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Trade Liberalization and Ready-Made Garments Industry in Bangladesh

(Liberalisasi Perdagangan dan Industri Pembuatan Pakaian Siap di Bangladesh)

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ABSTRACT

The study aims at examining the effect of trade liberalization on ready-made garments (RMG) industry in Bangladesh. It employs Johansen-Juselius Cointegration test and Vector Error Correction Modeling (VECM) on yearly data from January 1990 through September 2011. The results reveal a significant long-term relationship between RMG export of Bangladesh and the three tested explanatory variables (merchandise export of China and India plus domestic inflation in Bangladesh). The Granger Causality test shows the presence of dynamic relationship between the performance of RMG export of Bangladesh and the value of merchandise export from China and India. However, this dynamic relation is non-existent in relation to the inflation factor.

Keywords: New industrial policy; revised industrial policy; quantitative restrictions; structural adjustment program; multi-fiber agreement; generalized system of preferences

ABSTRAK

Kajian ini dilakukan bagi menguji kesan liberalisasi perdagangan ke atas industri pembuatan pakaian siap di Bangladesh. Kaedah kajian melibatkan penggunaan ujian kointegrasi Johansen-Juselius dan model pembetulan ralat vector (VECM) bagi mengenal pasti jenis-jenis interaksi antara nilai eksport pakaian siap dan tiga pembolehubah ekonomi (nilai eskport barangan dari China, India dan kadar inflasi di Bangladesh). Menggunakan data tahunan dari bulan Januari 1990 hingga September 2011, kajian mendapati terdapat hubungan jangka-panjang antara nilai eksport pakaian siap Bangladesh dengan ketiga-tiga pembolehubah. Analisis statistik melalui ujian kesan-akibat Granger menunjukkan terdapat hubungan dinamik yang signifikan antara nilai eksport pakaian siap Bangladesh dengan nilai eksport barangan dari China dan India. Bagaimanapun, hubungan dinamik ini tidak kelihatan apabila nilai eksport pakaian siap Bangladesh dikaitkan dengan kadar inflasi tempatan.

Kata kunci: Polisi industri baru; penyemakan semula dasar perindustrian; sekatan kuantitatif; program pelarasan struktur; perjanjian multi-fibre, sistem umum keutamaan

INTRODUCTION

Over the last 30 years an enormous transformation has taken place in Bangladesh economy. Traditionally Bangladesh has been an agriculture-based economy. However, in the last couple of decades Bangladesh has stepped into industrialized economy and liberalizes trade with export-oriented industry (Faruque 2009). Massive overpopulation, widespread poverty, unstable political condition, immense bureaucratic corruption, inefficient state-owned enterprises, mismanaged port facilities, inefficient use of energy resources, and insufficient power supplies are some of the major obstacles fueling the economic growth of Bangladesh. Despite these hurdles, the country has abundant cheap work force, simple technology support by the industry and delicate policy support by the government which began attracting foreign investors in the 1980s (Shawon 2011).

Bangladesh propelled its trade liberalization program in the mid-eighties (1980s) through a radical economic reformation from a highly restricted and inward-oriented nature of trade regime to an open economy. Since then Bangladesh had passed through three phases of liberalization policy. The first phase of reform covered the period between 1981/82 to 1985/86 with the introduction of New Industrial Policy (NIP). The NIP-82 object was to encourage private sector industrialization in the country. The second phase was initiated in 1986 with the Revised Industrial Policy (RIP) covering the period between 1986/87 to 1990/1991. The RIP-86 objective was mainly to remove a large part of quantitative restrictions (QR) on imports as well as introducing a system of concessions and special incentives for export-oriented activities. The third phase of reforms was the most intensive among all introduced in 1991-92 with Structural Adjustment Program (SAP). The proactive policy of SAP-92 created an

environment to export promotion and sustainable anti-export bias in the economy in Bangladesh (Rahman & Bhattacharya 2000). Such a sharp change in Bangladesh has made an drastic departure from a highly restricted system focusing only on import substitute to a much dynamic, export-oriented system (Baysan 1999).

Bangladesh is a model from East Asian miracles demonstrating its success in ready-made garment (RMG) industry. RMG industry of Bangladesh has shown a phenomenal growth over the last three decades (Khundker 2002). The first garment export unit took place in 1978. Since the early 1990s, RMG entrepreneurs have successfully uplifted and transformed Bangladesh into a garment exporting economy from a very jute-centered export economy (Baysan 1999). Today, RMG industry is one of the key drivers in registering growth to the economy of Bangladesh. Nevertheless, it is also necessary to point out that Bangladesh RMG's success is the direct outcome of the two international contributing factors – Multi Fiber Agreement (MFA) quota provided by the USA and Generalized System of Preferences (GSP) scheme offered by the European Union (Ahmed & Sattar 2004).

