

# Empirical Analysis Between Export and GDP: A Case of BIMSTEC as a Regional Trading Bloc

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## Abstract

This main aim of study was to assess the empirical relationship between exports and GDP for BIMSTEC nations by using annual data for the period from 1997- 98 to 2012-13. Time-series data was used for testing econometric techniques (Granger causality and cointegration) for the assessment of hypothesis of GDP strategy led by exports and exports led by GDP. BIMSTEC was proposed with the object to merge Thailand's 'Look West' policy and ASEAN with the 'Look East' policy of India and South Asia. The results explained the evidence of uni-directional causality between GDP and exports among the BIMSTEC bloc. The results support the growth-led exports in case of BIMSTEC. For making BIMSTEC a "vibrant regional entity," there is need to revitalize coastal shipping preparations and inter-modal transport, practices for easy flow of goods and services.

**Keywords :** BIMSTEC, export, GDP, co-integration, unit root, Granger causality

**JEL Classification :** C12, C13, F15

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In the present world, no nations survive in economic isolation. Each and every aspect of the economy - its industries, service sector, employment and levels of income, and living standards are associated to the economies of its trading cohorts. In Asia, there are different regional trading blocs such as ASEAN (Association of Southeast Asian Nations), SAARC (South Asia Association of Regional Cooperation), ECO (Economic Cooperation Organization), MGC (Mekong - Ganga Cooperation), BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation), SCO (Shanghai Cooperation Organization), ACD (Asia Cooperation Dialogue), and GCC (Gulf Cooperation Council). These trade blocs play a significant role for the growth of Asian nations. The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) is an international organization linking a cluster of nations in South Asia and South-East Asia. Member nations of BIMSTEC are India, Thailand, Bangladesh, Myanmar, Sri Lanka, Bhutan, and Nepal.

In the 1990s, these countries were determined to get engaged in a regional corporation with a view to attain superior economies of scale in production, achieve specialism, boost competitiveness, expand export basket, and make utilization of their under-utilized economic impending in terms of human beings, technological, and natural resources with lesser potential of back-sliding. In Bangkok, in June 1997, a new sub-regional alliance was created and given the name BIST-EC (Bangladesh, India, Sri Lanka, and Thailand Economic Cooperation). Myanmar was present at the foundational gathering as a spectator and connected the group as a complete part at a special

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ministerial conference held in Bangkok in December 1997, and the name of the alliance was altered to BIMSTEC. BIMSTEC is an initiative with the objective to merge Thailand's 'Look West' policy and ASEAN with the 'Look East' policy of India and South Asia. BIMSTEC can be explained as an association among ASEAN and SARRC. The uniqueness of BIMSTEC is in its multi sectoral approach compared to other Asian blocs. Seven members of BIMSTEC cover up 14 main concern sectors escorted by member nations in a voluntary approach, that is, Trade & Investment, Technology, Energy, Transport & Communication, Tourism, Fisheries, Agriculture, Cultural Cooperation, Environment and Disaster Management, Public Health, People-to- People Contract, Poverty Alleviation, Counter-Terrorism, and Intercontinental Crimes and Climate Change.

Historically, the Bay of Bengal has been an essential component of India's strategic, economic, and civilization areas of interest and consciousness. BIMSTEC was formed at the time when the process of globalization was sweeping the world. At the end of the Cold War, the nonaligned movement lost its relevance. China emerged as a strong economy. WTO had been formed in 1995. SAARC, the South Asian regional organization, which was formed in 1985, was not making any headway due to mutual dissensions and mistrust of member countries. This was broadly the international and regional scenario when BIMSTEC was being conceived and formed in 1997. The creation of BIMSTEC can be accredited to two things - one is the breakdown of SAARC to form energetic regional environment for trade and economic cooperation, and second is ongoing procedure of liberalization of South Asian economies frantic to find out latest markets in the ASEAN region as an alternative of SAARC, whose scale is restricted due to the non-economic aspect that is improbable to alter in the close future. One more aspect, which might be cited for the creation of this bloc, is Thailand's craving to set up a strong grip on the Indian subcontinent as of escalating competition it has been facing in the ASEAN markets. Although BIMSTEC came into reality very recently, its creation can be traced back to mid-1960s, when together India and Sri Lanka were invited to attach to ASEAN, but declined. In 1981, Sri Lanka made a vain effort to join ASEAN, but it was mutually India and Pakistan, which obtained Dialogue Partner status in 1993. The approach of South Asian nations to establish connection and enlarge economic cooperation shows their purpose to support economic associations with the ASEAN countries. BIMSTEC might be used as an instrument for South Asian nations to set up and enlarge a good-quality relationship with the ASEAN nations (Devi, 2007).

