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PROBLEMS OF BILATERAL TRADE DEFICIT BETWEEN BANGLADESH AND INDIA: A 2SLS REGRESSION ANALYSIS

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ABSTRACT

This study investigates the factors that determined the bilateral trade deficit of Bangladesh against India. The results of the Johansen cointegration test indicated that there were long-term associations between the trade deficit of Bangladesh real income levels, and the bilateral RER of both countries. Results from the two-stage least squares regression analyses indicated that a 1% increase in the real income levels of Bangladesh and India aggravated the bilateral trade deficit of Bangladesh by 4.61% and 3.98% respectively while a 1% real appreciation of the bilateral real exchange rate was found to reduce the deficit by almost 6%, ceteris paribus. Results also showed that Bangladesh faced persistent deficits in its bilateral trade balance against India due to its exports being comparatively less elastic than its imports engagements with India. The paper also sheds light on the anti-dumping policy pursued by India that has contributed to the unbalanced trade between the two economies.

Contribution/Originality: This study contributes to existing literature by analyzing the elasticities of Bangladesh's imports from and exports to India. It is relevant from the perspective of policy implications to understand the degrees of responsiveness of Bangladesh's import demand and export supply leading to the nation's trade deficit with India.

1. INTRODUCTION

Welfare gains from the opening up of closed economies to engagements in bilateral and multilateral trading activities is believed to spawn economic welfare within the trading economies which, if executed under the appropriate trade regulations, can result in the nations' consuming beyond their respective production possibility frontier (Heckscher and Ohlin, 1991; Baldwin, 1992; Suga and Tawada, 2007). However, although the benefits from trading activities are conceptualized to ensure welfare gains for all the participatory nations in general, sometimes inefficient trading arrangements result in vast inequalities with respect to the unequal distributions of the gains from trade (Lincoln, 2001; Fajgelbaum and Khandelwal, 2016). As a result, more often than not, international trade under such circumstances results in welfare losses particularly for the relatively smaller trading partners as opposed to the comparatively larger counterparts (Markusen, 1981; Hamilton, 1985; Redding, 1999).

International trade under suboptimal trading frameworks often leads to the exploitation of one trading partner by the other which ultimately contributes to the large trade deficit for the economy that is at the receiving end of

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such unfair treatments (Feenstra, 1995; Irwin, 2010). The imposition of undue trade restrictions, that favor a particular nation while adversely impacting the other one, often results in large amounts of deadweight losses which ultimately questions the participatory decision of the trading economy that loses welfare from the trade engagements (Lopez and Pagoulatos, 1994; Das-Gupta, 2006; Kee et al., 2008). Keeping these negative impacts of inefficient mechanisms of international trade in consideration, it is pertinent to examine the trading patterns between economies, particularly focusing on the bilateral trading trends.

Against this background, this paper investigates the Bangladesh-India trade history in order to unearth the possible mechanisms through which international trade has resulted in large welfare expansions for India while placing the burden of stiff Bilateral Trade Deficits (BTD) on the shoulders of Bangladesh (Islam, 2004; Siriwardana and Yang, 2007). The trade associations between India and Bangladesh have been sustained for more than four decades as of now. The proximity between the two South Asian economies coupled with the similar tastes and preferences across the boundaries have made it easy for these nations to engage in the trading of goods and services (Dorosh, 2001; Sikdar et al., 2006). Trade between the two countries has also played a critically important role in harnessing friendship and stimulating political cooperation to a large extent (Banerjee et al., 1999; Sikdar, 2006). However, the soaring trade imbalances between these nations have gone on to become a concern, especially for the government of Bangladesh mainly due to the national interests of these two nations diverging with time (Pant, 2007). Simultaneously, the BTD to some extent has also accounted for the negative mindset of the common people of Bangladesh towards the Indian nationals which invariably needs to be improved in order for the friendship between these two neighbors to continue.

There are numerous channels through which the BTD between Bangladesh and India has surged over the years. For instance, due to the geographical proximity between India and Bangladesh, the two countries have identical demographics and factor endowments which have particularly resulted in the export items of Bangladesh being similar to the items in which India has a comparative advantage in production and as a consequence, these goods are seldom imported by India. However, the demand for Indian products in Bangladesh has escalated over the decades which has also played a key role in catalyzing the persistent BTD faced by Bangladesh (Rahman, 2005; Basu and Datta, 2007a; Basu and Datta, 2007b). The overvaluation of Bangladeshi taka against Indian rupees in the past has also accounted for the sustained BTD of Bangladesh (Basu and Datta, 2007c). Many studies have also voiced in favor of inadequate infrastructure, lower productivity, appreciation of taka against rupees, and relative backwardness of the Bangladeshi industries being the other vital contributors of the nation's BTD (Rahman, 2005).

Apart from the aforementioned grueling issues, the dumping of Indian products into Bangladesh has gone on to become one of the major bilateral trade concerns for Bangladesh (Taslim, 2006). This paper also sheds light on this regard and recommends the possible remedies to improve future bilateral trade relations between Bangladesh and India.

The rest of the paper is structured as follows. Section 2 highlights the historical trends in trade engagements between India and Bangladesh. A review of the relevant literature is presented in Section 3. Section 4 explains the empirical models and sheds light on the attributes of the dataset used. The methodology is briefly discussed in Section 5 while Section 6 reports the results found in the econometric analyses. A qualitative assessment of the dumping issue attributed to the BTD of Bangladesh against India is explained in Section 7. Finally, Section 8 provides concluding remarks and recommendations.

2. HISTORY AND TRADE RELATIONS BETWEEN BANGLADESH AND INDIA

Trade imbalances have always been a predominant feature in the bilateral trade relationship between Bangladesh and India. As a result, India has thrived to export more while importing a lower amount of goods and services from Bangladesh. This is pretty evident from Figure 1 and Figure 2 which seem to provide an explicit scenario that has led to Bangladesh facing persistent BTD following trade involvements with India. Figure 1 shows

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that the share of Bangladeshi commodities in India's total imports values has always been minimal as opposed to the corresponding relatively robust shares of commodities exported to Bangladesh in India's total export figures. However, the scenario is completely reversed when we see the same trends in the context of Bangladesh.
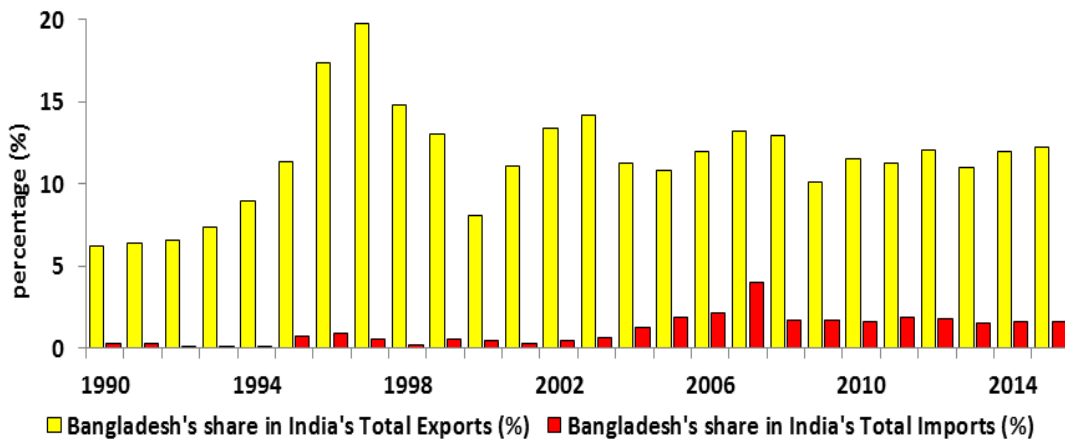

Figure-1. Bangladesh's shares in India's total imports and exports (1990-2015).