The MFA was introduced in 1974 for a short duration up to 2004. Its main objective is to govern world textile trade by imposing quotas on import merchandise from developing countries to developed nations. MFA worked as a stepping stone in reducing trade barriers as well as promoting RMG liberalization. MFA agreement was successful for Bangladesh as the merchandise export of RMG has shown a phenomenal growth. Similarly, GSP is another mechanism by European Union (EU) offering preferential market access to certain products from the developing countries. GSP requires the implementation of two stage conversion processes; rule of origin and process criteria. Rule of origin specifically states that the product must originate from Bangladesh and to be exported directly from Bangladesh to an EU member country. Meanwhile, process criterion requires that the product must be produced in Bangladesh. However, Bangladesh has failed to fully utilize the GSP scheme until 1997 as Bangladesh's RMG depends heavily on imported fabrics from China and India. Today, EU has substantially relaxes some of its stringent policies by allowing import of yarn or fabric from ASEAN countries.

It is important to note that over the past 15 years, earnings from RMG export have increased by more than 8 times with an exceptional growth rate of 16.5% per annum (Mamun 2010). In addition, a 200% growth in the RMG market share helps to place the country from the 36th to 16th rank among global apparel exporters (CPD 2000). Nevertheless, the policy makers of Bangladesh still need to formulate some new strategies in order to survive in the global competitive apparel market. India, for example, has invested Rs.250 billion in infrastructure and technology (approximately USD6 billion) in order to modernize its RMG industry (Robbani 2001). Although Bangladesh is successful on exporting RMG, it has failed to develop basic textile spinning and weaving sub-sectors. Garment makers in Bangladesh still rely on import of fabric and other important component materials such as zippers and buttons.

LITERATURE REVIEW

Several standard trade theories have been appraised to examine the positive co-relationship between trade liberalization and economic growth. Smith (1776) advocates that increase in trade can be achieved through improving the division of labor which in turn will enhance the level of productivity. Smith also emphasizes that having an open and an extensive market will give rise to capitalism and economic growth. The study of Smith was advanced by Ricardo (1817) who proposes that international trade should be based on relative efficiencies (producing at lower opportunity cost) involving the trading nations. For instance, two trading nations will gain from international trade if they have different relative costs for producing the same goods. The Heckscher-Ohlin Theory (1933), which is built on Ricardo's Theory of Comparative Advantage, suggests that the patterns of trade should be based on the factor endowments of the trading nations. Essentially, this theory points out that a country will export a product that uses its abundant and cheap factor inputs and import those products that require the country's scarce resources.

Heckscher (1919) and Ohlin (1933) support trade liberalization because such an approach will increase supply of cheaper raw materials and fixed capital goods. An increase in international trade activities will stimulate faster export expansion which in turn leads to a stronger gross domestic product contribution. Many empirical studies have shown that trade liberalization has no negative impact on the manufacturing sectors like RMG industry. Baysan (1999) argues that trade liberalization contributes toward a positive growth in productivity. Therefore, the importance of trade liberalization in driving dynamic productivity gains and economic growth should not be overlooked.

Earlier empirical studies suggest that the relationship between trade liberalization and economic growth is rather strong. Based on Hecksher-Ohlin Theory, a third world country like Bangladesh is likely to benefit from international trade with respect to income growth and poverty reduction. Dollar (1992) discovers a positive co-relationship between a measure of per capita GPD growth and outward orientation after examining 95 developing countries. Wacziarg (1998) suggests, after investigating 57 countries, that trade openness has a strong impact on economic growth. Likewise, Frankel and Romer (1996) conclude, after having cross-country regressions, that trade has a robust effect on income. Having this empirical evidence, it is safe to say that open trade allows a developing county to grow faster which in turn lead to an effective and efficient means for poverty alleviation (Ahmed & Sattar 2004).

Another theory which is equally important in explaining economic development of Bangladesh in early 1980s is the Growth theory. Neoclassical Growth theory (also known as Exogenous Growth theory) was initially developed based on a controversial economic model advocated by Harrod (1939) and Dolmar (1946). Solow (1956) and Swan (1956) improvise this model and it is later known as Solow-Swan Growth model. The theory postulates that long run economic growth should be propelled by exogenous factors, namely capital accumulation, increase in national productivity, and technological advancement. In the middle of 1980s, the Solow-Swan Growth theory is profoundly criticized and a revised model emerges and later known as Endogenous Growth theory. This new theory suggests that economic growth is a function of endogenous factors rather than external forces. The theory holds that human capital development, innovation, knowledge, and education are the key contributing factors to economic growth. In relation to Bangladesh economic development, both Exogenous and Endogenous growth theories seem relevant in explaining the progress of its RMG industry from the early 1980s until today.

