Sharif M. Hossain

SOUTH ASIAN FREE TRADE AREA: EXAMINING BANGLADESH'S TRADE POTENTIAL

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Abstract

The current paper has analysed the impact of South Asian Free Trade Area (SAFTA) on Bangladesh in terms of export generation within member countries. A standard gravity model has been used to analyse Bangladesh's export potential using cross section data. From the estimated result, it is observed that Bangladesh has huge export potential to South Asia in general, and India in particular. If SAFTA agreement is properly implemented then Bangladesh's exports within this region would be much higher than the estimated potential export. In terms of imports, Bangladesh has exceeded its potential level. Therefore, the expected increase in import by Bangladesh from SAFTA member countries might not be as large as the expected increase in export. But it should be mentioned that the expected results can only be achieved by free trade in real sense, i.e. goods and services can move freely across countries without any tariff and non-tariff barriers.

1. Introduction

There is a growing evidence for the emergence of Regional Trading Arrangements (RTA) in different parts of the world over the last two decades. The establishment of such an arrangement in South Asia is no exception. The process of regional cooperation in South Asia was initiated by establishing the South Asian Association for Regional Cooperation (SAARC). In 1985, the seven South Asian countries – Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka formed SAARC to promote economic, social and cultural cooperation. The newest member of SAARC is Afghanistan which has been included in 2005. In 1993, the SAARC Preferential Trading Arrangement (SAPTA) was initiated by the SAARC member countries as the first step towards

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achieving higher levels of trade and economic cooperation in the region.[1] Some progress was achieved in the economic area under the framework of SAPTA.[2] Subsequently, the member countries of SAARC launched the South Asian Free Trade Area (SAFTA) in 2004 which came into force on January 01, 2006. The key motivation behind the creation of SAFTA was to enhance intra-regional economic cooperation to maximize the potentiality of trade and development in the region.[3]

During the last decade, South Asia has experienced an increase in intra-regional trade. This increase is mainly generated from India's export to its neighbours. However, India is not a fast growing destination for her neighbouring country's export. The major export destinations of India's neighbours are located in North. India's high protectionist policy towards other South Asian neighbours is one of the reasons for this one way export flow. However, it is also argued that because of the similar production structure and lack of trade complementarities, smaller countries in South Asia have supply side constraint to fulfil India's import demand. In such a scenario, some argue that a free trade area in South Asia might increase Indian exports to the smaller member countries without any reciprocal export growth for them to India.[4] In contrast, there is a general belief among the policy makers and business people in South Asia about the potentiality of significant increase in intra-regional trade.[5] It is also expected that the small member countries will generate significant intra-regional export because of the large market access to India. On the other hands, there is argument against low level of trade complementarities in this region. Evidence shows that, despite low level of trade complementarities, some trading bloc like ASEAN generated significant intra-regional trade.[6] Hence, there are divergent views about the possible impact of SAFTA on small member countries in terms of intra-regional trade expansion.

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[1] "Agreement on SAARC Preferential Trading Arrangement (SAPTA)", 1993, available at: http://www.worldtradelaw.net/fta/agreements/saptafta.pdf, accessed on January 04, 2010.

[2] Kant K. Bhargava, "EU – SAARC: Comparisons and Prospects of Cooperation", Discussion Paper No. C 15, Bonn: Center for European Integration Studies, 1998, p.8.

[3] "Agreement on South Asian Free Trade Area (SAFTA)", 2004, available at: http://www.saarc-sec.org/data/summit12/saftaagreement.pdf, accessed on December 28, 2009.

[4] Rehman Sobhan, "The Twelfth SAARC Summit: Charting a Road Map for South Asian Cooperation", *South Asian Survey*, Vol. 12, No. 1, 2005, p. 6.

[5] Selim Raihan, "SAFTA and the Bangladesh Economy: Assessments of Potential Implications", Discussion Paper No. 2, Dhaka: South Asian Network on Economic Modeling, 2008, p. 13.

[6] Intra regional trade in ASEAN has been increased from 6 percent in mid-1970s to 23 percent in 1997 after the enforcement of FTA in that region (Than 2005, p. 23).

The impact of RTA in South Asia has gained attention in different studies which expressed different views about the possible impact on member countries. Some studies[7] expressed optimism about the impact of SAFTA, arguing that regional trade liberalisation in South Asia generates significant benefits for its member countries by increasing intra-regional trade. Alternatively, many scholars[8] are skeptical about the impact. Using gravity model, T. N. Srinivasan,[9] and T. N. Srinivasan and G. Canonero[10] argued that multilateral trade liberalisation on a global basis would yield higher return to the region compared to preferential trade liberalisation within the region. Jayatilleke and Wusheng[11] addressed the question of desirability of SAFTA and showed that SAFTA would not be beneficial for this region. Therefore, the existing literatures reflect the lack of consensus regarding the outcomes of SAFTA. While most of these studies analysed the overall impact of SAFTA considering total trade, a very few studies considered the export potentiality of small member countries of SAFTA.

Against this backdrop, for Bangladesh, one pertinent question may be raised: Is there any export potential for Bangladesh to other member countries of SAFTA? This paper aims to seek answer of this question using gravity model of international trade. The total trade and import potentiality of Bangladesh, within SAFTA region, are also analysed. A standard gravity model is used to analyse the world trade/export/import flows of Bangladesh. The estimated coefficients, obtained from standard gravity model, are then used to predict the trade/export/import potentiality of Bangladesh to all other SAFTA member countries. The study inferred that Bangladesh has untapped export potential to South Asia in general, especially to India, Maldives and Nepal.

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[7] Miria Pigato, Caroline Farah, Ken Itakura, Kwang Jun, Will Martin, Kim Murrell and T. G. Srinivasan , *South Asia's Integration into the World Economy*, Washington D. C.: The World Bank, 1997; Selim Raihan, *op. cit.*; Selim Raihan and M. A. Razzaque, "Welfare Effects of South Asian Free Trade Area (SAFTA) Regional Trading Arrangements (RTAs) in South Asia: Implications for the Bangladesh Economy", Paper prepared for the UNDP Regional Centre Colombo, 2007, available at: http://www.gtap.agecon.purdue.edu/resources/download/2956.pdf, accessed on April 10, 2009.