Source: WITS (2018).

Figure 2 shows that the total imports of Bangladesh are heavily sourced from India. The share of Indian goods and services in Bangladesh's import was around 33% in 1990 which exhibited a staggering growth and went on to being close to 78% by the end of 2015, projecting a rise in the associated figure by 48 percentage points within the aforementioned time frame. In contrast, Bangladesh has failed miserably when it came to exporting its indigenous products to India. The statistical estimates in Figure 2 suggest that between 1990 and 2015, the share of exports to India in Bangladesh's total exports rose from about 5.5% to almost 32% which although it was a significant growth was still expressively lower as compared to the corresponding shares of India in Bangladesh's exports.
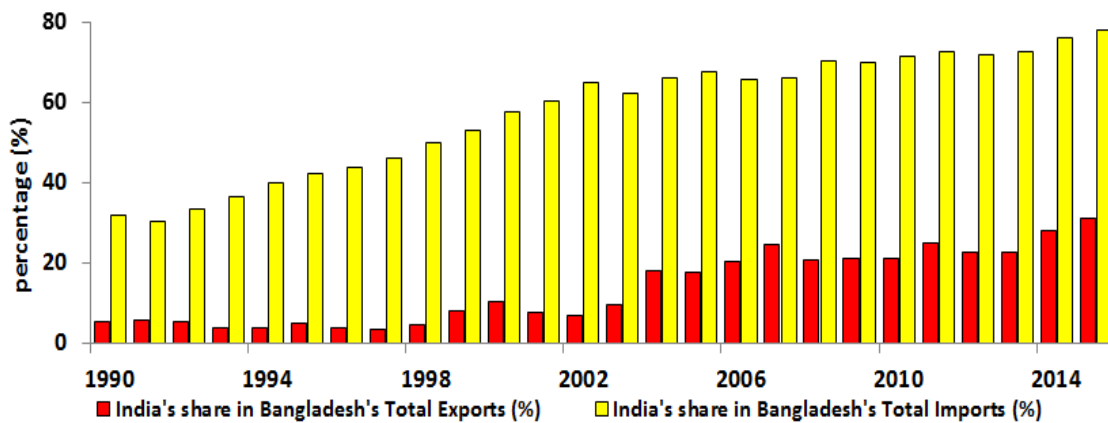

Figure-2. India's shares in Bangladesh's total imports and exports (1990-2015).

Source: WITS (2018).

The BTD of Bangladesh following the nation's trade engagements with India can be explicitly understood from Figure 3. According to the estimates, it is encouraging to see that the monetary value of Bangladesh's exports and imports to and from India, respectively, have moved together in the same direction and have exhibited positive trends in most of the time period in between 2005 and 2015. Although such trends are inspiring from the perspective of globalization and international trade induced welfare implications, the fact that the import figures always dominated the export figures tend to undermine the welfare impacts to a large extent. Such imbalances attributed to the BTD for Bangladesh are gradually questioning the patterns of trade between the two economies whereby the welfares are being unequally shared between the two trading partners. The BTD of Bangladesh stood

at close to 1195 million US dollars in 2005 which surged to more than 5364 million US dollars in 2015. This is pretty alarming from the context of the sustainability of the harmonized trade relationship between the two countries since the aforementioned statistics imply that the BTD of Bangladesh against India has increased at a rate of almost 380 million US dollars per annum, on average, within the span of only eleven years.

Figure-3. Bilateral Bangladesh-India trade statistics (2001-2015).
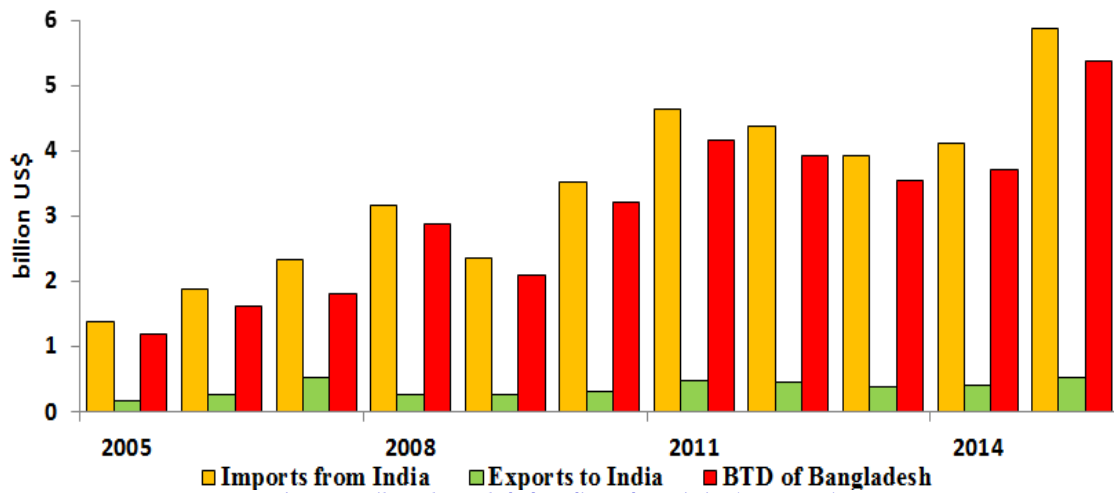
Figure 4 provides a graphical illustration of the trends in commodity-wise BTD of Bangladesh between 2001 and 2015. It is apparent from the graph that the BTD, in the context of all the crucial commodities traded between Bangladesh and India, had positive growth trends in the aforementioned time period. The lion's share of Bangladesh's BTD with India is attributed to the trade of manufacturing products. In 2015, the total value of manufacturing items imported by Bangladesh from India was worth more than 36 billion US dollars as opposed to the manufacturing exports to India being merely around 3.2 billion US dollars. The growth in the BTD of Bangladesh at the end of 2015, in the context of the manufacturing products, was more than 6.4 times of that in 2001. Apart from this, Bangladesh has also displayed positive inclinations in its overall BTD with India in the contexts of textile and clothing, capital goods, consumer durables, intermediate goods, raw materials, fuels, food products, and machinery and electronic items that grew by 15.32, 5.01, 7.71, 6,46, 5.78, 7.89, 1.66 and 3.78 times respectively between 2001 and 2015.
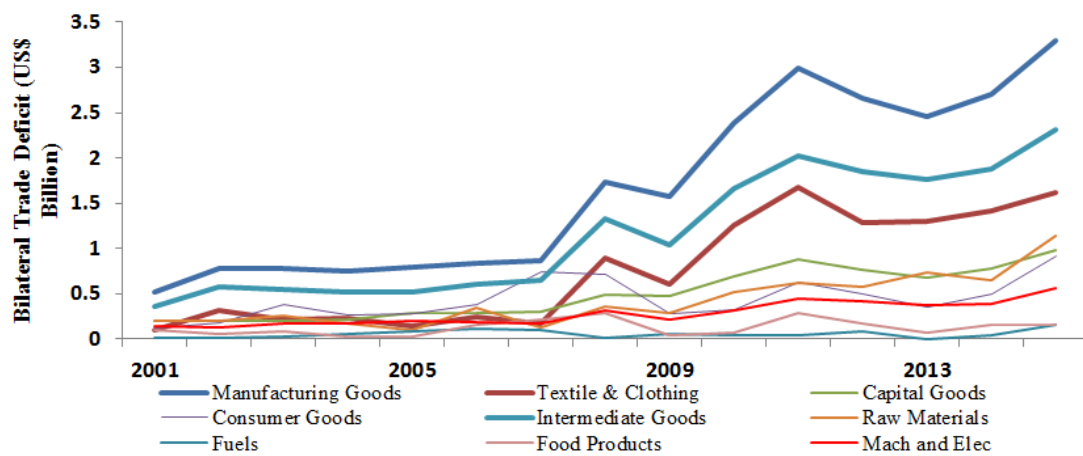