To understand the impact of trade liberalization on Bangladesh economic growth, Begum and Shamsuddin (1998) investigate the short-term impact trade liberalization on export growth from 1961 to 1992. Their study shows a significant economic growth in Bangladesh is attributed to an increase in total factor of productivity of the economy. Razzak et al. (2003) examine the same issue on the long-term perspective using revised and updated data from 1980 until 2000. Their study employs neoclassical and endogenous growth models along with three trade liberalization measures, namely trade to GDP ratio, ratio of consumer goods import to GDP and the implicit nominal tariff rate. Interestingly, they find that there is no significant effect of trade liberalization on the export-growth. Khondokar and Raihan (2004) examine the impact of different policy reforms based on applied general equilibrium framework. Their study reveals negative consequences on the macro-economic activities as well as on the welfare and poverty alleviations. Similarly, Raihan (2007, 2008) finds no evidence of any statistically significant positive output when he analyzes the effect of trade liberalization on economic growth.

World Bank Report (1999) indicates that Bangladesh imports 2 to 3 billion yards of fabric annually to meet the export demands for its RMG. The main suppliers of fabric for Bangladesh over the last 20 years have been India and China. Spinanger (2000) points out that Bangladesh will undoubtedly lose its ground of being on the advantage side due to the shortage of supply of raw materials and the high financing costs. To overcome this situation, he suggests that local entrepreneurs should start investing in the latest technology as well as in the development of human resource skills at all levels. By doing so, wastage can be minimized and production capacity can be optimized. Due to weak backward integration within the RMG industry, Bangladesh loses out in terms of production lead time. It is worth to note the fact that on the average lead time, where China and India are currently taking only 40-60 days and 50-70 days respectively, Bangladesh is taking 90-150 days (McDonald-Vollrath 2005; Haider 2007).

It is also important to see how local economic condition affects the growth of Bangladesh export. Inflation has been identified as one of the key factors affecting the economic growth of Bangladesh. Inflation refers to the rise in prices of goods and services over a period of time. Inflation causes erosion in the purchasing power of money and it has a direct connection with unemployment, income level and output. Theoretically, in any economy, an increase in inflation rate may reduce the unemployment rate. But such was not the case for Bangladesh in year 2010 and 2011. During the period from 2009 till 2010, inflation rate has shown a marginal increase from 8.68% to 8.80% while unemployment rate also rose from 4.9% to 5.2% (Bangladesh Economic Update 2011).

Cost-push and demand-pull are two key factors that influence the inflationary spiral in Bangladesh economy. Cost-push (supply-shock) inflation indicates substantial increases in the cost of important goods or services where no suitable alternative is available. According to Dornbush and Fischer (1994), the US economy experiences remarkable inflation during the period of 1971-74, 1979-80 and 1990 due to oil-shock disturbances. Concurrent global inflation is also viewed as a reason of the recent oil crisis. Over the recent couple of years, a series of inflationary incidents have taken place in Bangladesh. Researchers have identified through various empirical examinations that supply side phenomena may be the main reason for such adverse cost conditions. In addition, labor cost and cost of imports are expected to work as the substantial influential factor for cost-push inflation (Majumder 2006).

Demand-pull inflation refers to a situation when the aggregate demand in the economy outpaces the aggregate supply (Basher & Khan 2007). As the economy grows, inflation follows suit coupled with an increase in real gross domestic product and a decrease in unemployment rate. Keynesian theory explains that the higher aggregate demand (AD) is the result of increasing employment rate which in turn generates economic growth. Due to capacity constraints, this increase in output will eventually become so small that the price of the good will rise. Strong export demand, increase in remittances, expansionary financial policy and higher growth of money supply are factors contributing to an increase in aggregate demand for goods and services in Bangladesh in recent year (Basher & Khan 2007).

This study is pursued with the motivation to find out the effect of trade liberalization or open trade on Bangladesh RMG industry with special attention given towards the roles of India, China and national inflation. Trade liberalization removes quotas, reduces restrictions or lowers tariffs and increases world output. Merchandise

export of India and China are the key variables in this study because India and China are the main suppliers of garment-related products, particularly yarn and fabric, for Bangladesh (Alam et al. 2009). This paper seeks for empirical evidence by exploring theoretical links between trade liberalization and the growth of Bangladesh RMG industry. Specifically, the study is narrowed towards a number of pertinent issues relating to the export of RMG within the framework of trade liberalization and local economic conditions. Subsequently, the following research questions are studied and analyzed:

1. Is wider trade openness likely to contribute towards higher economic growth through export?
2. How does merchandise export of China influence the export growth of Bangladesh RMG?
3. How does merchandise export of India affect the export growth of Bangladesh RMG?