[8] Jayatilleke S. Bandara and Wusheng Yu, "How Desirable is the South Asian Free Trade Area? A Quantitative Economic Assessment", *The World Economy*, Vol. 26, No. 9, 2003, pp. 1293-1323; T. N. Srinivasan, "Regional Trading Arrangements and Beyond: Exploring Some Options for South Asia, Theory, Empirics and Policy.", Report No. IDP-142, 1994, Washington DC.: The World Bank; T. N. Srinivasan and G. Canonero, 1995. "Preferential Agreements in South Asia: Theory, Empirics and Policy." Yale Growth Centre, Yale University (mimeographed).

[9] T. N. Srinivasan, *op. cit.*

[10] T. N. Srinivasan and G. Canonero, *op. cit.*

[11] Jayatilleke S. Bandara and Wusheng Yu, *op. cit.*

The structure of this paper is as follows. Following the introduction, Section 2 discusses the evolution of SAFTA. Section 3 provides intra-regional trade structure of Bangladesh within South Asia. In Section 4, impacts on trade flows, using the gravity model, are analysed. In this Section methodology and database, econometric issues and estimation results are presented and discussed. Section 5 provides a discussion on the results and offers some concluding remarks.

2. Evolution of SAFTA

The first concrete initiative to establish a regional cooperation in South Asia was initiated by Bangladesh in May 1980. Although, India and Pakistan were suspicious about Bangladesh's intention, other South Asian countries promptly accepted the idea. India thought that Bangladesh's proposal to establish a regional organisation might create a group of other South Asian countries to add up all bilateral issues against India. On the other hand, Pakistan viewed it as an Indian strategy to corner Pakistan. For these reasons, the original Bangladesh working paper on SAARC indirectly laboured to tone down the divergent security and political perceptions of the South Asian countries and only included non-political and non-controversial issues. Many believed that such misgivings between India and Pakistan delayed the formation of the regional cooperation in this region. The first South Asian Foreign Ministers' Conference officially launched a regional organisation known as South Asian Regional Cooperation (SARC) in 1983. Following the creation of SARC, the foreign ministers could meet on a regular interval. Subsequently, South Asian Regional Cooperation (SARC) transformed into South Asian Association for Regional Cooperation (SAARC) to promote and develop cooperation among the member countries. The SAARC charter was adopted in 1985 during its first summit of heads of state or government of the South Asian countries[12]. The first attempt, towards an economic integration in South Asia, was initiated by the establishment of the Committee of Economic Cooperation (CEC) in 1991. The CEC recommended a draft agreement of SAPTA in order to prevent the marginalisation of South Asia's trade in global market by improving the productive capacity of the member countries particularly in manufacturing sectors.[13] In April 1993, the agreement of SAPTA was signed which came into effect in December 1995.

SAPTA was considered as a milestone for the member countries of SAARC. Although, SAPTA was a mildest form of integration, it provided the opportunity for greater forms of economic cooperation. Three rounds of tariff concession have been implemented following the formation of SAPTA. In addition, Special

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[12] Kishore C. Dash, "The Political Economy of Regional Cooperation in South Asia", *Pacific Affairs*, Vol. 69, No. 2, 1996, pp. 187-188.

[13] Mohan Lohani (2008), "SAARC Economic Cooperation: From SAPTA to SAFTA", The Weekly Telegraph, August 06, 2008, online edition, available at: http://www.telegraphnepal.com/news_det.php?news_id=3859, accessed on April 25, 2009.

and Differential Treatments (SDTs) are offered to Least Developed Countries (LDCs)[14] in terms of coverage of commodities and depth of tariff cuts. Tariff concessions offered by different countries in different rounds of SAPTA are shown in Table 1.

Table 1: Tariff Concession Offered Under SAPTA

Concession offering country	SAPTA Round	No. of HS Lines offered		
		For all countries	For LDCs	Total
Bangladesh	I	11 (10)	1 (10)	12
	II	215 (10)	11 (10)	226
	III	338 (10)	143 (10 &15)	481
Bhutan	I	4 (15)	7(10, 13 & 15)	11
	II	37 (10)	10 (15)	47
	III	23 (10)	101 (10, 18, 20)	124
India	I	44 (10, 25, 30, 50 & 90)	62 (50 & 100)	106
	II	390 (10, 15, 25 & 40)	514 (25 & 50)	904
	III	43 (10 & 20)	1847 (50)	1917
Maldives	I	17 (7.5)	17 (7.5)	34
	II	5 (10)	2 (15)	7
	III	390 (5 & 10)	368 (5 & 10)	758
Nepal	I	10 (7.5 & 10)	4 (10)	14
	II	166 (10)	67 (15)	233
	III	52 (10)	137 (10 & 15)	189
Pakistan	I	20 (10)	15 (15)	35
	II	227 (10)	131 (15)	358
	III	24 (20)	271 (30)	295
Sri Lanka	I	20 (10 & 20)	11 (10 & 15)	31
	II	72 (10)	23 (10, 50 & 60)	95
	III	28 (10)	54 (10, 30, 50 & 75)	82
Total	I	126	100	226
	II	1109	759	1868
	III	876	2580	3456

Note: Figures in parentheses represent percentage concessions in tariff rates.
Source: S. K. Mohanty, "Regional Trade Liberalization under SAPTA and India's Trade Linkages with South Asia: An Empirical Assessment", Discussion Paper No. 48, 2003, New Delhi: Research and Information System for Non-Aligned and Other Developing Countries (RIS), p. 24.

Table 1 represents that in SAPTA-I 226 products at 6-digit HS[15] level were considered for tariff reduction among which 100 products are allocated for LDCs. Total product coverage for tariff concession under SAPTA-II and SAPTA-III are 1864 and 3456 respectively. The amount of tariff cut differs from country to country which is indicated by the figures in parentheses in Table 1.

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[14] Bangladesh, Bhutan, Nepal and Maldives are LDCs within SAARC.