Figure-4. Commodity-wise bilateral trade deficit of Bangladesh with India (2001-2015).

The dismal state of Bangladesh's BTD against India can also be seen in the contrasting trends in the number of Harmonized System (HS) six-digit products traded between the two countries. Figure 5 shows that between 1990

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and 2015, the total number of HS six-digit products imported by Bangladesh from India grew from 960 to 3275 while the total number of HS six-digit products imported from India by Bangladesh simply grew from 20 to 537. It is important to understand that the number of HS six-digit products exported to India in 2015 is even less than the number of HS six-digit products imported from India way back in 1990 which further shows the poor performance of Bangladesh in accessing Indian markets through its exports. Thus, the increasing BTD of Bangladesh, as perceived from all the statistics displayed in this section, seems to be multidimensional in nature which calls for effective policy interventions by the Bangladeshi government to address these issues.
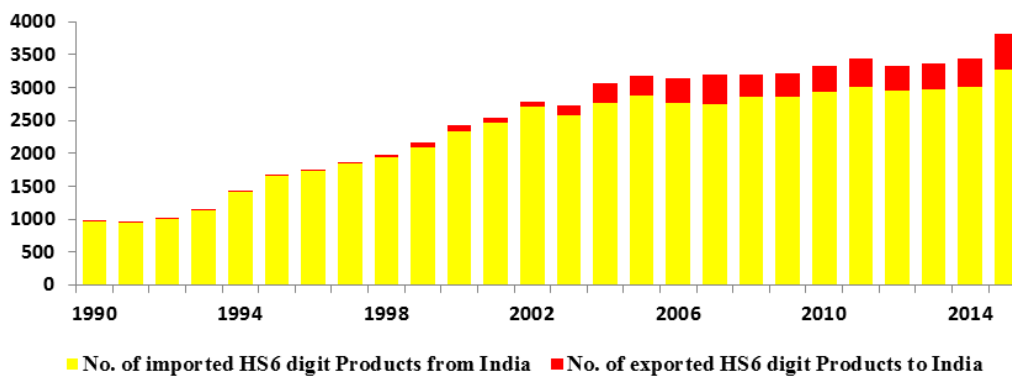

Figure-5. Bangladesh's HS6 digit export and import trends with India (1990-2015).
Source: WITS (2018).

3. LITERATURE STUDY

The theoretical background in the context of the factors for bilateral trade flows is key to understanding the relative trade imbalances between two trading economies. In the past, bilateral trade flows were presumed to be predominantly influenced by the geographic proximity between the two trading partners whereby the volume of trade between neighboring economies was said to outweigh the trading magnitudes between non-neighboring countries (Beckerman, 1956; Tinbergen, 1962; Smith, 1964). However, the theoretical justifications of bilateral trade flow provided in these aforementioned studies seemed to have overlooked the aspect of unbalanced trade stimulating BTD between the trading partners. Thus, multivariate analyses of bilateral trade were carried out in order to explain the trading imbalances between the neighboring nations in particular.

Apart from the geographical distance as a core determinant of bilateral trade between neighboring nations, the size of the economy and the population are also asserted to portray critically important implications regarding the volumes of trade. In a study by Linnemann (1966) bilateral trade flows for a panel of 80 countries were expressed as a function of the Gross National Product (GNP), population, preferential trade measures and distance. It was found that most of the variations in the trade flows were explained by the GNP and distance while the population of the respective countries also played a nominal role in stimulating the magnitude of the trade flows.

The bilateral exchange rate is also believed to dictate the trade balances between the trading economies (Baharumshah, 2001; Wilson, 2001). The ultimate argument behind the positive association between exchange rate and trade balance is that following a depreciation of the local currency against the foreign currency, local exports are expected to rise as the domestic products become cheaper to the foreign buyers. However, local imports are supposed to go down due to foreign products being relatively more expensive. Thus, a rise in the exchange rate can be expected to improve the trade balance of the local country while worsening the trade balance of the foreign country, ultimately attributing to unbalanced trade flows.

Channeling improvement in bilateral trade balance via attraction of Foreign Direct Investments (FDI), Xing (2007) examined the bilateral intra-industry trade flows of China with two of its major trading partners Japan and the United States. The results from the analyses indicated that the direct investment made by Japan in the Chinese economy boosted the intra-industry trade volumes between the nations whereby China's intra-industry trade with

Japan rose to more than one-third of its overall trade. However, direct investments flowing from the United States to China were not found to explain the surge in the intra-industry trade between these nations.

3.1. The Bangladesh-India Unbalanced Trade Literature

As far as the bilateral trade between Bangladesh and India is concerned, Basu and Datta (2007a) argued that the similarity in the export basket of both countries and the mismatch between Bangladesh's export and Indian import items have cumulatively accounted for the BTD of Bangladesh. The authors used a wide array of econometric methodology to specifically examine the factors attributing to both intra-industry and inter-industry trade between these two countries. In conclusion, the authors recommended the pursuit of an appropriate exchange rate policy by Bangladesh in order to curb its BTD with India. More importantly, the authors highlighted the fact that Bangladesh's imports from India were not being financed by the corresponding exports to India; rather, the import is financed by inward remittances which in turn exerted appreciative pressures on the RER and therefore worsened the nation's BTD.

Referring to the inappropriate imposition of tariffs and non-tariff barriers to Bangladesh's exports to India, Hossain and Rashid (1999) looked into the fundamentals causing the BTD of Bangladesh to escalate from 1993 onwards. The authors also stated that India's currency devaluation policies have been nudging the deterioration of Bangladesh's trade balance with India. The authors particularly pointed out that the incongruous devaluation policy provides an artificial comparative advantage to India over Bangladesh's tradable commodities as a result of which India had managed to secure robust growth in its bilateral trade balance with Bangladesh.