The main thing that makes BIMSTEC dissimilar as of other organizations is that BIMSTEC represents one of the most varied regions of the world, be it the way of life, religion, language, or culture. BIMSTEC has visibly recognized issues of development and common concern into 14 main concern sectors, which cover a diversity of facets of 'development' and the issue of general concern like counter-terrorism and intercontinental crime. The seven new sectors were discussed in the first BIMSTEC Summit. BIMSTEC links 1.5 billion people, more than 21% of the world population, and has a combined GDP of nearly US\$ 2.5 trillion (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), n.d.). BIMSTEC was formed to create economic and social affluence based on equality in order to enhance the common benefits in economics, social, and technological aspects, it also engrosses intra-regional aid in training, research, and development as well as cooperation in industry, agriculture, expansion of trade and investment, up gradation in communication and transport, improving living standards and collaboration with other international organizations (Chakraborty, 2007).

In Asia Pacific, BIMSTEC is playing an important role to attract trade and investment. India played a chief role by integrating trade and investments to promote economic cooperation. The North Eastern states of Mizoram, Nagaland, Assam, Arunachal Pradesh, Meghalaya, Sikkim, Tripura, and Manipur are enclosed by Bangladesh and Bhutan, and are essential to the BIMSTEC proposal. These are essential to BIMSTEC in the sense that its association consists of nations from South and Southeast Asian regions. The initial level of meeting in consolidation of liberalization profit is expected out of this initiative considerate that both SAARC (South Asian Association for Regional Cooperation) and ASEAN are at diverse levels of progress. BIMSTEC has a potential to enhance the trade between member countries by taking benefit of their geographical position in the region of the

Bay of Bengal and the Eastern coast of the Indian Ocean. A number of initiatives towards intra-regional trade liberalization among individual associate nations of BIMSTEC under bilateral and regional trade agreements have been undertaken in the earlier period (Taw, 2014).

Being a lead country in the grouping, India draws attention in the BIMSTEC framework and its functioning in the backdrop of the fast-changing global economic environment. India is a fast emerging global power and is both the factor for peace and stability as well as is a dynamic economic player in the region. India, with its recent economic clout, capacity building measure, and IT prowess, together with a gradual shift in the foreign policy outlook to suit to a rapid change in global geo-political issues deserves a special status in the BIMSTEC region. Together with Thailand, India can change the economic profile of the region and can provide an edge of regional perspective over national sovereignties.

India and Myanmar share a long border of 1640 km of the seven North Eastern states, and four have been really fortunate to share this tranquil border. The growing cordiality between the two countries has been manifested in various transport corridors jointly developed by India in Myanmar. According to Myanmar foreign minister U Win Aung, the transport corridors are the symbol of close cooperation between two countries. The new road will help to promote economic development and cooperation based on our common desire to have good relations between our countries and to uplift the socioeconomic standard of the national races living along the border. India and Myanmar have cooperation in the areas including remote sensing, gas exploration, and hydel power generation. India and Nepal have good linguistic and cultural relations. Mutually beneficial bilateral relations and cooperation have been facilitated by the frequent exchange of high level visits between the two nations. India and Bhutan share a border of about 700 km. India is the principal donor for the economic development of Bhutan. India also offered financial assistance for several hydroelectric projects in Bhutan and also agreed to buy the surplus power. After achieving liberalization, Bangladesh opened its economy, and India had offered help to Bangladesh in various sectors such as IT, cyclonic tidal surge management, etc (Devi, 2005).

The BIMSTEC nations contain both developing nations and least developing countries (LDC's). Therefore, they are characterized by higher tariff barriers on their imports vis-à-vis their developed counterparts. It was anticipated that on the one hand, the special treatment would permit the nations to increase improved access in each other's markets. The 'enabling clause' provision would give them the requisite safeguard to protect the responsive domestic sectors on the other. Furthermore, apart from the tariff barriers, it was predictable that the trade facilitation procedures would considerably lower the level of transaction costs, which presently put a downward pressure on the intra-regional trade dimensions (Chakraborti, 2007).

## **Research Gap and Objective of the Study**

The present study is conducted with an aim to evaluate the empirical analysis of causality between GDP and exports in case of the BIMSTEC region. Most of studies have pointed the issues such as trade, investment, economic cooperation, political diplomacy, etc., but there is lack of existence of studies on the exports and GDP relations in the BIMSTEC region. Since this issue is a vital one, the present study is conducted for intensive analysis on the topic. The scope of this study is limited to export performance of BIMSTEC as a regional trading bloc. The aim of the study is to analyze the empirical relationship among exports and GDP for BIMSTEC nations from the period from 1997-98 to 2012-13.