DATA AND METHODOLOGY

This study employs the Vector Autoregressive method (VAR) which encompasses the Johansen-Juselius Multivariate cointegration, Vector Error Correction Model (VECM), Impulse Response Function (IRF) and Variance Decomposition (VDC). To examine the theoretical relationship between RMG export of Bangladesh and the three explanatory variables, the model below is developed:

$$RMG_B = f(ME_I, ME_C, Inflation_B)$$

Equation (1) articulates the mathematical expression of the model;

$$RMG_B = \beta_0 + \beta_1 ME_I + \beta_2 ME_C + \beta_3 Inflation_B + \mu_t \quad (1)$$

where:

RMG_B = ready-made garment export of Bangladesh,
ME_I = merchandise export of India,
ME_C = merchandise export of China,
$Inflation_B$ = inflation in Bangladesh, and
μ_t = Error Terms.

This model is based on the framework of modern trade theories with special attention given to Heckscher-Ohlin Theory (1933). Specifically, the research framework attempts to identify the type and strength of the relationship (long-term and dynamic relations) between the endogenous and exogenous variables.

The data for this study covers a 22-year period spanning from January 1990 till September 2011. In evaluating the statistical relationships between RMG_B and the three variables, both the Engle-Granger (1987) and Johansen-Juselius (1990) cointegration procedures are used. It is an econometric technique for testing the correlation between non-stationary time series variables (Granger 1981, Granger & Weiss 1983, and Engle a & Granger 1987). Two variables are considered to be 'cointegrated' when a linear combination of the two is stationary, even if each variable is, by itself or at level, non-stationary. Generally, when two variables are non-stationary, it is highly possible that their linear combination to also be non-stationary. Nonetheless, Engle and Granger (1987) have proven this to be incorrect. In line with Granger (1981) and Engle-Granger (1987), components in vector X_t are cointegrated at *d,b* degree if (i) every component in X_t is *I(d)* and (ii) given that *d* is the number of differencing, and *b* the number of cointegrating vector, there exists a nonzero vector $\beta = (\beta_1, \beta_2, \ldots, \beta_n)$ such that the linear combination of $\beta X_t = \beta_1 X_{1t} + \beta_2 X_{2t} + \ldots + \beta n X_{nt}$ is cointegrated at *d,b* degree, where $b > 0$. The vector β is called the cointegration vector.

In order to stay away from non-stationarity problem, it is necessary to utilize the first difference (or difference at a higher level) data. Still, this may result in a loss of valuable data points on long-run attributes of the data. However, if there is an equilibrium association between such variables, the error terms should be stationary (Engle & Granger 1987). The unit root test is essential in determining the stationarity of time series data. Questions like (1) whether the variables tested have the tendency to return to its long term trend after a shock (i.e., it is stationary) or exhibits a random walk pattern (i.e., it has a unit root) needs to be answered preceding any further data analysis. This is to avoid any spurious regression relationship. This Augmented Dickey Fuller test (ADF) below is used:

$$\Delta X_t = \lambda_0 + \lambda_1 T + \lambda_2 X_{t-1} + \Sigma \lambda_i \Delta X_{t-i} + \varepsilon_t \quad (2)$$

where:

i = 1, 2, 3,…, k.

The hypotheses being tested are:

H_0: $\lambda_2 = 0$ (the data is not stationary, it contains unit root)
H_1: $\lambda_2 < 0$ (data is stationary, it does not contain unit root)

Once this condition of stationarity is satisfied, both variables are assumed to be cointegrated. The Vector Error Correction Model (VECM) method can then be run. VECM allows for short run adjustments while confining the long run behavior of endogeneous variables to converge to their cointegrating relationship. The VECM allows us to break up the short-term from long-term associations. The VAR model is as follows;

$$X_t = A_0 + \sum_{k=1}^{p} A_k X_{t-k} + e_t \quad (3)$$

where:

X_t = an n ×1 vector of variables,
A_0 = an n × 1 vector of constant terms,
A_k = an n × n matrix of coefficients, and
e_t = an n × 1 vector of error terms.

The outcome from the cointegration test will depict the long term relationship among the variables. The short run dynamics will be represented by the VAR model. If the variables are non-stationary and are not cointegrated, the VAR model above (in first differences) will be used.

Alternatively, if the variables are cointegrated, the VECM model (a level VAR) is used.