In a study by Bhattacharya (2004) the impacts of preferential trade agreements on Bangladesh's trade outcomes with India were explored. The analysis primarily focused on the failure of the South Asian Preferential Trade Agreement (SAPTA) in ensuring relative equality in trade flows between Bangladesh and India in particular. Using a gravity modeling analysis, the results strongly advocated in unequal trade welfare between these nations whereby free trading arrangements were found to result in India's exports to Bangladesh being overwhelmingly higher than its imports from Bangladesh.

In a recent study by Islam (2018) the author analyzed the trade engagement between Bangladesh and India in light of the comparative advantage in the tradable commodities of these two countries. The prospects and trends in the inter-industry and intra-industry trade flows were also discussed using the revealed comparative advantage and Grubel-Lloyd indices, respectively. Based on the results, the author highlighted the dominance of Indian trade policies over that of Bangladesh which have contributed to the increasingBTD of Bangladesh with India. The paper also referred to Bangladesh having a comparative disadvantage in many of its exportable commodities whereby the growth in the export of these items to India has been stalled over the years.

However, a limitation of these aforementioned studies is that the elasticities of Bangladesh's imports from and exports to India received scant emphasis. It is pertinent from the perspective of policy implications to understand the degrees of responsiveness of Bangladesh's import demand and export supply following changes in the relevant factors attributing to the nation's persistent BTD with India. Thus, this paper aims at contributing to the literature in this regard.

4. EMPIRICAL MODELS AND DATA

Following Halicioglu (2008) the trade balance of Bangladesh against India was expressed as a function of the real incomes and bilateral exchange rates in the context of the two countries. The reduced equation is given by:

$$lnBTD_t = \beta_0 + \beta_1 lnRGDP\_BD_t + \beta_2 lnRGDP\_IND_t + \beta_3 lnRER_t + \varepsilon_t \qquad (1)$$

Where $\ln BTD_t$ is the measure of Bangladesh's overall annual BTD with India; the real incomes of Bangladesh and India, measured in terms of their real GDP levels, are given by $lnRGDP\_BD_t$ and $lnRGDP\_IND_t$ respectively;

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and, $lnRER_t$ is the bilateral real exchange rate in terms of Bangladeshi taka per unit of Indian rupees. Based on the fact that the real incomes of Bangladesh and India respectively denote the import demand and export capacity of Bangladesh, the signs of β_1 and β_2 were expected to exhibit positive signs. The sign of β_3 was expected to be negative since a real appreciation (or increase) in the real exchange rate would make exports cheaper for India while making imports relatively costlier for Bangladesh whereby the BTD of Bangladesh is likely to diminish. For the robustness check, the overall BTD of Bangladesh was disaggregated with respect to commodities for which the nation had experienced persistent deficits in the respective trade balances against India. This can be shown by:

$$lnA_{it} = \partial_{i0} + \partial_{i1} lnRGDP\_BD_t + \partial_{i2} lnRGDP\_IND_t + \partial_{i3} lnRER_t + \varepsilon_{it} \qquad (2)$$

Where lnA_{it} refers to a set of commodity specific ($_i$) BTD of Bangladesh against India. Each of these BTD are expressed as separate functions and the choice of the commodities are made based on the sustained negative trade balance trends between 1990 and 2017 which includes manufacturing goods ($lnMFG\_BTD_t$), textile and clothing ($lnTEX\_BTD_t$), capital goods ($lnCAP\_BTD_t$), consumer durables ($lnCON\_BTD_t$), intermediate goods ($lnINT\_BTD_t$), raw materials ($lnRAW\_BTD_t$), fuel ($lnFUEL\_BTD_t$), food products ($lnFOOD\_BTD_t$) and Mach and Elec ($lnME\_BTD_t$).

The factors of the BTD can also be understood from the relative differences between the export and import elasticities. Thus, following Oğuş and Sohrabji (2009) the bilateral exports and imports of Bangladesh with India were expressed as follows:

$$lnX\_ALL_t = \beta_0 + \beta_1 lnRGDPPC\_IND_t + \beta_2 lnRER_t + \varepsilon_t \qquad (3)$$

$$lnM\_ALL_t = \beta_0 + \beta_1 lnRGDPPC\_BD_t + \beta_2 lnRER_t + \varepsilon_t \qquad (4)$$

Where lnX_ALL_t and lnM_ALL_t denote the Bangladesh exports and imports of all commodities with India while $lnRGDPPC\_BD$ and $lnRGDPPC\_IND$ are the per capita real incomes of the two countries respectively. The real per capita income levels were considered in Equation 3 and 4, as opposed to the real income levels in Equation 1 and 2, for the ease of comparison between Bangladesh's export and import elasticities. For the robustness check, the aggregate exports and imports figures were also disaggregated to perform the commodity-specific elasticity analyses as well.

Relevant data stemming from 1990 to 2017 were sourced from multiples sources. Data in the context of the bilateral trade indicators were retrieved from the WITS (2018) of the World Bank while the real income, real per capita income and real exchange rate data were compiled from the World Development Indicators (WDI, 2018) database of the World Bank as well. The real exchange rate was calculated using the ratio of Bangladesh's and India's nominal exchange rates, against US dollars, and multiplying it with the ratio of the consumer price indices of India and Bangladesh. All the variables were converted into their natural logarithms for the purpose of the elasticity analyses.

5. METHODOLOGY

Prior to the regression analysis, it was relevant to examine the dataset and test for a possible unit root in the data since non-stationary data impedes the efficiency of the estimates resulting in the regression being spurious. Thus, the Augmented Dickey-Fuller (ADF) unit root test for time-series analysis (Dickey and Fuller, 1979) was performed. The unit root analysis basically shows us whether or not the variables are mean reverting at their levels or 1st differences. The unit root tests were followed by the Johansen test of cointegration (Johansen and Juselius, 1990) which shows whether the variables move together in the long-term or not. The cointegration analysis provides the validity of the long-term association between the variables considered in the econometric models.

5.1. The Two-Stage Least Squares Estimation

The Ordinary Least Squares (OLS) estimator for regression purpose was not appropriate in the context of endogeneity in the dataset. Thus, the Two-Stage Least Squares (2SLS) approach was applied to account for endogeneity which improved the statistical significance of the estimates. The endogeneity problem in the data was likely to occur following the presence of correlation between the error term and the explanatory variables, possible reverse causation between the dependent and the independent variables and due to estimation errors. Under such circumstances, the OLS estimation assumption of the error term's independence of the regressors was violated whereby its efficiency to produce unbiased estimates was marginalized. Thus, the 2SLS estimation technique accounts for a solution to this endogeneity problem in the models via the incorporation of Instrumental Variables (IV) (Angrist and Imbens, 1995; Heckman *et al.*, 2006).