The Table 1 depicts the GDP at purchasing power parity of BIMSTEC nations. The distinction in per capita GDP of the richest nation, Thailand, that is, US\$ 7974 purchasing power parity(PPP) and the poorest member, Nepal having US\$ 1183 PPP is huge at about 574%. The per capita GDP (PPP) of other member nations is : India is US\$ 2789.9, Bhutan is US\$ 4760.8, Bangladesh is US\$ 1398.39, Myanmar is US\$ 1151.38, and Sri Lanka is US\$ 4588.98. Between 2005 and 2009, with the exception of Nepal, every member nation saw an average annual rate of growth of over 5%.

**Table 1. GDP at Purchasing Power Parity (PPP) of BIMSTEC Nations**

Nations	GDP (PPP) ( IN US \$)
India	2789.9
Thailand	7974
Myanmar	1151.38
Bangladesh	1398.39
Sri Lanka	4588.98
Nepal	1183
Bhutan	4760.8

Source: BIMSTEC.org

## Export Performance of BIMSTEC

India is the biggest economy in terms of its macroeconomic indicators, while Bhutan is the smallest in the bloc among all the member nations. In between these two, only Thailand can be noticed as a dominant nation in the group. The member states collectively had a combined GDP of US\$ 1.7 trillion in nominal terms and US\$ 4.2 trillion in purchasing power parity (PPP) terms. They account for approximately one-fifth of the world's population, occupy 3.64% of the surface area. The BIMSTEC is characterized by momentous heterogeneity of income among the member countries as all nations are at diverse levels of development (Batra, 2010). The

**Table 2. Percentage Share of BIMSTEC Member Nations in Total Exports of BIMSTEC Trading Bloc**

Year	Total exports of BIMSTEC nations (in US\$ Million)	Percentage share of Nepal	Percentage share of Bangladesh	Percentage share of Myanmar	Percentage share of Bhutan	Percentage share of Sri Lanka	Percentage share of Thailand	Percentage share of India
1997-98	103324.21	0.40	4.68	0.94	0.10	4.49	54.83	34.54
1998-99	98435.92	0.49	5.22	1.08	0.11	4.88	53.59	34.55
1999-2000	105705.71	0.58	5.16	1.21	0.10	4.35	53.71	34.62
2000-01	125507.76	0.62	5.10	1.31	0.09	4.33	54.10	34.89
2001-02	122094.66	0.59	4.98	2.05	0.08	3.95	51.67	34.46
2002-03	131106.41	0.48	4.65	1.83	0.08	3.58	50.37	36.69
2003-04	154658.01	0.45	4.56	1.73	0.07	3.32	50.49	39.01
2004-05	190652.28	0.41	4.28	1.52	0.08	3.02	49.82	39.37
Average	<b>128935.6</b>	<b>0.50</b>	<b>4.83</b>	<b>1.46</b>	<b>0.09</b>	<b>3.99</b>	<b>52.32</b>	<b>36.02</b>
2005-06	232059.5	0.39	4.01	1.62	0.09	2.73	47.13	40.88
2006-07	275802.7	0.31	4.19	1.63	0.11	2.50	46.38	44.03
2007-08	332874.62	0.28	3.75	1.87	0.17	2.30	45.43	44.88
2008-09	406136.13	0.24	3.82	1.75	0.15	2.00	43.14	46.20
2009-10	348726.57	0.24	4.32	1.78	0.15	2.03	43.24	48.90
2010-11	454535.85	0.20	4.23	1.69	0.12	1.90	42.15	48.24
2011-12	563130.88	0.18	4.36	1.45	0.12	1.88	38.91	49.71
2012-13	570078.34	0.17	4.39	1.38	0.10	1.68	39.66	53.10
Average	<b>397918.1</b>	<b>0.25</b>	<b>4.13</b>	<b>1.65</b>	<b>0.13</b>	<b>2.13</b>	<b>43.26</b>	<b>46.99</b>

Source: UNCTAD database (United Nation Conference on Trade and Development)