15 The Harmonized Commodity Description and Coding System (HS) of tariff nomenclature is an internationally standardized system of names and numbers for classifying traded products developed and maintained by the World Customs Organization (WCO).

However, the issue of non-tariff measures was considered only from SAPTA-II. The evaluations of intra regional trade under different round of SAFTA were examined in different studies.[16] Some of these studies concluded in favor of SAPTA in case of potential intra-regional trade.

In 1997, the regional approach to FTA in South Asia was firstly initiated by the member countries of SAARC. A year later, the member countries decided to establish SAFTA by 2001. But due to the political tension between two big countries in South Asia, India and Pakistan, the establishment of SAFTA was delayed. However in 2004, at SAARC summit at Islamabad, the framework agreement of SAFTA was signed. The member countries of SAARC also set up a vision to establish South Asian Custom Union (SACU) by 2015 and South Asian Economic Union by 2020 to drive to the final stage of economic union.[17] When SAFTA agreement was signed in 2004, a number of issues like finalising the sensitive list, criteria for rules of origin, revenue compensation mechanism for LDCs, and areas for technical assistance for LDCs were left out. In order to finalise the agreement, a committee of expert was convened to discuss and take decisions about these issues before January 2006. Subsequently, SAFTA came into force on January 01, 2006, after taking decisions on above issues. However, because of the delay in ratification of the agreement by the member countries, trade liberalisation program came into force on July 01, 2006. In order to achieve the objective of SAFTA, the framework agreement has set the following instruments.[18]

- Trade Liberalisation Program
- Rules of Origin
- Institutional Arrangements
- Revenue Compensation Mechanism
- Technical Assistance for LDCs
- Safeguard Measures
- Consultations and Dispute Settlement Procedures

3. Intra-regional Trade in South Asia

The volume of intra-regional trade in South Asia is very low compared to other regional trading blocs in the world. The establishment of a free trade area with low volume intra-regional trade generates limited scope of gaining from such free trade arrangement.[19] This is one of the major criticisms against the

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[16] Charan D. Wadhva, "Assessing SAARC Preferential Trading Arrangement (SAPTA)", *South Asian Survey*, Vol. 3, No. 1 & 2, 1996, pp. 173-195; Swapan K. Bhattacharya, "Regional Trading Arrangements among SAARC Countries and India's Imports", *South Asia Economic Journal*, Vol. 2, No. 2, 2001, pp. 281-312; S. K. Mohanty, *op. cit.*

[17] Jayatilleke S. Bandara and Wusheng Yu, *op. cit.,* p. 1300.

[18] For details please see the "Agreement on South Asian Free Trade Area (SAFTA)", *op. cit.*

[19] Jayatilleke S. Bandara and Wusheng Yu, *op. cit.,* p. 1296.

success of SAFTA. Figure 1 compares the intra-regional export of South Asia with some other trading blocs in the world. The figure shows, South Asia has lowest intra-regional export share. Although South Asian intra-regional export share rose slightly from 3.2 percent in 1970 to 7.4 percent in 1999, still it is very low. However, in case of MERCOSUR,[20] it is observed that after implementation of regional trading arrangement in 1991, intra-regional export increased significantly from 8.9 percent to 20.3 percent in 1995.

Figure 1: Intra Regional Export as a Share of Total Export of South Asia
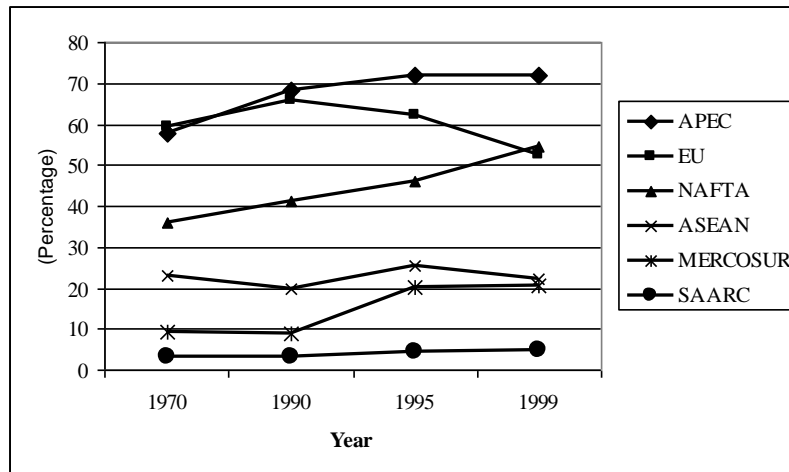
Source: Based on Nazneen Ahmed (2006), "Bangladesh Apparel Industry and its Workers in a Changing World Economy", PhD. thesis, 2006, Wageningen University, The Netherlands, available at: http://library.wur.nl/wda/dissertations/dis3942.pdf, accessed on June 10, 2009, p. 85

Within this limited intra-regional export, India dominates the export market without any strong contender. Figure 2 and figure 3 show the share of individual South Asian country's intra-regional export and intra-regional import as a percentage of total intra-regional export and import respectively. Figure 2 identifies India as the single largest exporter in this region comprising 62.2 percent of intra-regional export in 2005. Bangladesh's share of intra-regional export is very low, 2.2 percent only. This figure reflects that at present South Asia is not a significant export destination for Bangladesh. However, Bangladesh is the largest import destination for neighbouring country's export. Bangladesh's share in intra-regional import is 28.2 percent which is the highest among member countries. India's intra-regional import share is only 17.2 percent which is noticeably low compared to its export share.

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[20] Common Market of the South (Spanish: Mercado Común del Sur) is the largest trading block in South America. MARCOSUR encompasses four countries: Argentina, Brazil, Paraguay and Uruguay.

Figure 2: Share of South Asian Countries Intra-regional Export in 2005

Source: Calculated from Direction of Trade Statistics Yearbook 2008, IMF.

Figure 3: Share of South Asian Countries Intra-regional Import in 2005

Source: Calculated from Direction of Trade Statistics Yearbook 2008, IMF.