The choice of the instruments was crucial to determine the outcome of the 2SLS estimates. The instruments used to modify the problematic explanatory endogenous variable, being correlated with the error term, should, in general, be an exogenous variable that could directly affect the particular explanatory variable but not directly affect the dependent variable of the regression model, as well as being independent of the error term. This regression approach basically involves two stages. In the first stage, the IV were used to transform the endogenous regressors to estimate its predicted value. In the context of the econometric models in this paper, government expenditure levels of Bangladesh and India ($lnGEXP\_BD_t$ and $lnGEXP\_BD_t$) were used to instrument $lnRGDP\_BD_t$ and $lnRGDP\_IND_t$ respectively, for Equation 1 and 2 and $lnRGDPPC\_BD_t$ and $lnRGDPPC\_IND_t$, respectively, for Equation 3 and 4.[1] In order to be considered as good instruments, the IV had to be correlated to the corresponding endogenous covariates {i.e. corr ($lnRGDP\_BD_t$, $lnGEXP\_BD_t$), corr ($lnRGDP\_IND_t$, $lnGEXP\_IND_t$), corr ($lnRGDPPC\_BD_t$, $lnGEXP\_BD_t$) and corr ($lnRGDPPC\_IND_t$, $lnGEXP\_IND_t$) were not equal to zero} and also had to be independent of the error terms {i.e. corr ($lnGEXP\_BD_t$), ε_t) = ($lnGEXP\_IND_t$), ε_t) = 0}.

In the first stage, the endogenous variables, in Equation 1, ere regressed on the respective IV to estimate the predicted values of $lnRGDP\_BD_t$ and $lnRGDP\_IND_t$:

$$ln\widehat{RGDP\_BD}T_t = \theta_0 + \theta_1 lnGEXP\_BD_t + \theta_2 lnRGDP\_IND_t + \theta_3 lnRER_t + \varepsilon_t$$

$$ln\widehat{RGDP\_IND}_t = \varnothing_0 + \varnothing_1 lnGEXP\_IND_t + \varnothing_2 lnRGDP\_BD_t + \varnothing_3 lnRER_t + \varepsilon_t$$

In the second stage, the endogenous variables were replaced by their predicted values, obtained in the first stage, in the original regression Equation 1 and then the model was regressed using the OLS estimator which can be shown as follows:

$$lnBTD_t = \beta_0 + \beta_1 ln\widehat{RGDP}\_BD_t + \beta_2 ln\widehat{RGDP}\_IND_t + \beta_3 lnRER_t + \varepsilon_t$$

Similarly, the 2SLS approach was repeated for Equation 2, 3 and 4 in order to account for the endogenous covariates.

6. RESULTS AND DISCUSSIONS

The stationarity analysis preceded the econometric analyses. The ADF unit root test results are provided in Table 1. According to the findings, all our variables were stationary at their first differences. Thus, it can be said

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[1] The government expenditure is used as a plausible instrument from the understanding that public investments are usually made in the non-tradable sector which develops the infrastructure facilitating the development of the tradable sector in the economy. Thus, it can be said that government expenditure has a direct impact on the real GDP, as shown by the national income accounting, and an indirect impact on the bilateral trade flows.

that the variables were mean reverting and therefore the possibility of the regression analyses to be followed being spurious was nullified.

Table-1. ADF unit root test results (Lags=2).

Variable	Level, I(0) ADF Stat.[a]	1st Diff., I(1) ADF Stat.[a]	Variable	Level, I(0) ADF Stat.[a]	1st Diff., I(1) ADF Stat.[a]
$lnBTD_t$	-2.86	-3.71**	lnX_MFG_t	-2.38	-5.58*
$lnMFG\_BTD_t$	-3.02	-3.25***	lnM_MFG_t	-3.09	-3.44**
$lnTEX\_BTD_t$	-2.93	-3.867**	lnX_TEX_t	-2.30	-3.51**
$lnCAP\_BTD_t$	-2.08	-4.45*	lnM_TEX_t	-2.97	-4.91*
$lnCON\_BTD_t$	-2.19	-4.80***	lnX_CAP_t	-1.51	-3.98**
$lnINT\_BTD_t$	-3.01	-3.31***	lnM_CAP_t	-2.67	-4.82*
$lnRAW\_BTD_t$	-2.69	-3.50**	lnX_CON_t	-3.01	-10.16*
$lnFUEL\_BTD_t$	-2.41	-4.02*	lnM_CON_t	-2.20	-4.80*
$lnFOOD\_BTD_t$	-1.57	-5.11*	lnX_INT_t	-2.60	-4.23*
$lnME\_BTD_t$	-2.77	-4.59*	lnM_INT_t	-3.02	-3.15***
$lnRGDP\_BD_t$	-0.74	-3.58**	lnX_RAW_t	-2.37	-5.79*
$lnRGDP\_IND_t$	-2.28	-3.26***	lnM_RAW_t	-3.10	-4.18*
$lnRER_t$	-2.24	-3.36**	lnX_FUEL_t	-2.24	-4.38*
$lnGEXP\_BD_t$	0.15	3.99**	lnM_FUEL_t	-2.13	-4.01*
$lnGEXP\_IND_t$	-2.58	-3.71**	lnX_FOOD_t	-2.20	-3.43**
$lnRGDPPC\_BD_t$	-1.74	-4.58*	lnM_FOOD_t	-1.60	-5.21*
$lnRGDPPC\_IND_t$	-2.28	-4.26*	lnX_ME_t	-2.57	-4.53*
lnX_ALL_t	-2.87	-5.04*	lnM_ME_t	-2.57	-4.78*
lnM_All_t	-2.86	-3.87**			

Note: a: considering trend; The optimal lags are selected using the Schwarz Information Criterion (SIC); *, ** and *** denote statistical significance at 1%, 5% and 10% respectively.
lnX_ALL_t, lnX_MFG_t, lnX_TEX_t, lnX_CAP_t, lnX_CON_t, lnX_INT_t, lnX_RAW_t, lnX_FUEL_t, lnX_FOOD_t, lnX_ME_t denote Bangladesh's export of manufacturing goods, textile and clothing, capital goods, consumer durables, intermediate goods, raw materials, fuel, food items and Mach and Elec to India, respectively; lnM_ALL_t, lnM_MFG_t, lnM_TEX_t, lnM_CAP_t, lnM_CON_t, lnM_INT_t, lnM_RAW_t, lnM_FUEL_t, lnM_FOOD_t, lnM_ME_t denote Bangladesh's import of manufacturing goods, textile and clothing, capital goods, consumer durables, intermediate goods, raw materials, fuel, food items and Mach and Elec from India, respectively.

The Johansen cointegration test results, as indicated in Table 2, showed a long-term association between the concerned variables in all the models. The estimates from both trace tests confirmed the presence of cointegrating equations which affirmed that the concerned variables in the respective models moved together in the long-term.

The regression findings in the context of Equation 1 and 2 are reported in Table 3. The OLS estimates for all the models tended to overestimate and underestimate the elasticity of the trade deficits with respect to the real GDP of Bangladesh and India respectively. These estimates were also statistically insignificant so commenting on the bivariate association between the concerned variables would not be conclusive. Almost all of the OLS estimates of the RER elasticities were also found to be underestimated and statistically insignificant as well. Thus, the 2SLS-IV estimator was employed to account for the possible endogeneity in the models which may have been the reason behind the standard errors in the OLS estimates being significantly high.