**Table 3. Compound Annual Growth Rate for Export Performance of BIMSTEC (in %)**

Year	Bangladesh	Bhutan	India	Sri Lanka	Nepal	Thailand	Myanmar	BIMSTEC
1997-98	20.72	1.79	5.82	13.27	6.44	4.13	3.91	5.78
1998-99	6.23	12.05	-4.56	3.65	16.50	-6.89	9.30	4.73
1999-2000	6.16	-5.94	8.22	-4.39	27.02	7.62	20.27	7.39
2000-01	17.24	9.15	17.27	18.33	26.76	19.58	27.90	18.73
2001-02	-4.91	-12.94	3.58	-11.45	-7.17	7.09	52.44	-2.72
2002-03	0.29	4.12	14.17	-2.44	-12.28	4.68	-4.06	7.38
2003-04	15.53	8.86	19.07	9.24	11.26	18.25	11.94	17.96
2004-05	15.61	39.75	27.99	12.16	9.93	21.64	7.99	23.27
<b>Average</b>	<b>9.61</b>	<b>7.11</b>	<b>11.45</b>	<b>4.80</b>	<b>9.81</b>	<b>9.51</b>	<b>16.21</b>	<b>10.32</b>
2005-06	14.13	34.53	31.10	10.24	16.79	15.15	29.48	18.85
2006-07	24.20	47.16	21.13	8.44	-5.99	16.97	20.22	20.69
2007-08	7.97	83.73	24.25	11.00	8.97	18.22	38.36	22.01
2008-09	24.27	4.45	29.14	6.16	6.66	15.85	14.24	-14.14
2009-10	-2.77	-13.81	-15.30	-12.65	-15.12	-13.94	-12.89	30.34
2010-11	27.66	5.50	34.31	21.76	7.69	27.07	23.90	23.89
2011-12	27.68	22.19	32.31	22.41	10.78	14.36	6.44	1.23
2012-13	1.77	-10.63	0.30	-9.15	-4.86	3.19	-3.75	12.56
<b>Average</b>	<b>15.61</b>	<b>21.64</b>	<b>19.66</b>	<b>7.28</b>	<b>3.12</b>	<b>12.11</b>	<b>14.50</b>	<b>14.53</b>

Source: Data taken from United Nations Conference on Trade and Development database (UNCTAD).

percentage share of BIMSTEC exports in the total exports of world was 1.85 % in 1997-98 and it increased by 3.10% in the year 2012-13. The average annual growth rate of BIMSTEC exports in world exports was 2.66%. To assess the export performance of BIMSTEC countries, percentage share, compound annual growth rate, and real value of exports (Base year = 2000) was calculated for individual nations.

The Table 2 depicts the percentage share of exports of individual BIMSTEC nations in total exports of BIMSTEC. For the period from 1997-98 to 2004-05, the average of total exports was US \$ 128935.6 million and for the period from 2005-06 to 2012-13, it increased to US \$ 397918.1 million. During the year 1997-98 to 2004-05, the percentage share of exports from Nepal decreased from 0.50% to 0.25% in 2005-06 to 2012-13. During the year 1997-98 to 2004-05, the percentage share of exports from Bangladesh decreased from 4.83 % to 4.13% in 2005-06 to 2012-13. Very minor fluctuations were noticed in average percentage of exports. During the year 1997-98 to 2004-05, the percentage share of exports from Myanmar increased from 1.46 % to 1.65 % in 2005-06 to 2012-13. During the year 1997-98 to 2004-05, the percentage share of exports from Bhutan increased from 0.09% to 0.13% in 2005-06 to 2012-13. During the year 1997-98 to 2004-05, the percentage share of exports from Sri Lanka decreased from 3.99% to 2.13% in 2005-06 to 2012-13. During the year 1997-98 to 2004-05, the percentage share of exports from Thailand decreased from 52.32% to 43.26% in 2005-06 to 2012-13.

During the year 1997-98 to 2004-05, the percentage share of exports from India increased from 34.02 % to 46.99 % in 2005-06 to 2012-13. The major reason for the decrease in the percentage share of member nations such as Bangladesh, Nepal, Thailand, Sri Lanka in world exports was that after the 19 rounds of Free Trade Agreements (FTA) negotiations, still, the agreements were not able to sort out issues such as dispute settlement mechanism. Another reason for the underperformance of these nations was the basic fundamentals of collaboration remaining unfinished. BIMSTEC restricted activities lead to some serious problems such as structural constraints on member states in the form of limited technological, lead-actor inertia, operational and financial capabilities.



The Table 3 depicts the compound annual growth rate of exports of BIMSTEC nations. In early years of the establishment period of BIMSTEC, that is, from 1997-98 to 2004-05, average of exports grew from 10.32% to 14.23% in 1997-98 to 2004-05. The compound annual growth rate basically smooths out the advancement of exports over a period of time, which provides a clearer depiction of yearly returns. In case of individual BIMSTEC countries, the average of Bangladesh exports from 1997-98 to 2004-05 was 9.61% and it increased by 15.61% during 2012-13. Bhutan also made a remarkable progress in exports. The exports of Bhutan increased from 7.11% (1997-98 to 2004-05) to 21.64% (2005-06 to 2012-13). India also made progress in exports. The average of India's exports increased from 11.45% (1997-98 to 2004-05) to 19.66% (2005-06 to 2012-13). In case of Sri Lanka, very little progress can be seen. The averages of exports grew from 4.80% (1997-98 to 2004-05) to 7.28 % (2005-06 to 2012-13) only. Nepal and Myanmar were the only countries among BIMSTEC nations who failed to increase their exports. The average of Nepal's exports decreased from 9.81% (1997-98 to 2004-05) to 3.12 % (2005-06 to 2012-13). The average of Myanmar's exports decreased from 16.21% (1997-98 to 2004-05) to 14.50 % (2005-06 to 2012-13). The average of Thailand exports increased to 12.11% (2005-06 to 2012-13) from 9.51% (1997-98 to 2004-05). Therefore, the compound annual growth rate of BIMSTEC nations as a whole depicts an average increase in exports, except in the case of Nepal and Myanmar.