The different patterns of Bangladesh's intra-regional export and import can be understood by huge trade deficit with India and Pakistan, two largest economies in this region. Figure 4 and figure 5 illustrate Bangladesh's bilateral trade with India and Pakistan respectively. From figure 4 it is observed that for a long period Bangladesh continued to have a high trade deficit with India which is worsening over time. Bangladesh's trade deficit with India was US dollar 895 million in the year 2000 which substantially increased to 1.8 billion in 2005.

Apart from high non-tariff barriers, the reason behind this huge trade deficit is high concentration of Bangladesh's export on Ready Made Garments (RMG) products on which India has been imposing relatively high specific tariff.[21] On the other hand India's export is highly diversified and its scale of production is high, probably, due to its huge domestic market. Furthermore, India faces relatively lower tariff for some of its exports to Bangladesh. The continuous and very high volume of bilateral trade deficit with India is a great concern in terms of balance of payment position for Bangladesh. Whether it matters or not is a debate, because Bangladesh is maintaining high trade surplus with United States and European Union. India's main export items to Bangladesh comprise primary agricultural products, processed food, textile and capital-intensive manufacturing. A large share of imports from India is raw materials which mainly used in Bangladesh's export oriented industries like textile and RMG sectors. According to Bangladesh's import policy, any imports of raw materials for export oriented industry are duty free. Therefore, India already has a duty free access in Bangladeshi market for some of its commodities. Such import from India helps Bangladesh to achieve trade surplus with other countries. Similarly, Bangladesh has trade deficit with Pakistan amounting US dollar 92 million in 2005.

Figure 4: Bangladesh's Trade with India

Source: Based on Direction of Trade Statistics Yearbook, Various Issues, IMF.

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[21] Selim Raihan, *op. cit.*

Figure 5: Bangladesh's Trade with Pakistan

Source: Based on Direction of Trade Statistics Yearbook, Various Issues, IMF.

Under SAARC Preferential Trading Arrangement (SAPTA), although tariff has been reduced on large number of products, there has hardly been any increase in Bangladesh's intra-regional export. This is because firstly, the level of tariff cut under SAPTA was not enough. Second, most of the Bangladesh's exportable items was excluded from tariff concession. Third, there was no agreement under SAPTA to reduce non-tariff and para-tariff measures. Furthermore, stringent rules of origin have shrinked Bangladesh's export growth in this region. It is also argued that comparative advantage in similar products and absence of strong complementarities also generated low level of export growth for Bangladesh in this region. Analysis based on revealed comparative advantage ratio, A. R. Kemal[22] found that South Asian countries have comparative advantage in a low range of products. Bangladesh has comparative advantage only in 7 groups out of 71 commodity groups. Similarly, bilateral trade complementarity between Bangladesh and other SAFTA member countries is not strong.[23] This lack of trade complementarity also acted as a constraint to increase Bangladesh's export under SAPTA. But, the counter argument against

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[22] A. R. Kemal, "SAFTA and Economic Cooperation", Paper Presented at SAFMA Regional Conference, August 20-21, 2004, Dhaka, available at: http://www.southasianmedia.net/conference/Regional_Cooperation/safta.htm, accessed on June 11, 2009.

[23] Nihal Pitigala, "What Does Regional Trade in South Asia Reveal about Future Trade Integration: Some Empirical Evidence", Policy Research Working Paper No. 3497, Washington D. C.: The World Bank, 2005, p. 39.

revealed comparative advantage ratio and trade complementarity index is that both of them have been calculated based on existing trade data. In such a case, if South Asian countries maintain a restrictive trade regime then future trade flows in the absence of trade barriers might not be understood by revealed comparative advantage and trade complementarity analysis.

4. Impact on Trade Flows

4.1 Theoretical Consideration

Econometric analyses that try to evaluate trade flows of any free trade area are mainly based on gravity models. Jan Tinbergen,[24] Hans Linnemann[25] and James E. Anderson[26] initially used the gravity model in empirical analysis of international trade flows. Currently, the gravity model has widely been used in quantitative analysis of trade flows because of its strong explanatory power.[27] The gravity model of international trade is based on Newton's gravitational law and used to explain the international trade flows. According to the model, the volume of bilateral trade between two countries is positively related to the product of their GDPs and inversely related to the distance between them. The standard gravity model in log linear form can be stated as follows:

$$Log(Trade_{ij}) = \alpha_0 + \alpha_1 Log(GDP_i * GDP_j) + \alpha_2 Log(DIST_{ij}) + U_{ij} \ldots\ldots\ldots(1)$$

Where,

$Trade_{ij}$ = Bilateral trade between country i and country j;

GDP_i = Gross Domestic Product of country i;

GDP_j = Gross Domestic Product of country j;

$DIST_{ij}$ = Distance between country i and country j;

U_{ij} = Error term; and

$\alpha_0, \alpha_1, \alpha_2$ = Coefficients to be estimated.

[24] Jan Tinbergen, *Shaping the World Economy: Suggestions for an International Economic Policy*, New York: Twentieth Century Fund, 1962.

[25] Hans Linnemann, *An Econometric Study of International Trade Flows*, Amsterdam: North-Holland, 1996.

[26] James E. Anderson , "A Theoretical Foundation for the Gravity Equation", *The American Economic Review*, Vol. 69, No. 1, 1979, pp. 106-116.

[27] Suresh Moktan (2008), "Evaluating the Intra-regional Exports and Trade Creation and Trade Diversion Effects of Trade Agreements in SAARC Countries", *South Asian Economic Journal*, Vol. 9, No. 2, 2008, p. 237.

This standard gravity model is frequently augmented by adding a number of dummy variables to capture the impact of contiguity and historical ties. Dummy variables that normally added are common border, common language, colonial links and common membership in a regional trading arrangement.

