereby there could be a dampening effect on export volumes and deterioration of the balance of payments. Therefore, in order to meet Bangladesh's national goal of leapfrogging into the elite group of upper-middle income countries in the near future, TOT improvement along with other trade liberalisation policies are of utmost importance provided that such policy actions do not trigger economic instability arising from a rise in the rate of domestic inflation.

Against this backdrop, the focal point of this paper was to investigate Bangladesh's TOT-INF nexus from a multidimensional framework using relevant annual time series data from 1980-2014. Findings reveal there exists a non-linear relationship between TOT and INF, to suggesting an inverted-U shaped association between the variables. This implies that in Bangladesh, an improvement in the TOT value, although inflationary at first, is temporary and the effect does not sustain with time as the relationship later on becomes negative, also shown in existing studies by Desormeaux, Garcia and Soto (2009) for Chile and by Kasirajan and Thirunavukkarasu (2015) for India. This is an important contribution to the existing literature as most studies do not explore the linearity of the TOT-INF nexus. In addition, the transition from a fixed to a more flexible exchange rate regime in Bangladesh is not found to inflict any substantial alteration to the TOT-INF relationship. Furthermore, following a robustness check concerning the TOT-INF causal association, no causal association between INF and the explanatory variables is found to exist in the long run. Thus, the results from this study suggests that any policy aimed at improving the country's TOT, with the underlying aim of ensuring the development of the EXP sector, can be welcomed without the fear of initiating volatility in the domestic rates of

INF over a longer time period. The threshold level of TOT is estimated to be around 102, which points to the fact that Bangladesh over the last decade has not been able to register a TOT figure close to the threshold. Hence, government should urgently look into this matter to adopt relevant policies that would help in enhancing the TOT index of Bangladesh.

A major limitation faced in this study was data inadequacy whereby the data set could not be disaggregated into quarterly or monthly data which could have added to the robustness of the findings. Moreover, due to the aforementioned constraint, uniformity of the sources of data could not be ensured which may have had some impact on the estimated results in the paper. As part of future research, the study can be conducted in panel framework incorporating relevant data in the context of the neighbouring countries in South Asia. Cross-sectional studies can also be an option provided the required data are available.

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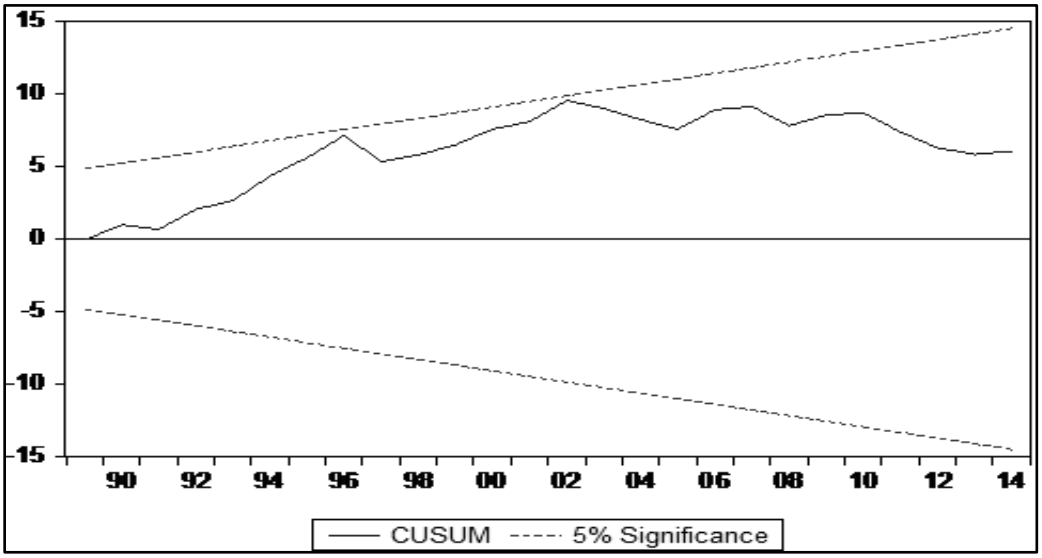
APPENDIX

FIGURE A.1: **CUSUM Test Results**



Source: Computed from EViews 7.1