This study also employs the Ordinary Least Square Method (OLS). The critical assumptions here are (a) time-series data is stationary, (b) the error term is homoscedastic, (c) there is no autocorrelation between residuals, (d) normal residual distribution, and (e) there is an absence of multicollinearity among independent variables. These are all in accordance to the Classical Normal Linear Regression assumptions. These assumptions must be observed to ensure the validity and robustness of the findings in this research. As such, diagnostic tests such as Augmented-Dickey Fuller unit root test, Moments of Specification Test/White test, Durbin-Watson test, Anderson-Darling test and Variance Inflation Technique are conducted. In investigating the relationship between RMG_B and the three tested variables, the study develops a model of unidirectional causality running from the three tested variables to RMG_B. This model is pursued because India and China have been the main key textile suppliers for Bangladesh since RMG industry was first introduced in early 1980s.

First, unit root tests are performed on all time-series variables. This is followed by Johansen-Juselius cointegration test. Then, the Granger causality test via Vector Error Correction Modeling is conducted. In order to observe the dynamic interaction between endogenous and exogenous variables, this study then makes use of the Impulse Response Functions (IRF) and Variance Decomposition (VDC).

EMPIRICAL FINDINGS

This study employs Augmented Dickey-Fuller stationary test on the four time series data. The p-value is used to determine the significance level of the hypothesis testing. The time series under consideration should be integrated in the same order before the study can proceed to Johansen-Juselius Cointegration test. Table 1 presents the test result from the ADF and PP tests on each variable at level and first difference respectively. The test results show the acceptance of null hypothesis indicating that all time-series variables are non-stationary at level. On the other hand, all null hypotheses on the first differenced data series are rejected indicating all data series under consideration are stationary at first difference. From the test results above, it is now obvious that all investigated variables are stationary at the same order or I (1).

TABLE 1. Results of Unit Root Tests
(at level and first difference)

Method	At Level		At First Difference	
	Statistics	Prob.**	Statistics	Prob.**
Null Hypothesis: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	2.68840	0.9964	-2.67650	0.0037
Null Hypothesis: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	2.07705	0.9811	-4.05880	0.0000
ADF- Fisher Chi-square	15.3564	0.0526	32.5000	0.0001
PP-Fisher Chi-square	7.03155	0.5332	40.6642	0.0000

Notes: **Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

To determine optimum lag-length, the study uses AIC and SC statistics. The test results in Table 2 show that the best model is obtained with the utilization of lag 1. To test the significance of the *ect* (or error correction terms) in each individual model above, the p-value is reported to indicate the level of significance.

Johansen-Juselius Cointegration Test (1990) is used to determine the number of cointegrating vectors. Johansen (1988) suggests two statistic tests to determine the cointegration rank, namely lamda trace and lamda max. The results of this cointegration analysis are reported in Table 3. Lamda trace and lamda max statistics indicate the existence of cointegration between variables. The null hypothesis of no cointegrating vector ($r = 0$) is rejected at 5% significance level on all lag tested (1, 2 and 3). Since lamda trace and lamda max are greater than their respective critical values, we conclude that there is at least one cointegrating vector exists for the time series variables in the system. This cointegrating vector or *r* is the variable that pulls all the five variables in the equation to be cointegrated in the long-run. In other words, *r* indicates the number of cointegrating relationships (Masih et al. 1996).

TABLE 2. VAR Lag Order Selection Criteria

Endogenous Variables: RMG_BD_INFLATION_BD_CHINA ME_INDIA
Exogenous variables: C

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-746.5238	NA	1.30e+26	71.47845	71.67741	71.52163
1	-688.7013	88.11040*	2.51e+24*	67.49536*	68.49015*	67.71126*

Notes : *indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

TABLE 3. Johansen-Juselius Cointegration Test Results

Series: RMG_BD_ME_INDIA ME_CHINA INFLATION_BD_
Lags interval (in first differences) 1 to 1

Hyp. No. of CE(s)	Trace	Stats	5% CV	1% CV	Eigenvalue	Stats	5% CV	1% CV
None**	0.8704	92.1245	47.21	54.46	0.8704	40.8630	27.21	32.24
At most 1**	0.8015	51.2615	29.68	35.65	0.8015	32.3405	20.97	25.52
At most 2*	0.5890	18.9210	15.41	20.04	0.5890	17.7842	14.07	18.63
At most 3	0.0553	1.13681	3.76	6.65	0.0553	1.13681	3.76	6.65

Notes : Trace test and Max-eigenvalue tests indicate 3 co-integrating equation(s) at the 5% level.
Trace test and Max-eigenvalue tests indicate 2 co-integrating equation(s) at the 5% level.
*(**) denotes rejection of the hypothesis at the 5% (1%) level.
CV = critical value.