Since Jan Tinbergen,[28] a large number of empirical works on international trade efficaciously applied the gravity model to analyse various bilateral, regional and multilateral trading arrangements. When Tinbergen used the gravity model, there was no theoretical basis behind this model. Hans Linnemann[29] first analysed theoretical foundation of the model arguing that this model is a reduced form of a partial equilibrium model of export supply and import demand. According to Linnemann's approach, there are three contributing factors that determine trade flows between two countries, for example home and foreign. The first two contributing factors determine the home country's potential supply and foreign country's potential demand on world market respectively. These two factors include the size of home and foreign countries GDP, population and per capita income. The third factor is denoted as "resistance" factor. Because it represents the "resistance" to trade flows between home and foreign. Resistance factor includes transportation cost and other barriers to trade like tariff, para-tariff and non-tariff measures. In order to get the equilibrium condition of the home country's potential supply and the foreign country's potential demand, a fixed exchange rate and a moderate price level are assumed in both countries. Now, the formula of trade flows from home country to foreign can be expressed by the following equation.

$$Ex_{HF} = \alpha_0 * \frac{(S_H^P)^{\alpha_1} * (D_F^P)^{\alpha_2}}{R_{HF}} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(2)$$

Where,

Ex_{HF} = Potential exports from home country to foreign country;

S_H^P = Total potential supply of home country;

D_F^P = Total potential demand of foreign country; and

R_{HF} = Resistance.

If in equation 2, three explanatory factors are replaced by their determining variables, then it will be similar to an extended form of a gravity equation.[30] A number of theoretical works established the consistency of gravity equation with

[28] Jan Tinbergen, *op. cit.*

[29] Hans Linnemann, *op. cit.*

[30] Mohammad Mafizur Rahman, "A Panel Data Analysis of Bangladesh's Trade: The Gravity Model Approach", *mimeograph*, 2006, available at: http://www.etsg.org/ETSG2003/papers/rahman.pdf, accessed on May 39, 2009, pp. 4, 33-34.

various trade flow models. Incorporating the product differentiation approach, James E. Anderson[31] derived the gravity equation which explains the presence of income variables in the model. On the basis of empirical work on fourteen industrial countries, Elhanan Helpman[32] established a linkage between the gravity model and the monopolistic competition model. After that Alan V. Deardorff[33] derived a gravity model from the Hecksher-Ohlin model both in the case of frictionless trade and with complete specialisation. Most recently, James E. Anderson and Eric Van Wincoop[34] developed a method to estimate a theoretical gravity model which can solve the "border puzzle".

The majority of the studies, which applied gravity models, predict trade potential between pairs of countries.[35] The wider use of gravity model in trade related literatures is twofold. Firstly, econometric studies show that GDP and distance are highly significant in explaining trade flows which is consistent with the gravity model. Secondly, as discussed above, gravity equation is consistent with various theoretical models of trade flows.[36]

4.2 Methodology and Data

4.2.1 Model Specification

Most of the empirical studies on international trade used bilateral total trade as dependent variable. However, it is not possible to analyse the potential export and potential import separately, using total trade as a dependent variable for a given pair of countries. To analyse Bangladesh's potential trade, export and import separately, this study has estimated three gravity models for Bangladesh, using bilateral total trade, export and import as dependent variables respectively. A standard gravity model as stated in equation 1 is adopted by including a

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[31] James E. Anderson , *op. cit.*

[32] Elhanan Helpman (1987), "Imperfect competition and International Trade: Evidence from fourteen industrial countries", *Journal of the Japanese and International Economics*, Vol. 1, No. 1, 1987, pp. 62-81.

[33] Alan V. Deardorff (1998), "Determinants of Bilateral Trade: Does Gravity Work in a Classical World?", in Jeffrey A. Frankel (ed.), *The Regionalization of the World Economy,* Chicago: University of Chicago Press, pp. 7-22.

[34] James E. Anderson and Eric Van Wincoop (2003), "Gravity with Gravitas: A Solution to the Border Puzzle", *The American Economic Review*, Vol. 93, No. 1, 2003, pp-170-192.

[35] Amit Batra, "India's Global Trade Potential: The Gravity Model Approach", Working Paper No. 151, New Delhi: Indian Council for Research on International Economic Relations, 2004, p. 5.

[36] Michele Fratianni, "The Gravity Equation in International Trade", in Alan M. Rugman (ed.) *The Oxford Handbook of International Business*, Oxford: Oxford University Press, 2008, pp. 87.

regional trading arrangement dummy for all these three models of Bangladesh's trade. These three models are stated in equation 3, 4 and 5 as follows.

Gravity model of Bangladesh's trade:

$$Log(Trade_{ij}) = \alpha_0 + \alpha_1 Log(GDP_i * GDP_j) + \alpha_2 Log(DIST_{ij}) + \alpha_3 RTA_{ij} + U_{ij} .....(3)$$

Gravity model of Bangladesh's export:

$$Log(Export_{ij}) = \alpha_0 + \alpha_1 Log(GDP_i * GDP_j) + \alpha_2 Log(DIST_{ij}) + \alpha_3 RTA_{ij} + U_{ij} .....(4)$$

Gravity model of Bangladesh's import:

$$Log(Import_{ij}) = \alpha_0 + \alpha_1 Log(GDP_i * GDP_j) + \alpha_2 Log(DIST_{ij}) + \alpha_3 RTA_{ij} + U_{ij} .....(5)$$

Where,

$Trade_{ij}$ = Bilateral trade between country i (Bangladesh) and country j;

$Export_{ij}$ = Bilateral export from country i (Bangladesh) to country j;

$Import_{ij}$ = Bilateral import by country i (Bangladesh) from country j;

GDP_i = Gross Domestic Product of country i (Bangladesh);

GDP_j = Gross Domestic Product of country j;

$DIST_{ij}$ = Distance between country i (Bangladesh) and country j;

RTA_{ij} = Regional trading arrangement dummy;

U_{ij} = Error term; and

$\alpha_0....\alpha_3$ = Coefficients to be estimated.

4.2.2 Hypotheses

The first explanatory variable is the product of GDPs between Bangladesh and country j which measures the size of the economy as well as the income. The better-off countries usually can spend more on imports from other countries and also attract a large share of other countries' expenditures. Hence, they tend to trade more than the poorer countries and thus the expected sign of the first coefficient is positive in all the three gravity models for Bangladesh. The second explanatory variable is distance which is a good proxy of transportation and information cost of trade. Therefore, a negative sign is expected for the coefficient of distance. The third explanatory variable is a RTA dummy variable for South Asia. When both Bangladesh and its trading partner belong to the same regional trading arrangements then the dummy variable equals to 1, otherwise 0. The estimated coefficient of RTA affirm how much of the trade can be created for establishing a regional arrangements. Very often RTA positively impacts on trade flows between countries, thus a positive sign is expected for this RTA dummy in Bangladesh's gravity model. This RTA dummy is included to analyse the impact of SAPTA on Bangladesh.