The reason behind decrease in average of compound annual growth of Myanmar was that the exports were enormously unstable and irregular in spite of various free trade agreements signed by Myanmar. The reasons behind decrease in Nepal exports is that Nepal is a land locked country and India imposed 4% transition duty on Nepal's exports. Other reasons are political instability, lack of competitive advantage in production by Nepali producers, unstable labor policies, energy crisis, and lack of industrial investments.

**Table 4. Real Value of Exports of BIMSTEC and Percentage Share of BIMSTEC in Total World Exports**

Year	Total exports of BIMSTEC nations (in US\$ Million)	Unit value index (base year 2000-01)	*Real Value of exports	Percentage share of exports of BIMSTEC nations in total world exports (%)
1997-98	103324.21	117	88311.29	1.85
1998-99	98435.92	107	91996.19	1.79
1999-2000	105705.71	101	104659.1	1.85
2000-01	125507.76	100	125507.8	1.94
2001-02	122094.66	94	129887.9	1.97
2002-03	131106.41	92	142507	2.02
2003-04	154658.01	104	148709.6	2.04
2004-05	190652.28	116	164355.4	2.07
<b>Average</b>			<b>124491.8</b>	<b>1.94</b>
2005-06	232059.5	130	178507.3	2.21
2006-07	275802.7	137	201315.8	2.27
2007-08	332874.62	158	210680.1	2.37
2008-09	406136.13	175	232077.8	2.51
2009-10	348726.57	159	219324.9	2.78
2010-11	454535.85	192	236737.4	2.97
2011-12	563130.88	225	250280.4	3.07
2012-13	570078.34	223	255640.5	3.10
<b>Average</b>			<b>223070.5</b>	<b>2.66</b>

Source: WTO database (World Trade Organization), UNCTAD database (United Nation Conference on Trade and Development)

\*Real export is calculated by (Export/unit value index base year 2000-01)\*100.

The Table 4 depicts the real value of exports from BIMSTEC nations for the period from 1997 - 2013 with the base year 2000-01. The average from 1997-98 to 2004-05 was US \$ 124491.8 million and from the period of 2005-06 to 2012-13, the average was US \$ 223070.5 million. A tremendous increment can be noticed. The average percentage share of BIMSTEC exports in the total world exports was 1.94% from the period of 1997-98 to 2004-05, and it increased to 2.66 % during the period from 2005-06 to 2012-13. The reason behind an increase in the real value of exports was the BIMSTEC win - win formula; it created an integrated market of 1.5 billion people with a combined economic strength of US\$ 2.5 trillion.

## Association Between GDP and Exports Among BIMSTEC Nations

This section explores the dynamics of the association among exports and economic growth between BIMSTEC with the annual data for the period from 1997-98 to 2012-13, and this includes 16 observations. The two chief variables are *REAL GDP* and *REAL EXPORTS*. Both the variables - economic growth rate (GDP) and exports are measured in US \$ million. The required data for the observed period were obtained from UNCTAD and UNCOMTRAD. With the time period from 1997-98 to 2012-13 for BIMSTEC exports, the study scrutinizes the long time and causal dynamic associations among the level of exports and GDP. The methodology used in the study is the unit root analysis, cointegration, and Granger causality technique.

**(1) Unit Root Analysis :** In time series data, realization is used to describe conclusion regarding the core stochastic procedure. To illustrate conclusion from the time series investigation, stationarity test becomes necessary. Stationarity tests which have been generally accepted over years are the unit root tests. In this study, the Augmented Dickey Fuller (ADF) test was used for the estimation of unit root. Augmented Dickey Fuller consists of estimating the following regression equation :

$$\Delta Y_t = \beta_0 + \omega Y_{t-1} + \sum_{i=2}^m \Delta Y_{t-i} + \varepsilon$$

where,

$Y_t$  = Relevant time series,

$\Delta$  = A first difference operator,

$\varepsilon$  = Error term.

The null hypotheses for unit root are:

$H_0$  : *REAL GDP* has a unit root.

$H_0$  : *REAL EXPORTS* has a unit root.

Macroeconomic time series data are usually characterized through a stochastic trend which can be detached via differencing. A few variables are stationary on levels, others turn into stationary after one differentiation, and a few might turn into stationary through more than one differentiation. The ADF equation was used for the case when it included intercept only in calculation to the case when it included both intercept and time trend (Ray, 2011).