In contrast to the OLS estimates, although showing similar signs, the 2SLS-IV estimates were found to be statistically significant in most of the cases. In line with the estimates, the real GDP levels of both India and Bangladesh positively influenced the overall BLT of Bangladesh. The marginal effects of 1% increments in the RGDP_IND and RGDP_BD were found to escalated Bangladesh's BTD with India by 3.98% and 4.61% respectively, on average, *ceteris paribus*. A critically important finding was that the domestic growth elasticity of the BTD of Bangladesh was greater than the foreign growth elasticity which implied that Bangladesh has not been able to penetrate the Indian markets to the extent at which it has provided access to Indian products in its local markets despite both the economies experiencing robust growth in their respective real GDPs. Ideally, the BTD of Bangladesh should be lessened following real growth in the Indian economy which was not supported by the statistical findings in this paper. A plausible explanation behind this phenomenon could be the fact that India sources the lion's share of its import demands from foreign countries other than Bangladesh whereas a significant

amount of Bangladesh's imports are from India. Hence, it is necessary for Bangladesh to diversify its import basket with respect to the origin of the importing country and simultaneously aim at penetrating the Indian markets further.

Table-2. Johansen cointegration test results.

Model	Dep. var.	Max. rank	Trace statistic[a]	5% critical Value	Decision
(1)	$lnTB_t$	1	17.54	29.68	1 cointegrating equation
	$lnMFG\_BTD_t$	1	19.75	29.86	1 cointegrating equation
	$lnTEX\_BTD_t$	1	16.40	29.68	1 cointegrating equation
	$lnCAP\_BTD_t$	1	18.01	29.68	1 cointegrating equation
	$lnCON\_BTD_t$	1	24.23	29.68	1 cointegrating equation
(2)	$lnINT\_BTD_t$	2	5.96	15.41	2 cointegrating equations
	$lnRAW\_BTD_t$	1	26.61	29.68	1 cointegrating equation
	$lnFUEL\_BTD_t$	2	7.55	15.41	2 cointegrating equations
	$lnFOOD\_BTD_t$	1	18.33	29.68	1 cointegrating equation
	$lnME\_BTD_t$	1	19.48	29.68	1 cointegrating equation
(3)	lnX_ALL_t	1	5.48	15.41	1 cointegrating equation
(4)	lnM_All_t	2	27.97	29.86	2 cointegrating equations
(3)	lnX_MFG_t	1	6.04	15.41	1 cointegrating equation
(4)	lnM_MFG_t	1	11.49	15.41	1 cointegrating equation
(3)	lnX_TEX_t	1	7.57	15.41	1 cointegrating equation
(4)	lnM_TEX_t	1	8.14	15.41	1 cointegrating equation
(3)	lnX_CAP_t	1	5.54	15.41	1 cointegrating equation
(4)	lnM_CAP_t	1	9.42	15.41	1 cointegrating equation
(3)	lnX_CON_t	1	5.31	15.41	1 cointegrating equation
(4)	lnM_CON_t	1	11.21	15.41	1 cointegrating equation
(3)	lnX_INT_t	1	6.43	15.41	1 cointegrating equation
(4)	lnM_INT_t	1	11.75	15.41	1 cointegrating equation
(3)	lnX_RAW_t	3	2.21	3.76	3 cointegrating equations
(4)	lnM_RAW_t	1	9.05	15.41	1 cointegrating equation
(3)	lnX_FUEL_t	1	7.44	15.41	1 cointegrating equation
(4)	lnM_FUEL_t	2	9.74	15.41	2 cointegrating equations
(3)	lnX_FOOD_t	3	2.22	3.76	3 cointegrating equations
(4)	lnM_FOOD_t	1	12.06	15.41	1 cointegrating equation
(3)	lnX_ME_t	1	6.43	15.41	1 cointegrating equation
(4)	lnM_ME_t	1	10.10	15.41	1 cointegrating equation

Note: a: considering trend; The optimal lags are selected using the Schwarz Information Criterion (SIC).

However, the RER elasticity of the overall TD of Bangladesh was found to exhibit a negative sign which was statistically significant at 1% level. The corresponding estimated coefficient implied that following a 1% real depreciation of Bangladeshi taka against Indian rupees, the BTD of Bangladesh increases by almost 6% on average, *ceteris paribus*. This particular finding was in line with the theoretical foundations engulfing the linkage between exchange rate and net exports of a nation since a real depreciation of Bangladeshi taka against Indian rupees makes it difficult for the local products to be exported to India while facilitating the imports from India that become relatively less costly following the real depreciation. Upon disaggregation of the import and export items, the 2SLS-IV estimates generated similar results which provided further explanation to the persistent BTD faced by Bangladesh against India with respect to the trading of manufacturing products, textiles and clothing, capital and consumer goods, intermediate goods, raw materials, fuel, food products and machinery and electronics.

Table-3. Regression outputs in the context of model (1) and (2).

Model	(1)		(2)							
Dep. Var.	**lnBTD$_t$**		**lnMFG_BTD$_t$**		**lnTEX_BTD$_t$**		**lnCAP_BTD$_t$**		**lnCON_BTD$_t$**	
Estimator	**OLS**	**2SLS**	**OLS**	**2SLS**	**OLS**	**2SLS**	**OLS**	**2SLS**	**OLS**	**2SLS**
Regressors										
lnRGDP_BD$_t$	6.33	4.61**	6.56	4.29***	7.81	5.17**	5.34	3.03	4.87	4.82***
	(5.89)	(2.35)	(5.16)	(2.27)	(5.87)	(2094)	(3.97)	(1.97)	(4.06)	(2.60)
lnRGDP_IND$_t$	1.56	3.98*	1.34	4.62***	0.58	6.18***	0.89	4.99**	1.54	1.69*
	(1.84)	(1.17)	(174)	(2.52)	(2.37)	(3.43)	(1.58)	(2.23)	(2.17)	(0.06)
lnRER$_t$	-2.76	-5.99***	-2.15	-7.01**	-1.04	-9.27**	-2.90	-6.05***	-2.53	-2.86
	(2.53)	(3.04)	(2.39)	(3.55)	(3.26)	(4.70)	(2.14)	(3.31)	(2.98)	(2.06)
Constant	-64.68*	-115.85*	-71.30*	-120.44*	-103.16*	-157.71*	-62.01*	-109.01*	-41.44*	-88.57*
	(16.23)	(29.21)	(15.35)	(27.05)	(20.92)	(32.72)	(12.78)	(23.49)	(9.12)	(33.41)
Wald chi²		62.25*		61.25*		57.41*		93.71*		55.01*
R²	0.74	0.79	0.72	0.81	0.75	0.83	0.63	0.78	0.61	0.79
Adj. R²	0.71		0.75		0.72		0.61		0.56	
Obvs.	28	28	28	28	28	28	28	28		28
Model	(2)									
Dep. Var.	**lnINT_BTD$_t$**		**lnRAW_BTD$_t$**		**lnFUEL_BTD$_t$**		**lnFOOD_BTD$_t$**		**lnME_BTD$_t$**	
Estimator	**OLS**	**2SLS**	**OLS**	**2SLS**	**OLS**	**2SLS**	**OLS**	**2SLS**	**OLS**	**2SLS**
Regressors										
lnRGDP_BD$_t$	7.21	5.01**	7.88	6.70*	7.40	5.40***	8.76*	5.04*	4.91	3.26**
	(6.51)	(2.44)	(7.01)	(1.98)	(6.21)	(2.95)	(6.89)	(2.11)	(3.29)	(1.66)
lnRGDP_IND$_t$	1.73	4.57***	2.14	2.38*	3.23	3.24*	5.92	1.10*	1.72	2.87***
	(2.12)	(2.70)	(1.90)	(1.12)	(3.82)	(1.01)	(4.01)	(0.89)	(.36)	(1.427)
lnRER$_t$	-2.22	-7.46***	-2.69	-4.59***	-2.21	7.97*	-1.39**	-7.62*	-2.19	-3.80*
	(2.77)	(3.97)	(2.61)	(2.24)	(5.24)	(1.48)	(0.11)	(1.89)	(2.21)	(1.19)
Constant	-75.96*	-130.79*	-81.61*	-126.58*	-16.67	-59.21*	-46.87	-158.60*	-43.53*	-82.73*
	(17.79)	(31.46)	(16.73)	(26.01)	(33.67)	(17.91)	(35.28)	(60.60)	(11.99)	(18.81)
Wald chi²		49.76*		85.10*		29.22*		32.81*		115.13*
R²	0.71	0.75	0.75	0.86	0.33	0.60	0.55	0.77	0.62	0.70
Adj. R²	0.69		0.73		0.27		0.50		0.60	
Obvs.	28	28	28	28	28	28	28	28	28	28