4.2.3 Sample Size and Database

For the purpose of estimating the gravity models for Bangladesh, data of 116 countries have been used in this study. These countries have been selected considering the major trading partners of Bangladesh, both in terms of exports and imports, and availability of data. Among the member countries of SAFTA, Afghanistan is excluded because of data constraint. The model is estimated based on cross-section data for the year 2003. Although the panel data approach has some advantages to capture the impact of changes in GDPs on changes in trade patterns, the cross-section data approach has popularly been used to estimate the classical gravity model.[37] The present study has taken the classical approach to estimate three gravity models for Bangladesh's trade, export and import. Annual data on bilateral trade, export and import have been obtained from Direction of Trade Statistics (DOTS) CD ROM database of International Monetary Fund. Data on GDP, at current US dollar, has been collected from World Development Indicators (WDI) CD ROM database of the World Bank. Data on distance in kilometer between capital of Bangladesh and capital of country j has been collected from a distance calculation website (http://www.timeanddate.com/worldclock/distance.html).

4.3 Evaluation of Trade Flows Using Gravity Model

4.3.1 Results from Gravity Models

The results of the Ordinary Least Squares (OLS) estimates of gravity models for Bangladesh are presented in Table 2. The estimated coefficients also reflect the standard features of gravity model with expected sign and magnitude. The estimated results of standard gravity models (without RTA dummy) of Bangladesh's trade, export and import, show that both gravity variables are statistically significant at 1 percent level of significance. In case of model for total trade, the coefficient of $Log(GDP_i*GDP_j)$ is 1.1 means that if the product of Bangladesh's GDP and country j's GDP is increased by 1 percent bilateral trade between Bangladesh and country j will be increased by 1.1 percent, ceteris paribus. In case of SAFTA, this implies that if the member countries experience higher economic growth then trade flows between Bangladesh and other SAFTA member countries will be increased significantly. The coefficient of $Log(DIST_{ij})$, which reflects the transportation and information cost, shows a negative sign as expected. The estimated value of -1.6 reflects that the trade between Bangladesh and country j will be decreased by 1.6 percent as a result of 1 percent increase in bilateral distance between these two countries, ceteris paribus. The R^2 in trade model is 0.68 which means that the model explains 68 percent of the variation of the log of Bangladesh's bilateral trade. Similar to the gravity model of total trade, the estimated coefficients of Bangladesh's export and import models are also

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[37] Amit Batra, *op. cit.*, p. 10.

statistically significant at the 1 percent level of significance and have the expected sign and magnitude. The estimated coefficients reflect that Bangladesh's bilateral export and import are positively related to the product of Bangladesh's GDP and country j's GDP and negatively related to the distance between them. The goodness of fit, R^2 of export and import models are 0.65 and 0.62 respectively, which are also quite nice, given the parsimonious specification.

Table 2: Estimation Results of Gravity Models

	Coefficient without RTA	Coefficient with RTA
Trade Model	**Dependent Variable $Log(Trade_{ij})$**	
Constant	-8.276251 (2.432453)*	-8.513072 (2.852143)*
$Log(GDP_i * GDP_j)$	1.108855 (0.076095)*	1.109944 (0.076725)*
$Log(DIST_{ij})$	-1.566968 (0.229926)*	-1.543314 (0.273751)*
RTA_{ij}	--	0.134338 (0.834933)
R-squared	0.678254	0.678329
Adjusted R-squared	0.672560	0.669713
Export Model	**Dependent Variable $Log(Export_{ij})$**	
Constant	-9.919784 (2.418910)*	-10.51935 (2.877279)*
$Log(GDP_i * GDP_j)$	0.967227 (0.072791)*	0.968975 (0.073222)*
$Log(DIST_{ij})$	-1.151071 (0.221886)*	-1.088686 (0.274595)*
RTA_{ij}	--	0.333675 (0.858642)
R-squared	0.647860	0.648365
Adjusted R-squared	0.641215	0.638319
Import Model	**Dependent Variable $Log(Import_{ij})$**	
Constant	-5.016117 (2.084003)*	-3.623849 (2.556811)
$Log(GDP_i * GDP_j)$	0.797116 (0.077065)*	0.785678 (0.078081)*
$Log(DIST_{ij})$	-1.121134 (0.209066)*	-1.247288 (0.248470)*
RTA_{ij}	--	-0.633045 (0.672389)
R-squared	0.627156	0.632098
Adjusted R-squared	0.616027	0.615375

*Significant at 1% level, Figures in parentheses represents standard errors.

The estimated coefficients of the gravity models with a RTA dummy reveal that GDP_i*GDP_j and $DIST_{ij}$ are statistically significant in all three models but the RTA dummy is not. This implies that South Asian Preferential Trading Arrangements (SAPTA) which came into force in 1995 was not a viable trading arrangement in terms of Bangladesh's bilateral trade/export/import creation. The three rounds of tariff reduction under SAPTA as mentioned in Table 1 do not have any significant impact on existing trade/export/import flows of Bangladesh within this region.

4.3.2 Bangladesh's Potential Trade under SAFTA

In this section, Bangladesh's bilateral trade potential with SAFTA member countries has been estimated using the coefficients arrived at by the standard

gravity model. Bilateral export potential and import potential have also been estimated in order to predict the future flows of export and import separately under SAFTA. The estimated trade/export/import potential and actual trade/export/import are then used to calculate the ratio of potential and actual trade/export/import. If the calculated value of this ratio of Bangladesh's trade/export/import is greater than 1 for any particular country then it indicates that, for Bangladesh, there is a scope of bilateral expansion of trade/export/import with that respective country. Similarly, values less than 1 indicate that Bangladesh has exceeded its trade/export/import potential with respective countries.