If the DW is close to 2, then the test is reliable, which means that no autocorrelation is there among residuals. If ADF is less (even more negative) than the negative critical value, then the series is stationary. If the ADF statistic is greater than the negative critical value, the series is not stationary. The Table 5 depicts the results of the unit root test. The outcome shows that variables *REAL GDP* and *REAL EXPORTS* attained stationarity at second differencing using ADF test. The Augmented Dickey Fuller test (ADF) provides results of stationary at second difference at all lag differences. At this level, we reject the null hypothesis and conclude that the series of

**Table 5. The Results of the Augmented Dickey Fuller (ADF) Test on *REAL GDP* with Intercept only**

Intercept only			
Variables	ADF (0)	ADF(1)	ADF (2)
<i>REAL GDP</i>	-1.348126	-2.071645	-4.266816
AIC	-1.667788	-1.663379	-1.448892
SBC	-1.520750	-1.565354	-1.352319
DW	1.587433	1.486237	2.098130
Prob. *	0.5820	0.2570	0.0051
Test Critical Values			
1% levels		-3.886751	
5% levels		-3.052169	
10% levels		-2.666593	

H0: *REAL GDP* has a unit root.

\*MacKinnon (1996) one-sided *p*-values. AIC denotes Akaike information criterion (AIC). SBC denotes Schwarz criterion. DW denotes Durbin-Watson stat.

**Table 6. The Results of the Augmented Dickey Fuller (ADF) Test for *REAL EXPORTS* with Intercept only**

Intercept only			
Variables	ADF (0)	ADF(1)	ADF (2)
Real Exports	-0.756279	-5.629382	-7.744046
AIC	21.16392	21.07175	21.78797
SBC	21.30086	21.16305	21.87488
DW	2.157641	2.079464	2.358604
Prob. *	0.8002	0.0006	0.0000
Test Critical Values			
1% levels	-4.004425		
5% levels	-3.098896		
10% levels	-2.690439		

H0: *REAL EXPORTS* has a unit root.

\*MacKinnon (1996) one-sided *p*-values. AIC denotes Akaike information criterion (AIC). SBC denotes Schwarz criterion. DW denotes Durbin-Watson stat.

*REAL GDP* has stationarity.

The Table 6 depicts the outcome of the unit root test. The outcome demonstrates that both variables, *REAL GDP* and *REAL EXPORTS* attained stationarity after first differencing using the Augmented Dickey Fuller test. The Augmented Dickey Fuller test provides stationary results at first difference at all lag differences. At this level, we reject the null hypothesis and conclude that the series of *REAL EXPORTS* has stationarity.

**(2) Johansen Cointegration Values :** Co-integration, an econometric technique of time series variable, is a prerequisite for the extension of a long term or stability in economic association among two or more variables that have unit roots. The Johansen technique can establish a number of cointegrated vectors for every certain number of non-stationary variables of the identical order. Two or more random variables are known as co-integrated if all variables of the series are themselves non stationary. The test might be regarded as a long term symmetry



**Table 7. Unrestricted Co-integration Rank Test (Trace) and Unrestricted Co-integration Rank Test (Maximum Eigenvalue)**

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.673963	18.48858	15.49471	0.0172	15.69040	14.26460	0.0296
At most 1	0.181163	2.798175	3.841466	0.0944	2.798175	3.841466	0.0944

Trace test indicates one co-integrating eqn(s) at the 0.05 level ; Max-eigenvalue test indicates one co-integrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level.

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

H0: *REAL EXPORTS* and *REAL GDP* are correlated.

association between the variables. The rationale of the co-integration tests is to establish whether a cluster of non stationary series is co-integrated or not.

The main approach which is used in the study to test co-integration is known as the Johansen co-integration approach. The Johansen approach can establish the number of cointegrated vectors for any known number of non-stationary variables of the identical order (Ray, 2011).

The Table 7 depicts the cointegration rank test for trace and maximum eigenvalue. At the 5% level of significance, the test statistic was greater than its *p* - values. So, we accept the null hypothesis at the 5% level. Hence, we can conclude that *REAL EXPORTS* and *REAL GDP* are correlated. There is a long run relationship among *REAL GDP* and *REAL EXPORTS*.

**(3) Granger Causality Test :** The Granger causality model is based on the following hypotheses for testing the causality and co-integration between GDP and exports for BIMSTEC nations : (a) whether there is bi-directional causality between GDP growth and exports for BIMSTEC nations, (b) whether there is unidirectional causality between the two variables, (c) whether there is no causality between GDP and exports for BIMSTEC nations, (d) whether there exists a long run relationship between GDP and exports for BIMSTEC nations (Mehrara & Firouzjaee, 2011). To assess the causation direction between *REAL EXPORTS* and *REAL GDP*, Granger test involves estimation of the following regressions equations.