TABLE 4. Vector Error Correction Estimates via VECM (1)

Variable Name	D(RMG_BD)	D(ME_INDIA)	D(ME_CHINA)	D(INFLATION)
ECMt-1	-0.084450	0.035085	2.094165	-4.94E-05
	(0.01199)	(0.13444)	(1.17879)	(2.7E-05)
	[-7.04502]	[0.26097]	[1.77653]	[-1.84126]
D(RMG_BD(-1))	-0.046900	17.30536	115.4983	-0.000386
	(0.49822)	(5.58772)	(48.9941)	(0.00112)
	[-0.09414]	[3.09703]	[2.35740]	[-0.34574]
D(ME_INDIA(-1))	0.317362	-3.072449	-28.86504	0.000209
	(0.07186)	(0.80594)	(7.06664)	(0.00016)
	[4.41636]	[-3.81224]	[-4.08469]	[1.30094]
D(ME_CHINA(-1))	-0.054616	0.401986	4.082447	-2.77E-05
	(0.01042)	(0.11684)	(1.02450)	(2.3E-05)
	[5.24242]	[3.44038]	[3.98480]	[-1.18797]
D(INFLATION_BD_ (-1))	112.4598	1127.921	7564.543	0.034281
	(112.119)	(1257.46)	(11025.6)	(0.25097)
	[1.00304]	[0.89699]	[0.68609]	[0.13660]
C	1188.565	37.60713	-3627.659	0.183652
	(413.347)	(4635.85)	(40647.9)	(0.92523)
	[2.87546]	[0.00811]	[-0.08925]	[0.19849]
R-squared	0.841972	0.713068	0.604402	0.243749
Adj. R-squared	0.785534	0.610592	0.463118	-0.026340
F-statistic	14.91843	6.958409	4.277900	0.902476
Akaike AIC	16.84780	21.68237	26.02463	4.643804
Schwarz SC	17.14652	21.98109	26.32335	4.942524

Notes: Standard errors in ( ) & t-statistics in [ ]

Table 4 shows the results of all VECM estimates. However, our study focuses only on RMG_B model in which the error correction terms (*ect*) in VECM(1) is significant at 5% level. Recall that *ect* has to be negative in value or its value must lie within the range of 0.00 and -1.00 (0.00>*ect*>-1.00). Having the value of *ect* from VECM (1) equals -0.0844, we can conclude that there is a significant long-run relationship between RMG_B and the other three variables, namely ME_I, ME_C and Inflation. Furthermore, there is about 8.4% speed of adjustment towards equilibrium made by RMG_B in the system. This is considered a slow adjustment process which could be attributed to the current scenario in the global commodity market. Higher speed of adjustment is preferred because a statistically reliable endogenous variable should demonstrate higher speed of adjustment. This finding is in line with our expectation that RMG_B is the endogenous variable in relation to ME_I, ME_C and Inflation. Interestingly, the test result from Granger Causality within sample in VECM (1) indicates a presence of dynamic relation between RMG_B and ME_I as well as RMG_B and ME_C. This finding implies that both ME_I and ME_C 'Granger-causes' RMG_B and therefore, the two explanatory variables are indeed leading economic indicators in the system.

The followings are the normalized long-run (variables at level) coefficients from the long-run regression by the system (*via* Johansen-Juselius Cointegration using lamda max). From Table 5, the respective ME_I, ME_C and Inflation coefficients of 4.9695, -0.6331 and 2616.777 indicate the type of relationship they have established with RMG_B. Specifically, there is a negative relationship between RMG_B and ME_I as well as inflation in the long-run (take

the opposite sign). An increase in either ME_I or inflation will leave some negative long-run effects on the RMG_B. It is quite a surprise to note that this finding is not in line with our expectation that increase in ME_I should boost the export of RMG_B.

TABLE 5. Normalized Equation Results

RMG_BD	ME_INDIA	ME_CHINA	INFLATION_BD_
1.000000	4.969500	-0.633074	2616.777
	(0.71513)	(0.09337)	(1302.67)

Notes: Standard errors in ( )

Dynamic simulations are used to calculate impulse response function (IRF) and to visualize variance decomposition (VDC) in order substantiate the results obtained from VECM. From one standard deviation shock in ME_I as shown in Figure 1, the response of RMG_B is seen significant even though it moves in both directions. Similar finding is observed in investigating the impact of ME_C and inflation on RMG_B. As such, the influence of ME_I, ME_C and inflation on RMG_B performance appears to be significant and consistent over long run.