It should be noted that the potential trade generated from gravity model is a long run equilibrium situation of bilateral trade/export/import flows. Thus, any type of interventionist policy that interrupts to reach the equilibrium situation, produces a gap between actual flows and long run equilibrium situation, the potential values.[38] In fact, the estimated gravity models used in this study have excluded one important variable which represents barriers to bilateral trade/export/import. This variable includes all sorts of tariff and non-tariff barriers as well as domestic rules and regulations which are usually very difficult to quantify. The actual value of this variable is not similar across countries and heavily differs from country to country. That means different countries impose different level of tariff and non-tariff barriers on imported goods from other countries. These differences of bilateral trade barrier generate different values of the ratio of potential/actual trade. In case of a country's export, if this ratio is greater than 1 (less than 1) for a particular country, then it means that the country's exports face relatively higher (lower) trade barriers to enter into that particular country compared to the rest of the world. Similarly, if the ratio of the potential/actual import is greater than 1 (less than 1) for a particular country, this reflects that this country is imposing relatively higher (lower) barriers on import from that particular country compared to the rest of the world.

Trade potential is nothing but the predicted trade flows estimated from gravity model. The gap between this predicted and actual trade flows can be interpreted as "untapped" trade potential. Now, if it is assumed that the only excluded variable from the gravity models used in this study is trade barrier, then untapped trade potential is the result of this trade barrier. In such a case, bilateral trade may be raised by the amount of this gap as a result of removal of this trade barrier or maintaining similar trade barrier across the world. A country with a higher ratio is considered to be a desirable FTA partner. Lars Nilsonn[39] and

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[38] Chan-Hyun Sohn, "Does the Gravity Model Explain South Korea's Trade Flows?", *The Japanese Economic Review*, Vol. 56, No. 4, 2005, pp. 426.
[39] Lars Nilsonn, "Trade Integration and the EU Economic Membership Criteria", *European Journal of political Economy,* Vol. 16, No. 4, 2000, pp. 807-827.

Matthieu Bussiers *et. al.*[40] used the ratio of potential and actual trade to define the degree of trade integration. An RTA with a country having higher ratio of potential and actual trade can increase bilateral trade substantially, recovering the large untapped trade potential. This recovery is possible if the member countries of an RTA reduce all sorts of trade barriers to a similar level of the rest of the world. If member countries of an RTA completely remove the trade barriers among themselves but maintain existing trade barriers to the rest of the world then the expected increase of trade under that RTA will be much higher than that of the potential trade.

Table 3: Bangladesh's Bilateral Trade, Export and Import Potential within SAFTA

Partner Countries	Actual Trade (Million US$)	Potential Trade (Million US$)	Potential/Actual
Trade Model			
Bhutan	6.22	4.25	0.68
India	1549.56	1268.82	0.82
Maldives	0.40	0.26	0.64
Nepal	7.84	24.49	3.12
Pakistan	138.19	81.45	0.59
Sri Lanka	15.04	13.34	0.89
South Asia	1717.25	1392.61	0.81
Partner Countries	**Actual Export (Million US$)**	**Potential Export (Million US$)**	**Potential/Actual**
Export Model			
Bhutan	2.38	0.87	0.37
India	55.34	163.74	2.96
Maldives	0.01	0.11	11.27
Nepal	2.98	4.44	1.49
Pakistan	42.7	16.08	0.38
Sri Lanka	5.8	3.38	0.58
South Asia	109.21	188.63	1.73
Partner Countries	**Actual Import (Million US$)**	**Potential Import (Million US$)**	**Potential/Actual**
Import Model			
Bhutan	3.84	7.43	1.94
India	1494.22	449.78	0.30
Maldives	0.40	1.00	2.49
Nepal	4.86	26.23	5.40
Pakistan	95.49	62.59	0.66
Sri Lanka	9.24	17.06	1.85
South Asia	1608.05	564.09	0.35

Source: Own calculation based on gravity model estimation

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[40] Matthieu Bussiers, Jarko Fidrmuc and Bernd Schanatz, *Trade Integration of Central and Eastern European Countries: Lessons for a Gravity Model*, Working Paper No 545, Frankfurt: European Central Bank, 2005.

Table 3 represents Bangladesh's bilateral trade/export/import potential with SAFTA member countries. From Table 3 one can observe that Bangladesh has exceeded its trade potential in South Asia in general and with all the member countries except for Nepal in particular, as the value of Bangladesh's potential/actual trade for all SAFTA member countries, except for Nepal, is less than 1. This implies that Bangladesh is trading more with SAFTA member countries than what is predicted by the model, and further scope to improve bilateral trade within this region is very little. Since, bilateral trade adds up both export and import, only analysing the trade potential, it is not possible to predict whether Bangladesh has export potential to SAFTA member countries or not. A careful observation of export potential figures obtained from gravity model of export reveals that Bangladesh has huge export potential to South Asian countries as the value of potential/actual export figure for South Asia is 1.73. The different phenomenon of trade potential and export potential can be realised if we consider Bangladesh's import potential to SAFTA members. The value of potential/actual import is only 0.30 and 0.66 for India and Pakistan respectively, which represent that Bangladesh's imports from these two countries are much higher than the potential imports, predicted by the model. Since, India is the largest economy in South Asia followed by Pakistan, exceeding potential import from these two countries is the main reason for this contradictory feature of Bangladesh's potential trade and potential exports in South Asian region.

Now, let us analyse the viability of SAFTA using this estimated trade potential in terms of Bangladesh's export and import. The value of potential/actual export figure for South Asia is 1.73 which implies that Bangladesh's export to SAFTA member countries will be increased by 73 percent, if trade barriers are reduced similar to the rest of the world under SAFTA. If all sorts of bilateral trade barriers are removed under SAFTA, as mentioned earlier, then the expected increase of Bangladesh's export will be much higher than the estimated potential export. Some studies argue that complete removal of tariff and non-tariff barriers under an FTA could increase export to the potential level.[41] But this interpretation will only be true if tariff and non-tariff barriers are also completely be removed for the rest of the world. However, if the member countries of an FTA maintain the existing tariff for the rest of the world then the outcome from an FTA will be much higher. The magnitude of Bangladesh's export potential is the highest with India. Figure 6 shows the gap between potential and actual export from Bangladesh to SAFTA members. From this figure, it can be observed that Bangladesh has untapped export potential to India amounting US dollar 108.4 million which is almost double to actual export of US dollar 55.34 million. So under SAFTA,

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[41] Pratima Dayal, Abhijit Das, Rashmi Banga, Kavita Iyengar and Shahid Ahmed, *Quantification of Benefits from Economic Cooperation in South Asia*, New Delhi: Macmillan, 2008, p. 46.