Notes: The robust standard errors are reported within the parentheses; *, ** and *** denote statistical significances at 1%, 5% and 10% respectively.

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For the robustness check, we resorted to estimating the per capita GDP growth and RER elasticities of both import and export of all aforementioned tradable commodities. The corresponding results are reported in Table 4. As per the 2SLS-IV estimates of the elasticities, a 1% rise in India's per capita GDP figure led to a mere 2.2% rise in the aggregate value of all goods exported by Bangladesh to India, *ceteris paribus*. However, a 1% rise in the per capita GDP of Bangladesh accounted for a staggering 9.68% increase in Bangladesh's aggregate value of imports channeled from India. This implied that the exports of Bangladesh have been less responsive to the growth in the import demand of India, much unlike the case of the imports being directed to the Bangladeshi markets from India following a change in the local import demand. Thus, this particular finding, controlling for the relative size differences between the two economies, provided strong evidence regarding the factors contributing to the dismal state of the BTD faced by Bangladesh.

Table-4. Export and import elasticities of Bangladesh in context of model (3) and (4).

Types of Import/ Export Items	Imports		Exports	
	lnRGDPPC_BD$_t$ Elasticity	lnRER$_t$ Elasticity	lnRGDPPC_IND$_t$ Elasticity	lnRER$_t$ Elasticity
All Products	9.68* (2.78)	-10.38** (5.10)	2.21* (0.92)	0.47* (0.02)
Manufacturing goods	11.79* (3.31)	-15.72** (6.08)	2.35* (0.86)	0.71** (0.34)
Textile and Clothing	6.91** (3.22)	-4.11** (2.05)	3.17* (0.26)	1.00* (0.10)
Capital goods	4.24* (1.09)	-0.9295	2.21* (0.69)	0.69 (0.60)
Consumer durables	14.30* (4.38)	-13.10*** (7.03)	2.57* (1.10)	0.08* (0.01)
Intermediate goods	9.24** (3.57)	-13.64** (6.56)	2.92* (1.06)	1.29*** (0.61)
Raw materials	5.51* (1.17)	-23.5554	3.75* (0.95)	0.32 (0.82)
Fuel	5.86*** (2.58)	-1.432	2.61* (1.01)	1.34* (0.15)
Food products	17.95* (5.35)	-19.18*** (9.84)	2.191* (0.34)	0.52* (0.06)
Mach and Elec	0.67 (2.24)	-16.8116	0.05 (2.46)	1.09 (2.14)

Notes: The robust standard errors are reported within the parentheses; *, ** and *** denote statistical significances at 1%, 5% and 10% respectively.

Similarly, the other results from the elasticity analyses show that for almost all the commodities, machinery and electronics being the only exception, the per capita growth elasticities of Bangladesh's imports were substantially larger than the per capita growth elasticities of its exports which implied that following a growth in real per capita incomes in both the countries, the rise in the total value of these goods being exported to India was significantly lower than the respective rise in the total value of these goods being imported from India. These results were even more alarming in the sense that the per capita GDP of India between 1990 and 2017 has been on average been 1.6 times more than that of Bangladesh, as shown in Table 5.

Therefore, in spite of the import capacity of Bangladesh being persistently outweighed by that of India, Bangladesh has failed to capture its share in the Indian markets and meet the demand for international products by India. As a result, Bangladesh's BTD with India has been sustained over the past, imposing critically adverse impacts on the Bangladesh economy. As far as the RER elasticities of Bangladesh's imports and exports with India are concerned, the RER elasticities of exports were comparatively less elastic to that of the imports. The estimates also suggest that Bangladesh's exports and imports were positively and negatively correlated, respectively, to the bilateral RER. Hence, it can be expected that a real appreciation of Bangladeshi taka against the Indian rupees would increase the imports way more than the extent to which exports to India are reduced and as a result, the magnitude of Bangladesh's BTD with India is presumed to go up as well.

The results also indicated the validity of the Marshall-Learner condition (Marshall, 1923; Lerner, 1944) for both the aggregate and the disaggregated trade flows of Bangladesh which further implied that a real depreciation of the bilateral RER would improve the trade balance of Bangladesh.

Table-5. A comparison between the per capita GDPs of Bangladesh and India.

Year	GDPPC(BD)	GDPPC(IND)	GDPPC(IND)/GDPPC(BD)
1990	1287.93	1754.86	1.36
1991	1301.70	1737.62	1.33
1992	1341.76	1796.53	1.34
1993	1374.42	1845.15	1.34
1994	1397.32	1930.11	1.38
1995	1437.64	2036.80	1.42
1996	1470.91	2149.37	1.46
1997	1504.87	2194.90	1.46
1998	1550.32	2288.05	1.48
1999	1590.25	2445.75	1.54
2000	1641.96	2495.05	1.52
2001	1692.83	2570.43	1.52
2002	1725.63	2623.33	1.52
2003	1775.98	2783.00	1.57
2004	1838.76	2955.20	1.61
2005	1929.94	3178.83	1.65
2006	2031.27	3419.93	1.68
2007	2148.47	3698.78	1.72
2008	2252.17	3786.63	1.68
2009	2339.87	4049.81	1.73
2010	2442.73	4404.70	1.80
2011	2570.85	4635.88	1.80
2012	2706.59	4827.56	1.78
2013	2835.77	5073.61	1.79
2014	2973.04	5385.14	1.81
2015	3132.57	5756.66	1.84
2016	3319.35	6095.72	1.84
2017	3523.98	6430.11	1.82
Average			1.60

Note: The per capita GDP figures are measured in terms of PPP constant 2011 international dollars.
Source: World Development Indicators (WDI, 2018).