The results of variance decomposition (VDC) are presented in Table 6. The ten-period horizon is used to demonstrate a sense of the dynamics in the system. The Granger-causal chain implied by the VDC analysis tends to suggest that RMG_B is relatively the leading variable, being the most exogenous of all, followed by INF. Decomposition of variance in RMG_D, besides being explained by its own, can also be explained by ME_I (20%) and ME_C (19.6%). Interestingly, the same can be said for INF, in which 30.5% of its variation is explained by RMG_B, while another 14.7% is explained by ME_C.

CONCLUSION AND IMPLICATION

This paper finds that there is a significant long-term relationship between RMG export from Bangladesh and the three tested explanatory variables. From Granger-causality test, both merchandise exports from India and China 'Granger-Cause' the performance of RMG export from Bangladesh. This evidence supports the initial theory on the importance of India and China in supplying base and intermediate products required by Bangladesh RMG industry. However, when a dynamic simulation via Impulse Response is used, domestic inflation factor seems relevant in explaining the performance of RMG export from Bangladesh. The RMG industry is one of the vibrant source of economic growth in Bangladesh's export market which accounts for almost four fifth of our total export earnings (Murshid et al. 2009). The empirical findings from this

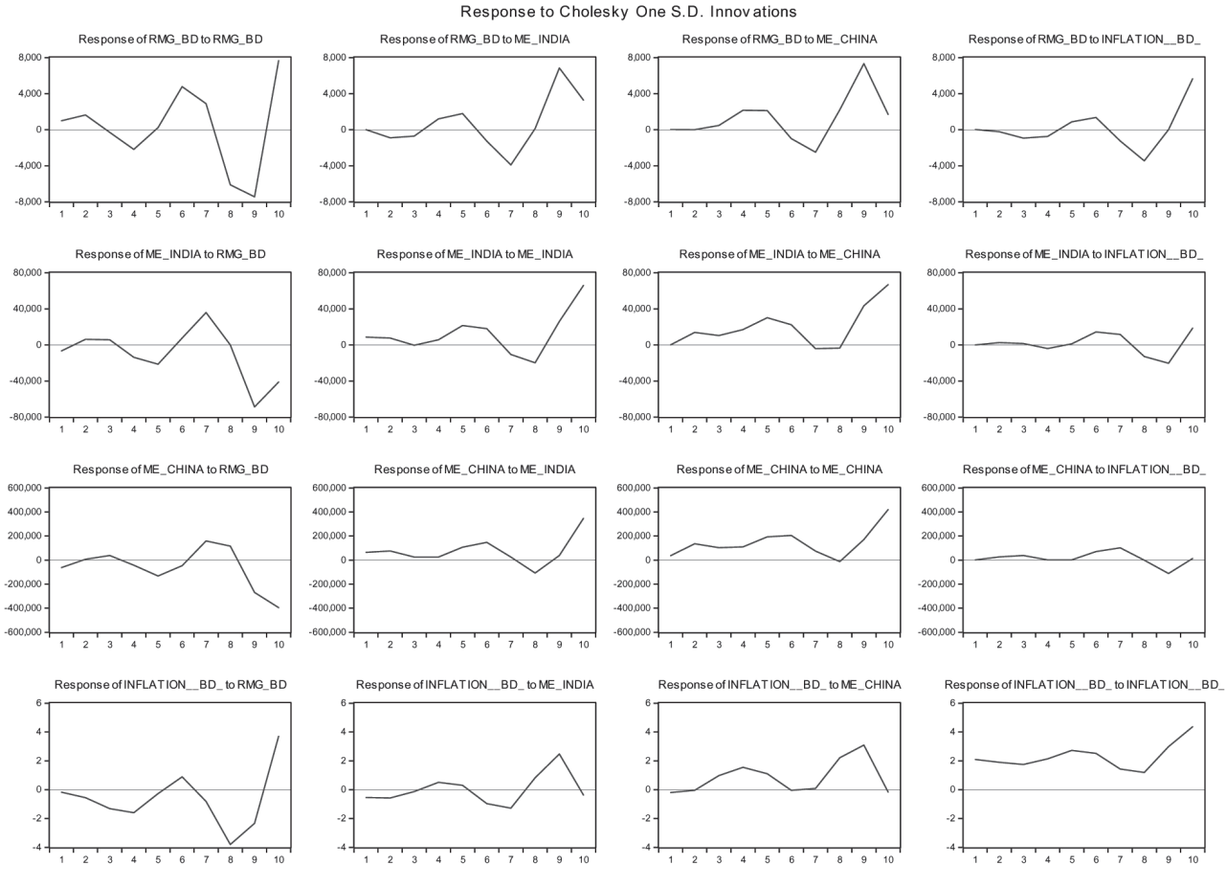

FIGURE 1. Impulse Response Function

TABLE 6. Variance Decomposition

Panel A. RMG_B Period	S.E.	RMG_BD	ME_INDIA	ME_CHINA	INFLATION__BD_
1	975.8409	100.0000	0.000000	0.000000	0.000000
2	2112.609	80.82855	17.99521	0.010512	1.165727
3	2482.573	60.07618	21.57293	3.327107	15.02378
4	4189.766	48.63654	15.58092	27.35182	8.430717
10	19962.75	47.91767	20.09282	19.60581	12.38370
Panel B. ME_I Period	S.E.	RMG_BD	ME_INDIA	ME_CHINA	INFLATION__BD_
1	10944.43	38.19184	61.80816	0.000000	0.000000
2	20182.56	20.90243	31.50831	45.97585	1.613402
3	23432.91	21.07512	23.40803	53.88791	1.628936
4	32799.56	28.63663	15.05824	53.99022	2.314910
10	157098.3	34.61735	26.28627	33.87188	5.224501
Panel C. ME_C Period	S.E.	RMG_BD	ME_INDIA	ME_CHINA	INFLATION__BD_
1	95962.50	40.76077	44.65763	14.58160	0.000000
2	184192.7	11.21368	28.74875	57.82204	2.215532
3	219655.0	11.00397	21.40480	63.07707	4.514149
4	250531.6	11.22901	17.44424	67.85645	3.470309
10	912980.8	35.34223	21.27608	39.74470	3.636986
Panel D. INF_L Period	S.E.	RMG_BD	ME_INDIA	ME_CHINA	INFLATION__BD_
1	2.184312	0.653126	6.006409	0.755943	92.58452
2	3.003991	3.794767	6.741996	0.418253	89.04498
3	3.848114	13.99768	4.219204	6.753000	75.03012
4	4.960957	18.65071	3.610501	13.94067	63.79812
10	11.40787	30.50405	8.046131	14.74058	46.70924

Notes: ME = merchandise exports and RMG = ready-made garments.

study are consistent with the study by Mamun and Nath (2005) who acknowledge the importance of exports sector to generate economic growth for Bangladesh.