Bangladesh's expected export to India will be more than that of untapped trade potential. Considering other members of SAFTA, Bangladesh exceeded its export potential to Pakistan which is around US dollar 26.62 million while the gap is not substantial with Bhutan, Maldives, Nepal and Sri Lanka. Now, the question is what will be the expected export to Pakistan from Bangladesh to whom Bangladesh has exceeded its potential level. A complete removal of tariff and non-tariff barriers can also boost Bangladesh export to Pakistan as there are still some barriers to export from Bangladesh to Pakistan. Obviously this increase in export to Pakistan will not be as high as that to India, since Bangladesh has untapped export potential to India but not to Pakistan.

Figure 6: Gap between Bangladesh's Potential and Actual Export within SAFTA

Source: Based on data from Table 3.

Accordingly, the gravity model analysis of this study shows that Bangladesh has exceeded its import potential from SAFTA members. However, from preceding analysis it can be argued that there is also scope to increase Bangladesh's import from member countries as well by removing all sorts of trade barriers. This trade potential can only be realised by not only removing the tariff barriers but also non-tariff barriers. For example, in the presence of non-tariff barriers, although under SAPTA, bilateral import tariff had reduced (Table 1), the exports from Bangladesh to other South Asian countries had not improved. This might be the underlying reason why RTA variable is found insignificant in explaining Bangladesh's trade/export/import flows within SAFTA region.

5. Conclusion

This study has examined the gravity model to estimate the bilateral trade potential for Bangladesh in SAFTA region. Cross section approach has been performed using OLS estimation technique in EViews package. The analysis of this study is based on the majority of Bangladesh's trade partners. Three gravity models of Bangladesh's trade, export and import have been estimated which fit the data. Estimated coefficients, delivered by the model, found that gravity variables are statistically significant and have expected sign and magnitude. However, the RTA dummy, found by the model, is not a statistically significant variable to explain Bangladesh's trade flows. From the estimated results, it is observed that Bangladesh has export potential to India, Maldives and Nepal. However, Bangladesh has exceeded export potential to Bhutan, Pakistan and Sri Lanka. The magnitude of export potential is very high with India compared to other South Asian countries which generated an overall export potential for Bangladesh in SAFTA region. On the other hands, Bangladesh has import potential from Bhutan, Maldives, Nepal and Sri Lanka while she exceeded import potential from India and Pakistan. The high magnitude of imports from India, compared to potential level, produced that for the region as a whole, Bangladesh exceeded import potential as well as trade potential.

The fundamental objective of this paper has been to find out whether SAFTA will increase Bangladesh's export to other member countries or not. The analysis has shown that Bangladesh has huge potential to increase intra-regional export in SAFTA member countries. According to results from gravity models, Bangladesh can increase its export three times of current exports to India. This new export from Bangladesh to India will be generated if India reduces its import tariff under SAFTA and other restrictions similar to the rest of the world. The expected export will be much higher if all barriers to trade are completely removed. Similar situation can be expected in case of Bangladesh's export to Maldives and Nepal. In terms of export to countries like Bhutan, Pakistan and Sri Lanka, positive effect in terms of export generation might be achieved considering complete removal of trade barriers under SAFTA. Although, Bangladesh exceeded its potential import form SAFTA member countries, it might be increased under the same condition when trade barriers are completely removed under SAFTA. But, the overall increase in import from SAFTA member countries to Bangladesh might not be as large as the overall increase in export from Bangladesh to other SAFTA members. It is relevant to mention that the expected results can only be achieved by free trade in real sense, i.e. goods and services can move freely across countries without any tariff and non-tariff barriers. Unfortunately, the previous attempts of SAPTA have not generated any significant increase in Bangladesh's export because of much tougher non-tariff barriers faced by Bangladeshi exports particularly in Indian market.

Finally, the expected outcomes are fully dependent on successful implementation of SAFTA agreement which depends on political stability in this region particularly between India and Pakistan. The political tension between India and Pakistan delayed the progress of SAFTA several times. To increase intra-regional trade under SAFTA, some other important issues need to be resolved also. These include reducing the size of sensitive list, settling appropriate rules of origin, improvement of physical infrastructure and cracking the problem of illegal border trade. Until and unless such issues are properly identified and resolved, the expected benefits from SAFTA cannot be realised. With a view to realising fully the potential benefits of SAFTA, this study suggests the following measures, which the policy makers of Bangladesh as well as other member countries might take into consideration:

- Emphasis should be given on the successful implementation of SAFTA agreement within its scheduled time. Although, SAFTA treaty came into force in 2006, there are some additional instruments which are supposed to be fully implemented by the year 2017.

- Bangladesh should take initiatives to fully eliminate all types of trade barriers including non-tariff barriers, especially which are involved in case of export from Bangladesh, in order to enhance Bangladesh's export as predicted by this study.

- To get the full benefit of SAFTA, the size of the sensitive list should be shortened. This will also reduce the informal trade across SAFTA member countries.

- SAFTA member countries should give transit facilities to each other to facilitate trade among them. If India gives transit facility to Bangladesh to export goods to Nepal and Bhutan, Bangladesh's export to these two countries would increase considerably. Similarly, Bangladesh can easily get access to Pakistan and Afghanistan market. This brings the issue of connectivity in its broader perspective.

- Since Bangladesh's exports are heavily dependent on a very few commodities, It should diversify its export basket and maintain proper quality of its exports.

- Finally, all member countries of SAFTA should jointly try to resolve the political conflicts within the region, thereby generating a common political will and commitment for cooperation in the region.