A major reason behind Bangladesh's exports being less responsive to changes in both the local per capita GDP levels and the bilateral RER could be due to the export-restricting trade regulations imposed by India with the primary aim of protecting its local industries. Following the similarity in labor endowments between the two economies, particularly due to being in geographical proximity, it is difficult for these nations to differentiate their locally produced commodities to a large extent. Thus, in order to protect the domestic producers against competition from the commodities imported from Bangladesh, India not only levied tariffs but it also practiced unfair import-inhibiting strategies through the imposition of inappropriate anti-dumping duties on several Bangladeshi products of which lead batteries and jute are of critical importance. The next section provides a qualitative analysis of India's inappropriate anti-dumping policies further attributing to the large BTD of Bangladesh with India. Apart from these, the growth in the informal trade between the two countries has further worsened the BTD of Bangladesh against India. For instance, Bangladesh is said to import goods worth 6 billion US dollar from India through the formal arrangements while an additional 6 billion US dollar worth of goods are imported via illegal channels which, keeping the relatively smaller volumes of total goods exported to India into consideration, further contributes to the soaring BTD of Bangladesh (Mridha, 2019).

7. BILATERAL TRADE BETWEEN BANGLADESH AND INDIA: THE DUMPING ISSUE

The inappropriate Anti-Dumping Duties (ADD) imposed by India on the products imported from Bangladesh have recently been brought into the limelight. It has been alleged that Bangladesh faces undue competition in the Indian markets following the anti-dumping policies pursued by India on a couple of its products being exported to India. Amongst these, the ADD on Bangladeshi jute has been presumed to be a key contributor to Bangladesh's

BTD with India, particularly due to jute being Bangladesh's number one export item to India. In the fiscal year 2015-16, the total value of raw jute and jute products exported to India was worth 96.69 and 164.06 million US dollars respectively, which collectively accounted for almost 38% of Bangladesh's global exports (Islam, 2018). Jute is also the second largest sector of export earning for Bangladesh after the readymade garments sector. However, following the decision of India to levy ADD, ranging from 19 to 352 US dollar per ton, on imported jute and jute products from Bangladesh in 2017, there has been a stern fall in Bangladesh's jute export earnings from India. In the first seven months of the fiscal year 2017-2018, the monetary value of jute exports to India was found to have fallen by almost 109 million US dollars (Parvez, 2018).

Bangladesh had also faced ADD on its lead acid battery (LAB) exports to India. Although Bangladesh started exporting LAB to India in 1996, it started to experience ADD from 2002 onwards. The decision was made based on the complaint to the Indian Directorate General of Anti-Dumping and Allied Duties by the two local LAB manufacturers Exide Industries Ltd and Amara Raja Ltd alleging dumping practices against Rahimafrooz, the leading exporter of LAB to India in Bangladesh (Taslim, 2006). The ADD on LAB exports of Bangladeshi origin made it difficult for Bangladesh to compete in Indian markets and as a result of which trade of LAB between these countries came to a halt in the fiscal year 2001/02. However, Bangladesh made an appeal to India, via the provisions of WTO dispute settlements,to reconsider the ADD decision. The ADD on LAB produced in Bangladesh was in the form of an *ad valorem* import tax on the weight of the imported LAB rather than on the number of units imported which increased the associated import duties to as high as 131% from 28.33% prior the imposition of the ADD. Imposing such duties on the weight of the imported product rather than on the quantity of the imports was not in line with the relevant import guidelines of India. As a result, in 2005, India removed the ADD on Bangladeshi LAB which once again initiated the resumption of LAB exports to India.

Thus, it is evident from the fact that not only due to the real income elasticities of Bangladesh's exports being relatively less elastic to the real income elasticities of its imports, the stubborn BTD scenario of Bangladesh against India had been stimulated via the imposition of ADD by India, specifically aimed at safeguarding the local industries from competition from the Bangladeshi products.

8. CONCLUSIONS

Unbalanced trade flows, unfair and inefficient trade restraining policies and increasing informal trade volumes have historically skewed favorable trade balances in favor of India while placing the burdens of high BTD on Bangladesh. Such trade imbalances have led to the overall welfare gains from international trade being unfairly skewed towards India. As a result, the national interests of these two neighboring economies are slowly diverging which not only could lead to disharmony in their multidimensional bilateral relations but could also contribute to acute macroeconomic problems as well. Although the bilateral trade balance of Bangladesh against India was negative all throughout, the BTD of Bangladesh has increased greatly from 1993 onwards. Thus, this paper investigated the nature of elasticity of Bangladesh's BTD. In addition, the country's import and export elasticities were analyzed separately to shed light on the persistent deficit in bilateral trade balances with India.

The results from the econometric analyses implied that the BTD of Bangladesh had long-term associations with real incomes of both Bangladesh and India and with the bilateral RER between these nations as well. An important finding revealed that Bangladesh's BTD was positively influenced by the growth in the real income levels across both countries. This is alarming in the sense that although a rise in the real income level of India is expected to stimulate lead higher amounts of exports being directed to India from Bangladesh and improve Bangladesh's bilateral trade balance, it also leads to a worsening of the Bangladesh BTD which implies that Bangladesh has not been able to capitalize on the opportunity to capture a significant share of the Indian markets by bridging the import demand of India. Thus, Bangladesh is better-off diversifying its export basket to India and identifying commodities in which it has relative comparative advantages in production over India. However, a major challenge

in this aspect is the similarity of the factor endowments between the nations whereby differentiation the respective indigenous commodities become relatively more perplexing.

The results also indicated a negative association between the BTD of Bangladesh and its bilateral RER with India. It has been said that the devaluation of the Indian rupees against the Bangladeshi taka has been critical in enhancing the BTD of Bangladesh. Thus, it is advised that the Bangladesh government restructure its exchange rate policy and make it more market-oriented keeping the adversities linked to possible Dutch disease problems[2] into check and balance. Apart from these, Bangladesh should ideally contest the ADD levied by India on Bangladeshi products which would enhance Bangladesh's export receipts and simultaneously curb the nation's BTD against India as well. Formalization of the informal trade transactions between the two countries should feature in the policy-making decisions of both countries which can also aid in mitigating the trade imbalances between the nations. Finally, it is recommended that Bangladesh engages in bilateral and multilateral preferential and free trade agreements with India which would tackle the possible trade diversion impacts of not being a member of the trade agreement in which India is a member nation. Effective initiatives have to be taken to revive the South Asian Association for Regional Cooperation (SAARC) in order to govern balanced and equitable trade flows across South Asia, particularly addressing the vigorous BTD problem of Bangladesh against India.

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[2] For more information on Dutch disease see Murshed (2018).

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