It is now evident that Bangladesh has strategically positioned its garment exporting economy by adopting a highly competitive market mechanism (Devaraja 2011). Today, Bangladesh holds more than 4% share in the global clothing export-market and position itself as third largest garment exporting country in terms of value after China and Turkey (Shawon 2011). Bangladesh Export Promotion Bureau forecasts higher export value from the RMG segment in the future and anticipating approximately USD25 billion in 2013. The strength of Bangladesh RMG industry lies on its low-cost skilled labor along with their innovation in adding value to the apparels and easy operational procedure. All these key factors have helped sustain the growth of RMG industry in Bangladesh since its inception.

Policy studies on macroeconomic variables that can pose serious threat the economy, such as inflation, need to be carried out consistently. For instance, India lost its competitiveness in 2011 due to domestic inflation. Any policy that can curb national inflation should be deployed by Bangladesh monetary authorities so as to ensure the country's level of competitiveness is maintained. Bangladesh must work collectively with its major trade partners, in particular China and India, in order to enjoy sustainable growth in the RMG industry. Bangladesh policy makers must look for trade policies that can provide long-term mutual benefits to both sides. Trade statistics show that China and India are Bangladesh's major trade partners in the RMG industry with annual business dealing worth of over USD4.5 billion and USD3.5 billion, respectively (Financial Express 2011). Direct competition with India and China on manufacturing of same product segments along the RMG value chain should be avoided completely because such an approach will dampen production harmonization in the long run. Specialization in the manufacturing of certain segments in the RMG value chain should be encouraged as this approach will not only enable both trading countries to produce at lower opportunity costs but also promote efficient allocation of resources among them. As such, the government of Bangladesh and its trade partners from India and China should come to an agreement on the terms of trade involving RMG products. Perhaps, economic cooperation in the form of customs union should be explored among themselves.

One cannot deny the fact that trade liberalization can result in some negative impacts, particularly when a country depends heavily on import of capital goods and intermediary products to support its export-oriented industries like RMG in Bangladesh. Within the free

market economy, domestic industries must devise some innovative strategies to fortify its supply chain. In the case of Bangladesh, its cotton, weaving and assembly process segments need to be technologically enhanced so that those segments in the RMG value chain remains highly competitive and not to be substituted by their counterparts from India and China (Bangladesh Economic Update 2011). As suggested by both trade and growth theories, it is timely for Bangladesh to devise a favorable trade policy and embrace new RMG manufacturing technology coupled with investment in human capital in order to improve its production efficiency and subsequently maintain its competitiveness in the designated segments in the RMG value chain.

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