If causality runs from *REAL EXPORTS* to *REAL GDP*, the equation is:

$$GDP = \sum_{i=1}^n \alpha_i X_{t-i} + \sum_{j=1}^n \beta_j Exports_{t-j} + \epsilon_t$$

If causality runs from *GDP* to *EXPORTS*, the equation is:

$$Exports = \sum_{i=1}^n \gamma_i X_{t-i} + \sum_{j=1}^n \delta_j GDP_{t-j} + \epsilon_t$$

where,

*GDP*, *t*, and *EXPORT* represent gross domestic product and exports, respectively,  $\epsilon_t$  is uncorrelated stationary random process, and subscript *t* denotes the time period.

The Table 8 explains that *REAL EXPORTS* do not Granger cause *GDP*. But *GDP* does granger cause *REAL EXPORTS*, and we cannot reject the null hypothesis since the *F*-statistic is rather small and most of the probability values are close to or even greater than 0.1 at the lag length of 1 to 4. So, from above, we accept the null hypothesis in the first case and conclude that *REAL EXPORTS* does not Granger cause *REAL GDP*. In the second case, we reject the null hypothesis and conclude that *REAL GDP* granger causes *REAL EXPORTS*.

**Table 8. Granger Causality Test Between *Real Exports* and *REAL GDP***

Null Hypothesis:	Obs	F-Statistic	Prob.
<i>REAL EXPORTS</i> does not Granger Cause <i>REAL GDP</i>	14	0.12469	0.8843
<i>REAL GDP</i> does not Granger Cause <i>REAL EXPORTS</i>		8.97086	0.0072

## Policy Implications

Most of the countries in the world have realized that a speedy growth of their economies can be achieved only through integrating their respective economies with the global economy. For that, it is necessary for governments of different countries to focus on their energies of liberalization and economic reforms. In order to achieve high level of economic cooperation among the BIMSTEC countries, it is very important to understand and appreciate the structures of individual economies as well as identify the potential areas of trade and economic cooperation.

The existing high tariff barrier among the BIMSTEC countries worked against their basic development objectives. The BIMSTEC accord aimed to form a FTZ (Free Trade Zone) where tariffs would be brought down to zero by 2014. The least-developed countries (that are Bangladesh and Myanmar) of the bloc have been given additional time to drop their tariff rates to zero level by 2017. There will be a need to soften and liberalize complex and extensive trade formalities to move towards the millennium goals.

The BIMSTEC is an initiative aimed at creating a free trade area amongst the member nations and expanding it to other nations and regional trade blocs also. The member nations together signed a Framework Agreement to set up a FTZ (Free Trade Zone) to create a favorable atmosphere for trade among the member nations with no barriers. The Free Trade Agreement was signed between Bangladesh, India, Myanmar, Sri Lanka, and Thailand on February 8, 2004 at Phuket (Thailand), but its implementation had been delayed. There is a need to take the necessary steps for the implementation of the Free Trade Zone for trade promotion.

The necessity of the hour is interdependence between member nations to compete in the globalized economy of the world. The member states had agreed in 2004 on creating the FTZ, but ignored the two least developed countries : Bhutan and Nepal. To create a free trade zone, there is a need to include these two nations also. Another thing is to improve the technology for the promotion of trade. The need of the hour is to adopt cheap and better technology so that the BIMSTEC increase their share in world exports. Research and development will be necessary for the promotion of exports in these nations.

There is a need to improve R & D in BIMSTEC regions because the major reason for the decrease in the percentage share of some member nations in world exports was that following the 19 rounds of Free Trade Agreements (FTA) negotiations, the agreement was not able to sort out issues such as dispute-settlement mechanism. Another reason for the underperformance of some nations was the basic fundamentals of collaboration remaining unfinished. BIMSTEC restricted activities lead to some serious problems such as structural constraints on member states in the form of limited technological, lead-actor inertia, operational and financial capabilities. More provision of export incentives cannot expand exports. There is a need for a coordination between production planning and trade policies with a specific orientation towards the market demand.

The comparative study of trade regimes and exports' expansion and the growth among the BIMSTEC nations reveals that there seems to be a correlation between the intensity of market forces and rate of growth of GDP. The greater the scope of market forces, the larger seems to have been the growth in general. The study also supports growth-led exports in case of BIMSTEC. So, the need of the hour is to create a custom union for the development of these countries. A trade creating Custom Union helps to promote the welfare of member nations. Trade creation encourages the full utilization of the resources and further leads to greater specialization based on the comparative advantages. It also increases the welfare of member nations because of the increase in real income.

So, the successful promotion of the mutually beneficial cooperation in the Bay of Bengal requires the speedy development of transport and communication linkages, exchange of information, relating the supply capabilities, progress in science and technology, and enhanced technical cooperation, simplification, and coordination of customs' procedure and formalities and above all, the establishment of institutional support for hastening the utilization of enhanced opportunities for multilateral regional cooperation.

## Conclusion

The rationale of the study is to find the export performance of BIMSTEC as a regional bloc after its formation. For this, various statistical and econometrics tools have been used. Some of the BIMSTEC member nations showed low growth in trade because of less connectivity with the North East of India as both Thailand and Myanmar are on one side and Bangladesh, Bhutan, and Nepal are on the other side. Another reason is connectivity as the state has insufficiency of infrastructure to provide effectiveness to the nation's economy and to improve mutually valuable exchanges. BIMSTEC nations are prosperous in resources, but they remain underdeveloped and disengaged from Asia's development story. Although the member nations of BIMSTEC are linked by regional cooperative processes, they remain at the margins of the Asian market integration. The high potential of mutual trade with Myanmar has remained unexploited for various hurdles such as lack of shipping and road connectivity. The reason for decrease in Sri Lanka's trade is terrorism from the last three decades. Compound annual growth rate and percentage share were calculated to analyze the export performance of BIMSTEC nations (Shekhar, 2014).

For making BIMSTEC a "vibrant regional entity," there is need to revitalize coastal shipping preparations and inter-modal transport, practices that had flourished in the past, for easy flow of goods and services. Now, the requirement of time is that member nations stress on encouraging investment for operating actions for economic development and to build capability in the sectors of comparative advantage such as tourism, hydropower, agriculture, and others to attain the greater goals and objectives. Econometrics technique was used to test the causality among Real GDP and Real Exports. To test for unit roots of the variables, Augmented Dickey-Fuller (ADF) tests were utilized. The calculated critical values of this test reveal the results of stationarity at first difference at all lag differences in case of GDP and result of stationarity at second difference at all lag differences in case of Exports. However, stationarity properties were found in the first and second differencing level of the variables.

To test the co-integration among variables, Johansen cointegration approach was used. This study has examined the role of exports in the GDP process among BIMSTEC nations by using causality tests for data over the period from 1997-98 to 2012-13. Granger causality was applied to test the causal association among Exports and Economic Growth. The results explain the facts of uni-directional causality among GDP and exports among the BIMSTEC bloc. In conclusion, this study provides support for growth-led exports in case of BIMSTEC. From past decades, with terrorism under control, the Sri Lankan economy has been constantly recording a growth rate of 7%. The consequence of BIMSTEC to Sri Lanka lies in the fact that it creates an essential trade accord inside member nations together with Sri Lanka. Sri Lanka has signed various trade agreements, such as FTA, with various Asian countries. India covers more part of Sri Lanka's trade whereas Myanmar and Thailand cover merely 3% of Sri Lanka's entire trade. Thailand is the second biggest market for Sri Lanka's exports of gems and diamonds next to USA. Thailand is not only the main market for gems, jewelry, and diamonds, but maintains the most significant market rank for Sri Lanka in South-East Asia. With the accomplishment of BIMSTEC, the advantages of Free Trade Area may be favourable to Thailand, but the authorities in export expansion look into the set-up gravely and take essential steps to narrow the gap as a counteractive measure.

The main challenges faced by BIMSTEC now a days is that India is the leading performer in BIMSTEC with respect to more than two-thirds of its constituency. India wanted to utilize the cluster (BIMSTEC) as a platform

for the growth of its landlocked North Eastern states and their integration with Southeast Asia for the construction of stronger ties with Bangladesh and Myanmar, and for the removal of the enormous energy resources existing inside the sub region. But the projects stay unfinished. Furthermore, India's intellectual involvements for the development of BIMSTEC have not been favourable as it has been plagued by the debates in the SAARC (South Asian Association of Regional Cooperation) and ASEAN. Conversation about BIMSTEC in the Indian strategic society has also been limited, brief, and fairly periodic in nature. As a consequence, the cluster has stayed on marginal to integrative conversation in South and Southeast Asia. Another is structural constraints, in the form of limited state capabilities of the bulk of its member nations, that has also foiled the development of the cluster. Major of the BIMSTEC nations are lacking in technology and are deficient in the resources to invest in growth and infrastructure projects, with Bangladesh, Bhutan, Myanmar, and Nepal being among the world's least developed nations (LDCs).

## Limitations of the Study and the Way Forward

The scope of the study is limited only to export performance of BIMSTEC as a regional trading bloc. India's possibility of emerging as a regional energy hub in South Asia depends on its likely setting up of bilateral grids in the coming years. Moving from BIMSTEC towards the Bay of Bengal Economic community will have long run advantages of fully exploiting the potential of economic integration in the Bay of Bengal region. Poor communication and transport facilities, lack of information regarding capabilities and resources across the countries are important stumbling blocks, along with tariff and non-tariff barriers to the evolution of the Bay of Bengal Economic community.

Future research in this area can examine the role of geo-politics for the promotion of trade among the BIMSTEC regions that would help in the successful promotion of mutually beneficial cooperation in the Bay of Bengal region.

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